BEFORE THE PUBLIC UTILITIES COMMISSION OF

THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop the Commission's Energy Efficiency Strategic Plan.	Rulemaking 08-07-011 (Filed July 10, 2008)
Joint Application of Pacific Gas and Electric Company (U39E), Southern California Edison Company (U338E), San Diego Gas & Electric Company (U902E), and Southern California Gas Company (U904G) Submitting the California Energy Efficiency Strategic Plan.	Application 08-06-004 (Filed June 12, 2008)

INITIAL COMMENTS OF CURRENT GROUP, LLC

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Pursuant to the Order Instituting Rulemaking ("OIR"), CURRENT Group, LLC ("CURRENT") hereby submits these initial comments to provide recommendations regarding the issues to be considered this proceeding. The OIR requested initial comments be filed on July 17, 2008. Accordingly, these initial comments are timely filed.

In response to the OIR's request that parties identify themselves and their interest in the proceeding consistent with Rule 1.4(b), CURRENT provides the following information. CURRENT is a Maryland-based company that provides a high-speed, two-way communications network with embedded sensing that is installed on existing electric distribution networks to transform them into efficient, automated Smart Grids. These Smart Grids are monitored by a 24x7 network management system and analytic software platforms specifically designed to enhance the reliability, security and efficiency of the electric distribution grids. CURRENT is presently supporting Smart Grid deployments in

Dallas, Texas with Oncor Electric Delivery and in Boulder, Colorado with Xcel Energy.[1] As discussed in these initial comments, Smart Grid can offer substantial improvements to the energy efficiency of the distribution system. Accordingly, CURRENT seeks to present this information to the Commission in order to support consideration of Smart Grid as an energy efficiency measure in the Commission's Energy Efficiency Strategic Plan.

SUMMARY

In its OIR and Preliminary Scoping Memo, among other issues to be addressed in this proceeding, the Commission seeks comment on strategies omitted from the utilities' California Energy Efficiency Strategic Plan ("CEESP")[2] that should be added and adopted in a Commission Strategic Plan.[3] These comments address the virtual absence in the CEESP of upgrades to the electric distribution grid with Smart Grid technologies as an energy efficiency measure in and of themselves.

In short, the CEESP's goals are not fully achievable without the deployment of Smart Grid technologies. In fact, the federal Energy Independence and Security Act of

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[1] *See e.g., Xcel starts construction of Boulder 'smart grid'*, Denver Business Journal (May 15, 2008), available at: http://www.bizjournals.com/denver/stories/2008/05/12/daily41.html. An overview of Xcel's Smart Grid City is available online at: http://www.xcelenergy.com/docs/SmartGridCityDesignPlan.pdf and http://www.xcelenergy.com/XLWEB/CDA/0,3080,1-1-1_15531_43141_46932-39884-0_0_0-0,00.html. Additional information about CURRENT is available at www.currentgroup.com.

[2] California Energy Efficiency Strategic Plan, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, and Southern California Gas Company, A08-06-004 (July 2, 2008) (*CEESP*).

[3] *See* OIR at p. 3; Preliminary Scoping Memo at p. 2.

2007 recently concluded that it is the federal policy of the United States to support Smart Grid.[4] The Act directs states to evaluate the deployment of Smart Grids, and authorizes more than half a billion dollars to help fund Smart Grid projects.[5] Further, Smart Grid legislation has recently been introduced in several states, including New Jersey, New York and California, and has already been enacted into law in Maryland and Massachusetts.[6] Smart Grid technologies are a critical component of any long-term, zero-net energy plan, yet the CEESP and the Draft Commission California Strategic Plan for Energy Efficiency ("Draft Strategic Plan") both omit any discussion of Smart Grid technologies.[7]

A Smart Grid will produce significant *net savings* for rate payers compared to the negative pricing impact of most meter-centric, or "smart meter," solutions. It also is an energy efficiency measure in and of itself, and as such, should be a key component of the Commission's energy efficiency Strategic Plan. The California Energy Commission recently estimated that such optimization could reduce distribution grid line losses by 15% or more and save 500,000 tons of CO_2 annually.[8] At least one utility estimates its

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[4] Energy Independence and Security Act of 2007 (P.L. 110-140, H.R.6), Sec. 1301.

