Carnegie Mellon University
Software Engineering Institute

Essential Answers about the Smart Grid Maturity Model (SGMM)

UTILITY ORGANIZATIONS USE THE SGMM to assess, guide, and improve their efforts toward a smart grid transformation.

What is the Smart Grid Maturity Model (SGMM)?

The Smart Grid Maturity Model, or SGMM, is a management tool that organizations can use to help assess, guide, and improve their efforts toward a smart grid transformation. It provides a common framework with defined stages and progress, as well as a common language for defining key elements of a smart grid transformation. It can also bridge gaps between strategy and execution.

The SGMM helps create and communicate a common vision of the smart grid both internally and with external stakeholders. An electric utility can use the SGMM to define its smart grid aspirations, assess where it is on the journey to implement the smart grid, prioritize options, and measure progress.

Who is the audience for the SGMM?

The primary audience for the SGMM is electric utilities and related stakeholders who are interested in modernizing and improving their operations and practices associated with delivery of electricity with a focus on transmission and distribution.

Who created the SGMM?

The SGMM was initially created by the Global Intelligent Utility Network Coalition (GIUNC) and APQC. At the time, the GIUNC consisted of Alliander; CenterPoint Energy, Inc.; Country Energy; CPFL Energia; DONG Energy; ERDF; IBM; North Delhi Power Limited; Oncor; Pepco Holdings, Inc.; Progress Energy; and Sempra Energy.

This was a model developed by utilities, for utilities.

What was the Software Engineering Institute's role in the SGMM?

The Software Engineering Institute (SEI), sponsored by the U.S. Department of Energy, was the steward of the SGMM and the administrator of the SEI Partner and Certification Programs for SGMM. The SEI

- provided governance with multiple stakeholders
- evolved and piloted the model based on stakeholder needs, market developments, user feedback, and interactions with domain experts
- made the model applicable to all types of utilities globally
- enabled widespread availability, adoption, and use of the model for the benefit of the community
- grew the SGMM community of users worldwide
- built the suite of SGMM products that enabled the model-based assessment
- developed transition mechanisms—education, training, awareness, research collaboration—to support the model

In mid-2018, the SEI retired its SGMM licensing and certification programs and made all SGMM materials publicly available.

As a utility, what are the benefits of using the SGMM?

Utilities use the SGMM to assess their current state of smart grid implementation, define their aspirations for a future state, and generate inputs into their roadmapping, strategic planning, and implementation processes. Around the world, major investor-owned utilities and small public power utilities alike have reported finding the model a valuable tool to help them

- identify where they are on the smart grid landscape
- develop a shared smart grid vision and roadmap
- communicate with internal and external stakeholders using a common language
- prioritize options and support decision making

- compare to themselves over time and to the rest of the community
- measure their progress
- prepare for and facilitate change

What materials do I need to get started with the SGMM?

The current SGMM version is 1.2. The assets for the model can be downloaded for free, under the Creative Commons Attribution (CC BY) license agreement, here: **resources.sei.cmu.edu/library/asset-view.cfm?assetid=512758**

- SGMM Model Definition Document: The core model describes 144 characteristics across the six levels and eight domains of the SGMM and serves as the foundation for the other product suite components.

- SGMM Compass Assessment Survey: Completing the Compass survey automatically generates a scoring report with a maturity level rating for each domain in the model and comparisons against aggregate scoring data from peer utilities.

- SGMM Navigation Process: The process was developed to help organizations chart a technical, organizational, and operational path through their grid modernization effort.

What are the benefits of the Creative Commons Attribution (CC BY) license agreement?

