CABA Public Research Library (Updated: June 20, 2016)

The following reports are made available to CABA members through the CABA Research Library.

(IS-2012-131) Emerge Alliance Control Applications
This report from the eMerge Alliance describes how to enhance the energy-related performance of building automation systems with the addition of sensors and distributed controllers in a mesh network at the fringe of the system. These sensors include daylight, motion, temperature, air quality, etc. Local power sources or power harvesting from heat, motion, or light are recommended instead of batteries. Data from these sensors could be processed and displayed on an energy dashboard. Other applications include enterprise-level control and participation in smart-grid demand response programs.

(IS-2012-130) Benefits and costs of improved IEQ in U.S. offices
This report from Lawrence Berkeley National Laboratory examines the costs and benefits of system that improve indoor air quality (IAQ). Improvements are possible with small increases and sometimes savings in the energy costs for operating a building. The objective is to increase the ventilation rate (VR) by up to 50%. The technology uses economizers attached to HVAC equipment for gathering outdoor air. A key finding: "The estimated benefits of the scenarios analyzed are substantial in magnitude, including work performance increases, reductions in SBS [Sick Building Syndrome] symptoms, absence reductions, and thermal comfort improvements in millions of office workers."

(IS-2012-129) How ClimateTalk™ Open Standards Complement Smart Grid Objectives
This report introduces the plans by the ClimateTalk™ Alliance to specify interconnections for HVAC and water heating equipment to participate in energy management programs. This equipment accounts for as much as 60% of home energy costs. The ClimateTalk Alliance specifications provide relatively low-cost interconnections to an energy management system. The positioning of an energy management system between a smart grid and end-devices reduces the communications complexity and cost for connecting HVAC and water heating equipment to a home network. A Universal Serial Bus (USB) with Plug and Play provides the interconnection.

(IS-2012-128) Is the time ripe for gas demand response?
This report from principals at the Brattle Group examines the effectiveness of managing natural gas consumption by residential customers. Electric companies are increasing the consumption of gas for running electric generators at peak times. This is causing fluctuating gas prices during the day. Decreasing residential

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consumption through thermostat setbacks by a few degrees is proposed. The authors claim that customers would accept such programs based on some studies in Canada and the United States.

(IS-2012-127) Assessment of Demand Response and Advanced Metering
The report from the United States Federal Energy Regulatory Commission (FERC) is the 2011 annual survey requested by Congress on demand response programs for all class of customers. Smart meter deployments increased from 8.7% to 13.4% between 2009 and 2011. Privacy protection for the more frequent consumption data collected is discussed. FERC is requesting that demand response be considered on par with generation when planning regional energy requirements. Demand response programs and actions by various states are summarized.

(IS-2012-126) The Old Model Isn't Working: Creating the Energy Utility for the 21st Century
This report from the American Council for an Energy Efficient Economy examines the financial deterrents for utilities to invest in energy efficiency programs. The issues are program cost recovery, lost energy sales, and maintaining investment returns for shareholders. The cost for energy savings programs is up to four times less than the cost of supplying that energy. Some costs are treated as expenses or short-term capital projects, or recovered through a customer charge. Some utilities are allowed frequent rate adjustments. Some utilities are offered performance incentives.

(IS-2012-125) Considerations in Broadband Architecture Moving to FMC
This report from the Broadband Forum examines trends among telecommunications providers to integrate customer services for voice, video, and Internet across wired and wireless media. This combined system is called Fixed/Mobile Convergence. There is a movement toward sharing a network transport infrastructure. Connectivity is provided via the wireless network or wired, which offers improved quality of service. Operators may combine customer databases and bills for wired and wireless services. The objective is to provide a uniform Quality of Experience to customers. The organizations involved in convergence technology are reviewed.

 (IS-2012-124) TR-069 Deployment Scenarios
This report from the Broadband Forum describes the TR-069 specification, CPE WAN Management Protocol (CWMP), for network management of a variety of telecommunications data services. TR-069 specifies local area network management of devices such as residential gateways and set-top boxes. It can also enable new services such as managed Wi-Fi, content filtering, Internet time blocking, online backup, and home surveillance without a site visit. Future plans this and related specifications are discussed.

(IS-2012-123) Smart Buildings: Ten Trends to Watch in 2012 and Beyond
This report by Pike Research provides a brief overview of current smart building technologies and presents a forecasting of ten trends on these smart building technologies including mature technologies like submetering and evolving new technologies like Cloud-based building energy data management, automatic demand response, and building information modeling.

(IS-2012-122) Sustainable Industries: Parallels to the Internet Boom, Bust...and...Rebirth
This four-page report provides a very short overview of the clean energy sector (in comparison to the lifecycle of the Internet) with 2009Q1-2011Q3 data for global venture capital and private equity new investment, global merging & acquisition volume, and global asset financing of new build clean energy assets.

(IS-2012-121) E-communications Household Survey
This is the Special Eurobarometer 362 co-ordinated by Directorate-General Communication. The survey was carried out by TNS Opinion & Social network. The Interviews were conducted among 26.836 EU citizens in the 27 member states. It is a statistic presentation of how the households in EU uses and/or have access to fixed telephone lines, mobile phones, computers and the Internet in 2011. There are comparisons between two other surveys in 2007 and 2009.

(IS-2012-120) Information Marketplaces - The New Economics of Cities
Cities have for centuries developed solutions for the physical aspects of urbanity but the use of information has just started. To use information as an asset in creating smart cities is necessary and there is a huge amount of information or raw data collected in a city that can be refined and used by entrepreneurs to create values and benefits for citizens. The report discusses how to connect smart cities to values and how to build city value chains. Examples from NY, Rome and London and other cities are provided on how information has been used to create values for the city and the citizen.

(IS-2012-119) A Policy Framework for The 21st Century Grid: Enabling Our Secure Energy Future
The paper emphasizes on Recommending Policy Framework for development of Smart, Modernized and Scalable Grid for Clean Energy future of the USA. One of the major focus of the paper has been installation of ICT for the electricity sector. The recommended policy framework in the paper has been an outcome of an extensive outreach and research process for identification of policies for enhancement of the Smart Grid Investments and creates a useful support to the Clean Energy Strategy of the Administration. The paper on one hand includes the

modernization of the Grid, on the other hand it also throws light on care of HV T&D lines as well as facilitating integration of variable renewable energy.

(IS-2012-118) PV Pricing Trends: Historical, Recent and Near-Term Projections
In recent years, the no. of installations of PV has been showing firm uptrend in the USA and globally. This paper presents useful information regarding carefully studied pricing movements based on its various criteria of impact and further examines the possibilities of PV stakeholders for transition towards Market-driven PVs. The paper ends with useful recommendations in form of suggestions to enable the PV pricing in the USA to match that of in Germany by indicating substantial cost reductions in the BOS.

(IS-2012-117) Assisted Living installation practice
This paper from the Foundation for Assistive Technology (FAST) discusses the importance of good installation practice. It presents experiences from a project aimed to refining and develops activity monitoring service using learning from 300 installations. It shows that it takes different skills to handle the preparation and installation of an assistive system and there is no guidelines or standards to use. It also presents the results from two concurrent online surveys, one for installers and one for commissioners of telecare and telehealth. It finally wraps up arguing for more and new training and education in the sector.

(IS-2012-116) Smart Metering Implementation Programme
This paper shares their experiences at different hierarchical levels in Smart Metering Implementation Programme in the UK. The paper initially begins with sharing of Conclusions and Consultations. Later, the background and progress of the programme. Later the paper puts forth the Vision and Strategic Context of the programme. Additional ideas regarding the programme have been also presented. The paper ends with indicating future areas for work with Forward Look and Conclusions Sections.

(IS-2012-115) Utility Scale Smart Meter Deployments, Plans and Proposals
This paper nicely compiles and summarizes current smart meter installations in the UK, as well as planned deployments and proposals, by investor-owned utilities, large public power utilities, and some rural electric cooperatives. Based on submitted and approved proposals, important and useful information regarding the responses to survey questions and other public information have also been included.

(IS-2012-114) Smart Metering for Electric and Gas Utilities
This paper provides detailed and useful information on Smart Metering for Electric and Gas Utilities. Useful guidelines with relevant issues especially regarding implementation have been clearly identified and discussed. Cost benefit analysis and support from Oracle have also been quite interestingly put forth. However, the reviewer suggests that involvement and discussions with organizations such as ISA, IEC, IEEE, IET, etc. and many other MNC manufacturers, Worldwide Solution Provider Companies, shall be useful in further enhancement and further generalization of the paper to increase its spread.

(IS-2012-113) Achieving High Performance Through Solar Photovoltaic (PV) Integration
This paper begins with Accenture's Study on Impact of high penetration of Solar PV. Later in Section-I, the paper describes Trends, Opportunities and Challenges for Solar PV and its integration, subsequently in Section-II, the paper suggest useful guidelines on Recommended Actions and New Business Models for high penetration for Solar PV and its integration. The paper ends with Concluding Notes at the end.

(IS-2012-112) Smart Cities
This document described the Smart Cities project that has been established in Northern Europe. The project aims to form a collaboration between government and academic partners to develop and deploy electronic services across cities. This unique transnational consortium will share experiences and best practices across the region, especially in the area of electronic delivery of government services. It includes the focus on six work packages, including User Profiling and Wireless services, and identifies the participating cities that will pilot the technology.

(IS-2012-111) Mobile Payment – Stepping into Uncharted Territory
This report from Parks Associates examines the growth of the mobile payment industry. A mobile payment is described as a purchase for which a mobile phone is used in the payment process. These payments can be made in-person or remotely. The market for merchants is large as only 30% of U.S. merchants currently accept payment cards. Mobile payment technologies provide a gateway between consumers and merchants, allowing more merchants to accept payment cards and allowing more variety in where consumers can make purchases. Predictions in the growth of the mobile payment market are discussed.

(IS-2012-110) Trends in Digital Gaming: Free-to-play, Social and Mobile Games
This report from Parks Associates explores current trends in digital gaming. Most gamers are casual gamers and have been attracted to the gaming world by social or free-to-play games through platforms like smartphones and tablets. Free-to-play games allow players to play for free and only pay when they want to enhance their gaming

experience. Social/Facebook games are often viral and can scale up their user base very fast. The number of mobile phone gamers is on the rise with the increase of smartphones. Tablets will have a large impact on the mobile gaming market and its monetization potential. Revenue models for mobile gaming are discussed.

(IS-2012-109) Impact of Smart Grid on Connected Homes 2012 Study: Executive Summary
In 2012, CABA conducted the Impact of Smart Grid on Connected Homes Landmark Research study with the objective of greatly improving the understanding of residential Smart Grid development and deployment in terms of: identifying market demand and growth areas for new products; comparing competing product strategies and communication of competitors; determining product preferences for end-users; developing messaging that resonates with the target audience; defining critical success factors to expand product offerings to end-user markets; and establishing a market approach and foundation for strategic decision-making efforts.

(IS-2012-108) The Internet of Things (a Cisco white paper)
The number of Internet-connected devices is growing faster than the number of people on the planet, and surpassed the world population in 2008. Looking forward, this Cisco white paper presents an Internet vision based on different types of sensor devices, communicating across disparate networks, under a common set of standards.

(IS-2012-107) UPnP Forum Update
This slide deck describes the Universal Plug and Play (UPnP) organization, its technology & certifications, its market momentum, 2011 achievements, and future plans.

(IS-2012-106) The Business of Health & Wellness: Engaging consumers and making money
Cambridge Consultants distils key findings from discussions on the future of the health & wellness market, the nature of the market, factors leading to consumer engagement, and the future of technology, products and business models in this space. One view is that sustainable revenues will only come from reimbursement for solutions that demonstrate a reduction in healthcare costs, while another approach targets consumers directly, encouraging them to improve their own health and wellbeing.

(IS-2012-105) Exploring the Digital Nation – Home Broadband Internet Adoption in the United States
This report by NTIA and the Economics and Statistics Administration presents the most accurate statistical profile of home broadband services adoption, citing Census data that shows that disparities among groups still persist. Persons with low incomes, seniors, minorities, the less-educated, non-family households, and the unemployed tend to lag behind others groups in home broadband use.

(IS-2012-104) Broadband Forum: Value Proposition for Connected Home
This report outlines the value proposition that The Broadband Forum (BBF) brings to Service Providers and consumers to enable the next generation family of value-added managed services for the Connected Home, such as Home Monitoring, Control, Security, Media, Health, Energy management, and others via its evolving set of standards. Connected Home Services are usually described as web based cloud services that provide consumer applications, delivered over a broadband Internet connection, to various in-home devices.

(IS-2012-103) The Tablet Revolution and What it Means for the Future of News
Eighteen months after the introduction of the iPad, 11% of U.S. adults now own a tablet computer of some kind, and about half (53%) get news on their tablet every day. They spend about 90 minutes reading long articles and browsing headlines, but most say they would not pay for news content on these devices. Tablet news users also say they now prefer their new devices over television, PCs or print publications as a way both to get quick news headlines and to read long-form pieces.

(IS-2012-102) Exploring the Digital Nation: Computer and Internet Use at Home
This report by the US Economics & Statistics Administration and National Telecommunications & Information shows that just over 68% of households subscribe to broadband services and that broadband adoption varies across demographic and geographic groups. Lower income families, people with less education, those with disabilities, Blacks, Hispanics, and rural residents generally lag the national average in both broadband adoption and computer use.

(IS-2012-101) HOME Networking Foundations: From LANs to RF Distribution to Windows 7
This Advantage Series from CE Pro contains four related articles about key aspects of home networking, including: (1) Networking Basics FAQ, (2) Designing Virtual LANs to Bridge A/V & IP Networks, (3) 5 Reasons Windows 7 is Good for Installers, and (4) RF Distribution: A Refresher Course.

(IS-2012-100) Cloud Computing for Electronics (an IBM White Paper)
From consumer electronics to medical devices, industry sub-segments are all trying to respond to lower consumer spending and stricter access to capital in their own unique ways. This paper provides a view of cloud computing for the electronics industry and describes the technologies and functions required to improve efficiency, reduce costs and enable new capabilities.

(IS-2012-99) Seventh Broadband Progress Report and Order on Reconsideration
The FCC is required to conduct an annual inquiry concerning broadband deployment, and this latest report shows that still too many Americans remain unable to fully participate in our economy and society because they lack broadband access. As many as 26 million Americans live in areas unserved by broadband, and about one-third don't subscribe due to barriers such as cost, lack of digital literacy, and a perceived lack of need.

(IS-2012-98) ZigBee: Expanding Communication Services
This paper presents ZigBee as a special opportunity for the global telecom industry to innovate by building large-scale solutions based on the "Internet of Things." With support for thousands of devices in a single multi-hop network, the ZigBee standard provides a low power, low data rate, and low cost solution that's ideally suited for personal area network applications in telecommunication devices.

(IS-2012-97) Mobile Medical Applications – Draft Guidance
This draft guidance when finalized will represent the U.S. Food and Drug Administration's (FDA's) current thinking on this topic. Its purpose is to inform manufacturers, distributors, and other entities about how the FDA intends to classify and regulate select software applications intended for use on mobile platforms (mobile applications or "mobile apps"), depending on risk.

(IS-2012-96) Connecting the Dots: Business Megatrends and Our Industry 2010
This marketing white paper by Stiernberg Consulting lists 12 megatrends as companies in the entertainment technology, music products, and AV systems industry emerge from the economic downturn of 2008 leaner, meaner and better equipped to serve customers than ever before.

(IS-2012-95) Residential Building Retrofits Working Group Blueprint
This presentation by The Residential Building Retrofits Working Group of the State and Local Energy Efficiency Action Network (SEE Action) provides a vision of the Home Energy Upgrade Market, market sizing, forecasts, barriers to expansion, and working group priorities and target projects.

(IS-2012-94) Measuring Broadband America
This report presents the detailed results of the first rigorous, nationwide study of actual home broadband performance in the United States, based on a study of the 13 largest broadband service providers, which collectively account for approximately 86% of all U.S. wireline broadband connections.

(IS-2012-93) Cloud Computing for Electronics (an IBM Executive Report)
Globalization, deregulation, commoditization and the impact of the Internet have been significant drivers of business transformation, particularly in the electronics industry. Cloud computing can help companies cope with rapid change, and this paper describes what's needed to improve efficiency, reduce costs and enable new capabilities, by significantly reducing the distances and costs between companies and their customers, and by improving their operational dexterity and customer focus.

(IS-2012-92) Beyond content (an IBM Executive Report)
Media consumption has not just gone digital; it's connected. Consumers of all ages are trading printed books for e-readers, traditional television for Internet-connected TVs and mobile phones for smartphones, as well as adding new device categories – like tablets. While these new devices present opportunities to further engage consumers, they also trigger disruption in the established media ecosystem as new entrants compete for consumer loyalty. So Media and Entertainment (M&E) companies must now focus on enhancing the consumer experience, embracing new distribution platforms and expanding revenue models through digital content.

(IS-2012-91) The connected consumer challenge (an IBM Executive Report)
IBM's latest industry study provides insights that help electronics companies expand their traditional manufacturing focus and think more about what their products actually do, with an increased emphasis on software & service development, IT infrastructure, and open collaboration to glean customer insight.

(IS-2012-90) Consumers driving the digital uptake
This paper from IAB Europe summarizes McKinsey & Company market research assessing the consumer value of free – i.e. Internet advertising supported – digital services. A key finding is that user benefits from Web services are significantly larger than the advertising revenues, user interruptions, or privacy issues associated with those ads. This value is six times larger than what they are willing to spend to avoid the advertising disturbance and privacy risks.

(IS-2012-89) Economic Value of the Advertising – Supported Internet Ecosystem
This paper by two Harvard consultants summarizes an ad industry-funded study of the size, scope and benefits, both social and economic, of the "advertising supported Internet" and lists the bigger companies in each Internet segment, including service providers, hardware & software companies, consulting firms, content sites, etc. While a narrow view would look only at the $23.4 billion spent on paid advertising, the broader view of this study considers also the Companies with websites to connect with customers & job seekers, Politicians using the Web

to explain their positions on issues, and Government Agencies striving to electronically serve citizens.

(IS-2012-88) Digital Omnivores: Insights into Today's Connected Consumer
This publication is a presentation on digital devices. It analyzes the impact of digital devices that connect consumers beyond the personal computer (PC). It describes how these digital devices have penetrated and are changing consumers' media consumption habits and how do consumers utilize these devices separately and in tandem to access digital content.

(IS-2012-87) Data Needs for Achieving High-Performance Buildings
The report discusses the data needs for measuring the performance of commercial buildings. In addition to energy usage data, other identified high-performance building attributes include safety and security, accessibility, cost effectiveness, water use and indoor environmental quality.

(IS-2012-86) Utility Cyber Security
This report from Pike Research was published in the fourth quarter of 2011 and provides a perspective on seven cyber security trends to watch within the smart grid space. Based upon 18 months of research by Pike Research, they provide forecasts of cyber security investments partitioned by region and segments through to 2018. The report continues on to expose that the lack of enforceable standards and the aging infrastructure could lead to vulnerabilities for the smart grid, and suggests that a system-level consideration of security must be followed. The report finishes up by proposing the top five most promising solutions to solving some of these smart grid cyber security concerns, including control network isolation and data encryption.

(IS-2012-85) Top 50 Technologies, TechVision 2020 Program
The paper highlights and evaluates top 50 technologies, relative research and funding which are going to influence the world by 2020.

(IS-2012-84) Next-generation television The need for home networking in Europe
The paper highlights and evaluates contemporary home networking standards, equipment, devices, TV set top boxes, Satellite boxes, Wireless Accesspoints, IPTV etc. The paper also highlights how complex future home network will be and addresses the solution.

(IS-2012-83) Proposal for Europe's Energy Efficiency Plan 2011
The proposal is meant to set up the framework to help achieve EU target of 20% primary energy saving by 2020 and for even more, further in the future. For the public sector, the proposal outlines rules for renovation and

purchasing building outlining high energy efficiency standards. Energy audits are also required for large companies and also set out regulations for energy companies for billing and metering. For the energy sector, there are new guidelines that need to be followed when refurbishing old electricity generation installations or building new ones certain requirements must be met. Finally the proposal requires an assessment to be done in 2014 to determine of the goals for 2020 can be met.

(IS-2012-82) Europe's Energy Efficiency Plan 2011
EU's goal is to have 20% less of its projected primary resource consumption by 2020. EU is currently on course; they are 10% less then projected. The next step is to take steps to reducing energy consumption in the following areas: building, transportation and products and process. The document also talks about challenges such as legal obstacle and training required for them to reach these goals. The document talks about what type of support can be expected from various institutions one can expect when making energy efficient changes.

(IS-2012-81) A Flair for Sharing – Encouraging Information Exchange Between CERTs
With the increased use of the internet for almost everything in today's society there is a need for more security. We need to create security with respect to fundamental human rights. Due to the nature of the internet it is important for countries to share information about security issues and attacks on Critical Information Infrastructures. The purpose of this paper is to identify several factors and perform an assessment on what effects they can have on cross-border information sharing between national and government CERTs (Computer Emergency Response Teams)

(IS-2012-80) Using Electrical Vehicles to Meet Balancing Requirements Associated with Wind Power
Due to the fact that there is a large range in the amount of energy produced by wind generation there is often an imbalance on the grid. One solution to handle this imbalance is to utilize plugged in hybrid and electric vehicles. The report looks at both charging and discharging strategies for balancing the power grid.

(IS-2012-79) The ROI of Cloud Apps
This paper looks at the long term and five year value of cloud applications for business and what, if any, benefits does it have. The analysis involves the following categories: customer relationship management (CRM), enterprise resource planning (ERP), collaboration (including email), and IT service management. The document then gives recommendations of the best way to get value from cloud applications.

(IS-2012-78) Applying Privacy by Design Best Practices to SDG&E's smart Pricing Program
The document describes certain privacy issues related to SmartGrid data and how San Diego utility (SDG&E) dealt with them. The document talks about protecting customer's privacy and the results from using PbD (Privacy by Design) principles in the planning of the Smart Pricing Program. The report was developed jointly with the office of the Information and Privacy Commissioner of Ontario.

(IS-2012-77) Global Smart Grid Federation Report
The document surveys the activities undertaken by the Smart Grid Federation and looks at the key opportunities and challenges of each. The document shows the importance of sharing and collaboration, which will enable the transformation of the energy infrastructure. The document looks at the situation in individual countries and what they are doing to achieve a smart grid as well as what role the government is playing in these projects.

(IS-2012-76) Capturing the Full Electricity Efficiency Potential of the U.K.
Results of a study on UK electricity demands and potential for demand reductions. This document also takes into consideration new electrical demands such as hybrid cars. The project plans to target the three largest categories per sector. Major barriers are discussed as well as design options.

(IS-2012-75) Clean Energy Solutions for American Cities
Even though America is having economic trouble, the majority of the cities are still committed to reducing energy consumption by implementing new energy efficient technology. This presentation looks at what are the most common and popular technologies that are being implemented currently and what are the goals of individual cities strategies. The document also looks at major partners and the types of funding that is given for different technologies. All the information is given in clear charts and graphs that are easy to follow.

(IS-2012-74) The U.S. Smart Grid Revolution – Smart Grid Workforce Trends 2011
The GridWise Alliance with the help of KEMA has performed market research on the U.S. utility industry and its workforce. This document is intended to shed light on the aging workforce issue in the United States and offer solutions for training and re-training the existing workforce to deal with the advent of the smart grid.

(IS-2012-73) Affluent Consumers in a Digital World
This paper summarizes and puts into context the results of a survey conducted by Ipsos Mendelsohn in 2011 about the impact of digital advertising in the US between households with greater than 100K total income and those with less.

(IS-2012-72) Sustainable Competitive Advantage: The 4th Economic Revolution

This paper looks at sustainability from 5 key areas namely: collaborative growth and efficiency; zero waste; renewable resource; climate resilience; and eco-performance measurement. The areas are proffered as organizational competencies and examples are given of different companies that use them to effect change and drive sustainable competitive advantage.

(IS-2012-71) 2011 Technology Map of the European Strategic Energy Technology Plan

The report is prepared by the Joint Research Centre of the Economic Union. This report addresses 20 different technologies, covering the whole spectrum of the energy system, including both supply and demand technologies. Included in the report are: a concise authoritative assessment; current and future market penetration; barriers to deployment; and reference values for operational and performance modeling. This report is an excellent reference for understanding the current and future direction of low-carbon energy technologies.

(IS-2012-70) Renewable Energy Facts and Fantasies

This book contains a series of interviews with 25 subject matter experts in the area of renewable energy. The book, authored by the editor of 2GreenEnergy.com, is grouped into three areas: technology; politics; and, advocacy, economic and other issues. A handy and easy to understand primer on the basic physics involved in renewable energy is included. At times opinionated, it is however accessible and easy to read. The areas covered are both wide ranging and topical.

(IS-2012-69) The 2011 State Energy Efficiency Scorecard

This 2011 report, published by the ACEEE (American Council for an Energy-Efficient Economy), presents an assessment of the policies and programs that are being implemented to improve energy efficiency. Each state is ranked based upon a scorecard which reflects their leadership in developing policies and programs, and considers various components such as utility and transportation policies, and building codes. The results are compared against a 2010 benchmark which allows us to review the progress that each state has made. The report also provides perspectives on what they consider are the most effective policies and projects. Overall, the data presented is useful in understanding the best practices across the states and what is the current strategy within each state.

(IS-2012-68) Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism, 2011

For the past decade, since the September 11, 2001 attack and anthrax events, the United States has grappled with how to best prepare for public health emergencies. This 90-page report, from the Robert Wood Johnson

Foundation and the Trust for America's Health, details specific programs at-risk for major cuts or elimination due to austerity. The report examines areas with major gaps in federal policies and offers recommendations for improving all-hazards preparedness. It also inspects state and local public health budget cuts; provides a review of 10 years of progress and gaps in preparedness; presents a timeline of major public health preparedness events; and reviews several special other topics.

(IS-2012-67) 2012 State of the Consumer Report
This market research report, by the Smart Grid Consumer Collaborative, examines low consumer awareness of smart grid and smart meters, overall attitudes toward the technology, interest in smart grid/meter-enabled programs, what benefits resonate with different consumer segments, and best practices in promoting the smart grid and energy management.

(IS-2012-66) The Seven Steps to Strategic Facilities Capital Planning and Management
A seven-step guideline an organization may take for improving property portfolio management. (Define the process; Gather data; Analyze benchmarks; Prioritize capital projects; Demonstrate impact of funding; Create defensible budgets; and Develop process for continuous update). Each step is described in detail.

(IS-2012-65) White Paper: Wireless Smart Grid Communications-A Mesh v/s Point-to-Multipoint Comparison
This paper provides detailed and useful information about various wireless topologies for applications development such as AMR, AMI, DA and SCADA. It also provide useful guidelines for making choice of final topology among available options for implementation. Interesting comparative analysis have been provided by including almost all applicable parameters of comparison.

(IS-2012-64) The Future of the Electric Grid – An Interdisciplinary MIT Study
This report, the fifth in the MIT Energy Initiative's Future of series, aims to provide a comprehensive, objective portrait of the U.S. electric grid and the identification and analysis of areas in which intelligent policy changes, focused research, and data development and sharing can contribute to meeting the challenges the grid is facing. It reflects a focus on integrating and evaluating existing knowledge rather than performing original research. Authors hope it will be of value to decision makers in industry and in all levels of government as they guide the grid's necessary evolution. The Report identifies the challenges and suggests valuable recommendations for resolving them with an aim of Reliable-Efficient-Effective-Scalable and Customizable Smart Electric Grid.

(IS-2012-63) Draft NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 2.0
This document, Release 2.0 of the NIST Framework and Roadmap for Smart Grid Interoperability Standards, details progress made in Phases II and III of NIST's three-phase plan since the establishment of the Smart Grid Interoperability Panel (SGIP) in November 2009.

(IS-2012-62) Guide to Developing a Cyber Security and Risk Mitigation Plan
This document is intended to help cooperatives develop a cyber-security plan for general business purposes and think about security in a systematic way, consistent with the current Federal thinking. The basic concept is not "do this and you are secure" but a commitment to a process of continuous improvement.

(IS-2012-61) Smarter Home & Digital Convergence: Transforming Consumer Electronics, Media & Entertainment and Telecommunications Industries
This paper summarizes key technologies for deploying cloud services in smart homes with digital convergence. The focus is on cloud functions for home management. IBM Dallas Demo Center is highlighted to justify the deployment of related technologies and services. The key contribution of this paper is related in justifying the distributed infrastructure control of smart homes via cloud technology.

(IS-2012-60) The Potential of Smart Meter Enabled Programs to Increase Energy and Systems Efficiency: A Mass Pilot Comparison
This report by VaasaETT Global Energy Think Tank summarizes the findings of 100 consumption reduction pilots involving 450,000 consumers from Europe, USA, Canada, Japan and Australia. The report assessed these pilots in three general areas: energy conservation, peak clipping and bill reduction. A number of different feedback and information channels were analyzed, with In Home Display providing the highest reductions in consumption. Consumers also reacted positively to various dynamic pricing models with a pilot participant satisfaction of 75 to 90% and have a lasting effect over a number of years. Consumption reductions varied within individual programs, and surrounding variables have a substantial impact on program success levels over and above supportive technology used or program structure. A utility rollout program strategy is provided. Smart meter enabled programs are consistently effective when developed in accordance with the needs of end consumers and enabled through constructive regulation. The report is extensive and provides a good reference summary of a number of consumption reduction pilots from five global regions.

(IS-2012-59) The Long Term Energy Efficiency Potential: What the Evidence Suggests
This report by the ACEEE builds on historical USA energy efficiency investments and their contributions to the nation's economic well-being. It highlights three economy wide, long-term scenarios that explore contributions in

more energy efficient behaviors and investments might play to reduce overall energy use by 2050. The three scenarios cover residential, commercial, industrial, transportation and electricity power sectors. Detailed analysis by sector is provided. Net projected economic benefits total $12 to $16 trillion cumulatively over the 39 year long time horizon, representing a 42 to 59% reduction in energy usage and net projected annual gains in GDP of $100 to $200 billion by 2050. This report provides an economic analysis suggesting the need for further investment in energy efficiency, and the significant positive impact that would be a result.

(IS-2012-58) Visible and Concrete Savings: Case Studies of Effective Behavioral Approaches to Improving Customer Energy Efficiency
This report by the ACEEE covers 10 selected case studies of successful behavioral programs that contribute to energy reduction. Although limited in number, the case studies cover programs that provide long term, cost effective and significant energy savings in three areas: buildings & utilities, industry and transportation. Recommendations cover various programs, including: web sites & in home displays, pay-as-you-go, advanced billing, corporate management, labeling, social norms and networks, and market segmentation. Summaries are provided in table format and include quantified results. This report is a good overview of a variety of successful behavioral based energy reduction programs.

(IS-2012-57) Aging in the Connected Home Executive Summary
The CABA Aging in the Connected Home 2011 research study is a collaborative, industry-funded research program that brought together organizations from the healthcare sector with connected home solutions providers. As Baby Boomers reach retirement age, 71 million Americans will be over the age 65, in which 90% indicate that they wanted to remain in their homes. As such, home healthcare services, as well as products designed to help the aging adult move through their home and interface with their home in a safe and efficient manner have seen rapid growth in demand. The objective of this study is to determine the key needs of the seniors and their caregivers as they seek to maintain their independence. The Framework for Social Impact is the methodology employed to identify these issues. Understanding the needs of seniors and their caregivers is vital to the design of products, services and home solutions that will enable the aging to maintain their independence in their homes. A thorough understanding of the unmet needs of aging seniors, and their caregivers, as well as the constraints that prohibit them from remaining in their homes, will provide the necessary stimulus for true innovation amongst healthcare providers and home solutions providers in optimizing the development, design and utilization of the connected home. The report was prepared for the Continental Automated Buildings Association (CABA) by Sandra Bates, President, The Innovation Partners and covers Healthcare Providers and Home Solutions Providers. The study participants were comprised of Ascension Health, Ingersoll Rand/Trane/Schlage, TELUS and United Health Care.

(IS-2012-56) Smart Grid Impact on Intelligent Buildings 2011 Executive Summary
The broad purpose of this collaborative research study was to identify, define and size the principle business opportunities presented by the growth of smart grids, in relation to intelligent buildings. The research provides a market size forecast and roadmap for smart grid and intelligent buildings, contributing to business process transformation deemed necessary to capitalize on investments in smart technology.

(IS-2012-55) State of the Connected Home Market 2011 Research Study Executive Summary
In 2011, CABA conducted its fourth wave of the State of the Connected Home Market Landmark Research, to update its understanding of North American consumer attitudes and behaviors about "connected home" products and services. The research was previously conducted in 2003, 2005 and 2008. The broad purpose of this study is to validate past and current trends, and to characterize consumers' understanding of the connected home today, and in the future. The 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. Organizations that participated in CABA's State of the Connected Home Market 2011 study included: 3M Company, ADT Security Services, Best Buy Co., Inc., Broan-NuTone LLC, BSH Home Appliances Corporation, Carrier Corp., Consolidated Edison Company of New York, GE Energy Services, Honeywell International, Hydro One Networks Inc., IBM, Ingersoll Rand/Trane/Schlage, Landis+Gyr, Microsoft Corporation, Moen Inc., NYSERDA, Pacific Gas & Electric, Qualcomm, Schneider-Electric, SecurTek Monitoring Solutions, Sempra Utilities, Shell, Southern California Edison Company, TELUS Corporation, USNAP Alliance, Verizon Wireless and Whirlpool Corporation. CABA commissioned Zanthus, an independent market research and consulting firm, to conduct several State of the Connected Home Market research studies over the years, including the current 2011 research study.

(IS-2012-54) Microbusiness & Small Business Managed Services Needs
The Microbusiness & Small Business Managed Services Needs Assessment Study, conducted by CABA's Internet Home Alliance Research Council in early 2007, was designed to assess the current state of the managed services market and to identify any potential areas for further development within the micro- and small business markets (where the former is defined as companies with fewer than 10 employees and the latter is defined as companies with between 11 and 100 employees). The key objectives were to profile target companies; assess the level of in-house IT/telco support; identify current and/or future managed services needs; and evaluate the incidence of current IT/telco change initiatives. AT&T, Cisco Systems, Costco Wholesale, Hewlett-Packard, Level Platforms and SupportSoft led, funded and participated in this research.

(IS-2012-53) Home Networking Study

The Home Networking Study, developed by the CABA Internet Home Alliance Research Council, provides an up-to-date, comprehensive understanding of opportunities and barriers to home networking as they occur throughout the adoption cycle: from purchase through installation, use and maintenance. Of particular interest to project sponsors are factors affecting consumer interest in advanced network applications in areas such as entertainment and home control. Cisco Systems, AT&T, SupportSoft, and Whirlpool Corporation led, funded and participated in this research.

(IS-2012-52) Digital Youth Study

The Digital Youth study, developed by the CABA Internet Home Alliance Research Council, examined youth influence on consumer technology purchase. It found that youth age 8-18 have influence on the purchase of products/services that are primarily used by youth and not by parents. They exert little influence on the purchase of: desktops, laptops, Media Center PCs, external hard drives, printers (color laser, all-in-one inkjet, standard inkjet, snapshot photo), broadband, digital cameras, satellite radio, HDTV, and DVRs. Cisco Systems and AT&T led, funded and participated in this research.

(IS-2012-51) Digital Kitchen Study

The Digital Kitchen was a CABA Internet Home Alliance Research Council study that investigated consumer electronics and appliances in use in North American kitchens to determine which new products and services homeowners would like to see added to their kitchens in the future. The study examined how technology is connected and integrated into people's lives through intuitive interfaces and culminated in a display at the 2007 Kitchen/Bath Industry Show (K/BIS). Whirlpool Corporation, Bell Canada, Cisco Systems, Inc., Direct Energy, Hewlett-Packard, HomeCrest Cabinetry, Intel Corporation, Microsoft, The National Association of Home Builders (NAHB), and the National Kitchen and Bath Association (NKBA) led, funded and participated in this research.

(IS-2012-50) Custom Mobile Advertising Study

Custom Mobile Advertising was a CABA Internet Home Alliance Research Council study that estimated the size of the maximum total addressable market for specific advertising concepts that could be offered via in-vehicle technology, mobile phone technology, and across both platforms. The goal of the study was to gauge interest in specific types of advertising content and advertising delivery mechanisms (such as voice and text). The study examined numerous consumer preferences for various features, including: connectivity options (wireless vs. wired); user interface (voice, text, on-screen menus); media and advertising storage and transfer options (mobile phone, PC, in-vehicle device, other); and user profile controls (computer, phone, in-vehicle).

(IS-2012-48) Follow the Leaders: Improving Large Customer Self-Direct Programs
State sponsored energy efficiency programs are typically funded by consumer fees paid through a Cost Recovery Mechanism (CRM).   Some states allow industrial and large commercial sectors to opt out of the CRM fees and "self-direct" all or a portion of these fees to internal energy efficiency investments. This report discusses the challenges and opportunities of various "self-report" programs in place today (as of October 2011), and provides a number of recommendations. This report is a good reference document for developing and implementing opt-out programs, and reinforces the need for policy oversight to ensure that energy efficiency objectives are achieved.

(IS-2012-47) Green Work Styles: An Analysis of Energy Behavior Programs in the Workplace
This report focuses on energy behavior programs, which are designed to reduce energy consumption through a change in employees' attitudes and behaviors. The report reviews five case studies and provides general strategies for the successful development and implementation of commercial sector programs. Common key requirements from the different case studies are identified. This report is a good reference document for developing and implementing employee and tenant based commercial energy efficiency programs.

(IS-2012-46) Smart Grid Challenges & Choices: Utility Executives' Vision for the New Decade II
This report provides the results of an online survey conducted in March & April of 2011, and follows up on a previous survey conducted in March 2010. Survey participants included 152 C-Suite Executives with operations located in the USA and Canada. The report further examines utilities' vision for the next decade, how smart grid plans and expectations are evolving, and how utilities can more effectively communicate these changes to their customers. Key priorities identified and ranked include: improving service reliability & operational efficiency AND controlling customer costs (both identified as the primary concern); developing demand response and energy efficiency programs; updating physical infrastructure; and, implementing smart meter. This ranking reflects a change from the previous year's survey. Results are provided by country and size of utility. Consumer benefits and concerns are discussed, and specific examples are provided. Smart grid predictions and key issues on the road ahead are discussed. This report provides insight into the C-Suite thinking that will drive smart grid investment over the next decade.

(IS-2012-45) Smart Grid Challenges & Choices: Utility Executives' Vision for the New Decade
Steve Winter Associates and HR&A Advisors, in collaboration with Deutsche Bank and Living Cities, analyzed 231 energy retrofit projects, including over 21,000 individual units, in New York City. The report examined affordable housing consisting of four main fuel and electricity comparative building types and the effectiveness of various energy efficiency upgrades. Insights were developed in three key areas: 1. Pre- and post-retrofit building

performance trends; 2. Reliability of savings projections; and, 3. Framing an approach to incorporate energy savings projections into underwriting. The report provides a solid analysis and argument for the financial underwriting of energy efficiency programs for multi-family buildings.

(IS-2012-44) Speeding Up the Smart Grid: Technique for Delivering More Robust, Higher Data Rate Communications for Automatic Meter Reading

This paper from ON Semiconductor examines improved techniques for power line carrier (data via electric power lines) for remote meter reading in Europe. Automatic Meter Reading in Europe operates on 9-95 kHz configured as a single channels carrying 2400 bps. Proposals are presented to replace the single channel with multiple S-FSK (spread frequency shift keying) channels at 4800 bps each. Systems architectures using a data concentrator are presented.

(IS-2012-43) The Tough Realities of Renewable Energy

This report from 2GreenEnergy examines challenges in transforming the energy industry to the wide-scale use of renewable energy sources. Reliance on fossil fuels is unsustainable for ecological and logistical reasons. Renewable energy deployment has high front-end costs that the public is resisting. Change will be difficult because of the lobbying power of the fossil fuel industry.

(IS-2012-42) Impediments to Renewable Energy

This report from 2GreenEnergy examines a survey of 500 people on the topic," The world is moving to clean energy, but at a far slower rate than many people would like to see. But why, exactly, is it so slow?" The consensus is that traditional energy industry lobbying efforts are inhibiting moves toward clean energy. The author concludes, "The US must not be content to become an after-thought in the global energy picture."

(IS-2012-41) Is It Too Late? Living with a World Energy Crisis

This report from 2GreenEnergy examines a survey of 300 people on the topic, "Will population growth and energy resource depletion have dire consequences over the coming years?" Most agree that a growing supply of energy is needed, that food shortages will affect many, and that transportation costs will rise as fossil fuels are depleted. Most are not focused on the long-term affects of global warming. Most think that clean energy sources will become more attractive than fossil fuel sources. Many are pessimistic about the future of humankind. All agree there is an urgent need to move forward with renewable energy sources.

(IS-2012-40) China Is Investing in Renewable Energy – But Why?
This report from 2GreenEnergy examines of a survey of 200 people about the goals of China in fostering the development of renewable energy sources. Some of findings: China looks after China; China is shifting from "made in China" to "designed in China"; green energy will be profitable; air pollution caused by coal leads to health problems; China has a long-range vision; China needs energy for a growing population; China does not want to be dependent on imported energy sources, etc.

(IS-2012-39) Excellence in Consumer Engagement
This report from the Smart Grid Consumer Collaborative guides utilities with customer smart grid programs to improve customer relations. 40 people from 21 utilities engaged us such programs were interviewed. Messages with engage customers are discussed. The basis tenants include addressing custom complaints, stages messaging, employee education, fostering consumer goodwill, saving money, incentive to enroll, simple smart grid programs, impetus for customers to act, customer segmentation, and focus on sales, not just service.

(IS-2012-38) Initial Findings from the Ultra Low Carbon Vehicle Demonstrator Programme: How quickly did users adapt?
This study from Ultra Low Carbon Vehicle Demonstrator Programme in the United Kingdom explores trials with 340 cars to determine driver acclimation to electric vehicles (EVs). The drivers took more than 110,000 trips covering more than 677,000 miles and charged their cars almost 20,000 times. They adapted well to EVs. The major finding is that drivers prefer a longer driving range between charges: 92 miles for private drivers and 121 miles for fleet drivers.

(IS-2012-37) Driving Transformation to Energy Efficient Buildings: Policies and Actions
This report from Johnson Controls explores energy conservation through improvements in new and existing buildings. Policies that can impact building energy conservation are reviewed. Among these are building efficiency codes, energy conservation targets, public awareness campaigns, financial incentives, utility programs, and workforce training. There are opportunities now for collaboration between building owners and policy makers.

(IS-2012-36) Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities
This report from the American Council for an Energy-Efficient Economy explores the potential for various initiatives to motivate consumer to reduce energy consumption. The results for 60 studies were review. Potential savings range from 4-12%. The largest savings come when detailed appliance consumption is report. Advanced Metering Infrastructure (AMI) may be an effective method for delivering data to consumers. Third-party suppliers

of energy information are likely to play important roles. Eventually, energy management will be done automatically by interacting with appliances.

(IS-2012-35) Electric Vehicles: Ten Predictions for 2012
This report from Pike Research was issued in 2011 with predictions regarding electronic vehicles (EVs) in 2012. The largest sales volume of EVs will be in Asia followed by North American (66,000+). EV rentals will become a popular form of car sharing. A registration tax on EVs will replace lost road taxes on gasoline. EV prices will stay about $30,000. Commercialization of fuel cells will be led by Germany, Japan, and Korea.

(IS-2012-34) The Future of Energy
This 2011 report from The Future Laboratory in the United Kingdom evaluates energy requirements in Europe by 2050. Supplies will be strained as worldwide demand is expected to increase 115%. Smart grids integrating renewable energy sources and storage will be commonplace. Data will be as important as energy in smart grids. Various aspects of smart grid technologies and projects are presented. Electric vehicles will be major catalysts for smart grids.

(IS-2012-33) Home Energy Management in Europe: Lots of solutions, but what's the problem?
This paper from Delta Energy & Environment examines trends in home energy management in Europe. Home energy management tools inform customers, automate information flows to appliances, and control appliances via pricing or remote signals. Products and target markets are reviewed. The future of in-home displays for energy management is questioned. European energy management trials are summarized.

(IS-2012-32) Smart Energy Program Consumer Study: Understanding Consumer Lifestyle Drivers and Energy Attitudes As Motivation for Smart Energy Program Participation
This report from Best Buy summarizes a consumer study of attitudes toward energy management. Customer lifestyles were correlated with energy management technology adoption. Feature sets were proposed. The goal is to identify marketing and messaging strategies including education outreach to customers. Customers were categorized as Home Safeguarding, Life Maximizing, and Environmentalism. Energy management features include automation & information and remote management. Detailed analysis data are presented.

(IS-2012-31) Clean Energy: Ten Trends to Watch in 2011 and Beyond
This report from Pike Research examines trends in electric power systems, technologies, and renewables related to cleaner energy. Utilities are becoming more involved with generation, especially renewables such as solar and wind. DC (Direct Current) transmission and distribution are growing in popularity for microgirds. Power plants are

being moved offshore with DC planned for bringing this power from distances greater than 50 miles. Geothermal energy for utility base-load is growing in the western U.S. The U.K. is harnessing wave and tidal energy. The sun provides 10,000 times more energy than the world needs, but 0.1% is being used for power. China plans to produce 15% of energy needed from wind and solar by 2020. Nuclear power is not likely to grow in popularity.

(IS-2012-30) The New Energy Consumer Strategic Perspectives on the Evolving Energy Marketplace
This report from Accenture explores changes in the utility industry related to residential customers. About 40-60% of the traditional utility business of viewing customers solely as cash flows will need to change. New programs that support smart home technology will be required. Motivations are distributed generation, electric vehicles, and home area networks. Consumers will be able to shop among competing service providers and retailers for energy management. Utilities will need stronger consumer capabilities with more product and service innovations. Various energy management programs and channels are reviewed.

(IS-2012-29) Energy Efficiency Comparisons of Wireless Communication Technology Options for Smart Grid Enabled Devices
This paper from General Electric (GE) examines options for wireless home area network (HAN) communications by devices engaged in energy management. GE estimates that such devices could surpass one billion by 2025 in the 120-million U.S. households. The top candidates are Wi-Fi, based on the IEEE-802.11 standard, and ZigBee, based on the IEEE-802.15.4 standard. Bluetooth was judged not suitable because of limit range. ZigBee chipsets in high volumes (more than 100,000) cost $2.00 to $2.20 than Wi-Fi. Test results showing that ZigBee is more energy efficient than Wi-Fi by about ½ Watt are included. Wi-Fi consumes more power than ZigBee when not transmitting data.

(IS-2012-28) Assessment of the Technical Potential for Achieving Zero- Energy Commercial Buildings
This report from the U.S. Department of Energy examines the feasibility of marketing net-zero energy buildings on a large scale by 2025. Projections are based on buildings constructed in 2005 and expected technology developments over the following 20 years. With 2005 technology 22% of these building could achieve net-zero by 2025 and 64% with newer technologies. Up to 37% of excess energy could be sold into the grid. The analysis is based on using photovoltaic cells to generate electricity.

(IS-2012-27) Here comes the sun: a field trial of solar water heating systems
This report from the Energy Savings Trust in London examines solar hot water for energy conservation and green-house gas reduction in the United Kingdom and the Republic of Ireland. A trial program showed that properly installed solar water heaters could provide up to 60% of household hot water, with a median of 39%.

84% of customers were satisfied with the results. Pipe insulation was important for delivering maximum benefits. Details of field trials at 88 houses are included.

(IS-2012-26) Getting to Zero: A Pathway to a Carbon Neutral Seattle

This report was prepared from the City of Seattle Office of Sustainability and Environment about making Seattle the first carbon-neutral city. The goal by 2050 is to reduce emissions by 90% from 2080 levels. Reductions will come from the use of public transit, bicycles, walking, increasing the energy efficiencies of buildings, renewable energy sources, and electric vehicles. Additional benefits are improved health and employment. The objective is to head off a possible increase in the temperature of the earth by 9°F by the end of the 21st century. Methods to accomplish carbon reduction are discussed.

(IS-2012-25) Telco Triple-Play Service Fulfillment

This paper from Heavy Reading examines the competitive market for voice, video, and Internet service offering called "triple-play" from cable and telephone companies. This paper argues that for telephone companies to compete effectively against cable companies, they must upgrade their network to fiber optics. This is enabling growth for telephone companies worldwide as the number of landline customers decreases. In 2009, AT&T and Version gained 2 million video customers compared to a loss of 1.3 customers by cable operators. The need for operations support system (OSS) best practices in the back office support is discussed.

(IS-2012-24) Time of use tariffs: reforming the economics of urban water supply

This report from the National Water Commission of Australia examines the potential benefits of smart water meters to record hourly consumption. The study also considered using the smart meters to implement time-of-use rates for water. A key issue was whether water consumption was elastic, meaning it responded significantly to price changes. The degree of elasticity varied by activity in the following order from the most elastic: outdoor watering, clothes washing, dish washing, cooking, person hygiene. Residential outdoor consumption was about 38% of the peak, while residential indoor consumption was 51% of the peak in this study that also included 11% commercial customers. Reduction in peak demand would not necessarily lead to smaller future water systems.

(IS-2012-23) Volatility of Power Grids under Real-Time Pricing

This paper from the IEEE Transactions on Power Systems examines the impact on system stability of offering real-time electricity pricing to consumers. It is assumed that the retail price will reflect the dynamic wholesale price. Consumer reaction in-turn will impact the wholesale price. This feedback mechanism might lead to system instability. The authors advise more study before real-time pricing is implemented on a large scale.

(IS-2012-22) Myths and Realities About Crossing Over Residential and Commercial Market Segments in the Electronic Systems Industry
This paper from Stiernberg Consulting examines the similarities and differences between residential and commercial consumer electronics companies. Listed are 12 myths and realities about transforming a business between these two markets. Among the issues addressed are product adaptation, regulatory standards, company reputation, selling practices, market size, product innovation, branding, product quality, and product features including packaging and manuals.

 (IS-2012-21) PG&E's Smart Grid Deployment Plan
This report presents plans by Pacific Gas & Electric for upgrading the utility to incorporate smart grids. Some of the topics addressed include the use of digital technology, optimization of grid operations, deployment of distributed energy resources, optimization of appliance operation, smart appliances, electric storage, consumer information and control options. communication standards for the grid, and removal of barriers to the adoption of smart grids. Considerable detail is including in this report of almost 300 pages.

(IS-2012-20) RS-485/MODBUS based Intelligent Building Automation System using LabVIEW
This paper from Dharmsinh Desai University and the Indian Institute of Technology Roorkee proposes a building automation system for residential buildings. Services offered include energy management, lighting control, water management, security and safety, entertainment audio/video distribution, remote control of appliances, and Internet access. The infrastructure network is based on a wired RS-485 topology running a MODBUS communications protocol. The software for this system is based on OLE (Object Linking and Embedding). LabVIEW was used to simulate this system. Possible extensions include links to a cellular telephone network, more functionality, and an enhanced graphical user interface.

(IS-2012-19) Benchmarking Energy Utility Efficiency Portfolios in the U.S.
This report by M.J. Bradley & Associates, LLC highlights the importance and challenges of benchmarking electricity utility energy efficiency portfolios, and initiates a benchmarking process that will evolve over time. Benchmarking allows for direct comparison of spending and energy savings across electric utility energy efficiency portfolios. The report discusses the difficulties involved in benchmarking energy efficiency portfolios, evaluates and recommends a suite of metrics, and demonstrates these metrics using a diverse set of electric utilities. This report is a good reference document for understanding the relative performance of utility based energy efficiency programs.

(IS-2012-18) A Framework for the Evaluation of Smart Grids
Ofgem appointed Frontier Economics and EA Technologies to develop a framework that will allow smart grid investment opportunities to be evaluated. This November 2011 report provides the proposed methodology for consultation in developing this framework. The key areas outlined in this extensive report include: smart grid evaluation framework; value drivers and scenarios; smart grid and conventional investment strategies; value chain analysis; and, proposed model specification. Once the consultation has been completed (December 2011), a second report will provide a simple and transparent evaluation model. This model will allow users to assess how the net benefits of smart grid technologies might change with different developments in the electricity sector. This paper is beneficial to those interested in public policy and research in the energy sector. Timing for completion of the second report was not provided.

(IS-2012-17) The Benefits of Smart Grid Business Software
Oracle provides a business overview as to why utilities will need to invest in new hardware, software, business process development and staff training. Consumers will invest in home area networks, smart appliances and devices. Smart Grid business software can ease the transition to a more flexible, reliable and responsive electricity grid. A high level overview of the benefits that will ultimately help consumers, utilities and the community is presented. This paper is a very basic primer, and a quick summary of the benefits of a smart grid.

(IS-2012-16) Consumer Motivation: Facts, Myths and Motivations
Using a combination of primary (consumer group interactions and online surveys) and secondary research (existing studies, industry scan), this 2011 paper from EPRI provides a background on consumer motivations in adopting smart grid technologies, and the importance of education for this adoption to be meaningful in its implementation. In general, consumers react positively to the benefits derived from the smart grid, however there are a number of identified challenges that will need to be addressed. The research covers: consumer perceptions and motivations for smart grid adaptation; importance of education; data privacy; industry challenges; consumer information sources; and, a ranking of consumer benefits associated with value and the various technologies. Although this paper does not provide detail on the specific technologies currently available, the study provides a good understanding and importance of consumer motivators in adopting smart grid technologies.

(IS-2012-15) Smart Grid Impact on Intelligent Buildings 2011 Research Study Executive Summary
The purpose of this CABA Intelligent Buildings Landmark Research was to identify, define and size the principle business opportunities presented by the growth of smart grids, in relation to "intelligent buildings". An examination of smart grid yielded immediate value to all stakeholders in the intelligent building industry, as smart grid and auto demand response held more relevance in the industry today - with opportunities in existing buildings and new

construction. Energy capacity/supply problems need to be addressed in the short-term, and made available in emerging technology. This serves to add to market education and understanding, and address market knowledge gaps. As well, open and interoperable communication between energy suppliers and commercial energy users is an eventuality - which was further explored in relation to smart grid development and intelligent buildings. The purpose of these initiatives was two fold – an educational and validation exercise for industry participants and a means to drive public opinion and facilitate policy decisions at industry stakeholder, public authority and government organization levels. There were twenty-nine sponsoring organizations involved in this landmark research study. The research was undertaken by research and buildings technology consultancy, BSRIA, on behalf of CABA.

(IS-2012-14) State of the Connected Home Market 2011 Research Study Executive Summary
CABA's 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. In addition to the "State of the Connected Home Market 2011" study, Southern California Edison conducted an additional, comprehensive residential energy study in the California market, "Future Outlook for Residential Energy Management", which they have graciously offered to include as an addendum to the main study. The Southern California Edison report provides a comprehensive, detailed and insightful examination of residential energy management in the southern California market, which serves as a complimentary extension of the Energy Ecosystem findings contained in the State of the Connected Home Market report. We offer our sincere thanks to Southern California Edison for making this important research report available to CABA and the sponsoring organizations of the State of the Connected Home Market study.**(IS-2012-13) Introduction to ISO 15926**
This paper provides detailed and useful documentation on complete standard and useful guidelines for its implementation. However, the reviewer suggests that involvement and discussions with organizations such as ISA and many other MNC manufacturers, Worldwide Solution Provider Companies, shall be useful in further enhancement of the standard. The same shall more generalize the standard, thereby increasing its acceptance at all levels.

(IS-2012-12) Wireless Communications in SCADA Systems
This paper from Sierra Wireless Inc., USA keeps its major emphasis on "Suitability of Wireless Telemetry Links for SCADA Systems". The paper begins with discussion about how wireless telemetry could be useful instead of conventional wired telemetry identifying relative merits. The paper also identifies key areas of power distribution system controlled by SCADA where deployment of wireless communication is feasible and also indicates potential

benefits arising of it. In the end, the paper concludes with establishing requirements and best practices for wireless communication in the SCADA based critical transmission and infrastructure solutions. The author organization marks end of the paper with suggesting how wireless communication could be useful in evolution of Smarter Grids along with mention of features of their own product/system.

(IS-2012-11) Introduction to OPC Building Automation
This whitepaper describes how OPC can complement a Building Automation system by providing a standardized way to exchange data with various Applications. It explains that BACnet provides a suitable communications mechanism for the controllers, and that OPC can provide an independent layer to exchange data between these building automation systems and enterprise applications such as Historian and Reporting systems.

(IS-2012-10) Submetering of Building Energy and Water Usage
This paper describes the benefits and complexities of the submetering of energy and water within buildings. Submetering can enable the efficient management of these resources through an understanding of the current usage, which can help drive targeted building system improvements. Additionally, the understanding of the current usage can lead to the conservation of these resources as a result of occupant behavioral changes. These benefits can lead to improved building performance and reduced resource consumption. The paper continues on to recommend that a life cycle cost approach is the most appropriate method for evaluating the feasibility of a submetering investment.

(IS-2012-09) 2011 State of the Consumer Report – Smart Grid Consumer Collaborative
This paper combines multiple sources of research to result in a consumer barometer of sorts towards the smart grid. It is focused on the North American residential market and includes research from the likes of Accenture, Best Buy, EPRI, GE, and IBM. The paper finds that few Americans know what the smart grid is and suggests ways to segment the consumer base in North America while improving upon the market's knowledge of the smart grid.

(IS-2012-08) CO2 Monitoring for Demand Controlled Ventilation in Commercial Buildings
This report from the Environmental Energy Technologies Division Indoor Environment Department Lawrence Berkeley National Laboratory Berkeley, CA reviews the accuracy of 208 of commercially available CO_2 (Carbon Dioxide) IAQ monitors in order to test their ability to achieve the energy savings that California Title 24 code requires for demand control ventilation DCV applications. The report also investigates the relative benefits of multi point detection and location within occupied rooms in tests conducted in 34 commercial properties. The authors

make certain recommendations regarding the further development of the accuracy of CO_2 sensors in order to achieve Title 24 compliance as well as more research to determine spatial location for monitoring points.

(IS-2012-07) EcoPinion – Is Prepay the Way? Consumer Perceptions of Prepay in the Utility Sector
This EcoPinion online survey, conducted in November 2010, highlights consumer acceptance of prepay services. A significant number of consumers like the idea of a prepaid energy offer, citing "convenience" and "ease", with 17% very interested and another 25% somewhat interested. The research covers: market comparison of expectations and consumer satisfaction with other industries' prepayment offers, potential market size, pricing expectations, concerns, communication channels, payment type, and product features / benefits and expectations. Recommendations are provided as to how a prepay bill payment service could be implemented.

(IS-2012-06) EcoPinion – Separating Smart Grid From Smart Meters? Consumer Perceptions and Expectations of Smart Grid
This EcoPinion online survey, conducted in May 2010, builds on previous work in this area. The research highlights three challenges managing consumers' expectations for the smart grid. Research areas covered include: cost / benefit expectations, preferred communication channels, privacy expectations, consumer concerns and overall appeal. The report also considered the relationship between the smart grid and smart meters. While the smart grid holds much promise in the eyes of consumers, the report highlights potential issues that service providers will have to manage when they implement the smart grid and smart meters. Indeed, the research provides insight as to why a number of smart grid programs, that have been implemented, have not been well received by consumers. While conducted in May 2010, the consumer insights and analysis are still relevant.

(IS-2012-05) EcoPinion – Lighting the Path Forward for Greater Energy Efficiency
This EcoPinion online survey, conducted in March 2011, highlights consumer expectations regarding CFL and LED energy efficient lighting. The report provides an industry background. In general, consumers are receptive to more energy efficient lighting options, even when considering pricing premiums. The research covers: market penetration, consumer satisfaction, performance comparisons, preferred communication channels, recommended positioning and messaging, impact of cost and advancements in technology. Some of this information is available by age group. This research provides insight into the market transformation from traditional incandescent lamps to more energy efficient lighting options.

(IS-2012-04) The Road to Customer Intimacy – Leveraging Investments in Customer Insights to Maximize Returns

This paper discusses how product development for consumer electronics manufacturers must change in order to be successful. It lists new ways that consumers are revealing their preferences and needs via social media and electronic communications and the need to capture that information and incorporate it into the manufacturing process to meet ever changing consumer needs and preferences.

(IS-2012-03) The elephant in the living room: How our appliances and gadgets are trampling the green dream

This Energy Savings Trust report is the follow up to a previous publication, The rise of the machines, and looks at how the regulatory, manufacturing and retail landscapes have changed; how appliances and gadgets have changed; and how there is a need to change the way that they are used. It re-examines the trends and future scenarios for domestic appliance electricity consumption in the UK that have emerged in the intervening years, and sets this within the context of achieving the UK's 2020 emissions reduction targets. While this report is framed within a UK context, it provides general recommendations for changing people's behavior and introducing energy savings measures into homes.

