Statement of
Andrew Tang
Senior Director, Smart Energy Web
Kevin Dasso
Senior Director, Electric Strategy and Regulation
Pacific Gas and Electric Company
Smart Grid OIR Workshop
California Public Utilities Commission
March 27, 2009

PG&E's Smart Grid Vision and Strategy

The modernization of our electrical grid is central to PG&E's vision of becoming the leading utility in the United States and to our goal of delighting customers, energizing employees, demonstrating environmental leadership and rewarding shareholders through operational excellence. PG&E is the first utility in California, and one of the first utilities in the United States, to deploy Smart Meters[1]*TM* to all our electric and natural gas customers, including advanced technology to support home area network (or "HAN") applications and functions.

To date, PG&E has installed over 2 million Smart Meters*TM* for our electric and natural gas customers, and by the middle of 2012 we will have installed over 10 million Smart Meters*TM* systemwide—each one a second generation meter with advanced functions including home area network support and remote connect and disconnect.

PG&E is not resting on its laurels as a national leader in advanced meter technology. We also are actively engaged in the following Smart Grid-related projects

[1] "Smart Meters" is a trademark protected name ("TM").

and programs:

- PG&E is working in partnership with Alameda County and Chevron Energy Services to implement a ***micro-grid pilot project*** recently funded by the US Department of Energy to test the integration of energy storage, commercial scale PV generation and fuel cells at Alameda County's Santa Rita Correctional facility. The project will assess the potential for micro-grids to integrate energy efficiency, demand response and renewable resources while meeting the reliability needs for a critical customer facility. The project is currently in the design phase and is expected to be connected to the grid this fall.

- PG&E is planning to deploy a ***large utility-scale battery energy storage project*** to assess the true value these systems can provide at the distribution system level. Today's energy storage systems have the potential to support renewable resource integration, enhance reliability and power quality and provide grid support through the CAISO's energy and ancillary services markets. PG&E has already purchased the sodium sulfur battery units and expects to complete installation in 2009 in collaboration with the Energy Commission's PIER program and EPRI.

- PG&E is in the planning stages for ***several demand response pilots*** to evaluate the opportunity to provide ancillary services to the CAISO from commercial and industrial loads as well as from participants in PG&E's Air Conditioning direct load control program. In addition, PG&E is developing pilots to better understand smart grid integration issues with respect to intermittent

resources, such as renewables, as well as Smart Charging pilots to explore managing loads coming from plug-in electric vehicles. Finally, PG&E is looking to leverage standards work on Home Area Networks to include load control devices for Demand Response and smart grid management.

- PG&E is developing a ***geographically focused smart grid pilot project*** to assess the benefits of leveraging our Smart Meter communications network to support the next generation of distribution system automation, demand response and load control systems. PG&E is working in partnership with Silver Spring Network and various system automation and control technology companies to implement the pilot later this year.

Each of these projects and programs is intended to lay a strong foundation for PG&E and our customers to deploy additional advanced Smart Grid technologies over the next decade. These Smart Grid technologies have the potential to help us achieve our critical energy policy goals, including:

- increased integration of renewable energy,
- increased customer energy efficiency,
- enhanced system reliability and
- reduced greenhouse gas emissions.

Workshop Question 1: What opportunities does PG&E see in ARRA to seek federal funding for smart grid investments that will benefit California?

In addition to PG&E's existing Smart Grid projects, we also are actively considering participating in the new DOE Smart Grid Demonstration Project program, made possible by the American Reinvestment and Recovery Act.

PG&E believes the building of the Smart Grid needs to follow a disciplined process starting with the development of standards to assure interoperability and security of the grid, accompanied by rigorous testing of standards-based smart grid technologies before exposing customers to technology that may not be ready for commercial application. Finally, community scale demonstrations will help us understand the real life benefits and challenges before deploying smart grid technologies across the entire utility network.

With this approach in mind, the following are a few of the opportunities that we have to leverage and extend our existing work in Smart Grid and create broader Smart Grid projects that could benefit from funding by DOE:

- A ***SmartGrid "Proof of Concept Test Facility"*** where PG&E would expand upon existing leadership in standards development and physical facilities to create an end-to-end electrical system that includes all elements of the grid from transmission and distribution to "customer premises," but is not connected to grid and therefore does not expose customers and the grid to

technology that has not been fully tested. The grid- and customer-side components would be networked to create a comprehensive operational system that can test and evaluate the functionality as well as the failure points of SmartGrid technologies. This ability will drive the acceleration of SmartGrid through the accelerated, reduced risk technology deployments and also by accelerated development of functional systems data that can be used to support industry standardization efforts.

- An ***end-to-end Integrated SmartGrid Community Demonstration project*** where PG&E would test SmartGrid concepts on a commercial scale and in a real world setting. This demonstration would allow PG&E to partner with a community and smart grid entrepreneurs to test smart grid concepts at the transmission, substation, and distribution levels with actual customer participation as well as incorporating distributed generation and renewables on a fully integrated basis. While similar in description to smart grid pilots announced by other utilities, this demonstration would go far beyond what has previously been proposed in its scale and scope in terms of depth and breadth of smart grid functions being demonstrated. This demonstration would be an ongoing test of smart grid concepts, business models and viability at large scale in the real world. This regional demonstration project will build on all that PG&E has learned through its existing smart grid activities and provide PG&E's technology-savvy community and customers the opportunity to test out the benefits of the smart grid.

