

Any discussion of smart grid deployment necessarily entails *planning*, if only because a smart grid is a “goal,” not a present reality. And, assuring success in the implementation of a plan implies systematic *monitoring* of progress. In September 2008 the Illinois Commerce Commission ordered the formation of a Statewide Smart Grid Collaborative to develop a *strategic plan* for smart grid deployment in Illinois. But the Commission’s orders leaves ample room for defining the scope and methods and processes for planning.

### **Principles for planning and monitoring deployment of a smart grid**

According to the ICC’s September ComEd order, smart grid planning should have these characteristics:

- (1) participation by utilities, stakeholders and ICC staff;
- (2) direction by an independent third-party facilitator;
- (3) a deliberate and thorough, but expedited manner;
- (4) periodic Commission oversight;
- (5) descriptions of smart grid principles, goals, functionalities, and analyses of costs and benefits; and
- (6) Commission review and approval of plans.

There should be a clear statement of goals for smart grid focused, not on technologies, but on societal objectives.

### **Policy questions**

- Should planning processes ensure that all potential smart grid users have a voice in planning?
- How can planners ensure that Illinois knows about industry standards, “best practices” and experiences in other jurisdictions?
- How should planners evaluate the value of proposed smart grid functions and planned projects?
- What metrics should be used to monitor progress?
- What is smart grid deployment trying to optimize – individual consumer energy cost? The broader economic health of the state or a region? Environmental impact? System reliability? It is unlikely that all can be optimized at once – who decides?
- Should smart grid planning be coordinated with other local, regional, or State concerns – particularly with sustainability or “greening” plans for GHG reduction?
- What are the appropriate roles for stakeholders in determining Smart Grid investments? Who retains the value?\*
- What role should local governments play through franchise agreements to support a smart grid?\*

\* Idea submitted to the ISGI Web Forum.

Environmental concerns over the production and consumption of electricity are not new. Since the early 1970s US public policy has begun to take environmental impacts into account in public decisions concerning the production and consumption of electricity. Smart grid holds the promise to address the environmental issues in an entirely new way and may enable technologies to address global warming and other environmental harms (e.g., plug-in electric vehicle hybrids).

### **Principles for the Environmental Improvement benefits of the smart grid**

- The deployment of smart meters as part of a smart grid should include the use the meter as the backbone of a home area network that will provide consumers new options for the voluntary automated control of their thermostat and other energy using devices as well as the deployment of in-home energy monitoring display and control units.
- The smart grid should allow plug-in hybrid electric vehicles to both take power from the grid at off-peak times and to supply power to the grid at on-peak times. The information collection infrastructure of the smart grid should allow vehicle owners should be utilize rates that appropriately charge/pay them for their energy/capacity contributions to the grid.
- Utilities should maximize the operational benefits of a smart grid by reducing lines losses through better system operation. Reduced line losses will mean fewer megawatt hours of energy produced at central station plants.
- Options for net metering and interconnection of small scale renewable and clean generation (e.g., PV, wind, combined heat and power) should be expanded through the deployment of the smart grid.

### **Policy questions**

- What are the public policy goals for addressing environmental effects of electricity consumption and production?
- How should, if at all, environmental benefits be incorporated into smart grid investment policy?
- What rules, regulations or other legal requirements need to change in order to support more renewable generation (e.g., should the state support renewable generation through RD&D funding?)
- How do environmentally friendly technologies get evaluated in the utility planning process?
- Can the state utilize the market to increase customer choice in renewable energy and demand response?
- All problems associated with our electricity infrastructure, including GHG emissions, are affected by failure to embrace greater fuel efficiency.

Any discussion of smart grid deployment necessarily raises questions concerning default service pricing. The ability to monitor, and potentially charge, customers for time based usage creates the opportunity to implement rate designs that are drastically different than traditional default service pricing.

### **Principles for Pricing Electricity Service grid:**

As Ahmad Faruqi, of the Brattle Group, discussed at the August 5<sup>th</sup> ISGI meeting, the smart grid will help customers make smart energy buying decisions:

- (1) Providing real-time feedback to customers on their energy consumption should help them better manage their energy behavior;
- (2) Providing real-time feedback to customers can lower energy use by a few percentage points;
- (3) Inclining block rates can reduce energy consumption by up to 6 percent in the short run and may additionally lower peak demand;
- (4) Dynamic pricing rates can reduce demand by 13 to 27 percent during critical peak periods.