(IS-2012-02) Achieving Energy Savings in California Buildings

This report is the California Energy Commission staff's draft recommendations for achieving zero-net-energy residential building by 2020, and zero-net-energy commercial buildings by 2030. The report provides background, analysis, key challenges and recommendations in the following areas: policy framework, technical strategies, market driven strategies, energy efficiency standards, use assessments, rating & labeling programs, whole-building cost-benefit approach, funding programs, and compliance & enforcement. The recommendations cover both new and existing buildings. This report provides a vision and plan to achieve the goal of zero-net-energy buildings.

(IS-2012-01) European Commission Energy Efficient Buildings PPP Multi-Annual Roadmap and Longer Term Strategy

This report provides a research framework and priorities for a longer term energy efficiency & carbon emissions reduction strategy and roadmap. The longer term goal is to create efficient districts and cities while improving the quality of life of European citizens. The report includes: market background, regulatory context, consumer and demographic trends, commercial/industrial trends, key challenges, research priorities, recommended funding requirements and anticipated impacts. The roadmap provides a thorough, holistic, systematic approach and considers both district and geo-clusters as Europe moves toward net zero energy and carbon emissions, with the goal of carbon neutral and energy positive buildings by 2050.

(IS-2011-169) Home Area Network – Opportunities for Added Value Services and Technology Considerations
This short paper from Secure Meters Group argues for the leverage of the infrastructure that comes with the deployments of Smart Metering that is going on in many countries around the world. If these deployments use interoperable communications, it is possible to provide additional services and functions. Services that could provide 'Safety & Security, 'Comfort' and 'Savings'. The key is a partnership between equipment and service providers using interoperable products.

(IS-2011-168) Europe's buildings under the microscope
Buildings Performance Institute Europe (BPIE) has undertaken an extensive survey across all EU Member States, Switzerland and Norway reviewing the building stock energy performance in terms of the existing building stock characteristics and policies in place. This survey provides an EU-wide picture of the energy performance of the building stock and how existing policies influence the situation. The data collected was also used to develop scenarios that show pathways to making the building stock much more energy efficient, in line with the EU 2050 roadmap.

(IS-2011-167) What Have We Learned From Energy Efficiency Programs?
This paper, sponsored by the American Council for an Energy-Efficient Economy, reviews a number of energy efficiency financing programs that have been implemented in a number of States over the last several years. While a number of these programs have many years of experience and have issued thousands of loans, this market has yet to come to scale. Quantitative research analysis of both residential and commercial data includes: participation rates, loan sizes, terms, energy savings, and funding sources. Recommendations are provided. This report is a first step at scaling up energy efficiency financing.

(IS-2011-166) The Costs and Benefits of Smart Meters For Residential Customers
This white paper from the Institute for Electricity Efficiency provides a framework for quantifying the costs and benefits of residential smart meters from a wide variety of perspectives across a range of electric utility and customer types. Drawing on previous research, utility pilots and analysis, it shows how the magnitude of both costs and benefits might vary according to different utility and customer parameters. While results will vary by utility profile and customer engagement type, the white paper provides a framework that is general enough to be adapted by individual utilities and regulators in conducting their own analysis.

(IS-2011-165) CABA Aging in the Connected Home: 2011 Executive Summary
In 2011, CABA conducted another wave of the State of the Connected Home Market Landmark Research to update its understanding of North American consumer attitudes and behaviors about "connected home" products and services. The research was previously conducted in 2003, 2005 and 2008. The broad purpose of this study is to validate past and current trends, and to characterize consumers' understanding of the connected home today— and in the future. The 2011 State of the Connected Home Market study identifies key emerging areas of opportunity over the next two years to advance the connected home space in the U.S. and Canada. In addition, the 2011 study has a special focus on uncovering how converged solutions can and should map to key unmet consumer lifestyle-related needs, particularly in the areas/ecosystems of entertainment, family and energy management. CABA commissioned Zanthus Corp., an independent market research and consulting firm, to conduct several "State of the Connected Home Market" research studies over the years, including the current 2011 research study. There were twenty-eight sponsoring organizations involved in this Landmark Research study. As well, a special addendum of the detailed table of contents, background, objectives, methodology and summary findings from a separate report regarding consumer energy management, written for Southern California Edison, is included in the report.

(IS-2011-164) Health Care Comes Home: The Human Factors
This 200-page report presents the results of a comprehensive study by a multidisciplinary Committee on the Role of Human Factors in Home Health Care to examine a diverse range of behavioral and human factor issues resulting from the increasing migration of medical devices, technologies, and care practices into the home, with the committee's conclusions and recommendations concerning the best use of human factors in home health care.

(IS-2011-163) The future of connected health devices
This report from IBM Institute for Business Value presents an excellent analysis of the health / medical device market, based on interviews with medical device makers and consumer electronics companies as well as inputs from more than 1,300 current device users and caregivers. It suggests solution providers to target a large, fragmented and often overlooked population who seek better information to effectively manage their health.

(IS-2011-162) Health Care Comes Home: The Human Factors
Health care delivered at home is valued by patients and, when managed well, can promote healthy living and well-being. These changes in the location of care are involving more people, both professional and lay, who are sometimes performing difficult tasks, with unfamiliar equipment, in environments not designed to support these

activities. All of these factors need to be addressed, and among the most critical are the human-systems interactions, also known as human factors, otherwise the safety, efficacy, and efficiency of that care will suffer.

(IS-2011-161) The connected consumer challenge
Consumers are making electronics choices today based on the "experiences" a particular device can offer, forcing electronics companies to expand their traditional product attribute-based view to include service. This 4-page marketing flyer describes an IBM study that suggests these companies need to capitalize on this trend by offering not only advanced technology via products, but also services designed to enhance the consumer experience.

(IS-2011-160) Broadband in America – 2nd Edition
This report updates an earlier independent analysis of publicly announced broadband network deployments and plans for the purpose of informing the FCC's efforts in developing its National Broadband Plan. By 2013-4, broadband service providers expect to offer about 90% of homes advertised speeds of 50 mbps downstream over wired connections and 5 mps over wireless, leaving the rest with significantly inferior choices

(IS-2011-159) ANSI Workshop Report Standards and Codes for Electric Drive Vehicles
This report from the American National Standards Institute is a summary of workshop held in April 2011 on electric vehicles. The goal was to explore methods for expanding the acceptance and use of electric vehicles that draw electricity from the power grid. The main focus was on consumer acceptance and conformance to standards. Also addressed was training the various industries involved such as insurance adjusters, service technicians, emergency responders, and codes enforcement personnel. The presentations and breakout group discussions are summarized.

(IS-2011-158) Toward LifeHome 21
This document provides guidance to those who may have to make decisions on the appropriate design, specification, construction and adaptation of "assisted living enabled" buildings. This group of people will include developers, architects, designers, builders, various consultants, health care workers, designers of health care equipment and systems, and the general public who are involved in caring for the elderly or less able.

(IS-2011-157) Warmer Bath: a guide to improving the energy efficiency of traditional homes in the city of Bath
This 79-page guide highlights an energy hierarchy that starts with various ways to reduce the need for energy, followed eliminating energy waste, and moves to low carbon or renewable energy, including a cost/benefits analysis, lots of good examples and photos, and ways to monitor progress.

(IS-2011-156) Advancing Renewable Energy and Energy Efficiency at Speed and Scale
This report from the U.S. Department of Energy explains how the National Renewable Energy Laboratory is promoting the adoption of clean energy technology. The lab is streamlining the process for technology partnership agreements and accessing licenses for intellectual property. An Energy Information Portal has been established to publicize results from all 17 national energy labs. Examples of projects and a list of web-based resources are included.

(IS-2011-155) The Role of Renewable Energy Certificates in Developing New Renewable Energy Projects
This report from the U.S. Department of Energy examines the impact of Renewable Energy Certificates (RECs) on the development of renewable energy sources. To promote the use of renewable power, some states mandate that renewable power plants issue an REC (with a specific serial number) for each 1 MW of power generated. RECs may be sold to utilities and consumers that cannot access the actual power, but want to contribute to the development of renewable power sources. Some RECs are issued on a voluntary basis. The impact of RECs on the development of renewable energy sources is analyzed and methods for encouraging such projects are discussed.

(IS-2011-154) Performance Evaluation and Opportunity Assessment for St. Bernard Project
This report from the U.S. Department of Energy reports on a project to examine the rebuilding of houses in New Orleans following hurricane Katrina. The focus is on energy efficiency improvement and the reduction of moisture retention. Anticipated saving are 10-13% in energy costs. Example houses and construction rebuilding details, including mistakes, are included.

(IS-2011-153) Alternative Fuels and Advanced Vehicles: Resources for Fleet Managers
This report from the U.S. Department of Energy illustrates web-based information for fleet managers. The intent of this information is to help manage costs, meet legal mandates, achieve corporate goals, support the economy, and promote green activities. Resources include cleancities.energy.gov, afdc.energy.gov (alternative fuels and advanced vehicles), and fueleconomy.gov.

(IS-2011-152) Testing Active Power Control from Wind Power at the National Wind Technology Center
This report from the U.S. Department of energy outlines a project in 2011 and 2012 to determine the integration of win turbine power into an electric grid and the cost. Topics to be investigated are outlined. The fundamental question is whether the fluctuating power output of a wind turbine can benefit a grid in adapting to fluctuating loads in the medium and short term. Can wind power supplement frequency regulation for short-term (up to 10

seconds) adaptation and supplement automatic generator control for medium-term (up to 10 minutes) adaptation to fluctuating loads?

(IS-2011-151) Process Development for High VOC CdTe Solar Cells
This report from the U.S. Department of Energy is a technical analysis of cadmium telluride (CdTe) material used in photocells for solar energy. The parameters that affect performance are analyzed and potential improvements are considered. The focus is on increasing the open-circuit voltage VOC from 850 mV. This paper is intended for a materials scientist.

(IS-2011-150) Strategy Guideline: Accurate Heating and Cooling Load Calculations
This report from the U.S. Department of Energy studies the process of determining the proper sized heating and cooling equipment for a house. As houses have been built tighter with better insulation and windows, the same rules-of-thumb have been used to select heating and cooling equipment. Many times the choices are over-sized, thereby wasting initial costs and operating costs. The resulting system may be uncomfortable for the occupants because it may not dehumidify properly. Example installations in Orlando and Chicago houses are presented.

(IS-2011-149) Wind Energy Workforce Development: A Roadmap to a Wind Energy Educational Infrastructure
This report from the U.S. Department of Energy examined training need for the emerging wind power industry. Wind power is expected to increase from 2% in 2008 to 20% in 2030 employing 350,000 in manufacturing and construction compared to about 60,000 in 2009. Educational programs are described at public schools, community colleges, colleges, and universities.

(IS-2011-148) 2010 Fuel Cell Technologies Market Report
This report from the U.S. Department of Energy surveys the fuel cell market. Fuel cells combine hydrogen and oxygen to produce water, electricity, and heat. Fuel cell systems are at fixed locations, in vehicles, or portable. The investments and performance of companies in this field are reported.

(IS-2011-147) Active Power Control from Wind Power
This report from the U.S. Department of Energy proposes a program for integrating wind power into an electricity grid. The goal is to optimize the economics and to enhance reliability. Various techniques are outlined. A project with tasks to study this issue is outlined.

(IS-2011-146) Stationary and Portable Fuel Cell Systems Codes and Standards Citations

This report from the U.S. Department of Energy is a compilation of references to codes and standards for fuel cells. Which codes apply depends on the jurisdiction. Some jurisdictions may apply their own codes.

(IS-2011-145) Report on Transmission Cost Allocation for RTOs and Others

This report from the U.S. Department of Energy examines cost allocations models for electricity transmission systems. Allocating costs is complicated because transmission lines may cover multiple regulatory jurisdictions and possibly independent generating companies. About $10 billion per year will be spent to grow the transmission network 8% by 2018. Various costing methods are presented. The U.S. Federal Energy Regulatory Commission (FERC) is likely to support "beneficiary pays" transmission cost allocation.

(IS-2011-144) Summary of Needs and Opportunities from the 2011 Residential Energy Efficiency Stakeholders Meeting

The meeting brought together more than 200 professionals representing organizations with vested interest in energy efficiency improvements in residential buildings to identify or reinforce a wide variety of needs and issues associated with delivering high-performance homes in both new and existing home scenarios.

(IS-2011-143) Assessing and Reducing Plug and Process Loads in Office Buildings

This report from the U.S. Department of Energy outlines methods for reducing energy consumed in buildings by plug and process loads (PPLs) in office buildings. These are tenant devices not related to the building operation or environmental control. Occupants are advised to measure PPLs to determine usage. The employee needs for a variety of devices and for operation during non-business hours in standby modes should be reduced. Intelligent power control is recommended.

(IS-2011-142) Assessing and Reducing Plug and Process Loads in Retail Buildings

This report from the U.S. Department of Energy outlines methods for reducing energy consumed in buildings by plug and process loads (PPLs) in retail stores where some of these loads generate sales. Suggestions are included for savings such as turning off bending machines during closing hours. A total saving calculator is included.

(IS-2011-141) Renewable Energy Cost Modeling: A Toolkit for Establishing Cost-Based Incentives in the United States

This report from the U.S. Department of Energy explores various incentives for promoting the deployment of renewable energy sources. A spreadsheet called Cost of Renewable Energy Spreadsheet Tool (CREST) has

been developed to evaluate various cost-based incentives. A discounted cash flow method is recommended for measuring the cost of energy to set rates.

(IS-2011-140) Hybrid and Plug-In Electric Vehicles

This report from the U.S. Department of Energy provides an overview of electric vehicle options and relative performance. The cars surveyed include hybrid electric vehicles (gas engine + battery to capture breaking energy), plug-in hybrid electric vehicles (charge from gas engine or from electric socket), and all-electric vehicle (charge from socket only). Fuel savings for the car range from 20% (highway driving with a hybrid electric vehicle) to 100% (all-electric vehicle).

(IS-2011-139) Interim Test Procedures for Evaluating Electrical Performance and Grid Integration of Vehicle-to-Grid Applications

This report from the U.S. Department of Energy examines the connection of an electric car battery to the electric grid both for charging the battery and for providing power from the battery to the grid. Detailed test procedures are presented based on IEEE Std. 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems. Some of the tests include power conversion efficiency, power reserve, and charging time.

(IS-2011-138) The Home Appliance Industry's Technical Evaluation of Communication Protocols

This report presents AHAM's (Association of Home Appliance Manufacturers) methodology and technical analysis of smart appliance network protocols, including Wi-Fi, Zigbee, and HomePlug Green PHY, with respect to the following key communications layers: Application (APP), Network (NET), and Media Layers (MAC, PHY).

(IS-2011-137) Innovative Feed-In Tariff Designs that Limit Policy Costs

This report from the U.S. Department of Energy examines the pricing of Feed-In-Tariffs (FIT). FIT is a payment by a utility for excess renewable energy sold back by the customer to the utility. FIT rates are intended as incentives for developing renewable energy sources. However, the incentives must be priced in a manner that encourages investment without penalizing the utility. Pricing schemes such as payment caps, level adjustments, and auctions are discussed. Case studies are included.

(IS-2011-136) Review of Current Data Exchange Practices: Providing Descriptive Data to Assist with Building Operations Decisions

This report from the U.S. Department of Energy examines impediments to effective systems for managing energy consumption by buildings. The focus is on metadata to name the energy-related data collected so these data can

be organized and applied to algorithms without the need for customization to each building. The naming system in BACnet and oBIX were examined and recommendation made for a standard naming point solution.

(IS-2011-135) FY 2010 Progress Report for the DOE Hydrogen Program
This report from the U.S. Department examines progress in research, development, and demonstration programs on hydrogen production and fuel cell technologies. $244 million was allocated to the fuel cell program in 2010. Progress in the following areas is presented with considerable detail: hydrogen production, hydrogen delivery, hydrogen storage, fuel cells, manufacturing, and basic research. Additional topics covered include technology validation, safety, codes, and standards, education, market transformation, systems analysis and integration, and international activities.

(IS-2011-134) The Home Appliance Industry's Principals & Requirements for Achieving a Widely Accepted Smart Grid
This 25-page Smart Grid white paper from AHAM (Association of Home Appliance Manufacturers) describes 3 essential requirements for the Smart Grid's interaction with consumers. (1) Pricing must provide incentives to manage energy use more efficiently and enable consumers to save money. (2) Communication Standards must be open, flexible, secure, and limited in number. (3) Consumer Choice & Privacy must be respected; the consumer is the decision maker.

(IS-2011-133) Study on the Future of Interconnection Charging Methods
This report submitted to the European Commission buy TERA Consultants examines tariffs for charging for mobile telephone calls in the European Union. In North American, the cell phone owner pays to make or to receive calls. In Europe, the caller pays a special (higher) charge to call a cell phone. (Call from the U.S. to a European cell phone cost up to 10 times more than terminating on a landline.) This report examines alternative charging schemes and the effect on customer rates and industry competition. The two schemes are called CPNP (Calling Party Network Pays) and BAK (Bill And Keep – shared costs).

(IS-2011-132) Sizing the Clean Economy
This report from the Brookings Institution examines the U.S. clean energy economy. It seeks to quantify the existing market, growth prospects, and methods that might spur industry developments. The clean energy sector employs more people than the fossil fuel industry. 26% of the work is in manufacturing. The report recommends government incentives for a low carbon economy. The clean energy economy is now driven by a vision of more jobs and a growing industry segment, not just environmental concerns.

(IS-2011-131) Implementation Proposal for The National Action Plan on Demand Response

This report from the Federal Energy Regulatory Commission (FERC) responds to a congressional mandate to develop a U.S. plan for demand response. Congress requested that FERC determine how to advise state regulators of demand response, how to educate consumers, and what tools would help customers, utilities, and regulators. This report lists specific activities to fulfill this mandate such as establishing a national forum, conducting educational programs, sponsoring technical papers, providing assistance to states, creating a panel of experts, distributing demand response grants, and identifying tools.

(IS-2011-130) National Action Plan on Demand Response

This report from the Federal Energy Regulatory Commission (FERC) responds to a congressional mandate to develop a U.S. plan for demand response. Congress requested that FERC determine how to advise state regulators of demand response, how to educate consumers, and what tools would help customers, utilities, and regulators. FERC recommended the creation of a coalition of government agencies, customers, utilities, and interest groups. Methods for forming such as coalition are described with example from other successful coalitions.

(IS-2011-129) The future of digital terrestrial broadcasting

The report provides a manufacturer's perspective of what a compelling and competitive Digital Terrestrial TV platform should look like in a post-switchover environment. It concludes that if the DTT platform is to remain competitive it must integrate broadcast and broadband to seamlessly offer consumers choice of content and innovative services, with manufacturers free to innovate and sell consumers compelling products at a price they will pay.

(IS-2011-128) Intergovernmental Panel on Climate Change: Summary for Policymakers

This report from the Intergovernmental Panel on Climate Change provides policy recommendations to support renewable energy and climate change mitigation. Renewable sources were surveyed and found to supply about 13% of worldwide energy. Solar electricity has the highest potential for growth. The report explains why dependence on renewable energy sources will grow.

(IS-2011-127) Modernizing Ontario's Electricity System: Next Steps

This report from the Ontario smart Grid Forum presents recommendations to support electric smart grids in Ontario. The Forum includes utilities, commercial, public, and university representatives. Recommendations cover privacy and security, third-party access to real-time consumption data, consumer engagement, electric

vehicle engagement, storage integration, standards, innovation and economic development, and measuring smart grid success. The report emphasizes that a smart grid should be carefully planned.

(IS-2011-126) SBI Energy White Paper: Smart Grid Utility Data Market
This paper from SBI Energy examines data management required to support electric smart grids. Data intensive applications include demand response, real-time pricing, automated and self-healing grid, and pre-failure replacement of equipment. The current focus on smart grid hardware, such as smart electric meters, needs to shift to data applications.

(IS-2011-125) Internet matters: The Net's sweeping impact on growth, jobs, and prosperity
As with electricity, the Internet has influenced every corner of the world, not just those countries that first developed it. It transformed the way we live, work, play and socialize, and almost $8 trillion exchanges hands each year through e-commerce. This report provides new insights from a holistic perspective that examines a range of players from enterprises & consumers to companies that form part of the Internet supply chain and those that leverage the technologies for their own business needs. It equates the Internet with wealth creation and describes it as one of the biggest drivers of global economic growth.

(IS-2011-124) A FUTURE OF INNOVATION AND GROWTH: Advancing Massachusetts' Clean-Energy Leadership
Clean Edge Inc. prepared this report for the Massachusetts Clean Energy Center. Massachusetts ranked second behind California in producing clean energy. It is a leading state in energy efficiency, solar, and energy storage. Recommendations for government and utility programs to sustain this position are presented.

(IS-2011-123) Technology for Aging in Place: 2011 Market Overview
Aging in Place refers to home designs and technologies that allow people to live at home as long as possible as they age. 80% of older people live in their own homes, and 90% of them want to stay there. If they move, it will be to another private home. This report describes the need and current market for solutions that help make homes safer and more comfortable for aging adults so they can live full lives in their homes of choice.

(IS-2011-122) U.S. Smart Grid: Finding new ways to cut carbon and create jobs
This report from Center on Globalization, Governance & Competitiveness at Duke University examines potential job creation among vendors to support an electric smart grid. The report identifies 334 locations in the U.S. where job might be created. The U.S. could lead the world in smart grid information technology. However, competition from China, Korea, Japan, and India will be strong. They already surpass the U.S. in some smart grid areas. The

report notes that while most U.S. projects have focused on advanced meters, "important smart grid applications that will be built upon the network infrastructure—including those needed to accommodate grid-scale renewable energy, distributed power, and electric vehicles—are still in their infancy"

(IS-2011-121) How State Government Enable Local Governments to Advance Energy Efficiency
This report from the American Council for an Energy-Efficient Economy reviews state programs advancing energy efficiency. States programs related to transportation and buildings are examined. The leading states in each program category are highlighted.

(IS-2011-120) FCC's Seventh Broadband Progress Report and Order of Reconsideration
The report shows that too many Americans still are unable to fully participate in our economy and society because they lack basic broadband services. Some 26 million Americans live in areas that are un-served by broadband. A full one-third of U.S. households don't subscribe due to other barriers such as cost and lack of literacy or perceived need. Adoption rates are lower among blacks, Hispanics, rural, low-income, less educated, disabled, seniors and the unemployed. The costs of digital exclusion are high and growing, limiting healthcare, educational, and employment opportunities that are essential for consumer welfare and America's economic growth and global competitiveness.

(IS-2011-119) EcoPinion: Resurgence for Retail Electricity Choice and Competition?
Federal government deregulation of the electric industry gave power-generating companies the right to connect to the grid and sell power to electric utilities, and many states extended that to allow power sales directly to end consumers. Federal deregulation resulted in more competition in wholesale energy, but consumer retail competition is spotty. This paper reports on what consumers think of energy competition and efforts to restructure the retail markets.

(IS-2011-118) EcoPinion: Is Prepay the Way?
While the business case for smart grid has largely been built on the operational efficiencies on the utility side of the meter, the customer-facing benefits of smart grid are less understood. This report examines consumer perceptions of the Pre-Pay concept, which could arguably be the "killer app" of smart grid. Pre-pay allows consumers to pay for energy upfront and then to monitor their usage, account information and energy management through daily communications with suppliers.

(IS-2011-117) EcoPinion: Separating Smart Grid from Smart Meters?
While millions of "smart meters" are being installed in homes and businesses across the country, their focus has been on enabling the "smart grid" to exist, with benefits for utilities. But with more focus on consumers, the grid could introduce even more change and innovation. This paper examines what consumers think about the smart grid, how they expect to benefit from it, their concerns, and how we should be talking to them.

(IS-2011-116) CENELEC Project Report Smart House Roadmap
Given the increasing need for system interoperability, the purpose of the Roadmap project is to (1) provide a snapshot of existing SmartHouse specifications & initiatives; (2) collect & analyze current & future consumer needs; and (3) recommend ways to support competitive markets for equipment suppliers, system integrators and application & service providers.

(IS-2011-115) Moving Forward: Findings and Recommendations from the Consultative Council
This report from the U.S. National Institute of Building Sciences recommends policies to encourage high performance buildings. A top-down approach is taken rather than starting with components. Metrics for energy and water efficiency are needed. The report urges a focus on economic growth, environmental stewardship and social progress. More emphasis is need on effective codes and standards.

(IS-2011-114) Technology Roadmap – Energy-efficient Buildings: Heating and Cooling Equipment
This report from the International Energy Agency (IEA) explores greenhouse gas emission reductions from buildings. The goal is to reduce overall emissions by 50% by 2050, of which one-third comes from buildings. The residential sector contributed 67% of this reduction. The IEA recommends improved heating and cooling technology to reduce emissions with impetus from national government policies. Active solar thermal for building heat is discussed. Innovation is need for heat pumps, combined heat and power, and thermal storage devices. Recommended actions by stakeholders are presented.

(IS-2011-113) Behavior and Energy Savings
This report from the Environmental Defense Fund reports on a study that sought to effect residential energy conservation. The subjects were shown comparisons of their energy usage compared to their neighbors. This led to consumption reductions in range of 0.9% to 2.9% with an average of 1.8%. The key is to target the right conservation program to the right household by size, number of occupants, and age of the occupants.

(IS-2011-112) Realizing the Benefits of BIM
This report from Autodesk explains the benefits of Building Information Modeling (BIM). A BIM model can be used for all aspects of design and construction. BIM facilitates collaboration on the physical and functional aspects of a building. Design-to-fabrication integration is enabled by BIM.

(IS-2011-111) Advanced Energy Design Guide for Small Office Buildings
This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small office buildings (up to 20,000 square feet). The goal is to achieve a 30% improvement over minimum code requirements while enhancing the work environment and reducing greenhouse gas emissions. Recommendations cover the building envelope and windows, lighting systems (including daylighting), heating, cooling and ventilation, building automation, water heating, external façade lighting, and electrical loads. Examples are presented.

(IS-2011-110) Consumer Attitudes about the Benefits of Smart Grid Technologies
This study from Parks Associates discusses customer attitudes toward smart energy technologies. Consumer are willing to buy energy efficient products to save money. They are willing to pay something for equipment that promises to save energy costs. Parks Associates suggests combining security and energy monitoring. Consumers are not keen on allowing remote control of appliances by service providers.

(IS-2011-109) Beyond Landline: Evolving Consumer Expectations for Technology Support
Accenture research shows that today's consumers are engaged in an increasingly wide range of technology-based activities across their homes and businesses, that there is a proliferation of new devices and new ways to interact with technology, and that most would welcome having one company support it all. The paper examines issues that consumers want technical support to address and over what mode and concludes that communications providers are well positioned to deliver.

(IS-2011-108) Joint Petition To ENERGY STAR To Adopt Joint Stakeholder Agreement As It Relates To Smart Appliances
This document is a petition from the Association of Home Appliance Manufacturers to the U.S. Environmental Protection Agency (EPA) seeking a 5% Energy Star credit for smart grid-enabled appliances. Appliances such as refrigerators, clothes washers, clothes dryers, room air conditioners, and dishwashers would have the ability to delay energy consuming operating modes in response to a utility "delay load signal." No response from the EPA has been reported as of August 2011.

(IS-2011-107) Energy Efficiency Resource Standards: State and Utility Strategies for Higher energy Savings

This report from the American Council for an Energy-Efficient Economy reviews programs for Energy Efficiency Resource Standards that are in 26 U.S. states. Strategies that have achieved saving goals are analyzed in two categories: "established saver" and "rapid start." The former has long-running programs, while the latter seeks customers who have not done much yet to save energy. Funding, regulatory, and operational methods for achieving successful programs are discussed. Case studies are included.

(IS-2011-106) Energy Efficiency Resource Standards: A Progress Report on State Experience

This report from the American Council for an Energy-Efficient Economy reviews programs for Energy Efficiency Resource Standards that are in 26 U.S. states. These programs set goals for annual or cumulative energy savings (such as 2% per year or 20% by 2020). The effectiveness and limitations of these programs are surveyed and discussed. The focus is on electricity, but some gas programs are included. Maximum savings were about 1.2%. Cumulative targets for 2020 are as high as 27% (Vermont). All states with such programs are on track to achieve their goals. Case studies are included.

(IS-2011-105) A POLICY FRAMEWORK FOR THE 21st CENTURY GRID: Enabling Our Secure Energy Future

This report from the National Science and Technology Council of the U.S. White House discusses energy policies for electric smart grids. The policy is built on a framework that supports cost-effective smart grid investments, innovation, customer involvement based on informed decisions, and securing the grid. Topics discussed include smart grid standards, demand response, access to usage data, customer privacy, and energy management equipment

(IS-2011-104) The Dawn of IPv6

Most companies polled show concern over their readiness to support Internet Protocol Version 6 (IPv6), which is needed to extend the number of unique addresses to individual nodes on the Internet. IPv4 could run out of addresses this year, and Network Address Translation (NAT), which allows a single device to represent a local network, is only a temporary fix. The paper shows how IPv6 will impact the world, including increased security, mobility and Quality of Service (QoS).

(IS-2011-103) U.S. Department of Energy 2011 Strategic Plan

This report is an overview of the U.S. Department of Energy (DoE) for 2011. DoE runs national laboratories, research facilities, and field office with a staff of 15,000. Developments in clean energy sources and equipment by other countries are compared to the U.S. Trends include decreased petroleum use, gradual electrification of the vehicle fleet, increasing production of advanced biofuels, and reduced greenhouse gas emissions.

(IS-2011-102) 2010 BOMA BESt Energy and Environment Report

This report from BOMA Canada is a survey of the energy and efficiency performance of 300 buildings. It assesses the performance and provides recommendations. Good results were found for emissions, indoor air quality, and environmental management. Improvements were needed for energy, water, and waste. Buildings were evaluated using the BOMA Building Environmental Standards (BESt) and BESt certification levels (1-4: lowest to highest compliance). Performance statistics are included.

(IS-2011-101) Advanced Energy Design Guide for K-12 School Buildings

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in schools (K-12). The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Expected benefits are productivity increases of 2-25% from better air quality, acoustics, and lighting including daylighting. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, building automation, air treatment, and water heating plus plug loads, renewable energy, and using the building as a teaching tool. Example properties are included.

(IS-2011-100) Advanced Energy Design Guide for Small Warehouses and Self-Storage Buildings

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in non-refrigerated warehouses. The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, and water heating plus exterior lighting and plug loads. Methods for quality assurance and commissioning are described. Example properties are included.

(IS-2011-99) Advanced Energy Design Guide for Small Hospitals and Healthcare Facilities

This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in a variety of medical buildings. The goal is to reduce energy consumption by 30% over American national standards while providing an environment for healing patients. A medical facility uses on

average 3.5 times as much energy as a commercial building, much of it for lighting. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, building automation, outside air treatment, and water heating. Example medical facilities and technologies are included.

(IS-2011-98) Advanced Energy Design Guide for Small Retail Buildings
This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in retail buildings up to 20,000 square feet. The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, and water heating plus exterior lighting and signage. Methods for quality assurance and commissioning are described. Example properties are included.

(IS-2011-97) Advanced Energy Design Guide for Highway Lodging
This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small hotels and motels (up to four stories and 80 rooms). The goal is to achieve a 30% improvement over minimum American national standard 90.1-1999. Recommendations cover the building envelope and windows, lighting systems, heating, cooling and ventilation, water heating, water conservation, and electrical loads. Methods for quality assurance and commissioning are described. Example properties are included.

(IS-2011-96) Advanced Energy Design Guide for Small to Medium Office Buildings
This report from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) provides guidelines for saving energy in new and retrofit small to media-sized office buildings (up to 100,000 square feet). The goal is to achieve a 50% improvement over minimum code requirements while enhancing the work environment and reducing greenhouse gas emissions. Recommendations cover the building envelope and windows, lighting systems (including daylighting), heating, cooling and ventilation, building automation, water heating, and electrical loads. Two office buildings were simulated. Project organizations to achieve these goals were presented.

(IS-2011-95) CABA Intelligent Buildings Roadmap
The CABA Intelligent Buildings Roadmap was a collaborative industry-funded research project that explored the opportunities offered by emerging intelligent building technologies. The Roadmap's primary objective is to identify strategies for developing intelligent buildings that have the greatest potential to drive broad acceptance. Published in 2007, the report examines the challenges facing intelligent building implementation within North America and identifies the market developments and industry initiatives needed to support the wider adoption of these

technologies. The report was prepared for the Continental Automated Buildings Association (CABA) by Building Intelligence Group LLC.

(IS-2011-94) Integrated Design & Delivery Solutions
This white paper from the University of Salford in the United Kingdom examines the benefits of integrated design and delivery solution for building construction. The techniques include product modeling and computer-aided design, standards-based exchange of product model data, the use of industry foundation classes, and building information modeling. Interoperability among software tools is needed to shield users from the complexity of the underlying technology.

(IS-2011-93) Powering our Lives: Sustainable Energy Management and the Built Environment
The UK Government's Foresight Programme explores how to help manage the transition to secure sustainable, low-carbon energy systems that meet the needs of society, the economy, and expectations of individuals. Buildings account for about half of the UK's carbon emissions, so they seek innovative & integrated solutions across building standards, urban design, planning and energy systems. This 213 page report examines different long term scenarios to identify uncertainty and risk, and to develop new insights into how the challenges can be met.

(IS-2011-92) Research Priorities for the Definition of a Multi-Annual Roadmap and Longer Term Strategy
The European Energy Efficient Building Public Private Partnership (EeB PPP) produced this roadmap as part of a one billion Euro project. The project goal is to reduce energy consumption and carbon emissions by existing and new buildings. This challenge is considered too large to be addressed by each building owner separately. Instead, work at a district level is proposed. The objectives are initially to reduce building energy consumption, make the building energy self-sufficient, and eventually, make the building an energy generator for the district. General technology issues are discussed. Financial issues are presented.

(IS-2011-91) A study of expected information needs that will be required by the wider building industry in the immediate and medium term
This report from Branz is a survey of information needs by building industry groups. About 1000 from the following groups were polled in 2010: architects, designers, builders, educators, building officials, and government agencies. Tops concerns are the building structure, materials, codes, and energy. Performance-based standards for each building were considered.

(IS-2011-90) Greenhouse Gas Emission Reduction Potentials from Buildings in South Africa
The operation of commercial and residential buildings accounts for some 23% of total greenhouse emissions. Although public and corporate sectors recognize the need to address energy efficiency and climate change, this South African report suggests that government initiatives and policy instruments could result in improved energy efficiencies of 40% to 50% in new commercial buildings and 30% to 40% in residential. The challenge remains translating intent into action. Recommendations included.

(IS-2011-89) The Business Value of BIM in Europe
This report from McGraw Hill Construction investigates BIM (Building Information Modeling) adoption in the U.K., France, and Germany. The adopters are more committed to BIM than Americans. 38% of those surveyed are adopting BIM with an expected increase to 75% in two years. The key benefits are reduced errors, reduced time for specific projects, and the ability to offer new services. Details of the survey are included with case studies.

(IS-2011-88) Building the Future: Four Visions of the New Zealand Built Environment in 2025
This 166-page report combines evidence, expertise and futures thinking with four scenarios to help the reader understand and influence the forces of change in the New Zealand building industry. It summarizes a large body of work and is intended as a reference document, rather than a book to be read from cover to cover. Details about trends and drivers that are directly relevant to the scenarios are given in this report, along with references.

(IS-2011-87) Understanding Perceptions and Usage Patterns of BIM Software Among Key Player Segments in the UK, France, and Germany
McGraw-Hill Construction conducted a survey among almost 1000 building professionals in Europe about Building Information Modeling (BIM) usage. About one-third are using BIM. Architects see the most value compared to engineers and contractors. The prevalent opinion of BIM: "Better multi-party communication and understanding from 3D visualization, along with improved project process outcomes, top the list of importance to the overall experience of value from BIM."

(IS-2011-86) Zero and Net-Zero Energy Buildings + Homes
This supplement to Building Design and Construction is a collection of eight articles on zero-energy buildings. Net-zero energy buildings are defined. Case studies are presented. A paper on technologies for achieving net zero buildings is included. The business case and financing for net-zero buildings are analyzed. Codes and standards are discussed. How to achieve zero carbon emissions is presented. Trade and government groups in this field are listed.

(IS-2011-85) Green Building & Human Experience: Testing Green Building Strategies with Volunteered Geographic Information
This report from the U.S. Green Building Council explores methods for gathering data from building occupants. It focuses on the human experience, Volunteered Geographic Information (VGI); and green buildings. VGI tracks volunteers as they use the building and nearby environment. The intent is to shift from a best-practices guide to evidence-based practices.

(IS-2011-84) A Local Government Guide to LEED for Neighborhood Development
This report from the U.S. Green Building Council is intended for local governments. It helps identify "development projects that successfully protect and enhance the overall health and quality of our natural environment and our communities." Three stages for LEED (Leadership in Energy and Environmental Design) certification are (1) conditionally approved plan, (2) pre-certified plan, and (3) certified neighborhood development. The LEED Neighborhood Development Rating System is referenced. Examples are provided.

(IS-2011-83) Transforming America's Power Industry: The Investment Challenge 2010-2030
This paper from the Brattle Group examines the investment required through 2030 to maintain a reliable electricity system. Four scenarios are studied: base level, realistically achievable levels of energy efficiency and demand response programs, maximum achievable levels, and carbon reductions that may be mandated. The projected investment ranges from $1.5 trillion to $2 trillion. Energy efficient and demand response programs could reduce generation requirements 38% to 48%. Renewables would account for 29% of total power generated. Investments in transmission and distribution could surpass generation.

(IS-2011-82) Toward Net Zero Water: Best Management Practices for Decentralized Sourcing and Treatment
This report from the Cascadia Green Building Council provides a strategy to foster water processing for reuse locally so the net water consumption in a building is zero. The following topics are covered: rainwater harvesting, including strategies for potable and non-potable uses, greywater reclamation and reuse, and on-site wastewater treatment and reuse, including composting toilets. 0.007% of the total water on earth is available for human use. The U.S. uses 30% of water for agriculture, 50% for industry, and 11% for domestic. Each person uses an average of 65-78 gallons per day. Case studies are included.

(IS-2011-81) Broadband Spectrum: The Engine for Innovation, Job Growth, and Advancement of Social Priorities, March 2011
According to the TIA, rising demand for wireless broadband internet access has created a spectrum crisis that jeopardizes economic productivity, job growth, innovation, and societal gains. Allocating additional spectrum for wireless broadband will produce numerous economic and societal benefits, but failure to do that could result in wireless data gridlock. Mechanisms should be established to permit fast and flexible spectrum reallocations.

(IS-2011-80) Technology Roadmap: Smart Grids
This report from the International Energy Agency (IEA) presents a roadmap toward a secure energy future with lowered carbon emissions. The roadmap focuses on the benefits of a smart grid for real-time monitoring and management. Large-scale trials and implementations of smart grid are recommended. The IEA set a goal of a 50% reduction in carbon emissions by 2050. The largest growth in energy consumption will occur in India (six-fold) and the Middle East (four-fold). The elements of a smart grid are described. Policies and pricing are presented.

(IS-2011-79) North American FTTH Status – March, 2011
While still relatively strong, FTTH growth has slowed somewhat since 2008. That's largely because Verizon, which represents over 73% of all North American FTTH connections, has approached its deployment targets, slowed its network build, and turned its attention to marketing. Other factors include general economic conditions. U.S. growth in 2011 is largely because stimulus money is now starting to flow to FTTH projects among smaller commercial providers and municipalities.

(IS-2011-78) Renewable Energy in America: Markets, Economic Development and Policy in the 50 States
This paper from the American Council on Renewable Energy is a survey of the U.S. projects, markets, and economic impact of renewable energy on a state-by-state basis. The survey covers wind power, photovoltaic power, geothermal, small hydro, ocean power, biomass, bioethanol, and biodiesel sources.

(IS-2011-77) A Model for Stakeholder Collaboration
This report is from the National Action Plan Coalition, a coalition of organizations involved in demand response for energy management. It summarizes results from the Washington PowerCentsDC demand response pilot program. The intent is to present a case study of a smart grid application. 900 customers participated in a test of dynamic electricity pricing facilitated with smart meters. Summer usage was reduced by one third. The importance of involving all utility departments was stressed.

(IS-2011-76) Passivhaus Requirements: Logical or Arbitrary?

The holy grail of cold-climate energy-efficient design is the house without a heating system, but most of these homes are neither "passive" nor without heating systems. The Passivhaus standard does, however, set a high bar for air tightness, super-insulation, and high-performance windows to achieve energy efficiency without fancy equipment.

(IS-2011-75) Guidance on the Design and Construction of Sustainable, Low Carbon Warehouse Buildings

This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to warehouses. Changes to the building structure and building services such as heating, cooling, and lighting are presented. Lighting improvements had the biggest impact. Local power generation is considered.

(IS-2011-74) Guidance on the Design and Construction of Sustainable, Low Carbon Supermarket Buildings

This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to supermarkets. Lighting was the largest contributor to emissions (about 50%), which could be ameliorated with efficiency improvements and skylights in the roof. Improvements in heating and cooling were difficult to achieve. Wind turbines in the parking lot are considered. Embodied carbon was considered, that is, carbon contained in building materials that could be emitted when the building is demolished.

(IS-2011-73) Guidance on the Design and Construction of Sustainable, Low Carbon School Buildings

This paper contains a proposal from Tata Steel and the British Constructional Steelwork Association for designing and constructing sustainable, low and zero-carbon buildings in the United Kingdom. This is responding to U.K. laws mandating greenhouse gas emission reduction of 34% by 2020 and 80% by 2050 compared to 1990. New non-residential buildings are to achieve zero emissions by 2019. This paper focuses on techniques applicable to schools. Design and structure examples that provide better performance are presented. Cases are shown of school buildings that reduced carbon emissions 25% by using only energy efficiency measures at an increased capital cost of 0.14%.

(IS-2011-72) The smart grid and the promise of demand-side management

This report from McKinsey is an overview of demand-side management. McKinsey uses this term to cover load shifting (demand response) and energy conservation. They define "Six Levers of Effective Demand-Side Management": rates, incentives, access to information, utility controls, education and marketing, and customer insight and verification.

(IS-2011-71) 2011 Master Index of Women and Technology

According to the research, Canadian women are avid users of mobile technology including cameras, MP3 players, cellphones and smartphones. However, the way women use these devices is often dependent on their age, income and life stage. Almost half (46%) of Canadian women admit they could not go a week without their mobile devices and the access they provide to social media networks, online shopping and keeping track of videos, music and other documents.

(IS-2011-70) Making the cloud relevant: E-business, IT as a Service, and Everything as a Service

This paper from Hewlett-Packard is an opinion piece about the value of cloud computing. The author maintains that cloud computing will solve new problems and will solve old problems "quicker, cheaper, and with higher quality results." Cloud computing will force information technology department to offer new services. Stages of evolution of cloud services are described.

(IS-2011-69) Magic Quadrant for MSSPs, North America

This report from Gartner analyzes managed security service providers and offers guidance on choosing one that fits the needs of the company. The main functions are firewall management, intrusion detection, and intrusion prevention. The dilemma of out-sourcing data security especially to providers in foreign countries that may be subject to government surveillance is considered. The strengths and cautions for a variety of companies are reviewed.

(IS-2011-68) Creative Partnerships Are Key To M2M Market Development for Wireless Carriers

Connecting new smart devices to networks is poised for rapid growth. Virtually all products that use electricity today possess inherent data processing capability and the potential to be networked in a wide array of applications including automotive telematics, commercial transportation, mobile health, smart grid and consumer electronics. Leading cellular network operators are advancing the use of wireless Machine to Machine (M2M) communications, but going it alone is risky.

(IS-2011-67) Technical Study of the Sofa Super Store Fire - South Carolina, June 18, 2007
This report from the U.S. National Institute of Standards and Technology (NIST) analyzes the causes and spread of a disastrous fire in a furniture store in Charleston, South Carolina (6/18/07). Nine firefighters were killed. The absence of sprinklers and compartmentalization of the building were direct causes of the spread of the fire. NIST provided 11 recommendations to minimize such future fires.

(IS-2011-66) Electricity Reliability: Problems, Progress and Policy Solutions
This paper from the Galvin Institute focuses on methods for improving the reliability of electricity. The authors maintain that reliability can be achieved with better metrics and without increased costs. Smart grids per se will not ensure enhanced reliability. Case studies of utilities that successfully increased reliability are presented. Underground wires are urged.

(IS-2011-65) EcoPinion Lighting Survey Report: Lighting the Path Forward for Greater Energy Efficiency
An important transformation is taking place in the market for residential lighting, moving away from traditional incandescent lamps to energy efficient lighting options such as CFLs and LEDs. This study found that American consumers are clearly ready to adopt the new lighting options and are happy with the results. Two-thirds installed CFLs in their homes over the past year, and 27% installed some sort of LED fixture. As prices of new lighting options fall, market penetration will increase.

(IS-2011-64) Energy Efficiency Investments as an Economic Productivity Strategy for Texas
This paper from the American Council for an Energy Efficient Economy assesses methods for assuring that the State of Texas can supply electric energy needed to support a population growth of 1.3% per year through 2030. The state already has plans for a 3.5% decrease in demand for energy by 2030 through a 30% increase in energy efficiency. This paper argues that energy efficiency should be coupled with an increased use of combined heat and power (CHP) systems. CHP plus energy efficiency increases would save about 23% in energy costs by 2030, which translates to $14 billion in savings between 2012 and 2030.

(IS-2011-63) The comScore 2010 MOBILE Year in Review
As mobile smartphones, 3G and unlimited data plans continue to play a more prominent role on the digital stage, it's imperative for marketers to understand how consumers are using mobile devices and perhaps more importantly what synergies and differences vary between the PC-Internet screen and the mobile media screen. comScore offers an overview of the prevailing trends in mobile media usage across geographies including the U.S., EU, and Japan and considers their implications for the year ahead.

(IS-2011-62) 2010 Canada DIGITAL Year in Review

The report analyzes digital media trends including overall Internet usage, high-growth categories, online display advertising, online video, search and mobile. It includes many good charts and considers trend implications for navigating the uncertainties of the year ahead.

(IS-2011-61) Civic Ecology: A Community Systems Approach to Sustainability

This paper from Sera Architects describes voluntary actions by a neighborhood of Philadelphia to encourage recycling. This program is part of a larger concept called Civic Ecology. Civic Ecology integrates economic, ecological, and social systems plus a long-range plan for 10, 20, and 50 years.

(IS-2011-60) Public Attitudes Toward Energy Efficiency and Appliance Efficiency Standards: Consumers See the Benefits and Support the Standards

This paper from the Consumer Federation of America reports on a survey of consumer opinions about home appliance efficiency. The public is more aware of energy consumption by autos than at home, even though the total for each category is about the same. Most people favor increased efficiency of large appliances and standards for energy efficiency even if appliance prices increase as a result. 1000 people were contacted for this survey.

(IS-2011-59) Next Generation Technologies Barriers & Industry Recommendations for Commercial Buildings

This report from The Zero Energy Commercial Buildings Consortium examines how to achieve the goals of net zero energy consumption by commercial buildings. Such buildings currently consume 40% of the energy used nationally and produce 40% of the greenhouse gases. This organization examined the building structure, systems, information technology, codes, and economic issues. Barriers to technology advancement include integrated design, sensors and controls, costs, and a lack of skilled workers. Issues affecting each technical area are examined.

(IS-2011-58) Analysis of Cost & Non-Cost Barriers and Policy Solutions For Commercial Buildings

This report from The Zero Energy Commercial Buildings Consortium examines market and policy barriers to achieving net zero energy buildings. The topics covered include codes and standards, integrated design and building delivery, benchmarking and performance assurance, voluntary programs, finance and valuation, owners and tenants issues, and workforce development. The gaps and barriers for each topic are examined. Recommendations are provided.

(IS-2011-57) 2011 Digital Out-of-Home Outlook & Planning Guide (US Media)
Provides U.S. intermediate & advanced media agencies with a baseline on what's going on in digital out-of-home (DOOH) advertising, offers ideas on the opportunities, and discusses the challenges. Covers the shift to consumer-driven marketing, the state of buying in a still-distressed economy, how networks and planners are making an impression, what's working, growth areas, what still needs works, and the ABC's of DOOH.

(IS-2011-56) 2011 Digital Out-of-Home Outlook & Planning Guide (Canadian Media)
Provides Canadian intermediate & advanced media agencies with a baseline on what's going on in digital out-of-home (DOOH) advertising, offers ideas on the opportunities, and discusses the challenges. Covers the shift to consumer-driven marketing, the state of buying in a still-distressed economy, how networks and planners are making an impression, what's working, growth areas, what still needs works, and the ABC's of DOOH.

(IS-2011-55) Revealing the Values of the New Energy Consumer
This report serves primarily as marketing collateral to sell Accenture's guide, "The New Energy Consumer: Strategic Perspectives on the Evolving Energy Marketplace" and related consulting services. It does include some useful market research and four key observations: (1) while consumers regard their utilities as primary providers of energy-related products, dynamic business models are emerging; (2) price is pivotal but not the only factor; (3) utilities need to differentiate their propositions and experiences; and (4) consumers will respond if they do.

(IS-2011-54) Absolute Zero: Net Zero Energy commercial buildings – an inspiring vision for today
This paper from Johnson Controls provides an overview of net zero buildings. Such buildings generate as much energy from renewable resources as they consume over a period of a year. Net zero buildings are required or encouraged for new construction by national and local mandates by 2020, 2030, 2040 or 2050. Case studies are included. "Aiming for 'near-zero' in larger commercial structures would seem a worthy goal, both achievable and financially attractive when considering the long-term cost of operating a commercial building."

(IS-2011-53) Digital Out-Of-Home Communications: The future is here and now
2054-era technologies from Minority Report are starting to appear in the market today. They include facial recognition, fingerprint & retinal scanning, augmented reality, multi-touch, gesture-based interfaces, neural interfaces, personalized advertising, and wearable computers. Market drivers and enablers include a mobile society, social media, convergence, the Cloud, near field communication, RFID, QR codes, open standards, digital signage, suggestive selling, and virtual sales assistance. The report also gives important insights and discusses implications of these trends.

(IS-2011-52) Summary Report of Energy Use in the Canadian Manufacturing Sector 1995-2008
This report from the Office of Energy Efficiency at Natural Resources Canada is an annual survey of energy usage for manufacturing in the country. Energy for manufacturing accounted for 21% of the total usage in 2008. Petroleum and gas had the largest increase, while paper decreased the most. Energy consumption by manufacturing sector is presented. Electricity has surpassed gas as the top energy source for manufacturing in Canada.

(IS-2011-51) Implementing Telework: Lessons Learned from Four Federal Agencies
Telework is touted as a winning strategy for government with potential savings of nearly $3.8 billion from reduced real estate costs, electricity savings, reduced absenteeism, and reduced employee turnover. But Telework adoption has been slow and presents technological, social, operational, and management challenges. This report offers practical implementation advice to agency leaders and front-line managers faced with applying the newly-enacted "Telework Enhancement Act of 2010" to over one million federal workers.

(IS-2011-50) Appliance and Equipment Efficiency Standards: A Money Maker and Job Creator
This study estimates net employment and wage impacts of U.S. DOE appliance, equipment, and lighting efficiency standards. These mandated standards are a key part of the nation's energy policy, energy & economic savings for consumers and the broader economy as well. Existing standards generate an estimated 340,000 jobs, or about 0.2% of all jobs, and new standards will raise this about 12% to 380,000 jobs by 2030. The increase results from saving some $34 billion in energy costs and consumers shifting spending away from utilities and onto other things.

(IS-2011-49) Building Information Modeling
This report from InfoComm presents an overview of Building Information Modeling (BIM) and the relevance to audio/video professionals. BIM is "a digital representation of physical and functional characteristics of a facility." BIM is a data repository for building design, construction, and maintenance information. BIM affects the building consultant, integrator, system designer, and manufacturer. BIM can track design changes.

(IS-2011-48) 2010 Financial Services Global Security Study – The Faceless Threat
This report from Deloitte highlights the growing threat of cyber security from organized criminals and governments. The results of a survey of top financial institutions, banks, and insurance companies worldwide are presented. Data loss prevention is a key issue. The need to protect paper copies of data is stressed. It was noted that many organizations provide employees with wide access to sensitive data.

(IS-2011-47) Next Generation Broadband Access White Paper
The Broadband Forum, successor of the DSL Forum, provides an optimistic overview of next-generation access technologies and shows how they can enable new services while coexisting with older broadband infrastructure. Covered technologies include: VDSL2, FTTx, LTE, and WiMAX, among others.

(IS-2011-46) Key Considerations for Home Energy Efficiency Retrofit Rebate and Financing Incentive Integration
This paper from the Electric & Gas Industries Association examines funding options for home energy management programs. The emphasis is a simple way for contractors to present the savings and net cost of improvements for energy improvements to homeowners. Programs that expedite incentives in various regions of the U.S. are summarized. Financing options are discussed.

(IS-2011-45) Energy Management Information Systems
This handbook from the Canadian Office of Natural Resources of Natural Resources Canada presents instructions to management and operations on an energy management information system covering metering, data collection, data analysis, reporting and cost/benefit analyses. Analysis is key to gleaning knowledge from data collected. Examples are provided. A checklist for an effective system is presented.

(IS-2011-44) U.S. Digital Media Year in Review 2010
The report provides an overview of prevailing trends in digital media usage during the year and considers their implications for the year ahead. It examines U.S. Internet usage, search activity, e-commerce, online video consumption, online advertising and mobile, and offers a prognosis for which digital strategies will be most critical for success in 2011.

(IS-2011-43) Demystifying the Cloud
The report from Bell Canada provides an overview of "cloud computing": outsourcing corporate information technology (IT). Some cloud vendors run systems dedicated to one company, while others share servers among many clients. Some users pay for services as needed, rather than entering into long-term contracts. Three cloud models are presented: Software as a Service (e.g., billing), Infrastructure as a Service (e.g., storage and computing), and Platform as a Service (e.g., application development). An advantage of cloud computer is the ability to scale quickly as business increases. Guidance for companies to choose the best cloud system is provided. Examples of successful cloud projects are included.

(IS-2011-42) Energy Management - A Mass Market Consumer Opportunity
The report from Best Buy examines how to develop a consumer market for energy management products and services. The solution is to focus not just on cost-savings, but on benefits and control. Energy management must be integrated with other home functions such as entertainment. Best Buy divides customers into those focusing on (1) financial and physical protection, (2) comfort and convenience, and (3) being "green." Any consumer product for energy management must be easy to use, convenient, and offer a return on the time and money invested.

(IS-2011-41) Revealed: The art of music listening
There's "listening", and then there's audiophile listening with musicality that the average person doesn't notice. Today's high-end audio is a pleasing blend of old analog and new digital technologies, including CDs, multichannel SACD and DVD-A formats, portable MP3s, high-res lossless digital files, and even vinyl. This report offers consumer advice such as choosing equipment, positioning speakers, and training your ear. It includes advertising from top brands.

(IS-2011-40) Next Generation Technologies Barriers & Industry Recommendations for Commercial Buildings
This report from the Zero Energy Commercial Buildings Consortium (CBC) presents results from a survey commissioned by the U.S. Department of Energy on new technologies to make buildings more energy efficient. The CBC was asked to "identify market potential, barriers, and strategic solutions needed to accelerate their deployment and widespread use." The CBC studied the building envelope, mechanical and plumbing systems, lighting, information technology, combined heat and power generation, and electric grid interaction. The report emphasizes the need for integrated design of these systems and continual monitoring during operations. More work-force training is needed. DC microgrids are proposed for lighting and building controls.

(IS-2011-39) 2010 Building Performance Institute, Inc. End of Year Report
This report from the Building Performance Institute (BPI) reviews accomplishments in 2010. BPI certifies contractors, totaling more than 20,000 by the end of 2010. The BPI was authorized by the American National Standards Institute (ANSI) to write American national standards for retrofitting residential buildings for energy efficiency. BPI is writing 10 standards related to home energy retrofits.

(IS-2011-38) Total cost comparison study of analog and IP-based video Surveillance
This report from Axis Communications compares video surveillance using analog and digital technology based on an IP (Internet Protocol) network. The cost of purchasing and operating a video system are analyzed. The digital IP system is less expensive for 14 or more cameras.

(IS-2011-37) NTCA 2010 Broadband/Internet Availability Survey Report
The National Telecommunications Cooperative Association represents small and rural telephone companies. Its 2010 survey of members found increased broadband deployment and identified technologies used: 94% DSL, 68% FTTH, 20% unlicensed wireless, 13% licensed wireless, 8% satellite, and 7% cable modem. The report also identifies funding, competition, challenges, Internet backbone connections, and new services such as VoIP and Video, along with trends from their 2000 report.

(IS-2011-36) Smart Grid White Paper: The Home Appliance Industry's Principles & Requirements for Achieving a Widely Accepted Smart Grid
This report from the Association of Home Appliance Manufacturers (AHAM) is a statement of principals for smart grid design as it affects large home appliances. Pricing should be the incentive for consumer energy management. Communications standards must be "open, flexible, secure, and limited in number." Consumer should have choices and have their privacy respected. AHAM estimates that with full consumer participation in demand response programs, consumers could contribute 10% to the reduction of peak demand, with businesses adding another 10%. Consumers should be able to override any energy savings instructions sent to an appliance by a utility.

(IS-2011-35) Fundamentals of Multicore: Operating Systems for Telecom/Networking Applications Adopters
The white paper from ENEA examines the challenges of designing application software for a processor with multiple cores. Multiple cores accommodate parallel processing of data. Key considerations in software design are configuring the applications for multiple cores, portability among various processors, scalability, and performance. Multiple cores can enhance execution speed unless the process is limited by I/O activities or contention for shared memory. Various strategies are discussed.

(IS-2011-34) Assessment of Communication Standards for Smart Appliances
The Association of Home Appliance Manufacturers (AHAM) set out to identify communications protocols and rank them by their ability to meet the Smart Grid needs of appliance consumers. Each technology was evaluated

against consumer driven requirements identified by participating AHAM members based on their industry knowledge and expertise. Each technology was then evaluated through a scoring system. For the Application layer, SEP 2.0 and OpenADR scored highest. For media and network layers, Wi-Fi, ZigBee and HomePlug Green PHY, scored highest.

(IS-2011-33) Cloud Computing: Hackett Study Identifies Emerging Best Practices and Experiences of Early
This report from the Hackett Group assesses the potential growth "cloud computing" business. Cloud computing consists of information technology (IT) services provided via the Internet by the corporate IT department or by an outside service provider. Companies are considering cloud computing to reduce IT investments. Cloud computing works best when designed from the ground up, rather that added to an existing IT infrastructure.

(IS-2011-32) Consumer Driven System Level Requirements
This detailed comparison grid is useless on its own and is meant to supplement CABA document RV311f. Each communications technology was evaluated against a set of consumer driven requirements, as identified by participating AHAM members based on their industry knowledge and expertise. Each technology was then evaluated through a requirements-driven scoring system by an independent consultant to rank its ability to meet the unique needs of appliance consumers.

(IS-2011-31) Advancing Broadband – A Foundation for Strong Rural Communities
USDA summarizes the initiative awards aimed at advancing the reach of broadband to rural communities and connecting about 7 million rural Americans, 360,000 businesses, and 30,000 community institutions like schools, hospitals, and fire and police service. $3.4 billion was awarded to 297 recipients in 45 states, with 89% going to last-mile infrastructure projects. The report details how the money was spent and describes the specifics of each award.

(IS-2011-30) Remote work - A practical guide to the new business reality
Today's remote workers aren't just telecommuters who work from home offices. They're salespeople, technicians & service personnel, consultants, educators and business travelers – all working, collaborating and staying connected wherever the job takes them. People used to go to work – now work moves with them, allowing them to reach new levels of creativity and output. This paper presents common benefits of Remote Work and gives advice for overcoming perceived barriers.

(IS-2011-29) Use of Residential Smart Appliances for Peak-Load Shifting and Spinning Reserves
This report from Pacific Northwest National Laboratory examines the potential impact of smart appliances on electric utility demand response. The following appliances were analyzed: refrigerator, clothes washer, clothes dryer, room air-conditioning, and dishwasher. Two aspects were studied: appliance operation deferral to off-peak hours; appliance operation delay for up to 10 minutes. The possible benefits to lowering utility spinning reserves are presented.

(IS-2011-28) Magic Quadrant for Cloud Infrastructure as a Service and Web Hosting
The paper from Gartner examines the business of "cloud computing": outsourcing corporate information technology (IT). Cloud Infrastructure as a Service is an extension of web hosting for some companies and a substitute of in-house IT for others, typically new companies. Options for running cloud service businesses are described. A survey of cloud companies, mostly located in the U.S., is included. The strengths and weakness of these companies are presented.

