Metering America 2010
Plenary Address of Commissioner Nancy E. Ryan
"Smart Grid Investments in California"
March 8, 2010

- Thank you for inviting me to discuss how we are looking at Smart Grid here in California.
    - The transition to the Smart Grid, and especially the widespread deployment of smart meters and default dynamic rates, represents a major paradigm shift in the electric industry.
    - So, I'd like to begin my remarks by looking at the first of two episodes in this process here in California.
    - I'll come to the second story as I close my remarks.
    - These Two Tales of a City provide important context and lessons that frame the information I'll also provide about smart grid policies in California.

<u>Bakersfield Part I</u>

- The city, or course, is Bakersfield, California
    - Situated at the Southern end of San Joaquin Valley, Bakersfield is California's 11th largest city.
    - And although the economic downturn has recently slowed its growth, Bakersfield's population more than tripled over

nearly 30 years from approximately 105,000 in 1980 to 333,000 in 2009.

- Bakersfield is also located in one of the hotter parts of the state
  - its climate is characterized by long, hot, dry summers
  - From mid June to as late as mid September daily temperatures usually exceed 100 °F (38 °C)
  - Temperatures above 110 °F (43 °C) are not unheard of.
- In short, Bakersfield is an ideal location to install smart meters and to deploy time dependent tariffs, critical peak pricing and other measures aimed at trimming California's air-conditioning driven, needle peaks.

- That's why in 2006 Pacific Gas and Electric Company, or PG&E for short, chose the Bakersfield area to be among the first places where it would install its new generation of smart meters.

- Unfortunately things did not work out as planned. Bakersfield is now the epicenter of a popular revolt against smart meter technology and dynamic pricing.

- Customers contend that their bills have doubled or tripled since their smart meter was installed—a sure sign to them that the new equipment is defective, or even deceptive. Some people are actually calling the smart meters "cheater meters."

- Consumer advocates, who opposed the investment in advanced metering technology as a costly boondoggle, have been quick to join the chorus. They're calling for suspension of the roll-out.

- PG&E says its new meters are working just fine. According to PG&E, customers experienced higher bills because the installation of the smart meters happened to coincide with an unusually hot summer and a rate increase that fell especially hard on heavy users of air conditioning.

- Over the last few months California newspapers have been full of stories about the Bakersfield situation and what it might portend for other communities that are next in line to receive their smart meters.

  - Headlines like "smart meters coming whether customers like it or not" are not unusual.

  - The PUC has even received requests by some communities to hold off on installing the meters in their areas.

- As a result of this uproar the PUC is now sponsoring an independent investigation of PG&E's smart meter technology, its billing system and the rollout of the program.
    - Perhaps the investigation will reveal a fault in the meters.
    - Maybe it will find a flaw in the billing system.
    - We shall see.
    - However, I suspect the most likely outcome is that we'll learn more about what we already know: that PG&E's rollout of the smart meters was flawed by inadequate customer education and outreach.
        - PG&E has already conceded that it did not do enough to prepare its customers for the smart meter installations and it is revamping its approach as the rollout moves to other parts of its service territory.
        - The point here is not to flagellate PG&E but to learn from its experience: after all, PG&E did go first, and the first mover is bound to make mistakes as it blazes the trail for others to follow.
- There are a few overarching lessons to be learned, and many more that will follow from close study of the Bakersfield Smart Meter experience.
    - First -- the deployment of advanced meters is not just a technological event in which an old-fashioned meter is

swapped out for a new more advanced one. In fact, it is the initial, enabling step in a radical change in how customers use energy and relate to the production of electricity.

- This involves a partnership between the technology vendor, the utility and the customer.
- To be successful this partnership requires thorough customer preparation.
- Otherwise the meter itself will take the blame, as it has to a large degree in Bakersfield.

o Second—customers need to see value from smart meters right from the start.

- It's unlikely they'll notice the year-round bill savings from lower meter reading costs. Nor will they notice that the lights went out less often than last year, or that they came on more quickly than after the last outage. These are important and valuable benefits of smart meters, and it's absolutely crucial to tell customers about them.
- But the smart meter also needs to be an instrument of customer empowerment right from the start.
    - Customers need real-time access to their energy usage data.

