



## Strategy, Management, and Regulatory (SMR)

vision, planning, governance, stakeholder collaboration

## Organization and Structure (OS)

culture, structure, training, communications, knowledge management

### 5 PIONEERING

- 1 Smart grid strategy capitalizes on smart grid as a foundation for the introduction of new services and product offerings.
- 2 Smart grid business activities provide sufficient financial resources to enable continued investment in smart grid sustainment and expansion.
- 3 New business model opportunities emerge as a result of smart grid capabilities and are implemented.

- 1 The organizational structure enables collaboration with other grid stakeholders to optimize overall grid operation and health.
- 2 The organization is able to readily adapt to support new ventures, products, and services that emerge as a result of smart grid.
- 3 Channels are in place to harvest ideas, develop them, and reward those who help shape future advances in process, workforce competencies, and technology.

### 4 OPTIMIZING

- 1 Smart grid vision and strategy drive the organization's strategy and direction.
- 2 Smart grid is a core competency throughout the organization.
- 3 Smart grid strategy is shared and revised collaboratively with external stakeholders.

- 1 Management systems and organizational structure are capable of taking advantage of the increased visibility and control provided by smart grid.
- 2 There is end-to-end grid observability that can be leveraged by internal and external stakeholders.
- 3 Decision making occurs at the closest point of need as a result of an efficient organizational structure and the increased availability of information due to smart grid.

### 3 INTEGRATING

- 1 The smart grid vision, strategy, and business case are incorporated into the vision and strategy.
- 2 A smart grid governance model is established.
- 3 Smart grid leaders with explicit authority across functions and lines of business are designated to ensure effective implementation of the smart grid strategy.
- 4 Required authorizations for smart grid investments have been secured.

- 1 The smart grid vision and strategy are driving organizational change.
- 2 Smart grid measures are incorporated into the measurement system.
- 3 Performance and compensation are linked to smart grid success.
- 4 Leadership is consistent in communication and actions regarding smart grid.
- 5 A matrix or overlay structure to support smart grid activities is in place.
- 6 Education and training are aligned to exploit smart grid capabilities.

### 2 ENABLING

- 1 An initial smart grid strategy and a business plan are approved by management.
- 2 A common smart grid vision is accepted across the organization.
- 3 Operational investment is explicitly aligned to the smart grid strategy.
- 4 Budgets are established specifically for funding the implementation of the smart grid vision.
- 5 There is collaboration with regulators and other stakeholders regarding implementation of the smart grid vision and strategy.
- 6 There is support and funding for conducting proof-of-concept projects to evaluate feasibility and alignment.

- 1 A new vision for a smart grid begins to drive change and affect related priorities.
- 2 Most operations have been aligned around end-to-end processes.
- 3 Smart grid implementation and deployment teams include participants from all impacted functions and LOBs.
- 4 Education and training to develop smart grid competencies have been identified and are available.
- 5 The linking of performance and compensation plans to achieve smart grid milestones is in progress.

### 1 INITIATING

- 1 Smart grid vision is developed with a goal of operational improvement.
- 2 Experimental implementations of smart grid concepts are supported.
- 3 Discussions have been held with regulators about the organization's smart grid vision.

- 1 The organization has articulated its need to build smart grid competencies in its workforce.
- 2 Leadership has demonstrated a commitment to change the organization in support of achieving smart grid.
- 3 Smart grid awareness efforts to inform the workforce of smart grid activities have been initiated.