[5] EISA-07, Secs. 1304, 1306 & 1307.

[6] *See* Smart Grid System Compatibility Act, NJ Assembly Bill No. 2917 (Introduced June 12, 2008); Smart Grid Pilot Program Act, NJ Assembly Bill No. 2918 (Introduced June 12, 2008); NY Assembly Bill No. 10885 (Introduced May 7, 2008)(in relation to "Smart Grid Systems"); CA Senate Bill No. 1438 (Smart Grid Systems); EmPOWER Maryland Energy Efficiency Act of 2008, Sec 2, HB 374/SB 2005, 2008 Md. Laws, Ch. 131 (enacted April 8, 2008); Green Communities Act, S.2768 (enacted July 2, 2008), Sec. 85 (requiring Smart Grid Pilot Programs).

[7] Draft Commission California Strategic Plan for Energy Efficiency, A08-06-004 (July 14, 2008) (*Draft Strategic Plan*).

[8] *CEC Report* at 75. Similarly, a study at Hydro Quebec quantified those savings at two billion kWh. *Id.* at 75.

Smart Grid can reduce its line losses by 30%,[9] The benefits to ratepayers from these energy efficiency improvements can be substantial. A typical one million-home Smart Grid deployment can reduce consumption and peak demand and produce nearly $3 billion dollars of *net benefits* for rate payers and utilities over 17 years that can be used to lower rates for consumers and reward utilities for investing in a Smart Grid.[10]

Further, Smart Grid technologies increase the reliability, security and efficiency of the distribution grid in ways that meter-centric solutions cannot because such mater-based systems do not monitor the entire grid and lack the necessary system capacity, *i.e.*, communications bandwidth. These Smart Grid applications include, among others:

- Distribution Equipment Automation;
- Underground Cable Fault Detection and Overhead Vegetation Management;
- Theft Detection based upon differences between meter-read consumption and measurements taken at the respective transformers;
- Real-time System Optimization through Load Balancing and volt/VAR controls based upon constant monitoring and measurements along the grid;
- Asset Management through predictive incipient equipment failure detection;
- Coordination and management of Distributed Generation sources, including eventually plug-in hybrid electric vehicles; and
- Demand Response functionality based upon real-time price changes and other conditions requiring real-time end user device communications and control.

Notably, a Smart Grid can achieve energy efficiency targets without requiring *any* change in consumer behavior. By one estimate a true Smart Grid can deliver ten times the benefits of a smart meter, or Advanced Metering Initiative ("AMI"), solution.[11] As a result of these unmatched value enhancements, Smart Grids also provide exponentially

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[9] *See Xcel Energy Smart Grid: A White Paper* at 5, Xcel Energy (Feb. 2008), available at: http://www.xcelenergy.com/docs/SmartGridWhitePaper.pdf

[10] See Section II, *infra*.

[11] *See Getting Smart*, Robert Robinson, Jr. and James C. Henderson, Electric Perspectives (Sept. /Oct. 2007), at 69.

higher reductions in CO_2 emissions than meter-centric solutions, namely through grid-oriented energy savings that are not dependent on uncertain customer response savings.[12]

In contrast, many utilities around the country have proposed smart meter plans that produce net losses to the affected rate payers over the projected cost-recovery period.[13] If these utilities do not evaluate alternative, more comprehensive approaches of which reading meters is only a subset, their regulators are left only with the choice of approving or rejecting a single smart meter technology proposed by that utility.

Accordingly, in its Strategic Plan, the Commission should acknowledge that Smart Grid technologies can create efficiencies on the distribution grid and lead to more efficient use of electricity by both the commercial and residential sectors, and should also make Smart Grid technology a key component of its Strategic Plan. Just as the Draft Strategic Plan encourages pilot programs for AMI technologies,[14] the Commission should direct utilities to conduct a pilot program to evaluate the capabilities of a comprehensive Smart Grid and to compare electricity and demand reduction savings achieved via a Smart Grid versus those achieved via an AMI-only deployment.

