



smartgridaustralia

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NATIONAL BROADBAND NETWORK

SUBMISSION

on

REGULATORY ISSUES

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Overview

Smart Grid power network is based on advanced network analytics, automated meter management (AMM), remote asset monitoring and control, transmission and distribution automation, mobile workforce management and IP-enabled supervisory control and data acquisition (SCADA).

It allows power providers to extend equipment life, prioritise the replacement of assets, defer costly network upgrades, prevent network failure and address technical employee shortages. Consequently the Smart Grid has direct positive affect on energy reliability, efficiency, environment, national security and productivity growth.

Sensors and smart meters monitor the status of the Smart Grid continuously and allow distribution companies to store this data a data warehouse. Advanced network analytics can be applied to this data to boost operational efficiency.

A nation's transformation to a Smart Grid may present challenges of its own, but the potential benefits make the journey well worth it. Creating Smart Grids can address a broad spectrum of energy problems. If we act now, our benefits will reach far – from energy reliability and independence and protection of critical infrastructure, to billions in cost savings and increase in national competitiveness.

The Challenge and the Opportunity

An increasing demand for electricity, aging power assets, reliability issues and revenue constraints are acute issues in our power infrastructure. There is also growing recognition that current difficulties in power delivery are compounded by inefficiencies in energy infrastructure (refining capacity, gas and oil pipelines, transmission lines, and electric generating facilities). Governments and companies around the world are beginning to address pain points relating to reliability, resources consumption, efficiency, national security, and environment and are beginning to relate them to the need for implementation of Smart Grid as a new smarter approach to operate power networks.

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Trends in the Energy Marketplace

The political and business interests in the Smart Grid are motivated by variety of factors – peak in demand, blackouts, competitiveness, renewable energy, emergence of new technologies, and customer centricity. These trends coupled with business catalysts, legislative, policy and regulatory drivers, and financial incentives, are increasingly shaping the dialogue and interest in reinventing the way we view, create, use and

share energy.

1. **Peak Demand:** Today, in almost every electricity market around the globe, peak demand is growing and along with it the need to augment the capacity of aging networks. Peak demand for electricity generally grows as a function of GDP.
2. **Blackouts:** With systems strained to the breaking point, high-profile failures are drawing public and political attention. "nowhere is there any decisive, visionary plan in place to tackle a real energy production and supply crisis. If this is the best they can offer, rolling black-outs, it will display a complete lack of leadership and willpower from everyone involved."
3. **Customer centricity:** With the emergence of utility deregulation customer retention becomes a significant factor in energy and utility business. Process improvements will orient towards the customer (i.e. billing and customer care) and cost reductions will need to be met while simultaneously delivering excellent customer service in a deregulated market where customers are able to choose utility providers. Current and emerging technologies, such as 'smart' meters, empower the customer, with usage information and pricing options that can help save energy by managing usage at home.
4. **Competitiveness:** In general, there is a direct correlation between competitiveness and quality of life and plentiful and reliable energy resource. Making the case for reliability, industry transformation and ability to better incorporate renewable (e.g. alternative) energy is therefore making the case for growth and competitiveness of a nation.
5. **New technologies:** Emergence of technologies, such as the iSmart Grid network, will allow for a successful inclusion of renewable energy sources. Part of the 'solution' to the current (fossil fuel) energy crisis could be solved by an diversified 'portfolio' of energy sources, such as hydro power, wind, solar, sugar cane alcohol (e.g. ethanol). The appropriate source will vary by the natural resources and physical and political accessibility of each region.

The New Approach – the Smart Grid

What makes the network smarter and better?

Sensors and smart meters monitor the status of the intelligent electricity network continuously and allow distribution companies to store this data a data warehouse. Advanced network analytics can be applied to this data to boost operational efficiency.

