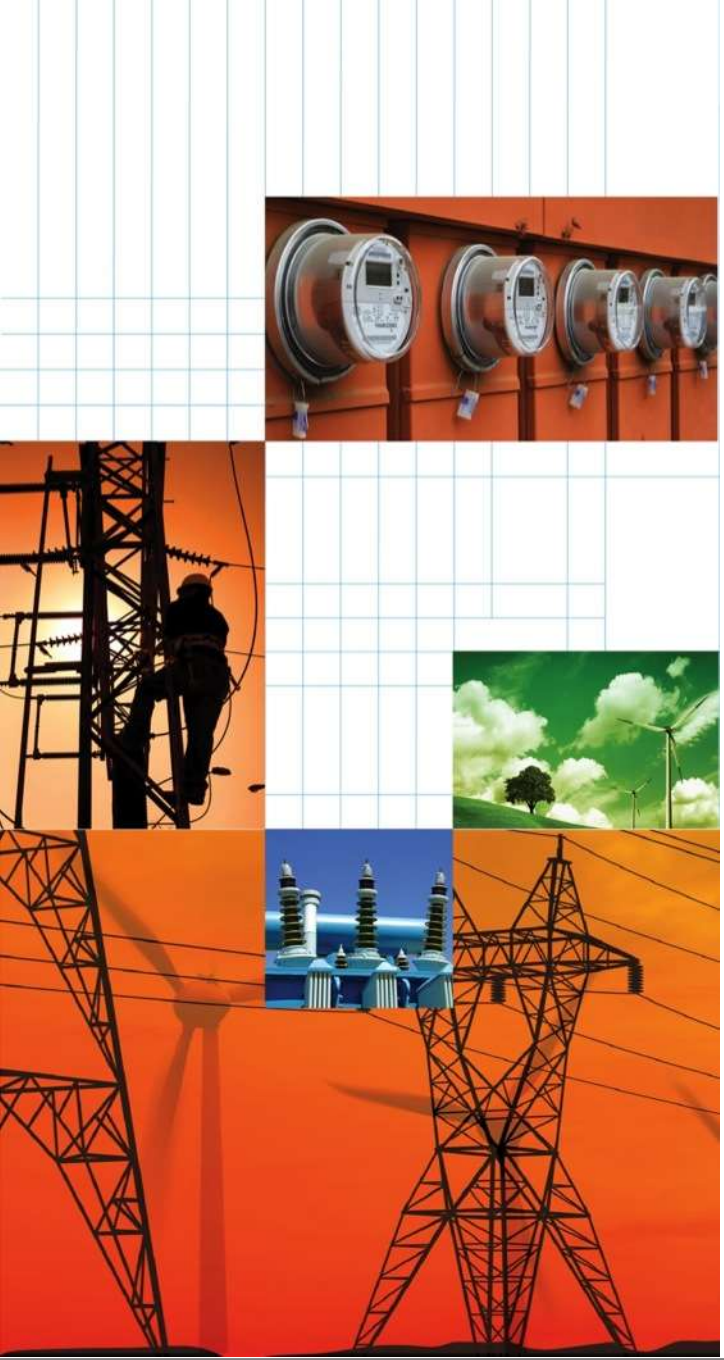
SGMM

Smart Grid Maturity Model

Overview

17 November 2011



A major power grid transformation is underway

How can utilities

- Develop effective roadmaps?
- Track progress?
- Understand their posture in comparison to peers?

The Smart Grid Maturity Model was developed by utilities to address these concerns

The Smart Grid Maturity Model is

A management tool

that provides a

common language and framework

for defining key elements of

smart grid transformation

and helping utilities develop a

programmatic approach

and track their progress

SGMM timeline

2007 | 2008 | 2009 | 2010 | 2011 | 2012

Global Intelligent Utility Network Coalition (GIUNC) develops SGMM

Utilities use SGMM v1.0

v1.1

v1.2

Software Engineering Institute serves as model steward

GIUNC:
- CenterPoint Energy
- Progress Energy
- DONG Energy
- North Delhi Power Ltd
- Country Energy
- Sempra Energy
- Pepco Holdings
- IBM
- APQC

SEI releases SGMM v1.1 product suite

Licensing & certification program for SGMM Navigation begins

SEI releases SGMM v1.2 product suite

Developed by utilities for utilities

Software Engineering Institute

SEI is a federally-funded research and development center at Carnegie Mellon University, a global university recognized worldwide for its energy and environmental research initiatives.

A trusted, objective source of best practices, methods and tools to organizations worldwide, SEI is a global leader in software and systems engineering, process improvement and security best practices – all critical elements of smart grid success.

SEI collaborates in public-private partnership with government and industry on important cyber security, architecture, and interoperability challenges of the smart grid.

Carnegie Mellon University

SEI's Role as Steward of the SGMM

Provide **governance** working with multiple stakeholders

Enable **widespread availability**, adoption, and use of the model for the benefit of the community

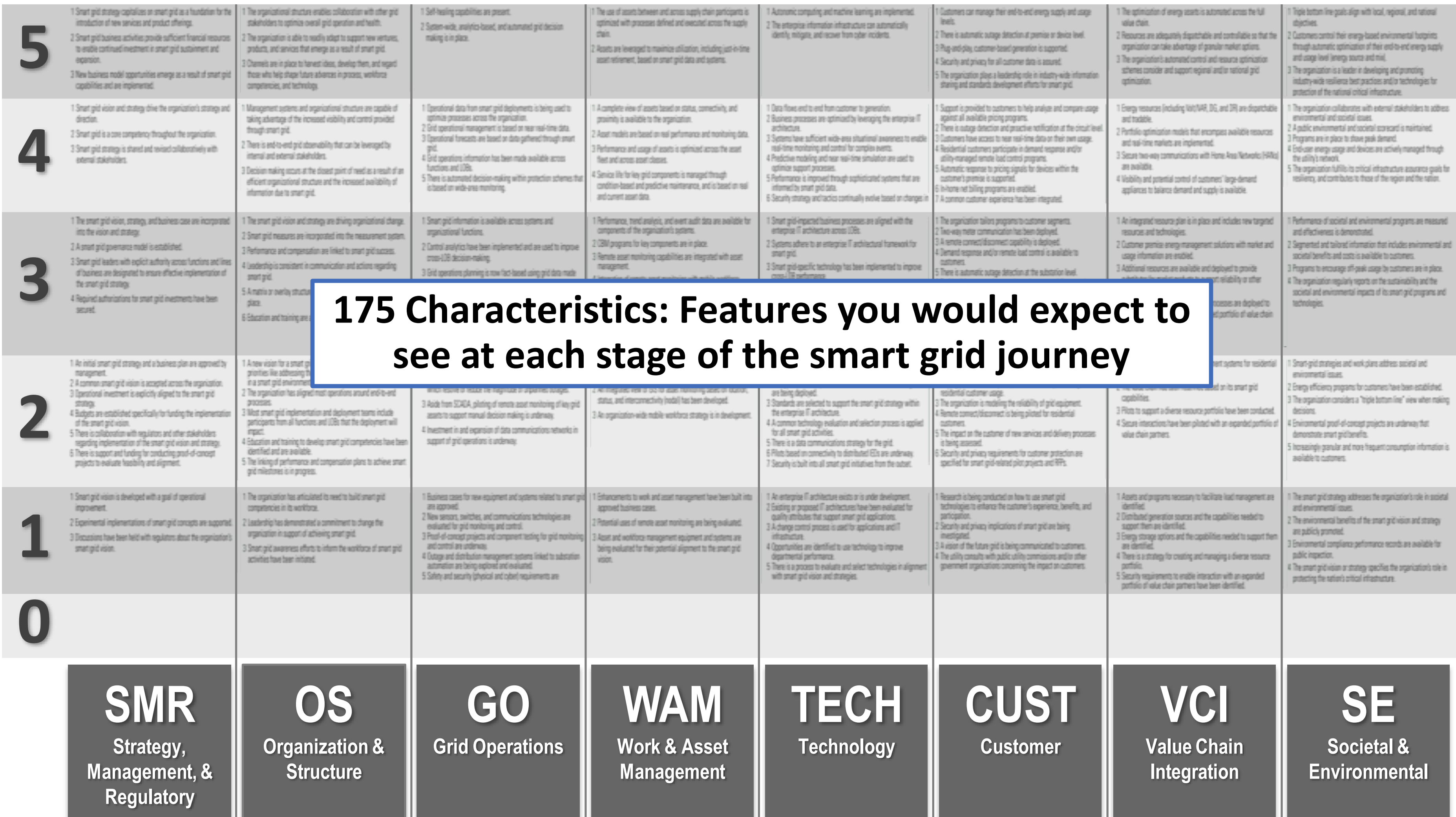
Evolve the model based on stakeholder needs, market developments, user feedback, and interactions with domain experts