[12] The Federal Energy Regulatory Commission report on the Assessment of Demand Response and Advanced Metering described the environmental impact of demand response as an "additional benefit" with the caveat that "the importance and perceived value of each of these (additional) benefits is subject to debate." *Assessment of Demand Response and Advanced Metering* at 11, FERC, Docket No. AD06-2-000 (Aug. 2006) ("*FERC Assessment*").

[13] For example, according to a First Energy filing with the Ohio PUC on December 13, 2007, McKinsey & Company projected a *negative* $199 million net present value for installing a 2.2 million smart meter system with a 20 year life. *See* Utility Presentations given at Public Utilities Commission of Ohio Workshop on Smart Metering, Case No. 07-0646-EL-COI (Dec. 13, 2007) ("Ohio Meter Workshop"), available at: http://www.puco.ohio.gov/emplibrary/files/media/CMSFiles/WebcastRelated/275/. *See also, Id.*, Presentations by AEP Ohio (p.15); Duke Energy (p.9); Dayton Power & Light Company (p.8).

[14] *Draft Strategic Plan* at p. 66.

I. Defining Smart Grid and Its Benefits

In defining a Smart Grid, several central characteristics have emerged: (1) self-healing and adaptive; (2) integrated across the entire distribution grid; (3) optimizing grid operations; (4) automating distribution; (5) secure; (6) interacting with and empowering consumers; and (7) predictive diagnostics.[15] The benefits of pervasive automation of points throughout the distribution network and other attributes of a Smart Grid were provided by the Electric Power Research Institute ("EPRI") in testimony before Congress last year:

> [A] power system that can incorporate millions of sensors all connected through an advanced communication and data acquisition system. This system will provide real-time analysis by a distributed computing system that will enable predictive rather than reactive responses to blink-of-the-eye disruptions.
>
> The grid of the future will require an order of magnitude greater number of touch points compared to today's system. For example, where today an electric utility company might monitor and control hundreds of grid devices, in the future it will monitor and control thousands to millions of devices, all designed to provide information on the power systems' performance.
>
> This increased number and scale of touch points will force utility companies to fundamentally change how they think of and approach the grid of the future. The result will be a flexible and secure intelligent power delivery infrastructure that can meet both today's needs as well as tomorrow's consumers' needs for information to better manage their day-to-day energy demands.[16]

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[15] *See*, *e.g.,* presentations given at California Energy Commission workshop on Smart Grid (Apr. 29, 2008 Workshop), available at: http://www.energy.ca.gov/load_management/documents/2008-04-29_workshop/presentations/.

[16] *See* Michael W. Howard, Ph.D., P.E., Senior Vice President, R&D Group, Electric Power Research Institute, *Facilitating the Transition to a Smart Electric Grid*, Testimony Before the House Energy and Commerce Subcommittee on Energy and Air Quality (May 3, 2007), available at: http://energycommerce.house.gov/cmte_mtgs/110-eaq-hrg.050307.Howard-testimony.pdf.

Similar definitions have been put forth by the Modern Grid Initiative sponsored by the U.S. Department of Energy (DOE)[17] and the California Energy Commission (CEC).[18]

CURRENT concurs with these authorities that a Smart Grid includes high-speed communications capable of timely moving large amounts of data both upstream and downstream as well as sensors embedded throughout the distribution network.[19] From an implementation perspective, this translates into dozens of specific applications that can be generally categorized.[20] In addition, these other authorities are correct that the communications infrastructure requirements have increased, and will continue to increase, over time. Smart meter systems are typically designed to read meters once a day with limited, "narrowband" communications capabilities, and have virtually no grid sensing or monitoring capabilities beyond the meters themselves. These smart meter

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[17] The DOE-sponsored Modern Grid Initiative identifies a Modern or Smart Grid as having five components: Integrated Communications, Sensing and Measurement, Advanced Components, Advanced Control Methods, and Improved Interfaces and Decision Support. It states "[o]f these five key technology areas, the implementation of integrated communications is a foundational need, required by the other key technologies and essential to the modern power grid" and that "[h]igh-speed, fully integrated, two-way communications technologies will allow much-needed real-time information and power exchange." A Systems View of the Modern Grid at B1-2 and B1-11, INTEGRATED COMMUNICATIONS, Conducted by the National Energy Technology Laboratory for the U.S. Department of Energy Office of Electricity Delivery and Energy Reliability (Feb. 2007).