Smart Grid can also moderate demand growth by using smart meters to collect timebased data on consumption. Retail companies can use these data to implement time-of-use tariffs, charging a premium for power used during periods of peak demand. By encouraging off-peak consumption, time-of-use tariffs help balance the load on the network.

The Smart Grid also offers a more granular, realtime view of its status. Sophisticated condition sensors provide detailed information on the status of power network assets and help controllers determine when assets are about to fail. Intelligent networks not only provide data that predict and help prevent faults, but

also provide a realtime picture of what is happening when a fault or incident occur.

Furthermore, with modern network analytics tools, sensor and meter data can be “mined” to support key strategic imperatives: to target investment at components that are about to fail or are running near full capacity (avoiding network downtime), to enable realtime reconfiguration in the event of a blackout (reducing downtime, revenue loss and public ill will), to optimise the configuration of the network and to satisfy regulators that prudent investment decisions are being made.

BENEFITS

A nation’s transformation to Smart Grid may present challenges of its own, but the potential benefits make the journey well worth it. Creating Smart Grid networks can address a broad spectrum of energy problems. If we act now, our benefits will reach far - from energy reliability and independence and protection of critical infrastructure, to billions in cost savings and increase in national competitiveness.

Benefits would include:

- Potential to reduce power outages in transmission and in distribution;
- End user savings from energy management systems in buildings and households;
- Enabling end users to redesign their production and business processes to utilise the increased power reliability and quality;
- Demand response reduces peak load and results in capital and operating cost savings to the electricity system;
- More secure, reliable, higher quality power delivery;
- Reduced vulnerability to accidents and attacks;
- Increased competitiveness become a leader in renewables;
- Address the skill shortage situation by automation;
- Impact on Australian GDP and productivity, Australian Business and Job Growth, attraction of high tech industries and job growth.

Recommendations

The National Broadband Network is one of the options that is available to this country to built smart grids. While SGA doesn’t recommend any legislative initiatives, it is important that the NBN will be designed in such a way that it stimulates utilities to consider the NBN options for the purpose of smart grids. Critical in that respect will be that the infrastructure will be an open infrastructure and that the topology of the NBN is designed in such a way that it provides maximum flexibility to include applications such as smart grids (as well as healthcare, education, etc).

Utilities as well as other (government) organisations do require full end-to-end control over the infrastructure for the purpose of their applications and as such it is important that telecoms regulations surrounding the NBN provide these end-to-end facilities.

Governments and companies should establish partnerships to enable Smart Grid networks in consideration of the overall Broadband requirements for Australia

Enabling Smart Grid networks means:

- Creating an integrated, electronic, internet-based, information network that enables private and secure transmission of energy consumption data between the stakeholders. This includes having a broadband infrastructure solution to support both Smart Grid, Internet, Health and Education requirements.
- Providing a foundation for detection and rapid response to system failures or national security threats and adverse events.
- Changing the way we use, view, and generate power.
- Promoting policies and incentives to drive adoption of the Smart Grid.
- To reduce duplication of infrastructure and lack of interoperability between services a holistic view needs to be taken on whether to deploy a separate BPL network and broadband network such as FTTH for Internet, Education and Health Services.

Key Considerations

A key part of the Smart Grid is the transport of data from the field devices back to the enterprise. Nearly all replacement equipment being installed in the distribution and transmission networks are now IP-enabled devices, presenting the opportunity for the enterprise to access this data and act on it to enhance their business operations. In addition, the advent of advanced metering systems places millions of additional smart devices on the distribution network.

In order to aggregate these large streams of real-time asset data, the utility needs to install broadband access to these devices. There are a large variety of communication technologies that can be applied to provide this data access, including public network providers, private fibre, wireless, Broadband over PowerLine (BPL), etc.

BPL is one the communications capabilities that utilities should, and do, consider as they look enable the Intelligent Network and the utility benefits that accrue from it. One of the benefits of BPL that is unique relative to other communications technologies is that it connects directly to the devices that utilities care about; the network assets that operate the electricity grid.

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