Develop **transition** mechanisms—education, training, awareness, research collaboration—to support the model

Grow the SGMM **community** of users worldwide

SGMM at a glance

6 Maturity Levels: Defined sets of characteristics and outcomes



8 Domains: Logical groupings of smart grid related characteristics

Smart Grid Maturity Model – levels

PIONEERING 5	Breaking new ground; industry-leading innovation
OPTIMIZING 4	Optimizing smart grid to benefit entire organization; may reach beyond organization; increased automation
INTEGRATING 3	Integrating smart grid deployments across the organization, realizing measurably improved performance
ENABLING 2	Investing based on clear strategy, implementing first projects to enable smart grid (may be compartmentalized)
INITIATING 1	Taking the first steps, exploring options, conducting experiments, developing smart grid vision
DEFAULT 0	Default level (status quo)

Smart Grid Maturity Model – domains

SMR	**Strategy, Mgmt & Regulatory** *Vision, planning, governance, stakeholder collaboration*	TECH	**Technology** *IT architecture, standards, infrastructure, integration, tools*
OS	**Organization and Structure** *Culture, structure, training, communications, knowledge mgmt*	CUST	**Customer** *Pricing, customer participation & experience, advanced services*
GO	**Grid Operations** *Reliability, efficiency, security, safety, observability, control*	VCI	**Value Chain Integration** *Demand & supply management, leveraging market opportunities*
WAM	**Work & Asset Management** *Asset monitoring, tracking & maintenance, mobile workforce*	SE	**Societal & Environmental** *Responsibility, sustainability, critical infrastructure, efficiency*

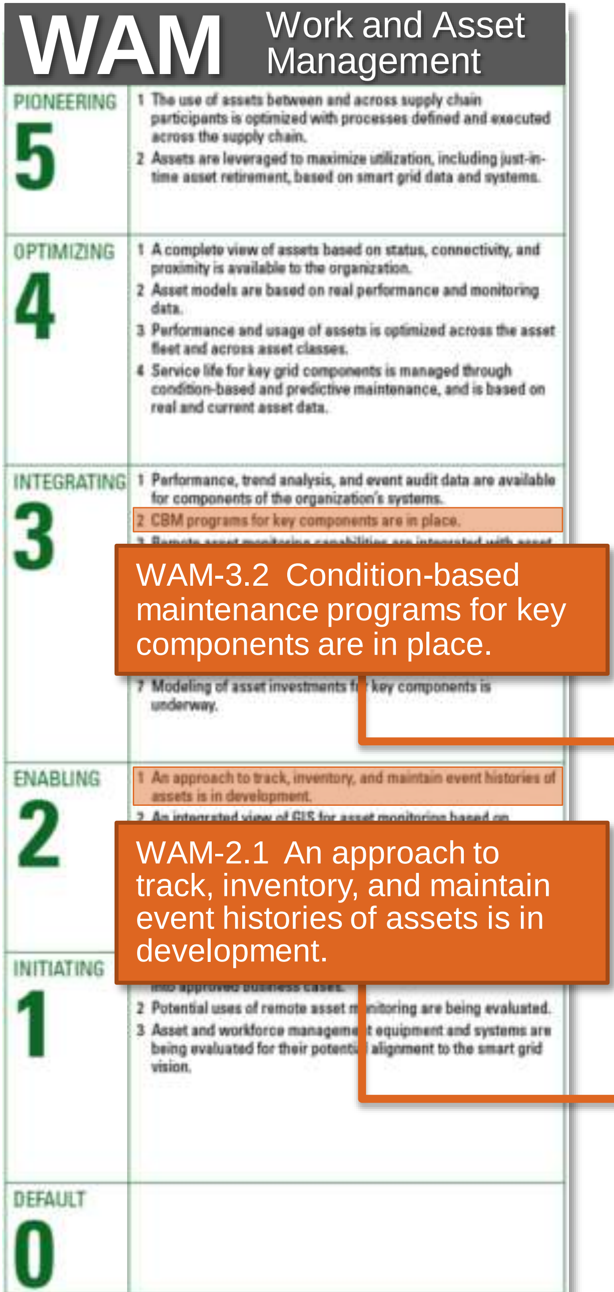
SGMM

Smart Grid Maturity Model

V 1.2 Product Suite

Model	Fully described in the Model Definition document
Compass Survey	Questionnaire-based assessment yields maturity ratings and comparisons
Navigation Process	Expert-led workshops to complete Compass and use results to develop consensus aspirations
Training	Overview Seminar and SGMM Navigator Course
Partner Program	License organizations and certify individuals to deliver Navigation process

www.sei.cmu.edu/smartgrid



SGMM Compass Survey

Contains

- One question for each expected characteristic in the model and
- Attribute and performance questions

Example questions:

WAM-3.2 For what percentage of key components have you implemented condition-based maintenance that uses real-time data from asset monitoring to drive maintenance and replacement decisions?

A. 0%
B. 1 - 25%
C. 26 - 50%
D. 51 - 75%
E. 76 - 100%

WAM-2.1 Have you established an approach to track, inventory, and maintain event histories of assets using smart grid capabilities?