[18] The *CEC Report* states that sensors are the next basic requirement for virtually all Distribution Automation applications: "communications is a foundation for virtually all the applications and consists of high speed two-way communications throughout the distribution system and to individual customers." *California Energy Commission on the Value of Distribution Automation, California Energy Commission Public Interest Energy Research Final Project Report* at 51 (Apr. 2007) (*CEC Report*), available at: http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CTF.PDF.

[19] Smart Grid also includes all the applications and functionality of smart meter technology.

[20] *See supra* pp.3-5.

systems are not upgradeable to higher bandwidths without replacing the meters and overlaying significant additional communications bandwidth system. Therefore they do not constitute an incremental step toward a Smart Grid.[21]

KEMA, a leading industry consultant, recently noted the short-comings of AMI systems as long-term solutions:

> The immediate requirements of AMI may not in themselves require high performance embedded communications. This can lead to a choice of wireless infrastructure as having lowest initial costs and comparable or lower ongoing costs. However, these technologies are not 'future proofed' and may not be able to support some of the capabilities described above as tied to high performance, ease of getting beyond the meter, and detection of power line anomalies…[22]

A true Smart Grid will manage or monitor equipment on the electric distribution network to optimize efficiency and perform power outage *avoidance* as well as real-time pin-point outage and restoration detection. This is significant because electric distribution networks are aging and facing increasing strain. They are one-way systems that lack self-healing, monitoring and diagnostic capabilities.[23] EPRI estimates that power outages and "blink of the eye" power quality disruptions cost U.S. businesses at least $100 billion per year.[24] A Smart Grid will provide a utility with real-time

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[21] FERC defines AMI as a metering system that records customer consumption (and possibly other parameters) hourly or more frequently and that provides for daily or more frequent transmittal of measurements over a communication network to a central collection point. *FERC Assessment* at 17.

[22] *Enabling the Power Plexus*, KEMA, Aug. 2007, available at: http://www.kema.com/consulting_services/it_automation_infrastructureservices/enterprise_level_integration_services/power_plexus/.

[23] *See, e.g., 2007 Integrated Energy Policy Report* at 151, CEC-100-2007-008-CTF, California Energy Commission (Nov. 2007), available at: http://www.energy.ca.gov/2007_energypolicy/index.html.

[24] http://www.energyfuturecoalition.org/preview.cfm?catID=57 (citing EPRI estimate).

actionable intelligence about its network that can be used to prevent such costly disruptions, reducing their costs to rate payers by up to 87%.[25] By measuring conditions throughout the grid in real time a Smart Grid is predictive, able to detect potential equipment failures and potential problems with the wires themselves, including stray voltage situations and underground cable faults, thus improving system reliability and safety.[26]

As a result, power system maintenance crews – which themselves are aging, with as many as 40% or more of such workers retiring over the next 10 years – will often know exactly where and when to go to repair the distribution grid *before* an outage occurs. When outages do occur technicians can expedite power restoration to customers through remote management of switches and other infrastructure. Power crews also will know in real time, and to what extent, restoration has occurred with each network repair performed, further reducing labor costs.

In addition, just as with smart meters, a Smart Grid will also extend through the meter and into the home: "The key issue here is that utility data communications networks that support advanced utility analytics must be TCP/IP-enabled. This provides the necessary flexibility and interoperability to support sensor data transport, network

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[25] *See Electricity Sector Framework for the Future: Achieving the 21st Century Transformation* at 42, EPRI, (Aug. 2003) (*"EPRI Report"*), available at: http://www.globalregulatorynetwork.org/PDFs/ESFF_volume1.pdf.

