



## **Comments of Google Inc.**

### **U.S. Department of Energy Request for Information: Implementing the National Broadband Plan by Empowering Consumers and the Smart Grid**

**July 12, 2010**

Google is pleased to offer these comments in response to the Department of Energy's Request for Information (RFI) regarding consumers and the smart grid. We applaud the Administration's efforts to date to ensure the smart grid benefits consumers directly and delivers transformational change to our aging electricity system. We stand ready to assist the Department as it works with the Federal Communications Commission (FCC) and other agencies on implementation of the National Broadband Plan and other efforts to empower energy consumers.

Google's mission is to organize the world's information and make it universally accessible and useful. Our philanthropic arm, Google.org, uses the power of information and technology to assist in solving major global challenges, such as energy security and climate change. We believe that building a smarter electricity grid can apply the synergies of information and technology to enable consumers and their energy suppliers to better manage energy use and, by doing so, save money and reduce greenhouse gas emissions.

We believe that consumers should have access to timely, useful, and actionable information about how much energy they are using and how much it costs. Combined with other measures, such as open standards and the ability for consumers to share their data with third parties, unlocking this information could lead to countless new products and solutions to help consumers save energy and money. As FERC Chairman Jon Wellinghoff stated last month at the National Town Meeting on Demand Response, "the smart grid starts with the consumer." We agree. We need the participation and engagement of consumers to fulfill the promise of the smart grid.

Inherent in this premise is ensuring the protection of consumers' privacy and security. Consumers must be confident their personal energy information will be protected and used only for their benefit. As we move forward with smart grid deployment, we must ensure user trust while encouraging the development of new energy management solutions. Google believes it is possible to address security and privacy needs in the smart grid in flexible ways that foster innovation. We recently filed comments in the Department of Commerce's Public Forum on

Information Privacy and Innovation in the Internet Economy and believe many of the issues raised in that forum are relevant here. Our comments are attached for your reference.

We are encouraged by the Administration's efforts to date to help make the smart grid work better for consumers. Earlier this year the Administration recognized the value of providing consumers with access to energy information in the FCC's National Broadband Plan. The Office of Science and Technology Policy (OSTP), along with the National Institute of Standards and Technology (NIST), is working with hundreds of private sector partners to facilitate the development of the standards necessary to make the smart grid work seamlessly, with appropriate consideration of issues such as privacy and security. The Department of Energy is leading programs to dramatically improve energy efficiency in homes and buildings and has led an unprecedented effort to accelerate the deployment of the smart grid through the economic stimulus. The Department's smart grid stimulus programs have placed a particular emphasis on empowering consumers, for example, by funding deployments of smart meters and in-home information displays. We look forward to seeing the results as the Department assembles data on these programs involving utility providers, technology companies, state utility commissions and consumers.

At Google, we are tackling this consumer information challenge on several fronts, including developing consumer software tools, partnering with utilities and technology companies, and advocating for policies that advance a consumer-friendly and open smart grid. Recently, Google signed a letter to President Obama with 46 other companies and organizations asking the Administration to adopt the goal of giving consumers access to timely, useful, secure and actionable energy information. The letter also includes specific recommendations for the Department of Energy and other agencies on how to pursue that objective. The letter is attached for your reference. Later this month, we will co-host a roundtable discussion in London with The Climate Group for industry and NGO leaders to continue the discussion about how to ensure that consumers in the UK and the EU benefit from the smart grid.

Google stands ready to work with the Department as it moves forward with its role in implementing the National Broadband Plan and we are eager to see what results from this RFI. We are happy to provide more detailed feedback as may be useful. Also attached for your reference are Google's comments filed previously with the OSTP and the FCC on consumer energy information issues. We should note that this is the third request from the Administration for comments on this subject within the past year. As stated in the letter to the President, we believe now is time for the Administration to set clear and ambitious goals for the Nation on how to empower energy consumers and implement a plan to achieve them.

Thank you for the opportunity to provide these comments and we look forward to continuing to participate in this important effort.

Michael Terrell  
Policy Counsel  
Google Inc.  
1600 Amphitheatre Pkwy  
Mountain View, CA 94043  
mterrell@google.com

Attachments:

- Comments of Google Inc. in Department of Commerce Public Forum on Information Privacy and Innovation in the Internet Economy (June 14, 2010)
- Letter to President Obama on consumer access to energy information (Apr. 5, 2010)
- Comments of Google Inc. in Office of Science and Technology Smart Grid Forum (Mar. 12, 2010)
- Comments of Google Inc. in Federal Communications Commission Forum on the National Broadband Plan and Implementation of Smart Grid Technology (Oct. 2, 2009)



**U.S. Department of Commerce  
Docket No. 100402174-0175-01  
Information Privacy and Innovation in the Internet Economy**

**Comments of Google Inc.**

Google thanks the Department of Commerce – including the Secretary, the National Telecommunications and Information Administration, the International Trade Administration, and the National Institute of Standards and Technology – for its welcome focus on privacy and online innovation.

It is difficult to overstate the social and economic benefits of the Internet for the United States and for the world. More than any technology in history, it has empowered entrepreneurs to bring their ideas directly to market – without tolls, without gatekeepers, without limitations. And by bringing the world's knowledge to the fingertips of each connected individual, the Internet has begun to unleash the true power of information to help consumers, create jobs, ensure government transparency, and achieve other societal benefits.

The Department of Commerce has a broad mandate to advance economic growth, jobs, and opportunities for the American people, as well as cross-functional responsibilities in trade, technology, entrepreneurship, economic development, environmental stewardship, and statistical research and analysis. The Department also has a strong history of thoughtful Internet policymaking. In the 1990s, the Department played a leadership role in the federal government's e-commerce activities, which encouraged and spurred responsible private sector leadership on issues ranging from privacy, private international law, and Internet governance. The Department's role and track record make it ideally suited to play a central role in developing the policies that will continue to organize, govern, and nurture the Internet.

The Department's Notice of Inquiry is timely and important. Existing regulatory frameworks for privacy, both domestic and international, are incomplete and sometimes in tension with one another to the detriment of both Internet users and online providers.

Google therefore urges the Department to work to develop comprehensive, baseline privacy rules that both help establish user trust and support the global data flows necessary for building new content and services in the data-centric Web. Such a framework also offers a consistent platform for providers to develop innovative, flexible tools that empower users to make privacy choices and self-regulatory structures that can keep pace with changing technology. The Department has a unique opportunity to shape this unified, comprehensive privacy framework in the U.S. and to encourage consistent, pro-innovation rules internationally.

Google has been a leader in developing user-friendly tools to inform and empower our users, including [promoting data portability](#), creating [educational privacy videos](#), developing an [Ads Preferences Manager](#) that allows users to see and control what interests are associated with their browser, and providing a centralized [dashboard](#) designed to help users view their information and control their individual privacy settings. To protect our users' communications, we [encrypt all Gmail traffic](#) by default, and we remain the only major search provider to allow users to [encrypt search queries](#). These types of privacy tools educate and empower consumers, provide enhanced transparency, improve security, and offer meaningful choice and control. We have attached to this submission our recent privacy comments filed with the Federal Trade Commission, which expand on these tools and Google's approach to privacy.