A. No
B. In documented plan including committed schedule and budget
C. In development
D. Being piloted
E. Completed

SGMM Navigation: five-step, expert-led process

Stakeholders complete SGMM Compass survey

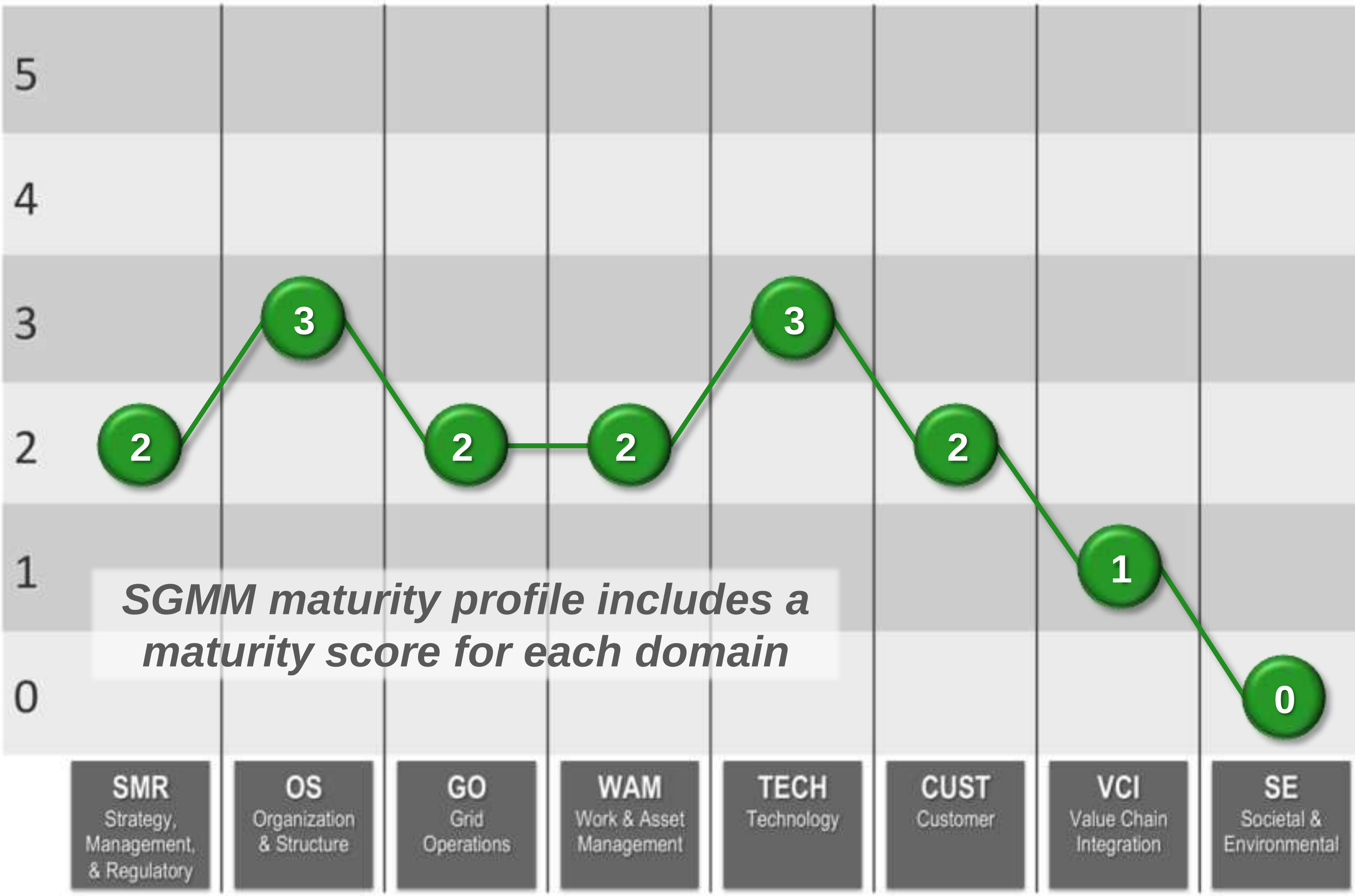
Discussion and consensus answers lead to internal alignment on current state

Stakeholders review survey findings & set aspirational profile

Consensus on aspirational state and identification of <u>motivations</u>, <u>actions</u>, and <u>obstacles</u> to achieve it