[26] For example, in Dallas, Texas Oncor Electric Delivery "is able to monitor its electric delivery system, obtaining a steady stream of data that can be analyzed for potential problems. Once a problem is pinpointed, Oncor dispatches operations personnel to investigate the irregularity before it can become an outage or other service issue. Issues are often resolved before consumers even realize that there was a problem." Oncor Press Release (Sept. 19, 2007), available at: http://www.oncor.com/news/newsrel/detail.aspx?prid=1094.

management, data security services support and smart device management."[27] But with far greater bandwidth and associated capacity than meter-centric solutions, Smart Grids deliver several times the demand response value by managing exponentially more devices at one time based upon several criteria (e.g., price changes, utility's load balancing needs, and availability of distributed or renewable energy sources) and by enabling verification of the results thereof in real time. [28]

With Smart Grid technology a utility can greatly reduce the electricity that is lost before it reaches the consumer due to network faults or inefficiencies. This is done through real-time monitoring and measuring of the distribution grid and modifying load distribution to maintain the lowest amount of electricity actually needed at any time and at any point along the grid.[29] The California Energy Commission recently estimated that

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[27] Technology Support for Utility Analytics, Jeffrey Taft - Lead Intelligent Utility Network Architect, IBM Global Business Services, IBM Application Innovation Services (now with Accenture) (May 2007), available at: http://www.utilitiesproject.com/documents.asp?d_id=4298.

[28] For example, the AMI Use Cases prepared by Southern California Edison (SCE) to determine AMI system requirements specifically reject the use of the AMI system to manage distributed generation serving more than one customer for several reasons, including the need for real-time communications not provided by the AMI system. *See* SCE AMI Use Case: D3 - Customer Provides Distributed Generation at 7, (Apr. 18, 2006) ("SCE AMI Use Case"). The recent report for the California Energy Commission on the Value of Distribution Automation, prepared by Energy and Environmental Economics, Inc. (E3), and EPRI Solutions, Inc., stated that the value of such distributed electric storage capable of being managed in real time (such as a battery or plug-in vehicles) would be increased by nearly 90% over a similar asset that is not connected by a Smart Grid. *California Energy Commission on the Value of Distribution Automation, California Energy Commission Public Interest Energy Research Final Project Report* at 95 (Apr. 2007) (*CEC Report*), available at: http://www.energy.ca.gov/2007publications/CEC-100-2007-008/CEC-100-2007-008-CTF.PDF.

[29] Smart meter systems reporting usage and other data on a next-day basis lack the ability to perform this function. *See also,* Staff Responses, at 30 ("The Smart Grid enables utilities to maximize the efficiency of their distribution systems in real time.").

such optimization could reduce distribution grid line losses by 15% or more and save 500,000 tons of CO_2 annually[30] and, at least one utility estimates its Smart Grid can reduce its line losses by 30%.[31] Savings on this level are essential to helping California meet the ambitious greenhouse gas reduction goals established by AB 32[32] in both the 2020 timeframe[33] and the 2050 timeframe in Executive Order S-3-05[34].

To put the energy efficiency benefits of Smart Grid into a national perspective, Federal Energy Regulatory Commission (FERC) Commissioner John Wellinghoff testified to Congress in May 2007 that "if we could make the electric grid even 5 percent more efficient, we would save more than 42 gigawatts of energy: the equivalent of production from 42 large coal-fired power plants. Those are plants that we would not need to build and emissions that we would not produce."[35] This would save approximately 275 million tons of CO_2 annually across the U.S., and a Smart Grid can deliver nearly all of those savings through just one of its many applications.[36]

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[30] *CEC Report* at 75. Similarly, a study at Hydro Quebec quantified those savings at two billion kWh. *Id.* at 75.

[31] *See Xcel Energy Smart Grid: A White Paper* at 5, Xcel Energy (Feb. 2008), available at: http://www.xcelenergy.com/docs/SmartGridWhitePaper.pdf

[32] Global Warming Solutions Act of 2006 (Chapter 488, Stat. of 2006).