(IS-2011-27) An MPG Rating for Commercial Buildings: Establishing a Building Energy Asset Labeling Program in Massachusetts
This report from the Massachusetts Department of Energy Resources presents a method for reducing energy consumption in commercial and industrial buildings. The approach is a system for comparing energy consumption among similar buildings independent of tenant activities by examining windows, insulation, mechanical, and electrical systems. The Massachusetts proposal is compared to other programs such as LEED (Leadership in Energy and Environmental Design), EPA (Environmental Protection Agency) Energy Star Portfolio Manager, and European directives on rating buildings. A building labeling pilot program is described.

(IS-2011-26) Smart Metering & Infrastructure Program Business Case
This brochure from BC Hydro describes the plans for installing smart meters. The schedule for installation is presented. The benefits claimed are faster outage notification, restoration notification, low theft rates, more accurate meter reads, etc. Options in-home displays will be offered.

(IS-2011-25) Health Impacts of Radio Frequency from Smart Meters
Wide deployment of smart electric meters for better management of power generation and distribution caused the California legislature to question the health effects. Carefully monitored scientific study shows that the FCC standard is sufficient to protect public health at the power level and frequencies used by smart meters. These

FCC guidelines provide a significant factor of safety against thermal impacts of RF emissions, but non-thermal impacts over long term exposure is not well known and needs further study.

(IS-2011-24) 2008 State of the Connected Home Market Study Executive Summary
In one of the more striking examples of cross-industry collaboration, 10 top companies – Whirlpool Corporation, Bell Canada, Cisco Systems, Direct Energy, Hewlett-Packard Company, Leviton, Microsoft, Procter & Gamble, Legrand and Zensys/Z-Wave teamed up to conduct one of the most in-depth studies ever launched into the state of the connected home. Consumers were most interested in an easy, seamless way to integrate all their smart home devices from mobile to TV to appliance. This research is a follow up to the previous State of the Connected Home studies that were completed in 2003 and 2005.

(IS-2011-23) North American Intelligent Buildings Roadmap Executive Overview
The research project was designed to outline long-term opportunities in the intelligent building industry. The Roadmap provides an understanding of the collective influence of emerging trends within the intelligent building industry, such as energy efficiency, renewable technology, IT convergence and the integration of buildings with the smart grid. The Roadmap also investigated the current and future direction of the intelligent building market in North America and the opportunities it represents for participants within the value chain. The research also examined the influence of current and emerging intelligent building technology solutions, with an analysis that considers commercialization, market preferences and product acceptance.

(IS-2011-22) Intelligent and Integrated Buildings Technologies: Market Size in North America 2010 Executive Summary
This report provides an in depth analysis of the growing North American markets for integrated and converged intelligent building control systems ranging from environmental control technologies, to fire detection, to security to lighting systems to IT convergence. By assessing the developments in technology and technical standards in the past five years, our report is able to make an unparalleled forecast of what lies ahead in the next five years. The result is the authoritative analysis of the size and potential of the North American intelligent building technologies marketplace.

(IS-2011-21) Energy as a Managed Service Executive Summary
The report found that the concept of energy as a managed service is appealing to the great majority of North American homeowners. The majority of consumers surveyed said that they would consider purchasing energy as a managed service if it was available at a reasonable price. The research was conducted for CABA by POCO Labs, a management consultancy which specializes in strategic consulting. The following organizations

participated in this "Landmark CABA Research Project": 3M Company, Bell Canada, Best Buy, Direct Energy, Freescale Semiconductor, Honeywell International, Ingersoll Rand/Trane /Schlage, Intel Corporation, Landis+Gyr, Microsoft Corporation, TELUS, Tyco Electronics and Whirlpool Corporation.

(IS-2011-20) BeyWatch White Paper
This paper introduces Building Energy Watcher, a consortium supported by the European Commission's DG Information Society and Media. The aim of this research project is to propose ICT (information and communication technologies) for energy efficient white goods, with the objective of saving 20% of the EU's energy consumption by 2020, thus also reducing carbon dioxide (CO_2) emissions and energy bills. Ultimately, the group envisions zero-footprint homes that can contribute surplus energy to the smart grid.

(IS-2011-19) VoIP News: Large Enterprise PBX Comparison Chart
This article from VoIP News compares the features of telephone switching equipment for large companies. Some of the features compared include size of company supported, hardware and software, support for mobile communications, and support of IP devices. Twelve products are compared.

(IS-2011-18) ICT for a Low Carbon Economy
This report from the European Commission examines how information and communications technology (ICT) can improve building operating efficiency in terms of energy consumed. "The ICT sector can deliver simulation, modelling, analysis, monitoring and visualisation tools that are vitally needed to facilitate a whole building approach to both the design and operation of buildings." Buildings in Europe consume 40% of energy produced and are the largest sources of CO_2. Energy consumption throughout the design, construction, and operation of buildings is examined. Technologies for intelligent buildings are reviewed.

(IS-2011-17) Executive Summary: Smart Appliances
Governments worldwide are developing policies, infrastructure, and tools to improve ways to manage energy, including smart grid and smart meter initiatives. Fueled partly by stimulus funds, smart household appliances will have a significant role to play moving forward and appears on the cusp of moving from the development stage to commercialization and growth. This market research excerpt covers energy management and demand response applications, communications technologies, standards, and key industry players.

(IS-2011-16) Towards an ICT Infrastructure for Energy-Efficient Buildings and Neighbourhoods for Carbon-Neutral Cities

This report from a workshop held by the European Commission examines the role of public-private initiatives to create smart cities. The goal is to demonstrate methods for achieving the European Union objective of a 20% increase in energy from renewables, a 20% reduction in energy consumption, and a 20% decrease in greenhouse gases by 2020. The workshop considered the role energy positive cities that generate more energy than they consume. Consumer involvement and concerns for energy costs and privacy were mentioned.

(IS-2011-15) ICT for a Low Carbon Economy: Smart Electricity Distribution Networks

This report from the European Union reviews the role of information and communications technology (ICT) in the infrastructure of a smart grid for electricity. ICT will help Europe achieve goals for improving energy efficiency and shifting to renewable energy sources. ICT applications to generation, transmission, distribution, metering, and customer services are reviewed.

(IS-2011-14) Multi-Agent Coordination in the Electricity Grid, from Concept towards Market Introduction

This paper from the Electric Research Center of the Netherlands describes a system for coordinating the generation and consumption of electricity. The operating environment is expected to include distributed energy resources. Each generator includes software agents that represent the power source, the pricing, the market bids, and a goal such as maintaining balance within a cluster. Agents communicate by issuing event notices. Details and field test results are included.

(IS-2011-13) Generations 2010

This 29-page report from Pew Research explores how different generations use the Internet and usage trends by application type. It segments users by age into Teens, Millenials, Gen X, Younger Boomers, Older Boomers, Silent Generation, and GI Generation. Email and search engine use remain the backbone of online activities. The youngest generations are far more likely to use social network sites, but interestingly, the fastest growth has come from Internet users 74 and older.

(IS-2011-12) Ontario's Long Term Energy Plan

This report from the Government of Ontario examines the strategic plans for electricity generation. The present supply is decreasing and is dependent on coal-fired generating plants. The Province plans to use more renewable sources of energy and demand response to reduce peak demands. Coals plants will be eliminated by 2030. Other sources of electricity are reviewed.

(IS-2011-11) M & A in the Canadian Renewable Energy Sector

This report from Price Waterhouse Coopers surveys mergers and acquisitions of Canadian companies involved in renewable energy. Most mergers and acquisitions are in Europe (60%), while 16% are in North America. The target companies are involved in wind, solar, and hydro. Opportunities for Canadian companies are analyzed and transactions are surveyed. Canadian companies may partner with companies in Brazil, China, and India. "The future of the Canadian renewable sector does indeed look bright."

(IS-2011-10) The Digital Entertainment Revolution

Internet-connected TVs, Blu-ray players and video game consoles are shifting the digital entertainment ecosystem and creating new opportunities and threats. Content producers such as the studios now compete not just with each other but with user generated content, and the broadcast TV schedule is being supplanted with "everything on demand." Still, research suggests the $10 billion in new service opportunities by 2013 will mostly enhance traditional TV rather replacement it.

(IS-2011-09) Analog Mobile TV: The World's Most Widely Available Option for Mobile TV

If the world is going digital, why does analog TV make sense for phones? Because of established broadcast standards and single-chip TV receivers, In-Stat predicts the number of viewers of free analog TV on mobile phones will be greater than subscription-based mobile digital viewers. The report compares the cost of analog and digital services, including Over-the-Top services like YouTube and Hulu and includes survey data supporting a similar conclusion.

(IS-2011-08) High Speed Access Report

In addition to providing market research and forecasts for fiber-optic-based Internet technologies; this 20-page report describes the increased adoption of reconfigurable optical add-drop multiplexer (ROADM) technologies, which providers use in the core of their networks. It compares the technical and market success of FiOS versus U-verse and shows adoption forecasts for major broadband technologies and service providers. U.S. adoption currently stands just above 65%.

(IS-2011-07) Overview of Greywater Reuse: The Potential of Greywater Systems to Aid Sustainable Water Management

This report from the Pacific Institute explores the benefits to developing countries of using greywater. Greywater is household waste water that does not contain sewage (called black water). Treatment options for filtering greywater are presented. Treatment is especially important if the greywater is stored.

(IS-2011-06) European Internet access and use in 2010
Market research data from the European Union shows that households with Internet connections doubled from 30% in 2006 to 61% in 2010. The report highlights the demographic and geographic differences and measures broadband adoption and applications like e-shopping, e-government, e-security and advanced communications and content services, including the fact that 80% of young Internet users are active on social media.

(IS-2011-05) Energy-Efficient Buildings PPP: Multi-Annual Roadmap and Longer Term Strategy
This report from the European Union provides a strategy for improving the energy efficiency of buildings. The long-term goal is zero energy consumption on average in buildings and eventually energy positive buildings, thus making them power plants. This would entail integration of distributed energy resources and smart grids at the district level. Buildings account for 40% of total energy consumption in Europe. Areas of research to achieve these goals are presented. A roadmap for 2011-2013 is introduced.

(IS-2011-04) Carbon Usage Effectiveness (CUE): A Green Grid Data Center Sustainability Metric
The Green Grid, a consortium of companies, education institutions, and government agencies, is proposing metrics to measure the energy efficiency of data centers. Among the metrics are power usage efficiency (how much power goes to information technology) and carbon usage effectiveness. Carbon usage effectiveness measures how much of data center energy results in carbon emissions. These measures apply to the data center operations, not the life cycle of the data center equipment. Formulas for computing these metrics are presented.

(IS-2011-03) Executive Summary: Building Energy Management Systems
This report from Pike Research summarizes trend in building energy management systems (BEMS). BEMS varies according to building age, size, and usage. Demand response will become an important impetus for BEMS because it combines information technology and energy management. BEMS revenues are projected to more than double from 2010 to 2016.

(IS-2011-02) Home Energy Saving through Wireless Sensor Networks
This short, two-page, paper presents a home automation system based on wireless sensor networks (WSN) that measure and profile light, temperature and user presence. The objective is to predict behavior and better manage energy consumption. The system is being developed within the AIM project and the European Union's Action Plan for Energy Efficiency.

(IS-2011-01) CABA Connected Home Roadmap 2010 Executive Summary
The Continental Automated Buildings Association has completed a consumer market study that examined all aspects of the connected home marketplace. CABA's "Connected Home Roadmap 2010" project was a large-scale study created to provide insights into consumer attitudes concerning technologies, value propositions and future market adoption. The Roadmap project examined the following market segments: safety, security, health, energy management, monitoring, entertainment, home control and automation.

(IS-2010-180) ZigBee Crosses the Chasm
This report from On World is a market survey of ZigBee radio technology and products. The market for short-range radio communications chips is projected to be 307 million by 2014. In 2009 the largest market for ZigBee and IEEE 802.15.4 (the radio standard used by ZigBee and others) was metering followed by consumer electronics. ZigBee RF4CE is being considered by consumer electronics companies to replace infrared remote control units. ZigBee/Pro has applications in homes, buildings, and medical products.

(IS-2010-179) Accelerating Successful Smart Grid Pilots
This paper from the World Economic Forum explores how to motivate the creation of sustained pilot projects for electric smart grids. This report found about 90 pilots mostly focusing on advanced metering infrastructure (remote meter reading, data collection, and data management). "Challenges remain around data privacy, security, interoperability and standards." "The majority [of pilot projects] still face a number of barriers that are reducing their ability to achieve their full potential." Recommendations for effective pilot programs are presented.

(IS-2010-178) Accelerating Smart Grid Investments
This paper from the World Economic Forum explains how a smart grid can benefit the world facing energy shortages and climate change. Financing smart grid by shareholders and customers is discussed. The case for a smart grid should be based on societal benefits, not just financial benefits. Examples of smart grid features are presented.

(IS-2010-177) The Smart Energy Report
This report from Aclara is a summary for a September 2010 conference called Smart Energy International. Various executives voiced their opinions on the future of electric smart grid. Some of the views included: the peaking and demise of smart grid, the lack of environmental drivers for a smart grid, the lack of customer education about smart grid, the benefits of grid frequency regulation, and the need to minimize data collection to protect consumer privacy ("If you don't need it, why collect it?").

(IS-2010-176) Smart Metering for Water Utilities
This paper from Oracle argues for water meters that can be read remotely on an interval basis. Among the claimed benefits are encouraging customer conservation and detecting water leaks. The integration with a Meter Data Management system is discussed.

(IS-2010-175) Bluetooth Special Interest Group: Remote Control
This brochure compares Bluetooth for remote control of consumer electronics to other methods. The other remote control methods include traditional infrared (IR) and a new radio system recently developed called RF4CE. Guidelines for a Bluetooth remote control unit are included.

(IS-2010-174) Telios: Low-Cost Bridging of Telehomecare and the Home Media Center
This paper from the University of California Irvine explores methods for remote health care. The objective was to find a method that did not require expensive equipment purchase. The health care is provided via the Internet. The user interface is a television with a custom remote control for accessing health data. Local medical equipment is interfaced to the Internet for remote reading. The system is called Telios.

(IS-2010-173) Lifestyle AMI Home Automation Networks
Bill Melendez argues for a power monitor showing appliance energy consumption to motivate energy conservation. This would be part of a home automation system that informs consumers about energy costs, savings, warning messages, and appliance status. The author urges manufacturers to build such devices.

(IS-2010-172) Implementing load shedding technology: A possible solution
This paper from Bill Melendez is a description of a method of energy management for devices in a home. The proposal is to equip appliances, especially motorized devices, with sensors that can detect grid instability and shut down the device if the grid become unstable. This provides more reliable load shedding than could be done by a utility demand response system.

(IS-2010-171) Health Device Profile: Implementation Guidance
This is a specification for Bluetooth communications intended for linking medical devices to a base station. It specifies how to implement a profile (subset) of the Bluetooth protocol for medical devices such as a glucose meter, scale, blood pressure cuff, and pulse oximeter (pluse rate and blood oxygen saturation). This profile operates in conjunction with ISO/IEEE 11073-20601, Personal Health Data Exchange Protocol. It can accommodate one or multiple devices linked to a single base station.

(IS-2010-170) Mobile Broadband: The Benefits of Additional Spectrum
This report from the United States Federal Communications Commission is an analysis of likely spectrum requirements to support mobile broadband data. The estimated growth of data traffic through 2014 is presented with a doubling of usage every year. An extra 275 MHz of spectrum will be needed by 2014 for the expected data demand. Detailed supporting evidence is included.

(IS-2010-169) EECC Final Action hearing Voting Recommendations
This report from the Energy Efficient Codes Coalition presents recommendations on energy codes proposed by the International Code Council. Recommendations as of October 2010 for supporting or opposing more than 200 sections of the proposed codes are listed.

(IS-2010-168) The Impact of Dynamic Pricing on Low Income Customers
This report from the Institute for Energy Efficiency of the Edison Foundation examines the expected impact of time-varying electric rates on low-income residential customers. The finding, based on utility trials, show that these customers can save money on time-of-use tariffs since their consumption tends to be flat over time. They will save more if they actively shift energy-consuming applications to off-peak times. Results from eight trials are presented.

(IS-2010-167) Visible and Concrete Savings: Case Studies of Effective Behavioral Approaches to Improving Customer Energy Efficiency
This report from the American Council for an Energy Efficient Economy provides profiles of programs to influence customer behavior to conserve energy. The objective is to determine how to make these programs more effective by persuading customers and matching their actions to the available technical and economic choices. Some of the customer motivations include information about energy consumption, social pressure, corporate culture to conserve, convenience, relevant benefits, and recognition. Details of the programs profiled are presented.

(IS-2010-166) Providing New Services for "Life-Segments" in the Networked Digital Industry (circa 2012)
This report from the University of Southern California is a survey of about 1500 people aged 12 and up about adoption of various digital technologies for home use. It was published in May 2009. The researchers divided the market into early adopters, the majority, and laggards. All three groups have about 85% ownership of desktop computers (for e-mail and browsing), TV, and DVD players. Early adopters are prevalent buyers for DVRs, HD-DVD, and HDTVs. Only 35% of early adopters favor multi-media phones. All groups use instant messaging.

Time shifting is motivating early adopters toward Internet TV. Some early adopters are willing to pay for this access. Free and easy installation motivates all groups. Details are provided.

(IS-2010-165) Master Table of Contents & Compliance Requirements
This 2302-page document outlines the communications specification for Bluetooth (short range radio communications) and defines compliance requirements for manufacturers wishing to license the Bluetooth technology to incorporate into products. It includes an overview of the architecture plus details of the communications protocol.

(IS-2010-164) AMI/HAN Business Concept and Model
This paper from HEMS Technology compares business models for marketing AMI/HAN services and products. Two scenarios are compared: selling OEM to a distributor and selling OEM to a service company. In the first case the distributor sells at retail to consumers and to a service company; in the second case the service company sells to consumers. Other variations are discussed with the goal of minimizing overhead infrastructure to maximizing margins for AMI/HAN manufacturers.

(IS-2010-163) Filter Recommendations for Coexistence with LTE and WiMAX
This paper is a Bluetooth specification on how to avoid radio interference from other systems. It is intended to instruct designers how to incorporate LTE or WiMAX radios in the same product with Bluetooth without interference. WiMAX and LTE (3G cellular) operate in band adjacent to the unlicensed 2.4-GHz band where Bluetooth transmits. A reference systems design is included.

(IS-2010-162) Automated Meter Reading Implementation Manual
This paper from Bill Melendez is a manual for lay persons to understand automatic meter reading. It explains the methodology for organizing a retrofit of existing meters with radio transmitter to remove reading. Management of the field crew is included with a detailed installation checklist.

(IS-2010-161) A Home Energy Management Network
This paper by HEMS Technology explains the utility goal to manage energy peaks versus the consumer goal to conserve energy. The author recommends a home energy management system using home automation to respond to energy peaks by turning of appliances. Energy management offered by a service provider who is not the utility is discussed. Also, applications of home automation for other services such as telehealth are suggested.

(IS-2010-160) Performance of integrated mechanical systems for residential heating and ventilation
This standard from the Canadian Standards Association specifies the performance of core functions for residential Integration Mechanical Systems (IMS) and overall performance. It measures thermal performance and energy consumption for space heating, water heating, and ventilation. Laboratory test methods are specified in detail.

(IS-2010-159) Strengthening Clean Energy Technology Cooperation under the UNFCCC: Steps toward Implementation
This report from the National Renewable Energy Laboratory was prepared for the United States government to examine strategies for achieving greenhouse gas reductions through global cooperation. It is estimated that $10 trillion is required to stabilize greenhouse gasses between 2010 and 2030. The methods proposed include research and development, national and international public policies, and financing sources. The programs in support of these goals by various international agencies are reviewed.

(IS-2010-158) 2008 Fuel Cell Technologies Market Report
This report from the United States Department of Energy reviewed the state of the fuel cell industry in 2008. Some successful installations, applications, and manufacturers are described. About 9000 portable fuel cells were shipped in 2008. The cost per kWh of fuel cell generated energy has dropped from $275 in 2002 to $73 in 2008. $367 million in private equity was invested in this field in 2007 and 2008. The capacity of stationary fuel cells is increasing. Some governments are starting to include fuel cells in renewable standards portfolios.

(IS-2010-157) Large Hospital 50% Energy Savings: Technical Support Document
This report from the National Renewable Energy Laboratory was prepared for the United States Department of Energy to determine potential energy saving in hospitals in various U.S. locations. The report using simulations to demonstrate a potential savings of at least 50% in all U.S. climates. Among the methods for achieving this saving are improved lighting systems with daylight and occupancy sensors.

(IS-2010-156) Temperate and Humid Climates
This report from the National Renewable Energy Laboratory was prepared for the United States Department of Energy to guide school administrators on how to save energy in school buildings. The guide covers 10 major topics and includes a checklist. Among these topics are siting, day-lighting and windows, building shell, lighting, HVAC, water conservation, recycling, transportation, and building materials. This guide was developed for temperate and humid climates, such as Atlanta. Indoor air quality was also included.

(IS-201-155) An Electric Revolution
This report from the Galvin Electricity Initiative examines the state of the electricity infrastructure in the United States. It is highly critical of antiquated equipment, power quality, wasted energy, and lack of incentives to innovate because of monopoly regulations. The report traces the history of DC electricity developed by Thomas Edison and AC from Nikola Tesla. He compares both to microgrids with distributed generation including local generation with excess sold to the utility. Proposals for reforming the electricity industry are presented.

(IS-2010-154) OSRAM SYLVANIA Commercial Lighting Survey Fall 2010
This survey from Osram Sylvania reports on consumer opinions about various lighting technologies. Tungsten, halogen, compact fluorescent lamps, and LED lamps were compared. Energy efficiency is a top consumer concern along with longevity, and value-for-money. About 25% of consumers are aware of the U.S. pending policy to phase out 100-Watt tungsten bulbs in January 2012. About 75% of consumer are concerned with the color quality of the light produced. As of 2009, about 5% of those surveyed used LED lamps in sockets.

(IS-2010-153) 2nd Annual Sylvania Socket Survey 12.19.2009
This OSRAM Sylvania survey of commercial lighting designers is reported. Energy conservation, operating costs, longevity, initial costs, and aesthetics were key factors in choosing lighting technologies. 62% of those surveyed are using LED lighting primarily because of efficiency and operating costs. The biggest barrier to adopting LED lighting is the initial cost.

(IS-2010-152) Canadian Housing Observer 2009
This extensive report from Canada Mortgage and Housing Corporation provides statistics for the Canadian housing market in 2009. It focuses on initiatives in the private, not-for-profit, and government sectors on affordable housing for low-income persons and families (about 13% of the population). Affordable housing is defined as costing less than 30% of household income before taxes. Housing starts have been relatively strong above 200,000 annually. There was a slight decrease in starts and prices in 2008, but Canada did not experience a banking crisis like other countries. The relationship of water availability to housing is discussed with consideration for using rainwater, storm-water, and wastewater.

(IS-2010-151) 2010 U.S. Smart Grid Vendor Ecosystem
This survey from the Cleantech Group examines private sector developments in support of smart grid to complement the government stimulus. This report focuses on companies in metering, demand response, and distribution grid management where $2.75 billion will be spent in 2010. Summary information is provided about

home energy management, building energy management, and grid interconnection. Leadership in smart grid connectivity has been provided by smart grid companies and communications vendors. Details about companies involved are included.

(IS-2010-150) Smart Devices and Services Connection by CDMA2000
This Harbor Research paper explains the benefits of interconnecting devices for machine-to-machine communications using wireless communications based on CDMA (Code Division Multiple Access), cellular telephone technology. Such devices might include cars, the power grid, industrial equipment, and heart monitors. About 160 million cellular devices will be interconnected by the end of 2010. The technical advantages of CDMA, such as coverage, data security, network capacity, low latency are discussed. Application examples are presented from diverse fields such as transportation, healthcare, E-reader, smart grid, and asset monitoring.

(IS-2010-149) Wi-Fi Provides Rx for Healthcare Challenges for Utility-Owned Wide Area Networks
This Aerohive brochure describes applications of Wi-Fi radio networks using IEEE 802.11n communications protocol. Such a network can deliver throughputs up to 170 Mbps with requisite quality of service. Security features in the network make it compliant with U.S. Federal law for the privacy of health records (Health Insurance Portability and Accountability Act – HIPAA). The benefits of connecting W-Fi access points into a mesh network are discussed.

(IS-2010-148) The Evolving Nature of Working at Home
Herman Miller Company reports on trends in working at home. Up to 80% of companies in Asia offer this option. Savings in office space depend on the numbers who always work at home. Whether telecommuting coupled with business-oriented social networking via the Internet can substitute for office interaction is open to debate. The need for office furniture at home is discussed.

(IS-2010-147) Why and How We Meet
This paper from Herman Miller Company examines meeting types and meeting rooms. Virtual meetings via Second Life, a virtual 3-D world, and telepresence are discussed. The benefits of exchanging subtle cues and enhanced collaboration during face-to-face meetings are presented. Meeting spaces need to evolve as technology changes.

(IS-2010-146) Patient Rooms: A Changing Scene of Healing
Herman Miller Company examines changes in patient room layouts in hospitals. The biggest motivator is the introduction of new patient care technologies, medical record access, and possibly videoconferencing for remote

diagnosis. Other factors are rooms that can be easily cleaned and disinfected, local storage of commonly-user medicines, pathways to minimize falls, noise reduction, outdoor views, and family involvement.

(IS-2010-145) Generations at Work

This paper from the Herman Miller company is a sociological overview of personnel interactions across generations. The report describes the characteristics and work-style preferences of baby boomers (age 49-67), gen Xers (age 33-48), and millenials (age 13-32). Baby boomers emphasize: be authentic; gen Xers: be creative; and millienials: be connected. Each group has a preference for the work-space environment.

(IS-2010-144) Culture and work styles in the BRIC countries

Herman Miller Company developed a white paper about workspace differences among offices in Brazil, Russia, India, and China. Some the differences discussed stemmed from varying degrees of collaboration versus hierarchy business structure. Office amenities vary according to land costs, local regulations, and social practices such as breaks and lunch. Another consideration is the quantity of paper records required. Some comparisons with U.S. offices are presented.

(IS-2010-143) WLAN Design and Site Surveys

This AirMagnet (a Fluke company) brochure compares an ad hoc design of a wireless local area network in a buildings with a methodical planned design. With the ad hoc method, coverage and signal levels are not assured. A site survey is recommended. The equipment and locations may need to be changed as the number of users and their applications change.

(IS-2010-142) Designing the Inpatient Unit Central Core for an Aging RN Workforce

This brochure from Herman Miller examines the challenges of creating a comfortable and productive work environment for nurses. The average age of nurses is increasing as is their use of computer terminals. A work environment is proposed that accommodates physiological limitations such as visual and auditory acuity and muscular capabilities. Since nurses spend more than 50% on documentation and care coordination, a redesigned nursing core is proposed. Various design options are discussed.

(IS-2010-141) Advertising Effectiveness: Understanding the Value of a Social Media

This report from Nielsen examines the impact of social media on brand advertising. Ads that elicit spontaneous consumer comments are called "earned" impressions and have the highest impacts compared with paid ads or paid ads with social information. The methodology for determining the impact of earned impressions is presented. The key to earned impressions is an ad that "sparks engagement and connections between brands and users."

(IS-2010-140) Global Trends in Online Shopping
Nielsen presents the results of a survey of 27,000 customers in 55 countries conducted in March 2010 about shopping via the Internet. 46% bought books in the prior three months, while 41% bought clothes. One-third buy from online stores with no physical presence. 44% spend less than 5% of monthly budget online. 57% of customers read online product reviews. This study presents statistics from Asia Pacific, Europe, North America, Latin America, the Middle East, Pakistan, and Africa.

(IS-2010-139) The Benefit of the Wireless Telecommunications Industry to the Canadian Economy
The Canadian Wireless Telecommunications Association studied the economic impact of wireless communications on Canadian business. Canadian wireless goods and services generate $16 billion, $14 billion in supplier sales, and $9 billion in indirect benefits. Statistics are presented about investments by the wireless industry in network infrastructure. The effects of wireless business on employment and productivity are estimated.

(IS-2010-138) Current Situations and Trends In Buildings and Facility Operations
Laney College conducted a survey among building managers to assess the training of operations and maintenance personnel to assess the impact on building energy consumption. Existing buildings are operating below par. Methods to save energy may not have been included in the original building design. A transition to high performance buildings requires better-skilled and respected operations personnel, improved tools, and better measurements for better performing buildings. Improved integration among building design, construction, and operation is needed. Gaps must be closed in three areas: people, process, and technology.

(IS-2010-137) Smart Systems Evolution
Harbor Research reports on the impact of data networks on electromechanical and electronic devices as they are connected to a data network. Networking may cut across vertical markets with common device interface. The article speculates whether existing large engineering companies are prepared for this convergence. "These companies are large bureaucracies founded on focused products addressing focused markets." Success will require taking risks in system design, business relationships, and the use of assets.

(IS-2010-136) Home Broadband 2010
The Pew Research Center did an annual survey for 2010 of Internet usage in America. Internet usage grew among African-Americans in a market that overall was flat from 2009. About 66% have high-speed Internet

access, while 5% have dialup access. Adoption is skewed toward those with more education and income, and lower age: 80% among the 18-29 year olds while only 31% above 65 year olds. There is more support for government efforts to expand broadband access among those under 30 years old than over. The applications used via the Internet were surveyed and are reported.

(IS-2010-135) How People Watch: A Global Nielsen Consumer Report
Nielsen reports on a worldwide survey of television viewing among 27,000 viewers in 55 countries. Consumers in many markets spend more than four hours per day watching TV (lowest in central Europe among those markets surveyed). More than half of those with Internet access watches TV online with the highest concentration in Asia Pacific. About 12% have or will buy 3D TVs. About 22% would like access to Internet TV on their television set. About 11% watch videos on mobile devices. Extensive survey statistics are presented.

(IS-2010-134) Business Case for Independent Security in Modern Wireless Networks
This AirMagnet (a Fluke company) brochure explains how to choose an effective method for monitoring a Wi-Fi deployment in a building for secure data packet communications. It is possible to embedded security checks in the existing access points. However, AirMagnet argues for a dedicated server that scans all data packets transmitted for rogue packets.

(IS-2010-133) Conducting a Site Survey
This AirMagnet (a Fluke company) brochure presents a guide for installers of 802.11 Wi-Fi radios for local area networks. The topics covered include preparation to learn about the customer and building, performing a site survey, analyzing performance and anomalies, reporting, and periodic checking of the building every 3-4 months.

(IS-2010-132) AirMagnet Expertise in 802.11n Deployments
This AirMagnet (a Fluke company) brochure explains the technical options for wireless data transmission using 802.11 radios. The IEEE 802.11 standard specifies multiple transmitter antennas and multiple receiver antennas. MxN refers to M transmit antennas and N receive antennas. The standard allows various signal configurations where the multiple transmitters can add signal redundancy or can aim the signal. Also, a variety of coding schemes is allowed that trade-off signal bandwidth, noise immunity, and data transfer rate ranging from 7-600 Mbps. Co-existence with older versions of Wi-Fi is discussed.

(IS-2010-131) AirMagnet PCI Wireless Guideline

AirMagent, a security unit of Fluke, has outlined the requirements for credit and debit card merchants to comply with data security requirements. This report discusses the Payment Card Industry Data Security Standard (PCI DSS) where wireless networks are used. The merchant must determine if there are any other wireless networks operating in the environment. Data encryption and password access are discussed.

(IS-2010-130) Solid-state lighting: an energy-economics perspective

This paper from Sandia National Laboratories in the U.S., examines the potential impact of solid state lighting on the demand for and use of artificial lighting. The cost trends for new lighting technology is presented. The authors speculate on new applications such as the ability to tailor light color and lamp position using an array of emitters. Lighting now uses about 6.5% of the world supply of energy. Increased lighting use with new technology can increase productivity according to the authors.

(IS-2010-129) Medical Device Networking for Smarter Healthcare

Lantronix examines applications of interconnected medical devices and the technology options for connectivity. Applications include operating room and anesthesiology, intensive care, patient room, hospital lab, mobile cart, and home monitoring (the fastest growing segment). The benefits are discussed. Wired and wireless interconnection methods are presented. Applicable international standards are described.

(IS-2010-128) Smart Grid Insights: Smart Appliances

Zpryme Research and Consulting predicts the growth of appliances with capabilities to interact with smart electric grids. They claims that smart appliance sales will increase from $3 billion to $15 billion between 2011 and 2015 driven by "pricing, environment, energy efficiency, Smart Grid build-out, and government subsidies." The report contains lots of projections for smart appliance market growth in the U.S., U.K., China, and Australia. The bases for these projections are estimates of the authors.

(IS-2010-127) Understanding the role of the Internet in the lives of consumers

Harris Interactive reports on a consumer survey of users and expectations of the Internet. Consumers in Canada, China, France, Germany, Japan, the United Kingdom, and the United States were surveyed at the end of 2009. Nine key insights are presented with supporting data. There are now about 330 million Internet users in China. The influence and trustworthiness of bloggers and microbloggers (such as Twitter users) are considered. 85% of Chinese, compared to 17% of French, think the influence of the Internet will grow over the next two years. The

authors note that the French have 25 years of experience with the Internet and the French predecessor called Minitel.

(IS-2010-126) Preparing for the Approaching Revolution in Public Safety Communications

This brochure from Alcatel-Lucent introduces LTE (Long Term Evolution) methods for wireless data communications. LTE is being developed for use by cell phone operators. It provides about 15 times the bandwidth of the current 3G data network used with cell phones. Applications include voice, data, and video. The potential utility of LTE for public safety providers is discussed. Deployment issues are presented.

(IS-2010-125) Social Norms and Energy Conservation

This study from MIT and NYU reports on a technique to motive consumer energy conservation. 80,000 customers in Minnesota received energy conservation information quarterly resulting in a 1.9% drop in energy usage. It is estimated the cost-effectiveness of the program could increase by 80% if the program were targeted at those households with the highest expected response to energy information, such as those with relatively high consumption levels.

(IS-2010-124) The Design of Eco-Feedback Technology

This study from the University of Washington explores how to motivate positive ecological actions with appropriate human-computer interface technologies. Among the motivations are cost/benefit analyses, altruism, and community spirit. Effective methods for providing ecological messages, including comparing the individual actions to a group and feedback, are discussed. Feedback should be coupled with specific recommendations for saving energy.

(IS-2010-123) Mobile Workforce Management and the Aging Utility Workforce

Oracle Corporation explores challenges faced by utilities in supporting a mobile workforce (formerly called field engineers) as a large number of employees plan to retire. The baby-boom generation (born 1945-1960) has constituted a stable pool of talent for utilities. As this generation retires, utilities need to transfer the accumulated knowledge to new workers. Software techniques for managing a mobile workforce and storing field data are discussed.

(IS-2010-122) A Policymaker's Guide to Feed-in Tariff Policy Design

This report from the National Renewable Energy Laboratory of the U.S. Department of Energy explains how utilities should price electricity they buy from local generation sources. Such sources of power include photovoltaic panels on buildings, wind turbines, and geothermal plants. The feed-in tariff is a long-term

agreement between a utility and the owners of the local generators for the price at which the utility will buy excess power generated. The intent is to encourage a long-term investment in renewable power. Options for pricing strategies and intended goals (such as encouraging renewable energy) are discussed. Funding for feed-in tariffs may come from the ratepayers or from taxes.

(IS-2010-121) The EPRI Smart Grid Demonstration Initiative
The Electric Power Research Institute (EPRI) reports on trials of distributed energy resources (DER). DER includes demand response, storage, distributed generation, and renewable generation. EPRI developed analytic methods, systems development, and integration tools to apply to demonstration sites in Canada, Ireland, France, and the U.S. A summary of each demonstration is provided. Abstracts of EPRI reports on smart grid are listed.

(IS-2010-120) Home Broadband Adoption 2009
The Pew Research Center reports on the growth of broadband Internet access in 2009. The largest growth areas were among senior citizens, those with incomes less than $30,000, and rural residents. The average bill is about $39 per month. 7% use dial-up access. 35% of dial-up users would switch to broadband if the prices were lower. 63% of Americans have broadband compared with 55% in 2008. Wireless access is growing.

(IS-2010-119) How wireless ISPs play a vital role in bringing broadband to underserved markets
This report from Motorola explores business strategies for deploying wireless Internet access by Wireless Internet Service Providers (WISPs) in rural areas. One way to justify the business is to market it to consumers and to the local government for operations such as healthcare and education. The spectrum available for WISPs is discussion, including using TV channels that are not carrying a local broadcast signal (called "white space"). Example installations are presented.

(IS-2010-118) Consumer Usage Patterns and Attitudes of U.S. FTTH and Broadband Consumers
The Fiber-to-the-Home (FTTH) Council did a survey of 1000 FTTH customers about the impact of TV and Internet delivery via fiber optics. Consumer awareness of FTTH is increasing from 28% in 2008 to 41% in 2009 of those surveyed. FTTH is used by 6% of broadband customers in the U.S. Those using FTTH are more satisfied than cable or DSL customers. The Council claims that deployment of FTTH will encourage telecommuting and decrease greenhouse gases.

(IS-2010-117) 3D CAD & Electronic Document Management: Use and Benefits The Underutilized Information Asset
This report from Trinity Technologies introduces a data management strategy called Paladin: Project Application Leveraging And Data Integration. The objective is to gather data in an enterprise and make it available to all users so these data can be shared, not duplicated. A guiding principle is to manage data locally while accessing these data globally. Methodologies and benefits are explained including a transition from paper-based to electronic data. Examples are presented.

(IS-2010-116) Coordination of Energy Efficiency and Demand Response
Lawrence Berkeley National Laboratory (LBL) reports on the potential benefits of combining energy efficiency with demand response. Energy efficiency reduces energy consumption, while demand-response shifts energy consumption in time. An overall savings in the "non-coincident summer peak demand" of 14-20% is possible by 2030. Coordinated program offerings, marketing, and education are proposed. Integrated building codes and appliance efficiency standards are discussed.

(IS-2010-115) Connecting America: The National Broadband Plan Broadband Plan
This report from the U.S. Federal Communications Commission (FCC) provides a strategic plan for high-speed Internet access. About 1/3 of the U.S. population does not have broadband access available. The FCC intends to develop policies that will deliver high-speed Internet to everyone who wants it with speeds of 100 Mbps for downloading available by 2020 to least 1/3 of the U.S. population. Among the potential applications healthcare, education, government interaction with citizens, and real-time access to energy consumption data.

(IS-2010-114) Methodological Approach for Estimating the Benefits and Costs of Smart Grid Demonstration Projects
The Electric Power Research Institute (EPRI) reports on a method for evaluating the effectiveness of various smart grid demonstration projects. The technique is a cost/benefit analysis that is applied methodically to all projects. The categories of benefits include economic, reliability and power quality, environmental, and safety / security. The beneficiaries are utilities, customers, and society (such as public health). Additional stakeholders include equipment manufacturers, environmental and other special-interest groups, and governments (including regulators). The methodology is explained in detail.

(IS-2010-113) Demand Response and Open Automated Demand Response Opportunities for Data Centers
Lawrence Berkeley National Laboratory (LBL) reports on the potential application of an energy management system called Open Automated Demand Response (OpenADR) for data centers running servers and data storage

computers. Data centers run all the time, but the processing loads are usually not near capacity. Savings are possible by concentrating data processing loads so machines not needed may be turned off. A process called virtualization is described for managing these data processing loads. This also reduces cooling and lighting requirements in data centers. Methods for controlling energy usage in data centers are presented.

(IS-2010-112) Information Security
This report from the U.S. Department of Commerce National Institute of Standards and Technology provides an overview of security and the need to integrate data security into business practices. A goal is to assess security risks and the trustworthiness of data in light of the security risks. A Risk Management Framework is introduced and explained.

(IS-2010-111) Smart Grid Cyber Security Strategy and Requirement, Volume 3
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-110) Smart Grid Cyber Security Strategy and Requirement, Volume 2
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-109) Smart Grid Cyber Security Strategy and Requirement, Volume 1
This is a report from the U.S. Department of Commerce National Institute of Standards and Technology Cyber Security Task Force. The security needs of a smart grid for electricity are analyzed. Also, the privacy implications of a smart grid are described. Possible architectures for a smart grid are presented with a high level view of security requirements and privacy threats in a smart grid.

(IS-2010-108) Northwest Open Automated Demand Response Technology Demonstration Project, Document 6
Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in

anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-107) Northwest Open Automated Demand Response Technology Demonstration Project, Document 5
Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-106) Toward a Smarter GridABB's Vision for the Power System of the Future, Document 5
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-105) Toward a Smarter GridABB's Vision for the Power System of the Future, Document 4
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-104) Northwest Open Automated Demand Response Technology Demonstration Project, Document 4

Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-103) Northwest Open Automated Demand Response Technology Demonstration Project, Document 3

Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-102) Northwest Open Automated Demand Response Technology Demonstration Project, Document 2

Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-101) Northwest Open Automated Demand Response Technology Demonstration Project, Document 1

Lawrence Berkeley National Laboratory (LBL) reports on the performance of an energy management trial using Open Automated Demand Response (OpenADR) with five commercial and retail buildings in the Seattle area. An LBL contractor ran a server that sent event notices a day in advance to client machines at the trial sites in anticipation of cold winter mornings and hot summer afternoons. The client application shed heating, air-

conditioning, and lighting loads, depending on the building. An average of 12% in the winter and 8% in the summer of peak load were saved in these trials.

(IS-2010-100) Toward a Smarter Grid: ABB's Vision for the Power System of the Future, Document 3
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-99) Toward a Smarter Grid: ABB's Vision for the Power System of the Future, Document 2
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-98) Toward a Smarter Grid: ABB's Vision for the Power System of the Future, Document 1
ABB presents an overview of the reasons to evolve the electric grid to a smart grid. Among the key motivations are power outages that cost the U.S. economy $25 billion to $180 billion per year, transmission losses that have doubled in 30 years, accommodating distributed energy resources, the need for greater power quality to operate digital technology, and environmental concerns. Some characteristics of a smart grid are two-way real-time communications, digital metering, and mesh power flow rather than radial from a few generators. EPRI (Electric Power Research Institute) estimates that the benefits outweigh the costs for a smart grid by between 4:1 and 5:1. Smart grid examples are presented.

(IS-2010-97) Smart Metering Implementation Programme
This report from the Government of the United Kingdom is a proposal for mandates regarding the deployment of smart gas and electric meters primarily for residential customers. The objectives of the government are presented along with questions for the public. This report covers in-home energy displays, consumer premises equipment,

home networks, and meter data management functions centrally. The government is seeking feedback by the end of September 2010 on such issues as data privacy and consumer protection. Every customer will be entitled to a free in-home display that shows the cost of energy consumed.

(IS-2010-96) Mobile Access 2010
The Pew Research Center reports on a survey of wireless Internet access via cell phones and laptop computers among more than 2000 American adults. 59% use wireless access compared to 32% in 2009. The two most frequent uses of cell phones besides voice are taking photos and test messaging, mainly by young adults. 55% own a laptop computer. The ethnic groups that predominate in cell phone uses are African-Americans and Latinos. Overall, cell phone ownership is 82% of Americans as of May 2010. Detailed statistics are provided.

(IS-2010-95) 2009-2010 Standards and Technology Annual Report
The Telecommunications Industry Association (TIA) issued this annual report on standards development by TIA committees. The TIA is a standards-developing organization authorized by the American National Standards Institute. Among the ANSI standards developed by TIA are voice and data communications via private radio networks, microwave transmissions, multi-media access (including modems), satellite systems, premises cabling, cell phone networks, and healthcare. TIA committees also formulate U.S. positions for ISO and IEC (international standards committees).

(IS-2010-94) The Digital Economy and the Green Economy: Opportunities for strategic synergies
This report from the International Institute for Sustainable Development (IISD) is a submission to the Government of Canada on sustainable development based on a combination of digital technology and green industries. Business opportunities include green ICT (Information and Communications Technology), smart grids for electricity, improved transportation and buildings, cloud computing, the Internet of Things (networked devices), and universal broadband access. The report notes that to continue business as usual would require the resources of 1.5 planet Earths by 2050. ICT will enable communications-based services such as e-commerce, digital media, tele-work, e-government, e-education, and e-heath. A solution in collaboration with Mexico and the United States is recommended.

(IS-2010-93) Wireless Monitoring in Home Healthcare
This report from Berg Insight summarizes the market for home healthcare devices using wireless communications. Applications include monitoring hearth rhythms, diabetes glucose, and cholesterol. Data will be gathered into central services and be made available via mobile phones. The market potential in the EU and US

is 250 million patients. About 50 million would benefit from a wireless-monitoring device. The corporate players are listed. Large telecommunications companies may enter this market.

(IS-2010-92) Mobile Widget Platforms: Reaching the Long Tail with Disposable Applications

This report examines the market for cell phone-based applications. These applications, called widgets, operate outside of a browser to provide a targeted web-based service. The market opportunity depends on customers buying open-platform phones, rather that Apple iPhones and the industry developing APIs (Application Programming Interfaces). The mobile widget market was $72 million in 2008 with an anticipated growth rate of 80%.

(IS-2010-91) The new science of personalized medicine: Translating the promise into practice

This report from Pricewaterhouse Coopers assesses the market potential for medicines that are individually designed for the patient. The design is based on the person's genetics and cell proteins. These drugs are intended to minimize drug reactions, to be preventative, and to involve the patient in care. The U.S. personalized medicine market was about $232 billion in 2009 and is expected to grow at 11% annually. This offers opportunities for companies that excel in consumer marketing such as food companies. Prevention and wellness medicines may be offered by nurses and physicians' assistants.

(IS-2010-90) A resource guide for using health IT to support the patient centered medical home

This study funded by Merck examines the Patient Centered Medical Home concept and role of Information technology (IT). "The basic premise of the medical home concept is continuous, uninterrupted care that is managed and coordinated by a personal provider with the right tools that will lead to better health outcomes. "The focus is on access to medical records by all healthcare providers while maintaining patient confidentiality. The value of IT is in enhancing transfer of care, referral, consultation, and collaboration among healthcare providers. Examples of health IT in various settings are included.

(IS-2010-89) Analyses written at the request of REIL

This report from the Yale School of Forestry & Environmental Studies examines the benefits of power distribution from local sources via direct current (DC). DC power distribution within buildings via a DC microgrid is recommended for DC sources such as photovoltaics and for grid power after conversion from AC (alternating current). The authors claim a decrease in conversion losses from 32% to 10%. DC can be used by variable speed drives and can be combined with energy storage and electric vehicles. DC networks are easier to

interconnect than AC networks because frequency synchronization is not an issue. The paper also discusses tax and ownership issue of DC microgrids.

(IS-2010-88) 802.11n: The End of Ethernet?
This report from the Burton Group compares office data and voice (VoIP) using wireless 802.11n versus wired Ethernet. The wireless technology (a version of Wi-Fi) delivers about 150 Mbps versus 1 Gbps for some versions of Ethernet. This report analyzes the performance differences between these technologies. The issues of convenience and portability favor wireless solutions in offices not just for data, but also for voice. More voice calls in offices are conducted wirelessly than on a corded phone now. A local area network based on 802.11n can supplement cell phone technology.

(IS-2010-87) The Revolution in Warehouse Lighting: LEDs and Intelligent Lighting Systems
This report from Digital Lumens explores the potential savings in electricity by changing lighting systems in warehouses. Most such facilities use high-intensity discharge (HID) lighting. Conversion to LED lighting with intelligent control is recommended. The lighting control would reduce light output in unoccupied areas and when there is ample sunlight. Electricity usage was reduced by a factor of 20 in an example presented.

(IS-2010-86) CPUC California Solar Initiative; 2009 Impact Evaluation
This report from Itron reviews the effect of the California Solar Initiative in 2009. Solar installations grew by about 55% over the previous year. 12% of installations, representing 40% of capacity, are owned by third parties. The cost per residential Watt of solar electricity generated is about $8.50. About 390,000 MWh of solar power were generated in 2009 in California (enough to power 66,000 houses). Among the impacts of solar power generation are a reduction of the load on transmission lines and a reduction in demand at peak times. Recommendations for improving the program are presented.

(IS-2010-85) GSA Schedules: the Shortest Path to Federal Dollars
This book written by Richard White explains how to become a vendor to the U.S. government. The focus here is on establishing a relationship with the government rather than submitting a bid for selling goods when a request-for-proposal is issued. The method is to become a pre-approved vendor at pre-agreed prices. The author acknowledges that this method may cost the government more, but can deliver goods quicker, especially for responding to emergencies. Methods for complying with government requirement are presented.

(IS-2010-84) Economic Benefits of a Comprehensive Feed-In Tariff
This report from the University of California at Berkeley examines the impact of feed-in tariffs on local power generation. Feed-in tariffs are rates for power paid to owners of local generators who sell their output or their excess into the electricity grid. A stable feed-in tariff is intended to encourage investments in local power generation. California has a goal of 33% renewable power sources by 2020. The impact on employment and state taxes is presented.

(IS-2010-83) Applying OSIPS to ICAM
This report from the Security Industries Association surveys various standards for access to buildings. Various American National Standards are reviewed that SIA has developed system integration and performance testing in the family of OSIPS (Open, Systems Integration and Performance Standards).

(IS-2010-82) The Four Hottest Markets in Telecom Equipment: LTE, WiMAX, Data Center Ethernet, Femtocells
This report from Infonetics Research provides a summary of developments in telecom technologies. LTE (Long Term Evolution) will provide high speed Internet access via cell phone networks. WiMAX is an alternative to LTE that may be attractive in developing countries and in rural settings. The demand for wideband Ethernet switches is growing as more video is being processed by data centers. Femtocells extend cell phone coverage into buildings where reception from cell towers was a problem.

(IS-2010-81) Technology for personalised, preventative healthcare
This report from the European Commission examines how ICT (Information and Communication Technology) can impact healthcare for Europeans. Topics covered include e-health to make healthcare accessible and personal health systems for monitoring. Spending on healthcare in Europe is increasing from 9% of GDP (gross domestic product) to about 16% by 2020. Disease information and remote monitoring may reduce doctor visits except for serious illnesses. Various projects involving ICT are reviewed in this report.

(IS-2010-80) Educating Europe, Exploiting the benefits of ICT
This report from the European Commission explores how ICT (Information and Communication Technology) helps educate and train Europeans. ICT enables life-long learning and personalized learning; it is not just a substitute for books. Mobility and flexibility in education are stressed. A repository for educational materials has been

established called the Learning Resource Exchange (http://lre.eun.org). Tools for educators to create new content are available.

(IS-2010-79) How Technology Innovation is Enabling the Transformation of Health Care
This report from Ernst & Young explores the role of technology in improving healthcare. Topics covered include health records, telemedicine, mobile delivery of healthcare information, a trend toward patient-centric care. The latter involves customer access to data covering medical pricing and medical quality. Some innovations using technology include remote viewing of intensive care patients remotely via two-way video, the delivery of test result delivery via iPhone, and social network for patients to compare notes.

(IS-2010-78) The American Power Act and Enhanced Energy Efficiency Provisions: Impacts on the U.S. Economy
This paper from the American Council for an Energy-Efficient Economy analyzes energy legislation that has been proposed in the U.S. Congress for 2010. The potential impact on energy efficiency will maximize the benefit to society. It should reduce consumer costs and generate 166,000 jobs in 2030. [The leaders in Congress announced on July 21 that Congress is not likely to enact this bill. A scaled-down version may be proposed according to news reports on July 25,2010.]

(IS-2010-77) Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities
This paper from the American Council for an Energy-Efficient Economy analyzes various techniques for encouraging consumers to shift consumption of electricity from peak demand times to off-peak times. A potential saving of 100 billion kWh of energy is possible by 2030. They studied methods of providing information about energy usage to consumers in North American and Europe. The most effective approach of those considered was real-time information about appliance energy usage with an average savings of 12%. Programs need to be tailored "to inform, engage, empower, and motivate people."

(IS-2010-76) Energy Savings and Performance Gains in GSA Buildings
This report from the U.S. Government Services Administration presents seven methods for saving 500 million kWh of electricity per year in government buildings. These methods include heating, cooling, and air quality improvements (including windows), computer equipment improvements, and lighting enhancements. Some examples of specific recommendations are adjustments of temperature settings, air-conditioning filter replacement, the use of LCD computer screens, consolidation of printers, and combining ambient, task, and outdoor lighting.

(IS-2010-75) Door Locking Options in Schools
This report from the National Institute of Building Sciences is a short summary of options for locking school doors while provide safe and rapid egress in emergencies. Door-locking options and state requirements are presented.

(IS-2010-74) Broad Agency Announcement
This document is an announcement from the Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities.U.S. government about research grants available from various laboratories of the U.S. Army Engineer Research and Development Center. The functions of the various laboratories are presented. Hundreds of research opportunities are listed. [The reader is cautioned to acquire an updated announcement before responding.]

(IS-2010-73) Smarter cities for smarter growth
This paper from IBM explores how technology can improve services in large cities. Topics covered include transportation, public safety, citizen education and training, and access to healthcare data. Examples from large city deployments are presented.

(IS-2010-72) Drive to Energy Efficiency
This report from Sustainability Resource Planning suggests how businesses can react effectively to calls for using energy in ways that sustain energy supplies. While politicians debate strategies such as a carbon tax to reduce green house gases, businesses are not sure what actions are cost effective. This paper recommends a focus on energy efficiency including retrofitting buildings and using renewables. "Having a thick skin and waiting it out is not the proactive stance. A forward-acting agenda to stay on top and innovating as the energy market evolves is the best option to harvest opportunity in the years ahead."

(IS-2010-71) Razorfish: Actionable Analytics
This paper from Razorfish, Inc. describes a marketing program for measuring the effectiveness of web-based advertising. Razorfish methods for increasing online sales and choosing between brand and direct response advertising are presented. The value of web analytic tools is discussed and contrasted with "Rich Internet Applications." Methods for customer relationship management include cross-channel personalization (web sites tailored to the visitor) and follow-up e-mails.

(IS-2010-70) An Overview of the DESERTEC Concept
This report from The Club of Rome proposes energy sources that replace fossil fuels to provide energy for a world population of 10 billion by 2050. The proposal calls for solar collectors covering 3000 deserts to generate 18,000 TWh per year. Each person requires a collector of 20 square meters to supply the average energy consumed. High voltage DC transmission lines are recommended because underground transmission is possible. Multiple medium-capacity transmission lines can provide system redundancy. This concept is called DESERTEC.

(IS-2010-69) Digital Mom
This report from Razorfish, Inc. studies how technology and social media are affecting how mothers socialize, shop, and parent. Mothers were divided into five categories based on experiences, values, and motivations. This report is based on a survey of 1500 mothers who use at least two social media. Digital channels are starting to rival TV as sources of commercial information. Mobile web casting and podcasting are becoming important. Marketer should seek to engage mothers by more than banner ads on social networks.

(IS-2010-67) DOE Solid-State Lighting CALiPER Program, Summary of Results: Round 10 of Product Testing
This report from The U.S. Department of Energy examines the performance of solid state lighting using LEDs (Light Emitting Diodes) for parking garages, outdoor lighting, cove lighting, and replacement lamps. The performance of 2010 products was compared to those of 2009. There was no improvement in efficacy. However, the light output is greater from wallpack luminaires (an array of LEDs). The coverage, light colors, and degradations over time were studied.

(IS-2010-66) Demonstration Assessment of Light-Emitting Diode (LED) Freezer Case Lighting
This report from the U.S. Department of Energy examines the performance of LEDs (Light Emitted Diodes) for supermarket freezer case lighting. A 5.4-year payback was reported from savings in energy and maintenance. A trial was run in a supermarket freezer case in Eugene, Oregon. Additional savings came from reduced heat load from the lamps in the freezer cases. Users found the light distribution and food package coloring about the same as with fluorescent lighting.

(IS-2010-65) Demonstration Assessment of Light-Emitting Diode (LED) Parking Lot Lighting, Phase I
This report from the U.S. Department of Energy examines the performance of LEDs (Light Emitted Diode) for parking lot illumination. A three to five year payback (depending on the cost of electricity) was reported from savings in energy and maintenance. A trial was run in a retail store parking lot in Manchester, New Hampshire.

Nearly all users would recommend the LED illumination compared to high-pressure sodium and metal halide lighting.

(IS-2010-64) Smart Grid System Report

This report from U.S. Department of Energy reports on a workshop to assess progress toward a smart grid for electricity. This report focuses on 20 metrics for measuring smart grid advancement in various parts of the electricity grid. As noted, "A smart grid is socially transformational. As with the Internet or cell phone communications, our experience with electricity will change dramatically. To successfully integrate high levels of automation requires cultural change."

(IS-2010-63) Energy Savings Potential of Solid-State Lighting in General Illumination Applications 2010 to 2030

This report from the U.S. Department of Energy examines the national energy savings possible from LEDs (Light Emitted Diodes), also known as SSL (Solid State Lighting). Methodologies are described in detail for each type of lighting replaced. It was noted that commercial lighting demand is 10 times higher per square foot than residential. Energy savings depend on price and performance developments for LEDs. Most of the savings comes from replacing fluorescent lamps in commercial settings with LEDs.

(IS-2010-62) Roundtable Discussions of the Solid State Lighting R&D Task Priorities

This report from the U.S. Department of Energy summarizes a three-day workshop in November 2009 to set research priorities for solid state lighting. Advocates for various research projects were gathered from industry and some academia. They proposed projects for LEDs (Light Emitting Diodes) and OLEDs (Organic LEDs). A list of suggested priority tasks was produced ranked by "high priority," (19 projects) "close calls," (5 projects) and others.

(IS-2010-61) Empowering the smart grid with WiMAX

This paper from the National Rural Telecommunications Cooperative (NRTC) explores applications of WiMAX wireless network technology for smart grid communications. WiMAX can provide communications for distribution and distributed generation, metering, mobile fleets, and backhaul to the utility network operations center. Also, NRTC is proposing to use the bandwidth of WiMAX to deliver broadband services to residential customers. Since the utility owns the WiMAX network (as compared with using a 4G cellular network from a telecommunications carrier), the utility can control message priorities on the network.

(IS-2010-60) Demand Response & Smart Grid-State Legislative and Regulatory Policy Action Review: October 2008 - May 2010

This report from the Demand Response Coordinating Committee survey developments in the U.S. states in smart grid, demand response, and smart metering as of May 2010. This report focuses on policy developments in the states. A separate section is devoted to each of the 50 states. Nineteen states had no smart grid legislative or regulatory policy activities.

(IS-2010-59) Guide to Operating and Maintaining EnergySmart Schools

This report from the U.S. Department of Energy provides a guide to improving energy efficiency in school buildings. A goal of 30% energy reduction is proposed through various methods. Improved operations and maintenance can save up to 20% without a significant capital investment. New schools can use 50% less energy than existing schools. A procedure for developing an energy management plan is presented. This report is targeted at elementary and secondary schools.

(IS-2010-58) Accuracy of Digital Electricity Meters

This report from the Electric Power Research Institute (EPRI – a research organization funded by investor-owned utilities) explains the differences between electromechanical and digital solid-state meters for electricity consumption. Sources of errors may include clerical mistakes when changing from the old to the new meter, the temporary use of estimated bills until the communications network is running, meter failures, and software glitches. Hot weather during the installation period may result in higher bills because of electricity used for cooling. Also, time-of-use rates instituted when digital meters are installed may result in higher bills for some customers. Old electromechanical meters may register low, thereby resulting in lower bills than digital meters.

(IS-2010-57) Home Plug Green PHY: The Standard For In-Home Smart Grid Powerline Communications

This paper from the HomePlug Powerline Alliance, Inc. introduces and summarizes HomePlug Green PHY, a reduced capability and reduced cost version of HomePlug AV. HomePlugAV is designed for audio/video transmission via power line. It supports data rates up to 200 Mbps depending on local conditions. The HomePlug AV sender and receivers adapt dynamically by testing the channel and choosing from among six coding techniques. HomePlug Green PHY uses one coding methods with a maximum data rate of 10 Mbps. Methods for conserving power in devices using HomePlug Green PHY are described. Applications for electric vehicles are presented.

(IS-2010-56) Preparing for the Future: How Asset Management Will Evolve in the Age of Smart Grid
This paper from Telvent provides an overview of changing requirements for managing the assets of an electric utility. In a smart grid environment there are more distributed assets that may extend to and into customer premises. Also, the assets cannot be easily compartmentalized. Currently, there are management systems for work management, location tracking, planning using modeling, SCADA, and fixed asset accounting records. Attempts to create a Common Information Model (CIM) have had limited successes in generation and transmission. CIM for low-cost distributed assets is expensive. Challenges are posed by electric vehicles, distributed generation, distribution telemetry, and smart switches. Spatial databases and workflow analysis are recommended.

(IS-2010-55) Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance
This report from the Smart Card Alliance presents details that were summarized in a companion paper approved for the CABA library: "A smart Card Alliance Summary of the Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance"

(IS-2010-54) A Smart Card Alliance Summary of the Federal Identity, Credential, and Access Management (FICAM) Roadmap and Implementation Guidance
This report from the Smart Card Alliance introduces concepts for U.S Federal Identity, Credential, and Access Management. This established a digital identity for access to computers and physical locations. Business and technical issues are presented. Challenges of present systems and desired systems are discussed.

