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About this document

This document is an informative version of the SEI Smart Grid Maturity Model (SGMM) Results Survey. The purpose is to provide prospective users the opportunity to view the scope, extent, and specific questions included in the survey.

The primary objective of the SEI SGMM Results Survey is to understand important factors related to the current state and associated performance of organizations that are in the process of implementing a smart grid network. The survey scope includes questions related to various dimensions of smart grid implementation: planning, design, construction, operations, customer service, and maintenance.

Questions are arranged in the following categories: demographics, reliability, costs, operations, customer benefit, technology, and strategy and management. The survey also includes a glossary (at the end of the document) which explains relevant terms.

1.1 Participating in the Results Survey

Participating in the SEI SGMM Results Survey will allow your organization to benchmark accomplishments in achieving smart grid objectives against other organizations. To participate in the SEI SGMM Results Survey, visit www.sei.cmu.edu/smartgrid to obtain information on receiving the survey and having it scored. You may also contact SEI Customer Relations at 412-268-5800 or customer-relations@sei.cmu.edu to participate.
1 Demographics

Provide demographic information for your entire company for a 12-month period for the following:

1.1 Number of employees (includes temporary, part time, and full time)

1.2 Number of customers
   1.2.1 Residential
   1.2.2 Commercial and industrial

1.3 Meter count
   1.3.1 Total
   1.3.2 Advanced

1.4 Megawatts
   Megawatt hours of generation served
   Peak demand (megawatt)
   Level of distributed generation (megawatt hours)

1.5 Number of line miles

1.6 Size of service territory in square miles

1.7 Annual number of field visits (e.g., truck rolls)

1.8 Percentage of automated substations

1.9 Percentage of substations with outage detection

1.10 Number of substations by voltage class:
   1.10.1 < 13 kV
   1.10.2 >= 13 kV < 35 kV
   1.10.3 >= 35 kV < 69 kV
   1.10.4 >= 69 kV < 115 kV
   1.10.5 >= 115 kV < 230 kV
   1.10.6 >= 230 kV < 345 kV
   1.10.7 >= 345 kV < 765 kV
   1.10.8 >= 765 kV < 1100 kV
   1.10.9 >= 1100 kV
   1.10.10 Total substations

1.11 Total revenue
   1.11.1 Generation
   1.11.2 Transmission
1.11.3  Distribution
1.11.4  Other

1.12  In which industry segments does your organization participate? (Select all that apply.)
1.12.1  Generation
1.12.2  Transmission
1.12.3  Distribution
1.12.4  Retail
2 Reliability

2.1 System performance for prior year:
   2.1.1 Predicted SAIFI
   2.1.2 Actual SAIFI
   2.1.3 Predicted SAIDI
   2.1.4 Actual SAIDI
   2.1.5 Predicted MAIFI
   2.1.6 Actual MAIFI

2.2 Average duration of outage

2.3 Average percentage of customers impacted by the typical outage

2.4 Total number of outages during the most recent fiscal year

2.5 Cumulative duration of planned outages during the most recent fiscal year

2.6 Average duration of planned outages during the most recent fiscal year

2.7 Total unplanned outages

2.8 Number of unplanned outages that were resolved due to automation (self-healed)

2.9 Number of unplanned outages that were reduced in magnitude due to automation

2.10 Total line loss
3 Costs

3.1 Total operating cost for transmission operation

3.2 Total operating cost for distribution operation

3.3 Capital expenditure for the following AMI/smart grid assets in the most recent fiscal year
  3.3.1 Automated meters
  3.3.2 Sensors
  3.3.3 Communications Infrastructure
  3.3.4 IEDs (relays, switches, reclosers, etc.)
  3.3.5 Total

1 See glossary for description of operating costs.
4 Operations

4.1 Total work orders initiated for field visit operations (truck rolls)
4.2 Total field visits operations (truck rolls) avoided by smart grid
4.3 Total connects and disconnects
4.4 Remote connects and disconnects
5 Customer Benefit

5.1 ERT (estimate of restoration time) accuracy

5.2 Percentage of customers who have visibility to their price and consumption information on demand
   5.2.1 At least monthly
   5.2.2 At least weekly
   5.2.3 At least daily
   5.2.4 Near real-time
6 Technology

6.1 Level of information technology and operational technology convergence (high, medium, or low)
   6.1.1 Integrated planning between IT and grid operations
   6.1.2 Technology convergence (e.g., grid communications IP-based)
   6.1.3 Grid infrastructure architecture enterprise driven
   6.1.4 Enforced governance of architectural investments

6.5 Adherence to documented, common internal or external standards (yes or no)
   6.5.1 Project management
   6.5.2 Vendor and external source selection
   6.5.3 Design, development, and implementation
   6.5.4 Configuration control

6.6 Percentage of deployment of security features
   6.6.1 Intrusion detection
   6.6.2 Key management systems (e.g., software, access control systems)
   6.6.3 Encrypted communications
   6.6.4 Firewalls
   6.6.5 Others (please describe)
7  Strategy and Management

7.1  What is the status of your strategy to recover costs of smart grid investments (in development, complete but not presented, presented but not approved, approved but not implemented, partially implemented, fully implemented)?