[33] See Cal. Health and Safety Code Section 38530(a) (requiring reductions in greenhouse gas emissions to 1990 levels by 2020).

[34] See Executive Order S-3-05 calling for reductions in greenhouse gas emissions to 80 percent below 1990 levels by 2050.

[35] Prepared testimony of John Wellinghoff, Commissioner - Federal Energy Regulatory Commission, to the House Energy and Commerce Subcommittee on Energy and Air Quality (May 3, 2007) , available at: http://www.ferc.gov/EventCalendar/Files/20070503100145-wellinghoff-5-3-7-testimony.pdf.

[36] DOE studies show that electricity generation and distribution produces 40% of all CO^2 emissions in the United States. CO^2 emissions from power plants climbed 2.9 percent in 2007, the biggest single-year increase since 1998, according to a recent analysis of data from the Environmental Protection Agency (EPA) by the nonprofit and nonpartisan

Further, Smart Grid implementation will provide necessary system controls to integrate renewables into the grid. System-wide control in real-time is something that most smart meter systems cannot accomplish.[37] In addition, many of these technologies have technical vulnerabilities that, if not resolved, will leave utilities without a fully vetted solution if in fact a utility were to test only that solution.[38]

These savings are also consistent with legislative direction that all cost-effective energy efficiency measures be pursued.[39] The Public Utilities Code does not constrain

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Environmental Integrity Project (EIP). Currently, the single largest factor in U.S. climate change pollution, the electric power industry's CO^2 emissions, have risen 5.9 percent since 2002 and 11.7 percent since 1997. Environmental Integrity Project Press Release (Mar. 18, 2008), available at: http://www.environmentalintegrity.org/pub493.cfm.

[37] *See, e.g.,* SCE AMI Use Case*, supra* note 22 (discussing limits of smart metering for distributed generation).

[38] For example, two suppliers of smart meter systems, Itron and Cellnet and Hunt, recently asked the Federal Communications Commission (FCC) to change its rules for the unlicensed radio frequency bands in which their "wireless mesh" systems operate to rectify interference vulnerabilities of their systems. *See* Comments of Itron at p. 5-6, *In re Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval*, ET Docket No. 03-201 (Oct. 15, 2007); Comments of Comments of Cellnet Technology, Inc. and Hunt Technologies, LLC at p. 7-8, *In re Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval*, ET Docket No. 03-201 (Oct. 15, 2007); *See also* Reply Comments of Cellnet Technology, Inc. and Hunt Technologies, LLC at p. 1, *In re Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval*, ET Docket No. 03-201 (Nov. 14, 2007). In unsuccessfully seeking to have the rules modified to accommodate the technology's use for utility applications, Cellnet and Hunt informed the FCC that "[t]he undesirable effects of such interference cannot be disputed and should not be understated. For its automatic meter reading operations, electric utilities may be positioned to suffer periods where key operational and load control data cannot be received. SCADA operations may also be impacted." Comments of Cellnet Technology, Inc. and Hunt Technologies, LLC at 17, *In re Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval*, ET Docket No. 03-201 (Oct. 15, 2007).

[39] *See* Public Utilities Code Sec. 399(c)(3), 454.5(b)(9)(C), 701.1(a) and (b); *see, also,* Decision no. 06-12-013 at p. 19 (recognizing that the definition of energy efficiency contained in the Energy Efficiency Policy Manual did not constrain the Commission's discretion to consider other energy efficiency measures.)

the definition of energy efficiency to just efficiency improvements made by end-use customers. First, Public Utilities Section 701.1 makes clear that "all practicable and cost-effective…improvements in the efficiency of energy use and distribution that offer equivalent or better system reliability" should be sought out and exploited. This statement of legislative direction clearly shows the Legislature is focused on not just end-use efficiency but efficiency in the distribution of energy to end-use customers. Smart Grid represents one such energy efficiency measure, and, therefore, is clearly within the realm of energy efficiency contemplated by the Legislature.