Compass results: maturity profile

example results



Compass results: dashboard

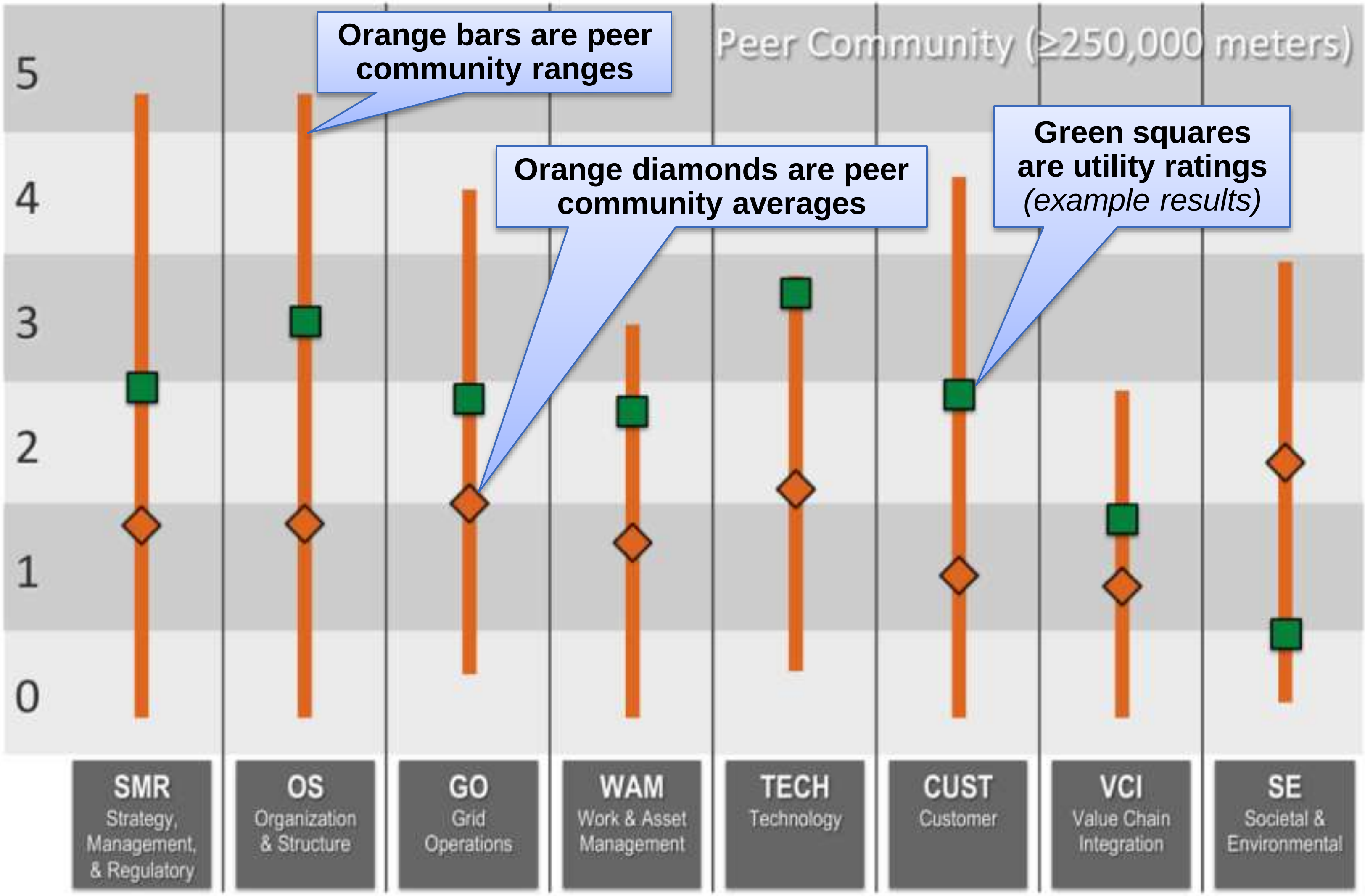
example results

Sample Results								
Level	Strategy, Management & Regulatory	Organization & Structure	Grid Operations	Work & Asset Management	Technology	Customer	Value Chain Integration	Societal & Environmental
5	0.53	0.50	0.25	0.00	0.00	0.20	0.30	0.30
4	0.57	0.17	0.28	0.30	0.40	0.36	0.25	0.40
3	0.65	0.75	0.57	0.47	0.73	0.59	0.58	0.35
2	1.00	0.82	0.93	1.00	1.00	0.92	0.58	0.76
1	0.90	1.00	1.00	1.00	0.84	0.85	0.78	0.68
0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Point Range	Meaning
≥ 0.70	Green reflects level compliance within the domain
≥ 0.40 and < 0.70	Yellow reflects significant progress
< 0.40	Red reflects initial progress
= 0	Grey reflects has not started

Compass results: peer community comparison

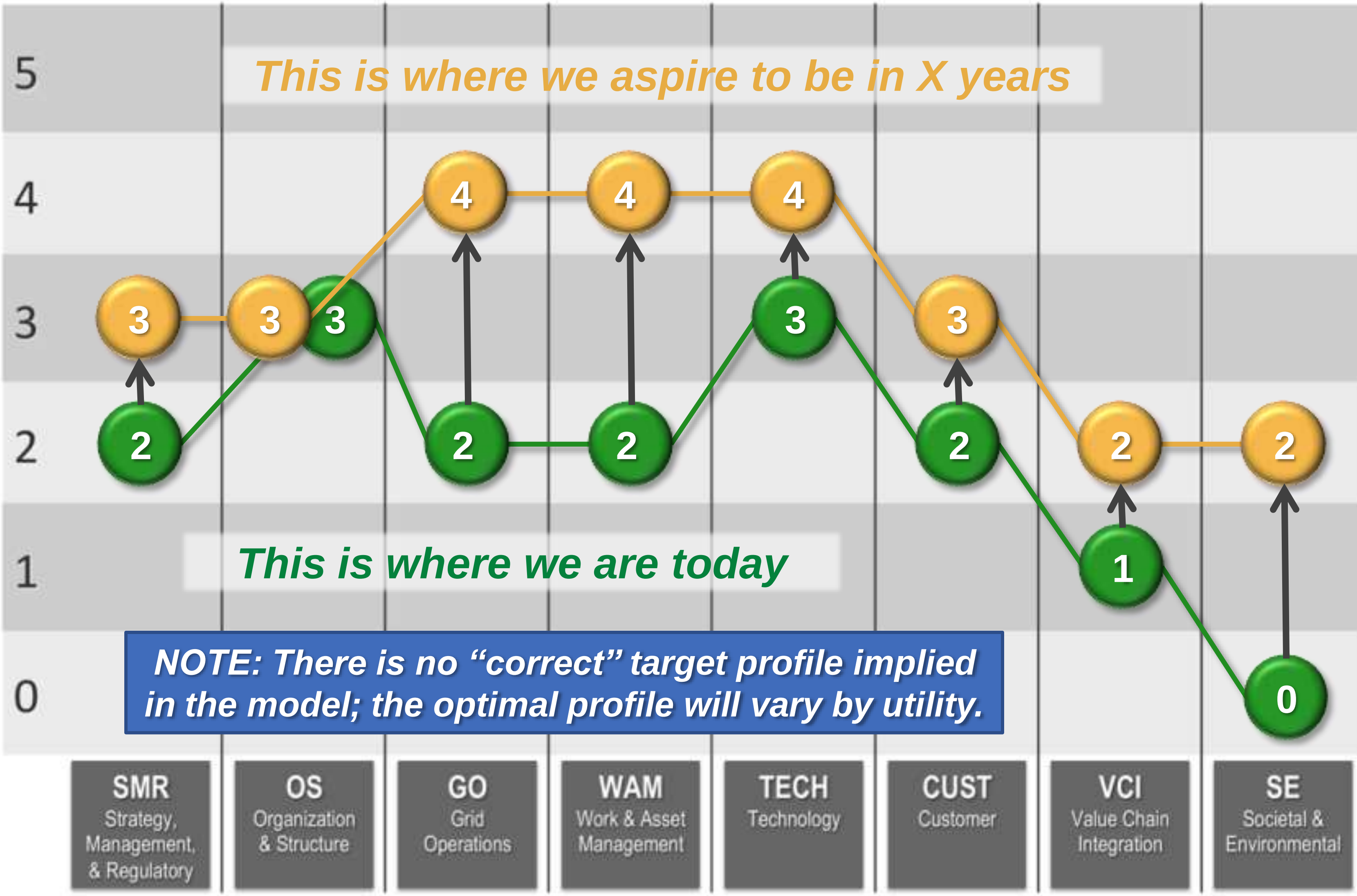
example results



Community data as of September 2011

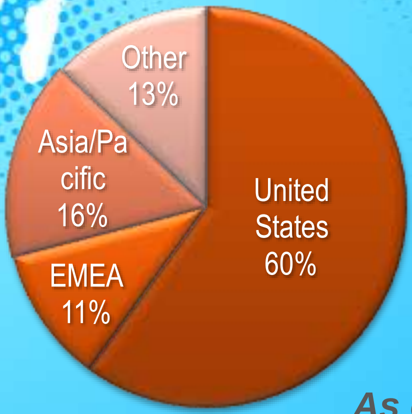
Navigation results: consensus aspirations