The Creative Commons Attribution (CC BY) license agreement provides

- free, unlimited use of SGMM materials, including the SGMM navigation process and self-scoring Compass survey

- the right to create and share derived works without the need for consent

- no annual fees, no survey scoring fees, no certification requirements, and simple license agreements

If I complete the assessment survey, will the information be publicly available?
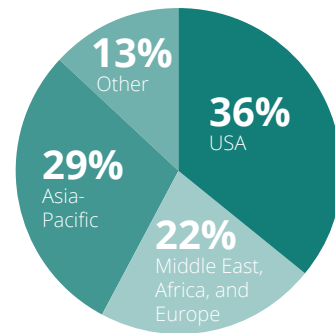
Organizations can now choose to submit their survey data to the SEI. Survey data linked to an individual electric utility will not be released without the permission of that utility. Survey responses will be entered into the aggregated data for comparison to future SGMM survey participants, but individual responses will not be attributed to any particular utility. Only aggregated or blinded views of the data will be publicly available, to include use of the data in white papers and presentations, or as part of best practice and research activities.

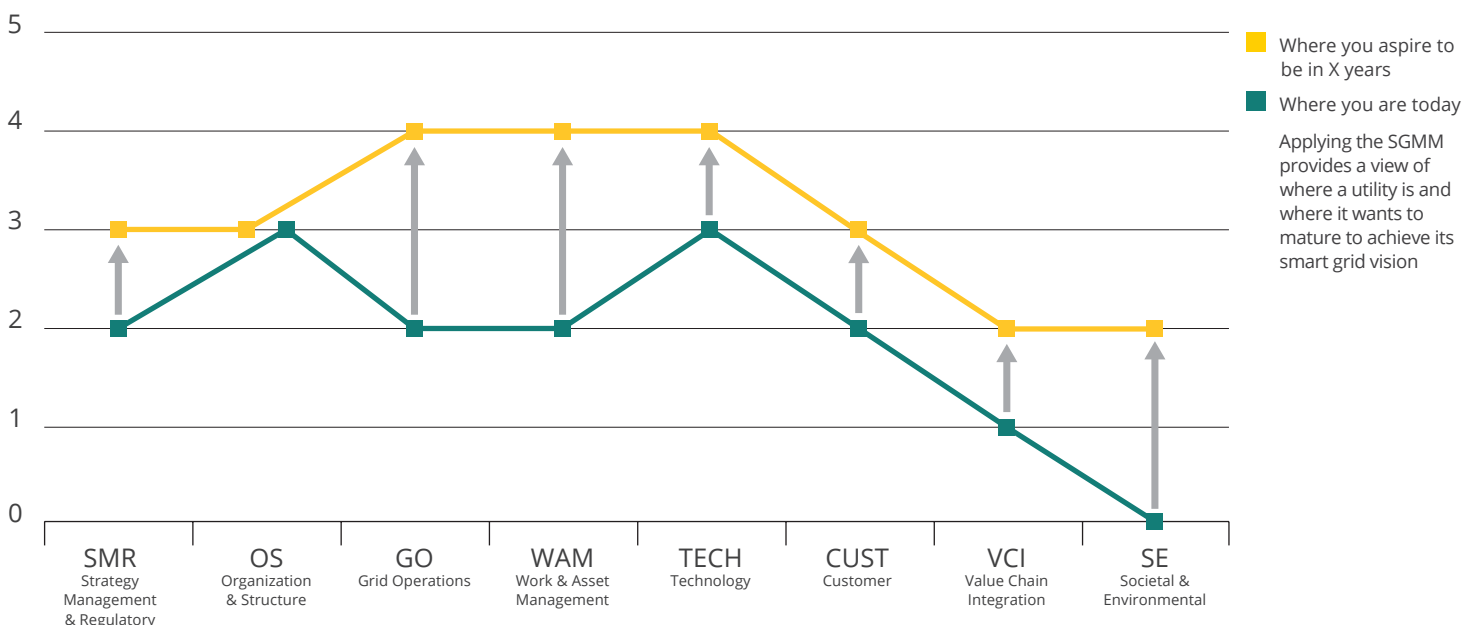## How many organizations have adopted SGMM?

