



Five Smart Grid Questions Every Utility Executive Should Ask (and a way to find the answers right for your organization)

In your smart grid transformation, you'll want to see clearly where your utility organization needs to go—and how to most efficiently and effectively move forward.

Executive Summary

Investment in the future of electricity generation, transmission, and distribution continues to grow, with billions of dollars pursuing smart grid benefits such as

- better management of peak demand
- improved grid reliability
- increased operational efficiency

Before embarking on an investment program, a utility should develop its vision for smart grid transformation and create a roadmap to reach its destination. This paper recommends a tool, The Smart Grid Maturity Model (SGMM), for planning and measuring smart grid progress that helps a utility answer:

1. Where are we now?
2. How do we compare with similar utilities?
3. Where do we want to go?
4. How will we go forward with modernization?
5. How can we track our progress?

The SGMM consists of guidance on 175 smart grid characteristics that are arranged in these eight utility organization domains:

- Customer
- Grid Operations
- Organization and Structure
- Societal and Environmental
- Strategy, Management, and Regulatory
- Technology
- Value Chain Integration
- Work and Asset Management

While motivations vary for investing in smart grid modernization, one aspect is constant: the need to establish a smart grid vision and develop a roadmap for realizing it.

UTILITIES NEED TO KNOW HOW BEST TO INVEST IN SMART GRID

It is important for utility executives to “define a smart grid vision and develop a road map to get there,” according to McKinsey and Company.¹

Since 2009, electric power utilities and the Software Engineering Institute (SEI) have been collaborating to create the SGMM Navigation Process, in which industry service providers use a management tool in guiding utilities to

- inform their smart grid visions
- gain input for smart grid transformation roadmapping efforts

The management tool is the Smart Grid Maturity Model (SGMM), a comprehensive model that includes 175 smart grid characteristics that ensure utilities will be able to consider all aspects of grid transformation.

Seeing the need in industry for a tool to help in smart grid planning, utilities in the Global Intelligent Utility Network Coalition (GIUNC) created the SGMM. With support from the U.S. Department of Energy’s Office of Electricity Delivery and Energy Reliability—along with input from a broad array of stakeholders—the Software Engineering Institute (SEI) fosters the adoption of the model by electric utilities and service providers and works to advance smart grid software engineering.

The SEI created the SGMM Navigator Certification Program and the Navigation Process to promote consistent, high-quality, and broad adoption of better smart grid practices using the SGMM.

THE SGMM NAVIGATION PROCESS HELPS UTILITIES ANSWER KEY PLANNING QUESTIONS

1 Where are we now?

A utility that follows the SGMM Navigation Process can learn about its readiness to take full advantage of an investment in smart grid, through understanding its current maturity in eight domains:

- Customer
- Grid Operations
- Organization and Structure
- Societal and Environmental
- Strategy, Management, and Regulatory
- Technology
- Value Chain Integration
- Work and Asset Management



Why this is important: Moving ahead with investment before assessing the current state can lead to costly false starts, crippling cost overruns, and sub-par results.