- A ***large scale Home Area Network Development Program*** which would include pilot activity for Home Area Networks including in-house displays, load management controls, demand response, ancillary services, small load aggregation and plug-in hybrid electric vehicles. This pilot would include the demonstration of smart charging capability for plug-in hybrid electric vehicles. In addition, we would look to develop technology to more rapidly and conveniently notify customer groups of impending Peak Day Pricing and related events.

- A ***Collaborative Regional Synchro-Phasor Measurement system*** that will monitor and measure grid conditions in order to anticipate problems and prevent or isolate bulk power system power outages. This system would be developed in collaboration with Southern California Edison and other key transmission system operators, and would build on the considerable phasor measurement unit deployment in West. The project has the potential to cover a significant portion of the Western Interconnection and evaluate the contributions that this promising technology has for managing transmission grid reliability across a wide area.

Workshop Question 2: What should the Commission do to support the efforts of California's investor-owned utilities and other parties to seek ARRA funding related to smart grid projects and initiatives?

PG&E and other California utilities and entrepreneurs will have to compete with other utilities and entities across the country for a share of DOE's $4.5 billion in Smart Grid demonstration funding. We strongly believe we should have a "leg up" for these

funds, because California already is an international leader in mass deployment of smart meter, demand response and renewable technologies. Other utilities across the country already have benefited because the CPUC, Energy Commission, California utilities and California policymakers have blazed the trail as pioneers in deploying Smart Meters*TM* and advanced "smart grid" technologies.

Now, with the $4.5 billion in federal funding, California has an opportunity to be a pioneer again, building on our success in advanced metering technology in order to achieve on a commercial scale the vision and promise of an end-to-end "Smart Grid."

But we cannot go it alone—and we cannot go in different or conflicting directions at the same time.

If California is to get its "fair share" of the DOE $4.5 billion—which could exceed $500 million based on our population alone—then we are going to need support from all directions.

First, we all need to know what specifications and requirements the DOE will provide as part of its Smart Grid funding and assure that they do not circumscribe California's management and supervision of its public utilities or restrict the ability of California's energy utilities to oversee their business and their employees.

Second, we need to work together and collaborate on the types of pilot and demonstration projects that we believe can genuinely build on our pre-existing successes in advanced metering, system reliability, dynamic pricing, demand response, renewables integration and customer energy efficiency.

Third, we need to leverage existing and new resources and ratepayer funding to come up with the 50% matching funds needed to qualify for the DOE funding. This does not mean we "rob Peter to pay Paul" by delaying or diverting existing funding for Smart Meters*TM*, CEE, demand response programs or transmission to serve renewables. It does mean that we work together to maximize our ratepayer funded capital so that the matching funds are reasonable from a cost standpoint and also amortized over time in order to minimize rate impacts.

Fourth, we need our policymakers, including those of you at the CPUC and Energy Commission, to step up and present a united California front in Congress and the Executive Branch to support California's requests for ARRA funding for Smart Grid projects. The DOE schedule for applying for and awarding these funds will be accelerated, which means we all need to step up quickly and work together.

As PG&E has stated in our comments in this proceeding, we need to continue to recognize and emphasize that a "Smart Grid" is not an end in itself, but is a process and means by which we in California and across the country can modernize our electricity grid and help achieve our highest priority energy policy goals, including addressing climate change, enhancing the reliability of electric service, and providing our customers with more choices and tools for managing their electricity use.

Most of all, we need to recognize that investments in a "Smart Grid" also will require sustained and consistent investments in the grid itself, over a long term. Because of the capital intensive nature of electric system investments, we strongly believe that we can achieve our Smart Grid investment goals at a reasonable cost to our customers—but

only if we are willing to commit to sustained and consistent regulatory policies that balance the costs and benefits to our customers over the long run, based on our country's long term energy policy goals, not based on short-term fads or public policy whims.

PG&E looks forward to rolling up our sleeves and joining all the parties here today as we begin this vital and exciting task.

PG&E's integrated approach accelerates the reliable deployment of SmartGrid technologies

Standards definition

- PG&E plays a broader role in shaping and accelerating the standards that will underlie future smart-grid implementations
- Expands upon PG&E's proven leadership role in shaping standards

Testing facilities

- PG&E expands and accelerates its plans for a fully-functional, extensible testing facility to enable rapid prototyping and testing of smart-grid technologies
- Accelerates technology development and ensures standards compliance early on
- Builds upon PG&E's state-of-the-art off-grid testing facilities

Pilots

- PG&E implements tested technologies in a real-world setting to demonstrate value of the end-to-end smart grid
- Partnerships spanning the smart-grid ecosystem ensure that insights are scalable

Full customer deployment

- PG&E extends current pilots to full-scale roll-out, assuming benefits are proven
- PG&E's industry-leading smart-meter deployment allows it to be at the leading-edge of other smart-grid technology deployments
- Insights are used to feed the next cycle of the technology deployment cycle

Pacific Gas and Electric Company