example results



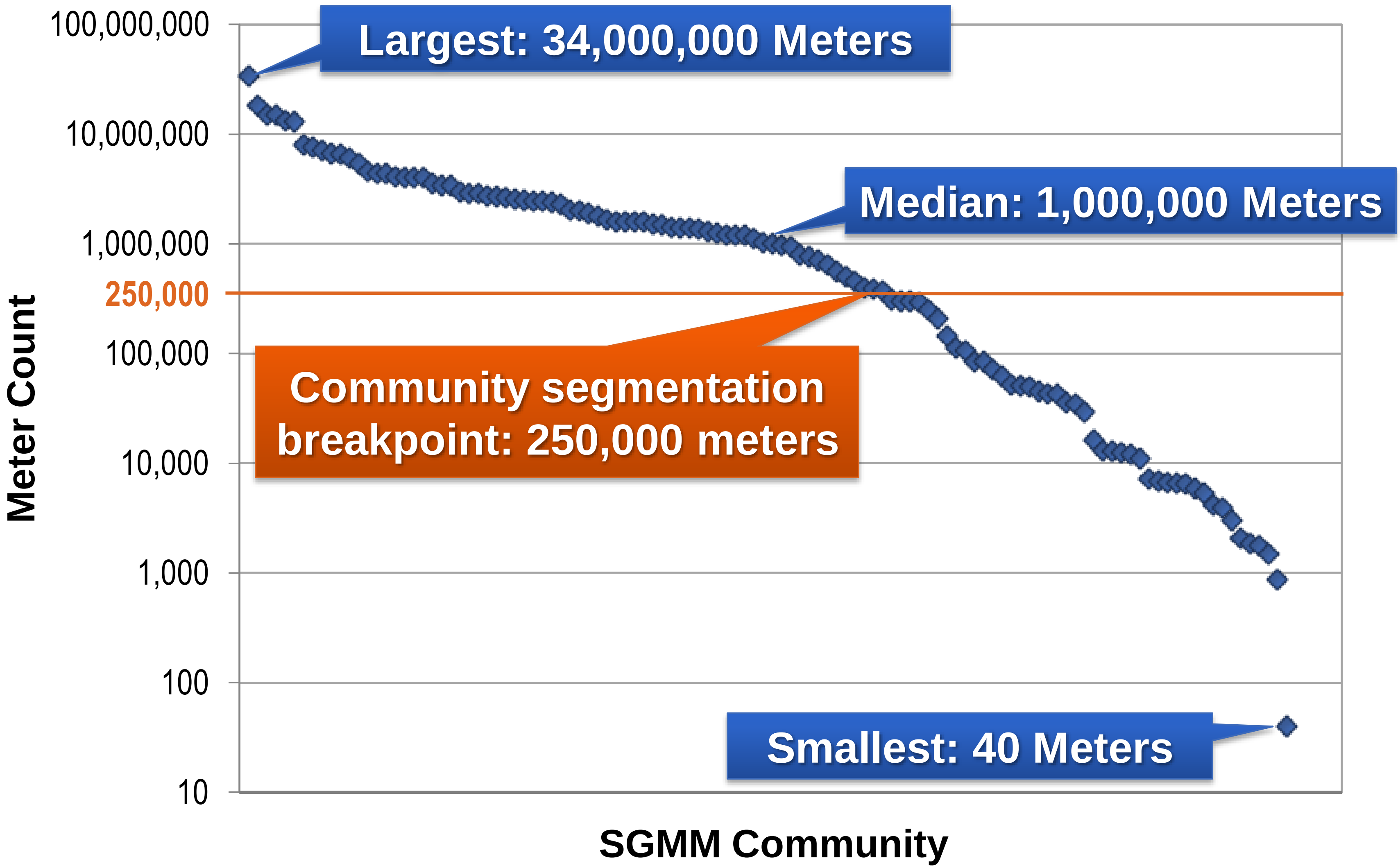
SGMM community: 119 utilities in 21 countries

USA	70	Netherlands	2	Japan	1
Canada	10	Belgium	1	Philippines	1
India	9	Denmark	1	Poland	1
Australia	5	France	1	Spain	1
Brazil	4	Hong Kong	1	Sweden	1
China	3	Ireland	1	Switzerland	1
Mexico	3	Israel	1	UK	1



