IBM Japan, ltd.

Scale, Open innovation, Insight in mind

Operating 78 years in Japan

IBM : 3,000 Smarter Cities projects to date

City leaders around the world are accelerating investment to make their cities smarter

- **Energy and Water**
- Transportation
- Environmental
- Government and Agency Administration
- Urban Planning
- Public Safety
- Education
- Social and Health

Insights and experiences from all over the world

Challenges : How we learn from others

Importance of framework to better understand and share transformation

Smart Grid Maturity Model: Matrix

	Technology (TECH) IT architecture, standards, infrastructure, integration, tools	Customer (CUST) pricing, customer participation and experience, advanced services
PIONEERING **5**	1 Autonomic computing and machine learning are implemented. 2 The enterprise information infrastructure can automatically identify, mitigate, and recover from cyber incidents.	1 Customers can manage their end-to-end energy supply and usage levels. 2 There is automatic outage detection at the premise or device level. 3 Plug-and-play, customer-based generation is supported. 4 Security and privacy for all customer data is assured. 5 The organization plays a leadership role in industry wide informa
OPTIMIZING **4**	1 Dati 2 Bus arcl 3 Syst able 4 Pre opti 5 Perf info 6 Sec cha	
INTEGRATING **3**	1 Sma ente 2 Syst sma 3 Sma cros 4 The bilit 5 The 6 A de tact	
ENABLING **2**	1 Tactical IT investments are aligned to an enterprise IT architecture within an LOB. 2 Changes to the enterprise IT architecture that enable smart grid are being deployed. 3 Standards are selected to support the smart grid strategy within the enterprise IT architecture. 4 A common technology evaluation and selection process is applied for all smart grid activities. 5 There is a data communications strategy for the grid. 6 Pilots based on connectivity to distributed IEDs are underway. 7 Security is built into all smart grid initiatives from the outset.	1 Pilots of remote AMI/AMR are being conducted or have been deployed. 2 The organization has frequent (more than monthly) knowledge of residential customer usage. 3 The organization is modeling the reliability of grid equipment. 4 Remote connect/disconnect is being piloted for residential customers. 5 The impact on the customer of new services and delivery processes is being assessed. 6 Security and privacy requirements for customer protection are specified for smart grid-related pilot projects and RFPs.
INITIATING **1**	1 An enterprise IT architecture exists or is under development. 2 Existing or proposed IT architectures have been evaluated for quality attributes that support smart grid applications. 3 A change control process is used for applications and IT infrastructure. 4 Opportunities are identified to use technology to improve departmental performance. 5 There is a process to evaluate and select technologies in alignment with smart grid vision and strategies.	1 Research is being conducted on how to use smart grid technologies to enhance the customer's experience, benefits, and participation. 2 Security and privacy implications of smart grid are being investigated. 3 A vision of the future grid is being communicated to customers. 4 The utility consults with public utility commissions and/or other government organizations concerning the impact on customers.
DEFAULT **0**		

Smart Grid Maturity Model: Matrix

	Value Chain Integration (VCI) demand and supply management, leveraging market opportunities	Societal and Environmental (SE) responsibility, sustainability, critical infrastructure, efficiency
PIONEERING **5**	1 The optimization of energy assets is automated across the full value chain. 2 Resources are adequately dispatchable and controllable so that the organization can take advantage of granular market options.	1 Triple bottom line goals align with local, regional, and national objectives. 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).
2	residential customers. 2 The value chain has been redefined based on its smart grid capabilities. 3 Pilots to support a diverse resource portfolio have been conducted. 4 Secure interactions have been piloted with an expanded portfolio of value chain partners.	environmental issues. 2 Energy efficiency programs for customers have been established. 3 The organization considers a "triple bottom line" view when making decisions. 4 Environmental proof-of-concept projects are underway that demonstrate smart grid benefits. 5 Increasingly granular and more frequent consumption information is available to customers.
INITIATING **1**	1 Assets and programs necessary to facilitate load management are identified. 2 Distributed generation sources and the capabilities needed to support them are identified. 3 Energy storage options and the capabilities needed to support them are identified. 4 There is a strategy for creating and managing a diverse resource portfolio. 5 Security requirements to enable interaction with an expanded portfolio of value chain partners have been identified.	1 The smart grid strategy addresses the organization's role in societal and environmental issues. 2 The environmental benefits of the smart grid vision and strategy are publicly promoted. 3 Environmental compliance performance records are available for public inspection. 4 The smart grid vision or strategy specifies the organization's role in protecting the nation's critical infrastructure.
DEFAULT **0**		

Smart Grid Maturity Model (SGMM) has been used as a resource for utility industry transformation by more than 100 utilities. Utilities leveraged this management tool to ensure that all aspects of transformation planning are considered, prioritize their options, and measure their progress as they move toward the realization of a smart grid.