Public Utilities Code Sec. 399.4(a)(1) provides another expansive definition of energy efficiency stating "[a]s used in this section, the term energy efficiency includes, but is not limited to, cost-effective activities designed to achieve peak load reduction that improve end-use efficiency, lower customer's bills, and reduce system needs." As discussed herein, Smart Grid can help achieve peak load reductions, lower customer bills, and reduce system needs, and thereby, meet the definition of energy efficiency provided in section in 399.4(a)(1).

II. The Economic Value of Smart Grid

EPRI has estimated that a Smart Grid can reduce electric usage by up to 10% and reduce CO_2 emissions from the electricity grid by up to 25%.[40] CURRENT has worked with several leading industry consultants and electric utilities to develop a Smart Grid Value Model that calculates the *net benefits* of a representative one million-home Smart

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[40] Electric Power Research Institute (EPRI), "Electricity Sector Framework for the Future: Achieving the 21st Century Transformation." Volume I (August, 2003), pages 41 – 43.

Grid deployment to exceed $3 billion over a 17-year period and a net present value over the same period of more than $700 million. These values are derived by including the capital and operating costs of the utility to deploy and operate the Smart Grid and the cost savings produced from the applications discussed above. These results will vary by utility as their costs and realizable benefits vary. In contrast, the net present value of a smart meter system is estimated to range from a net *loss* of $199 million[41] to less than $100 million positive.

Arguably the net value in a smart meter deployment is even lower because even though the utility assumes benefits from demand response, it often does not include the cost of the in-home devices to be purchased by the consumer to achieve the demand response. Presently, such devices (such as programmable thermostats installed in a home) cost approximately $150 per home, and advanced home energy management systems cost $1,000 or more. In evaluating the benefits of any automated meter proposal it is important that all such costs are included.

III. The Commission Should Direct That Utilities Conduct Both Smart Grid And Smart Meter Pilots

Smart Grid is essential to achieving the Commission's goal of making energy efficiency a way of life in California by achieving long-term savings through structural changes in the way Californians use energy.[42] This is not to say, however, that utilities and rate payers may not benefit from a combination of smart meter and Smart Grid technologies.

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[41] *See, e.g., supra* note 15, *First Energy-McKinsey Model.*

[42] *Draft Strategic Plan* at 2.

No single technology will produce the optimum deployment scenarios across the diverse topographies and population densities of every utility. This is why utilities should not pilot only a single technology. Even if a single-technology pilot were to produce positive results, the Commission could not confirm whether an alternative technology would not, by itself or in combination, produce even better functionality and rate payer returns. This is an important principle because narrowband smart meter solutions are not an incremental step toward Smart Grid; investment spent on smart meters will be stranded later if the utility upgrades to Smart Grid.[43] While Smart Grid requires more upfront capital investment than smart meters (estimated between 20%-30%), it provides exponentially more benefits – up to 10 times the benefits according to one study – ultimately providing net savings to both utilities and rate payers.[44]

Thus, utilities should demonstrate not only that a solution they propose works and delivers quantifiable savings, but that it delivers as many value enhancements and as much net savings as reasonably available alternatives. Absent such a comparative evaluation, the Commission's Strategic Plan would fail to produce the best results for the rate payers it is designed to help. Therefore, Smart Grid is critical component to long-term energy and demand savings and should be included in the Strategic Plan.

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[43] *See Getting Smart* at 68, Robert Robinson, Jr. and James C. Henderson, Electric Perspectives (Sept./Oct. 2007), available at: http://www.eei.org/magazine/editorial_content/nonav_stories/2007-09-01-Smart.pdf.

[44] *Id.* at 69 ("Simple sensing and monitoring extensions are not, in and of themselves, compellingly economic—such improvements produce only about 10 percent of potential asset management benefits and do not engage customers beyond what AMI based pricing schemes may deliver.").