(IS-2010-53) What Consumers Watch: Technology Enhances the Video Experience
This report from Nielsen examines trends in television viewing. The survey finds that total viewing has increased because of new technologies including HDTV, broadband, and smart phones. TV viewing on smart phones is small but growing at more than 50% per year, with more than half the audience in the age range of 25 to 49. TV viewing on the Internet is also growing. More than half of U.S. households have HDTVs.

(IS-2010-52) G.hn: The New ITU-T Home Networking Standard
This paper from two manufacturers presents a technical overview of G.hn, a standard developed by the International Telecommunications Union (ITU), part of the United Nations. G.hn specified a network for multi-media data transmission via power line carrier (data on electricity wires), telephone wires, and coaxial cables. A

raw data rate of 1 Gbps is specified. G.hn uses a data-coding scheme called OFDM (Orthogonal Frequency-Division Multiplexing) with 256 to 4096 carriers, each carrying 1 to 12 bits of data. There are provisions for data encryption on the shared media.

(IS-2010-51) Guidelines for the transition from analogue to digital broadcasting
This report from the International Telecommunications Union, part of the United Nations, is a guide for countries to plan a transition of television broadcasting from analog to digital technology. It applies to over-the-air broadcasting for fixed-location TVs and for mobile TVs. Government involvement is described, although the report notes, "ultimately the market will determine the success of the services that are offered." This guide was developed for African countries. A few European countries, Korea, and the U.S. have instituted this conversion. A benefit of digital broadcasting is spectrum efficiency since 4-8 digital TV signals can replace one analog signal.

(IS-2010-50) Where Energy Efficiency Collides with Human Health
This report from Environment and Human Health, Inc. examines how the LEED (Leadership in Energy and Environmental Design) program for energy efficiency buildings could be augmented to consider human health. Buildings in the U.S. consume 76% of energy and emit half of the greenhouse gases in the country. As buildings are designed tighter for energy efficiency, human health is impacted by out-gassing from building materials. Of the 110 possible points awarded by the LEDD evaluation, on 15 apply to indoor-environmental quality. This report includes a survey of typical building materials and associated risks. A greater focus on human health is urged for LEED, especially since LEED is being referenced in laws.

(IS-2010-49) Sustainable Energy Security - Strategic risks and opportunities for business
This report from Lloyds, the insurance company, explores the risks to stable energy sources with a potential increase of 40% in energy demand by 2030. Risks include access to oil, the consequences to the environment such as carbon dioxide emissions, and energy demands from Asia, especially China. Policies for carbon reduction are not likely to be uniform. Those countries that lead in these policies are likely to lead in technologies and to exports these technologies. Just-in-time manufacturing will be impacted by higher energy costs for transportation. Energy smart grids will motivate partnerships between utilities and manufacturers. "…an energy transition…is inevitable; the only questions are when and how abruptly or smoothly such a transition occurs."

(IS-2010-48) Generating the Future: UK energy systems fit for 2050
This report from the Royal Academy of Engineering presents scenarios for the United Kingdom to achieve the goal set into law in 2008 that carbon emissions be reduced by 80% by 2050. This goal can be achieved, not by one technology, but by a combination of renewable energy sources, biomass, nuclear power, and demand

management. Beyond 2050, nuclear fusion is expected to be practical. Combinations of demand response and the electrification of transportation are presented.

(IS-2010-47) Technology M&A - Finding your place in the land of giants
This report from Deloitte examines mergers and acquisitions (M&As) among large technology companies. Even during the 2009 recession, large technology companies accumulated enough cash to fuel M&As. This report recommends how companies should judge the potential value of M&A through a process called "game-boarding." Issue raised are international cultural differences, bribes, and protection of intellectual property.

(IS-2010-46) Clean Energy 1.0 - Moving beyond green to create sustainable jobs and a long-term energy strategy
This report from Deloitte examines trends in energy resources including green energy. They argue that the movement toward green energy is being tempered by costs and is focusing on clean energy from fossil fuel sources as a transition to green energy sources such as wind and solar. Energy supplies are viewed as critical for economic growth and employment. China has a more stable and predictable market for clean energy than does the U.S. China will increase solar energy production tenfold from 2010 to 2020.

(IS-2010-45) A Life Sciences Industry Stance on Health Care Reform
This report from Deloitte examines the potential impact on the healthcare industry of the health reform law enacted by the U.S. in 2010. Device manufacturers are likely to have increased markets for remote monitoring and tele-medicine, which will be covered by insurance. The impact on drug companies is reviewed.

(IS-2010-44) The conceptual framework: Six zones of health care consumerism
This survey from Deloitte examined consumer attitudes toward healthcare in Canada, the U.S., Germany, France, Switzerland, and the U.K. The insurance systems in these countries are reviewed. In all these countries nearly everyone is insured except in the U.S., where 16% are uninsured. The French, Swiss, and Canadian are the most satisfied with their systems. The U.S. and Germans are the least satisfied. U.S. consumers perceive the most waste. Most do not think they are well insured. To control costs healthcare providers need to move from a patient view to a consumer view so customers are more involved in healthcare. All consumers are open to in-home healthcare using remote technology.

(IS-2010-43) Rising to the Challenge
This survey from Savvis examined information technology (IT) business trends in Singapore, the U.K., and the U.S. in 2009. There is a movement toward outsourcing IT to "the cloud" for an anticipated savings of 12-18%. In-

house IT is expected to shrink by 23% by 2020. The key motivator is budgetary pressure. Current IT outsourcing is 10% in the U.S., 18% in the U.K, and 38% in Singapore. "Security is the main reason why people do not trust the cloud." 456 IT professionals were surveyed.

(IS-2010-42) The State of Online Video

This survey from the Pew Research Center polled Internet users of video. About 70% have viewed videos on line. The types of videos in order of popularity are comedy, educational, movies and TV, and political videos. 14% have uploaded videos mostly to social and video sharing sites. The most common videos posted are home movies. About 10% have paid to watch a video.

(IS-2010-41) The smart phone becomes a search phone

This report from Deloitte presents predictions fore the mobile telephone industry in 2010. Internet search engines for mobile phones will grow as a competitive market. Search will include product data plus directions for finding the product using GPS. Voice service may move to mobile VoIP using 3G and Wi-Fi networks. This could impact mobile voice revenues. Mobile network spending is expected to grow 7%, more than double overall telecom and IT spending in 2010. Consumer demand for bandwidth will continue to outpace the growing supply. Tiered pricing on usage may be introduced. Reliability may decrease. Energy consumption for telecom will decrease.

(IS-2010-40) The New Solar Market

This report from Pike Research examines the demand for solar electricity equipment, the buyers, and the suppliers. The report projects a 43% increase in demand in 2010 compared to 2009, reaching 10.1 GW. The largest buyers are in Germany (47% of the market), Italy (10%), the United States (8%), Japan (5%), and France (4%). By 2013 the demand should be 19 GW, a 25% compound annual growth rate. The total available module capacity may reach 30 GW by the end of 2010. This report analyzes the business prospects of the approximately 190 manufacturers. There is a large oversupply; 17 of the top producers could fill the 2010 demand. The price per watt for a solar cell will decrease with lower-cost manufacturing in East Asia, lower-cost materials, lower-cost processes, and economies of scale.

(IS-2010-39) Canadian Commercial Real Estate Sustainability Performance Report

This report from the Real Property Association of Canada explores how to measure environmental, social, and governance performance of commercial real estate companies. Sustainability drivers include corporate responsibility and sustainability, green buildings, and responsible property investing. "Climate change is now a main-stream policy concern." Green buildings decrease average operating costs by 13.6%. Buildings account for 13% of carbon emissions in Canada. Evaluation methods are discussed.

(IS-2010-38) Winds of Change - East Asia's Sustainable Energy Future
This report from the World Bank analyzes the energy consumption and carbon emissions of five East Asian countries: China, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. It presents a strategy for achieving sustainable energy in two decades. Half the savings come from improvements in energy efficiency and half from carbon reduction by using renewable energy sources. To achieve energy efficiency, subsidies for fossil fuels should be removed. Renewable energy sources include solar, wind, biomass, and nuclear. To achieve these goals, $80 billion per year must be invested for the next two decades. Shifting to renewable fuels will lessen dependence on imported fuel with volatile prices.

(IS-2010-37) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 2
This report from the European Climate Foundation is part of a three volume series. The executive summary has been reviewed and approved. This chapter presents a policy report including financing options.

(IS-2010-36) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 1
This report from the European Climate Foundation is part of a three volume series. The executive summary has been reviewed and approved. This chapter presents a technical and economic analysis.

(IS-2010-35) Roadmap 2050 - Practical Guide to a Prosperous, Low-carbon Europe, Volume 1 – Executive Summary
This report from the European Climate Foundation presents a roadmap for Europe to achieve an 80% reduction in greenhouse gas emissions below 1990 levels by 2050. This will require a reduction in carbon emissions from power generation by 95-100%. Although this would increase the cost of electricity initially, the costs over 40 years will not increase. Also, energy efficiency improvements of about 2% per year are expected. Technologies available today can achieve these goals. Incentives for this carbon reduction would include a charge for carbon. New policies and regulations are required.

(IS-2010-34) Enterprise Estonia Building Automation Comparison of its Local Small Stores Market
This masters thesis focuses on building automation as applied to residential and small building in Estonia. The thesis was written in Estonian and translated roughly by a Google service. Building automation in Estonia is described using technology from a CABA building automation roadmap and the European Building Controls Association. Building automation includes audio/video, security, heating and cooling, lighting, and health care. The technologies of building automation are reviewed. Building automation by 19 Estonian companies is studied (six are subsidiary of foreign companies).

(IS-2010-33) Energy performance of buildings - Impact of Building Automation Controls and Building Management

This document is a European standard issued by CEN, the European Committee for Standardization. It applies to the 27 member nations of the European Union plus Iceland, Norway, and Switzerland. EN 15232:2007 is the designation of this standard that seeks to estimate the effects of building automation and management on energy usage and performance. It is intended for building owners, architects, engineers, and public authorities that set requirements and perform inspections. Building automation systems are categorized in four classes according to energy efficiency features such as variable speed and temperature. Home automation features that contribute to energy efficiency are included.

(IS-2010-32) The IBM vision of a smarter home enabled by cloud technology

This report from IBM examines the future of home automation. IBM predicts that with the prevalence of broadband access from homes to the Internet, home automation services will be hosted "in the cloud." This means that providers will deliver home automation services from their servers. Applications fields are expected to span entertainment and convenience, energy management, safety and security, and health and wellness. Health and fitness monitoring is expected to generate $2.5 billion by 2012. Cloud services depend on home devices containing instruments for sensing and monitoring conditions, such as functions in an appliance. IBM proposes a local "clone" of the server-based application in case Internet access is down. A Service Deliver Platform on the servers is described.

(IS-2010-31) The Value of Behavioral Targeting

This study from the National Advertising Initiative examines behaviorally targeted advertising. Behavioral targeting delivers web-based ads based on use browsing within the web site and across related web sites. Revenues average almost three times higher for behavioral targeted ads compared to "run of network" (RON) ads. Behavioral ads are more appealing to consumers and generate more sales for advertisers. Consumers are almost eight times more likely to click through targeted ads than RON ads.

(IS-2010-30) The Right Rx for Upgrading Today's Hospitals

This article from Lantronix, Inc. explains the challenges of computerizing medical records and making them available from a server via the Internet. Among the issues are data security, patient privacy, medical equipment with interface not compatible for Internet data transmission, and lack of qualified information technology persons. Methods for data encryption are discussed. Wireless interfaces for medical equipment are considered.

(IS-2010-29) Where Has All the Data Gone? The Crisis of Missing Energy Efficiency Data
This article from the American Council for an Energy-Efficient Economy report on U.S. government projects to gather energy consumption data. Such data are collected and reported by the Energy Information Agency (Department of Energy), the Census Bureau, and the Federal Highway Administration. All have had significant budget reductions. These cuts impact the tracking of the impacts of building codes and other policies. The Council is advocating for more funds for these government agencies.

(IS-2010-28) Clean Energy Trends 2010
This report from Clean Edge, Inc. evaluates the economic contribution of the energy sector. Even during the recession in 2009, revenues for local power generation from renewables grew 11.4% over 2008 and are expect nearly to triple in a decade. Investments in clean energy are surpassing investments in fossil fuels. The report predicts the commoditization of solar photovoltaics, smart meters, energy storage devices, wind turbines, and other clean technologies over the next decade. China is leading country in wind farm and solar water heater installations, and is the largest source of photovolatics. Companies that are investigating products from carbon captured during manufactured are discussed. Other clean tech products are reviewed.

(IS-2010-27) The New Consumer Behavior Paradigm: Permanent or Fleeting?
This report from Price Waterhouse Coopers analyzes changes in shopping behaviors as a result of the recession of 12008/2009. Conspicuous consumption is being replaced by more practical choices. Baby boomers are conserving for retirement, so the leaders in retail recovery will by Gen X (29-45, but ¾ the population of the baby boomers) and Gen Y (10-28, outnumber baby boomer, little wealth, but seekers of instant gratification). Online shopping is enabling consumer to pick specific products, rather than browse. The market for luxury goods will shrink. Purchasers of discretionary products will favor attributes of value over time, usefulness, versatility, and green. Retailers need to offer relevant products.

(IS-2010-26) Radio spectrum - why Europe needs effective co-ordination
This report is the transcript of a presentation by the Vice President of the European Commission and Commissioner for the Digital Agenda, Neelie Kroes. Topics covered include the re-allocation of television bandwidth for wireless data communications, competition among terrestrial and satellite providers, efficient use of spectrum already licensed, and harmonization across European Union borders. The need for faster action by the International Telecommunications Union (a sector of the United Nations) was also mentioned.

(IS-2010-25) How will this recession affect the future of retailing?

This report from Price Waterhouse Coopers was written in 2008 to estimate the impact of the recession on the retail sector. Even as the retail sector recovers, there is a long-term trend favoring aggregation rather than the expansion of retail. Also, many retailers are expanding private brands. Consumer clout is growing with the use of tools from social networking. Predictions for various retail sectors are included.

(IS-2010-24) Federal Communications Commission: National Broadband Plan

This report is a summary of decisions taken by the U.S. Federal Communications Commission in March 2010 regarding high speed Internet access using broadband communications. The FCC supports a policy of a competitive market for broadband with access to all especially deployment in high cost and low-income areas. The FCC is planning to support broadband with appropriate radio spectrum (extra 500 MHz within 10 years) and rules to encourage competition for equipment such as set-top boxes. A goal of a minimum 4 Mpbs download speed is proposed with a desired service of at least 100 Mbps. Possible applications of broadband by government agencies include healthcare, education, energy management (including real-time consumption data), economic growth, civic engagement, and public safety. Access rates of 1 Gbps are proposed for public institutions in every community.

(IS-2010-23) What global executives expect of information security - in the middle of the world's worst economic downturn in thirty years

This report from Price Waterhouse Coopers was written in 2009 to determine the effect of the recession on purchases of products to ensure data security. This survey of 7200 persons found that expenditures would increase or stay the same. Investments in data security were considered worthwhile. Many were concerned that they did not know where their privacy-related data were stored. Also, social networking will challenge the requirements for data security.

(IS-2010-22) AARA Survey Analysis

This research brief from Pike Research examines consumer sentiment on energy and environment provisions within the American Recovery and Reinvestment Act of 2009.

(IS-2010-21) Real Prospects for Energy Efficiency in the United States

This executive summary from the National Academy of Sciences explores the impact of technology on improving energy efficiency. Potential savings by 2020 would come from buildings (53%), industry (35%), and transportation

(12%). Some of the technologies that will impact buildings include LED lighting, new window systems, new cooling systems, and more efficient electronics.

(IS-2010-20) BroadbandSuite 3.0 Companion Guide
This article from the Broadband Forum provides an overview of specifications developed for telephone companies to deliver Internet access. The initial technology was DSL and now has moved to IP-Ethernet and fiber optics. The objective is to improve the delivery of IPTV and a better "Quality of Customer Experience" (QoE). Each specification is summarized. Future specifications will include IPv6 transition, converged network, and multi-service architecture.

(IS-2010-19) Energy Management Systems for Commercial Buildings
This executive summary report from Pike Associates analyses the evolution of energy management for large buildings. Heating, cooling, and lighting account for 57% of building energy consumption. Energy expenditures for these functions were considered fixed costs. There is now a shift in thinking due to energy awareness, government policy, and applications of information technology. Long term, building design will move toward net-zero buildings and electricity demand response. Shorter term, the focus will be on energy efficiency.

(IS-2010-18) Green Telecom Networks
This executive summary report from Pike Research examines the impact of green practices on the information and communications and technology (ICT) industry. It focuses on plans by fixed and mobile telecommunications companies to reduce greenhouse gases. Although ICT accounts for only 2% of emissions, the industry is growing and may be able to reduce overall emissions by 15% over the next 10 years. Most approaches require higher initial investments. The industry is starting to evaluate life-cycle costs. Some of the approaches for reducing energy include equipment-cooling improvements, turning off unused equipment, use of renewal energy sources, and more efficient design of circuits for processors.

(IS-2010-17) Home Energy Management
This executive summary report from Pike Research analyses the potential market for energy information devices (EIDs) that provide consumers with data about home energy consumption. The early market is driven by utility decisions and deployments. Later EIDs will move into retail channels. Shipments are estimated at 5 million units by 2015 with 11 million users of web-based energy displays (called web dashboards).

(IS-2010-16) Green Jobs Study
This study by Booz Allen Hamilton for the U.S. Green Building Council estimates the jobs and investments created by green building construction. Buildings account for a bout 40% of greenhouse gas emissions. Green categories include energy efficiency, water efficiency, resource efficiency, responsible site management, and improved indoor air quality. The numbers from 2002-2008 are 2 million jobs worth $100 billion; 8 million jobs from 2009-2013 worth $400 billion. During theses periods LEED-related jobs were $830 million and are projected at $12.5 billion. The analysis methods are presented with a breakdown of job-types created and energy saved.

(IS-2010-15) Summary of the Architecture, Engineering, Construction, Owner Operator Phase 1 (AECOO-1) Joint Testbed
This report from two building consortia covers a trial of improved communications among the design team for a new building to facilitate energy efficiency. Methods explored were testbeds and interoperability programs. The need to integrate building data in to a building information management system was discussed. The use of XML and web-based services is considered.

(IS-2010-14) 4th Annual Green Building Survey
This article from experts in the green building marketplace examines the market for green buildings. 92% of 1600 design and construction professionals surveyed in 2009 supported green and sustainable construction because it saves energy and lowers operating expenses. LEED certification dropped 4.7% in 2009 because of the average 4% that LEED increases costs. Green leases that promise energy conservation are growing slowly.

(IS-2010-13) Climate Change Policy as an Economic Redevelopment Opportunity: The Role of Productive Investments in Mitigating Greenhouse Gas Emissions
This report from the American Council for an Energy Efficient Economy examines the potential impact of energy efficiency legislation such as the proposal for cap and trade. Jobs are expected to increase to support new energy efficient technologies. If no energy policy bill is enacted, energy consumption is expected to increase by 28% with a doubling of energy costs by 2050. These figures are based on an average economic growth rate of 2.6% for the next 40 years. Electricity generation and transmission is only 32% efficient. This study uses the Dynamic Energy Efficiency Policy Evaluation Routine. Modeling system to model the U.S. economy.

(IS-2010-12) Cisco Lab Setpoint Increase

This report from the Silicon Valley Leadership Group examines a case study of energy conservation by adjusting air-conditioning. Cisco raised the room and chilled water temperatures (about 8°F and 4°F respectively) in data centers to achieve a savings of 13-21% savings in cooling costs.

(IS-2010-11) Dynamic Power Management: Adjusting Data Center Capacity in Real-Time

This report from the Silicon Valley Leadership Group examines the management of servers as a method to reduce energy consumption. The objective is to determine when servers need to be processing data rather than standing-by waiting for traffic. The focus is shifting from "always on" to "always available." Servers used for retail sales showed an average usage of 19.83% with a peak usage of 85%. A saving of almost 57% was predicted with the "always available" model.

(IS-2010-10) Control of Computer Room Air Conditioning Using Sensors in the IT Equipment

This report from the Silicon Valley Leadership Group examines the role of information technology (IT) in improving the energy efficiency of data centers. Greater energy efficiency can be achieved by measuring temperatures at the point-of-use by servers rather than at the return air duct of the air-conditioning system. Energy reductions in the range of 30-40% are predicted.

(IS-2010-09) Control of Computer Room Air Handlers Using Wireless Sensors

This report from the Silicon Valley Leadership Group examines methods for improving the energy efficiency of data centers. The benefits of a wireless network for sensors, fan speed control, and chilled water flow were reported. Energy consumption was reduced 21%. This reduction was achieved by reducing the energy needed to cool the air and to move the air while achieving the temperature goal of the data center.

(IS-2010-08) Next Generation Broadband Access White Paper

This article from the Broadband Forum describes the growth of Internet access. By 2025 almost 90% of customers are expected to have access service at 100 Mbps or higher. Applications are expected to include the delivery of HDTV. DSL access has the greatest penetration in China followed by the U.S. VDLS2 has the potential of 100 Mbps. China leads in fiber optics subscribers. Specifications from the Broadband Forum support these deployments.

(IS-2010-07) MMBI White Paper on Use of MPLS in LTE

This article from the Broadband Forum introduces Multiprotocol Label Switching (MPLS) for use in the backhaul network that links mobile telephone radio access networks (RANs) with the communications network.. MMBI is the MPLS in Mobile Backhaul Initiative. It advocates for the use of MPLS in developing the next generation of mobile data networks called LTE (Long Term Evolution). Mobil data traffic recently surpassed mobile voice, and voice traffic is declining. MPLS combines TDM (Time Division Multiplex) voice and data packets onto an IP network. Technical details are included.

(IS-2010-06) Energy Efficiency, Dematerialization and the Role of the Broadband Forum

This report from the Broadband Forum recommends methods for communications and information companies to use materials in a manner that promotes energy conservation. Information and communication technology (ICT) accounted for 2% of greenhouse gases in 2007. ICT is the largest growing business sector, so this percentage is likely to grow. Applications of broadband connections to the home for consumer energy management are discussed. To conserve energy, networked devices should be always available, rather than always on. The article proposes substituting communications and displays for travel, physical media, and paper.

(IS-2010-05) Data Passport

This report from comScore surveys Internet usage and trends worldwide. Over the past decade the predominant users of the Internet shifted from the U.S. to Asia, led by India and China. There are also high growth rates in Latin America, the Middle East, and Africa. The most popular applications are instant messaging, social networking, entertainment, and email. 35% of those aged 18-34 watch TV only online. Advertising across multiple media is becoming important to raise consumer awareness. Social networking and browsing on mobile devices tends toward an older demographic because of the cost of the browser phone.

(IS-2010-04) Concepts to Enable Advancement of Distributed Energy Resources

This article from EPRI (Electric Power Research Institute) explores the impact of smart grid on control in an electric utility. The premise is to replace "command and control" with "inform and motivate." An objective is to communicate with smart grid devices in a technology-independent manner that focuses on the smart characteristics of these devices. For demand response, smart devices can be told the situation and requested to respond appropriately without being commanded, for example, to turn off. Applications of this principle to distributed energy resources are discussed. EPRI recommends that utilities "should not be in a role of operating buildings or becoming the surrogate control system for a product or device."

(IS-2010-03) Growth through Innovation in the Electronics and High Tech Industry
This article from Accenture discusses drivers and methods for corporate product innovation even during a recession. Innovation is now occurring in developing countries in addition to the traditional developed countries. The importance of customer-focused rather than technology-focused innovation is stressed. Innovation may come from collaboration among related companies.

(IS-2010-02) Mobility Takes Center Stage: The 2010 Accenture Consumer Electronics Products and Services Usage Report
This article from Accenture explores the growing market for consumer electronics. The most popular items are cell phones and personal computers. Web-enabled phone ownership tripled between 2007 ands 2009. Mobile devices are more popular in emerging markets. More consumers in developing countries than in the U.S. are willing to pay a premium for environmentally friendly products. By 2009 Internet access was considered more important than cable or satellite TV. Almost 60% of Baby Boomers were using social networking in 2009, up from about 20% in 2008. 160,000 technology-literate people were surveyed in eight countries: China, France, Germany, India, Japan, Malaysia, Singapore, and the United States. 85% of the respondents purchased consumer electronics during the recession, although cost was a factor in purchase decisions.

(IS-2010-01) The Role of Social Media in Commercial Property
This paper from RICS, a U.K. organization that "advances standards in land, property, and construction," investigates the potential benefits of social media for property professionals. Social media are part of Web 2.0 and enable personal branding. Methods such as blogs, Twitter, Wiki, RSS feed, tagging using Folkonomy, Facebook, and Crowdsourced content are discussed. A key issue is trusting and training employees to use these tools as brand ambassadors for the company. Examples of use in the commercial real estate industry are presented. It is important for a company to keep track of the information disseminated via social media about the company.

(IS-2009-159) Green, High Performance Schools
This article from Air Quality Sciences explains the benefits of public and private schools that combine energy conservation with improved indoor air quality. A major concern is the increased initial cost to build a green school, even though the operating costs over a 40-year (or more) lifetime are expected to be lower for a green building than traditional construction that meets building codes. Good indoor air quality is claimed to improve student attendance and performance. The chemical constituents of indoor air are presented. Among the pollutants are volatile organic compounds, mold, and formaldehyde. The impact on asthma and autism is discussed.

(IS-2009-158) Greening of Corporate America

This article from McGraw Hill Construction surveyed executives to determine changes in attitudes toward sustainability between 2006 and 2009. A small of majority of executives now sees business opportunities in sustainable products and a benefit to their companies to promote sustainability. The most popular sustainable activities are recycling, employee engagement, green buildings, and involvement with programs from governments and non-governmental agencies. Practices by many companies are presented.

(IS-2009-157) Creating Business-Class VoIP; Ensuring End-to-End Service Quality and Performance in a Multi-Vendor Environment

This article from Frost & Sullivan explains the challenges of using VoIP (Voice over IP) for telephone services. As of 2007 about 50% of companies surveyed were planning to substitute VoIP for switched telephony services. Although costs may be lower and flexibility increased, more responsibility rests on the company to ensure quality of service and availability. VoIP telephone service is sharing the same path and bandwidth as data traffic. Also, more responsibility rests at the periphery of the network with the company than with a switch that may be maintained by a telephone company.

(IS-2009-156) Doing Well by Doing Good? Green Office Buildings

This report from the Center for the Study of Energy Markets at the University of California at Berkeley examines the economic impact of green buildings. Buildings that are certified as green command higher rents by about 3-6% and sell for about 16% more. These conclusions are based on a study of more than 10,000 buildings. Buildings consume about 40% of the world energy and emit about 30% of the worldwide green house gases. Buildings were rated using Energy Star and LEED (Leadership in Energy and Environmental Design). The statistical methodology is described in detail.

(IS-2009-155) Solid State Lighting: Benchmarking Analysis

This paper from Cleantech Approach evaluates the market potential for sold state lighting. Lighting accounts for 20-25% of U.S. electricity consumption. 40% of lighting is used in buildings, both commercial and residential. LEDs outperform incandescent and halogen lights on a payback basis, and are a slight improvement over compact fluorescent bulbs. Detailed analyses are included.

(IS-2009-154) The Smart Grid: An Introduction

This booklet from the U.S. Department of Energy introduces the electric grid and explains technologies that could improve reliability to create a "smart grid." The state of the electric grid reliability is discussed, including the increased rate of failures leading to blackouts. Topics for a smart grid are presented including AMI (Advanced

Metering Infrastructure), visualization (distributed sensors), and distributed generation. Technologies and projects for a smart grid are mentioned.

(IS-2009-153) A National Assessment of Demand Response Potential

This report for the Federal Energy Regulatory Commission in the U.S. fulfills a Congressional mandate to explore the potential benefits of electric demand response. Under a scenario of full participation, the projected growth over 10 years in peak consumption could be reduced by about 20% for no net gain in the peak. Possible demand response programs range from limited to advanced programs that include dynamic power pricing and wide deployment of advanced metering infrastructures. The greatest impact of demand response is in regions that use a lot of air-conditioning. Demand response techniques need to be studied, coordinated across states, deployed nationwide, encouraged with federal tax policies, and accompanied by consumer education.

(IS-2009-152) Fan Industry - Facing up to the Energy Challenges

This article from the Air Movement and Control Association (AMCA) presents the history and status of standards for measuring the energy efficiency of fans. Considerable technical detail is provided. Methods for measuring efficiency are discussed. The long-term objective is to reduce the energy consumption of fans. National and international standards are referenced.

(IS-2009-151) Quantifying "Green" Value: Assessing the Applicability of the CoStar Studies

This paper from the Green Building Finance Consortium analyzes a March 2008 study that claimed LEED-certified buildings rented for a 36% premium over non-LEED buildings. Energy Star buildings had a 9% premium in rents. The methodology used in theses calculations was critiqued especially the fact that real estate prices were rising fast during the period of the study and the granularity of building detail was missing. Investment decisions in green buildings require both qualitative and quantitative analyses.

(IS-2009-150) High Performance Green Building: What's it Worth?

This paper from a consortium of organizations in British Columbia and Washington state explores the relationship between green features in a building and the financial impact on the building rents and value. It seeks to link building designers with the financial community. Valuation specialists performed this study by evaluating three buildings in Vancouver, Seattle, and Portland. The impact of green choices on building values is discussed. Various methods for establishing valuations are considered based on cost, recent sales, and income generated from rents.

(IS-2009-149) Green Building Impact and Market Report 2009
This article from Greener World Media surveys the growth of LEED buildings in 2009. Although the number of building starts did not grow significantly, the square footage of LEED development expanded about 40%. The reasons why are explored. Water shortages are expected to deter new building construction, rather than energy shortages. Details about the benefits of LEED buildings are presented.

(IS-2009-148) The Home Area Network: Architectural Considerations for Rapid Innovation
This article from Trilliant, an electric metering company, examines the pros and cons of including a gateway in an electric meter. The gateway translates communications telemetry between a neighborhood network and a home network. Although the number of smart meters to be deployed may reach 100 million over the next five years and half may include gateways, the number of households with home networks may reach only 20% by 2013. There are technical challenges for the gateway to communicate successfully with a home network if the gateway uses radio or power line carrier, depending on the meter location. Also, a gateway in a meter cannot adopt the variety of competitive home network technologies. The conclusion is that a gateway should be in a home device, not in a meter.

(IS-2009-147) Industrialization in the Construction Sector
This report written by the National Research Council of Canada explores the potential for using more factory processes in building construction. Increases depend on improved business models for collaboration between the building and manufacturing industries, technological innovations and transfer, and appropriate regulations. In 2007 about 8% of Canadian construction was prefabricated. This report explores two scenarios for 2025: increase from 8% to 25%; increase from 8% to 10%.

(IS-2009-146) LEEDing Retail to Greener Pastures
This article from Research Review explains the LEED rating system for buildings. The LEED rating is based on a weighed score of sustainable site, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation and design process. A new LEED rating for retail spaces is discussed. LEED for retail weighs the scoring with energy being the largest constituent in the score. Some California cities now require all large private-sector developments to achieve LEED status.

(IS-2009-145) Clean Tech Job Trends 2009
This paper from Clean Edge, Inc. explores the creation of new employment opportunities in the "clean tech" industries. Clean tech is defined as renewable materials and energy, use of natural resources more efficiently,

and reduction of pollution and toxic wastes. Job locations and average salaries are presented. Colleges offering training for these positions are highlighted. Opportunities in electric smart grid are discussed. Resources for seeking these jobs are listed.

(IS-2009-144) Green Noise or Green Value? Measuring the Price Effects of Environmental Certification in Commercial Buildings
This report from the University of Reading in England examines the financial benefits of green buildings. These building offer premiums in rental prices and sales prices. This study is based on LEED and Energy-Star certified buildings in the U.S. Detailed calculations are included. Certification now applies to only a small percentage of buildings, but is growing.

(IS-2009-143) How Real is the Vision of a "Smart Grid"?
This report from GP Bullhound of the U.K. presents stock analysts' views of investment opportunities in smart grids. They review companies involved with smart grids such as Silver Spring Networks, Trilliant Networks, and Tendril. Smart grid and demand-response are described. There is doubt about the economic benefits of a smart grid. The benefits depend on consumer behavior change, concerted efforts by all stakeholders, and new business models.

(IS-2009-142) Hidden Reservoir: Why Water Efficiency is the Best Solution for the Southeast
This report from American Rivers analyzes the water supply in the Southeast U.S. The long-term solution is not to build dams, but to improve efficiencies. Examples include stopping leaks, charging for waste water, improving landscaping to minimize waste, increasing household water fixture efficiency, using gray water, and maintaining rivers.

(IS-2009-141) The Digital Single Market: A key to unlock the potential of the knowledge based economy
This presentation from a European Union Commissioner examines the impediments to the growth of Internet usage in the European Union. A key limitation in Europe is regulation that varies by country. Rights to digital media are not clear across Europe and availability on a variety of devices is limited. The Commissioner warned that only U.S. citizens might have the right to European content from sources such as Google. The presenter explained the need for net neutrality.

(IS-2009-140) SRSM & Beyond Project
This document from the Energy Retail Association of Great Britain provides requirements for electricity and gas smart meters. Communications capabilities to a wide area network and to a home network are specified. Customer displays of energy consumption are included. Detailed specifications are presented.

(IS-2009-139) Ethernet Point-to-Point vs. PON - A comparison of two optical access network technologies and the different impact on operations
This paper from Keymile compares fiber optics networks that use active Ethernet Point-to-Point (PtP) versus PON (Passive Optical Network). PtP depends on a fiber optics line from optical multiplexer in the central office to each subscriber, while PON uses a single source and splitters with filters for each subscriber. Upstream PON uses a time–division multiplexed time slot assigned to each subscriber. PtP could be terminated in a building equipment room. PtP can offer higher data rates than PON. PtP might be suited for large companies. The growth of IPTV may push Internet speed requirements to 100 Mbps with 1000 Mbps a possible requirement in 10 years. Performance and cost comparisons are included.

(IS-2009-138) Five Emerging U.S. Public Finance Models: Powering Clean-Tech Economic Growth and Job Creation
This report from Clean Edge, Inc. examines financing options for U.S. clean tech investments. The financing options include the Green Bank, Clean Energy Victory Bonds (like World War II Victory Bonds), tax credit bonds, federal loan guarantees, and Clean Tech city Funds (operated by about a 10 cities now). The Green Bank would be created by the federal government, like the Export-Import Bank. This report argues that strong federal involvement is required.

(IS-2009-137) GreenFormat, an Online Tool Providing Structure for Environmental Product Evaluation
This paper introduces the GreenFormat from the Construction Specifications Institute. The GreenFormat is a web-based tool that provides data about the sustainable aspects of building products. Factors include life-cycle costs, end-of-life, and climate-change data. GreenFormat depends on reporting by manufacturers that complies with ISO 14201 guidelines for responsible data reporting.

(IS-2009-136) NTCA 2009 Broadband/Internet Availability Survey Report
This survey from the National Telecommunications Cooperative Association (NTCA) reports on deployment of Internet access by NTCA members in 2009. 98% of members (rural telephone companies) offer broadband Internet access; of those 98% utilize DSL with 59% delivering via fiber. Some use wireless (licensed and

unlicensed), satellite, and cable modem. Data rates vary from 200 kbps to 6 Mbps or more. 89% of operators face competition from cable and wireless companies. The broadband subscription rate by customers is 37%. 54% of operators see VoIP (Internet telephony) as a threat. 75% of operators offer video services.

(IS-2009-135) 802.11n Drives an Architectural Evolution

This article from Hewlett-Packard (HP) explains how to maximize performance of a wireless local area network (WLAN) using 802.11n radios. HP recommends moving from centralized LAN management to access points that are controlled across the LAN.

(IS-2009-134) Designing Space to Support Knowledge Work

This paper from the Environmental Design Research Associates explores optimal designs for an office to house a communications design organization. A quantitative measure of office space layout is presented with a qualitative description of social interaction among the occupants. The effect of office layout on the work process is explored. A corporate space redesign is presented with survey results before and after the change.

(IS-2009-133) Do Green Buildings Make Dollars and Sense?

This paper from the University of San Diego and CB Richard Ellis surveyed tenants of green buildings. 534 tenants in 154 Energy Star buildings were surveyed. Rents of green buildings are higher. Working in a green building is important for tenants. Methods for measuring productivity in green buildings are discussed. It is noted that green buildings are more intensively managed. "Our results continue to support the notion of green paying off."

(IS-2009-132) Estimating the Exaflood

This article from the Discovery Institute in Seattle explores the data impact of video and rich media on the Internet. U.S. Internet traffic is expected to reach 1021 bytes (one zettabyte). The 2015 Internet will be 50 times larger than the 2006 Internet. Applications in 2015 will include movie downloads, video calls (the largest volume of data on the Internet), cloud computing, gaming, IPTV, business IP, and other applications (phone, e-mail, photos, music, and web browsing). The history of the growth of Internet traffic is presented.

(IS-2009-131) Retrofits that Deliver

This article from the National Electrical Manufacturers Association (NEMA) examines the benefit of retrofitting a lighting system. New indoor lighting can save energy and produce appropriate light levels (many spaces are over-lit). Other issues include choosing the correct lamps, maintenance, and the impact of solid state lighting such as LEDs.

(IS-2009-130) IPD Cost Code

This report from Investment Property Databank (IPD) of the U.K. examines the measurement of building performance. The IPD Cost Code, fifth edition, is introduced for measuring the cost performance of commercial property. Details are included for determining which costs to include. Categories for each element of cost are provided, including information technology and communications. Case studies for various organizations are presented. Methods for reducing costs are discussed.

(IS-2009-129) Towards a Smarter Future: Government Response to the Consultation on Electricity and Gas Smart Metering

This report from the U.K. Department of Energy and Climate Change explains the plans for smart electric and gas metering mandated by 2020. Residential meters must include displays. This document is the Government response to 270 public comments on questions posed by the Government. Centralized communications for smart meters is planned with local coordination.

(IS-2009-128) Satisfaction with Certified Green Buildings-an Inquiry of Building Occupants in Minnesota

This paper from Dovetail Partners reports on a survey of occupants of green buildings in Minnesota. The basic topic was whether nine green buildings that were LEED registered remained green after occupancy. Favorable findings were reported on dual-flush toilets, dimmer switches, exhaust fans, paints and materials with low volatile organic compounds (VOCs), rain barrels, tankless water heaters, Energy Star appliances, programmable thermostats, wood from responsibly-managed forests, and use of local materials. Better education for manufacturers, contractors, and users is recommended.

(IS-2009-127) Doubling Down on Green

This article from the National Real Estate Investor and the U.S. Green Building Council reports on a survey about green investments during the recession of 2009. While new construction in 2009 was near zero, 73% of developers retrofitted properties with green features. 66% of developers think that green features will become required by building codes. Green building space commands about 2% higher rents than non-green space. Tax incentives would promote the installation of green features. Two-thirds of developers and corporate leaders see green as important.

(IS-2009-126) Rolling Out Golden Shield in China's Second-Tier Cities

This report from China Origins Associates describes where China is investing in high tech surveillance. China plans to track the movements of every person in the country using video and facial recognition. All new

commercial and residential buildings will be connected to the government network. This project is called Strengthening of Police Through Science and Technology. Partnerships with major Western technology companies are planned for this program.

(IS-2009-125) The smart way to display
This report from the Energy Saving Trust in the U.K. presents the findings form consumer research into user interfaces for energy management. Some of the findings include: use an analog indicator instead of numbers, use cost instead of energy consumed, interactivity should not be default mode, a portable display is not important, provide daily and cumulative consumption costs. Details of the study and focus group results are presented.

(IS-2009-124) Understanding ZigBee RF4CE
This article from the ZigBee Alliance presents extensions to the ZigBee protocol for networking consumer electronics. The application-layer protocol is described along with a discovery process. The application language includes a generic profile and an application component for specific device functionality.

(IS-2009-123) ZigBee Wireless Sensor Applications for Health, Wellness and Fitness
This article from the ZigBee Alliance explains how ZigBee devices can carry messages defined by an IEEE standard for health care applications. Such applications might include monitoring vital signs, activity and motion, home safety, and physical fitness.

(IS-2009-122) ZigBee - WiFi Coexistence
This report by Schneider Electric examines interference between ZigBee and WiFi. In most residential situations the interference may delay ZigBee packets. If WiFi were used for high volume data such as video, the impact could be more severe. In that case, a frequency-agile version of ZigBee is recommended that can change frequency while in operation. Also, the interfering nodes should be separated by at least 2 meters. Test results are presented.

(IS-2009-121) The Web of Things
This paper from Tridium explores technology that allows devices to be networked using versions of the Internet protocol. The author argues for using the 6LoWPAN Internet specification both for wireless (the original intent) and for wired networks including serial links. The goal is to make device data available as Web services. Protocols for representing device messages (oBIX encoded in binary) and for encoding device packets (Chopan) are proposed. Unresolved issues include data security and scripting.

(IS-2009-120) Mobile WAN Optimization Can Help Cut Costs and Avoid Future Upgrades
This brochure from the Yankee Group explores how to deliver Internet access for mobile users that provides application performance comparable to a PC running at headquarters. Mobile WAN (Wide Area Network) optimization is introduced.

(IS-2009-119) Integrated Edge Services: The TCO Advantage
This brochure from the Yankee Group examines the technology needed by service providers to deliver Internet, TV, and voice. The challenges are to integrate these services into a digital platform and to accommodate higher data rates. Pressure to increase data rates is coming from increased video transport via the Internet. The equipment that handles these data stream consists of edge routers that interface with customers. To lower operating costs, the triple services of Internet, TV, and voice need to be fully integrated at the operations level. Operator cost models are provided.

(IS-2009-118) Wild About Widgets Differentiating Video Platforms in the Age of Internet TV
This brochure from The Diffusion Group examines plans to include Internet access capabilities within TV sets. The author cautions manufacturers that a minimalist incorporation of Internet capability will limit market share and revenue. The Diffusion Group surveyed 2000 adults and found overwhelming support for using widgets (icons) to access Internet-based services via a TV. Widgets might access favorite TV shows, movies, weather, or news. The conclusion is that the Internet should enhance traditional TV viewing, rather than deliver social networks or online videos. Customers are willing to pay about $25 more for a TV with built-in widgets.

(IS-2009-117) TVE vs. OTT - Are You Ready for a Throwdown?
This brochure from The Diffusion Group explores the battle between cable TV delivery of TV programs and movies versus direct access by customers via the Internet. Cable operators are proposing TV Everywhere that allows Internet access only to cable TV subscribers. There will be a battle between the walled-garden approach of TV Everywhere and distribution available to all via the Internet. The author predicts the growth in Internet TV access from 20 million in 2009 to 63 million in 2014 with both walled-garden approach and open access co-existing.

(IS-2009-116) Over-the-Top, Cord-Cutting, and the Consumer
This brochure from The Diffusion Group explores those market segments attracted to TV programs delivered via the Internet. It explores how many are using Internet delivery in place of broadcast of cable TV, as opposed to supplementing these. It proposes a new offering of 20-30 channels plus selected movies customized to the viewer. Two-thirds of 2000 surveyed are interested in replacing or supplementing or both a custom service with a

traditional cable TV service. Some demographic details are included. Those favoring replacement are seeking lower cost and personalized TV.

(IS-2009-115) Online Video Threats and Opportunities for Pay TV Operators
This brochure from The Diffusion Group examines the business opportunities in Internet video distribution instead of inserting the program in a TV channel on cable. Some Pay TV content provides are allowing subscribers to access the Pay TV content via the Internet, but with restrictions or for an additional fee per month.

(IS-2009-114) The Business Dynamics of Pay TV versus Internet TV
This report from The Diffusion Group examines the growth of Internet access to entertainment that is now offered as Pay TV. Many viewers are now choosing to watch advertiser-supported video via the Internet on computers and mobile devices. So far, advertising revenues from on-line video does not match broadcast ad revenues. Furthermore, cable operators are generally not licensed to show content on the Internet. The content producers are exploring distribution channels that are not limited to cable TV channels.

(IS-2009-113) New communication behaviours in a Web 2.0 world – Changes, challenges and opportunities in the era of the Information Revolution
This white paper from Alcatel-Lucent explores the impact on business of Web2.0. Internet advertising will grow as more time is spent on the Internet instead of watching TV. This advertising will be tailored to users' preferences. Mobile usage will grow with dual-mode WiFi;/mobile phones. Emerging trends include collaboration, social interaction, personalization, active participation, less face-to-face communications. Web 2.0 is characterized by more user interaction. The Web 2.0 technologies market will grow from $746 million in 2008 to $4.6 billion in 2013. The future beyond Web 2.0 is the semantic web that understands user requests.

(IS-2009-112) When Corporate Network Safety Starts at Employees' Homes - Protecting Your Network from Home Wireless Hackers
This brochure from WatchGuard Technologies explains techniques for making WiFi connections more secure. These methods involve programming the access point to suppress the SSID broadcast and encrypt the data. Further techniques include installing a proxy-based firewall, using strong passwords, avoiding malicious web sites, preventing connections to a bogus access point, allowing only known computers on the WiFi network, and using IPsec-based VPN for accessing a corporate network.

(IS-2009-111) The Future Branch Office
This white paper from Citrix examines the growth of branch offices that need full IT capabilities as employees are dispersed. The trend is to centralize the servers at headquarters while focusing on improving wide area networks (WANs) for access. As WAN performance increases, more applications and desktop functions can be run remotely. However, large files may be staged on local servers. Eventually, no IT staff will be needed at branch offices and policies will be centralized. With centralized IT, some services can easily be outsourced via cloud computing.

(IS-2009-110) Acceleration 101
This white paper from F5 Networks, Inc. explains techniques for improving throughput via a wide area network running Internet protocols. It explains methods such as balancing the loads based on traffic to multiple servers containing the same, compression, data duplication, caching, optimizing TCP, optimizing http and applications, and offloading SSL process (data encryption) to remote offices. Some data compressors can run up to 1 Gbps. Data duplication updates local caches based on changes in data streams.

(IS-2009-109) The Education "Last Mile" - Closing the Gap from School to Work
This report from the Intelligent Community Forum describes a project for 2010 to prepare people for work with the proper education. The objective of ICF is to match community job skills needed with the education offered in that community. Examples are presented from Canada, Taiwan, France, U.S. and Sweden.

(IS-2009-108) Unlocking Energy Efficiency in the U.S. Economy
McKinsey & Company has analyzed why the potential of $130-billion annual savings from energy efficiency is not exploited. They estimate that 23% in energy expenditures can be saved by 2020. The barriers to reaping these savings are lack of information and education, incentives and financing, codes and standards, and third-party involvement. A strategy is presented that includes recognizing energy efficiency as an important resource, developing national and regional programs, finding sources of funds, aligning suppliers, users, and governments, and fostering innovation.

(IS-2009-107) Networked Systems Herald the Next Evolution of Restroom Efficiency
This brochure from Sloan explains the benefits of networked plumbing fixture in restrooms.

(IS-2009-106) ZebOS® 7.7 Network Platform Carrier Operation Maintenance Functions and Applications
This brochure from IP Infusion provides an overview of IEEE 802.ag, a standard for Ethernet Operations, Administration, and Maintenance (OAM). Ethernet OAM defines fault management functions, performance management functions, and network resilience functions. Acceptance of this paper for the CABA Information Library does not constitute endorsement of those portions of the brochure that describe the company's software product.

(IS-2009-105) 2008-2009 Standards & Technology Annual Report
This annual report from the Telecommunications Industry Association (TIA) summarizes standards activities in the following fields: mobile and personal private radio and communications systems, point-to-point communications systems, multi-media access, satellite equipment and systems, user premises telecommunications requirements and cabling, terrestrial mobile multimedia multicast, vehicular telematics, and healthcare ICT. Also, the TIA hosts U.S. technical advisory group for ISO/IEC standards information technology equipment, cabling, optical radiation safety and laser equipment, fiber optics, and intelligent transport systems. The TIA is the project secretariat of the third generation partnership (Internet access via cell telephone network).

(IS-2009-104) Insulation Energy Savings: Key Issues and Performance Factors
This report from Honeywell explains the benefits of building insulation in achieving the national goal of energy consumption reduction in commercial buildings. Closed-cell spray polyurethane foam (ccSPF) insulation is described. This material is impervious to most heat flow and to vapor. It can be applied to building materials, roofs, and walls. An analysis of the performance of this material in various environments is presented.

(IS-2009-103) Understanding Cost-Effectiveness of Energy Efficiency Programs: Best Practices, Technical Methods, and Emerging Issues for Policy-Makers
This report from the U.S. Environmental Protection Agency examines how to measure the effectiveness of energy efficiency programs. A combination of the following measurements are recommended: the participant cost test (PCT), the utility/program administrator cost test (PACT), the ratepayer impact measure test (RIM), the total resource cost test (TRC), and the societal cost test (SCT). Additional benefits include greenhouse gas reductions and a portfolio of renewables. Methods and examples for applying these measures are presented.

(IS-2009-102) ENERGY STAR Snapshot: Measuring Progress in the Commercial and Industrial Sectors
This report from the U.S. Environmental Protection Agency (EPA) examines trends in commercial and industrial building performance rating and certification. EPA ratings are used the most by schools and offices. The states leading in increased adoption of EPA ratings are California, Illinois, Ohio, and New York. The leading cities are Los Angeles, San Francisco, and Houston.

(IS-2009-101) IP for Smart Objects
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance is an overview of the benefits of equipping devices with Internet protocol interfaces for communications. The Internet protocols are summarized. The claimed benefits of IP are open, lightweight, versatile, ubiquitous, scalable, manageable, stable, and end-to-end.

(IS-2009-100) Video Consumer Mapping Study
This report from Nielsen Media examines consumer preferences for viewing video. It examines shifts in practices with the introduction of streaming video via the Internet. The viewing of 376 Americans were observed in their homes for a few days each. Viewing was categorized by screen: TV, PC, mobile, and others (e.g., GPS, cinema). 98-99% of viewing is on the TV among all ages and uses live TV (not DVD or DVR). PC is the number-two medium, then radio, then print. TV views saw about 60 minutes of ads and promos per day. Consumers tend to under-report their TV viewing and over-report their PC and mobile viewing.

(IS-2009-99) 2008 Ex Post Load Impact Evaluation for Pacific Gas and Electric Company's SmartRate™ Tariff
This report from Pacific Gas and Electric describes a limited trial of time-of-use pricing of electricity among 10,000 customers. Peak charges were 60¢ per kWh for residential and 75¢ per kWh for non-residential customers; off-peak was 3¢ per kWh. The average load reduction for residential customers was 16.6% and reached 19.2% on a few critical days. Reductions by non-residential customers were slightly lower and decreased over time.

(IS-2009-98) A National Assessment of Demand Response Potential
This report from the U.S. Federal Energy Regulatory Commission (FERC) fulfills a congressional mandate to examine progress on demand response programs. FERC projected the effectiveness of demand response by 2019 under four levels of aggressiveness toward promoting demand response: business as usual, expanded business as usual, achievable participation, and full participation. Under the full participation scenario the projected growth in peak demand for electricity can be cut to zero from the projected 20% growth under the

business-as-usual scenario. State-by-state analyses are presented along with recommendations for achieving each scenario.

(IS-2009-97) 6LoWPAN: Incorporating IEEE 802.15.4 into the IP Architecture
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance describes a method for transmission IPv6 messages via an IEEE 802.15.4 radio (the radio used for ZigBee). IEEE 802.15.4 is a LoPAN (Low Powered Personal Area Network). IPv6 expand the Internet address space from 32 bits to 128 bits. This increases the size of message headers. Fragmentation of messages is introduced to simply routers. Details of the LoPAN protocol for IPv6 (6LoPAN) are presented.

(IS-2009-96) Lightweight IPv6 Stacks for Smart Objects: The Experience of Three Independent and Interoperable Implementations
This paper from the Internet Protocol for Smart Objects (IPSO) Alliance describes software to enable devices to communicate using IPv6 (Internet Protocol with an expanded address space.). Methods for data compression, and datagram fragmentation are specified. Code size and battery requirements are presented.

(IS-2009-95) Moving Toward Utility-Scale Deployment of Dynamic Pricing in Mass Markets
This paper from the Edison Foundation explores the deployment and performance of dynamic pricing systems for residential energy. The response of customers is facilitated by equipment that reminds them of high energy cost periods or equipment that manages energy consumption. Results from utility trials are presented.

(IS-2009-94) G.hn – Compatibility with Existing Home Networking Technologies
This is a paper from the HomeGrid Forum, a trade group promoting the adoption of the ITU-T standard called G.hn. G.hn defines transceivers for sending data on coaxial cables and electric power wires using power line carrier (PLC) technology. There are many existing PLC technologies deployed. G.hn has defined methods to coexist with some of these technologies. Dual-mode transceivers are proposed for interoperability between G.hn and legacy PLC devices. Co-existence with MoCA (Multimedia over Coax Alliance) specification is described.

(IS-2009-93) How the Internet of Things, Social Networks & creative collaboration will shape future market structure
This report from Harbor Research examines the parallels between the growth in social networking and networks of devices. Connected devices could potentially be anything that uses electricity. The author predicts, "In a collaborative device community, devices themselves can blog, send & receive messages, report status, share files and interact on a peer-to-peer basis along with humans." A practical application is report product

maintenance. This is described as a shift in information technology from "what happened" to "what is happening." The benefits of collaborative development communities using social networks are explored.

(IS-2009-92) Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.
This report from Electric Power Research Institute (EPRI) examines energy efficiency and demand response programs that could reduce the growth in electricity consumption. The goals are to reduce the annual growth in consumption through 2030 from the historical 1.7% to 0.83% and even 0.68% under an ideal set of conditions. Likewise EPRI examined the goals of reducing the summer peak demand from 2.1% historically to 0.83% and to 0.53% ideally. To achieve these goals by 2030 will require a total investment of $41 to $63 billion depending on the target growth rate.

(IS-2009-91) Doing Business in a New Climate - A Guide to Measuring, Reducing and Offsetting Greenhouse Gas Emissions
This report from the David Susuki Foundation in Vancouver is a guide for companies of how to impact greenhouse gas emissions. Methods are proposed for measuring, reducing, and offsetting emissions. Examples of techniques used for emissions management by a variety of companies are presented.

(IS-2009-90) The Ocean: The Next Frontier in Renewable Energy?
This report from Greentech Media estimates the potential for generating energy from ocean activities. Ocean waves, current, and tides could supply 8% of the U.S. energy and 25% of the world energy. The ocean energy industry is projected to reach 1 GW by 2016 with sales of $650 million per year. Capital costs are expected to decrease. Technical challenges are discussed.

(IS-2009-89) Assessment of Demand Response & Advanced Metering
This report from the U.S. Federal Energy Regulatory Commission (FERC) surveys the installation of AMI (Advanced Metering Infrastructure) systems and demand response from 2006 to 2008. AMI installation increased from less than one percent to 4.1%. National Rural Cooperative utilities had the largest increase in penetration levels to 16.4% in 2008. Demand response programs accounted for 5.8% of the peak in 2008. FERC is examining regulations to encourage AMI and demand response. Among these are regulations related to time-of-use rates, customer access to meter data, measurements of load reduction, and financial investments required for demand response.

(IS-2009-88) Canada's Greenhouse Gas Emissions: Understanding the Trends, 1990-2006
This report from Environment Canada presents data on greenhouse gas emissions from 1990 to 2006. Emissions grew 22% during this period, which is 29% above the target of the Kyoto Protocol. However, the growth rate decreased by 2.8% from 2003 to 2006 as the service sector expanded and some technological improvements were introduced. The challenge is continue this decrease as population and economic activities increase.

(IS-2009-87) Jump-Starting Your EE Portfolio: Quick Start, Quick Return Energy Efficiency Programs
This report from the Edison Foundation describes a portfolio of programs for utilities to offer customers for achieving energy efficiency. Among these are appliance efficiency and recycling, demand response, lighting and consumer electronics improvements, plus commercial and industrial programs for lighting HVAC, and motors. The pros and cons of offering programs to suppliers versus customers are examined.

(IS-2009-86) Residential Electricity Conservation Through Smart Home Energy Management Technology: A Case-study in Milton, ON (Additional note)
This report is a refinement of a report of the same name based on analyzing consumer reactions to a home energy management system. The previous report was extended with an estimate for savings for a full year. The 90th percentile reduced consumption by about 20% and peak usage by about 23%, while the 10th percentile increased consumption by about 25% and peak consumption by about 24%. Overall, the result reported in the previous study should be modified from average consumption reduction of 19% to 16% and a peak consumption reduction from 24% to 18%.

(IS-2009-85) Residential Electricity Conservation Through Smart Home Energy Management Technology: A Case-study in Milton, ON
The University of Waterloo in Ontario examined how 123 consumers reacted to demand response events with the assistance of a home energy management system. Some consumers lowered consumption, while others did not. These households were compared to a control group without the energy management system. Of this who used the system, electricity consumption was reduced 4 to 14% overall, while peak consumption was reduced 5 to 23%.

(IS-2009-84) Analysis of the Waxman-Market Climate and Energy Bill
This report from the Alliance to Save Energy (ASE) is a commentary on the energy bill being considered in June 2009 by the United States House of Representatives. It includes a cap on greenhouse gases with a provision for polluters to trade the right to pollute within the limits of the cap. The ASE claims that cap and trade is "the most

significant energy efficiency policy ever implemented in this country." Other provisions in the bill strengthen building codes, mandate 20% of electricity by 2020 come from renewables, and establish building, home, and appliance rating systems. Funding for energy efficiency is estimated at $3 billion per year from 2012 to 2050.

(IS-2009-83) Top Ten Utility Solar Integration Ranking: Results of the 2008 Utility Solar Electricity Survey
This survey from the Solar Electric Power Association surveyed the electric utility industry in early 2009 to determine how utilities were integrating solar electric sources into their grids. Solar power includes photovoltaics and concentrating solar power to a point where the heat generates power. The leading utility for total solar megawatts is Pacific Gas & Electric, while the total solar watts per customer is San Francisco Public Utilities Commission for municipal buildings. The top municipal utility was the Sacramento Municipal Utility District.

(IS-2009-82) Utility of the Future
This report from a 2008 KEMA, Inc. forum examines the challenges facing electric utilities. The need for a smart grid was discussed especially to accommodate power from renewable sources. Reduction of greenhouse gases was another major topic. A commissioner from the U.S. Federal Energy Regulatory Commission (responsible for the wholesale electric market) estimated that a $1 trillion investment in electricity generation, transmission, and distribution was needed. Other topics included advanced metering, electric cars, and building automation.

(IS-2009-81) Renewable energy country attractiveness indices
This survey by Ernst & Young rates national performance in developing renewal energy sources. The rating is weighted 75% for wind, 10% for solar, and 15% for biomass and other technologies. The U.S. Germany, China, India, and Spain lead the index in all renewables. Canada ranks ninth. The effects of the economic slowdown are discussed. Country-by-country performance is presented.

(IS-2009-80) Increasing Water Efficiency in California's Commercial, Industrial, and Institutional (CII) Sector
This paper from the Natural Resources Defense Fund examines the long-term water supply in California. California is seeking to reduce per capita consumption 20% by 2020. The largest uses are office buildings, golf courses, and schools. The secondary benefits include lowered energy costs and the consequential effects on the environment, and improved fisheries. Policy changes to encourage water conservation are presented.

(IS-2009-79) International Energy Outlook 2009
This report from the Energy Information Agency of the U.S. Department of Energy projects the world energy market through 2030. Usage will grow 44% with 73% of the growth outside the developed countries. Consumption of all fuels will grow. However, production of biofuels will increase six-fold. The effects of the

current downturn that have reduced energy consumption are expected to end after 2010. Renewable electricity will be fueled by wind and hydro, but not solar unless subsidized. Electricity from nuclear plants will increase about 40%. Carbon dioxide emissions are expected to increase 39%. The 2030 oil price is projected at $130 with a low of $50 and a high of $200 per barrel.

(IS-2009-78) Development of an Operation and Maintenance Rating System for Commercial Buildings
This report from the University of Washington presents a study for the National Center for Energy Management and Building Technologies of the U.S. Department of Energy. This study created a rating system to quantify the performance of outsourced building operations and maintenance services. The ratings cover building energy usage; operation, maintenance, and functionality of the heating, ventilation and air conditioning (HVAC) systems; building occupant satisfaction; and building operation and management. Detailed survey forms are included in the report.

(IS-2009-77) The Influence of Home Energy Management Systems on the Behaviours of Residential Electricity Consumers: An Ontario, Canada Case Study
This is a thesis written by a masters student at the University of Waterloo in Ontario. The effectiveness of a home energy management system to reduce average and peak electricity usage is reported. The home energy management system presented time-of-use rates via the web and allowed users to choose their level of conservation. Control was exercised via a home gateway and X-10 control of thermostat, light switches, etc. Overall, about 3% load reduction and 13% peak reduction was achieved with about 3% shift in load to off-peak.