Partners and suppliers have a better understanding of the smart grid level at which a utility company is positioned by sharing the current status, and can better answer for proposal.

http://resources.sei.cmu.edu/asset_files/Brochure/2011_015_001_28227.pdf

Demand side management progress last five years in Japan

Smart community projects started

Energy saving request and actions

BEMS/HEMS/MEMS deployment

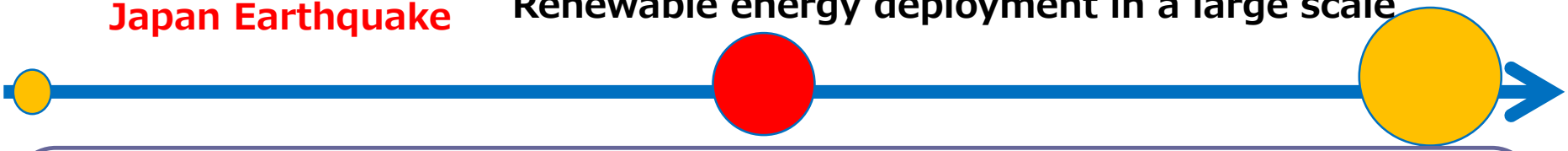
Demand response

Smart meter

Energy de-regulation

The Great East Japan Earthquake

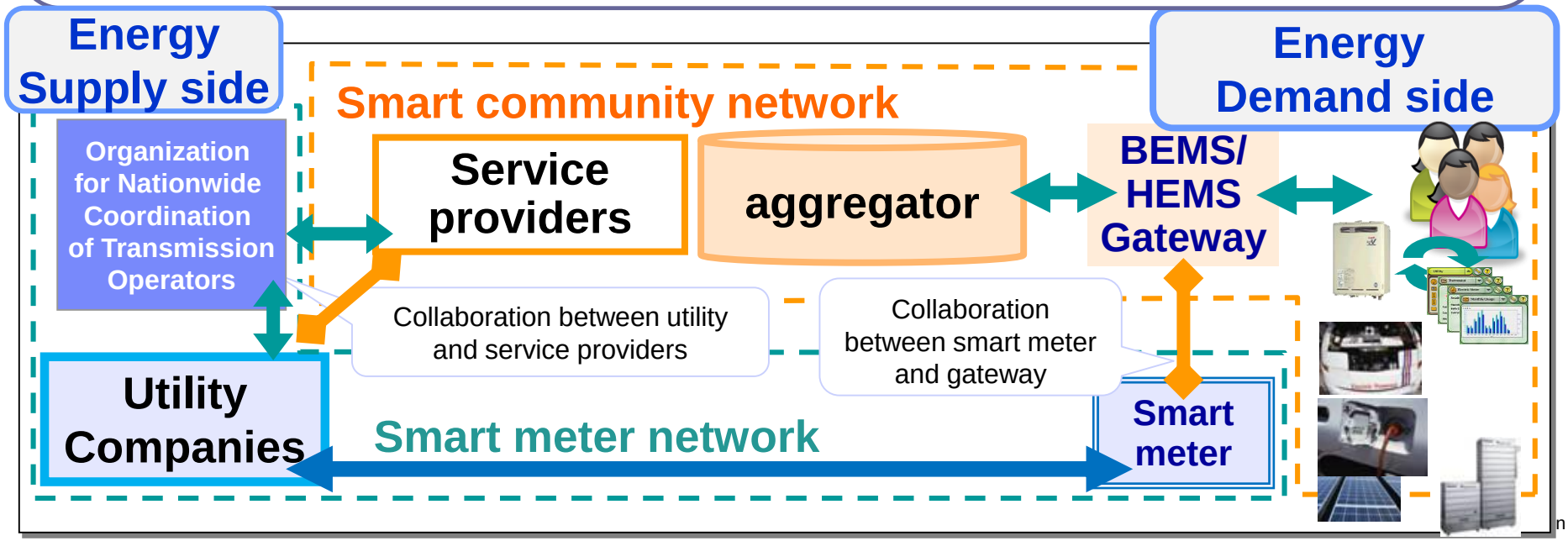
Renewable energy deployment in a large scale



For prosumers to make a better decision and action is on-going.

Discussion on a collaboration model between supply and demand is being made.