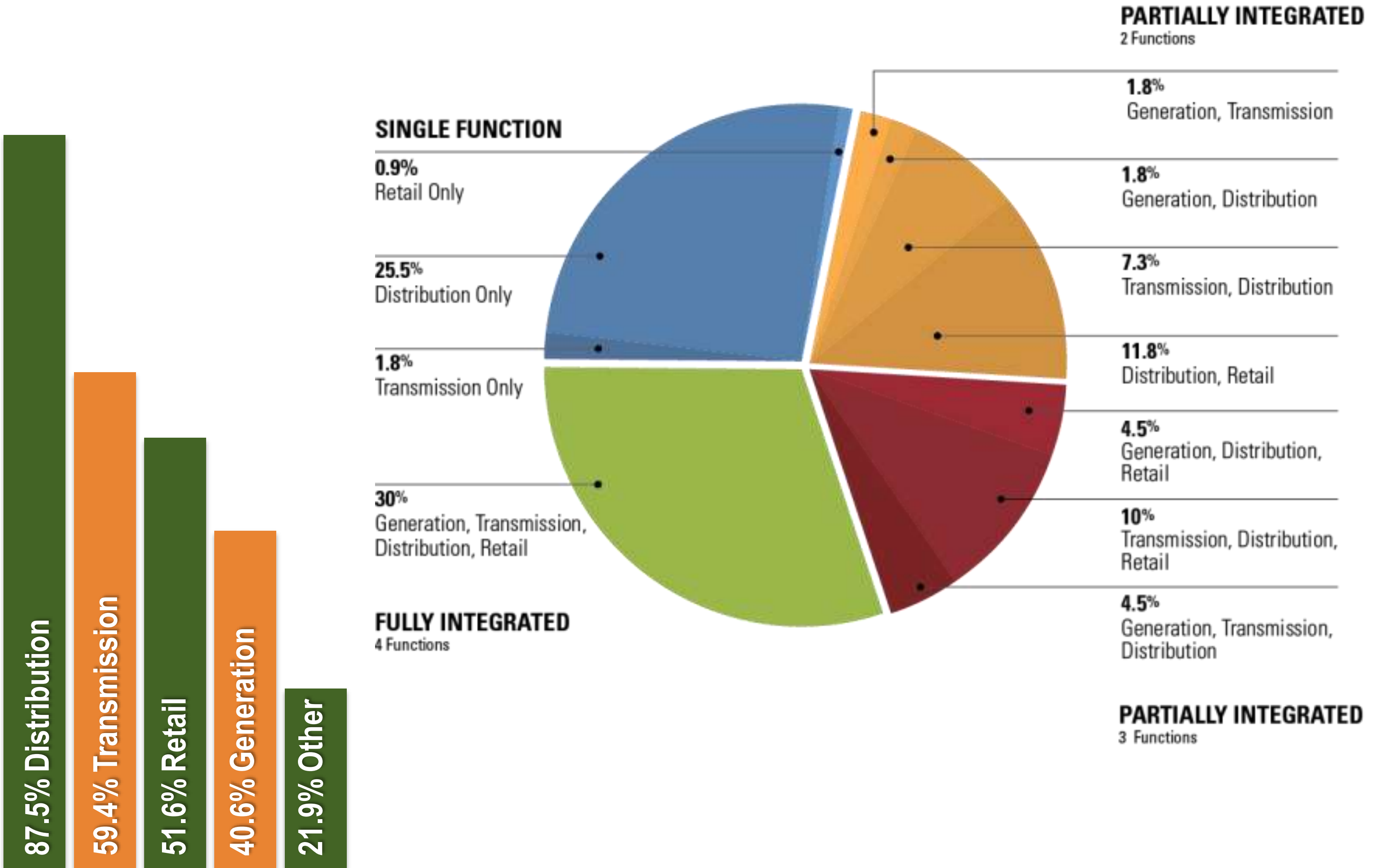
As of September 2011

SGMM community – meter count



As of September 2011

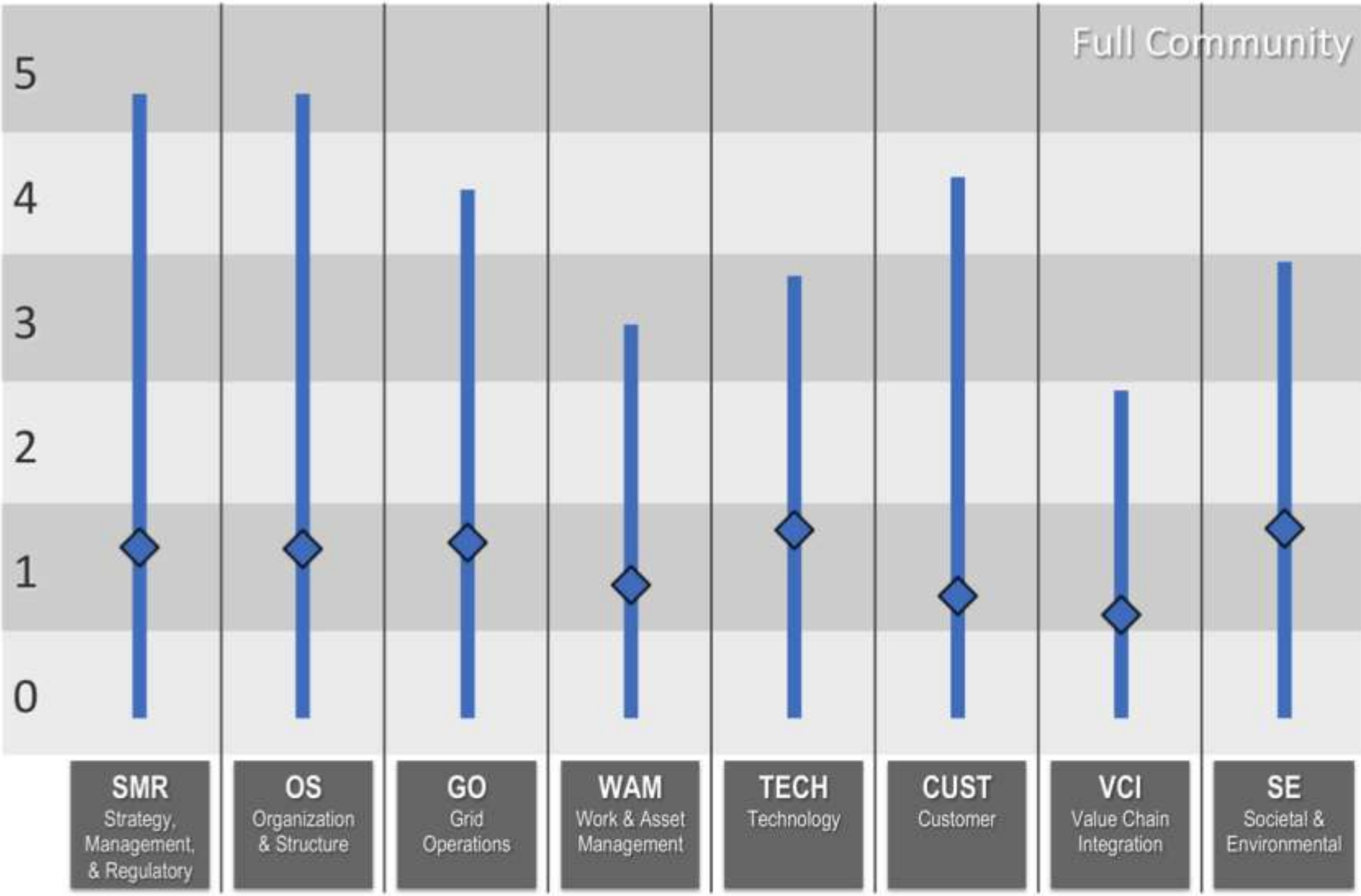
SGMM community – utility type



As of September 2011

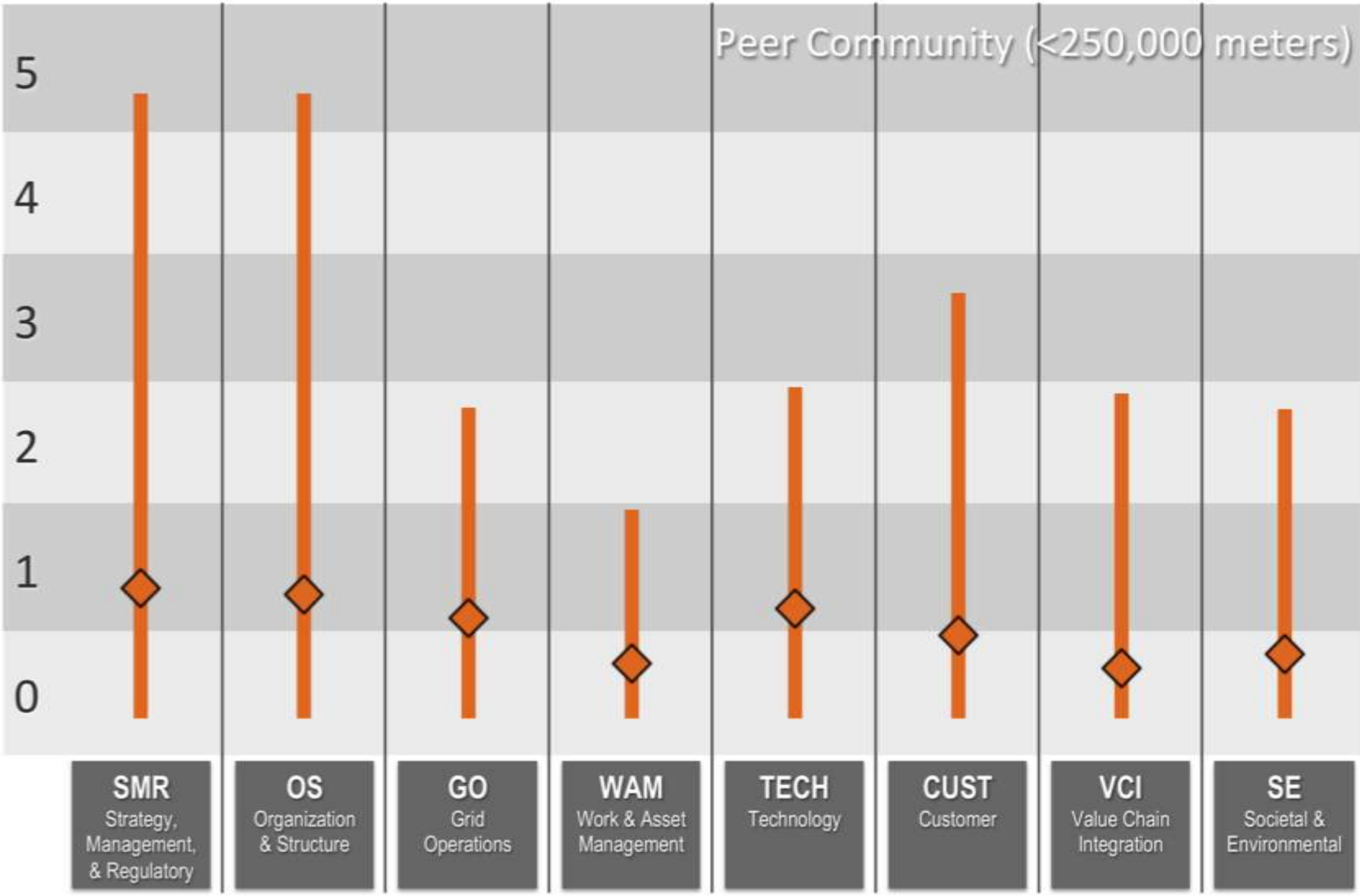
SGMM community: all participants

average and range maturity scores as of September 2011



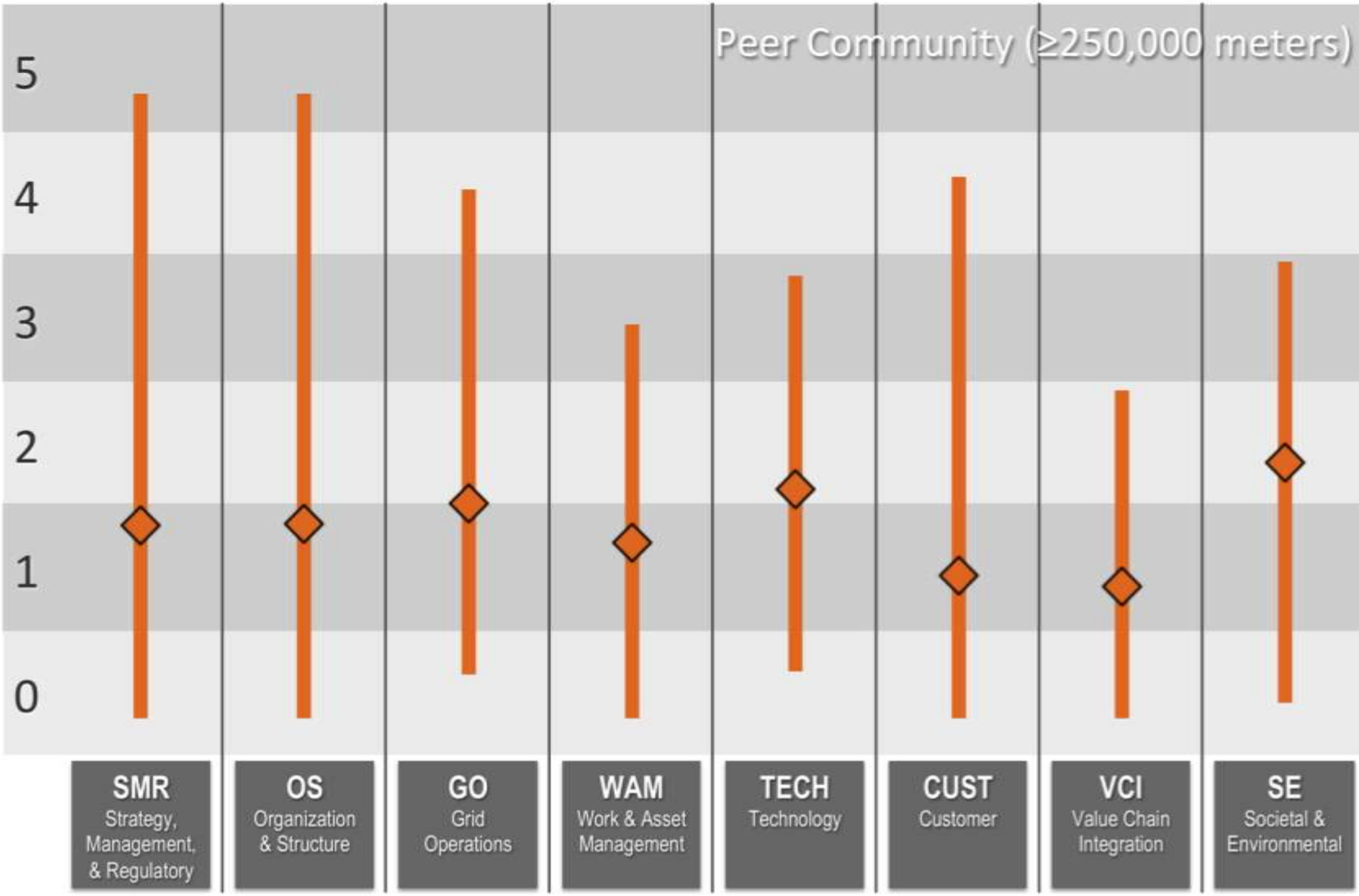