2 How do we compare with similar utilities?

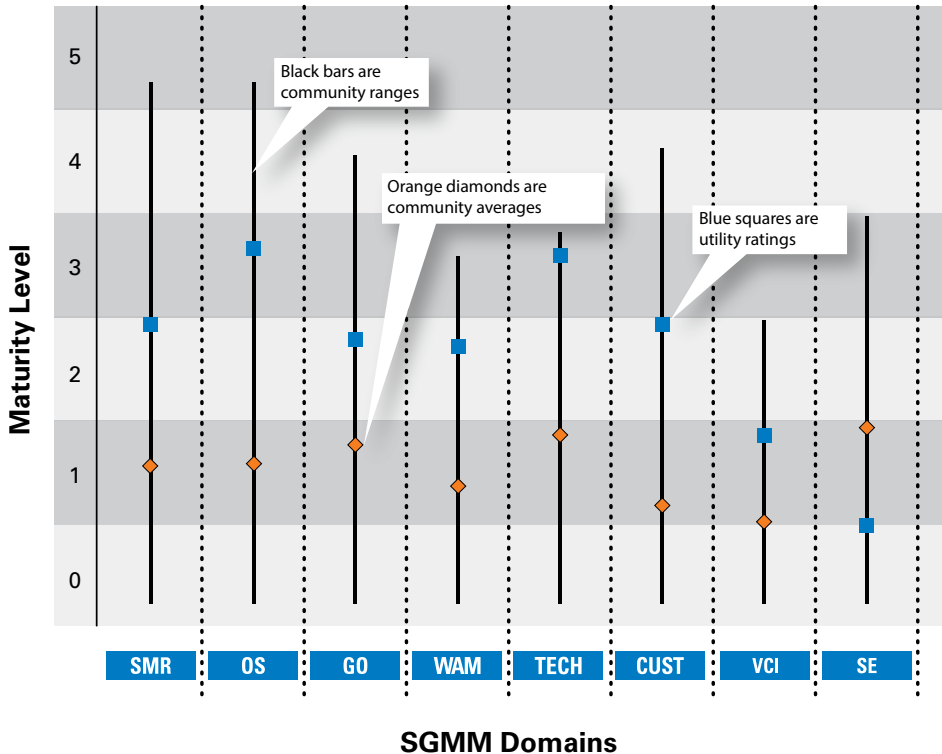
The SGMM Navigation Process also provides data on where a utility stands compared to similar utilities. The SGMM Navigation community comprises

- a continually growing number of electric utilities worldwide, totaling more than 120 as of June 2012
- public and investor-owned utilities with a median size of 1 million meters and a range in size of 40 meters to 34 million meters
- utilities engaged in the generation, transmission, distribution, combination of those functions



Why this is important: Learning from similar utilities brings insight into best practices and lends clarity to decision making.

The SEI created the **SGMM Navigator Certification Program** and the **Navigation Process** to promote consistent, high-quality, and broad adoption of better smart grid practices using the SGMM.



At left: Example results from the SGMM Navigation database for a peer community of utilities with more than 250,000 meters installed

“The key to success in any grid transformation is to have a good plan and to work that plan.”

—Steve Rupp, Vice-President, SAIC Energy, Environment & Infrastructure and an SEI-Certified SGMM Navigator

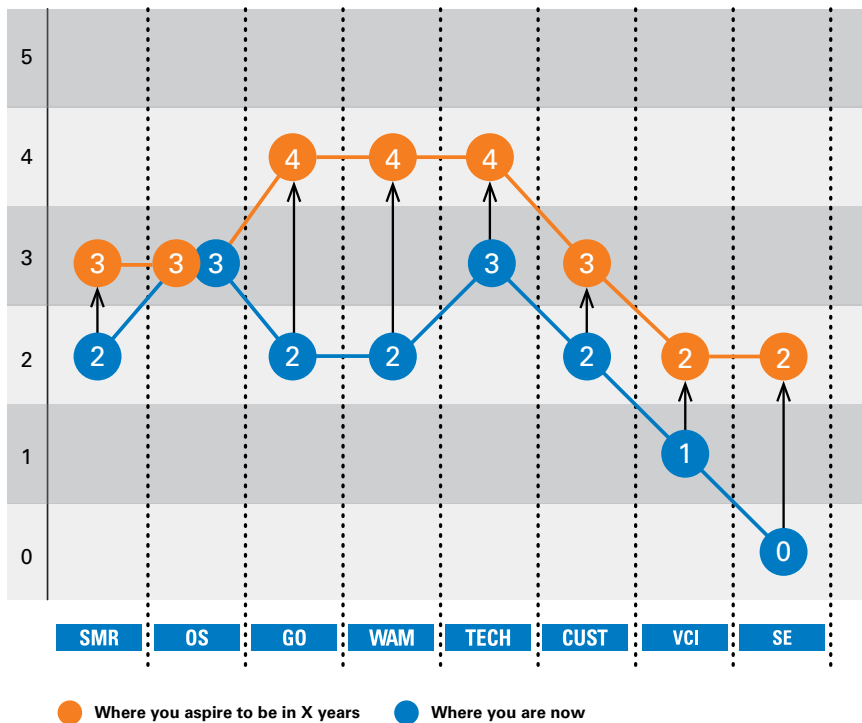
At right: The SGMM Navigation process produces a view of the utility's current smart grid maturity against the eight domains of the SGMM. It also helps a utility set aspirational goals for its smart grid maturity over time (example results).