In the comments below, we apply some of what we have learned about privacy to address the strengths and weaknesses of existing domestic and international privacy regulations and their impact on users and innovation. We then suggest ideas for how to conceive a comprehensive, baseline privacy framework and about how the Department can play a central role both here and abroad in developing this framework.

### **Domestic Privacy Regulation**

#### **Although the U.S. privacy system needs a comprehensive vision, the system has protected online users and encouraged innovation**

Although Google believes that the U.S. would benefit from a unified, principles-based legal framework specific to privacy, we nevertheless believe that there are real and effective protections established under U.S. privacy laws and regulations. Moreover, Internet innovation has flourished in the United States in part *because* of the flexible nature of U.S. privacy laws and an enforcement framework that places substance over form. Accordingly, we believe that before policy makers discuss what could be improved in the domestic arena they must start with the very real successes of the current system.

Between sectoral laws, Federal Trade Commission policy and enforcement, state consumer protection laws, and self-regulation, the U.S. has assembled a system that protects user privacy and supports innovation. In fact, the success of this system is perhaps the best evidence that user privacy and data innovation are not mutually exclusive.

Increasingly, privacy is not merely a laws-based construct, but rather one that is driven by technological innovation and evolving consumer expectations. As Professors Kenneth Bamberger and Deirdre Mulligan [recently explained](#) in the *Stanford Law Review*, while the U.S. may suffer from an incomplete set of “privacy on the books” (the privacy laws that establish minimum standards for the protection of information) it has developed a flexible and powerful tradition of “privacy on the ground” – the practices and policies devised and implemented to meet evolving consumer expectations, as well as comply with existing privacy laws.

Adherence to privacy laws in a rapidly changing environment is necessary but by itself will not address consumer expectations. Certain approaches, however, provide a better framework to facilitate adaptation in light of evolving consumer expectations. [The Gramm-Leach-Bliley Act](#) (GLBA), for example, requires financial institutions to protect the “security and confidentiality of

customer records and information” while eschewing specific technological mandates that would effectively wed financial institutions to specific technology solutions. Under the GLBA Safeguards Rule, financial institutions have the flexibility to implement privacy and security protocols that address new and emerging threats to the security and confidentiality of customer records and information. A more prescriptive approach – *e.g.*, mandating the use of specific technologies or administrative protocols – would likely constrain the ability of financial institutions to design and implement solutions that are attuned to the unique privacy challenges presented by specific products and services.

The FTC, too, has used its authority to stop unfair and deceptive trade practices to develop flexible, standards-based privacy rules that reflect consumer expectations. Under its existing statutory authority, the FTC has penalized bad actors, enforced privacy promises, and sent important signals about evolving standards for proper notice, choice, consent, and data security. The FTC communicates its expectations clearly, effectively, and prospectively to protect consumer privacy without unnecessarily disrupting legitimate business practices and innovation.

In its enforcement role, the FTC has sought to articulate consumer expectations in the privacy and data security arena – asserting itself in cases where specific practices failed in its view to satisfy evolving consumer expectations concerning privacy and data security. As Professors Bamberger and Mulligan noted, “a key to the effectiveness of FTC enforcement authority is the agency’s ability to respond to harmful outcomes by [enforcing evolving standards of privacy protection](#) as the market, technology, and consumer expectations change – the very opposite of the rule-based compliance approach frequently embodied in regulation.”

The FTC’s guidance in privacy and data security enforcement compels both the subjects of such enforcement actions and others in the industry to embrace forward-looking and creative solutions to new and emerging privacy and data security issues. Simultaneously, the Commission seeks to [educate consumers](#) about emerging privacy issues. Finally, the Commission and staff use roundtables and town hall meetings to engage in a discussion with industry and advocates, and to offer flexible guidance based on information about evolving user needs and provider practices discussed in those settings. Public dialogue with industry and advocates helps to develop consensus about emerging issues and to create incentives for industry to identify appropriate solutions. Its self-regulatory guidance for the online advertising industry, for instance, has helped spur broad industry support for improved advertising notice and opt-out functionality.

To provide greater context, it is instructive to compare Internet innovation in the U.S. and the European Union. For instance, many of the Internet advertising companies in the U.S. were established at a time when European regulatory models already presented a barrier to entry in terms of the need for implementing varying and complex data protection legislation. In fact, the European Commission itself admitted, in 2003, that the European data protection regime had failed to anticipate new technological developments. Noting the huge changes in “the means of collecting personal information,” the [European Commission wondered](#) “whether legislation can fully cope with some of these challenges.” This is precisely the advantage of the flexible U.S. approach.

## **Despite successes, further consistency and comprehensiveness in U.S. privacy regulation will help strengthen user privacy and promote continued innovation**

Although we believe that privacy regulation and enforcement mechanisms in the United States have both encouraged Internet innovation and evolved to meet consumer expectations, there are improvements to the U.S. system that the Department can help promote. Inconsistency and gaps in the rules create unnecessary costs and burdens to innovation and undermine user trust.

Generally, Internet users neither expect nor want different baseline privacy rules based either on the type of provider processing their information, the type of device or service that is being used, or the local jurisdiction in which they or the provider reside. In many respects, our current legal framework often creates precisely these distinctions – upsetting users’ reasonable privacy expectations and complicating the competitive marketplace with inequitable rules. For instance, privacy can be implicated by offline practices just as much as in online environments. Proposed privacy legislation at both the state and federal level, however, often ignores the former while regulating the latter. A comprehensive approach to privacy must focus on both offline and online privacy and must seek to avoid wherever possible artificial distinctions.

The Electronic Privacy Communications Act starkly illustrates the problems created by privacy laws that are oriented toward technologies rather than baseline standards. Enacted in 1986, ECPA made assumptions about a static technology marketplace that bears little resemblance to the way in which individuals communicate, interact, and engage on the Internet in 2010. The advent of “cloud computing” – where users store their data with online providers and access them via the Internet – is leading to a vast migration of data from personal computers, filing cabinets, and offices to remote third-party servers. ECPA, however, affords lesser protections to e-mail communications based on where messages are stored, whether messages have been opened, and how long messages have existed. Such distinctions belie consumer expectations concerning the privacy of e-mail communications. The [Digital Due Process Coalition](#), of which Google is a leading member, has proposed ways to update ECPA to ensure that its privacy protections are consistent with privacy expectations.

In addition, state laws occasionally impose rigid technology mandates that embody a “checklist” mentality to privacy and data security that stymies innovation and does not serve online users. In Nevada, for example, a business entity that either transfers “personal information” outside of its secure system or moves storage devices containing personal information beyond its physical or logical boundaries [must use encryption to protect this information](#). Even if less expensive and more effective technologies become available, Nevada statutorily prohibits businesses from deploying such technologies to protect personal information. If, however, a business accepts payment cards from Nevada residents, the business must comply with the current version of the Payment Card Industry Data Security Standard, which does not necessarily mandate encryption. In a borderless environment such as the Internet, it is often impossible to ascertain the state residency of a specific user, much less deploy a specific technology solution based on nuances in state laws. Although well-intentioned, these laws often provide few appreciable benefits to consumers while imposing substantial burdens on and creating significant legal risks for Internet companies.