### 0 DEFAULT



## Grid Operations (GO)

reliability, efficiency, security, safety, observability, control

## Work and Asset Management (WAM)

asset monitoring, tracking and maintenance, mobile workforce

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| <b>5</b> PIONEERING  | <ol style="list-style-type: none"> <li>1 Self-healing capabilities are present.</li> <li>2 System-wide, analytics-based, and automated grid decision making is in place.</li> </ol>   | <ol style="list-style-type: none"> <li>1 The use of assets between and across supply chain participants is optimized with processes defined and executed across the supply chain.</li> <li>2 Assets are leveraged to maximize utilization, including just-in-time asset retirement, based on smart grid data and systems.</li> </ol>   |
| <b>4</b> OPTIMIZING  | <ol style="list-style-type: none"> <li>1 Operational data from smart grid deployments is being used to optimize processes across the organization.</li> <li>2 Grid operational management is based on near real-time data.</li> <li>3 Operational forecasts are based on data gathered through smart grid.</li> <li>4 Grid operations information has been made available across functions and LOBs.</li> <li>5 There is automated decision-making within protection schemes that is based on wide-area monitoring.</li> </ol>  | <ol style="list-style-type: none"> <li>1 A complete view of assets based on status, connectivity, and proximity is available to the organization.</li> <li>2 Asset models are based on real performance and monitoring data.</li> <li>3 Performance and usage of assets is optimized across the asset fleet and across asset classes.</li> <li>4 Service life for key grid components is managed through condition-based and predictive maintenance, and is based on real and current asset data.</li> </ol>   |
| <b>3</b> INTEGRATING | <ol style="list-style-type: none"> <li>1 Smart grid information is available across systems and organizational functions.</li> <li>2 Control analytics have been implemented and are used to improve cross-LOB decision-making.</li> <li>3 Grid operations planning is now fact-based using grid data made available by smart grid capabilities.</li> <li>4 Smart meters are important grid management sensors.</li> <li>5 Grid data is used by an organization's security functions.</li> <li>6 There is automated decision-making within protection schemes.</li> </ol> | <ol style="list-style-type: none"> <li>1 Performance, trend analysis, and event audit data are available for components of the organization's systems.</li> <li>2 CBM programs for key components are in place.</li> <li>3 Remote asset monitoring capabilities are integrated with asset management.</li> <li>4 Integration of remote asset monitoring with mobile workforce systems, in order to automate work order creation, is underway.</li> <li>5 An integrated view of GIS and asset monitoring is in place.</li> <li>6 Asset inventory is being tracked using automation.</li> <li>7 Modeling of asset investments for key components is underway.</li> </ol> |
| <b>2</b> ENABLING    | <ol style="list-style-type: none"> <li>1 Initial distribution to substation automation projects are underway.</li> <li>2 Advanced outage restoration schemes are being implemented, which resolve or reduce the magnitude of unplanned outages.</li> <li>3 Aside from SCADA, piloting of remote asset monitoring of key grid assets to support manual decision making is underway.</li> <li>4 Investment in and expansion of data communications networks in support of grid operations is underway.</li> </ol>   | <ol style="list-style-type: none"> <li>1 An approach to track, inventory, and maintain event histories of assets is in development.</li> <li>2 An integrated view of GIS for asset monitoring based on location, status, and interconnectivity (nodal) has been developed.</li> <li>3 An organization-wide mobile workforce strategy is in development.</li> </ol>   |
| <b>1</b> INITIATING  | <ol style="list-style-type: none"> <li>1 Business cases for new equipment and systems related to smart grid are approved.</li> <li>2 New sensors, switches, and communications technologies are evaluated for grid monitoring and control.</li> <li>3 Proof-of-concept projects and component testing for grid monitoring and control are underway.</li> <li>4 Outage and distribution management systems linked to substation automation are being explored and evaluated.</li> <li>5 Safety and security (physical and cyber) requirements are considered.</li> </ol>   | <ol style="list-style-type: none"> <li>1 Enhancements to work and asset management have been built into approved business cases.</li> <li>2 Potential uses of remote asset monitoring are being evaluated.</li> <li>3 Asset and workforce management equipment and systems are being evaluated for their potential alignment to the smart grid vision.</li> </ol>  |
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## Technology (TECH)

