An Overview of the Smart Grid Maturity Model (SGMM)

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Background

IBM and a group of leading utilities, the Global Intelligent Utility Coalition, originally developed the Smart Grid Maturity Model (SGMM) and have just recently transferred the SGMM assets to the Software Engineering Institute (SEI)/Carnegie Mellon University (CMU).

The U.S. Department of Energy Office of Electricity Delivery and Energy Reliability has entered into a work plan with the SEI for the SEI to serve as independent steward of the SGMM with primary responsibility for the ongoing governance, growth, and management of the SGMM.
Smart Grid Maturity Model – Levels, Descriptions and Results

**Level 5:**
**Innovating – Next wave of improvements**
New business, operational, environmental and societal opportunities present themselves, and the capability exists to take advantage of them.

**Level 4:**
**Optimizing – Enterprise Wide**
Smart Grid functionality and benefits realized. Management and operational systems rely on and take full advantage of observability and integrated control across and between enterprise functions.

**Level 3:**
**Integrating – Cross Functional**
Smart Grid spreads. Operational linkages established between two or more functional areas. Management ensures decisions span functional interests, resulting in cross functional benefits.

**Level 2:**
**Functional investing**
Making decisions, at least at functional level. Business cases in place, investments being made. One or more functional deployments under way with value being realized. Strategy in place.

**Level 1:**
**Exploring and Initiating**
Contemplating Smart Grid transformation. May have vision, but no strategy yet. Exploring options. Evaluating business cases, technologies. Might have elements already deployed.

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**Perpetual Innovation**
- Self-healing operations
- Autonomic business

**Transformation**
- Real time corrections
- Broad reuse

**Systemization**
- Repeatable practices
- Shared information

**Strategy**
- Proof of Concepts

**Vision**
- Experiments

**Innovators**
**Victors**
**Cross LOB Champions**

**Prophets, Heroes**
**Missionaries**

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Smart Grid Maturity Model (SGMM) Overview
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## SGMM Process Domains

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<tr>
<th>Grid Operations</th>
<th>Work and Asset Management</th>
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<td>Includes: Advanced grid observability &amp; advanced grid control, quality and reliability. <strong>A solid core foundation of intelligent grid components and operational design, using technology and automation fused with enterprise processes becomes a holistic Smart Grid.</strong></td>
<td>Includes: Optimizing the assets and resources (people and equipment). <strong>Operating and maintaining assets based on up to date, fact based performance data, enabling the evolution from preventative and reactive to predictive and self healing for more efficient use of resources.</strong></td>
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<th>Value Chain Integration</th>
<th>Customer Management and Experience</th>
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<td>Includes: Enabling demand and supply management, distributed generation, load management, leveraging market opportunities. <strong>Extending automation beyond traditional boundaries, and across the entire value chain, opens opportunities for innovation and efficiencies.</strong></td>
<td>Includes: Retail, customer care, pricing options and control, advanced services and visibility into utilization quality, and performance. <strong>Through Smart Grid, the customer becomes empowered to make their own choices regarding their use and cost of energy.</strong></td>
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**SGMM People and Technology Domains**

**Strategy, Management & Regulatory**
Includes: Vision, strategic planning, decision making, strategy execution and discipline, regulatory, investment process

*The mission, vision, strategy, and how it is managed must be fully integrated in order to guide the way through a successful Smart Grid transformation.*

**Organization**
Includes: Communications, culture, structure

*For Smart Grid to be successful, the organizational structure must promote and reward cross functional planning and design and operations, but still allow for empowered decision making.*

**Technology**
Includes: Information, engineering, integration of information and operational technology, standards, and business analytics tools

*A cohesive technology strategy must connect and support the innumerable data sources and users, that make up a Smart Grid, today and into the future.*

**Societal and Environmental**
Includes: Conservation and green initiatives, sustainability, economics and ability to integrate alternative and distributed energy

*Smart Grid can provide the ability for a utility, and society, to make choices and take advantage of energy alternatives and efficiencies, regarding both production and consumption.*
3. Level 3 Integrating – Cross Functional

3.1. Strategy and Management

A. Has your smart grid vision, strategy and business case been incorporated into your corporate vision and strategy?

- a. no
- b. limited
- c. extensive
- d. complete

B. Do you have a smart grid governance model in place (roles, processes, tools, etc.)

- a. not at all
- b. partial
- c. extensive
- d. integrated into existing organization

C. Do you have one or more smart grid leaders with explicit authority across functions and lines of business to ensure application of smart grid?

- a. no
- b. a single leader
- c. multiple leaders

D. Have regulators authorized your smart grid investments (e.g. via mandate or other technique)?

- a. no
- b. indirectly
- c. partially
- d. explicit and complete
SGMM Participation To Date

North America

- Manitoba Hydro
- BC Hydro
- Bonneville Pwr.
- Portland Gen.
- Salt River Proj.
- Sempra
- Austin Energy
- CoServ
- Centerpoint
- Entergy
- EPCOR
- Hydro Ottawa
- ComEd
- VELCO
- Allegheny Pwr.
- Dominion Vir.
- First Energy
- AEP
- PHI
- Exelon
- Duke Energy
- SCANA Corp.
- East Miss EPA

Rest of World

- Alliander
- DONG Energy
- ERDF (France)
- Union Fenosa
- NDPL (India)
- Zhejiang Energy
- Energy Australia
- Country Energy
- CPFL (Brazil)
- EDP (Brazil)
Leveraging SEI Experience for the Smart Grid

SEI is recognized as a global leader in best practices for improving software and systems engineering, with a track record of success in providing frameworks that enhance business and technical processes, security, resiliency, architecture and interoperability—all critical elements in successful implementation of the Smart Grid.

SEI has developed worldwide de facto standards, like the Capability Maturity Model Integration (CMMI) and led international efforts to improve network security through its world-recognized CERT program.

In recent years SEI has worked closely with industry and government stakeholders on architecture and cyber security aspects of the Smart Grid.

By assuming stewardship of the SGMM, SEI expands its involvement to apply the full range of its support capabilities.
SEI’s Role As Steward of the SGMM

SEI will provide technical advice and support SGMM stakeholders as steward of the SGMM including:

• Assuming responsibility for overall governance of the SGMM
• Supporting the widespread availability, adoption, and use of SGMM
• Maintaining and evolving the SGMM
• Ensuring a reliable, valid, consistent set of supporting products and services for the SGMM user community
• Administering quality control of the SGMM and its usage
• Analyzing and providing feedback on SGMM usage
How Stakeholders Participate and Benefit

SEI will maintain and enhance the SGMM based on stakeholder needs.

SEI will be reaching out to the user community to solicit feedback on the SGMM, its application and its value.

Going forward, SEI will be developing user education, training products and other supporting materials, and will enroll business partners to expand the available support services.

SEI is planning a webinar on Monday March 30, 2009 at 11 am EDT to announce the transfer of the SGMM assets from IBM to SEI. Please go the SEI web page (www.sei.cmu.edu) for more details.
Contact information

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