IV. A Smart Grid Better Connects the End User To The Marketplace

Most smart meter systems are designed for once-a-day communication, and thus have very limited communications bandwidth. Even the "best-in-class" smart meter solutions (typically wireless mesh) operate at approximately 28.8 to 56 kbps (the equivalent of dial-up modem speeds that were outdated a decade ago). One recent smart meter vendor recently disclosed that its system could send a one-way message to 3 devices per second.[45] On the typical 2,000 meters per collector, this equates to being able to send a one-way message in slightly over 11 minutes to all the devices and another 11 minutes to get a message back (assuming times are not further delayed by meter reading activity, congestions or interference). Such a system lacks sufficient capacity to engage in two-way management and communication with large volumes of devices virtually in real time, including real-time measurement and verification of load shedding.

For instance, to use demand response as a spinning generating reserve requires the demand response system to communicate load shed signals at all of the endpoints within four seconds. When these systems need to support distributed generation resources such as rooftop solar panels or plug-in hybrid electric vehicles they need to be able to poll these resources in the minutes and seconds before dispatch in order to assess their readiness, determine their capacity, and monitor their progress during dispatch. The demands on the communications infrastructure increase dramatically as there is more data to move, and that data needs to move much more quickly than narrowband metering systems can provide.

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[45] George Flammer, Chief Scientist, Silver Spring Networks, Presentation to EUCI conference, May 5, 2008.

In contrast, a Smart Grid connects advanced meters, smart thermostats, smart appliances, load control devices and distributed generation and renewables in homes and businesses directly to the utility through a two-way, high-speed communications network. This enables meters and other devices to respond to information about prices and reliability events as they change in real-time. And because most consumers do not have the time or desire to monitor and respond to such information themselves, a Smart Grid enables the utility to administer more robust time-of-use, real-time pricing and renewable-sensitive (voluntary) programs not possible with more limited technologies. Automated in-home energy management systems continue to evolve and the most sophisticated of these systems already require a high-speed communications path.

By enabling 15-minute (and shorter) interval data and "on-demand" meter reads to the consumer, Smart Grid enables innovative demand response and real-time pricing programs that are not feasible using more limited smart meter technologies. Meters and other end-user energy management devices are able to provide consumers with information about wholesale prices and reliability events as they change in real-time.

With a Smart Grid, demand side management ("DSM") programs can confirm in real-time the precise reductions in load occurring at an individual residential customer levels all across the distribution grid. Utilities can also centrally monitor and manage literally millions of DSM devices through a single, centrally located "head-end" software system. The communications to the customer will be received in the appropriate time frames and, equally as important, the utility will know whether the desired action occurred so it can verify results and promptly take further actions if necessary. Bandwidth for real-time, interactive communications that can ensure customers receive pricing and other signals will be an increasing need as in-home energy management systems and appliances increasingly become smart and able to interact with the markets in real time.

CONCLUSION

CURRENT submits that the deployment of a Smart Grid is the best means of increasing the efficiency of the distribution grid, lowering the costs borne by rate payers for the distribution of electricity, and enabling consumers to manage their energy consumption through demand response programs. It is incumbent upon the State's policy makers to examine whether smart meter deployments currently contemplated by utilities and/or Smart Grid deployments are cost effective in reducing consumption and reducing adverse environmental affects associated with the distribution of electricity. For the reasons set forth herein, CURRENT recommends that the Commission incorporate Smart Grid into its Strategic Plan, and require the deployment of Smart Grid pilots so the Commission can evaluate the efficiencies realized by Smart Grid technologies and/or smart meter technologies.

Respectfully submitted this July 17, 2008 at San Francisco, California.

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3199/002/X101378.v1

CERTIFICATE OF SERVICE

I, Lisa Vieland, certify that I have on this 17th day of July 2008 caused a copy of the foregoing

INITIAL COMMENTS OF CURRENT GROUP, LLC

to be served on all known parties to R.08-07-011 & A.08-06-004 listed on the most recently updated service list available on the California Public Utilities Commission website, via email to those listed with email and via U.S. mail to those without email service. I also caused courtesy copies to be hand-delivered as follows:

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I declare under penalty of perjury that the foregoing is true and correct. Executed this 17th day of July, 2008 at San Francisco, California.

/s/ Lisa Vieland
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