Smart/Intelligent Grid Development and Deployment in Thailand (Smart Thai)

“Smart Grid: Policy, Services and Applications”

Balance Carbon Reduction and Security of Supply
Creation of Incentives to Encourage Investments

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Balance Carbon Reduction and Security of Supply

Creation of Incentives to Encourage Investments
Global Investment

✓ Energy Demand Growth
  ➢ by 2025, we will need approx. 428 GW of new capacity,
  ➢ by 2050, we will need approx. 25-30 TW/year of electric power,

✓ Energy Business Value
  ➢ 2008 – $6 Trillion (a 10th of the world’s economic output)

✓ Global Spending
  ➢ $13 trillion: electric infrastructure upgrade by 2030 *(Source: International Energy Agency – IEA)*
    ➢ More than half for the grid and related equipment (as opposed to new or refurbished power plants)
  ➢ $70 billion: smart grid investment by 2013 *(Source: IDC’s Energy Insights)*
  ➢ Critical industry constraints: workforce availability, manufacturing capacity, project complexity

✓ Government Spending
  ➢ North America: Recovery and Reinvestment Act of 2009 - $32.1 Billion
  ➢ Europe:
    ➢ The UK government is mandating the deployment of smart meters for domestic premises in the UK by 2020
    ➢ Significant pressure across Europe to upgrade the grid to accommodate renewable, distributed electric generation
Geographic Differences in Drivers

Global Conditions:
- Customer and regulator expectations for service quality rising
- Half of skilled workers to retire in the next 5 to 10 Years
- Aging infrastructure could lead to significant asset replacement plans

North America:
- Customer and regulator expectations for service quality rising; reliability is often an issue
- Aging infrastructure could lead to significant asset replacement plans
- Several state energy master plans (CA, NJ, etc.) combined with Federal climate change agenda calling for step change in conservation outcomes

Europe:
- Increased focus on mitigating emissions and reduce carbon footprint
- Rising fuel costs and demand growth leading to increased focus on renewable and Distributed Energy Resources

Asia:
- Massive growth in electric power infrastructure underway
- Rising fuel costs and demand growth
Electric Utility Challenges

- Aging Infrastructure
- Aging Workforce
- Peak Load Growth
- Emission Standards
- Rising Prices
- Regulatory Requirements
- Customer Satisfaction / Perception
- System Reliability
- Shareholder Value
- Technology Advancements
- Not in my backyard syndrome
Modern Utility Perspective

- Wants to remain profitable: good value to shareholders
- Wants to provide superior customer service
- Wants to continue to grow revenue streams
- Will invest in technology: competitive advantage
- Will comply to all environmental and regulatory requirements
- Will operate an reliable grid to meet load requirements
- Will make product offerings cost effective and pain free for customers to participate
- Will offer new product offerings to customers in order for customers to be more energy savvy
- Will partner with new players in the industry to provide more value to society
Modern Utility = Reliable Grid (Smart Grid)

The Modern **Reliable Grid** is enabled by technologies/applications/solutions from several industries.

The **Reliable Grid** (Smart Grid) is enabled by:
- Electric/Power
- Telecommunication
- Internet
- Information/Data Computing
Modern Utility = Educated Customer

- Wants to utilize energy wisely
- Wants to control the cost of their electrical bill
- Wants to be environmentally responsible and reduce their carbon footprint
- Will likely purchase energy star appliances
- Will likely purchase PHEVs
- Will embrace new technology which facilitates making energy management a back of the mind experience
- Will participate in programs that help foster & support societal benefits
- By definition is a person with common sense, so they will invest their money wisely for products that yields a good value.
Smart Grid Customer Offerings

Products, Services and Pricing enable utilities to reduce and shift consumption, relieving capacity constraints at a cost below that of building new generation capacity.

Value Proposition
“Why Smart Grid?”

Customer Segments

Customer Benefits

Value Proposition Elements

Information

Devices & Solutions

Plans & Packaging

Customer Experience

Recruit
Qualify
Sign-up, Enroll & Schedule
Install
Demand Event
Technical Support
Terminate/Remove
SmartGridCity brings the latest energy management technology to my home, connecting me to my devices, appliances and climate systems to make managing my energy consumption as easy as "set it and forget it". With SmartGridCity I can be green, learn to manage my energy dollars, and enjoy the benefits of better service, without sacrificing the comfort I am accustomed to. At the same time, I feel good about being part of a project that will build a better future for America.

**Overarching Value Proposition**

Conservation & Community

Cost & Community

Convenience & Control

Consistency (Reliable Power)

Conservat’n (Reduced Carbon Footprint)

Cost (Reduced Energy Bills)

Comfort & Convenience (Latest & Greatest Tech)

Coolness (Monetize Energy Production)

Community (Making a Difference Together)

Choice (Getting to choose what I use)

**Benefits Spectrum**

Consistency

Conservat’n

Cost

Comfort & Convenience

Coolness

Cash

Community

Choice

**Umbrella Positioning**

SmartGridCity provides customers with an Innovative Energy Management system, creating active participation for making informed choices about energy usage, and resulting in a reduced carbon footprint.

**Translated to align with segment value drivers**

- Affluent Empty Nests
- Accumulated Wealth

- Midlife Success

- Conservative Classics
- Young Achievers
- Striving Singles

**Conservation & Community**

“SGC lets me do my part by being Smart with technology that mission-control for all my energy needs. Being a part of SGC is reflective my green values and is central to creating a legacy of energy responsibility for the next generation.”

**Convenience & Control**

“SGC gives me the technology I need to take control of my Home from anywhere I can access the web. SGC represents a new era of home technology that will make managing my energy use more convenient.”

**Cost & Community**

“SCG helps me save money while being environmentally responsible – All without sacrificing comfort. At the same time I feel like I am joining a powerful movement to rebuild America for the next generation.”
“If an energy provider was proposing products / services that help reduce the level of carbon emission, would you be willing to switch to this provider if this was an option?”

“Customers are poised to shift to Energy Consumerism.

“What do you think of the products / services offered by your current electricity / natural gas provider to help you address climate change at your individual level?”

- Better than the products / services offered by the competitors: 61% (US Consumers)
- Equivalent to the products / services offered by competitors: 35% (US Consumers)
- Worse than the products / services offered by competitors: 2% (US Consumers)

Age of ‘Energy Consumerism’

- Yes, certainly: 30% (Developed countries), 13% (Emerging economies)
- Yes, probably: 56% (Developed countries), 61% (Emerging economies)
- No, probably not: 12% (Developed countries), 1% (Emerging economies)
- No, certainly not: 2% (Developed countries), 3% (Emerging economies)
“Running today’s digital society through yesterday’s grid is like running the Internet through an old telephone switchboard”

Energy Future Coalition

“… a fully automated power delivery network … ensuring a two-way flow of electricity and information between the power plant and appliance, and all points in between. Its distributed intelligence, coupled with broadband communications and automated control systems, enables real-time transactions and seamless interface among people, buildings, industrial plants, generation facilities and the electric network”

U.S. Department of Energy Grid 2030
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