SGMM community: < 250,000 meters

average and range maturity scores as of September 2011



SGMM community: ≥ 250,000 meters

average and range maturity scores as of September 2011

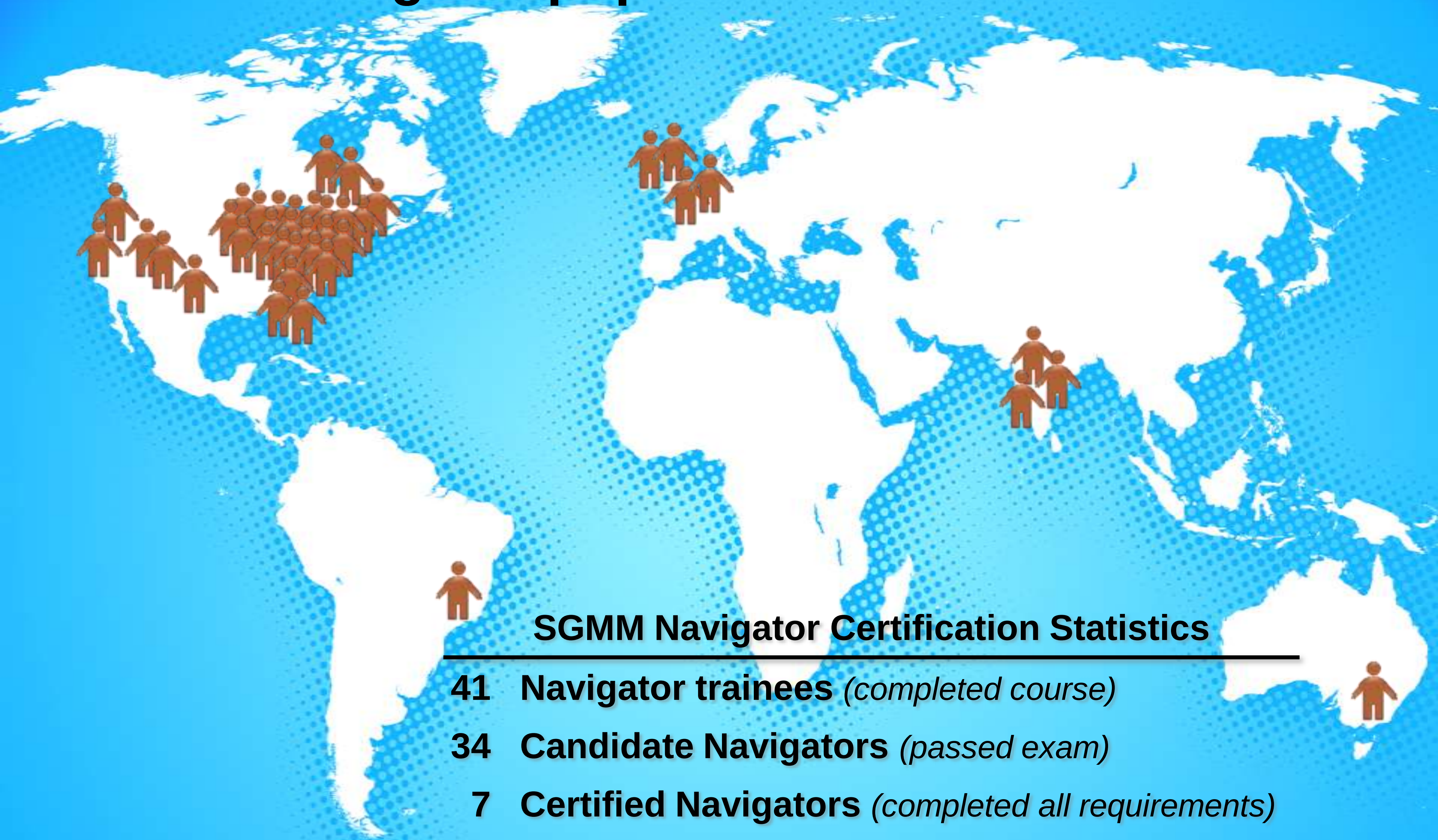


SGMM Partners

SGMM Partners are licensed by the SEI to provide official SGMM services, which are delivered by SEI-Certified SGMM Navigators

For the current list of SGMM Partners, visit:
