

The Smart Grid: An Investors Perspective

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Investing in the “Smart Grid”

- Who are some of the possible investors in smart grid initiatives?:
 - Utilities
 - Municipalities, State and Federal players
 - Tax payers
 - Rate payers
 - Private Industry
 - Users seeking conservation and cost management
 - Software, Service, Equipment and device producers
 - Private Equity and Venture Capital
 - Others..

- Commodity providers:
 - Generally very conservative. They oversee a system “that the nation depends on”. So they tend to be slow to change and to adopt new technologies
 - Focused on Capacity, evolving Regulatory environments and costs, including effects of Clean Air regulations.
 - Partly conflicted by their business model. At the end of the day, the greatest profit opportunity is still selling more kWh.
- Positive Movement
 - Some innovative players are using deregulated markets to introduce demand pricing and related technologies.
 - Demand Response programs
 - Real Time Pricing
 - Demand forward pricing and long term supply contracts
 - Smart metering
 - Still too limited in scope and susceptible to change but markets are developing.



Municipalities, State and Federal

- Regulation and De-regulation.. and re-regulation?
- Deregulation has begun to enable the necessary market forces for both innovation and conservation.
- However, uncertainty around de-regulation has and continues to hamper investment
- Externalities abound and create a complex environment for public/private collaboration
 - Managed monopolistic supply & distribution, local infrastructure, geopolitical/security issues and environmental issues.
- All of this does require regulatory change to create incentives if conservation & ecology are deemed national priorities
- Mechanisms for change and investment are primarily:
 - Deregulation
 - Legislatively driven markets (e.g. Clean Air Act, Carbon Cap & Trade)
 - Tax incentives
 - Rate based incentive programs
- A greater focus is needed on market based incentives

- Significant increase in focus on energy issues
 - Elevated costs are driving a desire to gain better control over energy usage
 - Renewed Sensitivity to social issues of foreign dependence on oil and gas, and on global warming
 - It's cool to be Green
 - This new environment is driving both product/solution development and purchasing.
 - Some barriers are limiting investment, Examples include:
 - Limited rate data or demand pricing systems – price incentives
 - Building design/build/own system - incentives for LT efficiency
 - Building Owner/Lessor relationships – who pays for improvements ?
 - Beware of some elements of the current environment where it's possible that too much of the incentive for purchasing is social and not sufficiently economically driven. –If not economically driven, it's not sustainable.



Private Equity and Venture Capital

- **Many funds have or are being created to invest in energy related technologies and businesses**
- **Smart Grid technologies are “Hot”**
- **However, solid business models that are not dependent on the timing of future markets and regulation are hard to find**
 - Investment is being held back and is lower than in other parts of the world
- **The smart investors are looking for products and services that can prove profitable in the existing market.**
- **Issues such as:**
 - The price of oil
 - Electric Industry regulation
 - Industry price incentives that reward load management
 - Environmental regulation
 - Development of a US Carbon market

All create significant opportunity but also meaningful uncertainty
- **ROI models for most opportunities in the Smart Grid arena are directly effected by these issues.**

Some Areas of Investment Focus

- **Smart Metering**
- **Real time pricing mechanisms and Smart Grid communication technologies**
- **Smart controls technologies that enable demand response and forward demand control**
 - **Building controls, lighting controls, local device intelligence: smart equipment and appliances etc.**
- **New generation of Ai based smart control systems enabled by open data and communication standards**
- **Wireless communications**
 - **Enabling communication across the grid and the “last mile” (50 feet?).**
- **Smart distributed sensors**
- **Energy storage: battery technologies, flywheel projects etc.**
- **Line loss and super conducting technologies**
- **Local generation/sustainable energy concepts including:**
 - **Fuel cells, Solar, Wind & Geothermal**
- **Pollution Control equipment**
- **Cellulosic Ethanol Technologies**
- **Coal to Gas technologies**
- **Also seeing significant investment in better technologies for traditional energy sources: exploration, extraction, refining etc.**

Wrapping Up

- **Smart Grid technologies stand to both drive much needed conservation and efficiency but also will provide consumers of energy with better tools to make energy decisions and reduce costs.**
- **Smart Grid initiatives will benefit tremendously from better private/public collaboration in the areas where externalities and regulation exist. Market based policies need to be defined and regulatory rhetoric “settled down” to maximize investment and innovation.**
- **When the broader investment, manufacturing and entrepreneurial world believes that the enabling elements of the smart grid will or are being rolled out, a marked increase in innovation and investment will follow.**
- **There appears to be a bubble developing in various parts of the “Green” & Smart Grid investment area, so old timers will remember Kermit the Frog..**

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“It’s not easy being Green”

Kermit the Frog, 1970