(IS-2009-76) Market failures and policy or policies' success
This publication from the International Energy Agency (IEA) focuses on the energy used by consumer electronics, including appliances, computers, and communications devices. The IEA is an inter-governmental agency of 28 countries including Canada and the U.S. Total energy use by these devices is expected to double by 2022 and triple by 2030. The IEA recommends government policies that encourage energy conserving products. They specifically recommend products that power only those functions active in the device.

(IS-2009-75) The U.S. Smart Grid Revolution - KEMA's Perspective for Job Creation
This study from KEMA, Inc. projects the impact of $64 billion in expenditures on smart grid projects from 2008-2012. About 278,600 jobs are expected to be created during this period. This paper surveys the transition of the electric utility industry to accommodate a smart grid. The smart grid will include advanced metering infrastructure (AMI), renewables, and increased reliability.

(IS-2009-74) Mobile Advertising: Buy In or Lose Out
This paper from Oracle examines the growing market for ads inserted in web pages delivered to mobile telephones. 23% of users click on such ads. This market may reach $1 billion by 2012 in the U.S. Methods of inserting ads in text messages are discussed. Billing options with ad subsidies are considered.

(IS-2009-73) Transforming the Market
This report from the World Business Council for Sustainable Development (WBCSD) examines energy used by buildings in Brazil, China, Europe, India, Japan, and the U.S. These countries account for two-thirds of energy consumption. Motivations to achieve energy reduction are needed beyond market forces. The report recommends incentives, integrated design, innovation, advanced technology, training, and an "energy aware culture." They warn against complacency and false optimism. Case studies are included.

(IS-2009-72) Energy Efficiency in Buildings: A Global Economic Perspective
This study from the Peterson Institute for International Economics examines financial motivation for building manager to improve building efficiency. The goal is to achieve a 50% reduction in green house gas emissions by 2050. The researchers examined what would motivate the owners of residential and commercial building to make change to reduce emissions. A worldwide investment of $1 trillion per year is needed to achieve the goals. 83% of this investment will be paid back in 20 years through lower energy consumption. The authors conclude "Imposing a price for carbon alone will be insufficient to achieve the necessary emission reductions from buildings, and barriers to adoption must be addressed through building standards, fiscal spending, and new approaches for financing energy-saving design and technology at scale."

(IS-2009-71) Bus-based Installation Technology in Residential and Commercial Buildings
The South Westphalia University of Applied Sciences in Germany conducted a market survey of opinions regarding building and home automation systems that use a communications bus. Most respondents favored this technology for increased comfort and convenience. Three-quarters of companies interviewed already incorporate this technology. Key applications are lighting, shading, and HVAC. The leading systems installed in Germany are KNX and LonWorks.

(IS-2009-70) Transforming Innovation into Market Growth: Digital Media
This report from Enterprise Florida surveys the impact of the conversions of media from analog to digital. A total of 4800 Florida companies are involved in game production, wireless and mobile data services, e-music, e-learning, and video production.

(IS-2009-69) Job Opportunities for the Green Economy

This study from the University of Massachusetts at Amherst examines the effect on employment of the expansions of industries that address global warming. The following areas were studied: building retrofitting, mass transit, energy-efficient automobiles, wind power, solar power, and cellulosic biomass fuels. Employment impacts in 12 U.S. states were studied. The conclusion is that workers with a wide range of skills can benefit from these growing industries.

(IS-2009-68) Evaluation Manual for Intelligent Building in Taiwan

This report from Taiwan explains the criteria used in Taiwan for labeling a building as "intelligent." Various evaluation systems from Japan, China, and Europe are discussed. The following criteria are used: Information & Communication, Safety & Security, Health & Amenity, Energy Saving Equipment, Premises Distribution System (PDS), System Integration, and Facilities Management.

(IS-2009-67) The Economic Stimulus Plan and the Construction Industry

This report from the law firm of Akerman Senterfitt reviews the U.S. law passed in February 2009 that allocates $135 billion for building construction. Funds are available for transportation, federal buildings, energy projects, and water and environment projects. These funds are intended for "shovel ready" projects to stimulate employment. There are provisions in the law requiring states to make quick decisions about using the funds. Project announcements are found in fedbizopps.gov. This paper examines the Buy American provisions of the Act.

(IS-2009-66) Widgets drive mobile content consumption

This paper from Fiercewireless explores the use of widgets on mobile device to generate revenue. Widgets are icons that initiate light-weight applications such as a local weather forecast or information about a museum. The use of widgets tailored to the user can create brand loyalty to the phone maker and can draw users to advertisers.

(IS-2009-65) Energy Efficiency in Buildings: Transforming the Market

This paper from the World Business Council for Sustainable Development explores building efficiency in six markets: Brazil, China Europe, Indian, Japan, and the U.S. Energy consumption for building operation was studied. Building operations account for 80% of the total energy consumed during the life cycle of the building that include construction and demolition. Buildings consume 40% of energy produced. The report proposes methods to reduce energy consumption sufficient to decrease carbon output by 77% by 2050. Codes, incentives, designs, and technologies to achieve this goal are discussed. Financial incentives alone are inadequate today;

taxes and subsidies are recommended. The net cost is estimated at $250 billion per year in the six market studied.

(IS-2009-64) Accelerating Unified Communications with an Enterprise-Wide Architecture
This article from the Yankee Group explores unified communications in a business. Unified communications combines voice, video, data, and mobile communications. Data communications now include instant messaging, called presence. Voice should be implemented with VoIP (Voice over Internet Protocol). This integrated communication not only saves money, but also improves competitiveness. The writer recommends a corporate-wide system, rather than upgrades at each site to foster system integration. Incorporating the industry standards SIP for communications and XML for data description are proposed. Suggestions for selecting a supplier are presented.

(IS-2009-63) Meeting Aggressive New State Goals for Utility-Sector Energy Efficiency
This report from the American Council for an Energy-Efficient Economy reviews the response of utilities to state mandates for improved efficiency. It examines which states achieved the greatest improvement and the relevant factors that contributed to this increase. Data from the top 14 states are presented. The top three states were California, Massachusetts, and Connecticut. Important factors were funding for energy efficiency programs and strong requirements for complying. No states have achieved the expressed goal of 1.5-2% increase in efficiency per year. The programs implemented by the successful utilities are reviewed.

(IS-2009-62) Micro-CHP Accelerator
This paper from the Carbon Trust analyzes the benefits of small combined heat and power (CHP) systems in both commercial and residential buildings. Some the results found: best saving are with long consistent heating periods; can save 15-20% of carbon emissions in commercial applications; there is a need for skilled operators; can save 5-10% of carbon footprint for older large houses and insignificant savings in newer small houses. The report recommends a policy that considers the installation environment. Devices with increased power generation efficiency should be considered.

(IS-2009-61) Economics of Emerging Electric Energy Storage Technologies and Demand Response in Deregulated Electricity Markets
This 2008 Ph.D. thesis from Carnegie Mellon University explores energy storage techniques and demand response for large users. Two storage methods were explored: battery and flywheel. The flywheel is 90% efficient with a much longer life than a battery and could be justified economically. The demand-response program provided a subsidy for load reduction when costs were high.

(IS-2009-60) Manufacturers in the Residential Systems Market Identify Market Opportunities and Constraints
This survey from Stiernberg Consulting examines the challenges to expanding markets for consumer products. Manufacturers of audio, control, automation, AV networking, video, media storage and management, wire/cable, lighting, furniture, racks, and accessories were questioned near the end of 2008. The top challenges were pricing pressures and shrinking margins, long product development cycles, limited talent, and new competition. Competition includes the entry of big-box retailers into the installation market. On a positive note, the economy problems are keeping people home and demanding more entertainment.

(IS-2009-59) Strategic Facility Planning: A White Paper
This article by the International Facility Management Association provides recommendation for strategic planning techniques for facilities management. The general method involves understanding, analyzing, planning, and acting. Costing issues are discussed. A strategic plan should consider life-cycle costs for buildings.

(IS-2009-58) Carbon Footprinting
This paper from the Carbon Trust provides a guide to estimating the carbon footprint or an organization. The carbon footprint is defined as "The total set of greenhouse gas emissions caused directly and indirectly by an individual, event or product." An organization is responsible for carbon emissions via the company buildings, the consumption of electricity, and the transportation required for goods and people. A method for calculating the carbon footprint is presented.

(IS-2009-57) Building Fabric - Energy Saving Techniques to Improve the Efficiency of Building Structures
This paper from the Carbon Trust provides practical advice for reducing heat losses by rehabilitating the ceiling, walls, windows, floors, and doors of a building (called the "building fabric"). About a 10-15% of energy is wasted through heat losses via the building fabric. Techniques for improving the building fabric are presented.

(IS-2009-56) Meeting Electric Peak on the Demand Side: Wholesale and Retail Market Impacts of Real-Time Pricing and Peak Load Management Policy
This 2008 Ph.D. thesis from Carnegie Mellon University explores the justification, costs, impact, and customer acceptance of technique for demand management of electricity. Studies of customer responses to time-varying pricing are reviewed. An economic analysis of the cost of providing peak supply versus customer willing to pay for a reliable electricity supply is presented. The cost of an advanced metering infrastructure (AMI) to support time-varying pricing versus the cost of peaking generators is explained. About 10-15% reductions in peak can be

achieved with modest programs, although some customers will see increased bills. Also, installing AMI is not cost-effective for small customers.

(IS-2009-55) Combined Heat and Power for Buildings

This paper from the Carbon Trust explains how to use a single plant in a building both to generate electricity and to provide building heat from the excess heat of the generator. This scheme utilizes 90% of the energy supplied to the generator. Such units need to be operated about 5000 hours per year to be economical. Various sizes of combination power and heat units are discussed. An example installation at a university saved about 14% in energy costs with an up-front cost of about $800,000. These units may be installed for standby power generation.

(IS-2009-54) Making the Business Case for a Carbon Reduction Project

This paper from the Carbon Trust provides practical advice for convincing corporate decision-makers to support company projects that reduce carbon. For example, start with a small project or a trial, generate success, and build on this success. Financing and risks should be presented to management.

(IS-2009-53) Low Carbon Refurbishment of Buildings

This paper from the Carbon Trust provides practical advice for reducing the carbon footprint of commercial buildings. It specifically provides guidance for the rehabilitation of existing buildings to mitigate carbon in the U.K. Rehabilitating without considering carbon may result in increased emissions. Issues such as the building envelope, lighting, heating and cooling, and office and food equipment are discussed.

(IS-2009-52) Air Conditioning: Maximising Comfort, Minimising Energy Consumption

This paper from the Carbon Trust provides practical advice for reducing the cost of air conditioning commercial buildings. It also presents methods in building design to minimize the need for air conditioning. Air conditioning technology is summarized. A checklist for building managers is included.

(IS-2009-51) Global Carbon Mechanisms

This paper from the Carbon Trust explores methods used to reduce carbon emissions. As carbon trading credits grow, new mechanisms to encourage practices that reduce emissions are needed. The appropriate pricing of carbon emissions to continue the scheme and to benefit developing countries are discussed. Detailed economic analysis in presented.

(IS-2009-50) Achieving 30% and 50% over ASHRAE 90.1-2004 in a Low-Rise Office Building

This study by ConSol attempted to reduce energy consumption is a low-rise four story 95,000 square -foot building by 30-50% below the ASHRA 2004 level. They were able to achieve only a 15-23% reduction with about a 10-year payback period. The study was done using energy simulation software from the U.S. Department of Energy. The simulation was conducted for the climates in thee cities: Newport Beach, California, Baltimore, and Chicago. Energy efficiency was achieved with improvements in insulation, glazing, lighting, HVAC, and the use of photovoltaics. Greater improvements would require "a design approach that analyzes buildings as holistic systems rather than as disconnected collections of individually engineered subsystems."

(IS-2009-49) Clean Energy Trends 2009

Clean Edge, Inc. tracks the implementation of the market for clean technologies for energy annually. This study for 2009 projects almost a tripling of markets for biofuels, solar, and wind in10 years. However, retrenchment is expected in 2009 because of the economic recession. Governments are now investing more in this sector. The following five trends were identified: smart grid, storage technology, development of clean energy markets, grid infrastructure improvements, and micropower grids.

(IS-2009-48) Geared for Change - Energy Efficiency in Canada's Commercial Building Sector

This paper is joint development of The National Round Table on the Environment and the Economy (NRTEE) and Sustainable Development Technology Canada (SDTC) about reducing the carbon footprint of commercial buildings. The NTREE seeks to reduce carbon emission by 58% less than the projected output in 2050 if there were no change. The focus is on clustered buildings that are highly efficient. Achieving this goal requires industry commitment and "stringent regulations." Buildings should be considered in the context of the city and transportation. Policies will be needed on energy pricing, command and control regulations, subsidies, and information programs. Policies in other countries are reviewed.

(IS-2009-47) Smart Grid: A Practical View

This paper describes some of the features of an electric smart grid. A smart grid overlays information technology on the elements of the electric grid. Losses of electricity (conversion to wasted heat) may occur due to faults to ground and resistive transmission pathways. The grid needs to be monitored for these faults with a distributed communications network, similar to a cellular telephone network. An Internet Protocol-based network is recommended.

(IS-2009-46) Sony Online Entertainment Realizes an Estimated 50% IRR on Its Service Strategy
This article summarizes the methods used by Sony to provide customer support for game products. Sony purchase specialized software to provide details about customer problems during game play. The integration of customer support into the game business at Sony is described with a summary of takeaways to benefit other companies. Sony was able to achieve a 50% return on the investment in this new system for customer service.

(IS-2009-45) Lighting the way: Understanding the smart energy consumer
This paper from IBM is a survey of 5000 consumers about their attitudes toward energy management. Cost is a key motivating factor for consumers to manage energy and to change patterns of usage. 65-75% of consumer said that environmental factors are important. Various demographic groups were analyzed. Consumers question the potential savings with a smart meter, unless the savings are guaranteed.

(IS-2009-44) How to Design a Solar-Powered Computing Device
This paper from Intel describes applications of solar power supplies built into computing devices. Examples include routers in remote locations, sensors, data acquisition, and femtocells (for extending cell phone networks). Power management is important in the design of such devices to minimize the solar collector size and power storage required.

(IS-2009-43) Strategies for Smart Services
This paper from Harbor Research discussed companies shifting from selling products to selling services. Services are facilitated by embedded intelligence in products. Examples from manufacturers are presented. The effect of this shift is explained: "When products become networked, the predominant value shifts from the product itself to the experience of owning and using the product inside an 'aware,' responsive support environment." The business value of interconnecting products is discussed.

(IS-2009-42) Designing the Future of Information
This paper from Harbor Research explores two approaches to applying the Internet for interconnecting devices. Work from Maya Design, called Internet Commons, and from the MIT Center for Bits and Atoms, called Internet 0, are presented. Both are important for what Harbor Research calls "The Pervasive Internet." The Internet Commons facilitates data fusion using a markup language called RDF (Resource Description Framework) as part of a new Information Device Architecture (IDA). Internet 0 is a version of the Internet suite of protocols intended for embedding in low cost devices.

(IS-2009-41) Securing the Future

This paper from Harbor Research presents the challenges of providing network security when the Internet interconnects devices. They maintain that the client-server model of the Internet needs to be changed for machine-to-machine communications. Between 500 million and one billion devices are expected to be interconnected by 2010. A framework for data security needed for machine-to-machine communications is presented.

(IS-2009-40) Tracking the Sun: The Installed Cost of Photovoltaics in the U.S. from 1998-2007

This report from Lawrence Berkeley National Labs examines cost trends for photovoltaics used to supply power. The average cost has dropped from $10.50 in 1998 to $7.60 in 2007 (in 2007 dollars). Costs are about 1/3 less for systems above 750 kW and for new installations compared to retrofits. A total of 10,600 MW of photovoltaic power has been installed worldwide. The leaders in installations are Germany, Spain, Japan, and then the U.S. The methodology for collecting data about installations is presented along with the findings. The motivations for installations are driven by government incentives. U.S. investment tax credits are expected to spur the installation of residential photovoltaics.

(IS-2009-39) The Role of Security in Trustworthy Cloud Computing

This paper by RSA introduces the security challenges for cloud computing. Cloud computing is the replacement of in-house corporate IT with services rented from a third party using server accessed via the public Internet. The need for increased data security before enterprises move to cloud computing is discussed. Enterprises are tempted by lower IT cost, but need to consider the liability for breaches to achieve security mandated by various regulations.

(IS-2009-38) Highlights of the 2009 International Solid State Circuits Conference (ISSCC)

This is a summary from Digdia of developments in solid state electronics presented at a conference. Among the highlights are LEDs for LCD TV illumination, mobile phone electronics for Internet and TV access, cameras, power reduction dynamically to unused circuits, and chips that can access a variety of radio networks.

(IS-2009-37) Wind Resource Site Assessment: A Guide to Selecting Monitoring Equipment

This brochure from Onset Computer Corporation explains how to assess the local environment at a wind generator. Appropriate sensors for temperature, wind speed, and wind direction plus data loggers are described. Accessing the data collected by the data logger using a communications network is discussed.

(IS-2009-36) Monitoring Physical Threats in the Data Center
This paper from APC Schneider Electric examines security threats to data centers. These threats include excess temperatures, water leaks, intrusions, harmful air quality, smoke, and fire. The placement of sensors, aggregation of sensor data, and reporting problems are discussed.

(IS-2009-35) Sales 2.0: How Businesses are Using Online Collaboration to Spark Sales
This investigation by TheTechCollective assesses the impact of Web2.0 interactions on the Internet to enhance the selling process, called Sales 2.0. Web 2.0 enables sharing and collaboration. A new technique of combining applications called mash-ups is discussed. When applied to sales it fosters collaboration within companies and with customers. A survey of companies using these new tools is presented. About 25% are using social networking tools such as LinkedIn, Facebook, Myspace, Twitter, and Jigsaw to enhance the sales process.

(IS-2009-34) Inquiry Insights: Client Virtualization, Q3 2008
This paper from Forrester Research explores the value of providing a virtual desktop for working outside the office. These people may be using a portable computer when traveling or working from home. Vendors of desktop virtualization software are reviewed. Application virtualization allows applications to run on a foreign machine without interference from other software on that machine.

(IS-2009-33) Shaping the ICT research and innovation agenda for the next decade
This paper from the European Commission explores the role of the European Union in fostering developments in the ICT (Information and Communications Technology) industry in Europe. Important applications of ICT include energy efficiency, environmental sustainability, and health and social care systems. Proposals for tax incentives and public financing of R&D are discussed. 565 persons were surveyed for this report. The top services were web-based and the top consumer markets were access to information, social networking, and on-line administration. There was strong support for the public sector to adopt innovative ICT solutions.

(IS-2009-32) Assessing the Electric Productivity Gap and the U.S. Efficiency Opportunity
This paper from the Rocky Mountain Institute explores how U.S. states use power generation efficiency as a resource. The U.S. could save 1.2 gigawatt-hours annually (30% of usage) if all states were as efficient as New York. Electric productivity was defined as $GDP/kWh normalized for various factors such as mild climates, economy, rates, culture, etc. The top ten states were New York, Alaska, Connecticut, Delaware, California, New Jersey, Massachusetts, Rhode Island, New Hampshire, and Colorado. The methodology for this study is explained.

(IS-2009-31) Cleantech Growth & Go-to-Market Report

This report from Sustainability Development Technology Canada (a foundation with government support) describes best practices and business opportunities for a clean technology industry in Ontario. This organization gives grants for "projects that address climate change, air quality, clean water, and clean soil" and "demonstration-scale facilities for the production of next generation renewable fuels." Opportunities for Ontario companies to develop clean technologies and to market them beyond Ontario are discussed. In 2008, 2600 companies generated $7 billion and employed 65,000 people in clean technology.

(IS-2009-30) A Greenhouse Gas Cap-and-Trade System for Ontario

This paper from the Government on Ontario explores plans for mitigating green house gas emissions. Discussed are a Cap-and-Trade program and harmonization with programs in Quebec and North America. The dangerous gases include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, petrofluorocarbons, and sulphur hexafluoride. Ontario and Quebec expected to start a Cap-and-Trade program as soon as 2010. The mechanism for this program is presented with the goal of an absolute reduction in greenhouse gases. The program is expected to be expanded to more Canadian provinces and U.S. states.

(IS-2009-29) Internet of the future: Europe must be a key player

This presentation by a European Union commissioner explores the role of the European Union (EU) in enhancing the Internet. Topics discussed include privacy, security, and governance. The drivers of the Internet are social networks, the Internet of Things (including cloud computing), and the mobile Internet. Social networks are expected to impact business. The Internet can help engage citizens in politics. The EU will focus on the openness of the Internet through "Net Neutrality" and standards, globalization, and economic investments in the Internet.

(IS-2009-28) Tomorrow's Markets

This survey by the owner of the Economist magazine and the U.K. government explores business opportunities in the emerging markets of Brazil, China, Indian, and Russia. 561 executives from 19 countries were questioned. Growth in the emerging markets is expected to offset declines in Europe and North America. The highest growth expectations are in China and India. The next set of emerging nations includes Vietnam, Mexico, the United Arab Emirates, and the Ukraine. Obstacles in emerging markets are legal and regulatory institutions, corruption, and poor infrastructures.

(IS-2009-27) Optimizing Users And Applications In A Mobile World
This report from Forrester Consulting is a survey of about 300 companies worldwide on how IT is adjusting to serve mobile workers away from the office. 63% of those surveyed use mobile connections with 55% via Wi-Fi hotspots. 45% now work from home full time for the companies surveyed. The greatest complaint received by IT help desks is application performance, rather than computer hardware and operating system issues. The VPN (Virtual Private Network) is the prevalent technology for accessing the company servers. Suggestions for improving wide area network communications are provided.

(IS-2009-26) Ubiquitous Broadband: The Future of Global Connectivity
This paper from the Yankee Group describes the size and penetration of the broadband market for Internet access and provides growth projections. The current market is $590 billion annually with the greatest penetration in Japan (89%), Sweden (86%), the Netherlands (81%), and Italy (79%). The market is expected to reach $903 billion by 2012 with ubiquitous access in Asia, Europe, and the U.S. Broadband is defined as Internet access at least 500 kbps or wireless connections via 3G or better. North America lags Europe because of lower 3G wireless availability. The leading countries in 2012 will be Sweden, Italy, the Netherlands, and the U.S.

(IS-2009-25) Ticket to success: escalators in entertainment venues
This paper by Schindler Elevator Corporation explains the parameters for designing escalators for public entertainment structures. The peak volume of people to be moved before and after the event is a key parameter. Also important in the design is accommodating a location exposed to the weather. Technical considerations include escalator placement for multiple floors, motor size (based on anticipated crowd size), color of escalator materials, and noise.

(IS-2009-24) UPnP Technology - The Simple, Seamless Home Network
This brochure from the UPnP Implementers Corporation is a promotional piece for UPnP. It provides an overview of the UPnP Forum and the UPnP Implementers Corporation, and announces that UPnP has been approved as an ISO/IEC standard. A very brief overview of the UPnP networking and control method is included.

(IS-2009-23) Automated Demand Response Cuts Commercial Building Energy Use and Peak Demand
This summary from Lawrence Berkeley Laboratory describes AutoDR. AutoDR is a demand response system for buildings that delivers data about a supply event requiring energy reduction. Energy management systems in building query a utility server for event notices. They then manage local energy consuming equipment, such as

air-conditioning equipment and lighting in response. The objective is to shed load so the utility can tailor the demand to the available supply of electricity.

(IS-2009-22) CES 2009 – Top 10 Trends
Digdia presents a summary of key innovation at the 2009 Consumer Electronics Show (CES) held January 2009 in Las Vegas. Among the products noted are LCD TVs that are back lit with LEDs for improved contrast, 3D TVs, and TVs with on-screen short cuts (widgets) to Internet-based information. Many products promoted "green features." Computer projectors small enough for embedding in a phone are coming. Flash memory is replacing tape and disks for camcorders. Digital photo frames are becoming a very competitive market. Netbooks, sized between a laptop and a PDA, are seeking market share. Mobile TV is growing.

(IS-2009-21) A Recent Whitestone Study of Energy-Saving Retrofits has Lessons for Other Green Projects
This overview of a report from Whitestone Research examines how to achieve U.S. federally mandated energy savings in older buildings. A key issue is initial investments versus life-cycle costs. A detailed analysis showed that a high initial investment saved money over 40 years. It included such features as a roof garden, triple-glazed windows, and a heat recovery chiller. Not all investments have the same or even positive returns. More research is needed.

(IS-2009-20) A U.S. Innovation Strategy for Climate Change Mitigation
This report from the Brookings Institution proposes fiscal and government investment policies for reducing greenhouse gasses (GHGs). Recommendations include establishing a price for GHGs, research and development tax credits, and public support for university and private sector research. An expenditure of $8 billion per year through 2016 for this research is proposed. The U.S. government currently funds 59% of the basis research in universities, non-profits, and government labs. The cost to stabilize GHG emissions is 0.2 to 5 % of global GDP, depending on the targeted GHG level. The U.S will bear about 25% of this cost.

(IS-2009-19) ZigBee Resource Guide
This guide from the ZigBee Alliance is a promotional magazine for ZigBee. It includes ads from ZigBee suppliers and summaries of market potential for ZigBee products. Applications of ZigBee for energy conservation and energy management are described.

(IS-2009-18) ICT & Ageing – European Study on Users, Markets and Technologies
This report from the European Commission discusses telehealth and telecare in Europe. The implementation of telehealth and telecare for an aging population at home is just starting. The potential benefits are not yet

recognized by policy service providers and practitioners. More data and education are needed. Large-scale trials are recommended. Issues of privacy and surveillance needed to be addressed. Also, the quality of care, outcomes, and economics must be considered. Telehealth and telecare are based on ICT (Information and Communications Technologies). ICT can impact mobility, social care, health care, and housing. Current technology focuses on a portable alarm device to call for help. Telehealth could benefit 25-60% of older ill people. Services among the European Union countries are reviewed with information about Japan and the U.S. included.

(IS-2009-17) Users' Guide to Green Performance Contracting
This is working draft report from the non-profit Leonardo Academy investigating how to factor sustainability into performance contracts for upgrading a building. These contracts are intended for upgrading public buildings without expending capital improvement budgets. Long-term energy savings can justify incremental increases in first costs for improvements. Business methods for selecting a contractor are presented.

(IS-2009-16) The Economics of LEED for Existing Buildings for Individual Buildings 2008 Edition
This 2008 annual white paper from the non-profit Leonardo Academy examines the cost of implementing LEED in an existing building and the cost of operating the building. LEED is the Leadership in Energy and Environmental Design Green Building Rating System. Data are based on 13 respondents. Total costs were about $1.50 to $2.00 per square foot for LEED certification. For most buildings surveyed the operating costs were lower than the average, per statistics of BOMA (Building Owners and Managers Association).

(IS-2009-15) How to Assess the Carbon Footprint of Goods and Services
This is a summary of a publicly available specification from the British Standards Institution (BSI) for determining the carbon footprint in a supply chain. The carbon footprint is a measure of greenhouse gas emissions. The specification, PAS 2050, provides guidance to companies and tools for calculating emission and "prioritising opportunities to reduce emissions." A process for selecting a product to evaluate and performing the carbon footprint evaluation is presented. This may include consideration of raw materials, manufacturing, distribution, sales, customer user, and disposal. Methods for calculating and reducing the carbon footprint are presented for a hotel and a food producer.

(IS-2009-14) Specification for the Assessment of the Life Cycle Greenhouse Gas Emissions of Goods and Services
This report from the British Standards Institution summarizes PAS 2050 (Publicly Available Specification). PAS 2050 defines a method for assessing the life cycle greenhouse gas (GHG) emission of goods and services. Measurement techniques for GHGs are presented. GHG offsets are not to be included. A consistent method for

considering the life cycle of products from raw materials to disposal in considered. Procedures for claiming conformance with this PAS are described.

(IS-2009-13) CB Richard Ellis Conference Report
This report from the non-profit Leonardo Academy describes the Cleaner and Green® program for evaluating greenhouse gas (GHG) emission. Offsets to the GHG emissions from holding the 2007 CB Richard Ellis Conference in Toronto are described. The largest source of GHGs was travel, which was partially offset by renewable energy certificates purchased from Community Energy. Renewable Energy Credits fund renewable energy projects that reduce fossil fuel emissions.

(IS-2009-12) The 2007 Leonardo Academy Sustainability Survey Report
This 2007 report from the non-profit Leonardo Academy surveyed 408 commercial, non-profit, and governmental organizations in North America and Asia about sustainability. Sustainability is important for 90% of the respondents; 45% were developing a sustainability plan. Most do not track their emissions, but plan to and almost half are offsetting greenhouse gases. Only 10% own LEED-certified buildings, but more than half plan to retrofit to LEED standards within a decade. More than 60% are using sustainability standards in procurement.

(IS-2009-11) Bright Green Buildings: Convergence of Green and Intelligent Buildings
The Continental Automated Buildings Association has released of a comprehensive report on "bright" green buildings. "Bright" green buildings leverage intelligent technologies to support environmental sustainability while providing a significant return on investment (ROI). The report features several real-world examples that show how property companies around the world have employed advances in green building and networking technologies to increase profits, lower costs, and help the environment.

(IS-2009-10) State of the Connected Home Market Study
In one of the more striking examples of cross-industry collaboration, 10 top companies – Whirlpool Corporation, Bell Canada, Cisco Systems, Direct Energy, Hewlett-Packard Company, Leviton, Microsoft, Procter & Gamble, Legrand and Zensys/Z-Wave teamed up to conduct one of the most in-depth studies ever launched into the state of the connected home. Consumers were most interested in an easy, seamless way to integrate all their smart home devices from mobile to TV to appliance. This research is a follow up to the previous State of the Connected Home studies that were completed in 2003 and 2005 by CABA's Connected Home Research Council.

(IS-2009-09) Green Building Impact Report 2008
This report from Greener World Media assess the impact of U.S. Green Building Council LEED (Leadership in Energy and Environmental Design) Green Building Rating System. The impact on land, water, energy, material, and indoor environment is considered.   LEED is impacting about 5% of the new construction building market with another 30% starting the registration process for LEED certification. LEED buildings consume about 25% less energy than non-LEED buildings. However, the expansion of building floor area is leading to a net increase in energy consumption. LEED is hoping for a zero increase by 2015 or 2020.

(IS-2009-08) Ontario's Chief Energy Conservation Officer Annual Report 2008
This report from the government of Ontario outlines a strategy for encouraging energy conservation. Topics include energy conservation in government buildings and encouragement for conservation in private buildings and multi-family residential buildings. Electricity billing to individual tenants is recommended. The goal is to reduce the electricity peak in Ontario by 6300 MW by the end of 2025. Opportunities for leadership in energy conservation by the government are discussed. Conservation projects throughout the province are presented.

(IS-2009-07) Building Information Modeling
This report from McGraw Hill Construction is a market survey of the acceptance and use of Building Information Modeling (BIM). The survey was conducted among 23 construction industry organizations including the U.S. Army Core of Engineers. BIM is being adopted from the bottom-up in the construction industry. 62% said they will be using BIM in 30% of projects in 2009. The benefits of BIM include coordination of software and project personnel and improved productivity, communication, and quality control. More training, management acceptance, and lower costs are needed. BIM is defined as "The process of creating and using digital models for design, construction and/or operations of projects." BIM can impact green buildings. Numerous case studies are included.

(IS-2009-06) Game Consoles and the Emerging Over-the-Top Video Opportunity
This report from The Diffusion Group examines developments enabling delivery of services that compete with Pay TV. Some require dedicated set-top box equipment. Some may be built into televisions. Some may be combined other equipment such as TiVo or the Xbox360 gaming console. Another possible solution links the PC with the TV via an adapter. This report examines how incumbent Pay TV providers can compete with video delivery via broadband Internet.

(IS-2009-05) e-Government and e-Participation

This report from the European Union examines the impact of information and communications technology on the operation of government and the delivery of services. The goals are to improve government effectiveness, efficiency, transparency, and democracy. E-Government is hoped to bring government services to the isolated, the poor, long-term unemployed, the elderly, and people with disabilities. Examples across Europe are presented.

(IS-2009-04) Improving America's Hospitals

This report from the Joint Commission, a not-for-profit organization that accredits hospitals, assesses the improvements in patient care from 2002 to 2008. It shows improved care for heart attack, heart failure, and pneumonia patients. Compliance by hospitals with Joint Commission quality guidelines is reviewed. The report notes significant variations in hospital quality. Details and methodology are presented.

(IS-2009-03) Big Trouble with No Trouble Found: How Consumer Electronics Firms Confront the High Cost of Customer Returns

This report from Accenture analyzes the growing phenomenon of consumers returning technology products that they think are broken but actually work (about 2/3 of returned consumer electronics). Returns cost manufacturers 5-6% of sales and cost retailers 2-3% of sales. The cost breakdown of returns is 29% for warranty repairs and 20% for processing products with no problems. The remaining major cost is 33% for scrapping the product. This report discusses improved customer education and more efficient processing of "No Trouble Found" products. Consumers will devote an average to 20 minutes to getting a product to work. A "set-up concierge" is proposed to help customers with installation problems. Also, built-in remote diagnostics and customer-assistance are recommended.

(IS-2009-02) Low Carbon, High Growth: Latin American Responses to Climate Change

This report from World Bank examines how Latin America can reduce carbon output even during an economic slump with falling oil prices. Climate change is already affecting temperatures, rainfall, and sea levels of Latin America. The net effects have been negative. The impacts on the various countries are presented. Policies for growth with low carbon output are discussed.

(IS-2009-01) 10 Best Practices for Online Merchandising

This brochure describes how to create an effective web site for retail merchandising. Two techniques are described: user navigation and user search. About half of shoppers prefer to navigate through a site, while half

prefer to search for a particular product. A search technique needs to help customers who do not provide enough specificity so they can locate the desired product. If a search fails, alternate products should be offered. Merchandizing zone techniques on a Web site are discussed for moving selected products, product lines, products with high inventory, or products with high margins.

(IS-2008-154) Mobile Broadband in North America and Europe; Change is Key to Continuing Profitability
According to Parks Associates accessing broadband Internet via mobile devices is growing very fast in Europe and North America. The average monthly bill is $37. This provides business opportunities for telecom companies and consumer electronics makers of cell phones, netbooks (small dedicated laptops), and media players (such as mobile TV). Most applications started with texting and some web surfing, and are moving toward streaming video, music, and games. Carriers tend to price by bandwidth offered. Typically, a mobile phone uses less bandwidth than a mobile PC netbook. High charges for bandwidth and for total data transferred can limit growth. Parks recommends more refined pricing policies.

(IS-2008-153) e-Health Opportunities for Global Service Providers
Parks Associates looks at the need to shift health care from acute to preventive care to deal with the growing elderly population. This paper explore how telephone and Internet companies can participate in offering e-health services as a revenue supplement to selling broadband access. Selling health care services requires the companies to understand the health care industry and to develop a more personalized relationship with customers. Examples are provided. Remote health monitoring will be used by 7.2 million customers in North America and Europe by 2012 (500,000 in 2008).

(IS-2008-152) Virtual Worlds and Social Media
This Parks Associates paper introduced virtual worlds, a computer simulation environment where users are represented by avatars that interact with each other. The most popular application is in gaming, where 10% of teenagers pay in virtual worlds. As these youths move to adulthood, will they expect virtual worlds in Internet communications, social networks, and e-commerce? Virtual world developers are exploring interoperability among virtual worlds. Virtual world does not have much presence in the adult world because "virtual world has yet to find the best intersection between entertainment, socialization, and community features."

(IS-2008-151) No Way to Regulate: Mobile TV in Europe
This report from Parks Associates considers the pros and cons of public regulation of radio spectrum technology. It notes the success of GSM as a unified cell network mandated in Europe, while explaining the challenges of a

uniform 3G (cellular data network) and DVB-H (TV to cell phones and PDAs). DVB-H is termed a mistake because of the difficulty of offering roaming services with broadcasts in the user's language.

(IS-2008-150) Know Thy Customer: Customer Analytics to Drive Value-added Services
This paper from Parks Associates examines value-added services that Internet service providers (ISPs) might offer to enhance revenue beyond delivering broadband access. Some companies offer trouble-shooting, but miss the opportunity to sell other services while fixing a PC. Serving a home network is a growing business area. Parks proposes custom analytics: a database to help ISP customer service sell additional services based on individual customer needs to enhance revenue, reduce churn, and reduce costs. An example of how this can be done is presented from HiWired, a company that provides support for the digital home. Parks recommends "holistic digital home support."

(IS-2008-149) 2008 Wireless Attitudes Study
This market study by the Canadian Wireless Telecommunications Association surveyed adults and teenagers to determine wireless usage in Canada. 72% of Canadian household (highest in Alberta) have cell phones in 2008; 6% use cell phones exclusively at home, while 19% are considering this change. The highest penetration of cell phones is in the age range of 18-34. Applications of cell phone are 61% for personal and 27% for business with more business use among those over 34. Cell phones rank third in importance after computers and Internet access. The most popular cell phone feature was text messaging followed by picture taking. Only 4% download music to the cell phone. The cell phone is not considered a replacement for an MP3 player. Digital camera, or video camera by more than 90% of respondents.

(IS-2008-148) Sustainability Report 2007
This report from the U.S. Army details progress in the Army Strategy for the Environment (ASE). Performance environmental data from 2004-2007 are presented. The Army seeks to lower the impact of operation on the environment and the community. About $1.5 billion was spent in 2007 on environmental funding. Summaries of various programs are provided in areas such as recycling, hazardous waste, toxic release, compliance with LEED, management of energy and water usage, energy star-compliant HVAC equipment, and fuel cells.

(IS-2008-147) Network Technology Integration Drives Business Success
This brochure from Cisco Systems explains the advantages of integrating data, voice (VoIP – Voice over Internet), and wireless services on one network. An advantage of an integrated solution is the ability to control the Quality of Service and multi-level security. The paper discusses unified WiFi and cellular service.

(IS-2008-146) When Worlds Collide: The Convergence of Physical and Logical Security
This is an introductory document from Honeywell about the motivation to integrate security for physical access and data access. The paper discusses a mandate by the U.S. government for identification verification. Spend in the area is expected to increase from about $700 million in 2005 to $7 billion in 2008. A suggested listed of actions for integrating physical and data security is provided.

(IS-2008-145) Green Recovery: A Program to Create Good Jobs and Start Building a Low-Carbon Economy
This report from the University of Massachusetts proposes government research programs to investigate a "low carbon economy" while stimulating job growth. The proposal calls for an investment of $100 million in retrofitting buildings to improve energy efficiency, expanding mass transit and freight rail, constructing "smart" electrical grid transmission systems, wind power, solar power, and next-generation biofuels. These research grants would be supplemented with federally guaranteed loans for private-sector investments in energy efficiency and renewable energy. About two million jobs would be created and imports for household expenditures would be reduced about 60 per cent.

(IS-2008-144) Carbon Disclosure Project 2008 - Canada 200
This report from the Conference Board of Canada discusses a survey of company actions regarding climate change risks and opportunities, greenhouse gas accounting, and greenhouse gas management strategies. Information was gathered from 55 per cent of the 200 Canadian companies surveyed. More than 80 per cent see climate change as a risk. The future cost of carbon emissions is being factored into capital expenditures by 44 per cent of respondents. This was part of a worldwide survey of 3000 companies with responses from 1550 companies. Survey details from Canadian companies are included.

(IS-2008-142) Towards Carbon Neutral Industrial Facilities
In March 2008, leaders from Eaton Corporation, CABA and Carnegie Mellon's Center for Building Performance and Diagnostics conducted a visioning workshop to explore approaches to carbon reduction for manufacturing facilities. The workshop resulted in a research report outlining a number of recommendations as critical to achieving carbon reductions and ultimately carbon neutrality for the manufacturing sector.

(IS-2008-141) 311: The Next Wave
This report from Harvard University explores a telecommunications method for government agencies to communicate with citizens. "311" is a telephone exchange reserved nationwide for non-emergency calls to the

government. It can become a single portal for citizens to access government services. Possible benefits and problems with the 311 system are discussed. A key issue is proper training at the 311 call-center.

(IS-2008-140) Net-Zero Energy, High-Performance Green Buildings
This report from the U.S. National Science and Technology Council described plans for Federal R&D into efficient buildings that on average consume no power. This R&D effort was mandated by Congress in energy laws passed in 2005 and 2007. Current technologies can reduce energy consumption in buildings by 30-50%. Commercial buildings consume about 40% of national energy and account for 40% of green house gasses. Also addressed are occupant health and indoor environmental quality. Methods for disseminating research results to industry are presented.

(IS-2008-139) National Water Program Strategy: Response to Climate Change
This report from the U.S. Environmental Protection Agency (EPA) describes the impact of climate change on water resources and possible reactions. Climate change may bring warming air and water, change in location and amount of rain and snow, increased storm intensity, sea level rise; and changes in ocean characteristics. The EPA is pursuing mitigation, adaptation, and research. The EPA has established five strategic goals to address these issues: Water Program Mitigation of Greenhouse Gases, Water Program Adaptation to Climate Change, Climate Change Research Related to Water, Water Program Education on Climate Change, and Water Program Management of Climate Change.

(IS-2008-138) The Smart Grid: An Introduction
This report from the U.S. Department of Energy introduces the concept of the Smart Grid for electricity. The Smart Grid in intended to transform the electric grid on a scale comparable to the change wrought by the interstate highways and the Internet. In additional to reliability, grid issues include energy efficiency, environmental impact, and customer choice. The Smart Grid is a two-way flow of electricity and information. Two-way electricity accommodates locally generated power such as wind and photovoltaics. Characteristics of a Smart Grid include intelligent, efficient, accommodating, motivating, opportunistic, quality-focused, resilient, and "green." Examples of Smart Grid projects are presented.

(IS-2008-137) Annual Report on U.S. Wind Power Installation, Cost, and Performance; Trends: 2007
This paper by the U.S. Environmental Protection Agency is an annual report on developments and trend in the U.S. wind power market covering 2007. The U.S. added more that 5000 MW of wind power bringing the total to almost 17,000 MW, the largest increase in the world. (Total world increase was 20,000 MW.) About 14% of wind generators are on the electric grid. At this rate of increase, 35% of power would come from wind by 2035. The

largest number of new wind generators was installed in Texas. Xcel Energy has the largest wind capacity, while Minnikota Power Cooperative (Minnesota and North Dakota) sells 11% of total power output from wind. GE Wind is the largest U.S. turbine maker.

(IS-2008-136) Windvision 2025: Summary

This paper is a summary version of the Windvision 2025 Backgrounder on Wind Energy report. This paper by the Canadian Wind Energy Association describes wind projects planned in Canada through 2025.

(IS-2008-135) Windvision 2025: Backgrounder on Wind Energy

This paper by the Canadian Wind Energy Association describes wind projects planned in Canada through 2025. Wind power worldwide accounted for 94,000 MW in 2007 and is expect to reach 500,000 MW by 2020 with a global investment of $1 trillion. Canada generated about 1900 MW in 2008. The largest generating country is Denmark and the fastest growing country is the U.S. Wind generation costs will become favorable as the price of oil increases and carbon emissions are charged. The Canadian Wind Energy Association has set a target of 20% power from wind generation by 2025 (the current level in Denmark). This will require 22,000 wind turbines in 450 locations generating 55,000 MW and an investment of $132 billion employing 52,000.

(IS-2008-134) Optimizing Users And Applications In A Mobile World

This paper by Forrester Research surveyed 300 IT manager worldwide to study the challenges of servicing distributed and mobile employees with communications and access to applications. The challenges are growing as companies open branch offices, use outsourcing, and employees choose mobile communications over wired links. Network solutions include virtual private networks (access to company servers), wide-area-network optimization (improved throughput and decreased latency), and virtualization technology (customized PC interfaces according to applications needed).

(IS-2008-133) Energy Performance of LEED for New Construction Buildings

This report by the New Buildings Initiative compared expected and actual energy performance of 121 LEED-certified newly constructed buildings. These buildings used about 24% less energy compared to the national average. The Energy Star ratings of these buildings were better that 68% of buildings. The methodology for these measurements is explained in detail.

(IS-2008-132) Carbon Free Prosperity 2025

This report by Clean Edge, Inc. and Climate Solutions examines how business in Oregon and Washington state can prosper in a global clean-technology marketplace. The technologies with the greatest potential impact are

solar photovoltaic manufacturing, green building design services, wind power development, sustainable bio-energy, and smart grid technologies. A 10-point action plan to accomplish this goal is described. The number one point is to put a price on carbon. 50 leading stakeholders were interviewed for this survey. 75% carbon-free electricity is expected to be generated by 2025. The challenges of raising capital compared to Silicon Valley and Boston are discussed.

(IS-2008-131) Forging a Frontier: State of the Voluntary Carbon Markets 2008
While public policy on cap-and-trade for carbon is being debated, some companies have voluntarily started trading carbon emissions. This report by New Carbon Finance tracks trading in 2007 via the OTC (over-the-counter) market, consisting mostly of bilateral deals. The world market for carbon trading doubled in one year to $64 million in 2007. Offset credits to carbon reduction included renewable energy, energy efficiency, methane destruction, and forestry land projects. The credit per ton of carbon increased by about 50% from 2006 to 2007. Europe bought 47% of carbon credits, while North America bought 34% worldwide. Data were gathered from OTC records and surveys of 150 suppliers.

(IS-2008-130) A Review of Canada's Offset System for Greenhouse Gas Emissions
This paper by Turner Lane Development Corporation describes plans by the Canadian government for encouraging reductions in green house gas emissions. The methodology for quantifying green house gas reductions and assigning a value is described. Until a cap-and-trade system is established in Canada, the government will buy the offset credits earned by companies for reducing green house gas emissions. This will enable Canada to comply with the Kyoto Protocol to reduce emissions between 2008 and 2012 to 1990 levels.

(IS-2008-129) Climate change – a business revolution?
The U.K government provided funding for the Carbon Trust, an independent company. The Carbon Trust surveyed the following industries to determine the potential impact of a low carbon economy: aluminum, automotive, beer, building insulation, consumer electronics, and oil and gas. If climate change initiatives were enacted, some companies would increase value by up to 80%, while others would decrease value by as much as 65%. Much depends on the timing and severity of the initiatives to reduce carbon emissions. Company value is determined by regulations, consumer behavior, innovations, and the cost attributed to carbon. The methodology for deriving impact estimates is described based on the cost of action versus "business as usual." The building insulation industry could improve 80% depending on building energy performance regulations.

(IS-2008-128) The US Wireless Teen Market
This market survey of cell phone usage among teenagers reports that 84% of 17 year olds have cell phones (91% female; 78% male). These teenagers help teach adults how to use additional features in the phones thereby generating additional revenue for the service provider. Cell phone purchases increase for back-to-school and for holiday gifts.

(IS-2008-127) The Endless Energy Report
This paper by the GLOBE Foundation provides a guide to energy independence in British Columbia, Canada by 2025 primarily by using biomass, hydro, wind, and solar energy. These renewables would be combined with hydrogen and ethanol and increased energy efficiency in homes and buildings. The results would not disrupt daily activities but would create energy and technology exports. The population of British Columbia is expected to increase by 30% by 2025 with a GDP of $190 billion. Details about energy consumption and energy sources are included.

(IS-2008-126) Energy Implications of Economizer Use in California Data Centers
This paper from the University of California explores methods for cooling data centers. Two techniques are compared: a water-side economizer that uses an air-conditioning compressor, and air-side economizer that blows in outside air and does not cool it if it is cooler than the building interior. The air-side economizer is lower cost, but may introduce air pollution that could affect the computers. Data centers were modeled in various locations in California. In all cases air-side economizers offered savings. For example, in San Jose, the saving was $130,000 per year. The cooler the outside air, the larger the savings. Also, savings are possible by accommodating a wider range of humidity.

(IS-2008-125) Wireless Sensor Technology for Data Centers
This paper explains how a data center can reduce energy consumption by using sensors for monitor temperatures throughout the building. The objective is to avoid over-cooling the building by providing sufficient cooling where needed. The Sacramento Municipal Utility District (SMUD) sponsored this investigation. A wireless mesh network of 400 sensors was installed in the SMUD data center. These sensors recorded 1,800,000 measurements during November 2007. Two computer room air-conditioners were identified that could be turned off. The net annual savings projected for SMUD was 13% (300,160 kWh), 22% in reclaimed floor space, and 9% additional energy available for data center growth.

(IS-2008-124) CompTIA Sixth Annual Convergent Technologies Research Study: Discovering Trends and Opportunities in International SMB Markets

CompTIA has conducted a survey of small and medium businesses (10-499 employees) in Canada, Germany, US, and UK to determine the role of communications and information technology (IT). Companies in the following fields were examined: manufacturing, finance, insurance, healthcare, government, and professional services. Challenges regarding communications and IT include cost, integration with existing communications devices, and difficulty to use. One-quarter of these companies have converged voice mail and e-mail systems. 17% had an IT security problem in the previous year. 43% of these firms manage their own communications and IT systems. The average company in the survey spent $40,000 on IT and communications in the preceding year.

(IS-2008-123) BIM and Project Management – Advancing Integrated Project Delivery on Capital Building Programs

A new methodology for building design is presented: Building Information Modeling (BIM). BIM is a three-dimensional representation of the architecture and structure of a building and the systems within it (mechanical, electrical, and plumbing). Project management for building design is being replaced with Infrastructure Lifecycle Management (ILM) that spans planning, building, and operating a building. Business value is increased by the integration of BIM and ILM. BIM drawings accompanying contracts can reduce misunderstandings.

(IS-2008-122) Personal Media Storage

CABA commissioned this study with the Aberdeen Group to better understand the role of portable storage products, most notably memory cards, in achieving a fully networked and connected Internet lifestyle. The report was authored by Aberdeen Group.

(IS-2008-121) Web based Family Calendar User Interface

Web-based calendars provide a way for users to gather information about upcoming personal or business events and present them in calendar form. The main purpose of this project was to identify the relative strengths and weaknesses of three existing Web-based calendars: Yahoo Calendar, Microsoft MSN Calendar, part of MSN 8.0, and SimpleDay prototype calendar. This qualitative research project produced detailed evaluations of these applications and recommendations for developing an ideal product.   The report was authored by Zanthus.

(IS-2008-120) Health & Fitness Needs Assessment

To assess the most salient consumer needs in the health and fitness area that could be addressed by products or services with a Web component, CABA sponsored a Web survey of 643 single-family, owner-occupied

households with Internet access in the U.S. The sample included both primary and mass market consumers. The report was authored by Zanthus.

(IS-2008-119) Home Automation Hub
This report identifies the optimal hub or control point for home automation applications; determines the level of appeal for the home hub concept and for potential applications (temperature control, light control, home security control, appliance service information, and garage door status); and determines preferences for interacting with appliance service information. The report was authored by Zanthus.

(IS-2008-118) Onstar@Home
The pilot team included General Motors, Invensys, Hewlett-Packard, ADT and Panasonic. The member companies jointly designed a prototype solution to be tested in consumer homes. The system was to remotely program and control functions in the home by speaking commands over the phone or on a secure Web site. The project was managed by Zanthus.

(IS-2008-117) Digital Entertainment Migration
The main purpose of this project was to determine the degree to which digital entertainment enthusiasts have an interest in potential non-entertainment features or functions of the connected home. The project was managed by Zanthus.

 (IS-2008-116) 2005 State of the Connected Home Market: Entertainment
(IS-2008-115) 2005 State of the Connected Home Market: Family
(IS-2008-114) 2005 State of the Connected Home Market: Career
For the purposes of market analysis, CABA has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Internet Home Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or ecosystem tracks: Entertainment, Family and Career. The project was managed by Zanthus.

(IS-2008-113) State of the Connected Home Market (With Tables)
(IS-2008-112) State of the Connected Home Market
The connected home is a place where entertainment, heating, lighting and other systems are linked into a central network for ease of control. This idea continues to attract considerable consumer interest, according to the 2005

State of the Connected Home Study. This Web survey of 1,834 online consumers in the U.S. was conducted in September 2005 by Zanthus. According to our research, about one-in-five online consumers considers the connected home concept very appealing, and about one-in-three would consider setting up such a home given a reasonable cost. Three basic prerequisites for the connected home either reached or exceeded mass market peneratration rates in 2005, according to our research. Around a third of all households now have multiple PCs, just under half have broadband Internet access, and nearly one-in-five have a home network. Among online U.S. households, about hald now have multiple PCs and broadband Internet access, and about one-in-four have either a wired or wireless home computer network

(IS-2008-111) Digital Entertainment Needs Assessment
The main purposes of the Digital Entertainment Needs Assessment project was to assess consumers digital entertainment needs at home and in their automobiles, with particular attention paid to potential cross over between the two domains. The research revealed several promising digital entertainment concepts, notably, high-definition radio, the home media server and the mobile music store. The project managed by Zanthus.

(IS-2008-110) Safe, Secure and Comforable Home
Safe, secure, and comfortable, these are words that describe an ideal home. In this research study, the Alliance evaluated a number of home automation concepts designed to deliver on this notion. Participants explored the unifying theme of a home information and control solution that will help home owners by managing and providing information about environment, energy consumption, safety, and security. The project was managed by Zanthus.

(IS-2008-109) Connected Home Roadmap
This primary research report is a segmentation study that determines the consumer profiles of those who buy digital lifestyle products and services. This report assists manufacturers and other vendors that cater directly to end-users to identify resource requirements and potential investment opportunities. The report was prepared for the Continental Automated Buildings Association by Ipsos Reid. The report was sponsored by Bell Canada, Brookfield Homes, Global Inventures, Invensys, Leviton, Microsoft, Motorola, Newland Communities, SaskTel and Trane.

(IS-2008-108) Preparing for the Internet Video Revolution: A Profile of the Internet-Connected Living Room Consumer
This paper by MultiMedia Intelligence predicts the business of Internet delivery of audio/video (A/V) to entertainment A/V devices rather than to PCs. Digital Media Adapters link the Internet to A/V equipment. The players in this new business include content owners, operators, equipment manufacturers and technology

providers. Some equipment will be purchased by the consumer, while some will be rented from the service provider. The fastest growing adopters of home networks are in the age range of 60-69. The initial households to adopt Internet A/V are those with incomes of $100-150k.

(IS-2008-107) The Changing Face of IFE: The Re-launch of In-Flight Broadband
This paper by MultiMedia Intelligence examines customer preferences for airline entertainment and new offerings. Many customers are supplying music and movies via their personal equipment. New airline entertainment technologies are examined that costs less and weights less. Examples include WiFi access for voice, video, and data.

(IS-2008-106) Ethernet Services: WAN options mature
Verizon has compiled a collection of papers that advocates Ethernet for applications outside of local area networks (LANs). Wide area network (WAN) applications include virtual private networks and Provider Backbone Transport for long-distance packet transport. Ethernet is being proposed to replace or to complement MLPS (Multi Protocol Label Switching) for the wide area networks. The net benefits are lower costs to manage and deploy LANs and WANs.

(IS-2008-105) Utility Solar Assessment (USA) Study
Co-op America Foundation has projected that the U.S. generation of solar power could increase from the current 1/10 of 1% to 10% by 2025. The technology would involve a combination of solar photovoltaics (PV) and concentrating solar power (CSP) (typically mirrors that focus the sun rays on a collector). Cost projections show prices competitive with conventional power generation within a decade. Price parity is expected by 2015. To achieve these goals utilities must be involved and must implement a smart grid. Environmental and carbon production issues are motivating solar power. Solar can supply peak demands for power. Stable tax incentives are advocated.

(IS-2008-104) Reducing U.S. Greenhouse Gas Emission: How Much at What cost?
This report from The Conference Board examines options for reducing green house gases by 2030. The U.S. is the largest emitter of these gases, but the growth rate is much lower than in China, Indonesia, and India. 40% of US CEOs thinks that reduction of these gases is very important. The reduction goals are achievable at a "quite low" net cost with possible economic benefits. However, costs will be concentrated in certain sectors such as existing buildings and homes with inefficient heating and cooling, and existing coal power plants. Buildings and homes that implement efficiency improvements in heating and cooling, building-shell designs, and consumer and office electronics will benefit.

(IS-2008-103) TIA Standards and Technology Annual Report, 2007-2008
This is the 2007 annual report of the Telecommunications Industry Association (TIA) focusing of standards development. The TIA writes American National Standards and formulates United States positions for 20 international committees and working groups. Some the domestic areas relevant for home and buildings include modems, faxes, telephone, and VoIP (Internet telephony) [committee name: TR-30]; business telephone systems [TR-41]; cabling in buildings and homes [TR-42]; and fiber optics [FO-4]. International standards include home and building systems and wiring [ISO/IEC JTC1/SC25].

(IS-2008-102) Third Annual Cisco IBSG E-commerce Survey: Mobile Emerges as Growth Channel for Retail
Cisco projects the growth of Internet commerce: 50% increase from 2007 to 2011 in the US (to $300 billion) and 100% increase in Europe (to $400 billion). Some retailers are integrating web shopping with mobile data. 85% of the online population worldwide have shopped online. Suggestions for improving the online shopping experience are presented. Social networks are complementing shopping with product reviews and information.

(IS-2008-101) SMART 2020: Enabling the low carbon economy in the information age
This report from the Global eSustainability Initiative explores how the ICT (Information and Communications Technology) sector can contribute toward the reduction of greenhouse gases. ICT accounted for about 2% of total greenhouse gases as of 2007. The goal is to reduce carbon dioxide emissions 15% by 2020, rather than triple emissions if business continued as usual. Costs savings are expect to reach almost one trillion dollars. The largest opportunities for savings are in smart motors, smart logistics (delivery of fuel, electricity, and heat), smart buildings, and smart grids. The concept of SMART transformation is introduced: Standardize, Monitor, Account, Rethink, and Transform. For example, half the energy for data centers is used for backups, uninterruptible power supplies, and cooling. Tele- and videoconferences could replace 5-20% of business travel.

(IS-2008-100) Choosing Data Loggers For Green Building Projects
This report from Onset Computer Corporation explains the function and benefits of data loggers. These are devices that are installed in buildings or houses to measure parameters such as temperature, light level, electricity, or solar radiation. Applications include adjusting heating, cooling, and solar panels. The factors that determine the performance of data loggers are discussed. Aggregation of data from multiple loggers via the Internet is possible.

(IS-2008-99) High Performance Buildings
This report from the National Institute of Building Sciences to the U.S. Congress summarizes high performance buildings that conserve energy while improving environmental impact, functionality, human comfort, and productivity. The High Performance Building Council was formed in April 2007 to assess the state of knowledge in building performance and constraints imposed by design and performance standards. This study emphasizes the building life cycle that spans "design, construction, operation, occupancy, repair, usability, extendibility, and retirement." Indoor air quality, energy conservation, accessibility, enhancing worker productivity, historic preservation, and aesthetics were identified as important goals. Recommendations are provided.

(IS-2008-98) The Chief Customer/Experience Officer Playbook
Forrester Research has conducted a survey among managers of customer service to determine elements of success. Chief Customer/Experience Officers (CC/EO) from eight companies were interviewed. CC/COs need a plan and need to promote customer-centric approaches. Parts of the company without direct customer contact can effect the customer experience. Forrester recommends establishing a working team and an executive steering committee, establishing metrics for measuring the customer experience, getting feedback from customers, maintaining enthusiasm in the organization to include the customer experience, and improving the plan.

(IS-2008-97) The Increasingly Important Impact of Wireless Broadband Technology and Services on the U.S. Economy
This paper by CTIA-The Wireless Association is an economic summary of the impact on business of wireless telecommunications. By 2005, the productivity value of wireless was greater than the value of the pharmaceutical industry. The healthcare and small business sectors have benefited the most from wireless. Most of the healthcare savings will come from direct input of data via a wireless phone. Technology, computers, and telecommunications have helped the US exceed Europe and Japan in labor productivity. This should generate $860 billion additional GDP by 2016. During this time fame broadband wireless use will grow from 25% of users to 83%. Applications of "mobile telematics" like wireless automatic meter reading are discussed. The states of California, Florida, Illinois, New York, and Texas will benefit the most.

(IS-2008-96) Network Technology Integration Drives Business Success
This document provides an overview of products sold by Cisco Systems for switching and routing, voice signaling, and call processing. The features offered by Cisco for security, implementation of quality-of-service, voice-over-IP telephony, and unified WiFi/cellular phones are discussed. A roadmap for selecting Cisco product is presented.

(IS-2008-95) Carbon Down, Profits Up - Third Edition
This report by the Climate Group surveys corporate and government plans for reductions of greenhouse gas emissions. Organizations are starting to respond to reduction goals as business challenges and opportunities, rather than simply as compliance with mandates. Even though there are costs involved, there is a potential net financial benefit. For example, DuPont saved about $4 billion from 1994 through 2005 by introducing energy efficiencies and reducing CO_2 emissions by 32%. Seattle City Light achieved net zero green house gas emissions through conservation and renewables to power all new loads.