1. **Data from/to devices in homes and buildings**
2. **Usage data from smarter meter to a gateway (Home/Building)**
3. **Collaboration between utility companies and service providers**



The mega IT trends and more

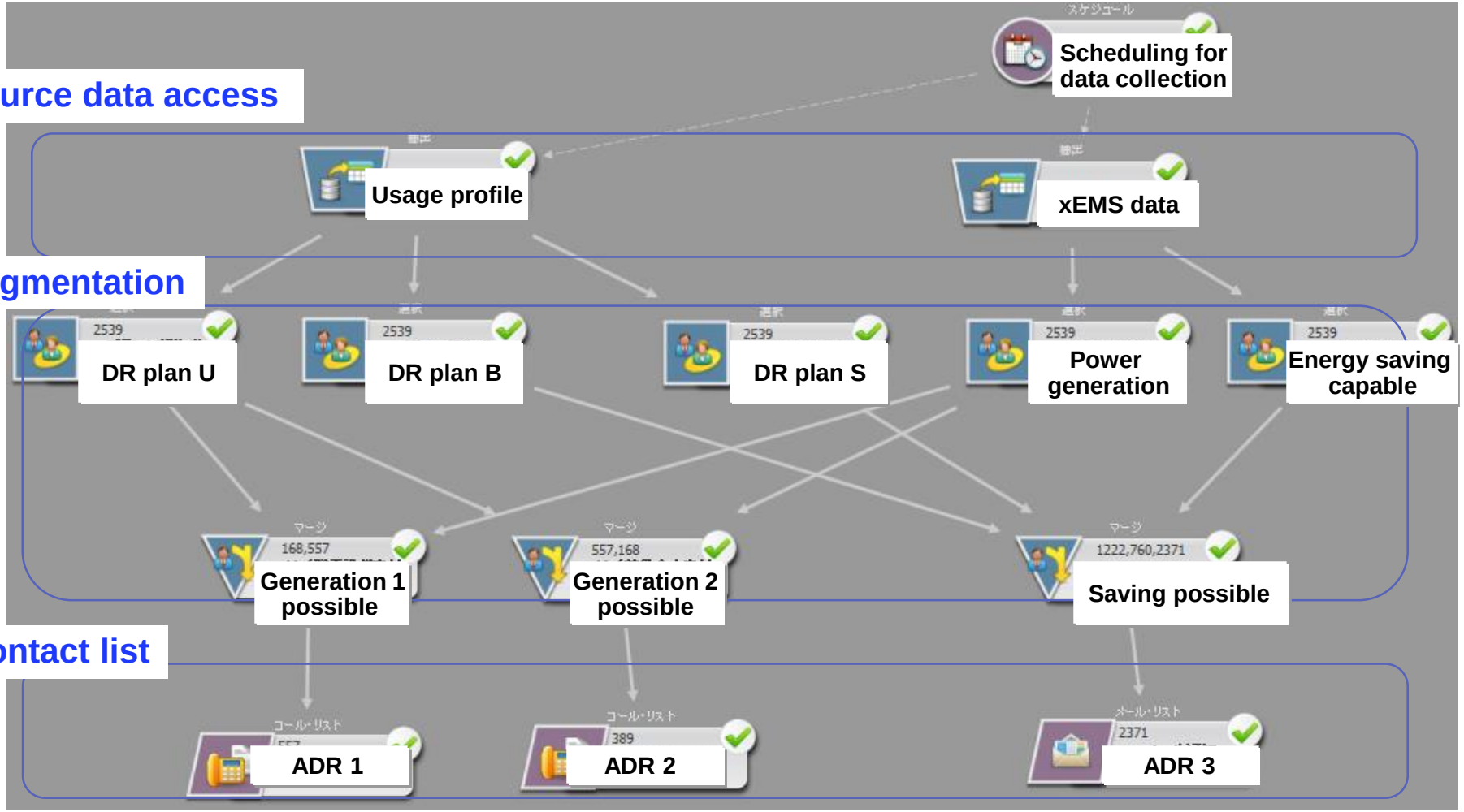
Rapidly changing market and technology landscape that drive prosumers act proactively and smarter

Prosumer's participation contributes most to energy savings.

Challenges : How we get prosumers involved

Campaign technology can be used for prosumers to act smarter

Campaign management with DR plan, xEMS data and weather



【Segmentation reference】

- by demand Response plan
- by allowance of energy saving that BEMS data shows
- by power generation option

Next steps

- ✓ Gravity being shifted to prosumers
  - ✓ Prosumer experience and insight should be shared
  - ✓ Proactive recommendation and messaging for prosumers
- ✓ Two-way automated demand response in PDCA cycle
  - ✓ Prosumers
  - ✓ Devices
- ✓ Applications and services for energy de-regulation
  - ✓ Real-time energy usage and response
  - ✓ Incentives
  - ✓ New energy pricing
  - ✓ Better customer care and interaction
- ✓ Energy, Life and Well-being
  - ✓ Integration of energy data with other types of data