Overall, for better or for worse, customers are familiar, and comfortable, with the way they use energy under the current pricing structure. Changing default rate structures has the potential to expose customers to risks that they may not otherwise choose to accept. These are serious questions that any sustainable new rate design must address.

### **Policy questions:**

- What public policy goals should be embedded in default service pricing?
- What types of rate designs do customers prefer?
- How do customers respond to the information embedded in each rate design?
- How do we determine the optimal amount of risk customers are comfortable accepting?
- How do we balance customer preferences with public policy goals?

The backbone of the smart grid requires capital investment. To be economically feasible, capital investment in infrastructure industries must have public policies that support a reasonable opportunity for investors to earn a return on the investment. Public policy toward traditional utility investment is well-known and the results of those policies are generally predictable. However, smart grid investments may not be considered traditional utility investments, thus raising the possibility that modified policies toward investment may be necessary.

### Principles for Financing Smart Grid:

- Utilities should be provided a reasonable opportunity to timely recovery of the prudent costs, including capital costs, invested in properly defined smart grid technologies, policies, and programs.
- Alternatives to traditional regulation should be considered for smart grid investments including incentives for the use of smart grid investment, by both utilities and non-utility entities.
- Cost recovery mechanisms used for utility financing of smart grid should incorporate cost savings from utility operations enabled by smart grid investments.

### Policy questions

- Are smart grid investments qualitatively different than traditional utility investments?
- How can a balance be struck between providing a reasonable opportunity for cost recovery and providing consumers with the benefits of that investment (e.g., should existing non-depreciated assets replaced by smart grid investment be included for recovery in rates, should reductions in utility expenses be flowed through immediately or through traditional rate cases, etc.)?
- Should, and if so how should, public utility investment in smart grid be treated outside of the traditional rate case?
- How can private (i.e., non-utility) financing and deployment of smart grid investments be encouraged?
- Should utilities be placed under some form of performance review in the regulatory mechanisms for determining price?
- Lack of a formal (ICC approved) plan that allows ComEd to adjust to revenue losses from master metering and on-site generation (and earn an ROI) stops entrepreneurs from finding market niches.\*
- What are the appropriate roles for stakeholders in determining Smart Grid investments? Who retains the value?\*
- Regulatory incentives that reward utilities for deploying capital, not managing costs, have kept a cleaner, cheaper and more reliable grid from being built.\*

\* Idea submitted to the ISGI Web Forum.

Smart grid deployment could have a dramatic effect on retail markets in Illinois. Retail electricity markets could benefit from the ability of suppliers and other market participants to fashion and sell new information-based products and services that are made possible by the information flowing on the Smart Grid. Examples include smart meters and dynamic pricing being needed to enable customers to lower cost through load shifting and installation of solar PV, and smart switches and dynamic pricing which enable the seamless integration of solar PV, electric cars, and other low carbon generation sources

New retail products might include backup generation to protect resident's basements from flooding, residential intelligent energy management systems, and innovative solar PV financing. Possibly the most interesting and exciting products will arise from the smart grid's ability to help integrate the demand side of the market through better and more accurate price signals, allowing consumers to choose when and how to respond to prices and providing for more active trading in the commodity markets.

### **Principles for Retail Smart Grid Services and Microgrids**

While some success has been achieved in opening Illinois markets for different products and services, competitive forces will have a better opportunity to provide benefits to consumers through the use of the Smart Grid platform. According to the ICC annual Retail Competition report the benefits of retail competition have not reached the small commercial and residential consumers.

In addition, the ISGI learned through the workshop process that existing rules have blocked entrepreneurs from financing and installing smart meters in multi-unit residential facilities. The purpose of this discussion is to identify policy changes that would remove barriers and maximize the consumer benefits of retail service.

### **Policy questions**

- On what aspects of the provision of retail service should policy change focus?
- What types of new products and services enabled by the smart grid will need significant policy change to promote?
- What role should the ICC/legislature/other government entities play in promoting these new options for consumers?
- Does lack of a formal (ICC approved) plan that allows ComEd to adjust to revenue losses from master metering and on-site generation (and earn an ROI) stops entrepreneurs from finding market niches?\*
- Would smart grid deployment be enhanced by allowing master metering?
- Should interconnection to the utility system be as simple as possible, assuming standardized engineering principles are applied?\*
- Who should have what opportunity to use what parts of the utility's distribution infrastructure?\*
- What can be done to encourage direct sales of renewable generation sources to consumers?
- Is AMI required to provide for retail choice?

\* Idea submitted to the ISGI Web Forum