IT architecture, standards, infrastructure, integration, tools

## Customer (CUST)

pricing, customer participation and experience, advanced services

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| <b>5</b><br>PIONEERING  | <ol style="list-style-type: none"> <li>1 Autonomic computing and machine learning are implemented.</li> <li>2 The enterprise information infrastructure can automatically identify, mitigate, and recover from cyber incidents.</li> </ol>   | <ol style="list-style-type: none"> <li>1 Customers can manage their end-to-end energy supply and usage levels.</li> <li>2 There is automatic outage detection at the premise or device level.</li> <li>3 Plug-and-play, customer-based generation is supported.</li> <li>4 Security and privacy for all customer data is assured.</li> <li>5 The organization plays a leadership role in industry-wide information sharing and standards development efforts for smart grid.</li> </ol>  |
| <b>4</b><br>OPTIMIZING  | <ol style="list-style-type: none"> <li>1 Data flows end to end from customer to generation.</li> <li>2 Business processes are optimized by leveraging the enterprise IT architecture.</li> <li>3 Systems have sufficient wide-area situational awareness to enable real-time monitoring and control for complex events.</li> <li>4 Predictive modeling and near real-time simulation are used to optimize support processes.</li> <li>5 Performance is improved through sophisticated systems that are informed by smart grid data.</li> <li>6 Security strategy and tactics continually evolve based on changes in the operational environment and lessons learned.</li> </ol>        | <ol style="list-style-type: none"> <li>1 Support is provided to customers to help analyze and compare usage against all available pricing programs.</li> <li>2 There is outage detection and proactive notification at the circuit level.</li> <li>3 Customers have access to near real-time data on their own usage.</li> <li>4 Residential customers participate in demand response and/or utility-managed remote load control programs.</li> <li>5 Automatic response to pricing signals for devices within the customer's premise is supported.</li> <li>6 In-home net billing programs are enabled.</li> <li>7 A common customer experience has been integrated.</li> </ol>   |
| <b>3</b><br>INTEGRATING | <ol style="list-style-type: none"> <li>1 Smart grid-impacted business processes are aligned with the enterprise IT architecture across LOBs.</li> <li>2 Systems adhere to an enterprise IT architectural framework for smart grid.</li> <li>3 Smart grid-specific technology has been implemented to improve cross-LOB performance.</li> <li>4 The use of advanced distributed intelligence and analytical capabilities are enabled through smart grid technology.</li> <li>5 The organization has an advanced sensor plan.</li> <li>6 A detailed data communication strategy and corresponding tactics that cross functions and LOBs are in place.</li> </ol>                         | <ol style="list-style-type: none"> <li>1 The organization tailors programs to customer segments.</li> <li>2 Two-way meter communication has been deployed.</li> <li>3 A remote connect/disconnect capability is deployed.</li> <li>4 Demand response and/or remote load control is available to residential customers.</li> <li>5 There is automatic outage detection at the substation level.</li> <li>6 Residential customers have on-demand access to daily usage data.</li> <li>7 A common experience has been implemented across two or more customer interface channels.</li> <li>8 Customer education on how to use smart grid services to curtail peak usage is provided.</li> <li>9 All customer products and services have built-in standards based on security and privacy controls.</li> </ol> |
| <b>2</b><br>ENABLING    | <ol style="list-style-type: none"> <li>1 Tactical IT investments are aligned to an enterprise IT architecture within an LOB.</li> <li>2 Changes to the enterprise IT architecture that enable smart grid are being deployed.</li> <li>3 Standards are selected to support the smart grid strategy within the enterprise IT architecture.</li> <li>4 A common technology evaluation and selection process is applied for all smart grid activities.</li> <li>5 There is a data communications strategy for the grid.</li> <li>6 Pilots based on connectivity to distributed IEDs are underway.</li> <li>7 Security is built into all smart grid initiatives from the outset.</li> </ol> | <ol style="list-style-type: none"> <li>1 Pilots of remote AMI/AMR are being conducted or have been deployed.</li> <li>2 The organization has frequent (more than monthly) knowledge of residential customer usage.</li> <li>3 The organization is modeling the reliability of grid equipment.</li> <li>4 Remote connect/disconnect is being piloted for residential customers.</li> <li>5 The impact on the customer of new services and delivery processes is being assessed.</li> <li>6 Security and privacy requirements for customer protection are specified for smart grid-related pilot projects and RFPs.</li> </ol>   |
| <b>1</b><br>INITIATING  | <ol style="list-style-type: none"> <li>1 An enterprise IT architecture exists or is under development.</li> <li>2 Existing or proposed IT architectures have been evaluated for quality attributes that support smart grid applications.</li> <li>3 A change control process is used for applications and IT infrastructure.</li> <li>4 Opportunities are identified to use technology to improve departmental performance.</li> <li>5 There is a process to evaluate and select technologies in alignment with smart grid vision and strategies.</li> </ol>   | <ol style="list-style-type: none"> <li>1 Research is being conducted on how to use smart grid technologies to enhance the customer's experience, benefits, and participation.</li> <li>2 Security and privacy implications of smart grid are being investigated.</li> <li>3 A vision of the future grid is being communicated to customers.</li> <li>4 The utility consults with public utility commissions and/or other government organizations concerning the impact on customers.</li> </ol>   |
| <b>0</b><br>DEFAULT     |  |  |