More than 380 utilities are using the model or have taken the survey. Please review the SGMM Overview at **resources.sei.cmu.edu/library/asset-view.cfm?assetID=524438**.

What is the geographical breakdown of organizations using the SGMM?

A little more than a third of the utilities are in the United States. Nearly another third are in the Asia-Pacific region. Nearly a quarter are in Europe, the Middle East, and Africa. The rest are in Canada, Mexico, and Central and South America.

36% USA
22% Middle East, Africa, and Europe
29% Asia-Pacific
13% Other

SGMM and Navigation process help you decide

- Where you aspire to be in X years
- Where you are today

Applying the SGMM provides a view of where a utility is and where it wants to mature to achieve its smart grid vision

SMR — Strategy Management & Regulatory
OS — Organization & Structure
GO — Grid Operations
WAM — Work & Asset Management
TECH — Technology
CUST — Customer
VCI — Value Chain Integration
SE — Societal & Environmental

> *"We recently completed the survey again, using the SGMM Navigation process. This 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. We look forward to using the tool as an integral part of our ongoing planning and transformation process, and in measuring our progress over time."*
>
> — Vice President, Business Transformation

> *"Performing the role of the Navigator is a rewarding and enlightening experience."*
>
> — An SEI-Certified SGMM Navigator

SGMM Information and Materials

- Information and links: **sei.cmu.edu/go/sgmm**
- Downloadable assets: **resources.sei.cmu.edu/library/asset-view.cfm?assetid=512758**
- APQC: **apqc.org/smartgrid**

Highlights from Aspirations Workshops

SGMM DOMAINS	MOTIVATIONS What motivates your aspirations?	ACTIONS What actions must happen?	OBSTACLES What obstacles must be overcome?
SMR	• improved business performance, success, and growth • improved productivity and profitability	• integrate with existing strategy • secure funding • prioritize and plan • educate stakeholders	• budget constraints and justification • skepticism of value • scale, scope, and pace of change
OS	• empowered and involved workforce • improved decision making • aging workforce addressed	• create a unified vision, strategy, goals, and plan • provide training • transform policies and processes	• resistance to change • culture • skill gaps
GO	• support for distributed generation (DG) cost savings • resiliency and reliability	• deploy the necessary infrastructure • implement plan • develop improved analytic capabilities	• interoperability and availability of technology • risk and complexity • security and privacy
WAM	• decreased recovery time • increased asset utilization and extended asset life	• improve GIS systems • develop standards for new technologies	• high-risk environment • managing large amounts of data • perceived ROI
TECH	• systems integration and compatibility • security and critical infrastructure protection • complex grid operations management	• enforce architecture and standards • fill application gaps • devise IT master plan • develop dynamic data distribution model	• cybersecurity risks • regulatory and statutory issues • increased systems complexity • technology lifespan
CUST	• improved customer – satisfaction – choice – quality of service – empowerment	• develop customer-enabling technologies and programs • understand customer wants and needs • educate customers	• customer willingness, acceptance, and adoption • privacy issues • customer attitudes and behaviors
VCI	• market demand for DG • enablement of supply and demand management • fuel diversity • reduced emissions	• obtain regulatory approvals • create new rate structures • promote adoption of enabling technologies • develop DG incentives	• tariff structure • reduced revenue from reduced use • marketplace readiness • cross-company pricing
SE	• meeting public policy objectives • being socially responsible • sustainability • improved image	• develop clear direction • define and report metrics and measures • support technological advancements	• ability to make it cost effective • balancing conflicting goals among stakeholders

About the SEI

The Software Engineering Institute is a federally funded research and development center (FFRDC) that works with defense and government organizations, industry, and academia to advance the state of the art in software engineering and cybersecurity to benefit the public interest. Part of Carnegie Mellon University, the SEI is a national resource in pioneering emerging technologies, cybersecurity, software acquisition, and software lifecycle assurance.

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