        - And they need to understand how they can use that information to lower their bills.

    - Both of these objectives can be achieved by effective customer education. The latter also requires forethought and planning by both the utility and the equipment vendor.

- Now let me step back and lay out for you the policies we've adopted for smart grid investment in California. Then in closing we'll return to Bakersfield for another tale, this one of smart meters and smart rates.

California Context

- First let me offer the broad policy context.

- In California we see an urgent need to modernize the grid to meet the state's ambitious energy and environmental goals.

- Foremost among our goals is the need to cut greenhouse gas emissions. Assembly Bill 32 requires that the state's greenhouse gas emissions be reduced to 1990 levels by 2020. The Governor further established a goal to reduce emissions to 80 percent below 1990 levels by 2050.

- To meet these targets, California has been aggressively promoting renewable energy and increasing energy efficiency.

- Twenty percent of the state's electricity is required to come from renewable sources by 2010.
    - Last year, the Governor declared that 33% of electricity should come from renewables by 2020. A bill to formally establish this target is currently pending in our legislature.
    - Notably, we expect that a significant portion of the state's renewable energy will come from distributed generation.

- California has also put in place aggressive energy efficiency and demand response policies.
    - These policies encourage Californians to use less energy
    - They can help shave peaks
    - The can also help to match demand to variable renewable generation.
    - And, consumers can save money in the process.

- Today, Congress is actively debating similar energy policies at a national level, taking California's lead.

- For the electric grid to handle more variable generation and responsive demand, we need to incorporate new communications, sensors and intelligence into the electrical infrastructure.
    - And this is generally what we are talking about when we talk about a Smart Grid.

California Smart Grid Activities

- In California, the utilities are laying the foundations of the Smart Grid as we speak.
    - By the end of 2012, every electricity consumer of the three big investor-owned utilities will have smart meters.
    - That's 12 million smart electric meters at a cost of $4.5 billion. Two million smart meters are already in place. San Diego Gas & Electric will finish its meter roll-out next year.

- The smart meters will provide the utilities more detailed information about how much each consumer is using and the health of the grid.
    - More importantly, the meters can also give consumers detailed information about how they use energy and enable new technologies to automate customers' responses to electricity prices and demand response signals.

- The California PUC is following Smart Meters with Smart Rates. Dynamic pricing will be an important new tool for consumers to take advantage of their Smart Meters and reduce their energy bills.
    - Dynamic pricing can help the state integrate more renewable energy into the electric grid by encouraging

consumers to use energy when it is cheapest and most abundant, rather than when the grid is stressed.
    - Dynamic pricing should also enable us to lower overall energy procurement costs and reduce local air pollution by reducing the need to run dirty and inefficient peaker plants.
    - These benefits support the state's greenhouse gas reduction and clean energy goals.

<u>The Grid Side of the Smart Grid</u>

- The California utilities are also very busy demonstrating and deploying new technologies in the transmission and distribution grid.
    - The utilities are deploying synchrophasors, testing distribution automation, and experimenting with microgrids.

- The American Reinvestment and Recovery Act has helped to accelerate our utilities' activities.
    - Southern California Edison won a Department of Energy grant to assemble an end-to-end Smart Grid demonstration in the Irvine area.
    - SDG&E won an award to for a Smart Grid communications backbone.
    - PG&E and Southern California Edison also won awards for significant energy storage demonstrations.

- California's public utilities and various technology companies also won grants for important projects in the state.

- Importantly, each of these projects includes a consortium of utilities, technology companies, and universities.
  - No one utility has all the answers. Collaboration is essential.

What's Next

- As if we weren't busy enough already, the state legislature and governor have taken an interest in Smart Grid.
  - Last year the legislature passed a new law that establishes modernizing the electric grid as the policy of the state. The law lays out characteristics of the Smart Grid in California. It also requires the utilities to develop "Smart Grid Deployment Plans".
  - But first, Public Utilities Commission needs to specify the requirements of a deployment plan. We are working on that now to meet a July 1, 2010 legislative deadline.