As we outline below, the Department can play a vital role in bringing greater consistency and comprehensiveness to domestic privacy regulation by formulating a usable, pro-innovation, pro-consumer framework for privacy together with the ongoing efforts at the FTC and in Congress.



## **International Privacy Regulation**

### **Inconsistencies in the international patchwork of data protection rules have economic costs and impact free expression without corresponding benefit to user privacy**

#### *Economic cost*

It is difficult to quantify the economic impact of inconsistent privacy regulations, but there can be little doubt that the growth of online, data-intensive services will suffer. Information, when collected and used responsibly and transparently, can offer tremendous value to users. Google, for instance, has used non-personally-identifiable data collected from users of our search service to add new features – such as spelling correction and suggested results – and to develop entirely new services, such as [Flu Trends](#). Google engineers discovered that certain search terms are good indicators of flu activity, and developed Google Flu Trends using aggregated Google search data to estimate flu activity. This allows health officials, the media, and the public to learn about local flu outbreaks sooner than using traditional public health methods. [Researchers](#) have used [Google Trends](#) data and other sources like Twitter to [develop economic trend data](#) ahead of official numbers. The value of innovative services like this would be lessened or lost completely by rigid or inconsistent data protection rules.

Researchers have drawn similar conclusions. Canadian and U.S. academics [recently found](#) that E.U. data protection laws reduced effectiveness of online advertising, as measured by purchase intent, by over 65% compared to other countries. While there may be important user benefits to more restrictive data use policies not addressed by this study, policy makers should take a close look to determine if user privacy can be protected at lower cost to business and innovation.

The difficulties and costs of international compliance are most obvious for global cloud-based providers. Cloud computing providers, including Google, allocate storage and processing resources in the network as efficiently as possible through an essentially global infrastructure of data centers. The most prominent international data protection laws were, in contrast, developed in an era of bulk data transfers, stable databases, and location-specific processing. The Department should work with its international colleagues toward a unified and flexible set of multilateral agreements and national standards that preserve user privacy and trust and encourage the growth of the cloud.

#### *Impact on global free expression*

Google acts every day to promote and expand free expression online and increase global access to information. As new technology empowers individuals with more robust free expression tools and greater access to information, we believe that governments, companies, and individuals must work together to protect the right to online free expression.

Strong privacy protections must be crafted with attention to the critical role privacy plays in free expression. The ability to access information anonymously or pseudonymously online has enabled people around the world to view and create controversial content without fear of censorship or retribution by repressive regimes or disapproving neighbors. While we cabin this right



in important ways – including individual liability for defamation or harmful speech – it is invaluable to the ability to exercise freedom of expression.

As the Web evolves, free expression can be affected by rigid application of access rights and mandated opt-in policies for information collection. For more than a decade, [scholars such as Fred Cate](#) have discussed the potential tension between the U.S. First Amendment protection of free information flow and some international models of data protection. Moreover, while appropriate in certain circumstances, broad opt-in requirements [can create perverse incentives](#) for companies to collect more identifying information than necessary and to obtain “consent” in inappropriate or confusing ways. If all online behavior were traced to an authenticated identity to preserve proof of consent or allow rights of access, the free expression afforded by anonymous web surfing would be jeopardized.

International privacy rules have unfortunately been applied in ways that implicate free expression rights. As we have recently seen in several different cases, liability for third party intermediaries under data protection law in some countries remains unclear. An Italian court recently held three Google executives criminally liable for a user’s uploading of an illegal video – a result at odds with widely accepted theories of intermediary liability in the U.S. and elsewhere. As the Center for Democracy and Technology [noted in a recent report](#):

Protecting intermediaries from liability is critical for preserving the Internet as a space for free expression and access to information, thereby supporting innovation and economic development goals. User-generated content sites in particular have become vital forums for all manner of expression, from economic and political participation to forging new communities and interacting with family and friends. If liability concerns force private intermediaries to close down these forums, then the expressive and economic potential of [information and telecommunication] technologies will be diminished. Governments everywhere should adopt policies that protect intermediaries as critical actors in promoting innovation, creativity and human development.

Different interpretations of third party liability create uncertainty, provider risk, and threats to free expression that chill innovation and growth of Internet services.

#### *International harmonization*

Compliance with differing standards imposes costs without obvious user benefits. International data protection law is far from harmonized, and attempts to improve consistency have been disappointing. The [European Commission directive on data protection](#) has been implemented variously in the member states, and interpretation of national law by data protection authorities have created even greater variations. Global companies that operate in Europe are subject to different compliance regimes in each of the Commission’s 27 member states. Many such countries require elaborate filings and prior approvals for data transfers – even when using a mechanism that has been pre-approved by the European Commission. As noted in [one recent paper](#), “The International Law Commission (ILC) has stated that ‘the international binding and non binding instruments, as well as the national legislation adopted by States, and judicial decisions reveal a number of core principles’ of data protection; however, it is doubtful whether such principles have won broad recognition among States.”

The Department of Commerce's experience with negotiating and maintaining the U.S./EU Safe Harbor Framework and its leading role at Asia Pacific Economic Cooperation makes it the appropriate United States Government agency to lead the U.S. in discussions toward greater global privacy harmonization. Moreover, the Department can encourage global recognition of the real strengths of the current U.S. system of "on the ground" enforcement and flexible standards.

We encourage the Department to play a leading and active role in establishing a global privacy framework that encourages innovation and allows for the global flow of data. There is widespread recognition that industry and users need a widely accepted and practical international standard of privacy protection if online commerce is to flourish. The [APEC Privacy Framework](#) is a good step toward helping member countries develop privacy laws and regulations that achieve effective privacy protection and continuity for cross-border information flows. We encourage similar efforts to create a set of global privacy principles.

Similarly, the Organization for Economic Cooperation and Development is this year marking the [30th anniversary of the OECD Guidelines](#) on the Protection of Privacy and Transborder Flows of Personal Data. The review of these Guidelines, which have served as the foundation for virtually all privacy laws around the world, offers another important opportunity for the Department of Commerce to lead a thoughtful effort to continue protecting privacy through the harmonization of standards and the enhancement of mutual recognition among member countries.

### **Towards a Comprehensive, Baseline Privacy Framework**

#### **The Department should develop and encourage the adoption of a comprehensive framework for unifying legal standards and creating a platform for responsible innovation**

The solution to the challenges posed by existing incomplete and inconsistent privacy standards is a unified, comprehensive, and flexible privacy framework that can encourage harmonization of law and multilateral agreements on data transfers and enforcement. Developing such a framework will be a long process and we look forward to working closely with the Department on this issue. To begin, however, we can articulate several foundational characteristics of such a framework.