(IS-2008-94) A Smarter Way to Mind the Store: IP-Surveillance
This paper from Axis Communications advocates the benefits of IP-based video surveillance for retailers. Systems can be installed that automatically identify suspicious customer or salesperson behavior. Also, the system could monitor traffic flow and congestion at cash registers. Digital cameras offer higher resolution than analog and may operate from power deliver via the data cable using Power over Ethernet technology.

(IS-2008-93) Internet of Things in 2020
The European Commission and the European Technology Platform on smart Systems Integration (EPoSS) report on a workshop on the Internet connectivity of devices anticipated over the next 20 years. IPv6 is expected to offer unique addresses for devices (not precisely defined). These devices will need to "harvest energy" in order to operate, will need to process data, and will need to communicate. Also, these devices will need to be integrated into packages and will need to interoperate. Challenges include governance, privacy, and security. Applications include retail, drugs, food, health, intelligent homes, and transportation.

(IS-2008-92) The ARTEMIS JU Annual Work Programme 2008
ARTEMIS (Advanced Research and Technology for Embedded Intelligence and Systems) is the European Technology Platform for Embedded Computing Systems. This paper reports on the first annual ARTEMIS Joint Undertaking (JU) Work Programme for 2008. The objective is to develop reference designs and architectures, seamless connectivity and middleware, and design methods and tools for embedded systems in industrial systems, nomadic environments, private spaces, and public infrastructure. Applications include transportation, process control, public utilities, medical applications, and energy. ARTEMIS seeks cost reductions of 15% by 2013 while complexity increases 25%. Proposals for funding are solicited.

(IS-2008-91) Expert Group on Services in the Future Internet Consultation Meeting, Brussels 12th November 2007
This 2006 report by the European Commission examines the projected growth of Internet services by 2011. Web based services will grow at 28% per year. These services will span government, business, and consumer applications. Also, users will produce services in a Web 2.0 environment. Eventually, the Internet will become an Internet of Things (IoT) interconnecting sensors and actuators. Trends include wireless access, always-on access, real-time services such as telephony, a simplified user experience, and machine-to-machine interactions.

(IS-2008-90) Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action
This report from the Quality Urban Energy Systems of Tomorrow in Canada describes how the energy industry will help achieve a 60% reduction in green house gases by 2050. The goal is make Canada "a world leader in urban integrated energy systems." Examples include district energy and small-scale urban energy systems. Urban energy consumption for homes, building, and industry account for half of the energy used. Examples are presented. Market-based pricing of carbon is proposed.

(IS-2008-89) Intelligent Middleware
This study by Forrester Research and Richards|Zeta Building Intelligence, Inc. explores middleware as a method for achieving integration among building automation subsystems. Many building automation systems include some proprietary elements. This report studies the possibility of interconnecting legacy subsystem with middleware software for integration at a high level, taking advantage of IP-based enterprise systems and web-based services. Examples are presented.

(IS-2008-88) Green Building in North America: Opportunities and Challenges
In this report, the Secretariat of the Commission for Environmental Cooperation (CEC) recommends that North American leaders make green building a foundational driver for environmental, social, and economic improvement in Canada, Mexico, and the United States.

(IS-2008-87) Super Buyers: The Key Broadband Segment Buying CE Products
Parks Associates explored the market for consumer products by surveying 2500 buyers. One quarter of the buyers accounted for 80% of all consumer electronics purchased in past year, spending more than $2000 each. These are called Super Buyers. Super Buyers are not defined by wealth, but by a positive attitude toward consumer electronics. They prefer shopping at specialty stores.

(IS-2008-86) Introduction to Commercial Building Control Strategies and Techniques for Demand Response
Lawrence Berkeley National Laboratory reports on field tests of demand response in 28 non-residential buildings. Most of the buildings were located in California and the rest in New York. Demand response was applied to heating/cooling and lighting. The report concluded with recommendations for tests in other climates. Also, a gradual return to full operation after a demand-response shift is advised to avoid sudden load increases.

(IS-2008-85) Estimating Demand Response Load Impacts: Evaluation of Baseline Load Models for Non-Residential Buildings in California
Lawrence Berkeley National Laboratory developed statistical models for calculating the baseline electric load of commercial buildings to assess the impact of demand response programs. The models are based on previous-days averages and on predictions based on weather forecasts. The accuracy of these models is reviewed. Models were tested at 32 sites in California. Results are presented.

(IS-2008-84) Demand Responsive Lighting: A Scoping Study
Lawrence Berkeley National Laboratory has studied methods of managing the demand for electricity used for commercial building lighting, which totals 30GWh per year in California. Lighting accounts for 30-33% of the peak commercial electric load. There are opportunities to cut the peak demand with bi-level lighting (required in California) and control systems tied to occupancy sensors and dimmable ballasts. Light reduction has less of an impact on occupant comfort than heating/cooling reduction. Strategies and example of managing energy consumption for lighting are described.

(IS-2008-83) Architecture Concepts and Technical Issues for an Open, Interoperable Automated Demand Response Infrastructure
This report from Lawrence Berkeley National Laboratory explains the Demand Response Automation Server (DRAS) used for managing customer energy consumption. It explains how DRAS supports automated utility/customer interactions for DR bidding, automated event handing, and real-time pricing. DR bidding allows customers to notify utilities how much load they are able to shed when necessary. Auto-DR operates without human intervention as the utility interacts with the home or building. Such operations may control lighting, heating/cooling, and non-critical equipment with the option for the user to opt out. The architecture of such a system is described.

(IS-2008-82) Ethernet Provides the Solution for Broadband Subscriber Access

This paper by the Ethernet Alliance explains how the Ethernet local area network protocol is being applied to the wide area network linking homes and building to a central office or "point of presence" (connection to the Internet). This avoids the cost and inefficiency of converting to other wide area network communications protocols. Methods for carrying Ethernet packets via a fiber optics network are presented.

(IS-2008-81) Quantifying Sustainability: A Study of Three Sustainable Building Rating Systems and the AIA Position Statement
The AIA (American Institute of Architects) has reviewed three rating systems for green buildings: Green Globes for New Construction, LEED for New Construction and Major Renovations version 2.2, and SBTool 07. These rating systems score sustainability features in building design and construction. The three are compared, but not rated by the AIA. Green Globes was developed by the Green Building Initiative using ANSI protocols. LEED was developed by the U.S. Green Building Council. The International Initiative for a Sustainable Built Environment (iiSBE) created SBTool 07 to assess building performance. An overview of each system is provided.

(IS-2008-80) The Ethernet Ecosystem
The Ethernet Alliance, a trade organization, has written this paper to provide a brief history of Ethernet. The Ethernet local area network was invented by Bob Metcalf at Xerox in 1973 and originally operated at 2.94 Mbps. Ethernet applications are expanding to home entertainment networks. Some wide area and metropolitan area networks are now based on Ethernet. Interfaces are being developed between Ethernet, wireless network., and fiber optics networks.

(IS-2008-79) IBM Sensor and Actuator Solutions
This IBM paper explains the expanding roles of sensors and actuators to provide industrial and product services. Applications include retailing, supply-chain management, and product adjustment to market demands. RFID sensor applications are discussed.

(IS-2008-78) Secure Router Virtualization: Critical Solutions for Optimizing IP/MPLS Network Convergence
This Yankee Group paper explains a technology that allows efficient Internet routing of packets representing disparate services. A technique called Multi-Protocol Label Switching (MPLS) accommodates packet with various service requirements (IPTV, virtual private networks, public Internet packets) in a consolidated IP core using secure router virtualization (SRV). SRV can lead to reductions in cost and capital, and improvements in operational efficiency. The hardware and software requirements to accomplish SRV are discussed.

(IS-2008-77) Moving electronics companies from global to globally integrated
IBM reports on how the company has adapted to a global market with reduced national barriers and increased competition from all parts of the world. Five of the leading electronics brands generate 85% of their revenues outside their home countries. IBM has proposed the Globally Integrated Enterprise that does not function as a collection of country-based subsidiaries. IBM emphasizes collaboration by stating, "becoming a globally integrated company is as much about the global sourcing of ideas as it is about the sourcing of labor." Management of this enterprise is based on open collaboration rather than top-down control.

(IS-2008-76) Telecom switches emphasis
IBM surveyed 252 executives from telecommunications companies around the world to assess business changes. Some are changing business models to emphasize service subscription and collaboration with external partners. Along with delivering video and content, these companies are seeking increased ad revenues. The majority of executives expects to partner with companies such as Yahoo and Google. Most revenue is still derived from voice and broadband access.

(IS-2008-75) Technology Meets Medicine: Business Models and Distribution Strategies
Parks Associates reports on the state of technology to promote health outside of a clinical setting. Large hardware, software, and communications companies are investing in heath care technology. Congress is authorizing reimbursement for remote monitoring. Customers for health monitoring are expected to grow from 800,000 in 2008 to 5.3 million in 2012, generating revenues of almost $2.5 billion.

(IS-2008-74) IP Video's Time Has Come
This report by Video Furnace explains possible applications of Internet TV that benefit enterprises. Examples include digital signage, corporate training, and event broadcasting. The business advantages of IP video are summarized.

(IS-2008-73) Enabling the New World of Pay-TV
This report by Verimatrix summarizes the need of pay-TV companies for data security as video is delivered to customers. Content security is described as 3-dimensional: multiple networks, multiple screens, and multiple layers of protection. Users want access to pay-TV on a variety of players (PC, TV, mobile) with a single purchase. The writer advocates for an IP-centric security system where decryption keys may be delivered for each viewing.

(IS-2008-72) Delivering Secure IP Video
This paper by Video Furnace discusses security vulnerabilities of various software media players and browsers when running IP video. The problem is that media players access operating-system resources and run scripts. A solution is to have the server download with permission of the users a specialized viewer on the client.

(IS-2008-71) Open IPTV Forum Whitepaper
The Open IPTV Forum wrote this introduction to Internet Protocol Television (IPTV). IPTV can be integrated with other media such as text and may be viewed on a variety of fixed and mobile displays. About 55 million IPTV subscribers are estimated by 2010 and will spend $2.8 billion for equipment. The Open IPTV Forum is writing interoperability specifications due by mid-2008. IPTV may be offered by a service provider on a managed network or via the open Internet.

(IS-2008-70) IPTV/VOD: The Open 4th Platform
This 225-page book is a collection of more that 20 papers by Alexander Cameron expressing his views of a worldwide television network using Internet TV (IPTV). Among these papers are an introduction to IPTV, IPTV applications and services, regulations, content, problems, and net neutrality. He paints a picture of the future with home automation and 5000 TV stations where IPTV is dominant in 10 years. IPTV is encoded using the MPEG-4 protocol that carries standard definition TV in 1-4 Mbps and high definition TV in 6-10 Mbps. This book is written from a U.K. perspective with lots of discussion about SkyTV, a satellite operator in the U.K.

(IS-2008-69) "Show me the money": Strategies for success in IPTV
PriceWaterhouseCoopers explores the emerging market for IPTV. They maintain that IPTV vendors need to focus on marketing, partnering, and investment in content and advertising. Long-tail content is recommended over premium sports. By 2012, 30% of TV viewing will be on-demand, compared to 5% in 2007. IPTV has two versions: delivery to PC and delivery to TV. Business arrangements and advertising to support IPTV are reviewed. IPTV needs scalable bandwidth for multiple TVs including high definition.

(IS-2008-68) Multimedia Handsets: The World's Most Ubiquitous Entertainment Device
This paper from MultiMedia Intelligence predicts the transformation of mobile phones to multi-media platforms. By 2010, 9 out of 10 mobile phones will include a camera, audio, and video. Additional features include support of games and a USB port for moving content. Handsets are moving toward high quality color with 18 or 24 bits per picture element (pixel) and resolution of at least 320 x 240. Examples of such phones are presented.

(IS-2008-67) Implementing Digital Advertising in Hardware
This paper from MultiMedia Intelligence explains the potential impact of new hardware technology on the delivery of advertising to digital devices containing displays. The technology supports interactivity with consumers, personalized databases, and personalized advertising. Consumers might opt-in to ads in exchange for a TV show. Opportunities for branding a display device and sources of hardware support are discussed. A USB plug-in could add advertising to a device.

(IS-2008-66) The Six Competitive Factors for Hot Spot Success
This paper from MultiMedia Intelligence surveys the availability of WiFi access to the Internet via public hotspots. There were about 180,000 hotspots worldwide by the end of 2007. There is a trend toward consolidation among providers, improvement in quality, location-based advertising, bundling hotspot access with mobile or broadband services, and marketing to consumers, not just to business travelers. WiMAX may pose a market threat to WiFi. A new market may be the support of WiFi phones.

(IS-2008-65) Internet Protocol (IP)-Enabled-Consumer Electronics: Semiconductors, Service Providers and Content Complete the Ecosystem
This paper from MultiMedia Intelligence explores the shift of digital video from personal computers to TVs. Examples of digital video are YouTube and MySpace, and will extend to IPTV (Internet TV). Set-top boxes will provide TVs access to digital video. By 2012 the largest segment of IP-enabled consumer electronics will be Blue-Ray DVD players and recorders. The semiconductor business to support IP-based consumer electronics will be $2.5 billion by 2012. IP content will be delivered predominantly via wired Ethernet and by power line carrier, coaxial cable, and WiFi. Consumer market awareness for digital video is limited now. Sales of 215 million units that support digital video are predicted by 2012.

(IS-2008-64) Advertising Goes Mobile
This paper from MultiMedia Intelligence explores the placement of ads on mobile devices when viewing TV as a way of subsidizing the cost of the mobile TV. A key motivator is the growth of digital video recorders (DVR) and the falling price of cell phone voice services. Mobile revenue is shifting to message and premium content. Half of the $400-billion market for TV, movies, etc. is funded by advertising. Mobile ads would be inserted in 1 to 5-minute intervals or prior to video-on-demand. Ads might be tailored to the time and location of the user.

(IS-2008-63) Advanced Controls for Demand Response and Energy Efficiency in Commercial Buildings - slides
This is a slide presentation of paper from the Lawrence Berkeley Labs paper of the same title, already reviewed.

(IS-2006-62) Advanced Controls and Communications for Demand Response and Energy Efficiency in Commercial Buildings

This paper from Lawrence Berkeley National Laboratory explores the potential of demand response strategies to reduce peak electricity demand from commercial buildings. These buildings account for 45% of the summer peak demand, which is estimated at 330GW nationally. Demand response may include limiting total usage (the demand) and load curtailment. These actions are motivated by time-of-use electricity rates, real time rates, or event notifications. A trial was described that achieved an average of 8% demand shedding with a peak of 56%. Demand response will not be a major driver for new building control systems but should be accommodated.

(IS-2008-61) White Paper on the Exhaust of Electronic Serial Numbers (ESNs) and Migration to Mobile Equipment Identifiers (MEIDs)

All cell phones contain a unique ID called the Electronic Serial Number (32 bits). Since 1997, the allocation of numbers has been managed by the TIA (Telecommunications Industry Association). Since the numbers are likely to be exhausted in 2008, an extended numbering scheme is planned called the Mobile Equipment Identifier (56 bits). Details are provided.

(IS-2008-60) The Promising but Plodding RFID Industry

According to the Security Industry Association (SIA), the growth of the RFID industry will not meet the expectation of investors. Inadequate standards, high costs, low reliability, and reluctance to adopt by end-users are limiting the industry. RFID tags and bar codes will co-exist. The authors maintain that manufacturers need to address privacy concerns about RFID tags and design privacy into the system. Active RFID tags (with batteries) and passive RFID tags are explained.

(IS-2008-59) Cable Component Material Innovations for Stringent Fire Safety and Environmental Compliance Requirements

This paper by David B. Kiddoo of AlphaGary Corporation discusses recent technological advances in the design of wires and cables to make commercial installations more fire resistant. Possible materials include fluoropolymers, PVCs, and halogen-free olefins. The properties of each are described. Conformance with European Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) is presented.

(IS-2008-58) Integrated Energy Systems in Canadian Communities: A Consensus for Urgent Action
This document by the Quality Urban Energy Systems of Tomorrow consortium reports on a conference held in Canada last November to address the 50 per cent of total green house emissions due to homes, building, and transportation. Among the recommendations is pricing carbon appropriately and integrated urban energy systems. Examples of such communities in British Columbia and Ontario are described.

(IS-2008-57) How to improve the Performance of a Mesh Wireless Sensor Network?
This paper introduces the challenge of data communications in a mesh network intended for automatic meter reading (and other applications) and proposes a network architecture. The performance of a mesh network requires range and coverage, robustness to changes and RF interference, scalability, flexible power consumption, and ease of integration, use, and maintenance. A technology called flooding is described whereby a node sends messages to all nodes that can receive them. The timing of transmissions is controlled so not all nodes send at once. The network does not need a router.

(IS-2008-56) Addressing High Density Fiber Management Issues
The technical issues of managing fiber optics cable distribution for home services are discussed in this PennWell article. A particular challenge is terminate each fiber run as the number of homes passed increases. Terminating at the central office or at a dedicated remote facility is discussed.

(IS-2008-55) Are Consumers Ready for Quad-Play?
This report by Compete Inc. analyzes adding cell phone service to the marketing of a bundled package of TV, Internet, and telephone. More than 2500 customers were survey in March and April 2008. 43% of those surveyed are amenable to a package of all four services. 22% have purchased a bundle of services. 56% buy from multiple suppliers. They are willing to buy a bundle from a telephone or a cable company. The company first to market may have an advantage. The provider of high speed Internet has an edge. Consumer drivers are simplicity and price.

(IS-2008-54) Buildings and Climate Change
This report from the United Nations analyzes energy usage in buildings. The goal is to improve the energy efficiency especially in building operations to help achieve the carbon dioxide emission goals of the Kyoto Protocol. Methods for conserving energy in buildings are presented covering the life cycle of a building from the manufacture of the building components to the construction and operation of the building to the ultimate demolition and recycling of the building materials. China, Russia, and the U.S. are the large producers and consumers of energy. Zero-energy buildings that on average consume no energy are discussed.

Recommendations are presented for policies, benchmarking, regulations, economic tools, education, understanding human behavior, public sector applications, and technology transfer.

(IS-2008-53) Refreshed Accessibility Standards and Guidelines in Telecommunications and Electronic and Information Technology

This report for the US Government explores changes that may be needed to the laws that mandate accessibility for information and communications technology equipment. Examples of such equipment include audio and video players, web access, and authoring tools. The report proposes alternative technical approaches to balance against specific standards. Accessibility applies to persons with visual, hearing, physical, speech, cognitive, and other disabilities.

(IS-2008-52) Green Building Research Funding: An Assessment of Current Activity in the United States

This is a survey of funding sources for green building research compiled by the US Green Building Council. The sources for at least one-million-dollar projects include the US Federal government, states, and one professional organization. The topics receiving the largest funding are energy, materials, and resources. The sources and recipients of green building funding from 2002-2006 are included.

(IS-2008-51) A National Green Building Research Agenda

The research agenda of the US Green Building Council is presented. US buildings consume 71% of electricity generated and produce 38% of carbon dioxide emissions and 40% of non-industrial waste. 0.2% of US federal funding is for green buildings. Among the planned research topics are tools to improve building design, operations, and processes; building finances; and metrics to identify further improvements. Other topics include building envelope performance, lighting, HVAC control, materials life cycle assessment, water management, ecological issues, and indoor environment quality.

(IS-2008-50) Energy Performance of LEED® for New Construction Buildings

The study, commissioned by the US Green Building Council correlates the actual energy performance of buildings with expected performance for 121 buildings that were LEED certified. Measurements of energy use per square foot, Energy Star rating, and comparisons to baseline modeling were performed. The LEED buildings used 24 per cent less energy per square foot than the national average. They scored 68 per cent better with Energy Star than similar buildings. However, one-fourth of the LEED buildings were below 50 per cent. There was considerable variation between predicting and measure energy consumption. Details of the study are reported.

IS-2008-49: Slashing the TCO for IVR
This paper by DataMonitor reports on the technology transformation of speech recognition from Interactive Voice Recognition (IVR) to Voice-XML. Voice-XML is based on open standards that are replacing proprietary IVR systems. The costs born by carriers to migrate to IVR are discussed. The total cost of ownership of a Voice-XML system for a carrier with 40 million subscribers is about 41 per cent less than IVR over five years.

IS-2008-48: The Global Opportunities for Digital Health Applications
According to Parks Associates, care of chronic diseases affects 90 million Americans and accounts for two-thirds of healthcare expenditures. Similar corresponding figures apply to Canada and Europe. In-home systems can help with disease management to avoid crises. Telehealth via the Internet will become important. European makers are looking are telehealth via the cell phone. Expenditures on telehealth are "quite limited."

IS-2008-47: Europe: Home Network Update
This report from Parks Associates looks at the growth in home networking in Europe spurred by a competitive telephone marketplace. Telephone operators are offering services to manage home networks and provide services with set-top boxes and DVRs (Digital Video Recorders). Europe is leading the world in home network deployment with 40 million residential gateway predicted by 2012. New broadband services will include voice over Wi-Fi and hand-off between mobile and land-based networks.

IS-2008-46: Key Trends and Outlook for 2008
Parks Associates predicts trends for 2008 in this report issued in November 2007. IP Multimedia System will facilitate bundled services from telephone companies. Movies-on-demand burned onto disks at store kiosk will be introduced. Mobile Internet access will grow. Cable operators will add home networking. Parks predicts higher quality TV on the web with targeted advertising. Other areas discussed include gaming, wireless technologies, networked consumer electronics, media servers (moving into a mass market), ad insertion for TV and web video, in-car entertainment, the need for "digital home advisors," and personal health.

IS-2008-45: TV Services in Europe: Update and Outlook
Parks Associates looks at the competitive market in Europe for video services. Regulators in Europe have provided competitive access to the local telephone lines. Competitors and incumbent telephone companies are offering new services including home networking, on-demand and interactive programming, and mobile entertainment. Digital Terrestrial Television (DTT) is an important market in Europe despite cable, satellite, and telephone companies. Some telephone companies are offering DTT with pay-TV in set-top boxes. Cable

operators serve 36 per cent of the European market with 80 per cent analog transmission. Satellite operators are adding interactive TV by using telephone lines. IPTV (Internet TV) is growing in Europe.

IS-2008-44: Better Living Through Wireless: The Wireless Revolution and U.S. Spectrum Policy

The Consumer Electronics Association (CEA) has written a position paper on public policy to encourage the development of innovative wireless products and services for consumers. CEA argues for 200 MHz in additional spectrum for consumer products (shifted from Federal and low-use commercial allocations) and further deregulation. The paper explains the role of spectrum allocation is fostering the cell phone market. The evolution of cellphone data technologies from 1G up through 4G is summarized, as are applications of wireless technology to networks in the home and beyond.

IS-2008-43: Broadband for all Americans

This survey by the Consumer Electronics Association reports on broadband penetration in the US and the impact on the US economy. About 50 per cent of US households have broadband access to the Internet. The US ranks 15th among countries in broadband deployment with South Korea being number one. Issues discussed include uniform access to all Internet service ("net neutrality") and municipal wireless access. Various services offering are summarized: VoIP (Voice over the Internet), telemedicine, and distance learning.

IS-2008-42: Who Makes What: Telco Home Gateways

This report about the Home Gateway Initiative (HGI) consortium of telephone operators presents a view of the residential gateway. The primary purpose is to translate between a wide area network and a home network. In addition the HGI offers the opportunity to control home network to deliver management services and to control devices for "new services and competitive differentiation." The role and history of the gateway are presented. The gateway might be a platform for service-provider applications, rather than loading such applications onto a home personal computer. The gateway might include a femtocell to relay cell calls into the home and possibly to include home automation and energy management services. The technology to support a gateway is described along with a list of manufacturers.

IS-2008-41: Pay-TV and the American Consumer

About 1,000 persons in the US were surveyed by ABI Research in December 2007 about TV viewing, service providers, technologies, programming, and price sensitivity. About 1/3 have media rooms and seven per cent have media servers. Although most have multiple TVs, advanced set-top boxes for premium services are used with only one TV. Cable providers are very susceptible to churn because customers are ready to switch for a better price. Prices for video services in the $100-150 range are a tipping point. Twenty per cent would like to

move content from a PC to a TV, and 18 per cent want to move content to a portable device. Thirty-one per cent watch TV series online. Twenty-nine per cent have purchased pay-per-view services. However 37 per cent would accept advertising in lieu of paying. Thirty-six per cent engage in time shifting with a DVR (Digital Video Recorder). Forty per cent have HDTV, but of those only 43 per cent subscribe to an HDTV package. IPTV is being incorporated in set-top boxes in Asia and is likely to spread to the US. Forty-two per cent have a home network.

IS-2008-40: Green Building in North America
This report addresses the imperative for green buildings in North America. It was written by the Commission for Environmental Cooperation, a North American Free Trade Agreement agency located in Montreal. In the US green buildings could reduce energy use by 30 per cent, carbon emissions by 35 per cent, water usage up to 50 per cent, and waste cost by up to 90 per cent. The Commission recommends a common vision for green buildings among Canada, Mexico, and the US, targets for adopting green buildings, and strategies for supporting green building efforts. Currently about two per cent of US buildings are green with an expected increase to about five to ten per cent by 2010. Buildings in Canada consume 50 per cent of the natural resources in the country, while US building use 68 per cent of electricity produced compared to 25 per cent in Mexico. Examples of buildings that achieve some of the green goals are shown. Drivers and barriers to achieving green buildings are presented.

IS-2008-39: National Building Information Modeling Standard
This paper introduces the National Building Information Modeling Standard (BIM) from the National Institute of Building Sciences (a non-government organization in the United States). The BIM includes innovative information technologies and business structures to reduce waste and inefficiencies in the building industry. This BIM specifies machine-readable plans for all phases of a building design, construction, operation, and maintenance. BIM is composed of the Information Delivery Manual (IDM) for accessing and presenting the data and the Model View Definition (MVD) for the software interface. A key objective is to provide a uniform interface between vendors and the building managers. The process for creating BIM and planned revisions are presented.

IS-2008-38: How Hollywood can Out-Apple Apple
This paper by Parks Associates examines emerging technologies for distributing video to portable devices such as cell phones and MP3 players. The display technologies currently are inferior to conventional TV and the choice of content is limited. The author presents opportunities for content producers (mostly located in Hollywood) to tie portable video clips to the sale of theater tickets and DVDs. Free video clips will prepare a market for the sale of portable video content.

IS-2008-37: The AirAdvice State of Commercial Buildings Performance Report 2007
This document is an overview of report on building performance. It evaluates the level of comfort offered by a heating, ventilation, and air-conditioning (HVAC) system versus cost based on a study of 300 buildings in 2007. The parameters measured were temperature variation and fluctuation from optimal set point and evidence of over-ventilation. Ninety-six per cent of the buildings examined had at least one parameter out of bounds. Possible energy saving may amount to 10 to 40 per cent of energy costs.

IS-2008-36: Asia-Pacific Partnership on Clean Development and Climate - Amanda Kramer
This presentation was delivered to the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate on March 11, 2008 in Vancouver. The Building and Appliances Task Force addresses greenhouse gas emission in the residential and commercial sectors through improved appliances and buildings. Some of the topics covered include lighting, electric motors, high performance buildings, stand-by power for appliances, and building codes.

IS-2008-35: Asia-Pacific Partnership on Clean Development and Climate - Rob James
This presentation was delivered to the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate on March 11, 2008 in Vancouver. The Partnership, founded in 2005, intends to develop clean technology through voluntary cooperation by government and the private sectors. Members include Australia, China, India, Japan, South Korea, and the USA. The current topics include renewable energy, buildings and appliances, fossil fuels, coal mining, cement, aluminum, steel, and power generation / transmission. This initiative is complementary to the United Nations climate change process. Funding is from the participating governments.

IS-2008-34: Asia-Pacific Partnership on Clean Development and Climate - Buildings and Appliances Task Force
This is a summary document of a meeting held March 11, 2008 in Vancouver by the Buildings and Appliances Task Force of the Asia-Pacific Partnership on Clean Development and Climate. Issues of funding, goals, and projects were discussed. Topics included alignment with industry, moving toward a net-zero-energy building, and participation on the Buildings and Appliances Task Force.

IS-2008-33: EPA Region 8 Headquarters Case Study
This case study by the National Institute of Building Sciences explains the choices made in the design and construction of a new building for the Denver office of the Environmental Protection Agency. The building includes

23 floors in two towers. The developer was required to achieve a minimum LEED Silver level and Energy Star Certification. The design process is explained. The roof accommodates plantings with four-inch deep plastic trays to create a "green roof." Also, 10kW of photovoltaic solar arrays are installed on the roof. A total energy savings of 35 per cent was achieved with efficient mechanical systems, use of free cooling, day-lighting, shading, and under-floor air system.

IS-2008-32: IPD Environment Code

This paper describes an analysis tool called the Environment Code from a company called IPD Occupiers (of London) for measuring the environment impact of a building. It can help achieve code compliance, reduce environmental impact, and allow comparison among properties. The global impact of climate change is estimated at five to 20 per cent of annual global GDP, while the cost of reducing greenhouse gases is about one per cent of annual global GDP. The IPD Code is a template for collection, measurement, and analysis of environmental information. Energy from renewable sources, water, and waste are key sets of quantitative measurements. The measurements are supplemented with qualitative measurements of transportation and travel, equipment and appliances, health and well-being, and adaptation to climate change.

IS-2008-31: Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.

This paper summarizes the procedure used by the American Council for an Energy-Efficient Economy to select programs as outstanding examples of energy efficiency. Ninety such projects were honored. These projects saved 2400 GWh of electricity, reduced peak demand by 400 MW, and saved 125 million therms of gas. The criteria for evaluating programs included energy savings, market transforming effects, quality of evaluation, qualitative assessment, innovation, and transferability.

IS-2008-30: GridWise Interoperability Context Setting Framework

This paper by the GridWise Architecture Council presents a context within which experts can discussion interoperability issues. An interoperability framework describes in high-level terms interactions among automation systems. It establishes a context in which to discuss alternatives. The application discussed is the integration of a utility system from generation to transmission and distribution to customer services. In abstract terms, solutions flow from designs, which flow from architectures, which flow from the framework. This report discusses interfaces between systems that are intended to collaborate. Examples based on residential and commercial electricity energy management are provided.

IS-2008-29: Utility Communications with BACnet Commercial Building for Peak Price Response
This presentation from the National Institute of Standards and Technology illustrates how a building automation system can interoperate with a utility communications network. The goal is to implement energy conservation through a program of demand response. BACnet messages to implement such interoperable communications are discussed.

IS-2008-28: GridWise Interoperability Workshop April 11-12, 2007 Proceedings Summary
This report by the GridWise Architecture Council summarizes a two-day workshop conducted by 45 experts in electric grid interoperability. The participants focused on reactions to a context-setting framework draft document. Improvements to this document were proposed. The technical, informational, and organizational aspects of interoperability were considered. A plan for enhancing the framework was developed. A follow-on Interoperability Symposium was proposed.

IS-2008-27: GridWise Architecture Council: Decision-Maker's Interoperability Checklist Draft Version 1.0
This paper by the GridWise Architecture Council explains the importance of interoperability in the system for generating, transporting, distributing, and using electricity. Distinctions are made among Technical Interoperability (physical and communications connections), Informational Interoperability (data content and meaning), and Organizational Interoperability (business and legal relationships). Interoperability will improve reliability, market operations, and will lower grid capital costs. The authors urge that interoperability be factored into equipment design as the grid is upgraded. They propose a checklist to determine if a proposed upgrade facilitates interoperability.

IS-2008-26: China Market, The Security Industry Association Report: Olympic Update
This paper by the Security Industry Association describes the plans for security systems at the August 2008 Beijing, China Olympic Games. There are 31 Olympic venues. The business organizations involved and coordination are described. Expenditures on security systems are estimated at $300 million for the Olympics. The equipment to be used and suppliers are listed.

IS-2008-25: ROADMs in Network Architectures
This document by Ciena explains the functions of Reconfigurable Optical Add/Drop Multiplexers (ROADMs) for enabling dynamic configuration of optical networks. ROADMs are designed to support Dense Wavelength Division Multiplexing (DWDM). DWDM supports multiple fiber optics channels of different wavelengths. ROADMs allows these channels to be added, removed, or modified automatically. The technology of ROADMs is explained.

IS-2008-24: Making the Case for Converged Ethernet Transport

This paper by Ciena explains that role of Ethernet for high-speed data transport outside of a local area network. Internet traffic is predicted to grow at a 35 per cent-compound rate between 2006 and 2012. Ethernet Internet Protocol traffic is expected to surpass time division multiplexing traffic by 2009. Technologies for optical Ethernet switches are discussed. Applications include triple play, business data services, and wireless backhaul operations.

IS-2008-23: Evolution to the 100G Transport Network

The technologies to transport 100 Gbps Internet data are discussed in this report authored by Ciena. Applications include video-on-demand and IPTV. Client connections to the Internet backbone are now reaching 10 Gbps. The backbone operates at two to 10 times the highest-speed client. 100 Gbps is considered for data centers and metropolitan and wide area network connectivity. Technologies for implementing 100 Gpbs using fiber optics are discussed.

IS-2008-22: Final Report of the California Broadband Task Force - January 2008

This paper is a report to the government of California about broadband Internet deployment in the state and policy proposals to increase availability. Benefits claimed include telecommuting, video conferencing, distant-learning, remote medical analysis, and increased civic discourse. Broadband is not widely available to rural locations where three million people live in California. It was noted that broadband costs are up to four times higher and one-tenth the speed than in other developed countries, such as a Japan. The US ranks 16th in broadband adoption and California ranks 10th compared to developed countries. The report recommends that high-speed broadband be available to all Californians "with the lowest subsidy necessary" and with tax incentives.

IS-2008-21: Compendium of Champions: ACEEE; Commercial/Industrial Retrofit Programs

This report by American Council for an Energy-Efficient Economy (ASEEE) summarizes energy management programs instituted in six regions of the U.S. by electric utilities. Many of the programs include rate reductions. Also, the utilities offer subsidized consultants and contractors to assist enterprises to determine where energy could be saved and to implement retrofits to generate the savings. Four programs were cited as exemplary and two as honorable mention.

IS-2008-20: The Innovation Dilemma: How to Achieve High Performance through Superior R&D

This paper by Accenture summarizes a study of investments by large companies in innovation. About 37 per cent have outsourced product development in areas where other companies or universities offer more competence.

Some companies "in-source" by opening research centers in foreign locations. Others acquire companies with special expertise. About 44 per cent of those surveyed have a standardized process for conducting research.

IS-2008-19: Case Study: Concordia University New Engineering Building, Montreal, Canada
This document by A. Tzempelikos & A. K. Athienitis summarizes the energy savings in a building at Concordia University resulting from the use of motorized shading, lighting control, and improved glazing. The installation of these technologies in the 16-story building allowed a $45,000 reduction in the purchase cost of the atrium cooling system. The building payback for the motorized shades is expected to be 2.8 years.

IS-2008-18: Integration of Dynamic Facades with other Building Systems
This paper by A. Tzempelikos & A. K. Athienitis summarizes the benefits from designing a building façade with technology that allows the windows and shading to adjust automatically. The objective is to integrate façade control with lighting and HVAC systems to maximize daylight without glare, and to minimize the sun heat load. With proper systems design, the expected savings in a 10-15 story building are a 40 per cent reduction in the cooling energy consumption, a 60 per cent reduction in energy for lighting, and 20-40 per cent reduction in the peak cooling load.

IS-2008-17: Enhanced Automation: Business Case Guidebook
This guide was created by the California Energy Commission to provide information for businesses on the costs and benefits of building automation technologies. This guide is aimed at businesses with buildings consuming a peak of at least 200 kW for 20,000 square feet or more. The benefits are increased employee satisfaction, higher property values, and energy savings. Energy automation includes energy management systems, energy information systems, and HVAC and lighting controls. Improved information systems can pinpoint areas that need maintenance. A step-by-step assessment procedure is described. Included is a discussion about choosing an electricity tariff that could reduce the building power bill. About a 15 per cent reduction in energy costs on average is possible.

IS-2008-16: There's No Place like Anywhere for the Holidays
This paper from the Yankee Group surveys wireless devices that facilitate access to audio, video, Internet data, and GPS (location data). The objective is to achieve connectivity anywhere. The devices reviewed for features provided and omitted include the Apple iPod, HP MediaSmart TV, HP MediaSmart Home Server, the Apple iPhone, Xbox 360 Elite, TiVo HD, and Sony PSP. Device connectivity is a product differentiator. Manufacturers are challenged to educate customers directly and via retailers.

IS-2008-15: BACnet: Answers to Frequently Asked Questions
This paper contains an overview of BACnet, the Building Automation Control Network. BACnet defines the messages, signaling methods, and communications media for remote control of building automation devices. Each device, such as a temperature sensor, is represented as a collection of objects with a set of properties. BACnet messages can be encoded for a variety of network transmission methods. Systems not designed for BACnet can be adapted via a gateway translator. The conformance of a device to BACnet is described in a protocol implementation conformance statement (PICS). BACnet is now a U.S. and an international (ISO) standard.

IS-2008-14: U.S. Construction Outlook 2008-2009
Reed Construction Data discussed the prospects for the U.S. construction industry in 2008-2009. The collapse of the sub-prime market is affecting funds availability for commercial building construction. Very slow growth in the economy is predicted. Charts of the national economic condition are included. As of July 2007, the highest growth was in New England with Massachusetts leading the nation. Recovery predictions for the housing market are presented. Commercial construction is expected to have peaked in 2007.

IS-2008-13: Structured Cabling System (SCS)
This tutorial from the International Engineering Consortium discusses an organized cabling system for delivering building control services. A Structured Cabling System (SCS) can save up to 30% in initial construction costs. A building management system facilitated by an SCS can lead to savings of up to 60 per cent. All building control and data cables can be combined, with the possible exception of fire alarm wiring depending on local codes. There are now national and international standards for integrated wiring of buildings. A goal of SCS is to maintain the cabling as the connected systems change over time. Cabling is reduced when an SCS is organized for distribution via subsystems. Cost calculations and potential savings in labor are presented.

IS-2008-12: Taking Television to the Next Level: The Combination of HD and IPTV
This paper from ANT Software Limited maintains that HDTV will be enhanced when users have more TV options made available by IPTV (Internet TV). IPTV offers the possibility that the use can choose programming from a huge library and can control the viewing experience (such as pause, rewind, etc.). Key to success is a consistent user interface.

IS-2008-11: A future in content(ion): Can telecom providers win a share of the digital content market?
Telephone companies are facing competition from wireless and VoIP (Voice over IP) providers as revenues from traditional services fall. This study by IBM proposes that telephone companies generate revenue from content

distribution. The goal should be to deliver content anywhere, anytime, anywhere, to any device. There will be a shift from physical distribution of media (on disks) to on-line distribution. Do-it-yourself media production, such as blogs and podcasts, will be a significant factor. IBM predicts that households will need 20-Mbps Internet access for new multi-media services. Telecom operators are not likely to gain a significant base even with fiber-to-the-home. Therefore, they must become more consumer-centric by focusing on distribution services and embedded advertising.

IS-2008-10: HomePlug AV White Paper

This paper by the HomePlug Powerline Alliance presents an overview of the HomePlug AV power line carrier technology that supports broadband audio and video. HomePlug AV provides a 200-Mbps channel that delivers an effective data rate of about 150 Mbps. The channel supports a multi-access contention system plus time division multiplexing without contention, but with quality-of-service. Block diagrams are included. HomePlug includes a Central Coordinator to organize a HomePlug network and to isolate logically multiple networks sharing the same power line with unique encryption for each network.

IS-2008-09: HomePlug & Service Providers

This is a promotional piece for the use of HomePlug power line carrier technology and a survey of possible services that might be offered via the Internet and via a HomePlug home network.. Possible services include entertainment, energy management, and appliance control. Some services being planned include VoIP (Voice over Internet Protocol), IPTV (TV via the Internet), firewall and virus protection, spam filtering, parental controls, content-on-demand, security, network management, and home health care.

IS-2008-08: Conquering the WiMAX Test and Measurement Challenge

Test and measurements to determine the performance on a WiMAX system are described in this Rohde & Schwarz white paper. WiMAX is one of the most complex wireless systems ever deployed. It is IP-based and incorporates multiple communications protocols. WiMAX includes techniques to overcome noise, fading, and interference. Of particular note is the use of multiple antennas to support a technique called MIMO (Multiple Input Multiple Output). Test equipment requirements are presented. Interspersed are advertisements for the products of the paper author.

IS-2008-07: VoIP over WiMAX: Market drivers and vendor opportunities

This paper by Rethink Research Associates is an executive summary of a survey to determine business prospects for voice transmission using Internet protocol (VoIP) via wireless WiMAX. About 400 service providers planning to offer WiMAX were surveyed for their intent to deploy VoIP. WiMAX will account for 75 per cent of the

broadband wireless market by 2010. About 65 per cent of WiMAX operators will offer VoIP by 2010. However, fewer than one-third of WiMAX vendors are considered strong in VoIP. Strategic alliances with VoIP partners will be pursued.

IS-2008-06: Is Your AAA up to the WiMax Challenge?

WiMAX is an emerging wireless technique for broadband voice and data communications over large areas. This paper by Bridgewater Systems discusses methods for user authentication to permit access, authorization of service levels, and accounting of service usage. Usage may be tracked according to flow-based accounting that determines how much of each type of service was used. Since WiMAX is an always-on system, authentication may occur frequently. Requirements for authentication, authorization, and accounting to support a high-growth WiMAX business are discussed.

IS-2008-05: What ISN'T Going to Happen in 2008

ABI Research presents predictions for 2008. Among technologies that will NOT blossom in 2008 are: mobile broadband, Palm (will lose market share), RFID (will not impact inventory management), navigation embedded in handsets, auto safety technology, Motorola mobile devices, mobile data traffic (until 2009), VoIP over WiFi in businesses, 802.11n (faster WiFi), improved network security, mobile WiMAX in China and 1 Gbps Internet access.

IS-2008-04: Framework for energy market communications - Part 101: General guidelines

This is a Technical Report published by the International Electrotechnical Commission (IEC), one of the three official worldwide standards organizations. This report provides an overview of XML-based database technology for e-business communications in the competitive energy market. The CABA document consists of the introduction, scope, and normative references, not the entire report (which is for sale by the IEC).

IS-2008-03: Europe's Home Networking Boom

This paper by Parks Associates surveys the rapid growth of broadband penetration in Europe from 2004 to 2006. Europe has moved from behind Asia and America to on-par with America. The growth in broadband has led to a growth in home networks in order to reach multiple personal computers.

IS-2008-02: IPTV in Europe: Digital TV in a Hyper-competitive Market

According Parks Associates the market for digital TV in Europe is very competitive and "a test bed for the rest of the world." Telephone and broadband service connections to customers are unbundled in Europe, thus encouraging new entrants. Digital Terrestrial TV is a significant delivery method in Europe. Competition is leading

to new value-added services and increased support for customer-provided home networking via a utility-provided gateway. The utility ensures customer satisfaction with the value-added services at reasonable costs. IPTV is growing the fastest in Europe by offering a la carte TV programming. The author contends that convergence of multi-media, support, and billing is key to success.

IS-2008-01: Buildings as Networks: Danger, Opportunity, and Guiding Principles for Energy Efficiency
This presentation from the International Energy Agency introduces the need to address energy consumption and conservation when designing networked building automation systems. The authors are concerned that networked consumer electronics focus on features and conveniences, not on reducing the energy consumed by devices when they are not being used. Likewise, devices that are networked for building control of lighting, heating, etc. should be designed so energy consumption is reduced when the devices are quiescent. International standards are needed to specify techniques for networked devices to conserve energy.

IS-2007-80: Custom Mobile Advertising
Custom Mobile Advertising was a CABA Internet Home Alliance Research Council study that estimated the size of the maximum total addressable market for specific advertising concepts that could be offered via in-vehicle technology, mobile phone technology, and across both platforms. The goal of the study was to gauge interest in specific types of advertising content and advertising delivery mechanisms (such as voice and text). The study examined numerous consumer preferences for various features, including: connectivity options (wireless vs. wired); user interface (voice, text, on-screen menus); media and advertising storage and transfer options (mobile phone, PC, in-vehicle device, other); and user profile controls (computer, phone, in-vehicle).

IS-2007-79: ZigBee and Wireless Radio Frequency Coexistence
This paper by ZigBee Alliance explains how ZigBee and other unlicensed wireless technologies can co-exist without interference. ZigBee operates in 2.4-GHz band worldwide, in the 900-MHz band in North America and Australia, and in the 800-MHz band in Europe. Possible interference sources are WiFi, Bluetooth, portable telephones and microphones, WiMax, and microwave ovens. ZigBee avoids interfering by employing a frequency division multiple access (FDMA) communications protocol. Methods to avoid message collisions and to achieve successful reception are described. The benefit of a ZigBee mesh network is explained. Various tests supporting and criticizing ZigBee performance are presented.

IS-2007-78: ZigBee: The Choice for Energy Management and Efficiency
This report by ZigBee Alliance explains the benefits of using wireless communications for implementing energy management. ZigBee is proposed as the wireless technology for the "last foot" connection. Energy management

initiatives worldwide are described. Applications of Zigbee for time-varying energy pricing and peak consumption management are explained.

IS-2007-77: Green Specs/LEED Specs

This report by Kalin Associates Inc. provides guidance to building specifiers on how to evaluate product claims about green attributes for incorporation into building designs. "By our definition, green products are those which maintain or improve the human environment while diminishing the impact of their use on the natural environment- in other words, sustainable." Characteristics of green products include green manufacturing, recycled contents, recyclable, low toxicity, and biodegradable. Who selects green products (owners, architects, engineers, and contractors) and when in the design/construction timeframe are they selected are discussed. A detailed checklist is included.

IS-2007-76: Cost of Green Revisited

According to a study of 221 buildings, green buildings cost about the same as conventional buildings. Eighty-three of these buildings were designed with the intent of being sustainable. Some green features were present in the non-green buildings. A majority of the green buildings did not cost more because of the green features. Detailed costing methods are included. This study recommends that green should be included in building planning, not as an added requirement.

IS-2007-75: Commercial Buildings - Eco-Efficiency

The Sustainable Development Technology Canada foundation was formed by the Canadian government to develop and demonstrate clean technologies. These technologies apply in energy exploration and production, power generation, energy utilization, transportation, agriculture, forestry and wood products, and waste management. Recommendations are provided in the form of business cases. The methodology for determining where investments are warranted is explained. A case study of energy, water, and sold waste production for commercial office buildings in Canada (380,000 buildings in 2004) is presented. A goal for 2030 is to reduce the energy used in these buildings by 50 percent , the water by 65 per cent, and the solid waste by 85 per cent.

IS-2007-74: LEED In Healthcare

This paper explains how hospitals, nursing homes, and clinics can implement energy conservation and achieve LEED certification (Leadership in Energy and Environmental Design) even though LEED was developed for office buildings. Methods for water savings are presented, emphasizing substitutes for potable water in laboratory and cooling applications. Some LEED standards such as indoor-air-quality and temperature control are generally in-

place in healthcare facilities. The U.S. Green Building council is preparing "The LEED Application Guide for Healthcare."

IS-2007-73: FTTH/FTTP Update
According to a market research study by RVA LLC, fiber optics for distribution of home services passed almost 10 million homes as of September 2007, is being marketed to about 8 million, and has been adopted by two million. About one million households receive video by fiber optics and 2 per cent of households get Internet access via fiber optics. The technology for fiber optics distribution varies by company. About 25 per cent of consumers who are offered fiber optics services adopt some. Customers with Internet access via fiber optics are more satisfied than those receiving Internet via cable or DSL (telephone lines). About half of fiber optics Internet access is at 5-10 Mbps for download and 1-2 Mbps for upload. The dominant supplier is Verizon. The writers claim that subscription to fiber optics services stimulates the purchase of various consumer electronics, increases home values, saves energy, and reduced pollution.

IS-2007-72: Digital Content Unleashed: The Slow but Inevitable Race Toward a Friction-Free Media World
This consumer survey from ABI Research reports on how consumers access audio and video (A/V) through retail purchases and downloads, and predicts access modalities in 2012. Impediment to the adoption of new A/V distribution and playback methods are difficulty in set-up, lack of content, and interoperability problems, all creating "friction" in A/V distribution. About 12 per cent of those surveyed bought on-line video in 2007 compared to less than 5 per cent in 2006. Now, most A/V is stored on CDs and DVDs. Over time, physical storage will migrate to network storage. This will facilitate place-shifting (alternate viewing locations) and time-shifting. Eventually, A/V will be stored on a home service and/or and Internet-based server. "Friction-free" access to A/V will benefit device manufacturers, software makers, content owners, and network operators.

IS-2007-71: High-Speed Services for Internet Access: Status as of December 31, 2006
The U.S. Congress has mandated that the Federal Communications Commission (FCC) encourage the deployment of advanced telecommunications. Therefore, the FCC reports annually on the adoption of Internet service access nationwide. This report for 2006 notes a 61 per cent increase in high-speed access from 51.2 million subscribers to 65.0 million. High-speed access is provided by cable modems for 38.9 per cent of customers and by ADSL for 30.8 per cent. Other high-speed access modes include fiber optics, satellite, broadband over power line (BPL), and terrestrial mobile. High speed is defined as faster than 200 kbps in at least one direction. 59.5 millions lines were faster than 200 kbps in both directions, of which 53.6 per cent were cable and 39.1 per cent were ADSL.

IS-2007-70: Small and Medium Business IT Market Evolution: An Opportunity and a Challenge for Channel Partners
CompTIA investigates the IT costs for small and medium-sized businesses. Growth partners show companies moving from personal computers to Internet access and networks to virtual private networks and wide area network. Many of these companies depend on IT support from outside vendors and value-added resellers. Many companies are starting to make purchase decisions based on the total cost of ownership. They are seeking IT solutions that can scale as the company grows. Therefore, IT vendors should help companies evaluate the long-term benefits of various IT solutions.

IS-2007-69: Innovative Approaches to Win the US Bundled Pricing Game
This paper from Accenture discusses pricing strategies for bundled services including Internet, TV, and wired/wireless telephone. Accenture maintains that bundled prices are eroding due to competition even while customer retention is growing. They propose that cable and telephone companies price by "customer value segment" rather than uniformly. For example, packages tailored for families or young professionals or baby-boomers might be offered with higher prices because of the perceived value.

IS-2007-68: Towards a High-Bandwidth, Low-Carbon Future
This paper from Climate Risk Pty Ltd in Australia was commissioned by Telstra, a communications provider in Australia, to investigate the benefits of telecommunications in reducing carbon usage and the deleterious effects of greenhouse gas emissions. Examples of savings are described, such as telecommunications to control appliance energy usage in standby mode or when a user is not present. Telecommuting or commuting to a nearby regional office is another savings opportunity, as is teleconferencing. An overview of global warming is included. It was noted that telecommunications equipment contributes to greenhouse gasses by using power for operations and for cooling. On balance, telecommunications could reduce 4.9 per cent of greenhouse gas emissions in Australia.

IS-2007-67: State of California: Energy Action Plan II
This paper summarizes policy decisions by the State of California regarding energy. The goal is for energy in California to be "adequate, affordable, technologically advanced, and environmentally-sound." Policies are outlined, including plans for dynamic pricing of power and demand response to managing loads. The States plan to generate 20 per cent of electricity from renewable sources by 2010 and 33 per cent by 2020. The rate-setting process for the investor-owned utilities will be made more transparent. Alternative fuels for transportation will be investigated. California is seeking to reduce greenhouse gases to 1990 levels by 2020 and 80 per cent below these levels by 2050.

IS-2007-66: Building the Green Way

According to this article, an emphasis on evaluating whether a building is "green" and sustainable has been developing since 2000. Some green buildings have achieved 40 per cent energy reduction and 30 per cent water reduction over similar non-green buildings. Some green building employees are more productive because out-gassing from building materials is reduced. A green building is estimated to increase costs by 0.8 per cent. Green concepts must be integrated in building design for the greatest savings. For example, building orientation can reduce lighting needs and the cooling needed to remove heat generate by these lights. Older buildings need to be upgraded to be green in order not to lose value.

IS-2007-65: Value Proposition for Enterprise Interoperability

The European Commission reports on a strategic investigation of enterprise interoperability (EI): how businesses can benefit from exchange of information and communications technology (ICT) to create new product and services and to operate more efficiently. ICT and EI can help companies deal with change and value creation. The report concludes, "[t]he potential created by new offerings and new business models together reflects radically new opportunities to generate value with EI."

IS-2007-64: ANSI/ASHRAE Addendum e to ANSI/ASHRAE Standard 135 -2004

The purpose of this addendum is to revise ANSI/ASHRAE Standard 135-2004. The modifications in this addendum are the result of change proposals made pursuant to the ASHRAE continuous maintenance procedures and of deliberations within Standing Standard Project Committee 135. The addendum focuses on BACnet: a data communication protocol for building automation and control networks.

IS-2007-63: Service Providers Affirm the Strategic Value of Policy Management

The Yankee Group surveyed service providers for planned expenditures on the management of policies for network access and bandwidth management. Such policies can affect revenue, subscriber access, quality-of-service, network security from threats, and operational efficiency and costs. Bandwidth allocation will become important as subscribers access IPTV, video-on-demand, and enhanced video services. Policy management includes the placement of advertising adjacent and relevant to video-on-demand programming. Also, customers will be able to upgrade services automatically.

IS-2007-62: When Should I Use a Managed Ethernet Switch?

This white paper from Contemporary Controls describes the functions of an Ethernet switch. First the differences between a hub and an unmanaged switch are explained. Then the functions possible in a managed switch are

listed. A managed switch can control the data rate delivered to each port. Also, diagnostic tools are available using the Simple Network Management Protocol (SNMP).

IS-2007-61: The Market Survey of the Energy Industry 2004

The Association of Energy Engineers surveyed 456 association members on the state of the energy market to help determine a national energy policy and the benefits of energy management. Energy efficiency and management was judged most important. New generation sources are needed, global warming must addressed, and investment tax credits are beneficial. A slim majority thinks that mergers will hurt the energy industry. The best incentive for utilities to encourage energy management is through rebates. This survey is based on 49 questions. Detailed answers are provided.

IS-2007-60: Technology Contracting: Designing Systems for Efficiency and Interoperability

Johnson Controls reports on the benefits of centralizing responsibility for the management of building automation systems through technology contracting. Instead of subcontracting HVAC, lighting, security, IT networking, etc. to separate companies with separate responsibilities, an overall manager is assigned. This is particularly useful when the building systems are integrated. This approach saves time, reduces risk and blame, cuts capital costs, reduces construction costs, cuts operating costs, and enables system interoperability. The process for technology contracting is described with a few examples.

IS-2007-59: Wireless Consumer and Business User Profiles

ABI Research conducted a survey among 1,223 cell phone users across the U.S. Results of the survey are reported in the following categories: cell phone brands, monthly usage, cell phone features including multimedia, Bluetooth, and Wi-Fi access. Business users of cell phone voice services spend 19 per cent more on voice and 80 per cent more on data than consumers. Twenty-four per cent would like Internet access on their cell phones. Femtocells extend cell phone service via a broadband connection into buildings and homes where service might have been poor. Seventy-two per cent were not interested in this service. About one-third of business users would add a cellular modem to their laptop for Internet access via cell phone service.

IS-2007-58: National Action Plan for Energy Efficiency

The US Department of Energy and the Environmental Protection Agency organized a study on improving energy efficiency in homes, buildings, schools, governments, and industry. Recommendations were developed for utilities, regulators, and partner organizations. Demand for energy is expected to increase 30 to 40 per cent for electricity by 2030. Energy efficiency programs could eliminate the need for 40 new 500-MW plants over the next

10 to 12 years. Among the recommendations in this extensive report are policy changes through rate designs to move utilities towards energy efficiency.

IS-2007-57: The Cost-Effectiveness of Commercial-Buildings Commissioning
This research report issued by the Lawrence Berkeley National Laboratory describes a process of building commissioning to detect and remedy problems. Such problems include design flaws, construction defects, equipment problems, and needed maintenance. A methodology was developed based on analyzing 224 buildings. HVAC presented the most problems. New buildings have three times the defects of existing buildings. System-level interactions were tested. Problems were found in valves, filters, controls, etc. Non-energy benefits include improved equipment lifetime, productivity, and indoor-air quality. Detailed data and charts are included.

IS-2007-56: Advanced Controls and Communications for Demand Response and Energy Efficiency in Commercial Buildings
The impact of commercial buildings on the peak demand for energy is investigated by Lawrence Berkeley National Laboratory and the U.S. Department of Energy in this report. According to the report, US commercial buildings account for a significant portion of the summer peak demand. Methods of demand response are explained, including pricing incentives and load shedding. Communications methods for the utility to reach the building controls include a gateway and an Internet relay. Trials in California and New York are presented.

IS-2007-55: Energy Use in Canada
This paper by the Government of Canada addresses methods for government agencies to meet the need for energy in Canada through 2020 as population grows 11 per cent and GDP by 43 per cent. Methods and tools to improve energy efficiency and conservation are discussed. It was noted that large-appliance energy consumption has dropped, but consumers bought more small appliances where conservation is not regulated. On-site energy generation is discussed. . Energy efficiency methods are included for buildings, industry, and transportation.

IS-2007-54: Fluorescent Lamp and Ballast Options
This paper, by Natural Resources Canada, constitutes a review of fluorescent lighting technology. The benefits of electronic ballasts in place of electromagnetic ballasts are discussed. The ballast is required to generate a high-voltage start-up surge. The advantage of the T-8 lamp over older models is summarized. Potential savings in an office building are included.

IS-2007-53: Monitoring and Targeting Techniques in Buildings

This paper, by Natural Resources Canada, presents a technique adopted from industry for managing energy consumption in buildings. It consists of data gathering, data analysis, and a resulting action plan. Specific factors that affect building energy consumption, such as occupancy, are measured. A regression analysis determines the relationship between the energy consumption and these factors. Examples are presented.

IS-2007-52: Businesses Worldwide Plan to Increase Spending on Network Security Next Year by as Much as 20 Percent

This Cisco Systems press release describes a study of IT security for mobile communications. A study of 700 IT personnel found that almost half expect IT security expenditures to increase 10 per cent, while almost 10 per cent think that there will be a 20 per cent increase. These outlays are motivated by regulatory compliance, increased mobility, and a growing labor force. Only nine per cent worldwide said security spending was because of loss or theft. However, 26 per cent in the U.S. said this is a motivation.

IS-2007-51: Study Reveals Insight, Opportunity for IT to Protect Mobile Wireless Users

This is a press release for a Cisco Systems study of methods to improve IT security for users of mobile communications. The study was conducted in North America, Europe, and Asia among 700 users. Most users did not pay attention to IT security. Recommended actions include educating and protecting employees' mobile communications practices. Some specific suggestions are included.

IS-2007-50: A Global Analysis of Mobile Wireless Security: Behavioral Challenges & IT Opportunities

Cisco Systems surveyed 100 users of mobile service and 100 IT persons worldwide about security issues. Forty per cent of users do not following company security policies. More than 25 per cent are not concerned about security. Twenty per cent never protect data, mostly because they do not know how. IT persons say that viruses are the biggest threat. One-third of respondents back-up their data. Sixty per cent of companies encrypt transmitted and stored data. Spending on security is expected to grow 20 per cent next year because of lost mobile devices and new hires.

IS-2007-49: Hiding in Plain Sight: Service Innovation, A New Priority for Chief Executives

This paper from IBM describes opportunities to improve customer relations and generate revenue from providing after-sales service. IBM recommends focusing on service-innovation model, operations, and growth. Service may expand beyond traditional product support to advisory and financial services. Examples of successful service

offerings are the Best Buy Geek Squad and General Motors OnStar. Companies should devote as much discipline and rigor in creating service offerings as they do in creating new products.

IS-2007-48: M2M Remote Device Management in Business: A Study of Current Users
Harbor Research surveyed manufacturers about investments in remote access to products in the field. Half of the respondents are already equipping products for remote maintenance and support. The links to the products include wired Ethernet, Wi-Fi, cellular, and satellite. The basic reason is to manage the cost of providing service. Nine vertical markets amenable to remote access were identified: buildings, consumer & home, industrial, healthcare & life sciences, energy, retail, transportation, public safety & defense, and IT networks. Remote access can also be used to optimize performance and upgrade products. Some companies charge separately for remote product management. Examples from various companies are presented.

IS-2007-47: Workforce Demographics: Addressing an Aging Workforce in the Natural Gas Distribution Sector
This paper by the Canadian Gas Association addresses challenges to finding labor in the Canadian natural gas industry as the general population ages. The industry supports increased immigration and employment of Canadian Aboriginal peoples. Information transfers between retirees and new labor is encouraged.