3 Where do we want to go?

An SGMM Navigation assessment also helps a utility determine its smart grid aspirations. In the SGMM Navigation Process, stakeholders from across the utility's enterprise reach consensus—not only on today's state of smart grid transformation readiness but also on the envisioned state at an agreed-to time horizon.



Why this is important: Working together, all the key players from a utility reach consensus about the organization's smart grid aspirations that provides input for strategic planning.



4 How will we go forward with modernization?

The SGMM Navigation Process provides input into a utility's smart grid roadmapping efforts. The utility can use its own "as-is" profile and "to-be" aspirations, as well as a peer community view for comparison—all work products of the SGMM Navigation Process—to assess and prioritize areas for investment.



Why this is important: Stakeholders prioritize areas for a modernization effort, using specific and credible information.

"...using the SGMM Navigation process ... was helpful in fostering candid, fact-based discussion of where we have been, where we are today, and where we expect to be in the future."

—George Potts, Vice-President, Business Transformation, Pepco Holdings, Inc.

SGMM IN USE: ROAD-MAPPING A SMART GRID FOR PUBLICLY OWNED UTILITIES

As part of a project to define a pathway to a 2020 smart grid vision for publicly owned utilities, the California Energy Commission (CEC) called on SAIC, an SEI SGMM Partner, for help.

SAIC's project lead Steve Rupp guided each utility's stakeholders through a **workshop to complete the SGMM Compass survey**. By completing the Compass survey, each utility provided input important for characterizing its smart grid modernization status.

Rupp used the survey results to develop **comprehensive assessments** of current activities, including views of how each utility compares with peers who have already been assessed in the SGMM Navigation Process.

Rupp then led the utilities in **aspirations workshops** to provide views of their future-state visions. Implementation roadmaps—driven by the actions and obstacles identified in the aspirations workshops—showed participating utilities how to **bridge the gaps** between current state and aspirations.

CEC utilities in the project saw immediate benefits from the SGMM Navigation Process:

- For some, the survey and aspirations workshops provided the first opportunity to formally review and plan smart grid activities.
- For others, the results benchmarked tremendous progress in the advancement of their smart grid planning and deployment efforts—essential evidence needed to maintain financial support for their initiatives.
- For still others, the results provided support for a “go-slow” approach to smart grid deployment.

5 How can we track our progress?

The peer community view that SGMM Navigation affords is valuable for comparison. However, the best benchmark for a utility is itself. Having established targets for roadmapping and investment through one application of the SGMM Navigation Process, a utility can check progress against its goals by periodically repeating the assessment.



Why this is important:

A repeated assessment fosters discussion among stakeholders based on the facts of where a utility is in its transformation. It also helps a utility determine whether it should modify its course, due to shifting priorities and needs.

SEI-CERTIFIED SGMM NAVIGATORS CAN WORK WITH YOU TO FIND YOUR ANSWERS FOR SMART GRID TRANSFORMATION

Take a first step toward SGMM Navigation assessment by finding an SEI-certified SGMM Navigator who suit your organization:

<http://partners.clearmodel.com/find-partner-organization/>

You might also consider taking these steps:

- Join the SGMM mailing list. Write to us at info@sei.cmu.edu.
- Join our group on LinkedIn, the Smart Grid Maturity Model User Forum.
- Download SGMM documents at www.sei.cmu.edu/smartgrid/start/downloads/
- Follow SGMM on Twitter at https://twitter.com/SGMM_Navigator.

About Us

We are the Software Engineering Institute (SEI), a federally funded research and development center sponsored by the U.S. Department of Defense and operated by Carnegie Mellon University.

We help organizations make measurable improvements in their software engineering capabilities by providing technical leadership to advance the practice of software engineering.

As steward of the SGMM, we

- Support the model's widespread availability, adoption, and use
- Ensure a reliable set of products and services for the SGMM user community
- Develop formal SEI Partner and Certification Programs
- Administer quality control of the SGMM and its usage
- Collect and analyze data and best practices
- Provide feedback on SGMM usage

¹ Asthana, Anjan; Booth, Adrian; and Green, Jason. Best practices in the deployment of smart grid technologies. McKinsey and Company, 2010.