#### *It must be comprehensive*

To protect users and offer consistency to providers, the privacy framework must cover all collection and use of data, all providers, and all manner of privacy harms. While not a complete list, the framework should include the following:

- **Even-handed application.** A pro-innovation privacy framework must apply even-handedly to all personal data regardless of source or means of collection. Thus, offline data collection and processing should, where reasonable, involve similar data protection obligations.
- **Recognition of benefits and costs.** As with any regulatory policy, it is appropriate to examine the benefits and costs of regulatory initiatives in this area, including explicit

attention to actual harm and compliance costs.

- **Security.** We pride ourselves at Google for industry-leading security features, including use of [encryption for our search and Gmail](#) services. The privacy framework should promote reasonable security principles – developed under evolving standards formulated by responsible industry actors and experts and reflective of current best practices. This will offer users a consistent, dependable and enforceable level of protection while offering clear, flexible guidelines for providers.
- **Clear process for compelled access.** As we have discussed above, the U.S. law governing government access to stored communications is outdated and out of step with what is reasonably expected by those who use cloud computing services. The problems in the law threaten the growth, adoption, and innovation of cloud technologies without a corresponding benefit. As part of the [Digital Due Process coalition](#), we are working to address this issue. A privacy framework should also include clear rules for civil litigant and other compelled access.

*It must be a baseline on which providers can innovate*

Perhaps most importantly, a pro-innovation privacy framework offers providers the flexibility to both develop self-regulatory structures and individually innovate in privacy practices and tools. The advertising industry and online publisher efforts to [develop self-regulatory rules](#) for interest-based advertising (IBA, for short), for example, are a strong example of the need for and utility of industry-driven efforts.

Beyond cooperative industry efforts, baseline, principles-based rules give room for individual providers to innovate in the privacy space. Google, for its part, offers a number of industry-leading privacy tools:

- Prior to the industry IBA effort, for instance, Google launched its own IBA product with a number of groundbreaking privacy features in place. Google's interest-based ads contain notice in the actual advertisement indicating that it is a Google advertisement. The in-ad notice is linked to information about IBA, including our [Ads Preferences Manager](#), which allows users to change the interest categories used to target ads or to opt-out of interest-based advertising altogether.
- Google also offers leading options for data portability. For Google, providing our users with control over their personal information must also mean giving them the ability to easily take data with them if they decide to leave. Starting with our Gmail service and now covering more than 25 Google products where users create and store personal information, our "[Data Liberation Front](#)" allows our users to "liberate" data if they choose to switch providers or to stop using one of our services.
- Google developed the [Google Dashboard](#) to provide users with a one-stop, easy-to-use control panel to manage the use and storage of personal information associated with their Google accounts. With the Dashboard, a user can see and edit the personally identifiable data stored with her individual Google account.

As noted above, more information on our innovative privacy tools is available in the attached comments, which we recently filed with the FTC.

Continued innovation in the privacy space is vital for users. Unfortunately, compliance-based rules can lock providers into a specific privacy model. A principles-based model encourages innovation and competition in privacy tools.

A baseline framework needs to encourage the development of innovative tools like these. We believe that stable, baseline principles set by regulation can permit flexible, adaptive structures to develop on top – much like the stable protocols and standards at the physical and network layers of the Internet allows flexible and innovative development at the content and application layers. With comprehensive, baseline privacy legislation establishing ground rules for all providers, self-regulatory standards and best practices of responsible industry actors will evolve over time. On top of that structure, individual providers will be free (and encouraged) to create innovative privacy tools and policies rather than stick with potentially outdated compliance structures.

#### *How the Department can lead*

The Department can lead in several important areas including the following:

- **Leverage its intra- and inter-agency competencies.** The Department is well-positioned to draw from relevant expertise at NTIA, ITA, and NIST. It can also take this expertise to help develop a privacy framework and inform the ongoing efforts at the FTC and in Congress.
- **Continue to work with international partners.** The Department should continue working with national data protection authorities as well as other foreign agencies and representatives to build international consensus around a privacy framework that recognizes the value of data and the need for consistency and, where consistency cannot be achieved, mutual respect and recognition.
- **Draw from experience and promote dialog.** The Department has a long history of seeking neutral economic and technological evidence. It should draw on this expertise to encourage innovation and competition in pro-privacy tools; to support and develop objective forums for gathering, analyzing, and reporting data on economic impact of privacy regulation; and to host discussions involving government, industry, and non-governmental organizations about emerging technology and associated privacy issues.

\* \* \*

Google thanks the Department for this opportunity to comment, and urges its continued involvement in the privacy space. The Internet, cloud services, and data innovation will drive the U.S. and world economies for years to come. Just as the Department showed global leadership in early Internet regulatory policy, it should lead in the creation of sensible and strong baseline privacy principles. Google stands ready to assist the Department in these and any other efforts to help develop and implement a comprehensive, baseline framework for privacy.

Sincerely,

A handwritten signature in black ink, appearing to read 'Pablo L. Chavez', written in a cursive style.

Pablo L. Chavez  
*Director of Public Policy*  
*Google Inc.*

Attachment: Comments of Google Inc. in FTC Privacy Roundtable Project

## A LETTER TO THE PRESIDENT OF THE UNITED STATES

April 5, 2010

President Barack Obama  
The White House  
1600 Pennsylvania Avenue, NW  
Washington, DC 20500

Dear Mr. President:

We are writing to ask that your Administration adopt the goal of giving every household and business access to timely, useful and actionable information on their energy use. By giving people the ability to monitor and manage their energy consumption, for instance, via their computers, phones or other devices, we can unleash the forces of innovation in homes and businesses. At the same time, we can harness the power of millions of people to reduce greenhouse gas emissions -- and save consumers billions of dollars.

Studies and experience show that when people have access to direct feedback on their electricity use, they can achieve significant savings through simple behavioral changes. Investments in home energy efficiency, along with automating appliances and other devices, can lead to even greater savings. These savings could be substantial when added up: if all U.S. households saved 15% on their energy use by 2020, for example, the greenhouse gas savings would be equivalent to taking 35 million cars off the road and would save consumers \$46 billion on their energy bills, or \$360 per customer each year.

Mr. President, we think consumers should have access to information such as:

- The ability to see their power use in a manner that will enable them to discover the sources and causes of their consumption;
- Pricing and pricing plans; and
- Available information about generation sources of electricity.

Technologies exist today that can be deployed to achieve this goal. To ensure success, we need clear rules on consumer access to information; incentives to promote the deployment of technologies, including cost recovery; programs that educate and engage both providers and energy users; and encouragement of diverse technologies. Robust privacy and security protection for consumers and

their information is essential. Along with the private sector and State and local governments, the Federal government can be a leader.