IS-2007-46: Broadband Connectivity Competition Policy
The US Federal Trade Commission held a workshop in February 2007 to solicit information from advocates and experts about broadband Internet access and net neutrality (uniform treatment of all data packets). The impact of enforcing net neutrality on consumer welfare is investigated. A key debate is about prioritizing Internet traffic and possibly blocking some content based on prior business arrangements. There is debate on just how competitive is the Internet market. Some claim it is a duopoly between the cable operators and the telephone companies. The applicability of anti-trust laws is considered. Also discussed is the impact on consumer privacy of Internet packet content examination.

IS-2007-45: The Internet's Capacity To Handle Fast-Rising Demand for Bandwidth
This article by the US Internet Industry Association explores business models that will support increasing demands for Internet bandwidth. The number of subscribers is not growing as fast as the increasing demands for bandwidth by the existing subscribers. Internet subscribers have reached 70 per cent of the population in many developed countries. Various schemes for charging for bandwidth are discussed. Examples of bandwidth-intensive applications include IPTV, peer-to-peer file sharing, and collaborative gaming.

IS-2007-44: Telecom Predictions: TMT Trend 2007

The Deloitte ToucheTohmatsu Technology, Media & Telecommunications Industry Group predicts trends based on internal and external interviews. Key among these is the possibility that the Internet is reaching capacity because of video data. The need for Internet appliances other than the PC, such as specialized products for e-mail, music, or streaming radio, is discussed as a method to gain additional customers for Internet Service Providers. The added revenue would pay for expanding the capacity of the Internet. Mobile operators should not focus on TV, but on video capture and improved in-home and in-building reception by linking with wireless LANs. Also, the mobile phone could become the control element for home automation. IPTV should not be a clone of traditional TV. Some ISPs and telecommunications companies want to charge content providers for carrying the content.

IS-2007-43: Internet Service Providers in the 21st Century

According to this US Internet Industry Association report, the business environment for Internet Service Providers (ISPs) is changing with the advent of broadband. A dial-up Internet business required much less capital than a broadband business. The paper presents four business models for an ISP. The ISP provides customers with a link between transport methods (telephone, wireless, power line, etc.) and content. Guidelines for running a successful ISP are presented.

IS-2007-42: MasterFormat 2004 Edition 2007 Implementation Assessment

This paper, published by the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC) provides a candid, real-world assessment of conversion penetration to the MasterFormat 2004 Edition. The 2004 edition marked a significant change in the construction industry as a new 50-division organizational structure replaced the familiar 16-division MasterFormat structure that dated back to 1964.

IS-2007-41: e-Health and America's Broadband Network

This paper, originally published by the US Internet Industry Association, is an examination of how broadband services enhance health care in America. The paper argues that the emergence of "eHealth" has been shown to reduce the cost of healthcare and increase efficiency through better retention and retrieval of records, better management of chronic diseases, shared health professional staffing, reduced travel times, and fewer or shorter hospital stays. More directly, broadband helps to address three of the most critical complaints about the US health care system - high administrative costs, discrepancies in geographic coverage, and the high cost of delivery of services.

IS-2007-40: Monetizing Triple-Play and Value-Added Services: The Role of the Customer Experience
This white paper, by Parks Associates, provides context for the customer service and technical support issues that service providers must address as they increase the sophistication of services to the home and requisite hardware and associated software inside the home.

IS-2007-39: Digital Photo Frames: A 2006 Home Run
This white paper, by Parks Associates, notes that 2006 was a watershed year for the digital photo frame market. Sales in the first half of 2006 inherited the normal growth curve that most vendors saw over the previous two years: steady increase of 30 to 35 per cent on a year-over-year basis. But during the second half of 2006, especially the fourth quarter of 2006, sales skyrocketed to a record level, with most vendors reporting 200 to 300 per cent unit growth on a semi-annual basis.

IS-2007-38: Home Controls: Trends and Opportunities
This white paper, by Parks Associates, projects that the market for home control hardware and software will reach $3.5 billion in 2007 and grow to six billion by 2012. Intelligent controls (excluding security controllers) will grow from just less than $600 million in 2007 to $1.5 billion by 2012 led by rapid growth of advanced entertainment controllers. Universal remote controls are a billion-dollar market in the U.S., and will continue to grow in popularity, creating a nearly $2 billion market by 2012.

IS-2007-37: Digital Kitchen
The Digital Kitchen was a CABA Internet Home Alliance Research Council study that investigated consumer electronics and appliances in use in North American kitchens to determine which new products and services homeowners would like to see added to their kitchens in the future. The study examined how technology is connected and integrated into people's lives through intuitive interfaces and culminated in a display at the 2007 Kitchen/Bath Industry Show (K/BIS). Whirlpool Corporation, Bell Canada, Cisco Systems, Inc., Direct Energy, HP, HomeCrest Cabinetry, Intel Corporation, Microsoft, The National Association of Home Builders (NAHB), and the National Kitchen and Bath Association (NKBA) led, funded and participated in this research.

IS-2007-36: Interactive Television & Advertising Study
The Interactive Television & Advertising Study, conducted by CABA's Internet Home Alliance Research Council in early 2007, investigated the effectiveness of interactive TV advertising and product purchasing. The aim of the market study was to: learn about potential business models for using advanced television programming; explore new advertising potential and interactive capabilities for message delivery; and create parallel experiences to live

and recorded programming and interactive capabilities. AT&T, Cisco Systems, Campbell Ewald, Digitas and Tandberg TV led, funded and participated in this research.

IS-2007-35: Microbusiness & Small Business Managed Services Needs Assessment Study
The Microbusiness & Small Business Managed Services Needs Assessment Study, conducted by CABA's Internet Home Alliance Research Council in early 2007, was designed to assess the current state of the managed services market and to identify any potential areas for further development within the micro- and small business markets (where the former is defined as companies with fewer than 10 employees and the latter is defined as companies with between 11 and 100 employees). The key objectives were to profile target companies; assess the level of in-house IT/telco support; identify current and/or future managed services needs; and evaluate the incidence of current IT/telco change initiatives. AT&T, Cisco Systems, Costco Wholesale, Hewlett-Packard, Level Platforms and SupportSoft led, funded and participated in this research.

IS-2007-34: The Forgotten Environment; Realities of Green Buildings
This short paper, by S.D. Snyder and Assoc., poses the problem of indoor air pollution and proposes a solution. Indoor air pollution is aggravated by attempts to conserve energy in buildings by making builders tighter to prevent the escape of conditioned air. This traps pollutants including carbon dioxide generated by human breathing. The opposite extreme of mandating periodic air exchanges wastes energy. The writer argues for the deployment of indoor landscaping with plants to absorb the carbon dioxide. He recommends installing automated irrigation systems.

IS-2007-33: Not Business as Usual: Changing Channels in Consumer Electronics
This paper by IBM offers manufacturers strategies for improving margins in the consumer electronics sector by being more active in managing the sales channel and dealing with retailers. Manufacturers are advised to focus on customer-relations management. Also, they should improve the supply chain to large retailers. Other recommendations include global integration, managing small retailers, and enhanced branding.

IS-2007-32: Custom Mobile Advertising Study
Mobile communications technology now promises advertisers the ability to deliver targeted commercial messages to consumers when their behavior can be immediately influenced and converted into a sale. The question is: How open are consumers to receiving these messages- either on their cell phone, or on a device installed in their car? That is the central question addressed by the Custom Mobile Advertising Study, conducted in May 2007 by Zanthus, an independent research consulting firm for CABA's Internet Home Alliance Research Council. AT&T, Cisco Systems and General Motors led, funded and participated in this research.

IS-2007-31: 2007 Energy Efficiency Indicator Report
Johnson Controls decided to conduct research within the North American business community to look at the impact of rising energy prices on organizations. For the first time, this survey of 1,250 executives examined what companies were doing in response to rising energy costs, what sort of payback they expected on investments in energy efficiency, to what extent they were motivated by concerns about the environment vs. purely economics, etc. Johnson Controls plans to repeat this survey annually.

IS-2007-30: Senior Living Research Study
CABA's Internet Home Alliance Research Council has conducted a study which identifies the solutions consumers over the age of 50 want most in a home to keep them safe, comfortable and living independently in their own homes as they grow older. The study was designed to help consumer product and service companies better understand - and develop products and services for - the mature market. Whirlpool Corporation, Aqua Glass Corporation, American Shower & Bath Corporation, AT&T, Delta Faucet Company, Echelon Corporation, KraftMaid Cabinetry, Merillat Industries, Milgard Windows & Doors and the National Association of Homebuilders led, funded and participated in this research.

IS-2007-29: Boomer Tech White Paper
Baby Boomers, like all generations, have come to view the PC and Internet as an essential tool in their daily lives. This white paper, commissioned by CABA's Internet Home Alliance Research Council in June 2007, notes that Baby Boomer households own desktops, laptops, and printers at the same rate as younger U.S. households.

IS-2007-28: Laundry Time Research Pilot
The Laundry Time Research Pilot, conducted by CABA's Internet Home Alliance Research Council in late 2006, examined how effective an "intelligent" laundry solution was at simplifying and saving time on laundry tasks while also uncovering consumer attitudes about remote access and control of laundry appliances. Whirlpool Corporation, HP, Microsoft, Panasonic, and Procter & Gamble led, funded and participated in this research.

IS-2007-27: Migrating to MPLS-based networks: Avoiding the mistakes your peers have made
This paper by Fluke Networks addresses problems that might arise as companies combine legacy data networks based on point-to-point communications into a private IP (Internet Protocol)-based network. An IP network carries packets over varying routes through a mesh network thereby making troubleshooting difficult. A methodology is provided for analyzing network performance and for setting application priorities.

IS-2007-26: Migrating to an MPLS-based/Private IP Network: Are You Ready?

This paper by Fluke Networks describes how to transform a data network within a business into a private IP (Internet Protocol) network using MPLS (Multi-Protocol Label Switching). The underlying networks may switch-based. An IP backbone interconnects the existing legacy networks (such as frame-relay and ATM). In a private network, priorities can be defined for various classes of service. Also, redundancies can be incorporated, a mesh network can be created, and bandwidth allocations can be optimized.

IS-2007-25: Building an ROI: Application and Network Performance Management

As businesses upgrade data networks to IP (Internet Protocol)-based networks, this paper by Fluke Networks argues that they need to determine qualitative and quantitative benefits. This upgrade can impact applications, operational costs, problem resolution, and bandwidth allocations. Examples are provided. Calculations of payback and return-on-investments are demonstrated.

IS-2007-24: Pipe Dreams? Prospects for Next Generation Broadband Deployment in the UK

This paper, by the Broadband Stakeholder Group, examines the potential impact of broadband Internet access on business in the United Kingdom. Business models to support increased bandwidth are uncertain. Therefore, public policy for high-speed access is considered, although immediate intervention is not recommended. The upper end of the market will demand 23 Mbps downstream and 14 Mbps upstream by 2012, requiring fiber optics. One study showed that broadband penetration to 90 per cent of the public could increase GDP by 1.6 per cent.

IS-2007-23: Natural Gas Markets Post-Heating Season Update

This paper, by the Canadian Gas Association, explains how the price for natural gas fluctuates. It describes the factors that influence gas prices by showing projections for Spring 2007 made in the Fall of 2006. Some of the factors include raw materials costs, weather, amount already in storage, and levels of exploration.

IS-2007-22: Simon Malls: the Largest Energy Management Deployment in North America

The paper, by Richard-Zeta Building Intelligence, Inc., describes a method for improving energy management in retail shopping malls. Energy management is achieved through remote meter reading, load shedding, and participation in demand response programs. The meters and energy management systems are integrated into a Meter Data Management System via a gateway. The meters use the Modbus protocol, while the Energy Management Systems use BACnet. The gateway is based on the Richard-Zeta Mediator Multi-Protocol Exchange platform. Meter data are encoded in XML.

IS-2007-21: Impact of ICT on Real Estate to Create a Total Branded Experience; Introduction to Community 2.0

According to a paper by Cisco Systems, new communities will combine residences and businesses to facilitate economic development. This integration uses IP-based services to create a "total branded experience" called Community 2.0. Communities and buildings need to adapt to humans.

IS-2007-20: CABA Intelligent Buildings Roadmap Executive Summary

The CABA Intelligent Buildings Roadmap is a collaborative industry-funded research project that explores the opportunities offered by emerging intelligent building technologies. The full report examines the challenges facing intelligent building implementation within North America and identifies the market developments and industry initiatives needed to support the wider adoption of these technologies.

IS-2007-19: Mastering the Metadata Menace

In this paper, published by The Diffusion Group, the functions and implementation methods for cable TV set-top boxes are explained. The set-top box stores the on-screen TV guide, manages video-on-demand (VOD), and may run a built-in personal video recorder (PVR). All these functions put stress on the data storage and processing requirements of the set-top box. Inconsistent implementation technologies and the variety of set-top boxes in the field are limiting growth in set-top applications, which is the future of the cable TV business.

IS-2007-18: FTTH in Asia: Japan Leads but China is a Sleeping Giant

According to this report, published by The Diffusion Group, the leading nations for FTTH are Japan and Korea, with China and India growing. Penetration was five million at the end of 2005 and is expected to reach 40 million by 2010. Korea has 80 per cent broadband penetration. China is surpassing the US in broadband users. The demand for broadband is fueled by IPTV and gaming. FTTH is more aggressively priced in Japan than in the US.

IS-2007-17: China's Path to Digital Multimedia - The Path Less Traveled

According to this report, published by The Diffusion Group, the Chinese are willing to spend more on cell phones and broadband than on IPTV (TV via the Internet). China will introduce digital TV as a hybrid of terrestrial broadcast, mobile, and broadband delivery methods.

IS-2007-16: Understanding the Shifting Demand for Home Networks

This paper, published by The Diffusion Group, maintains that the demand for home networking is declining. The market growth for broadband and home networking is "about to be exhausted." This market will be sustained by push campaigns.

IS-2007-15: The IPG Goes New Media: Trans-Platform Personal Entertainment Guides
According to this report, published by The Diffusion Group, the on-screen program guide, called the Interactive Program Guide, is evolving into a Personal Entertainment Guide (PEG). Such a guide must know the viewer, be available on multiple viewing media, and simplify entertainment viewing. The PEG is geared to individual viewers, not to households.

IS-2007-14: The Distribution of Profits in the Networked Digital Home
This paper, published by The Diffusion Group, claims that the market for integrated home systems will not become a mass market for five to 10 years. Products in the home are divided into four clusters: entertainment, productivity and data communications, voice communications, and home management. These clusters will be independent, centrally controlled, or distributed. The key issue is who will profit from owning the control points.

IS-2007-13: The Medium is the Message - New Media and Its Impact on Media Consumption
This paper, published by The Diffusion Group, wrestles with defining new media. It characterizes new media as computer-based and likely to use the Internet with digital imaging and a graphical user interface. Academic sources are cited.

IS-2007-12: Multimedia Phones as a Portable Game Console Replacement?
The paper, published by The Diffusion Group, argues that the cell phone is not and will not become a substitute for a portable gaming console. Most prefer to use cell phones for talking, playing music, and playing video (in that order). Cell phone makers would need to get established in the portable gaming console market for their cell phones to be used widely for gaming. Alternatively, a cell phone company might partner with a gaming company.

IS-2007-11: Mastering Content in the Mobile Video Market
This paper, published by The Diffusion Group, questions the market size for portable video players such as the iPOD Video. Will consumers pay for the video programming? The author maintains that a multimedia cell phone is better suited for video. About one-third of cell phone users who were surveyed have an interest in video on cell phones and 14 per cent would pay for it. The favorite contents are news and sports. Likely content preferences by demographic segments are described.

IS-2007-10: The Emergence of Broadband Television
This paper, published by The Diffusion Group, introduces Internet-based TV (IPTV), applications ranging from short video presentations up to movies, and likely market developments. The delivery mechanism is broadband

with an adapter to present the video on a television. About 160 million TVs will use or include such adapters by 2011.

IS-2007-09: IPTV's Impact on the Business of Television and the Emergence of "Internet 3.0"

According to this report, published by The Diffusion Group, IPTV is driven by the proliferation of broadband and the need for telephone operators to gain income from TV distribution. There will be competition from satellite companies, cable companies, broadcasters, and telephone companies. Hotel operators may benefit from IPTV. IPTV will succeed based on the programming offered. The author calls IPTV "Internet 3.0."

IS-2007-08: Business Models for Managing the Digital Home

This paper, prepared by Parks Associates, summarizes a survey of households with Internet access in the US and Canada on their willingness to pay for maintenance services. Such services might deal with security (viruses, spyware, spam), home networks, and software/hardware failures. Other potential services include on-line storage, installation and configuration management, and remote or on-site technical support.

IS-2007-07: Digital Home Health - A Primer

This paper, prepared by Parks Associates, examines what motivates the healthcare industry and consumers to adopt technology for supplementing care delivered by medical professionals. It notes consumers will take the lead with self-monitoring provided there is appropriate equipment, cooperation of caregivers, and insurance reimbursement. Geriatric monitoring of routine daily activities may be included. Long-term studies are needed to convince insurers to pay for these services. The market for home health technology was $461 million in 2005 with an expected growth rate of 74 per cent per year through 2010.

IS-2007-06: Media Servers in the Digital Home

This paper, prepared by Parks Associates, examines storage systems for homes, and categorizes them as network attached storage, multimedia PCs, set-top box media servers, and high-end media servers. Manufacturers of hard disks are drivers for this market. Some consumers are increasing multi-media storage capacities by 50 per cent per year. Media server shipments will total about 50 million in all categories by 2010.

IS-2007-05: Broadband Europe: A Tale of Many Markets

This paper, prepared by Parks Associates, examines broadband markets in Europe. It finds as of February 2007, the highest penetration of broadband in Europe is in Scandinavia. 82 per cent of broadband customers use DSL. Those countries encouraging competition have greater broadband penetration. This report includes a survey of services offered by incumbents and new competitors.

IS-2007-04: Digital Youth Study

The Digital Youth study, developed by the CABA Internet Home Alliance Research Council and released Feb. 15, 2007, examined youth influence on consumer technology purchase. It found that youth age 8-18 have influence on the purchase of products/services that are primarily used by youth and not by parents. They exert little influence on the purchase of: desktops, laptops, Media Center PCs, external hard drives, printers (color laser, all-in-one inkjet, standard inkjet, snapshot photo), broadband, digital cameras, satellite radio, HDTV, and DVRs. Cisco Systems and AT&T led, funded and participated in this research.

IS-2007-03: Home Networking Study

The Home Networking Study, developed by the CABA Internet Home Alliance Research Council and released Feb. 15, 2007, provides an up-to-date, comprehensive understanding of opportunities and barriers to home networking as they occur throughout the adoption cycle: from purchase through installation, use and maintenance. Of particular interest to project sponsors are factors affecting consumer interest in advanced network applications in areas such as entertainment and home control. Cisco Systems, AT&T, SupportSoft, and Whirlpool Corporation led, funded and participated in this research.

IS-2007-02: Russian Market for Building Automation Systems

This report is an executive summary of a market survey of heating, ventilation, and air-conditioning (HVAC) equipment installed in Russia, published by the Russian Association for Building Automation and "BIG-RU" Association BACnet Interest Group Russia. The methodology for gathering and costing the data is explained. HVAC equipment is categorized as control and control/monitoring systems. Controllers are divided into those with interfaces to sensors and valves, and network controllers without such connections.

IS-2007-01: Ceramifying Polymers for Advanced Fire Protection Coatings

This paper, published by the Co-operative Research Centre for Polymers at Monash University, describes a new fire retardant. It consists of ceramic polymer that can coat thermoplastics. The basis for the ceramifying polymer is a PVC material and a non-halogen ethylene-propylene diene rubber (EPDM). The fire retardant characteristic is due to a cellular structure that also provides a support structure. Tests are reported that demonstrate the fire retardant features.

IS-2006-79: Intelligent Home and Feng Shui

The ancient Chinese belief in Feng Shui asserts that the natural harmony of the earth is disturbed by building location and orientation. The art of Feng Shui provides guidelines for minimizing this disturbance. An intelligent

home may allow flexibility for adapting rooms to various living functions, for example, with an adjustable lighting system. Such adaptation would enable a house to be configured for maximum Feng Shui. The author, Dr. So of the Asian Institute of Intelligent Buildings notes that a skeptic might just have fun changing the functions of rooms every few years. He concludes that Feng Shui is one motivation for increasing the popularity of intelligent homes.

IS-2006-78: The Effect of Ramps in Temperature and Electric Light Level on Office Occupants
This paper by Guy Newsham, Cara Donnelly, Sandra Mancini, Roger Marchand, William Lei, Kate Charles, and Jennifer Veitch of the Institute for the Research in Construction at the National Research Council of Canada, reports on a controlled study to determine effective methods for load management in the workspace of an office building. The lighting and cooling were reduced using a gradual ramping of illumination and temperature to minimize detection by the occupants. A 20 per cent decrease in lighting and a 1.5 degree C increase in AC temperature were considered acceptable to most occupants.

IS-2006-77: Designing the Future: A Smart Grid Newsletter Case
This paper describes the methodical process pursued by Southern California Edison (SCE) to introduce automatic meter reading and ancillary services, such as remote turn on and off. SCE developed a three-phase plan to install an infrastructure that includes digital meters, a communications network to customers, and links to networked devices in the home, such as thermostats. The evaluation process included researching technology, developing use cases and requirements, evaluating products, specifying standards-based technology, and working with vendors.

IS-2006-76: Third Quarter 2006: High-Speed Access Report
IGI Consulting has released its third quarter 2006 report on high-speed broadband Internet access within North America. According to the report, a select number of major North American telecommunication firms deployed 4.2 million high-speed access lines in 2005, in comparison to 3.5 million high-speed access lines deployed by the cable companies. IGI Consulting predicts that telecom broadband deployment will over take cable broadband deployment by the end of 2006.

IS-2006-75: A Study on the Wireless Environment in Canada
The Wireless Environment in Canada is the most comprehensive analysis to date of the country's wireless telecommunications sector. The Canadian Wireless Telecommunication Association (CWTA) commissioned the report in June 2006from Wall Communications, an independent economics research and analysis consulting firm, to assess six key aspects of the industry: the financial state of the industry; the state of competitiveness; current

wireless coverage; technology innovation and deployment; wireless penetration rates relative to other jurisdictions; and pricing.

IS-2006-74: An Examination of Issues Raised in the Policy Review Concerning the Mobile Wireless Service Industry

This report, commissioned by the Canadian Wireless Telecommunication Association (CWTA), examines and provides comment on statements made by the Telecommunications Policy Review Panel (TPRP) relating to the Canadian mobile wireless services industry as well as the TPRP's recommendations relating to the wireless segment of the Canadian telecommunications services industry.

IS-2006-73: Trends in Consumer Technology: Defining and Sizing the Market

This white paper by Parks Associates attempts to provide a snapshot of the digital lifestyle landscape.

IS-2006-72: Mobile TV in Europe

This white paper by Parks Associates examines changing mobile TV standards in Europe.

IS-2006-71: IGI Consulting First Quarter 2006 High Speed Access Report

This report, provided by IGI Consulting, provides in-depth analysis on high speed access growth within the North American marketplace for the first quarter of 2006.

IS-2006-70: Cisco Connected Real Estate

This paper explores how Cisco Connected Real Estate is delivering huge financial and operational advantages not only to the construction, real estate and property service industries but also to their customers - such as hotel operations, multiplexed retail outlets, and corporate tenants - in sectors as diverse as hospitality, healthcare, education and retail finance.

IS-2006-69: Chairman's Roundtable: Sustaining Change Efforts

Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance's Chairman's Roundtables take place on a quarterly basis. Participants include members of the Alliance's board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-68: Chairman's Roundtable: Principals of Consumer Privacy
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance's Chairman's Roundtables take place on a quarterly basis. Participants include members of the Alliance's board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-67: Chairman's Roundtable: From Next to Now
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance's Chairman's Roundtables take place on a quarterly basis. Participants include members of the Alliance's board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-66: Chairman's Roundtable: Crossing the Zone of Discomfort
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance's Chairman's Roundtables take place on a quarterly basis. Participants include members of the Alliance's board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-65: Chairman's Roundtable: Connected Home Taxonomy
Designed to surface, discuss and debate issues critical to advancing the home technology market, Internet Home Alliance's Chairman's Roundtables take place on a quarterly basis. Participants include members of the Alliance's board of directors as well as other invited thought leaders. Post-event reports capturing the roundtable discussions are written and made available first to Alliance members and then to the public at large.

IS-2006-64: Ecosystem Framework White Paper
A natural ecosystem is an ecological community, together with its environment, that functions as a unit. The connected home can be seen as an artificial ecosystem defined by its technological infrastructure and its residents. This paper describes the three distinct, but related ecosystems within the connected home the Alliance considers critical to the future of the market. We believe the thinking behind this concept will help companies identify new opportunities for profitable collaboration.

IS-2006-63: State of the Connected Home Market: Entertainment
For the purposes of market analysis, Internet Home Alliance has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or 'ecosystem' tracks: Entertainment, Family and Career. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-62: State of the Connected Home Market: Family
For the purposes of market analysis, Internet Home Alliance has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or 'ecosystem' tracks: Entertainment, Family and Career. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-61: State of the Connected Home Market: Career
For the purposes of market analysis, Internet Home Alliance has adopted an ecosystem perspective on the connected home market, dividing the space into three separate, but related ecosystems: family, career and entertainment. In the fall of 2005, the Alliance sponsored a comprehensive Web survey. Approximately 1,800 online consumer panelists between 18 and 64 years of age participated across the U.S. The sample was divided equally into three separate lifestyle domain or 'ecosystem' tracks: Entertainment, Family and Career. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-60: Mobile Worker IHA Research Pilot
A public work space built specifically to meet the needs of mobile workers—workers who use a PC at least 15 percent of the time and have the freedom to work from home, the office or some 'third place,' is the latest project from Internet Home Alliance to provide real life research learnings. The results found that a mobile work environment was a viable business proposition, increasing the revenue of retailers in the area, prompting the pilot participants to keep the Plano, Texas, test site up and running indefinitely. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-59: Mealtime IHA Research Pilot

According to the results of the Alliance's Mealtime Pilot, an eight-month, real-world test of a connected kitchen solution led by members Whirlpool, Hewlett Packard, IBM, Icebox, Peapod by Stop & Shop and Sears, Roebuck & Co., having broadband Internet access in the kitchen has the effect of bringing family members together and actually increasing the amount and quality of time they spend with one another. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-58: Energy Management IHA Research Pilot

This pilot, which wrapped in November 2001, tested the market viability of a remote-controlled thermostat solution in over 300 homes. Users could monitor and control their home's air-conditioning from any Web-enabled device, including PCs, cell phones and PDAs. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-57: Video Experience Point of Contact

Parks Associates completed eight focus groups, four in Dallas and four in Los Angeles for Internet Home Alliance in July 2003. These groups addressed consumer interest and reaction to the concept of home entertainment servers that will allow the networking of entertainment and PC equipment for the purpose of moving content (audio, video and still pictures) from one output/display device within a home to another. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-56: Subsidized Media and Location Based Advertising Study

Faced with declining consumption of traditional mass media such as newspapers and broadcast television fare, as well as advertising-skipping technologies like digital video recorders, advertisers are seeking new ways to deliver messages to their target audiences. At the same time, current trends in mobile telecommunications and digital media are opening up opportunities for advertisers to deliver custom-tailored messages to audiences in ways that consumers may find more relevant and compelling than advertising designed for the masses. This research effort was designed to yield insights into two such potential advertising formats, subsidized media and location-based advertising. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-55: Safe, Secure and Comfortable Home
Safe, secure, and comfortable – these are words that describe an ideal home. In this research study, the Alliance evaluated a number of home automation concepts designed to deliver on this notion. Participants explored the unifying theme of a home information and control solution that will help home owners by managing and providing information about environment, energy consumption, safety, and security. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-54: Personal Media Storage
Internet Home Alliance commissioned this study with the Aberdeen Group to better understand the role of portable storage products, most notably memory cards, in achieving a fully networked and connected Internet lifestyle. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-53: Web-based Family Calendar User-interface
Web-based calendars provide a way for users to gather information about upcoming personal or business events and present them in calendar form. The main purpose of this project was to identify the relative strengths and weaknesses of three existing Web-based calendars: Yahoo!Calendar, Microsoft's MSN Calendar (part of MSN 8.0), and SimpleDay's prototype calendar. This qualitative research project produced detailed evaluations of these applications and recommendations for developing an 'ideal' product. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-52: Mobile & Remote Worker Needs Assessment
Balancing work and life (family and leisure time) is of paramount importance to consumers. This project will determine, in part, if corporate policies regarding mobile and remote work, along with supporting technologies, can help consumers achieve the kind of balance they desire. The results of this two-phase project will also help segment the market, determine popular drivers and barriers to mobile and remote working, and identify the technology, IT support and environments that would best suit mobile and remote workers. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-51: iPTV Demand Study
Based on an earlier Alliance-sponsored project, the Digital Entertainment Needs Assessment Study, we understood that a substantial percentage of online households want the type of functionality iPTV (Internet

Protocol television) can deliver, including time-shifted TV programming, multi-room viewing options, and the ability to surf the Web while watching broadcast programming. The main purpose of this project was to determine the most appealing features/functions of a hypothetical iPTV service. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-50: Home Networking in a Box

The number of networked homes in the United States is projected to grow to 32.3 million by the end of 2007 from 6.7 million in 2002. Increasing adoption of broadband, multiple PCs in the home, the introduction of connectivity hardware by broadband providers, and improvements in wireless networking performance are factors driving the trend. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-49: Health & Wellness Web Portal Study

It's clear that controlling obesity and the chronic health conditions that come with it is vital to the nation as a whole, both in economic terms and quality-of-life terms. Previous research by Internet Home Alliance on the general health of U.S. families confirmed that many Americans are heavier than their ideal weight, and they chalk it up to three factors: lack of time to cook and eat healthy food, lack of time to exercise, and not enough discipline to exercise regularly. Based on these findings and the nationwide trends in health, Alliance members developed a concept called My Health Port, which combines a set of health data monitoring devices and access to a secure, personalized Web portal. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-48: Health & Fitness Needs Assessment

To assess the most salient consumer needs in the health and fitness area that could be addressed by products or services with a Web component, Internet Home Alliance sponsored a Web survey of 643 single-family, owner-occupied households with Internet access in the U.S. The sample included both primary and mass market consumers. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-47: Digital Entertainment Needs Assessment

As of the beginning of 2005, more than 16% of U.S. households had a broadband connection, multiple PCs and a home network. To the extent that these three components comprise the 'heart' of the connected home, the concept has reached an important milestone. Now, it seems industry players should focus on how to best capitalize on this burgeoning digital infrastructure. The recently completed Digital Entertainment Needs

Assessment study was designed primarily to help companies do just that. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-46: Digital Entertainment Migration

The main purpose of this project was to determine the degree to which digital entertainment enthusiasts have an interest in potential non-entertainment features or functions of the connected home. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-45: Asset Management (RFID) Study

In this study, Internet Home Alliance member companies were interested in investigating consumer response among early technology adopters of an RFID tagging solution for use in the home. Additionally, Alliance members sought to uncover specific needs regarding the use of RFID, and additional application possibilities. This report provides a synposis of the full report available to CABA Internet Home Alliance Research Council members.

IS-2006-44: Managing Serial Devices in a Networked Environment

This paper, published by Lantronix, Inc., describes how remote management of a device can migrate from a dedicated serial connection to access via a local or wide area network running TCP/IP. Such devices are connected to the Internet or to an intranet via a Device Server. Remote terminals can access these devices via Redirector Software or by "tunneling" messages through the network.

IS-2006-43: Web Enabling Non Networked Devices Using JAVA

This paper, published by Lantronix, Inc., describes a method for access and control of remote devices. Such devices are intended for direct serial connection (RS-232 standard). A Device Server adapts the device to TCP/IP and allows access via HTML and JAVA applets.

IS-2006-42: The Freedom of Wireless

This paper, published by Lantronix, Inc., summarizes wireless technologies for local area networks. The IEEE standards for WLAN (Wireless Local Area Network) are presented and compared.

IS-2006-41: Encryption and Its Importance to Device Networking

This paper, published by Lantronix, Inc., presents an overview of cryptography applied to protecting device data while being transmitted on a communications network. The Advanced Encryption Standard (AES) offers the strongest commercial encryption as of 2004. Encryption for wireless transmission and for virtual private networks is discussed.

IS-2006-40: Enabling Business Intelligence with M2M: An Introduction to Device Networking Solutions
The topic of this paper, published by Lantronix, Inc., is networking devices via local area networks using Internet protocols. Such devices may be components of a building automation system. Applications include remote access, diagnosis, and repair, for example, for HVAC systems. A Device Server converts serial device data into Ethernet packets.

IS-2006-39: Intel Developer Forum (Digital Home) & iHollywood Forum Digital Living Room
This report originally published by Gary Saski of Digdia focuses on the Intel Digital Home Group, as presented at the Intel Developers Forum in 2005. Intel is developing chips for PC platforms that can process video including HDTV. Intel is also working with the Digital Living Network Alliance (DLNA) and promote enhanced DLNA features in their products. This report discusses challenges in sending video streams over a home Ethernet and wireless options. The Digital Living Room conference covered ease of distributing audio and video content. Options for purchasing versus subscribing to music are discussed.

IS-2006-38: CEDIA 2005
This paper originally published by Gary Saski of Digdia introduces the CEDIA trade show. CEDIA members serve the upper end of the market. They indicate the direction of digital home products. The 3000 CEDIA members focus on home theater, distributed audio, security, lighting, and HVAC. CEDIA members are moving toward networked applications. Customers of CEDIA installers are demanding the highest resolution HDTV available. Front projection TVs are popular among such customers.

IS-2006-37: A Multicriteria Lifespan Energy Efficiency Approach to Intelligent Building Assessment
This paper by University of Reading scholars presents a multicriteria decision-making model for lifespan energy efficiency assessment of intelligent buildings (IBs). The decision-making model called IBAssessor is developed using an analytic network process (ANP) method and a set of lifespan performance indicators for IBs selected by a new quantitative approach called energy–time consumption index (ETI). In order to improve the quality of decision-making, the authors of this paper make use of previous research achievements including a lifespan sustainable business model, the Asian IB Index, and a number of relevant publications. Practitioners can use the IBAssessor ANP model at different stages of an IB lifespan for either engineering or business oriented assessments. Finally, this paper presents an experimental case study to demonstrate how to use IBAssessor ANP model to solve real-world design tasks.

IS-2006-36: Intellectual Capital and Interoperability

This paper by Cyon Research argues that successful interoperability projects first require an understanding of the ultimate use of the data. They also require the use of capable software tools, sophisticated processes, careful validation, and, guidance from people with expertise and experience in interoperability. Interoperability is not a one-size-fits-all proposition. There are many common use scenarios which require that the product data be treated differently. There are also significant interoperability challenges, including continuing difficulties in translating basic geometric and topological information, complexities in translating semantic information, lack of information on common file formats, limited information content in some file formats, and uncertainty about the needs of the ultimate data user. These challenges can be better addressed by understanding the data.

IS-2006-35: CABA Connected Home Roadmap Summary Report

The Connected Home Roadmap project was initiated by the Continental Automated Buildings Association (CABA) in 2005 to stimulate the evolution of the Connected Home industry. The Roadmap is an assessment of the market today and of the probable short-term evolution of the Home industry. It is intended to provide a framework to support stakeholders and players in this arena as they navigate the complex and shifting dynamics of this emerging market.

IS-2006-34: Glossary of Abbreviation, Acronyms and Initialisms

The paper is a list of acronyms and initialisms with the appropriate descriptions as to the meaning. This reference document was provided by the International Centre for Facilities . It is a suggested use of shortened terms to increase communication efficiency and effectiveness. It is continuously being updated and appears on the ICF Web site at (http://www.icf-cebe.com/). ICF's mandate is to share such information and all recipients are encouraged to send ICF new items, which can be added to the document.

IS-2006-33: Closing the Loop for Full Service Life

The paper, provided by International Centre for Facilities, describes a "process of events", which breaks down each event in a step by step analysis for determining whether buildings or modification costs are (can be) justified well enough in the analysis stage, to confidently make the decision to go ahead with a project or not. It outlines a way to assemble the justification for or against the project necessity.

IS-2006-32: A Mobile Security Solution: Secure and Mobile Communications Across Any Wireless or Wired Network

This paper, provided by Secured Services, is a description of a solution that would eliminate the shortfalls of security, authentication, log-in, and establishing communications via the protocols and systems available at present. This solution would create a seamless, effortless communication vehicle to mobile computer users, whether individual or business.

IS-2006-31: Delivering High-Definition Digital Life-FTTH Community Owned Networks

The paper, provided by Plextal Corporation, is attempting to present an approaching horizon that will, in their perception, cause a panic among consumers when they realize the availability of the Internet information is limited by technology. It presents a solution for increased connectivity to information and entertainment, not as an alternative, but as a must have. The concept presented is sound, the reasoning logical, but the need will be decided by demand.

IS-2006-30: The Intelligence of Intelligent Buildings

This extremely large document is a doctoral thesis written at the Helsinki University of Technology on what constitute an intelligent building. The author defines the Building Intelligent Framework. The thesis reports on an investigation of whether an intelligent office building affects the working environment and the office building market. An encyclopedia-amount of background information is presented. The investigation showed a positive effect of intelligent buildings on the workplace.

IS-2006-29: Performance Based Building: Conceptual Framework

The European Union has funded a study of building design based on required performance, rather than on a prescription of how it is to be accomplished. Validation against desired performance is required. Even prescription-based approaches should include performance goals. US government buildings are required to use performance-based measures. Canadian building codes now include performance goals. Performance goals may extend to the building use, esthetics, and contribution to the environment.

IS-2006-28: Reaching the Unreachable Consumer: Advertising in the Digital Age

According to Parks Associates, advertising must become more relevant because consumers are becoming more likely to change stations to skip ads. Internet advertising is growing at 28 percent compared with 4.8 percent for TV and 1.8 percent for newspapers. Consumers consider Internet advertising more relevant than other media. TV advertising should switch to targeted ads, with user permission, using interactive technology.

IS-2006-27: Making TV Meaningful: Consumers and IPTV Applications
According to Parks Associates, IPTV delivers television programming via a high speed Internet transport. Telephone companies are installing fiber optics to deliver IPTV in order to prevent customers switching telephone services from traditional fixed lines. The author maintains that telephone operators must offer new services beyond price competition to keep customers. Such services include programming choices (such as sports packages) and video-on-demand. Telephone operators may have greater growth potential than cable companies. IPTV may reach 13 million subscribers by 2010.

IS-2006-26: Outlook for Home Management Systems
According to Parks Associates, the availability of installation services will stimulate the growth of home control systems. Such systems include lighting, safety, and comfort controls. The current home controls market is 1 percent of the potential. Home controls system sales are expected to grow at 8-9 percent from $2.2 billion in 2004 to $3.2 billion in 2009.

IS-2006-25: The Future of Gaming is Networked
This paper by Parks Associates describes a booming business in online gaming, including Massively-Multiplayer Online (MMO) games with up to 5 million players per game. The gaming population spans all ages and genders. Gaming is played via PC, game consoles, and cell phone. The future of gaming is predicted to be based on networking the players with revenues reaching $3.5 billion by 2009.

IS-2006-24: Indoor Air Quality and Thermal Comfort in Open-Plan Offices
The paper discusses methods for managing Indoor Air Quality (IAQ) in an open office plan. The purpose is to reduce employee health problems and fatigue. Recommended temperatures and levels of relative humidity are provided. Problems may result from drafts, air contaminants, and elevated levels of carbon dioxide. Personal ventilation systems are discussed.

IS-2006-23: Using Garden Roof Systems to Improve Performance
The benefits of roof garden for buildings in Ottawa, Canada were studied. The gardens can lower heat penetration into the building in the summer and thereby reduce cooling demands. Also, the garden absorbs rainwater, reducing the sudden load on drainage systems during a downpour.

IS-2006-22: BACnet: Not Just a Vision Anymore

BACnet is a communications protocol development for interconnecting building automation products from a variety of manufacturers. Applications include HVAC (Heating, Ventilation, and Air-Conditioning), lighting, security, and utility management. BACnet runs on multiple network types, although BACnet/IP over Ethernet is most widely used. Supporting BACnet are the BACnet Manufacturers Association, BACnet interest groups, and BACnet International. The BACnet Testing Laboratories run the BACnet Interoperability Workshop. Integration with enterprise operations is provided with BACnet web-based tools.

IS-2006-21: High Definition Audio-Video Network Alliance (HANA) White Paper

The HANA consortium has been formed to develop and promote a scheme for networking audio/video (A/V). The goal is to accommodate digital TV, including HDTV, and other digital A/V components. HANA is adopting user interface standards and transmission via an IEEE 1394 network.

IS-2006-20: Nortel Campus Mobile Workers

This paper presents examples of telecommunications services offered by Nortel to mobile workers via a wireless mesh network.

IS-2006-19: Layered Defense Approach to Network Security

This is a marketing presentation for the Nortel approach to communications network security. The company applies security checks at multiple layers in the network with a strategy called Layered Defense. The techniques at each layer are described.

IS-2006-18: Nortel Enterprise Mobility Solutions

This marketing presentation describes the tools offered by Nortel for employees to access the company computer services when away from the office. The system is based on the SIP (Session Initiation Protocol) of the Internet.

IS-2006-17: Secure Multimedia Solution

The paper explains methods for ensure secure communications for users of mobile services when away from the office. The goals are to improve privacy, reliability, and to reduce theft of service and identity. The Nortel Unified Security Framework is described. It was noted that half of the threats originate inside the business.

IS-2006-16: Blueprint for Convergence
This white paper explains the benefit of integrating communications for voice, video, data, and applications. Benefits include cost reduction, improved productivity, and enhanced competitiveness. Step-by-step procedures for analyzing current operations and for planning a transition to a converged system are described.

IS-2006-15: P2P Makeover: Showtime for DRM?
The paper reviews methods by entertainment companies to limit consumers' abilities to copy content. Digital Rights Management (DRM) is discussed as a method to limit copying. It is noted that excessive restrictions can stifle market demand. Peer-to-peer files sharing is used by 20 per cent of online consumers. Plans for attaching DRM to peer-to-peer servers are discussed.

IS-2006-14: Home Builders: Key Channel for Consumer Electronics
Many homebuilders are including consumer electronics in addition to kitchen appliances in the sale of new homes. About 80 per cent of builders are offering products such as security systems, structured cabling, and control for HVAC and lighting systems. As well, 60 per cent of builders are offering multi-room audio systems. Most installations are done by electrical contractors.

IS-2006-13: Internet Protocol Television (IPTV): A Survival Strategy or Revenue Generator to Telcos?
The paper discusses business strategies for telephone companies using Internet delivery of television (IPTV). Telephone companies need to offer packages of programming, not just the communications pathway to the home. They need to offer video-on-demand services that surpass those of cable and satellite operators. The author has identified four market segments: Interact with Me, TV on my Terms, Converge Me, and Don't Bother Me. Telephone companies can capitalize on the image of reliability.

IS-2006-12: Putting the Home Network to Work
As home networks proliferate for broadband access, multimedia, and other home applications, the need for network management, monitoring, and maintenance grows. Challenges facing consumers include viruses, spyware, computer performance, network configuration, and equipment sharing.

IS-2006-11: Wireless VoIP: A Trojan Horse
Voice over IP (VoIP) is lowering the cost for calls and threatening to erode to financial base of voice telephone companies. It will also affect cell phone operators. These operators are now preventing consumers from using the data services for VoIP by limiting the capabilities in the cell phone handset. However, if and when this changes, revenues for operators will fall.

IS-2006-10: Progress Report on Sustainability
This white paper reviews developments in the green-building movement, sustainability in hospitals, schools, and homes, and presents guidelines for state and local green-building laws. LEED (Leadership in Energy and Environmental Design) for existing buildings and commercial interiors are reviewed. A report is cited that shows LEED buildings cost almost the same as non-LEED buildings. Home construction (a $355 billion market for single family homes and $44 billion for multi-family dwelling) represents about 60 per cent of total building construction in the US. The Canadian Green Globes online auditing tools for buildings are discussed.

IS-2006-09: Workstation Design for Organizational Productivity
This paper reports a study by the Canadian government on improvement in employee productivity possible in an open office environment. The following factors were analyzed: acoustics, lighting, air quality and thermal comfort, and workstation design. A study found that 54 per cent of employees are bothered by noise. Giving employees some control of air flow and temperature is recommended.

IS-2006-08: Life Cycle Assessment and Sustainability
The Life Cycle Assessment (LCA) of building materials determines the impact on climate change of the building materials over the life of the building including product disposal. Such an assessment is more than the cost of ownership and operation over the life of the product. Product manufacturers are expected to perform LCA. LCA is more accepted in Europe than in the US. Various tool for computing the LCA of products and systems are presented. Standards are being developed to facilitate LCA. The relationship of LCA to the LEED building rating is discussed.

IS-2006-07: Guidance for Metering in Federal Buildings
The US Energy Policy Act of 2005 requires that advanced electric meters be installed in all federal buildings where feasible. The paper provides guideline for installation by 2012. Such meters must provide at least hourly reads to accommodate time-varying charges for electricity. Other benefits include sub-metering for each tenant,

energy usage monitoring for diagnosis, power quality, response to energy emergencies, and remote access via the Internet. This paper reviews choices for metering features, communications methods, and costing.

IS-2006-06: Living Intelligence in the Enterprise

This paper, by Harbor Research, describes the business benefits of exploiting the computing power in devices so these devices can communicate with each other. The writer calls this "living intelligence" for machine-to-machine communications. A system developed by BT in the United Kingdom for building security is described.

IS-2006-05: Growth Opportunities and Business Models for the Pervasive Internet

The author maintains that the ultimate impact of the Internet has not occurred yet. The "Pervasive Internet" will enable products to be connected to manufacturers who can add value through services over the life of the products. Examples include: the "Solutionist," a company that provides a solution for the customer, not just a product. Concerning home automation, the Eaton Home Heartbeat is cited as such an example. This paper was provided from Harbor Research.

IS-2006-04: Smart Power: Pervasive Internet Technology in a Changing Energy

Smart Power, by Habor Research, explains how electric utilities will improve efficiencies through applications of networking technology. Networks will impact electric generation, transmission and distribution, and usage. These networks support distributed resources.

IS-2006-03: Home Awareness

In this white paper by Harbor Research, the concept and unique features of the Eaton Home Heartbeat product line are discussed. This category of product is a gadget for control. These gadgets use machine-to-machine low data-rate communications via an always-on Internet connection. A typical application is remote sensing of appliance on/off state, such as a space heater.

IS-2006-02: Designing the Future of Information

This white paper, by Harbor Research, introduces two projects that illustrate new uses of the Internet geared toward device-to-device communications. The "Information Commons" from MAYA Design (spin-off from Carnegie Mellon University) seeks to redesign the World Wide Web so data sets that are uniquely identified, can be accessed from multiple sources, rather than the typical single server. "Internet Zero" from the MIT Center for Bits and Atoms is exploring an Internet that accommodates millions of nodes that may be embedded in devices, not formal computers.

IS-2006-01: Four Strategies for the Age of Smart Services
The advent of sensors, microprocessors, communications networks, and the Internet is facilitating service offering to complement product sales. These services enable monitoring of products (typically large capital intensive products) for proper operation and for preventive maintenance needs. Examples of monitoring a commercial HVAC unit and home water sensors are presented. Data gather via a Zigbee network is mentioned. This paper was written by Glen Allmendinger and Ralph Lombreglia.

IS-2005-47: Intelligent Thermostats Save Energy and Give Improved Control Performance
This paper, Bertil Thomas and Mohsen Soleimani-Mohseni, reports on the study and laboratory testing of smart thermostats in controlling HVAC systems. The report concludes that smart thermostats result in energy savings and energy efficiency.

IS-2005-46: Feed-forward in Temperature Control of Buildings
The feed-forward control system is described as providing efficiency advantage over the general feedback control system, as it compensates more quickly to disturbances in small buildings. This report, by Bertil Thomas, Mohsen Soleimani-Mohseni, Per Fahle, provides a description of the lab test and its findings.

IS-2005-45: Leed is Broken ... Let's Fix It
This paper, by Auden Schendler and Randy Udall, reviews the original objectives of the LEED certification program, reports on its performance and concludes that improvement is required. One of the concerns focuses on the cost of certification or that going green is not expensive. The paper does suggest that the remarks are the ones of the authors and that a second opinion is recommended. Nevertheless, the report provides an insight on the value of certifying buildings.

IS-2005-44: Neural Network Models for Predictive Climate Control in Intelligent Buildings
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, deals with the problem of identifying black-box prediction models for indoor climate control in intelligent buildings.

IS-2005-43: A Study of Demand-Controlled Ventilation and Constant Air Volume Systems
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, deals with the study of the demand-controlled ventilation systems and the need for a constant volume of replacement air when purging in-building pollutants. The study shows that demand-controlled ventilation, using a feedback system, requires less integrated outdoor air flow in order to maintain an accepted air quality.

IS-2005-42: Neural Networks for Self-Tuning of PI- and PID-Controllers
This paper, by Mohsen Soleimani-Mohseni and Bertil Thomas, demonstrates how neural networks can be used to estimate parameters of PID-controllers for different classes of dynamic processes.

IS-2005-41: Insteon, The Details
The Insteon report, although product focused, suggests that the automation of homes will become a major industry in the years to come. From a technical viewpoint, the paper describes the networking, signaling requirements, radio frequency and Powerline carrier applications used in automated systems. The paper, originally published by Smarthome Technologies, enforces the need for simplicity of implementation and use. In addition, the paper suggests a future vision in automating the homes for entertainment, utilities and environment controls.

IS-2005-40: Modelling and Intelligent Climate Control of Buildings
The main purpose of this paper, a reprint of Mohsen Soleimani-Mohseni's doctoral thesis, is to examine the possibilities of different indoor climate control techniques, feed-forward control and demand-controlled ventilation, together with intelligent technology to improve the indoor climate and/or the energy efficiency of buildings. A large portion of the paper focuses on developing mathematical models for the prediction of the indoor operative temperature using linear models as well as non-linear artificial neural network (ANN) model. The different controllers used in indoor climate control are also investigated in this paper.

IS-2005-39: Green Value Report
The Green Value, Green Building, white paper draws the attention to the marketplace that intelligent (green) buildings are healthier places to work and live, in addition to using fewer non-renewable resources, produces less waste and air emissions and, cause less disturbance to site ecology.

IS-2005-38: Intelligent Building Index Version 2.0
The Intelligent Building Index Version 2.0 (IBI2.0), authored by Dr. Wong, Dr. So and Prof. Leung, provides a model for the rating of intelligent buildings. It summarizes the mathematical evaluation criteria and focuses on rating 10 elements, which are themselves sub-divided in numerous features and facilities with their individual rating weight. This paper is a detailed reference of a rating scheme and is a good reference to better understand the rating practices of an intelligent building.

IS-2005-37: Wireless Networks in Building Automation Systems
The Wireless Network in Building Automation Systems white paper by Siemens Building Technologies addresses the potential interference with IEEE 8012.15.4 devices in the presence of IEEE 802.11b. Since most of the wireless networks occupy the unlicensed 2.4GHz band, interference between them can occur while in close proximity. Avoidance procedures and testing methods are discussed.

IS-2005-36: Building–IT Convergence – What Next?
This paper, published by Clasma Events Inc., covers the driving forces, trends, predictions on how our lives will change as the convergence of technology takes place in buildings globally. The paper highlights four aspect of technology with potential impact: i) the affects of introducing internet as a technology enabler, ii) the changes that convergence will bring to the stakeholders of the industry, iii) the changes to the marketing of building and, iv) the interaction of these forces and the possible consequences.

IS-2005-35: Global Optimizing Systems (GOS)
The Global Optimizing Systems (GOS) paper, by Shariar Makarechi of the Georgia Institute of Technology, focuses on the implementation of automation systems in buildings to derive financial benefits in related maintenance. The research paper supports the feasibility of real time monitoring of global automation systems and suggests that with the Web-based solutions at our disposal, cost saving technology, which has been evolving for the last 20 years, can now be easily implemented.

IS-2005-34: The Intelligent Home Index
The Intelligent Home Index paper, Version 1.0, originally published by the Asian Institute of Intelligent Buildings, focuses on the rating of an intelligent home and provides for the division of the elements into three levels: the building provisions, the building management and the user level. Each of these categories is then sub-divided in a multitude of supporting features and facilities with a rating weight relative to their importance.

IS-2005-33: On the Quantitative Assessment of Intelligent Buildings
This paper, by Albert T.P. So, and K.C. Wong, recommends a new approach to define intelligent buildings. It calls for a two-level strategy to define intelligent buildings. There are nine Quality Environment Modules (QEMs) and underneath each one, there are a number of elements. In addition, there are features or facilities to consider and these can be classified as functional requirements, functional space, and technology. Although the paper focuses on Asian definition, it suggests that the approach can be applied around the world.

IS-2005-32: A New Definition of Intelligent Buildings for Asia

This paper, by Albert T.P. So, Alvin C.W. Wong and K.C. Wong, attempts to create a definition of intelligent buildings for Asia. It provides a detailed explanation of the process required to define a building as intelligent as specified by the Asian Institute of Intelligent Buildings.

IS-2005-31: Life-Cycle Costing: Fundamental Estimating Issues

This document provides an overview of the process of determining life-cycle cost. It outlines techniques that simplify economic assessment of design alternatives including estimating procedures for project costs such as energy, maintenance, repair, and replacement. The report also provides a brief analysis of evaluating economic performance of investments. The following report was provided, under the IIBC Life-Cycle Cost (LCC) initiative, by Reed Construction Data/RSMeans as Phase I of the project.

IS-2005-30: CABA Consultant Report on Life Cycle Costs

This document summarizes the finding of a study to assess the incidence of highly integrated buildings in the U.S. and to determine typical life-cycle cost considerations when constructing fully integrated buildings. The report also provides the result of an extensive research of both new and existing projects to determine the level of integration in buildings. The following report was provided, under the IIBC Life-Cycle Cost (LCC) initiative, by Reed Construction Data/RSMeans as Phase I of the project.

IS-2005-29: Why are our Buildings so Dumb?

In this white paper, Tom Lohner, P.E. of Teng Solutions argues: "Its time to get our industry to step up to the plate and quit wining about how we are losing our edge to our foreign neighbors. This is not rocket science but the application of common sense and good design and construction practices - albeit - different than our current standard practices. We have found the need for a Chief Technology Officer (CTO) in our internal businesses; it is time to secure the services of a professional that can serve in this capacity for our buildings."

IS-2005-28: The Building Commissioning Guide

The Building Commissioning Guide, published by the U.S. General Services Administration, provides the overall framework and process for building commissioning from project planning through tenant occupancy, keys to success within each step and the ways that each team member supports the process of commissioning. The primary audience for this Building Commissioning Guide is GSA's project managers, their construction management agents, and the commissioning agent. The secondary audience for this Guide includes the many stakeholders in the commissioning process including customer agencies, the balance of the project team, other members of government, as well as GSA's partners.

IS-2005-27: Benefits of Element Management Systems in FTTP Networks
This paper, published by Alloptic, explores the management challenges and opportunities associated with fiber-to-the-premise (FTTP) networks and the strategic role of related Element Management Systems.

IS-2005-26: Advanced Controls & Sensors Workshop Report
On June 11, 2003, representatives from universities, federal, and state government agencies, U.S. Department of Energy (DOE) national laboratories, and the private sector attended a one-day workshop in Washington, DC. The objective of the workshop was to obtain review and input of DOE's assessment of the market for advanced controls technology and potential R&D pathways to enhance the success of advanced controls in the buildings market place. This paper , originally published by the U.S. Dept. of Energy & Pacific Northwest National Laboratory (PNNL), provides a synopsis of the proceedings.

IS-2005-25: Advanced Controls & Sensors Workshop Report
This document, originally published by the U.S. Dept. of Energy & Pacific Northwest National Laboratory (PNNL), provides a market assessment of existing building sensors and controls and presents a range of technology pathways (R&D options) for pursuing advanced sensors and building control strategies. This report is a synthesis of five white papers, each devoted to either the market assessment or the identification of R&D options to expand the market, and resultant energy savings, from advanced building controls and sensors.

IS-2005-24: Building Trust for Embedded Systems Starting at the Platform Foundation
Layer Security is becoming an essential requirement for all computing devices as we begin to trust and rely upon them to control our environments and protect our information, identity and ultimately our lives. This paper from Certicom discusses the importance of ensuring the reliable operation of devices that include computing features and firmware and/or software. The Trusted Computing Group (TCG) initiative is focusing on a secure computing framework. Techniques for establishing trust are discussed.

IS-2005-23: The Future Success of VoIP – It's All About Timing
This paper from Symmetricom presents a technical comparison of conventional circuit switched telephone service and packet switched voice telephony. The latter is now called Voice –over-IP (VoIP). Technical issues include timing errors due to transmission delays through the Internet and buffering at network routers. Methods for measuring time delays and establishing synchronization across the Internet are discussed.

IS-2005-22: Is There a Market for Wireless Automation, Telematics & M2M?
In the context of this white paper from Informa Telecoms & Media, telematics, telemetry and machine-to-machine (M2M) communications and systems are all considered to form part of wireless automation. This paper addresses applications of wireless technologies for telemetry and machine-to-machine-to-machine communications. This paper describes many of the new narrowband and wideband technologies and how each of them can be competitive and complementary, depending on needs and requirements of groups of end users. Each can be used alone or in combination with others to produce the desired end results, and each will offer special advantages in different circumstances.

IS-2005-21: Creating New Value with M2M Solutions
This paper, co-written by Harbor Research and e-principles discusses the business potential for machine-to-machine communications. Such communications are enabled by a combination of embedded intelligence in devices and pervasive networks to interconnect these devices. Three levels of applications are defined: remote device monitoring, automated device management, and enterprise-wise integration.

IS-2005-20: Optical Wireless: Secure High-Capacity Bridging
Today's economy depends on the transmission of data, voice and multimedia across telecommunication networks. Optical networks represent the ideal medium for high-bandwidth communications. There are two distinct types of optical communications: fiber optics and optical wireless based on Free-Space Optics (FSO) technology. This paper from LightPointe outlines how optical wireless complements fiber optics in metro networks and local area networks (LANs) to meet projected bandwidth needs with considerably less expense and faster deployment.

IS-2005-19: Development and Evaluation of Fully Automated Demand Response in Large Facilities
The Public Interest Energy Research (PIER) Program, managed by the California Energy Commission, commissioned Lawrence Berkeley National Laboratory to develop this report. LBNL conducted trials of technologies for businesses to reduce electricity consumption in response to automatically issued requests in the form of price signals from a utility. Results of the test are presented with recommendations for further research.

IS-2005-18: The American Digital Dream
The Internet Home Alliance commissioned market research among new home buyers to determine their interest in connected home technology, their sources of product information, and criteria for purchases. Technologies preferred by consumers were structured wiring, intercom systems, distributed audio, central vacuum cleaners,

and home security. The survey identified improvements needed in the selling process and recommended technology choices, financing options, and certified installers.

IS-2005-17: Understanding the Shifting Demand for Home Networks

The writer observes the demand for home networks is slowing. Only about 10 per cent of broadband households without network say they want one and 5 per cent are likely to install one. The initial surge in demand was generated by early adopters; future demand must be stimulated using a push marketing strategy through incentives and subsidies. This topic paper from The Diffusion Group discusses (1) why demand for home networking is declining, and (2) the implications of this decline to vendors and service providers.

IS-2005-16: The Digital Home: Is It Really Here? You're Kidding, Right?

The term "digital home," has become a seemingly boundless concept that has been expanded to include everything from Internet-connected refrigerators and talking toasters to robots that wash windows on command. Before we can engage in a meaningful dialogue about the nature of the "digital home," we need to define our terms. This paper from The Diffusion Group offers a definition and it also demonstrates that the demand for the digital home is reaching critical mass. Some recommendations for vendors focused on the growing market are also included.

IS-2005-15: The Top Seven Intelligent Communities of 2005

Each year, the Intelligent Community Forum selects communities from around the world to appear on a list of the Top Seven Intelligent Communities of the Year. This paper describes the criteria for judging successful penetrations of Internet access in cities worldwide. The top seven communities for 2005 are named as outstanding for adoption of Internet access to serve citizens individual and community services.

IS-2005-14: Analysis of System Strategies Targeting Near-Term Building America Energy-Performance Goals for New Single-Family Homes

This report from National Renewable Energy Laboratory (NREL) describes an analytical method for reducing whole house energy consumption 50% by 2010 and 90% by 2019. The benefits focus on the impact on housing and on peak energy demand. About 20% of energy savings is eventually expected to be derived from onsite power systems. The analysis involves a tradeoff between equipment costs amortized in a mortgage loan versus utility bills with the goal of minimizing total annual costs. Software is described for performing such tradeoff calculations using a sequential search among component choices.