Benefits for Consumers

- The last area I'd like to focus on is the importance of demonstrating the benefits of Smart Grid to consumers.
- As I noted in my first tale from Bakersfield, it is imperative that customers see value in their new smart meters.

- The new Smart Meters on the sides of their homes will make consumers aware of the costs of the Smart Grid. However, many of the benefits aren't so visible.
    - The Smart Grid cost savings are swamped by the frequent rate changes caused by swings in commodity prices.
    - The reliability benefits are difficult to discern. Consumers notice outages, but will they notice reliability improvements?

- Utilities must prioritize the visible benefits of the Smart Grid.
    - First, we need to get energy usage information into the hands of consumers as quickly as possible. At the California PUC we are addressing this issue in our Smart Grid rulemaking.
    - To accelerate this process the PUC has set deadlines by which the utilities need to provide real-time energy information to consumers through the home area networks that are integrated into the meters.
    - We have also concluded that we need to stimulate the creativity of the marketplace to develop tools for consumers to manage their energy use. To this end the PUC has required that the utilities put in place systems and processes so consumers can designate third parties to get access to their energy usage data.
    - At a public workshop next week we will be discussing implementation issues with stakeholders.

- In addition to providing energy information, utilities and competitive retail providers need to put in place dynamic pricing.
    - Dynamic pricing can lead to immediate bill savings for consumers.
    - However, the introduction of dynamic pricing needs to be coupled with extensive consumer education and outreach.

- I urge the companies represented in this room to pay special attention to low income and seniors.
    - Consumers with low and fixed incomes are eager to find ways to cut their utility bills. Smart Meters can help.

<u>Bakersfield Part II</u>

- The topic of dynamic pricing brings us back to Bakersfield for a second and final tale.
    - This one is not a cautionary take
    - Instead it is a tale of promise and possibility.
    - It reinforces the lessons of our first Bakersfield tale, and offers some new ones.
- In Bakersfield PG&E has been offering customers who have received smart meters the opportunity to participate in its SmartRate program.
    - SmartRate is a critical peak pricing program

        - High peak time rates apply during peak hours of up to fifteen days a year when the grid is stressed,
        - Normal rates are discounted by 3% in other hours.

- PG&E's SmartRate program is the first large scale deployment of critical peak pricing in North America
    - Ten thousand customers in Bakersfield and the Kern County region signed up for SmartRate in 2008.
    - Low income customers signed up at a greater rate than customers at large.
- Most participants cut peak time usage and lowered their bills.
    - Overall, residential customers reduced their usage by 17% on peak days.
    - 70% of customers reduced energy demand for the average event, and
    - The third day of each event showed a larger reduction than the first two days.
    - Notably, low income customers, who are sometime thought to have little flexibility, lowered their use by 11%.
- The Bakersfield experience reinforces on a larger scale what we have seen in dozens of pilot programs around the country: people can and will reduce their peak energy use when faced with high peak time rates.

- In California we are moving, albeit slowly, toward universal default dynamic pricing.

- We already have the framework in place to do this for commercial and industrial customers over the next couple of years.
- For the time being dynamic pricing is optional for residential customers. However, legislation passed last year will let us start phasing in default dynamic pricing for the residential sector after 2013.
- This is important because the residential sector is a major user of air-conditioning and air-conditioning drives California's very peaky peak demand.
    - The residential sector offers a deep reservoir of potential to trim our peaks.
    - It also has the potential to absorb some of the supply-side swings resulting from integration of ever greater amounts of intermittent renewable generation.

- As my second Bakersfield tale showed, Smart Rates and Smart Meters offer California's electricity customers the ability to understand and manage their energy use and, in many instances, the opportunity to lower their bills.
    - To realize these individual and system benefits customers need to be engaged, educated and empowered.
    - The smart grid and smart meters in particular offer cost savings, improved reliability, cleaner air and reduced GHG emissions: but only if customers see these benefits.

- If there is one overarching conclusion to draw from my two tales from Bakersfield it is this: it is imperative that the installation of smart meters is seen as something that is done for customers not something that is done to customers.

- I would be happy to answer any questions you have.