## Value Chain Integration (VCI)

demand and supply management, leveraging market opportunities

## Societal and Environmental (SE)

responsibility, sustainability, critical infrastructure, efficiency

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|--------------------------------|---|--|
| <b>5</b><br><b>PIONEERING</b>  | <ol style="list-style-type: none"> <li>1 The optimization of energy assets is automated across the full value chain.</li> <li>2 Resources are adequately dispatchable and controllable so that the organization can take advantage of granular market options.</li> <li>3 Automated control and resource optimization schemes consider and support regional and/or national grid optimization.</li> </ol>   | <ol style="list-style-type: none"> <li>1 Triple bottom line goals align with local, regional, and national objectives.</li> <li>2 Customers control their energy-based environmental footprints through automatic optimization of their end-to-end energy supply and usage level (energy source and mix).</li> <li>3 The organization is a leader in developing and promoting industry-wide resilience best practices and/or technologies for protection of the national critical infrastructure.</li> </ol>                                       |
| <b>4</b><br><b>OPTIMIZING</b>  | <ol style="list-style-type: none"> <li>1 Energy resources (including Volt/VAR, DG, and DR) are dispatchable and tradable.</li> <li>2 Portfolio optimization models that encompass available resources and real-time markets are implemented.</li> <li>3 Secure two-way communications with Home Area Networks (HANs) are available.</li> <li>4 Visibility and potential control of customers' large-demand appliances to balance demand and supply is available.</li> </ol>   | <ol style="list-style-type: none"> <li>1 The organization collaborates with external stakeholders to address environmental and societal issues.</li> <li>2 A public environmental and societal scorecard is maintained.</li> <li>3 Programs are in place to shave peak demand.</li> <li>4 End-user energy usage and devices are actively managed through the utility's network.</li> <li>5 The organization fulfills its critical infrastructure assurance goals for resiliency, and contributes to those of the region and the nation.</li> </ol> |
| <b>3</b><br><b>INTEGRATING</b> | <ol style="list-style-type: none"> <li>1 An integrated resource plan is in place and includes new targeted resources and technologies.</li> <li>2 Customer premise energy management solutions with market and usage information are enabled.</li> <li>3 Additional resources are available and deployed to provide substitutes for market products to support reliability or other objectives.</li> <li>4 Security management and monitoring processes are deployed to protect the interactions with an expanded portfolio of value chain partners.</li> </ol> | <ol style="list-style-type: none"> <li>1 Performance of societal and environmental programs are measured and effectiveness is demonstrated.</li> <li>2 Segmented and tailored information that includes environmental and societal benefits and costs is available to customers.</li> <li>3 Programs to encourage off-peak usage by customers are in place.</li> <li>4 The organization regularly reports on the sustainability and the societal and environmental impacts of its smart grid programs and technologies.</li> </ol>                 |
| <b>2</b><br><b>ENABLING</b>    | <ol style="list-style-type: none"> <li>1 Support is provided for energy management systems for residential customers.</li> <li>2 The value chain has been redefined based on its smart grid capabilities.</li> <li>3 Pilots to support a diverse resource portfolio have been conducted.</li> <li>4 Secure interactions have been piloted with an expanded portfolio of value chain partners.</li> </ol>  | <ol style="list-style-type: none"> <li>1 Smart-grid strategies and work plans address societal and environmental issues.</li> <li>2 Energy efficiency programs for customers have been established.</li> <li>3 The organization considers a "triple bottom line" view when making decisions.</li> <li>4 Environmental proof-of-concept projects are underway that demonstrate smart grid benefits.</li> <li>5 Increasingly granular and more frequent consumption information is available to customers.</li> </ol>                                |
| <b>1</b><br><b>INITIATING</b>  | <ol style="list-style-type: none"> <li>1 Assets and programs necessary to facilitate load management are identified.</li> <li>2 Distributed generation sources and the capabilities needed to support them are identified.</li> <li>3 Energy storage options and the capabilities needed to support them are identified.</li> <li>4 There is a strategy for creating and managing a diverse resource portfolio.</li> <li>5 Security requirements to enable interaction with an expanded portfolio of value chain partners have been identified.</li> </ol>      | <ol style="list-style-type: none"> <li>1 The smart grid strategy addresses the organization's role in societal and environmental issues.</li> <li>2 The environmental benefits of the smart grid vision and strategy are publicly promoted.</li> <li>3 Environmental compliance performance records are available for public inspection.</li> <li>4 The smart grid vision or strategy specifies the organization's role in protecting the nation's critical infrastructure.</li> </ol>   |
| <b>0</b><br><b>DEFAULT</b>     |   |  |