www.sei.cmu.edu/partners/sgmm

SGMM Navigator population

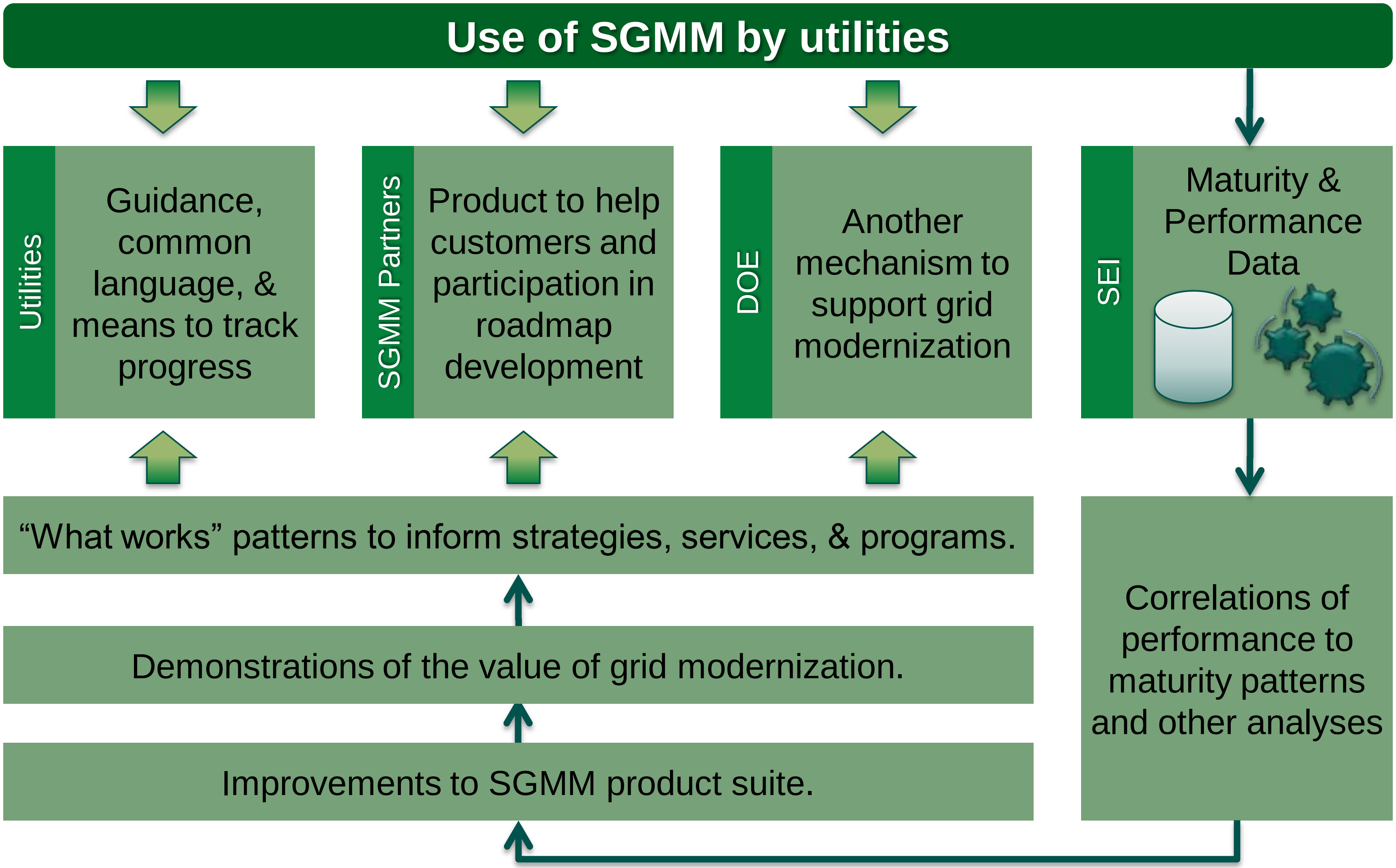


SGMM Navigator Certification Statistics

41	**Navigator trainees** *(completed course)*
34	**Candidate Navigators** *(passed exam)*
7	**Certified Navigators** *(completed all requirements)*

As of September 2011

SGMM benefits – a community view



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