IS-2005-13: Smart Power: Pervasive Internet Technology in a Changing Energy Market
Deregulation and demand for smart and efficient power have driven technology innovation in the power venue, particularly in distributed resources (DR) technology. This paper from Harbor Research outlines advantages for utilities in networking distributed resources. The author notes that many utilities will need to upgrade facilities soon and should include provisions for networking. Benefits to various utility functions ranging from generation to transmission and distribution to customer services are discussed.

IS-2005-12: Product Pedigree May Be the "Killerest" of Apps
Tracking the pedigree of product components is not a new idea. Traceability has been an essential part of quality assurance for a long time, and is built into the ISO 9000 family of quality standards. But even with the advent of vast desktop computing power, tracing product pedigree has remained a labor-intensive and error-prone process. That's all about to change as we enter the era of smart, connected products- the Pervasive Internet era. This paper from Harbor Research outlines an example of applying device-to-device communications to improve the tracking of processed food through the supply chain.

IS-2005-11: Home Awareness
The term "convergence" implies unification, but you wouldn't know it from today's home technology market - a fragmented landscape full of narrow point solutions, time-sink gadgetry, entertainment obsession, and software/platform incompatibility. In this paper from Harbor Research they present the HomeHeartbeat™ from Eaton as an example of an inexpensive, wireless, intuitive, and useful product with a different approach to the market.

IS-2005-10: Connecting To Your Future: The Networking of Every Manufactured Thing
This research study overview from Harbor Research describes their recent study focused on challenges faced by manufacturers as they move to adopt the next-generation technologies of the real-time enterprise. The study offers a portrayal of the adoption climate, technology issues, business models, and opportunities arising from the convergence of device networking, wireless sensors, machine-to-machine (M2M) communication, and the Internet. The author states that companies with network products will win in the marketplace.

IS-2005-09: Centralized Telecommunications Rooms Offer Economy, Security, Serviceability
Changes in the services delivered over cabling infrastructure in Multi Dwelling Units (MDUs) such as high-speed Internet access and digital High-Definition Television (HDTV) have led to changes in building design and construction. This paper from InfiniSys Inc. presents a proprietary technology, FTTA™ (Fiber to the Apartment) for

installing small-diameter conduits in apartment buildings. These conduits are then filled with fiber optic and CAT 5e cables for delivery of command and control, telephony, data, and video services.

IS-2005-08: Caveat Emptor

"Let the Buyer Beware" applies especially to Real Estate transactions. While most commercial are used to physical inspections, the information age presents new challenges that the inspector may overlook. This paper from InfiniSys Inc. presents methods for assessing the quality and usefulness of cabling systems installed in buildings. These techniques are intended to guide purchasers of multiple dwelling unit buildings. Issues that affect the installation are age, location of demarcation point between service provider and building owner, and accessibility of the cables. Building owners might add a "technology fee" to the rent for recovering upgrade costs.

IS-2005-07: CA*net 4 Research Program Update -UCLP Roadmap

CANARIE Inc. is a not-for-profit corporation supported by its members, project partners and the Federal Government. CANARIE's mission is to accelerate Canada's advanced Internet development and use by facilitating the widespread adoption of faster, more efficient networks and by enabling the next generation of advanced products, applications and services to run on them. This document describes how User Controlled LightPath (UCLP) software (developed for CANARIE to manage geographically distributed optical and SONET/SDH cross connects and switches) using web services and workflow can be incorporated with IP routed networks to provide more user control over data flows and queue management. The paper lays out requirements for new features and enhancements to the current implementations.

IS-2005-06: Intelligent Building Operating Technologies

The prevalent practice in the building industry is to spend the minimum on operation and maintenance. The result of this approach is that most buildings have problems that are unknown to the operator and there is no easy way to identify them. This leads to the vicious cycle where building operators are not aware of problems that waste energy, consequently nothing is done to correct them. This paper, developed by CANMET Energy Technology Centre - Varennes, Quebec, a department of Natural Resources Canada, proposes an efficient solution to break this vicious cycle: the use of Intelligent Building Operating Technologies to continuously diagnose equipment problems, provide performance reports and allow the operator to optimize the operation of the building.

IS-2005-05: Open Systems for Homes and Buildings: Comparing LonWorks and KNX

This white paper from i&i Limited traces the origins of LonWorks from Echelon Corporation and European Installation Bus (EIB) - now the mainstay of Konnex (KNX) - originally developed by Siemens. The paper examines their impact in one particular market: home and building electronic systems. Both systems support

communications over twisted-pair wiring and power line carrier, but with different data rates. The scope of the study is limited to the application area of KNX: LonWorks is used in a much wider range of applications. The standards and trade association activities of both groups are discussed.

IS-2005-04: ABC's of Home Networking

In its new report, "Worldwide Home Networking 2004-2008 Forecast and Analysis," IDC expects home network households to grow 25 percent to 111 million by 2008. And according to DLNA (Digital Living Network Alliance), research predicts that 52 percent of online households in America will have home networks by 2008. This guide from DSL Forum focuses on explaining the basic components users will need for this home networking explosion, and highlights the various services and applications that users will enjoy with a home network. Applications described include printer and file sharing, telecommuting, multi-player gaming, entertainment, and home automation.

IS-2005-03: A Full House (FTTH) Beats HFC Every Time

The paper by Michael Bowers of Icon Broadband Technologies presents introductory material about fiber optics to the home (FTTH) and hybrid fiber/coax (HFC) distribution. The capacity of fiber optics is generally limited by the electronics at the ends of the fiber. Video is generally frequency modulated when carried on fiber, although some new systems are carrying video as IP packets. FTTH costs are now comparable to HFC, while FTTH offer greater capacity. FTTH will gradually supercede HFC.

IS-2005-02: If You Build It… Will They Come?

An important cost factor in FTTH is the number of homes connected to the fiber and the number of customers who buy services. The customer "take rate" depends on competition and marketing. This paper from Michael Render, President of Render. Vanderslice and Associates presents the case for incumbent telephone companies to install FTTH to offer video services or risk losing customers to other service providers. Successful efforts to influence, measure, model, and forecast FTTH take rates will have a profound impact on the speed at which FTTH proliferates.

IS-2005-01: Solving the "Messy Network" Problem

The M2M industry is predicted by Harbor Research to reach $650 billion in revenue by 2010. This paper from nPhase focuses on the data communications component of M2M describing the challenges of machine-to-machine communications via wireless transmission utilizing cellular telephone networks. Issues include security, routing, and packet format. The paper recommends a particular commercial solution.

IS-2004-56: Focused Solutions to Complex Wired Community Transaction Issues

This paper outlines the business opportunity and legal challenges of pre-wiring a residential communication with fiber optics to each home. Important issues and challenges include mandatory subscription, competitor access, capital structure and return on asset, entity structure, service quality and carrier performance, default and remedies, and implementation. The author, Lawrence Freedman of Fleischman and Walsh, L.L.P, states that this market offers "tremendous potential for growth."

IS-2004-55: Defining 10-Foot Gaming Requirements for the Entertainment PC

The Entertainment PC is intended for use at a TV distance of 10 feet. This paper, submitted by Intel Corporation provides guidelines to developers of services, such as gaming, intending to use the Entertainment PC. The target display device may be a new digital TV or a traditional analog TV with lower resolution. Some technical issues include image size, aspect ratio, range of colors, contrast, viewable screen area, remote control unit, audio playback, and CD vs. DVD distribution. Developers are encouraged to create the same gaming software that run on both traditional PCs and Entertainment PCs.

IS-2004-54: VLAN Best Practices

This technical paper, intended for installers and managers of Virtual Local Area Networks (VLANs) was provided by Fluke Corporation. A VLAN allows devices distributed throughout a building to appear logically as if they were located on one LAN. Devices in a particular VLAN are identified by using a particular IP port number, a particular communications protocol, or by MAC address. IEEE-802.1Q is a standard that supports VLANs.

IS-2004-53: Designing Smart Environments: A Paradigm Based on Learning and Prediction

This paper presents an overview of the potential of home automation. It also introduces the MavHome (Managing an Adaptable Versatile Home), a research project at the University of Texas at Arlington. Sensor data is collected and processed by intelligent agents (computer algorithms). These agents can deduce the occupant's movement within the house, and deliver services where appropriate, thereby saving energy.

IS-2004-52: Learning to Control a Smart Home Environment

A future home run by computer-based agents is envisioned. These agents collect and process data from sensors throughout the house looking for meaningful patterns. The researchers simulated sensor data generation to test the algorithms. Trials of MavHome (Managing an Adaptable Versatile Home) are being run in a laboratory (MavLab) and in an apartment (MavPad) at the University of Texas at Arlington.

IS-2004-51: Smart Homes

First in a series of papers from the Department of Computer Science and Engineering at the University of Texas at Arlington, this paper introduces the MavHome (Managing an Adaptable Versatile Home) research project. An intelligent home uses inputs from sensors to operate home automation systems in order to create a comfortable and efficient environment. The intelligent system is based on physical devices, communications networks, data collection, and automatic decision-making. The decision algorithms seek patterns from the sensor inputs.

IS-2004-50: The Digital Future Report: Surveying the Digital Future

This report from the University of Southern California "explores how the Internet influences the social, political, and economic behavior of users and non-users." About 75 percent of those surveyed used the Internet for an average of 12.5 hours per week in 2004. Email and Web surfing were the top uses. Sixty percent of those who have stopped using the Internet say they do not miss it. There is growing skepticism of the reliability of information gleaned from the Internet. There has been a slight increase in on-line shopping over four years. Seventy-five percent of parents are not concerned about the time spent by children on line. Almost two-thirds of those surveyed accessed health information via the Internet. Eighty-eight percent are concerned about on-line privacy.

IS-2004-49: Ultra Broadband Access, Unleashing the Power of PON

This paper, provided by Nortel Networks discusses deployment of PON (Passive Optical Networks). Local telephone companies are considering methods for offering "triple-play" services (voice, Internet access, and video services). The latter is a challenge because telephone companies do not have broadband capabilities comparable to cable. They are planning to overcome this with PON. Multiple PON technologies such as Broadband PON (BPON), Gigabit PON (GPON), and Ethernet PON (EPON) currently exist or are near standardization, and multiple deployment models are possible. The paper describes many of the decision criteria that must be considered when deploying PONs such as time to market, technology maturity, system availability, operational considerations, video compression performance, service requirements, engineering rules, and business impacts.

IS-2004-48: Consumer Broadband: The Path to Growth and Profitability

This paper, provided by the Internet Business Solutions Group (IBSG) of Cisco Systems, Inc discusses the business opportunities associated with providing broadband services. The paper surveys the state and growth prospects for broadband-based communications. Broadband customers were found to use more services, some of which could be sold as value-added services (services beyond flat monthly rate for connection). Some providers are bundling multiple services to reduce customer churn. Broadband voice communications (VoIP) will drive out switched networks. The paper concludes that communications companies should not offer content, but rather a range of communications services: voice, video, and Internet access.

IS-2004-47: The Municipal Role in U.S. FTTH Market Growth
This white paper provided by the Communications Futures Program of the Massachusetts Institute of Technology discusses opportunities for municipalities to foster a market in fiber optics to homes. Municipalities accounted for 32% of FTTH installations in 2003. While telcos will be installing FTTH in some areas, municipalities will remain important market drivers for Fiber-to-the-Home (FTTH) deployment. Municipalities that operate utilities are likely candidates. State laws that burden municipal entry into communications are effective at discouraging it, suggesting that the March 2004 Supreme Court ruling (Nixon vs. Missouri Municipal League) will constrain growth in the FTTH market.

IS-2004-46: Net Gain: Advancing the Market for Home Technology
The purpose of this paper, submitted by the Internet Home Alliance is to provide a clear overview of the home technology integrator channel and to recommend steps industry players can take to improve it. Fifteen organizations were studied as providers of certification for integrators. Currently, there are approximately one million integrators in the U.S. only with one percent certified.

IS-2004-45: TEAHA Market Background Document
This market background document was produced by Homega Research in the framework of the TEAHA (The European Application Home Alliance) Project and was funded by the European Commission (IST Programme) It encompasses a marketing survey of past, present, and future connected home applications. This paper provides a foundation for a market analysis of the connected home. Three factors influencing this market are the environment (technological, economic, and public policy), product and services offerings, and customer demand including price sensitivity.

IS-2004-44: Big Broadband: Public Infrastructure or Private Monopolies
Wayne Caswell recently returned from an Economic Summit in Loudoun, VA, where he was invited because of a paper he wrote earlier this year: "Reviving the FORGOTTEN Information Superhighway." The summit expanded his thinking about the role of government in telecommunications policy and led to an invitation to speak at Austin InnoTech, a regional conference and exhibition with focus on the mutual relationship between technologies and nnovation. This newer paper summarizes and expands on that presentation, which was called "Fiber, Wireless and Bandwidth for TeleWork."

IS-2004-43: Are You Ready for the Audience of One?
Home media networks (HMNs) are poised for explosive growth and will radically alter the home entertainment market, making the consumer an "audience of one" for on-demand digital multimedia content. This paper, from Booz Allen Hamilton Inc. discusses the business prospects for home media networks supporting video, audio, digital photography, and gaming. Distributed media centers, including storage outside the house are presented. Advertisers will be challenged by consumers spending time viewing digital photos and listening to music rather than watching TV with commercials.

IS-2004-42: The Case for Broadband Wireless Connectivity
This white paper from Proxim Corporation, explores the options open to executives and networking professionals in public and private enterprises who seek high-speed building-to-building connectivity solutions for their campuses and remote locations, but who are also constrained by real-world budgets. It reviews the most popular leased line options including DSL, T1/E1 and fiber optic cable, as well as wireless LANs. And it delineates the advantages of broadband wireless connectivity, a solution that is finding greater acceptance due to its high capacity, ease of installation, and low cost.

IS-2004-41: Voice Over Wi-Fi Capacity Planning
As voice-over-Wi-Fi emerges as a productivity-enhancing wireless application in the enterprise, the requirements placed on Wi-Fi infrastructure deployment planning increase from simple coverage and throughput considerations to detailed capacity planning. This paper from Proxim Corporation proves that the number of non-overlapping channels in a wireless network is the key determinant of the total capacity of a network that carries voice traffic.

IS-2004-40: The Smart, Affordable Way to Build Network Redundancy
Most medium to large-scale businesses, and virtually all large organizations, have some sort of disaster recovery plan. For many, that plan begins and ends with data backup; for others, it includes remote failover servers. But, fewer businesses have plans in place to protect their network connectivity. This is a mistake that can result in hundreds of hours of downtime with unacceptable real-dollar costs. This paper from Proxim Corporation presents a case for using broadband wireless technology as a backup for a wired link to support a business.

IS-2004-39: NAIOP Terms and Definitions: U.S. Office Market
The National Association of Industrial and Office Properties (NAIOP), the Forum for commercial real estate, developed this document of terms and definitions as a standardization project that would define selected office

real estate terms commonly used by owners, brokers, and others in their day to day business operations. The general perception within the industry is that a standardization of terms and the resulting transparency of information may contribute significantly to increased capital flow, improved liquidity and enhanced credibility for the industry at large.

IS-2004-38: Monitoring your WAN - When, What and How
This paper from Fluke Networks makes the case for a network manager to measure the performance of a wide area network delivering network access to a company. Network managers often assume that the network vendor is supplying the promised service. The paper will help calculate the value of link monitoring as well as help you calculate the total cost of downtime.

IS-2004-37: Connecting Devices with Web Services
Digital devices are moving from the domain of the tech-savvy to the hands, purses and pockets, homes, and cars of mainstream consumers and knowledge workers. This paper from Microsoft discusses how Web services, the cornerstone to overcoming the challenge of software and business integration, provide a consistent way to exchange information within home networks, corporate intranets and across the Internet, spanning heterogeneous environments.

IS-2004-36: Converged Applications and Enhanced Services Market Study
Converged applications, in the form of products and services, unite telephony and voice over IP (VoIP) networks with data products and services, like email, database, and customer relationship management (CRM) applications. This paper from CompTIA explores customer knowledge and acceptance of converged services. The motivation is primarily cost saving and network integration. Most companies expect to purchase converged services from a "value-added solutions provider."

IS-2004-35: Internet-Based Video Services
Cable companies, telephone companies, and others are seeking revenue from the delivery of movies to consumers. One option is packet delivery via the Internet. This paper from Parks Associates describes key issues and impediments to growth including bandwidth limitations, especially of DSL, and licensing restrictions imposed by content producers.

IS-2004-34: Electronic Signage Networks (ESN) as Killer App
An Electronic Signage Network (ESN) provides the means for real time environmental monitoring and information display that are critical elements of Homeland Security. With the growing commercial capacities of electronic

displays, Wi-Fi, narrowcasting, kiosks, satellite transmission and mobile display devices, ESNs that comprise these elements are key to public safety and community information infrastructure. This paper from Apogee Partners describes how public safety and commercial success can be achieved through Electronic Signage Networks and kiosk systems.

IS-2004-33: An Introduction to Wireless Mesh Networking
Wireless networks provide unprecedented freedom and mobility for a growing number of laptop and PDA users who no longer need wires to stay connected with their workplace and the Internet. This paper from Firetide, Inc., describes how wireless mesh networks can offer a breakthrough approach that enables making the leap from localized HotSpots to fully wireless HotZones with building-wide or campus-wide coverage and even HotRegions that span an entire metropolitan area.

IS-2004-32: Integrated Service Delivery: The 21st Century Business Model
We have gone from a product-driven business model to a customer-driven corporate structure. This paper, written by Paul Greenburg and provided by Indus Corporate Marketing explains the Enterprise Value Chain (EVP) as the basis for a services-delivery model. EVP includes collaboration among employees, partners, and suppliers. An Integrated Service Delivery model enhances customer relationships by focusing on service delivery, rather than service shipment. Revenue is generated through terms in Service Level Agreements.

IS-2004-31: Ultra-Wideband (UWB) Technology: Enabling High-Speed Wireless Personal Area Networks
Wireless connectivity has enabled a new mobile lifestyle filled with conveniences for mobile computing users. Consumers will soon demand the same conveniences throughout their digital home, connecting their PCs and other digital electronic in a wireless personal area network (WPAN) in the home. This paper from Intel Corporation describes how Ultra-wideband (UWB) technology offers a solution for the bandwidth, cost, power consumption, and physical size requirements of next-generation consumer electronic devices.

IS-2004-30: Wireless USB - The First High-speed Personal Wireless Interconnect
The Universal Serial Bus (USB), with one billion units in the installed base, is the most successful interface in PC history. Wireless USB will build on the success of wired USB, bringing USB technology into the wireless future. This paper, written by Intel Corporation, describes the Wireless USB specification that is being defined as a high-speed host-to-device connection including the targeted audience, the technology and future plans.

IS-2004-29: Electronic Systems Technicians: Estimates of Occupational Employment & Projections of Future Demand

This report from the Electronic Systems Industry Consortium presents the results of analysis performed on information available from both primary research and from secondary public data sources. The focus of this analysis was the Electronic Systems Technician occupation, a fast-growing and rapidly-evolving job category of interest and importance to a large number of U.S. employers and training institutions. The technicians provide cabling infrastructure for homes and or commercial buildings, signaling devices, signal controllers, and devices for mechanical and electrical control.

IS-2004-28: Games-on-Demand: the Reality and Future

As of 2003 there were about 110,000 customers for PC games and two million by the end of 2007. This paper written by Yuanzhe (Michael) Cai, Analyst for Parks Associates categorizes PC games as online browser-based, online non-browser-based, sales via downloads of the complete games, partial download + online play. 50% of the core gamers are interested in games-on-demand. Some retailers don't want competition for downloads of games upon initial market release. Game console makers have little motivation to use the web for software distribution.

IS-2004-27: Judo Lessons for Wireless ISPs

Parks Associates anticipates that by 2008, more than 2 million U.S. households will be using services based on unlicensed broadband wireless (UBW) technologies, including Wi-Fi, proprietary technologies, and the upcoming WiMAX standard. Such an accomplishment, however, is contingent on the Wireless Internet Service Providers (WISPs) ability to create and execute successful competitive strategies. This paper written by Yuanzhe (Michael) Cai, Analyst for Parks Associates proposes business strategies for WISPs to gain market share of broadband Internet access without incurring crushing competition from telephone and cable companies.

IS-2004-26: Home Entertainment Automation Using UPnP AV Architecture and Technology

This paper written by Edward Steinfeld, Embedded Computing market Consultant, presents an overview of the UPnP Audio Visual (AV) specification and unique functions, followed by a description of the UPnP functions and protocols. The UPnP AV specifications define a set of UPnP device and service templates that specifically target home environments with consumer electronic (CE) equipment such as TVs, VCRs, DVD players, stereo systems, MP3 players, and PCs. The key elements are a media server, a media player (also called a renderer), and a control point for selecting the content and managing the networked devices.

IS-2004-25: XML Web Services Security: Learning From Application Security Disasters

Adoption of Web Services technology promises potentially great benefits, but like most new technology adoption, there are also serious questions about new information security risks. This paper, written by John Sebes of

Integral Security Consulting, presents methods for protecting data that is encoded in a database using XML, and transmitted using SOAP via the Internet. Recommendations are provided for data encryption, user authentication, validated code packets, and checking queries into a database.

IS-2004-24: GridWise Standards Mapping Overview

"GridWise™ is a concept of how advanced communications, information and controls technology can transform the nation's energy system—across the spectrum of large scale, central generation to common consumer appliances and equipment—into a collaborative network, rich in the exchange of decision making information and an abundance of market-based opportunities" (Widergren and Bosquet 2003). To support this effort, Pacific Northwest National Laboratory, developers of the GridWise concept, has surveyed relevant official standards and specifications developed by consortia in the fields of home and building systems, information technology, market trading and economics, energy, and industrial systems that could ultimately contribute significantly to advancements toward the GridWise vision.

IS-2004-23: XML Web Service in Utility Automation

Software vendors and IT departments in the "business" community have adopted the Simple Object Access Protocol (SOAP) and XML Web Services paradigm as the de facto standard for loosely integrating computing systems. Utility company automation system managers, managers charged with the task of maintaining a reliable power grid, are beginning to recognize the benefits of loosely coupled system integration. In this paper, originally published in the March/April 2004 edition of Electric Energy T&D Magazine, Gridlogix describe how XML Web Services, a standards-based integration technology, will allow system managers to leverage existing monitoring and control systems and rapidly integrate them with new automation technologies and external business applications.

IS-2004-22: Content Control for Wireless Data

Content Control presents yet another opportunity to Service Providers to drive new revenue streams, as subscribers are now demanding content for their wireless devices. It also presents an opportunity to provide value-added services that will help reduce churn and build customer loyalty. In this document, Bridgewater Systems discusses Content Control for wireless data services, content opportunities that exist for Service Providers, and how Content Control is achieved.

IS-2004-21: Reliable Wireless Networks for Industrial Systems

This paper from Ember Corporation details both theory and case studies for mesh networks, focusing on several important issues including: weaknesses of point-to-point wireless systems that can be addressed by adopting an

Internet-like distributed messaging model, why networks for "smart devices" must be able to configure themselves, and why wireless mesh systems actually become more reliable as the number of nodes is increased.. The paper also includes a Case study of a wireless mesh installation at a water treatment plant.

IS-2004-20: Life Cycle Costing of Automation Controls for Intelligent and Integrated Facilities

The purpose of this report, written by Thomas Keel of Georgia Institute of Technology for CABA's Intelligent & Integrated Buildings Council, is to demonstrate, by using life cycle costing methodology that owners receive the best value, as defined by total cost of ownership over the life of new building construction or substantial renovation, by implementing intelligent & integrated building technologies. Many sources provided data, both objective and subjective, for this research. Current literature on the subject suggests that intelligent buildings with integrated controls can maximize energy saving control strategies, and more readily abide with federal guidelines for building construction. This research and data analyses can be tailored to, and is applicable for, any commercial office building.

IS-2004-19: Zen and the Art of Content Protection

Despite years of research on content protection, a 14 year old with a smart ripper and a basic PC can start distributing high quality copies of a DVD within minutes of release. This paper from The SVP Alliance starts with a short description of how digital content distribution works and concludes with four foundations of secure content distribution.

IS-2004-18: Best Practices for Securing the Mobile Enterprise

Employees need to access sensitive data while using portable computers, PDAs, and cell phones. But increased mobility also means increased risk. In this paper Credant Technologies present a management checklist of methods for improving the security of data exchanged between the enterprise and mobile equipment.

IS-2004-17: A Standard Approach to Content Protection

This paper, provided by The SVP Alliance describes Secure Video Processor (SVP) - a standard secure method for digital content protection providing new opportunities for content delivery while ensuring protection for content owners, and low cost and ease of use for consumers.

IS-2004-16: "New" Ultra-Wideband Technology

The U.S. Federal Communications Commission is allowing unlicensed communications in the 5GHz range with modulation schemes occupying 500 MHz. This paper from Staccato Communications introduces multi-band signaling methods that comply with this specification while using well known principles of wireless

communications. These multi-band technologies maintain many of the while utilizing the UWB unlicensed spectrum.

IS-2004-15: CABA Intelligent & Integrated Buildings Council Task Force 2 Middleware White Paper

The Middleware white paper was developed by a Task force of CABA's Intelligent and Integrated Buildings Council ((IIBC) - http://www.caba.org/aboutus/com_intelli.html to promote and orchestrate awareness of the capabilities and benefits of middleware to the commercial building industry; To enhance the relationship between key commercial building stakeholders (ie: architects, contractors, systems integrators and owners/operators) and the community of CABA members that produce building automation middleware; and to improve the business environment for middleware solutions in the commercial building market. The paper defines middleware and describes a number of case studies where middleware has provided a solution to integrate new intelligent building technology implementations with legacy systems.

IS-2004-14: Prepaid Wireless Data Services

Mobile voice services are maturing and most Service Providers are finding that market growth is slowing, requiring that they implement new services to maintain revenues. In addition to marketing to existing subscribers, though, Service Providers also need to add new subscribers. Bridgewater Systems suggest that one market segment that provides immediate revenue opportunities is Prepaid Data Services.

IS-2004-13: Why Is Government Subsidizing the Old Networks When 'Big Broadband' Convergence is Inevitable and Optimal?

At a recent forum former, former FCC Chairman Reed Hundt described the benefits -- and inevitability -- of digital convergence, and called on federal government and the FCC to replace today's old networks with a universal Big Broadband network capable of spurring innovation and U.S. telecom sector growth into the twenty-first century. In this paper published by the New American Foundation, Hundt presents the benefits of U.S. government rewriting communications regulation to encourage the creation of a public network that delivers 10-100 Mbps to residences and 1-10 Mbps to business for voice and video Internet-based services.

IS-2004-12: If Buildings Could Talk: How Information Technology Can Increase Energy Efficiency and Demand Management in Buildings

This paper written by Pacific Northwest National Laboratory for the U.S. Department of Energy discusses energy management in a competitive environment. The paper describes how the demand for electricity can be controlled to avoid supply peaks and excess reserves through load management. Load management can be achieved

through the installation of "smart devices" such as appliances that react to a varying price for electricity or "smart gateways" in buildings.

IS-2004-11 GridWise™: The Benefits of a Transformed Energy System
The combination of market deregulation, the growth in electricity demand and the normal "boom and bust" cycle all add up to a looming crisis in the industry. The increased availability of energy information technologies can play an important role in addressing these issues. The collective application of these information-based technologies to the U. S. power grid is becoming known as the GridWise™ vision or concept. This paper written by Pacific Northwest National Laboratory for the U.S. Department of Energy presents a preliminary scoping assessment conducted to envision the general magnitude of several selected benefits the GridWise concept could offer when applied nationally.

IS-2004-10: IT Basics for Energy Managers - The Evolution of Building Automation Systems Toward the Web
The capability and use of information technology (IT) and the internet in the form of web-based energy control systems continues to grow at a rapid rate, and it is imperative that facility managers, maintenance managers, and energy managers become ready to work with current and future applications of internet-based control technologies in their facilities. This paper, published first in the Strategic Planning for Energy and the Environment Journal of The Association of Energy Engineers is intended to help prepare energy managers to understand some of the fundamental concepts of web-based building automation systems (BAS). We thoroughly examine each component of a BAS in today's BAS technology and what a BAS might look like in the future.

IS-2004-09: Sound Solutions for Wireless Woes
Several new technologies will improve the range and speed of wireless networks, with a combined effect of 10,000 times the capacity of dialup 56 Kbps modems. With such advancements, networks that use radio signals for communication could replace most of the network cabling we now use. How real is this promise? When will we see it? And what will it mean for equipment manufacturers, service providers, homebuilders, and homeowners? This paper from Wayne Caswell provides a survey of the present and emerging radio-based LAN standards including 802.11x, 802.15x, 802.16, 802.20, 3G, mesh networks, and smart antennas.

IS-2004-08: Sum Total - determining the true cost of development for embedded security
Embedded security has become a prerequisite: manufacturers must embed security in their devices to meet market demands. This paper from Certicom explores the issues surrounding development costs for embedded

applications — and particularly embedded security — and concludes with a method for calculating the total cost of development.

IS-2004-07: Operations support system (OSS) requirements and solutions for carrier-grade Wireless LAN Services

One of the major challenges in offering carrier-grade public Wi-Fi service is choosing and deploying an effective OSS infrastructure. This paper from Pronto Networks discusses the OSS requirements for end-users, service providers, network operators, and venue owners, in addition to providing recommendations for service providers and network operators evaluating different OSS options. . Some issues discussed include quick user access, roaming among networks, optional charging for services, network security, network brand identification, and location information for local ad insertion.

IS-2004-06: MMS Business Models

The Mobile Message Standard enhances cellular telephone text messaging with graphics, photos, and sound. Charles Lafage of Juniper research describes the Peer-to-Peer and Server-to-Mobile Business models for delivering MMS-based services. He also describes new relationships that will be required in the Server-to-Mobile model that will result from revenue sharing required as content is delivered from alternative sources.

IS-2004-05: Infotainment Essentials

One of the most interesting fields within the mobile entertainment space is that of 'infotainment': the combined worlds of information and entertainment as well as related services. Paul Skeldon of Juniper Research describes the applications and services that will comprise this market and the extraordinary growth forecast. He also touches on some of the hurdles including security and whether people will pay for this type of service.

IS-2004-04: WiFi - The Opportunity

This paper provides a short overview of a research paper by Juniper Research, a UK based provider of business intelligence. The excerpted data forecasts the opportunity as well as the access technology choices, device choices and location variables for the nomadic user. Worldwide opportunity forecasts are included.

IS-2004-03: SAFE: A Security Blueprint for Enterprise Networks

The principle goal of Cisco's secure blueprint for enterprise networks (SAFE) is to provide best practice information to interested parties on designing and implementing secure networks. This document focuses heavily on threats encountered in enterprise environments. Network designers who understand these threats can better

decide where and how to deploy mitigation technologies. By taking the threat-mitigation approach, this document should provide network designers with information for making sound network security choices.

IS-2004-02: The Strategic and Financial Justification for IP Communications

Today's economic climate has made it more crucial than ever for decision makers to consider what type of return their organizations can expect from prospective investments. The intent of this white paper from Cisco Systems is to provide senior managers with the necessary strategic and financial justifications to make effective decisions regarding investments in IP Communications. It explains why a combined network for carrying data, voice, and video is less expensive for a company to maintain and more useful for employees to access e-mail, voice mail, faxes, etc. whether inside the building, at home, or traveling. Issues of quality and reliability are also discussed.

IS-2004-01: Extending the Enterprise - A bottom-line look at extending network access to mobile workers

Throughout history, corporations have continually honed their workflow processes to improve productivity, lower operations costs, and maximize profitability. The latest opportunity for business-process improvement lies in extending network access to mainstream employees who are often away from their desks. This paper contributed by Cisco Systems encourages companies to use wireless networks, IP communications, and teleworking as the technology enablers to allow professionals to conduct business away from their desks.

IS-2003-37: Creative Ways to Build Broadband Networks And Underground Power Cables Through Strategic Partnerships Among Utilities

This paper, submitted by Dr. Jeyapalan & Associates, LLC advocates inserting fiber optic cables into existing water and sewer pipes to reach customers and avoid pole-mounted wiring. He proposes that the U.S. Federal Government pay for such projects to stimulate broadband service deployment. The fiber network could be used to monitor the performance of power distribution grids.

IS-2003-36: Welcome to the Real World – embedded security in action

This paper is the third in Certicom's "Got Security?" White Paper series. It describes how to determine the right security model for a given device and set of user needs and addresses the challenges of providing security for data stored in resource-constrained devices and for data transmitted between devices. Hardware and software techniques are discussed. A checklist of security features that may be embedded in devices is included.

IS-2003-35: Broadband Video over Twisted Pair Cabling

This NORDX/CDT paper explains the benefits of high performance twisted pair cable for one of the most demanding applications on the market today – broadband video. It compares the signal-to-noise performance of various categories of twisted-pair wiring including CAT 5, CAT 6, and enhanced higher quality CAT 6.

IS-2003-34: Is China Alpha or Omega For The Rest of The World?

This paper, provided by Instat/MDR describes the changes in Chinese policies in the past few years toward encouraging investments in semiconductor fabrication and providing 50% of outsourced materials for the world market. It also examines the negative impact and the positive opportunity this economic growth presents to the rest of the world.

IS-2003-33: Think Smart, Think Connected White Paper

This Harbor Research White Paper (in conjunction with Spinnaker Venture Partners, LLC) highlights the findings of an Executive Summit on European Union adoption of Internet-enabled device networking/M2M to maintain a competitive advantage in an open, connected landscape. Devices from multiple companies will be interconnected via the Internet. Open systems for interconnection will lead to new business opportunities that will not accrue to companies with closed systems. Interconnection requires alliances among companies and a shift from a product-centric to a services-centric business model.

IS-2003-32: The Economic and Social Benefits of Broadband Deployment

This Telecommunications Industry Association (TIA) paper offers an examination of various applications broadband can enable, including in particular the economic and social benefits of using broadband for those applications. The TIA includes some regulatory context and explains their policy views including their argument that incumbent telephone companies should not be required to open their local-loops ("last mile") through unbundling to competitive suppliers so that the incumbents will be encouraged to invest in broadband.

IS-2003-31: Digital Home White Paper

This white paper is an introduction to the mission of the Digital Home Working Group, an industry organization whose goal is to make the digital home vision a reality. Their digital home vision integrates the Internet, mobile, and broadcast islands currently existing in the home through a seamless, interoperable network which will provide a unique opportunity for manufacturers and consumers alike. Strategies for achieving interoperability among consumer electronics, personal computers, and mobile devices are discussed. Such devices are classified as Digital Home Servers and Digital Home Renderers.

IS-2003-30: Many Happy Returns - The ROI of Security

For manufacturers of communication devices and developers of applications, security has become an unavoidable imperative. More than ever, their customers — enterprises and network operators — require sophisticated security features. This paper from Certicom includes charts and fill-in tables for determining the cost and value for a company to invest in data security. Four business situations for investing in security are identified: Process Improvement, New Business, Renewal, and Transformation

IS-2003-29: The Inside Story: Embedded Security for Constrained Devices

Security has become an undeniable requirement for wireless and other constrained devices. Fast on the heels of consumer uptake, corporations and government organizations are making wireless technology part of their daily lives — using it to handle private and sometimes sensitive information. This paper, the first in a series of 3 wireless security white papers from Certicom presents reasons why security should be embedded in the hardware design of wireless devices, rather than added on to existing devices. Standard security protocols are preferred over proprietary methods.

IS-2003-28: Digital Home Implementation Plan For Realizing Digital Life in South Korea

The government of South Korea is planning to make high-speed Internet access available to 10 million Korean homes by 2007 using fiber-to-the-home. Applications include learning, entertainment, safety, and home services such as shopping and energy management. . The following article, provided by Information Gatekeepers Inc. is an excerpt of a translated version of the Korean Policy Statement and it details their vision to bring broadband not only to the home but also inside the home.

IS-2003-27: Connecting Legacy Devices on the Home Network: The Challenges of Connectivity

At present the vast majority of revenues in the home networking industry are very much centered on the data networking, and we are not likely to see mass-market revenues generated by multimedia network solutions over the short-term (the next 18 months, for example). This is the basic premise of this white paper submitted by Parks Associates which describes in some detail the reasons that their research has shown that consumers aren't adopting digital home technologies as quickly as the industry would like.

IS-2003-26: Public Hot Spots: One Truth and Two Myths

Public WiFi networks are being offered by new companies and by incumbent telephone companies. Yuanzhe (Michael) Cai of Parks Associates describes survey results from a forthcoming report called Public Hot Spots: Moving beyond Road Warriors which indicates that pricing, security, and quality-of-service are not fulfilling consumer needs.

IS-2003-25: Disconnected: Consumers and the Mobile Phone Industry
John Barrett of Parks Associates writes that despite an investment of tens of billions of dollars in mobile phone services and equipment, the average revenue per customer is not growing. He concludes that the industry has not presented the technologies to consumers in a meaningful, attractive package. Instead they have offered unwieldy products that provide ill-defined services at an uncertain price. In short, it is no surprise consumers are not buying.

IS-2003-24: Core Networks: Can they Escape the Commoditization Spiral?
In this paper, Harbor Research make the argument that public network service providers have shrinking profits in long distance and Internet services. Future profits will come from providing a registry and warehouse to manage data originating from devices in the home. The network provider will aggregate information from similar devices in their customers' homes for delivery to a service provider, acting as an infotributor.

IS-2003-23: Let the Circle Be Unbroken: How the Pervasive Internet Will Automate the Global Enterprise
By the year 2010, the Internet will have trillions of users it doesn't have today. Most of them will not be human beings. This paper, written and submitted by Harbor Research describes how the transmission, harvesting and interpretation of this device-based information as a basis for strategy and action will make every form of business dramatically more efficient and profitable than ever before.

IS-2003-22: Going the extra mile to bring carrier-class management to Ethernet in the first mile
The IEEE is finalizing a standard for applying Ethernet technology in the "first mile" (aka last mile, local loop, metro access and subscriber access network) outside buildings to link the building LAN to a WAN operated by common carrier. This paper argues that this Ethernet standard resolves "the mismatch" between customer needs and current solutions such as DSL, ISDN, cable TV, T1/E1 or T3/E3 lines with their shortcomings, ranging from performance bottlenecks, fixed bandwidth increments, limited scalability, lack of flexibility and provisioning complexity to quality of service issues and a high cost structure.

IS-2003-21: Standards and Technology Strategy
The author discusses the importance of standards and how standards are developed. He explains that he prefers private consortia to write standards instead of going through the formal ratification processes defined by entities like the ITU, IETF, ISO, and National Bodies because of the time to market. He also describes in detail some of the risks and challenges inherent in the development of standards as part of a consortium.

IS-2003-20: Fiber-to-the-Home White Paper

Fiber to the home (and business) will fill the speed gap between Gbps servers and PCs. Drivers for high bandwidth are video conferencing, interactive games, telecommuting, and file transfers (video on demand, video and still-image email attachments, program sharing and downloading, e.g. of entire books). When fiber delivers Internet, telephone, and cable TV services, the cost of the equipment will become economical for the four U.S. incumbent telephone companies and will enable these companies to regain the lead over cable companies for delivery of broadband services.

IS-2003-19: Information Technology and Electric Power Systems

The Finnish National Technology Agency (TEKES) has been funding a five-year program (called TESLA) of research in information technology for electric power distribution and sale. This government-sponsored work is being migrated to industrial applications. This large report (81 pages) summarizes the TESLA projects.

IS-2003-18: Connected Solutions: Landscape and Supply Side Analysis

This market analysis projects the growth rates of broadband access networks and home distribution networks (wires, wireless, power line carrier, and telephone lines). The initial motivation is data distribution, then multimedia. The paper includes information about OSGi, UPnP, HomePlug, WiMedia, and ZigBee and interviews with representatives of each of the organizations.

IS-2003-17: Extending Energy Management to the Enterprise

Businesses are being given the opportunity to aggregate energy purchases across multiple locations of a distributed enterprise. To make economical energy decisions, they need to collect data from multiple sources in a common format based on XML Web services. The enterprise data will be integrated with supplier information about energy prices and demand-management programs available via the web.

IS-2003-16: Facility Lifecycle Management For Process Industries

Massy Mehdipour, Chief Executive Officer of Skire, Inc. describes why the process industry has different building automation requirements than other industries. Since the requirements for product and process development are continually changing - due to technology changes and market dynamics - process facilities undergo constant renovation and retrofit almost immediately after the facility construction is completed. Suitable data-management technology can reduce renovation and retrofit requirements and can take months off of the schedule. More

importantly, it allows owner/operators to incorporate provisions for future changes into the installation, without jeopardizing quality, cost, or schedule. This paper was prepared in the first quarter of the year 2003.

IS-2003-15: Reviving the FORGOTTEN Information Superhighway

Wayne Caswell, CAZITech Consulting Services, has developed this paper to promote the need for a national broadband policy. In Wayne's forward he states "Debate still lingers over government's role in building an Information Superhighway and whether our lack of a national broadband policy means the concept is forgotten. Broadband – the 'always on' network connection that receives and transmits digital content and services at high speeds – was supposed to change the way we live, work and play … as well as how we learn, shop, make things, entertain ourselves, and interact with others. It was supposed to give us remote access to libraries, museums, medical care, jobs, and government – resources that are available only to people living nearby. But since that aging vision is coming slower than expected, this paper, written in May 2003, aims to revive the initiative."

IS-2003-14: Why Intelligent Agents can reduce Energy Cost better than Building Management Systems or Human Experts

Dr. Dirk Mahling, Chief Technology Officer at WebGen Systems, Inc. wrote this paper April 17, 2002. This white paper maintains that an expert system using artificial intelligence for energy management in a building can save more money and provide more comfort than a skilled operator. These systems manage energy, dynamically based on changing data and algorithms using intelligent agents and neural networks that access numerous device parameters. The scenarios discussed highlight the major differences between knowledge-based energy management and conventional, schedule-driven energy management.

IS-2003-13: Managed Wireless LAN Services – A User Perspective

This paper, written March 7, 2003, sponsored by Bridgewater Systems and written by TeleChoice discusses business opportunities for telecommunications providers to offer management services for wireless LAN operations in manufacturing and service companies. The paper concludes, based on a survey of healthcare, manufacturing, and financial services companies, that there is a market for telecommunications companies to manage wireless LANs. The outside providers most favorably considered are ISPs and incumbent telephone companies.

IS-2003-12: A Network for Customizable + Reconfigurable Housing

This paper, written by Kent Larson, Tyson Lawrence, Thomas J. McLeish, Deva Seetharam and H. Shrikumar of MIT Media Lab, presents the initial implementation of a building network protocol consisting of three layers named Get, Set, and Go (GSG). The current housing development process discourages innovation and produces, mostly

low-grade, generic commodities that cannot respond to the unique requirements of individual occupants. This paper, written in April 2003, proposes the decoupling of the base building design, approval and construction process from the customization of individual components, and to make customization practical.

IS-2003-11: The Top Ten Drivers of the Converged Home Network

Written by Mike Wolf, In-Stat/MDR, this paper describes the top ten drivers that will bring mass acceptance to the market of home networking as it evolves to a Converged Home Network. This paper, written in April 2003, focuses on broadband growth and sharing, emerging technologies, gaming, digital audio, home security and the drive for broadband services by service providers for the networking home.

IS 2003-10: CONVERGENCE: WHAT IS IT, WHAT WILL IT MEAN, AND WHEN WILL IT HAPPEN?

This paper was contributed by Tom Hartman, P.E., Principal, The Hartman Company and Contributing Editor, AutomatedBuildings.com. CABA would like to thank Engineered Systems and AutomatedBuildings.com for allowing us to adapt this paper from their "Controlling Convergence" article. The author discusses the significance of the trend for building control systems to be based on Internet technologies. This transforms building controls into an information technology discipline. Also, the building controls technology will migrate from proprietary hardware to software based on standards. Building control hardware may become commodities and threaten the business models of building control manufacturers.

IS 2003-09: Productivity and Energy Conservation are NOT Mutually Exclusive Objectives

This paper was contributed by David Dougan, President, EBTRON, Inc. and Len Damiano, Vice President - Sales & Marketing & National Accounts Manager, EBTRON, Inc. and Contributing Editor, AutomatedBuildings.com. HEALTH and PRODUCTIVITY are the "Two Big Carrots" that should provide more than sufficient motivation to building owners to insist on exceptional indoor environments. This paper, written in March 2003, presents quantitative justification for expenditures that improve indoor air -quality (IAQ) in office buildings. Calculations show that the cost of IAQ is less than the loss of worker productivity measured in cumulative salaries. Also, improved IAQ may reduce tenant turnover.

IS 2003-08: VOD Everywhere! Considerations in Transport Methods for Scalable VOD/SVOD Deployment

This paper, contributed by Scientific-Atlanta, Inc.written in October, 2002, discusses the issues involved with engineering a cable TV distribution network to accommodate the new "Everything-on-Demand" (EOD) model. EOD is a fairly new acronym that provides a catch-all phrase to include all video content transmissions. Existing Broadband Hybrid-Fiber Coax networks are challenged by this new model. This requires re-engineering the cable distribution network for the increased traffic.

IS 2003-07: A Vision of Green Building Economics for the Private Sector
This paper, contributed by David Gottfried, President of Worldbuild Technologies Inc. and founder of the US and World Green Building Councils and describes the economic benefits of designing a building with minimum impact on the environment as measured by the LEED Green Building Rating System. The U.S. Green Building Council has developed the LEED rating system for measuring the "Green" features of a building. The paper describes the advances of green building technologies and points out the practical steps towards a green building and how to make profit out of the use of the concept in buildings.

IS 2003-06: Integrating Security Into Intelligent Buildings
This was booklet developed by Peter Manolescue, Sales & Marketing Director, security XML Limited and published in January, 2003. It features and discusses building security systems now and in the future. The paper presents an overview of current security systems for fire detection, intrusion detection, access control, and closed-circuit TV. The market structure of security system distribution and technological features are discussed. New Internet-based technology, using the XML language, is proposed for integrating security system functions with each other and with other building automation systems.

IS 2003-05: Road Map to 802.11 Services
This paper, provided by Bridgewater Systems Corporation, is subtitled as "A Business Opportunity for Service Providers on the 802.11 Wireless Local Area Network Standard". The document discusses the current standard of 802.11 wireless Internet offerings, suggests some 802.11 business models for Service Providers, and suggests steps that will need to be taken so that Service Providers can capitalize on this market potential. This paper was prepared in January 2003.

IS 2003-04: The Continuing Evolution of the Wireless LAN Hotspots and the Banias Effect
Nick Hunn of TDK Systems discusses how Wi-Fi computer network penetration in business is limited because of security and standards concerns. Residential growth is now greater than the business market. Also, hotspots providing public Wi-Fi access are proliferating. This paper, written in November 2002, discusses how Intel's Banias chip could change the ownership of the market and describes different revenue models for hotspots.

IS 2003-03: Bluetooth and Wi-Fi: The Market Status
This paper was written by Nick Hunn of TDK Systems in March 2002, and discusses the growth of Bluetooth and Wi-Fi Wireless LANs. Mr. Hunn discusses the adoption and growth potential of Bluetooth and Wi-Fi and explains discrepancies in some recent publications and projects relative growth rates based on sales of integrated chip

sets and applications. He concludes that both are success stories and it is time for proponents of each to stop arguing about supremacy, but start working to turn the two respective technologies into applications for users.

IS-2003-02: ADSL2 and ADSL2+ The New ADSL Standards

This paper, written by Aware, Inc. explains the new ADSL2 Standards which provides for several improvements over the first generation ADSL Technology. Such improvements include improvement in data rate, in transmission reach, enhanced diagnostic and trouble shooting, reduced cross talk and a host of other improvements. The paper also covers the ADSL2+ Standards that are currently under development, which doubles the downstream bandwidth of the ADSL2 Standards.

IS-2003-01: Building Control Network

Communications protocols are simply a means by which different systems may communicate. They are the message formats and procedures used to transfer information, in an understandable form, from one device, or array of devices, to another. They permit products from different vendors to communicate with each other and interact to produce intelligent integrated building systems and manage and interface with these products as if the same vendor supplied them all. This paper, prepared by CABA's Intelligent & Integrated Buildings Council Building Protocol Task Group explores four of the most common protocols used today and compares a number of the parameters that "Assist the large building industry to understand the strengths and overall features of the building control communication protocols that are available for use in designing and implementing an "Intelligent Building".

IS-2002-32: The Benefits of Energy Efficiency Investment

This paper describes the impact of improving the energy efficiency of the residential, commercial and industrial sectors on the economy. Resulting from a study by the Canadian Energy Efficiency Alliance, it provides evidence that the impact will be overall positive and that the negative aspects will be more than compensated for by the positive ones. It focuses on the benefits of energy efficiency and shows how energy efficiency can be married to other initiatives such as renewable energy to build a stronger economy and meet the various goals associated with greenhouse gas (GHG) emissions reductions.

IS-2002-31: Home Gateway

Home Gateway The ubiquity of broadband connectivity and the advancements in home networking technologies introduces a new breed of consumer premises equipment termed as home gateways or residential gateways. This paper, written by Satish Gupta of Wipro Technologies describes what a home gateway is and some of the alternatives. The architecture of residential gateways spans a gamut of products. Not all products in this category

have equivalent functionality. The white paper contains tables that compare gateway types, functions, and typical commercial products.

IS-2002-30: Trends and Outlook for Wireless Home Networks

Trends and Outlook for Wireless Home Networks This market overview, written by Kurt Scherf, Vice President of Research for Parks Associates describes the projected growth of wireless home networks over the next four years. Although the market growth for home systems has been slower than projected, networks for linking PCs and laptops will increase about three-fold by 2006. Wireless technology for such networks will dominate consumer choices.

IS-2002-29: The Emergence and Growth of Entertainment-Centric Home Networks

The Emergence and Growth of Entertainment-Centric Home Networks In the traditional sense, home entertainment networks have allowed consumers to route audio or video throughout the house to different receivers (primarily TVs and stereo receivers/speakers). This paper written by Kurt Scherf, Vice President of Research for Parks Associates describes the shift in home entertainment networking to include the PC and other home automation devices. Projections for the growth of different classifications described in the paper are provided to 2006.

IS-2002-28: Best-Practices Guide for Evaluating Intelligent Buildings Technologies

This guide, authored by Kenneth P. Wacks, Ph.D., builds upon the Technology Roadmap for Intelligent Building Technology. This paper consists of criteria by which intelligent building technologies can be evaluated. The topics in this guide are important for various audiences, such as building owners and managers, intelligent building designers, installers.

IS-2002-27: VLSI Implementation of OFDM Modem

Orthogonal Frequency Division Multiplexing (OFDM) is a multi-carrier system where bits are encoded to multiple sub-carriers and sent simultaneously in time. This technical paper provided by Wipro Technologies lists various approaches to implementing an OFDN system and then describes the Very Large-Scale Implementation (VLSI) of OFDM in detal.

IS-2002-26: Art and Style of Designing Home Control Systems

This paper, authored by Mr. Bill Wimsatt of CorAccess Systems describes some of the design considerations when developing home control systems. Mr. Wimsatt discusses the universal remote controls available today and the complexity involved with these multi-button devices. He then explains why the sophisticated automation

systems available for today's homes that can encompass many subsystems within the home, must use re-designed control interfaces blending physical and digital design to provide a useable human interface.

IS-2002-25: Ensuring HomePNA Devices Work in the Home Environment

This paper provided by Spirent Technologies focuses on the impact of wireline loops and noise egress as two primary issues affecting the performance of gateway access equipment. It describes some of the key factors affecting the performance of broadband systems networked by phone lines in a Small Office/Home Office environment and describes testing models that should be implemented to ensure that maximum performance and reliability within the home will be provided by the installed equipment.

IS-2002-24: Building a Positive, Competitive Broadband Agenda

Broadband Internet access is available to a majority of American households, yet consumers are hesitant to use it. Is the problem cost, service or content? The Information Technology Association of America (ITAA) has launched the Positively Broadband campaign to shift public attitude about broadband. This paper is the campaign's first call to action – a call to create a positive competitive broadband agenda.

IS-2002-23: Energy Management Pilot Research Results

In November 2001, The Internet Home Alliance concluded its research into a uniquely powerful energy management pilot designed specifically to answer the question: How can energy utilities leverage the Internet and other advance communications technologies most effectively? This paper from the Internet Home Alliance reports on the results of this research.

IS-2002-22: Any Time, Any Place, Anywhere: Broadband and the Changing Face of Work

This white paper, part of the Positively Broadband campaign of The Information Technology Association of America (ITAA), explores the impact of broadband on e-workers, e-work managers, and e-work organizations. The paper explores how broadband changes the face of work, and the impact these changes may have on the economy as a whole. While broadband enabled e-work poses many opportunities and benefits, it comes with an associated set of practical, technical and organizational challenges; these are likewise addressed.

IS-2002-21: In Home Wiring Testing to ITU-T GT.996.1 Standard

This paper, provided by Spirent Technologies, describes the four home networking implementations (Home Phoneline, Powerline, Wireless and New Wires) and the important factors when making an implementation decision. It also defines a number of home networking applications and discusses the advantages of Home

Phoneline implementations and, it explains the importance for manufactures to do proper testing and simulation of their products to ensure reliable home networking.

IS-2002-20: Category 6, Questions and Answers
In his most recent white paper, Paul Kish, NORDX/CDT's Director of IBDN Systems and Standards and vice-chair of the TIA TR-42 committee examines what the newly published Category 6 cabling standards mean for the telecommunications marketplace. In addition, he addresses several important questions about Category 6 standards and why a Category 6 installation offers an optimum performance solution.

IS-2002-19: Maximizing Network Performance: The Case for Fixed Wireless Connectivity
This paper explores the options open to executives and networking professionals in public and private enterprises who seek high-speed building-to-building connectivity solutions for their campuses and remote locations, but who are also constrained by real-world budgets. It reviews the most popular leased line options including DSL, T1/E1 and fiber optic cable as well as wireless LANs. And it delineates the advantages of fixed wireless connectivity, a solution that is finding greater acceptance due to its high capacity, ease of installation, and low cost.

IS-2002-18: Why DSL Still Matters
Looking at the press about Digital Subscriber Line (DSL), it may appear to be a failure, but the technology is being deployed - and successfully deployed - by service providers worldwide. So why the bad press for DSL? This paper explores some growing pains service providers have experienced deploying DSL and how these miscues have blunted the potential of the technology to date. It also explores how the technology has matured and how growing competition from outside forces (like cable companies) has made DSL even more vital to the ongoing success of telcos.

IS-2002-17: The Market for Control Systems Integrators
This paper, prepared for The Control Systems Integrators Association by Walt Boyes of Spitzer and Boyes, LLC, attempts to clearly define what a professional Control System Integrator is and what the market potential for Control System Integration is worldwide. It discusses the current size of the market as well as forecasting the growth based on market and industry trends.

IS-2002-16: Home Networking - from WiPro Technologies
Author Satish Gupta defines Home Networking as the collection of elements that process, manage, transport and store information, enabling the connection and integration of multiple computing, control, monitoring and communication devices. He discusses how the need for simple, flexible, and reliable home networks is greatly

increasing as the proliferation of multi-PC homes, increasing Internet usage, advances in telecommunications technology and progress in smart devices increasingly emphasizes the need for in-home networking.

IS-2002-15: Development of fire detection systems in the intelligent building

The paper, from The Institute for Research in Construction, reviews the current state of development of fire detection and alarm systems in intelligent buildings. It covers new technologies and concepts such as advanced multi-function sensors (chemical, occupancy, and imaging), computer vision systems and wireless sensors and addresses issues related to real-time control via the Internet and integrated building service systems. It concludes that although intelligent building technologies have a strong potential to improve fire safety, care should be taken to avoid creating completely new risks such as ensuring the security of these systems, as well as the possible risk of data overloading the communication systems in case of emergencies.

IS-2002-14: Total Building Integration Cabling for Commercial Buildings

Total Building Integration Cabling [TBIC] is a program developed by the Siemon Company for integrating commercial building systems utilizing structured cabling. This document, prepared by Bill Fortin of Integrated Building Systems, Inc., is a detailed description of TBIC that can be used to support any multi-product, multi-vendor environment. This document is also closely aligned with the newly released TIA 862 Building Automation Systems Cabling Standard for Commercial Buildings.

IS-2002-13: Selecting and Specifying a Web-Accessible Controls System (WACS)

Web Accessible Control Systems (WACS) present building information in the form of Web pages that can be viewed through a standard Web browser such as Netscape Navigator or Microsoft Internet Explorer. This paper, from Automated Logic Corporation, describes the benefits of WACS technology and the considerations when specifying and implementing a WACS.

IS-2002-12: Information Model: The Key to Integrating BAS with Other Enterprise Applications

The key to the successful integration of Building Automation Systems with other enterprise applications lies not in the protocol, but in the information model that it represents. This paper, from Automated Logic Corporation, describes the history of BAS and how the industry has evolved from "not enough" to "too-many" protocols and how there has been a parallel evolution in the Information Technology realm. The paper then describes how Web services developed by the IT industry can be applied to BAS to integrate the enterprise.

IS-2002-11: Wireless Market Confusion

Kelly Kanellakis of Enterasys Networks feels that he is spending too much time trying to keep ahead of the plethora of competing technologies in the wireless field. In this paper, aimed at the enterprise network environment, Kelly describes some of the factors that cause this concern, ranging from security to lack of interoperability between the 802.11x products to incompatibilities within developing technologies. His conclusion - "learn from history."

IS-2002-10: The WLAN Market Place

This paper, prepared by Signa Services, describes the main wireless technologies in the marketplace with emphasis on 802.11b and 802.11a. It describes the differences between the protocols and some of the interoperability and security issues. As well, It provides a brief history of the WLAN market, some adoption/deployment information and a market outlook for wireless LANs.

IS-2002-09: Industrial Ethernet: An Emerging Growth Market

This paper, written by FTM Consulting, discusses the expected growth of Ethernet in the industrial sector over the next few years. While Ethernet has become the pervasive network in the commercial LAN office marketplace, it has not had a significant impact on the factory floor. As the need to interface to the in-place LAN infrastructures in the enterprise's office increases, Ethernet provides an ideal solution for the automation control systems. Many elements are coming into place at the current time to make this possible. These developments are described in this white paper including the market forecasts over the next five years.

IS-2002-08: Auto-Configuration for basic Internet (IP-based) Services

This technical paper, provided by The DSL Forum, describes current best practices for providing access to most Internet (IP-based) services using standard network technologies. Consumer Internet Access has evolved from dial-up modem access to broadband connections and service providers want to extend their existing sophisticated infrastructure to their new high-speed customers with few or no changes.

IS-2002-07: A Machine-Crafted Home of the Future

"A Machine-Crafted Home of the Future" was written by Kent Larson, the director of the MIT Home of the Future. It provides an interesting view of the future process of selecting and constructing a house with parallels to high-tech consumer products. If it seems farfetched, Mr. Larson believes that is only because the housing industry is years behind others in transitioning to the information economy. But the rules have recently changed in the housing industry, creating risks for companies stuck in the old ways and extraordinary opportunities for those who

know the new game. This paper describes how the Internet, demographic changes and new technologies are combing to force the housing industry to join the 21st century.

IS-2002-06: UCLA Internet Reports: Surveying the Digital Future

The UCLA Internet Report 2001, Surveying the Digital Future Year Two, presents data on more than 100 major issues. Most of this 2001 data is compared with findings from 2000. The 2001 UCLA Internet Project leaves little doubt that the Internet is now a mainstream activity in American life that continues to spread across all age groups, education levels and incomes. The report focuses on five major areas, such as: Who is online? Who is not? What are users doing online?; Media Use and Trust; Consumer Behavior; Communication Patterns; and Social and Psychological Effects.

IS-2002-05: Transforming the Appliance Industry - Switching on revenue streams in services

As with the automotive industry, white goods manufacturers have started to integrate Internet based services with their products transforming them into platforms for service delivery. This paper outlines this transformation of the industry to the future Networked appliance market describing new revenue streams and marketing opportunities. It provides a good overview of the technology required to implement the program strategy.

IS-2002-04: Drivers for Home Networking

This document provided by Kurt Scherf of Parks Associates is a market analysis of the home networking market in the U.S. and its key driving factors as a base for a strategic projection of its future. It describes how entertainment, control and communications technologies come together to drive the growth of home networks.

IS-2002-03: Understanding High Performance Structured Cabling Systems

This paper provides a good overview of what structured cabling is all about and for the layperson gives an insight into the parameters and limitations of the media and connectors used for Cat 5, Cat 5e and Cat 6. It is easy to read and understandable for the customer who wished to install a strcutured cabling system around the office or Small Office Home Office environment.

IS-2002-02: Intellectual Property Rights, Innovation and Standardization: Friends or Foe?

Tim Schoechle of the International Center for Standards Research at the University of Colorado, Boulder, examines Intellectual Property Rights (IPR) from a historical perspective, providing a good argument for why our historical understanding of IPR doesn't meet the requirements of today's digital world. Mr. Schoechle argues that we need to re-think our ideas of IPR in order to move digital content forward, and standards can play a role in the release of IPR into the public domain.