Mr. President, to this end, we request that you consider the following:

- Initiate a White House led effort to work in partnership with Federal agencies, States, industry and other stakeholders to determine the best strategies, programs and policies needed to meet the goal of providing consumers access to their energy information, including principles to protect consumer privacy and control of their energy data.
- Direct the Department of Energy and the Environmental Protection Agency and ask the Federal Energy Regulatory Commission to add the availability of timely, useful and actionable energy information to consumers as a criterion for consideration in rulemakings, grants, and other programs related to end use electricity distribution and energy efficiency. This will ensure that consumer energy information is integrated into programs as diverse as home weatherization, energy efficiency grants, appliance standards, home and commercial building programs, federal energy management, research and development funding, and regulation of energy suppliers.
- Encourage the purchase and installation of technologies, devices and methods of delivery that will help ensure timely, secure, and clear information on energy consumption is available to consumers. To that end, we request that you consider access to this information as part of any program aimed at improving home and building energy performance.
- Convene a White House summit to address how to empower consumers with better information and tools for managing their energy use. We would welcome the opportunity to work with the White House to host a consumer energy technology showcase that will highlight energy information and control solutions for consumers.

Your Administration recently recognized the value of providing consumers with access to energy information through the Federal Communications Commission's National Broadband Plan. The Office of Science and Technology Policy, along with the National Institute of Standards and Technology, recently facilitated a discussion on the consumer interface with the smart grid and how to develop the standards necessary to make it work seamlessly. The Department of Energy is leading programs to improve energy efficiency in homes and buildings and accelerate the deployment of the smart grid. We strongly support these efforts and hope that you will carry them further as outlined above.



We stand ready to assist you in your efforts to empower energy consumers, rebuild the economy, save energy and reduce greenhouse gas emissions.

Respectfully,

Aclara  
Alliance to Save Energy  
American Council for an Energy-Efficient  
Economy (ACEEE)  
APC by Schneider Electric  
AT&T  
Best Buy  
C3  
Center for American Progress  
The Climate Group  
Comcast  
Consumer Electronics Association (CEA)  
Control4  
Demand Response and Smart Grid  
Coalition (DRSG)  
Digital Energy Solutions Campaign  
(DESC)  
Dow  
Efficiency First  
eMeter  
Energy Future Coalition  
EnergyHub  
EnerNOC  
Environmental Defense Fund  
Environmental Entrepreneurs (E2)  
Foundation Capital

General Electric  
Google Inc.  
Green Electronics Council  
GridPoint, Inc.  
Hara  
Hewlett-Packard  
Honeywell  
iControl Networks, Inc.  
The Information Technology Industry  
Council (ITI)  
Intel  
Itron  
Johnson Controls, Inc.  
Khosla Ventures  
Kleiner Perkins Caufield & Byers  
Natural Resources Defense Council  
Nokia  
Opto 22  
Pew Center on Global Climate Change  
Telecommunications Industry Association  
(TIA)  
Tendril  
U.S. Green Building Council  
Vantage Point Venture Partners  
Verizon  
Whirlpool

*For further information, please contact Michael Terrell at [mterrell@google.com](mailto:mterrell@google.com) or Molly Webb at [MWebb@theclimategroup.org](mailto:MWebb@theclimategroup.org).*



Comments of Google Inc.

Office of Science and Technology Policy Forum:  
Consumer Interface with the Smart Grid

March 12, 2010

Google is pleased that the Office of Science and Technology Policy has opened this inquiry on the customer interface with the smart grid. As Congress recognized in the Energy Independence and Security Act of 2007, one goal of the smart grid is to provide consumers with access to timely information and control options. By giving consumers the ability to better monitor and manage their power use, a fully functioning smart grid can facilitate significant energy and money savings, create more efficient overall power management including peak demand planning, spur investment and innovation in home energy management, and reduce greenhouse gas emissions. To achieve these benefits, as a nation we must develop and deploy smart grid technology in a manner that empowers consumers with timely, useful and actionable information about how they use energy. At Google, we believe consumer access to this information should be a national priority and are pleased that the Administration is looking at ways that it can accelerate this transformation.

**1. Should the smart meter serve as the primary gateway for residential energy usage data, price data, and demand response signals? What are the most important factors in making this assessment, and how might those factors change over time?**

The smart meter should be one of multiple gateways for residential energy use data, price data, and demand response signals. A variety of other interfaces, including broadband Internet and mobile devices, can also serve as gateways and should be encouraged. The widespread availability of multiple gateways will best enable applications to be quickly adopted and scaled. In addition, utilizing open platforms for these gateways will ensure greater innovation and consumer choice.

**2. Should a separate gateway other than the smart meter be the primary gateway for all or a subset of this data described in question 1?**

As discussed in question 1, Google believes there should be multiple gateways for residential energy use data, price data, and demand response signals in order to maximize consumer access and choice. The use of separate gateways may also improve the security of the grid. For example, even where a smart meter has been installed, it may be prudent to use a separate gateway such as the Internet for controlling and automating home appliances and equipment. The physical separation between the delivery of energy and the delivery of energy services could be an effective way of addressing many security concerns.

**3. If the smart meter, via the utility network, is the primary gateway for the data described in question 1, will consumers and their authorized third party service providers be able to access the data easily and in real-time?**

Not necessarily. Simply installing a smart meter will not ensure that consumers, or their authorized third party providers, will have access to data easily either via the utility backhaul or a Home Area Network. To ensure access to smart meter data, meter deployments need to be coupled with strong data access policies. In addition, designating a single, primary gateway via a utility network may not be the most cost effective way to deliver information and energy savings. A variety of options should be available to consumers to encourage competition, innovation and consumer choice.

**4. Who owns the home energy usage data? Should individual consumers and their authorized third-party service providers have the right to access energy usage data directly from the meter?**

Customers and their authorized third-party service providers should be able to access home energy usage data at any time without having to pay extra for the data itself. The customer should also have full control over who has access to their data, and no one should have access to a customer's data without the customer's consent. Clear rules around customer access and control of data should also be coupled with a robust standards architecture that protects the communication of that data and ensures that the authentication process and transmission of energy data is done securely.

**5. How are low-income consumers best served by home-to-grid technology?**

A number of studies indicate that access to direct feedback on energy consumption leads to energy and money savings. For example, an Oxford University review of research on the effects of providing immediate feedback on electricity usage found that overall energy savings generally ranged from 5 to 15 percent. Recognizing that energy costs place a significant burden on low-income consumers, home-to-grid technologies can help facilitate simple energy usage modifications that generate high-value savings to those consumers. Multiple, competing gateways to receive energy data will also help ensure the broadest and lowest cost access to data by consumers.

**6. What alternative architectures involving real-time (or near-real-time) electricity usage and price data are there that could support open innovation in home energy services?**

As previously discussed, several alternative architectures exist for providing electricity usage and price data. For example, customers can now install software and hardware to access their usage data.<sup>1</sup> By connecting these devices to the Internet, customers not only increase their architecture choices, but also can benefit from third party applications. Utilizing open platforms like the Internet will help to foster applications that will provide customers with more options on how they view and interact with their price and usage data.

**7. Some appliance manufacturers have announced plans to market smart grid-enabled appliances in late 2011 provided that appropriate communication standards are defined in 2010. What standard data communications interface(s) should be supported by appliances and the smart meter or data gateway so that appliance manufacturers can cost-effectively produce smart appliances that can communicate with the smart grid anywhere in the nation? How can communication between smart appliances and the smart grid be made "plug and play" for consumers who do not have the skills or means to configure data networks? If gateways or adapters are needed, who should pay for them? The utility or the consumer?**

The communications standards for smart-grid enabled appliances are still evolving, but using Internet Protocols (e.g., Wifi and 6LoWPAN) is likely to foster and accelerate the adoption of plug-and-play devices. The use of widely used standards like IP would enable devices to take advantage of existing economies of scale and would minimize the need for complex and expensive adapters.