7.2  How is your organization planning to recover those costs?

7.3  What percentage of your smart grid investment to date has been recovered through operational savings?

7.4  What percentage of your smart grid future investment do you expect to recover through operational savings?

7.5  What percentage of your smart grid investment to date has been recovered through rate recovery?

7.6  What percentage of your smart grid future investment do you expect to recover through rate recovery?

7.7  What time period does your multiyear smart grid plan cover? (Select only one.)
   • 7.7.1 < 3 years
   • 7.7.2 3–4 years
   • 7.7.3 5–7 years
   • 7.7.4 > 7 years
   • 7.7.5 Not applicable / no plan
**Glossary of Terms**

**Automation, substation**

Substation automation goes beyond traditional SCADA to provide added capability and information that can further improve operations and maintenance, increase system and staff efficiencies, and leverage and defer major capital investments. Applications and data of interest may include remote access to IED/relay configuration ports, waveforms, event data, diagnostic information, video for security or equipment status assessment, metering, switching, volt/VAR management, and others maintain uninterrupted power services to the end users.

**Connect/disconnect, remote**

The ability to connect or disconnect service to a customer without sending a technician to the physical location.

**Estimate of Restoration Time (ERT) accuracy**

The percentage of actual restoration times (time from outage detection until service is restored to a customer, or actual clock time of restoration) that meet or exceed the initial ERT.

**Field visit**

An event where utility personnel go to a physical location to operate, maintain, or inspect some aspect of their grid.

**Industrial customers**

Customers that have factories or are involved in manufacturing; they typically have the highest energy needs. Other customers are residential and commercial.

**Line losses**

Energy waste resulting from the transmission of electrical energy across power lines.

**Operating costs**

**Personnel cost:** The cost associated with personnel compensation and fringe benefits of employees (i.e., those classified as FTEs, which includes both full-time and part-time salaried and hourly employees) contributing to each respective process. Personnel cost should include all of the following costs: employee compensation (includes salaries and wages, bonuses, overtime, and benefits), fringe (includes contributions made towards the employees’ government retirement fund), workers compensation, insurance plans, savings plans, pension funds/retirement plans, and stock purchase plans. This should also include special allowances, such as relocation expenses and car allowances.

**Systems cost:** Include all expenses, paid or incurred, in conjunction with computer hardware or computer software acquired by the organization or provided to the organization through service contracts. Any related costs to process, service and maintain computer hardware or computer software. The costs of providing and maintaining services for each applicable process (e.g., computer system(s)
processing (CPU) time, network/system communication charges, maintenance costs for applications and data storage). This includes the costs related to LANs, WANs, etc. This does not include one-time costs for major new systems developments/replacements. Consultant fees should not be included in depreciation of new system implementations. Include only those costs that occur more than six (6) months after implementation, as normal system maintenance costs.

Any systems cost (e.g., maintenance) which is outsourced to a third-party supplier should be captured in the separate cost category labeled outsourced cost. All salaries, overtime, employee benefits, bonuses or fees paid to full-time, part-time or temporary employees or independent contractors who perform services relating to computer hardware, computer software, processing or systems support.

**Overhead cost:** For the purpose of this study, provide the total actual overhead costs for the year related to the specified process. These are costs that cannot be identified as a direct cost of providing a product or a service. Include the primary allocated costs such as occupancy, facilities, materials handling equipment, fleet equipment, utilities, facility, materials handling and fleet maintenance costs, and other major costs allocated to the consuming departments. Exclude systems costs that are allocated, since these will be captured separately as systems cost.

**Other costs:** Other costs are costs associated with the specified process, but not specifically covered in personnel cost, systems cost, overhead cost and outsourced cost in this questionnaire. These other costs include costs for supplies and office equipment, travel, training and seminars. Include the cost of telephones, except for that portion captured in systems cost.

**Outsourced cost:** In determining outsourced cost, include the total cost of outsourcing all aspects of the specified process to a third-party supplier or third party logistics provider. Exclude one-time charges for any type of restructuring or reorganization. Outsourced costs should also include costs for intracompany outsourcing (i.e., reliance on a shared services center).

**Outage duration**

The time from first indication of outage to restoration of service to all impacted customers.

**Outage frequency**

Total number of customer interruptions/total number of customers over a year; this is the same as SAIFI.

**Recover Strategy, cost or rate**

A strategy for how a utility will manage reduced revenue and/or increased costs from the implementation of smart grid; this must be worked with regulators to ensure viability.

**Revenue**

For the purpose of this survey, total annual revenue is net revenue generated from the sale of products or services. This should reflect the selling price less any allowances such as quantity, discounts, rebates and returns.

**Total customer count**

Total number of customers, not meter count (since some customers may have multiple meters).