---

<sup>1</sup> Several of these customer installed devices are already available or will soon become available, including the TED5000, Blueline Innovations PowerCost Monitor and Energy Hub devices.

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
	)	
Comments Sought on International	)	GN Docket No. 09-47
Comparison and Consumer Survey	)	
Requirements in the Broadband Data	)	
Improvement Act	)	
	)	
Inquiry Concerning the Deployment	)	GN Docket No. 09-137
of Advanced Telecommunications	)	
Capability to All Americans	)	
In a Reasonable and Timely Fashion,	)	

## **TABLE OF CONTENTS**

<b>INTRODUCTION AND SUMMARY.....</b>	<b>2</b>
<b>QUESTION 4: REAL-TIME DATA.....</b>	<b>3</b>
<b>QUESTION 5: HOME AREA NETWORKS.....</b>	<b>8</b>
<b>CONCLUSION .....</b>	<b>11</b>

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
A National Broadband Plan for Our Future	)	GN Docket No. 09-51
	)	
	)	
Comments Sought on International	)	GN Docket No. 09-47
Comparison and Consumer Survey	)	
Requirements in the Broadband Data	)	
Improvement Act	)	
	)	
Inquiry Concerning the Deployment	)	GN Docket No. 09-137
of Advanced Telecommunications	)	
Capability to All Americans	)	
In a Reasonable and Timely Fashion,	)	
And Possible Steps to Accelerate	)	
Such Deployment Pursuant to	)	
Section 706 of the Telecommunications Act	)	
of 1996, As Amended by the	)	
Broadband Data Improvement Act	)	

**COMMENTS OF GOOGLE INC. – NBP PUBLIC NOTICE #2**

Google Inc. files these comments in response to the Federal Communication Commission’s (“FCC” or “Commission”) Public Notice seeking comment on how broadband infrastructure and services could help achieve efficient implementation of Smart Grid technology, as part of the Commission’s development of a National Broadband Plan (“NBP”)<sup>1</sup> as directed by the American Recovery and Reinvestment Act of 2009 (“Recovery Act”).<sup>2</sup> These comments address Question 4, Real-Time Data, and Question 5, Home Area Networks.

---

<sup>1</sup> *A National Broadband Plan for Our Future*, NBP Public Notice #2, DA 09-2017 (Sept. 4, 2009) (“NBP Public Notice #2”). See also *A National Broadband Plan for Our Future*, Notice of Inquiry, 24 FCC Rcd. 4342 (2009) (“NOI”).

<sup>2</sup> Pub. L. No. 111-5, 123 Stat. 115 (2009).

## INTRODUCTION AND SUMMARY

*If you cannot measure it, you cannot improve it.*  
– William Thompson, Lord Kelvin (1821-1907)

In December 2007, the U.S. Congress pronounced that it is the policy of the United States to build a “smart grid” capable of providing consumers with access to electricity usage information.<sup>3</sup> Google has been an advocate of providing consumers with such information and is developing a free, web-enabled software tool called Google PowerMeter to facilitate such access.<sup>4</sup> The Google PowerMeter application, now in its test phase, will enable consumers to receive, at no charge, information about their electricity consumption from utility smart meters and energy management devices.<sup>5</sup>

Today, there is extremely limited ability for households and small businesses to access their energy usage information more than once a month, and even less ability to interact with this data (including remotely) through intelligent devices and other hardware and software. Smart Grid policies that promote easy access to energy consumption information will, over time, save money and energy, reduce greenhouse gas emissions, create more efficient overall power

---

<sup>3</sup> See Energy Independence and Security Act of 2007, Pub. L. No. 110-140, § 1301 and § 1307(a).

<sup>4</sup> See e.g., Comments of Google Inc. submitted to United States Department of Energy in response to Notice of Intent to Issue a Funding Opportunity Announcement for the Smart Grid Investment Grant Program (May 6, 2009); Testimony of Edward Lu, Advanced Projects Program Manager, Google, Inc., Senate Committee on Energy and Natural Resources Hearing on Smart Grid (Mar. 3, 2009); Comments of Google Inc. to California Public Utilities Commission, Proceeding R08-12-009, Order Instituting Rulemaking to Consider Smart Grid Technologies Pursuant to Federal Legislation and on the Commission’s own Motion to Actively Guide Policy in California’s Development of a Smart Grid System (Feb. 9, 2009). Google is addressing the challenges of energy independence and efficiency on several fronts. Google.org, the company’s philanthropic arm, uses information and technology to help solve major global challenges including climate change and energy security. See <http://www.google.org/>.

<sup>5</sup> See <http://www.google.org/powermeter/>.



management including peak demand planning, help with the integration of plug-in vehicles and on-site generation, and spur economic growth.

Smart Grid policy should promote the development of hardware and software tools and programs as part of an open ecosystem to empower consumers to make informed choices about their energy use, encourage participation in third-party demand-response programs, support on-site generation and plug-in vehicle adoption, and spur the development of innovative intelligent devices. Access to the Internet is an important component of the Smart Grid because it can support the transmission and exchange of consumer energy usage information, which will engage and empower consumers.

Specifically, as discussed in more detail below, Google urges the Commission to consider and recommend, as part of the NBP, adoption of policies and goals that seek to:

- Enable all households and small business to have access to near real-time information about their own energy use in a format that is easily accessible and understandable, creating a feedback loop to reduce energy consumption, save money and reduce greenhouse gases.
- Promote Innovation-friendly Home Area Networks grounded in open non-proprietary standards to drive development of creative, new energy management products and services for homes and small businesses.

#### **QUESTION 4: REAL-TIME DATA<sup>6</sup>**

As the FCC correctly notes, simply providing consumers access to their energy consumption information, whether via in-home displays, web portals or other methods, reduces energy consumption. To create the most enduring, dramatic reductions consumers should have

---

<sup>6</sup> Google's comments in this section focus on the questions in Paras. 4(b), (d), (e) and (f) of the NBP Public Notice #2.

access to near real-time information about their energy use in a format that is easily accessible and understandable.

Ideally, a consumer should be able to turn on an appliance and, within seconds or minutes, see the resulting change in their electricity consumption – creating a "Prius effect" for the home.<sup>7</sup> A different matter than the immediacy of feedback is the granularity of the data presented to the consumer. In other words, even if a consumer is not able to access her energy information data until the end of the day (or even the following day), if the information is provided in at least 15-minute increments the consumer will be able to identify specific appliances based on a recollection of when they were used. By contrast, receiving energy usage data that merely provides the aggregate level of household electricity consumption on an hourly or even less frequent basis is not as useful. In the case of less granular information, the consumer will have a more limited understanding of the consumer's actual usage patterns.<sup>8</sup>

A number of studies indicate that access to near real-time information has a direct, measurable and substantial impact on energy consumption. For example, an Oxford University review of research on the effects of providing immediate feedback on electricity usage found that overall demand reductions generally ranged from 5 to 15 percent.<sup>9</sup> Many other tests and pilot programs also are being conducted. A pilot study of near real-time energy use feedback

---

<sup>7</sup> The "Prius effect" refers to the fuel-reducing responses of Toyota Prius drivers to that car's real-time fuel-efficiency monitor. *See e.g.,* Michael S. Rosenwald, *For Hybrid Drivers, Every Trip is a Race for Fuel Efficiency*, Wash. Post (May 26, 2008).

<sup>8</sup> In addition to reductions spurred by feedback alone, consumers empowered with energy awareness will be more likely to invest in energy efficiency measures – something that can lead to even great energy savings.

<sup>9</sup> Sarah Darby, *The Effectiveness of Feedback on Energy Consumption: A Review for DEFRA of the Literature on Metering, Billing and Direct Displays* 3 (2006), <http://www.eci.ox.ac.uk/research/energy/electric-metering.php>.

monitors in Ontario, Canada, for example, followed the electricity consumption of over 400 pilot participants and control customers over a two-and-a-half year period.<sup>10</sup> The average reduction in overall electricity consumption across the sample was 6.5 percent, and energy demand reductions continued throughout the study period. Similarly, a 370-home pilot program by Energy Trust of Oregon concluded earlier this year using in-home displays found that 63 to 75 percent of consumers believed that these devices have changed the way they use energy, especially regarding lighting, air conditioning, computers and dryers.<sup>11</sup> These outcomes echo the results from a pilot program by National Grid, NSTAR, Western Massachusetts Electric in 2007-2008 with over 3,500 homes, and others.

Energy savings prompted by access to near real-time data can be enhanced when combined with programmable appliances and dynamic energy pricing. A study conducted by the Pacific Northwest National Laboratory<sup>12</sup> gave customers in Oregon and Washington access to energy consumption information broken down by appliance every 15 minutes, and allowed them to program their water heaters and thermostats to respond to changes in electricity prices. Participants received cash when they operated their household loads in collaboration with the needs of the grid — *i.e.*, when they reduced their energy usage at times of peak energy demand. Over the year of the study, peak load on the grid was reduced by approximately 15 percent and consumers saved approximately 10 percent on their electricity bills as compared to the previous

---

<sup>10</sup> D. Mountain, Mountain Economic Consulting and Associates, Inc., *The Impact of Real-Time Feedback on Residential Electricity Consumption: The Hydro One Pilot* (2006).

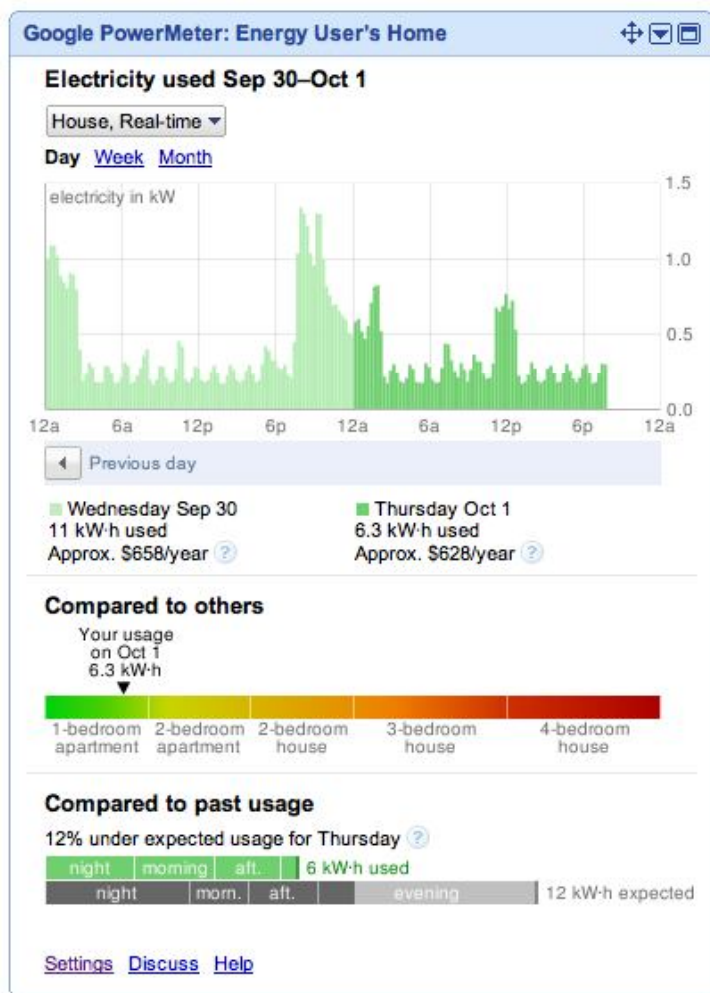
<sup>11</sup> Electric Power Research Institute, *Residential Electricity Use Feedback: A Research Synthesis and Economic Framework*, Final Report, App. E, 4 (Feb. 2009)  
<http://my.epri.com/portal/server.pt?space=CommunityPage&cached=true&parentname=ObjMgr&parentid=2&control=SetCommunity&CommunityID=405>.

<sup>12</sup> D.J. Hammerstrom, Pacific Northwest National Laboratory, *Olympic Peninsula Gridwise Study* (2007), [http://gridwise.pnl.gov/docs/op\\_project\\_final\\_report\\_pnnl17167.pdf](http://gridwise.pnl.gov/docs/op_project_final_report_pnnl17167.pdf).

year. Based on these results, the authors determined that, if all customers nationwide were engaged in reducing peak loads, peak electricity prices would be substantially reduced and approximately \$70 billion in new generation, transmission and distribution systems could be avoided, with the savings passed along to ratepayers.

Near real-time energy usage information can be provided to customers in a wide variety of ways, including utility-supplied smart meters (advanced metering infrastructure or "AMI"), as well as by consumer-installed hardware and software, empowering consumers to view their data via displays in the home, online, or even on smart phones. While smart meters enable automated reading and accurate collection of consumption data by utilities, as well as delivery of detailed consumption data to consumers, there is no reason to limit these intelligent devices simply to smart meters with usage information. Communications can be interactive, empowering consumers to adjust their behaviors and energy usage according to data about rates, complementary services and other factors.

Google PowerMeter, a free, opt-in, web-enabled software service, draws data from electric utility smart meters and energy management devices to give people access to their home electricity consumption data. Google PowerMeter currently is being tested with several large and small utility companies throughout the United States including San Diego Gas & Electric, TXU Energy, and White River Valley (Missouri) Electric Cooperative, as well as in Canada, Germany and India, and Google plans to expand its rollout later this year. As shown in the following graphic, the Google PowerMeter default view can show the current day's energy consumption in fifteen minute increments compared to the previous day's consumption.



By providing access to this level of granular information in a format that can be easily integrated into daily life, energy usage information will become part of consumers' usual daily routine. This energy usage awareness will also motivate consumers to obtain programmable devices and use any available dynamic energy pricing, and help drive down longer-term consumption trends. Such awareness can also drive consumers to make energy efficiency upgrades that can lead to additional long-term usage

reductions and savings.

The benefits of near real-time energy usage data availability scale up very quickly in terms of consumer cost savings, CO2 emission reductions, reduced overall peak usage reductions and decreased need for new generation infrastructure. For example, the average U.S. residential customer spends about \$1,200 a year on electricity, meaning that even a 5 to 15 percent consumption reduction due to near real-time feedback could save the average consumer \$60 to \$180 per year.<sup>13</sup> If just half of U.S. households cut their demand by 10 percent, the electricity

<sup>13</sup> Energy Information Administration ("EIA"), U.S. Average Monthly Bill By Sector, Census Division, and State, Table 5 (2007), <http://www.eia.doe.gov/cneaf/electricity/esr/table5.html>. The average monthly electricity bill for California households is less than the national average,

savings would be greater than the wind and solar power output.<sup>14</sup> The CO2 emissions avoided would be equal to taking approximately 8 million cars off the road.<sup>15</sup> With the addition of dynamic pricing, programmable appliances, and other incentives, the potential for savings could be significantly greater.

## **QUESTION 5: HOME AREA NETWORKS**

Home Area Networks (HANs) can be implemented in a number of ways. The most common are Ethernet cabling, WiFi (IEEE 802.11 wireless), IPv6 6LOWPAN (IEEE 802.15.4) and Zigbee. Of the four, the first three are open standards supporting the use of the Internet protocols and presumably attractive for that reason. The purpose of HANs is to allow devices in the home to be interconnected with one another and, potentially, to the Internet. Not all devices need to be directly reachable through the Internet, however. Some may be confined to in-home connectivity and, in fact, separated from access to the public Internet. In the context of energy monitoring and management, a HAN can be instrumental in capturing energy consumption information on a very granular basis, for exerting controls on energy consumption and for providing potentially on-demand, real-time feedback on energy usage.

---

even though California has some of the highest electricity rates in the country. This is due in large measure to the many successful state energy efficiency initiatives already in place. Next Ten, California Green Innovation Index 63 (2009), [http://www.next10.org/pdf/GII/Next10\\_GII\\_2009.pdf](http://www.next10.org/pdf/GII/Next10_GII_2009.pdf).

<sup>14</sup> See EIA, Annual Energy Outlook (2008), <http://www.eia.doe.gov/oiaf/archive/aeo08/index.html> (“*EIA 2006 Annual Energy Outlook*”); American Wind Energy Association, U.S. Wind Energy Projects as of 12/31/2008, <http://awea.org/projects>.

<sup>15</sup> See EIA 2006 Annual Energy Outlook; U.S. Dep’t of Energy, Transportation Energy Data Book (2008), <http://cta.ornl.gov/data/index.shtml>; Environmental Protection Agency, Greenhouse Gas Equivalencies Calculator (2008), <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

For maximum benefits, near real-time data should be part of an open ecosystem of hardware and software for energy monitoring, home automation, appliance/device control, and demand responses. Third party service providers are likely to bring even greater innovation in data usage and applications. For example, a utility or third party could offer services or applications that analyze energy use, identify inefficient appliances, provide appliance discounts or suggest energy management practices. Interactive devices and/or software, including obvious examples such as thermostats that adjust automatically and dishwashers that run only at preferred times according to energy pricing, monthly usage or other consumer-driven factors, can be developed. One can also imagine energy usage information that shows how “green” the source, such as whether the energy was generated by wind versus coal or a device that turns itself off and on when energy costs rise above a certain set level. Consenting and informed consumers should be able to share their information in a standardized, open format – *i.e.*, a format that is uniform, freely published, and unencumbered by a patent or proprietary claim. The primary goal should be to transparently and securely provide consumers more useful choices and information, regardless of the source.

Further, a HAN platform also can generate innovations by third-party providers, particularly if the data is standardized and uniform. Consenting and informed consumers sharing data with third parties in a standardized, open format, will facilitate the development of a range of products and services. Just as XML allowed Internet services to proliferate through simple, unified, fee-free and open standards to share diverse data, so too can uniformity in energy data bring us a smarter energy framework.

Most importantly, by creating a platform for information exchange, it is likely that – as with the Internet – there are numerous other applications, devices and services that have not yet



been conceived and that will spring from the energy information exchange enabled by intelligent devices. It is important to approach a smarter energy infrastructure with the understanding that data flows two ways. This means that information (consumer usage, pricing and other utility data) can be exchanged between the utility and the consumer, between appliances and other consumer electronic devices (game consoles, etc.), and between consumers, utilities and third-party service providers. All of this information can be exchanged via the Internet, so that consumer energy usage can flow from the smart meter and appliances to the Internet, and demand response requests and information can flow back from the Internet to the smart meter and devices. Enabling the Internet to facilitate this two-way flow helps stimulate competition for services and promotes greater consumer choice.<sup>16</sup>

Broadband infrastructure is significant because it determines the level of robustness and efficiency of the real-time delivery of information, and allows delivery of information on a granular basis, increasing the likelihood that it will lead to rational and efficient choices regarding consumption. By enabling access to various types of information, including information accessed remotely via broadband connections, consumer consumption is best affected. Narrowband simply is not as compelling or useful for consumers and will limit or preclude new Smart Grid applications and services. With the availability of new broadband platforms, including increased use of unlicensed spectrum, we further increase the likelihood of better interactivity between consumers and utilities, empowering consumers to make sound energy choices. Connecting WiFi HANs to the Internet has produced numerous benefits for consumers; additional benefits will result as Internet-connected HANs encompass energy

---

<sup>16</sup> Moreover, just as the Internet Protocol (IP) is well understood and has formed the foundation to bring us the dynamic creativity and innovation that characterizes the Internet, so too may it prove useful in the roll-out of our national smart grid.

applications and services – some we can foresee (such as Energy Management Systems and Internet Control) and some that we cannot. For this reason, broadband in all its various flavors (DSL, cable, fiber, LTE, WiMax, etc.) has a role in a smarter national energy grid.

## **CONCLUSION**

Today, energy efficiency, renewable energy, plug-in cars, on-site generation and a number of other clean energy opportunities have become high priorities because of serious environmental, security and economic concerns. Capturing these opportunities will require, among other things, a smarter energy infrastructure. We encourage the Commission to consider the points made above as it considers Smart Grid in the context of its National Broadband Plan. We urge the Commission to adopt recommendations that will promote consumer access to near real-time data, including over HAN platforms, using open, non-proprietary standards, in a manner that maximizes consumer choice, engagement and control. This approach will help to ensure that the Smart Grid, essentially an "energy Internet," benefits from the freely flowing information exchange that broadband enables.

Respectfully submitted,

/s/ Harry Wingo

Harry Wingo  
Policy Counsel  
Google Inc.  
Public Policy Department  
1101 New York Avenue NW  
Second Floor  
Washington, DC 20005

October 2, 2009