Progress and Plans: 
Annex 1 Global Smart Grid Inventory

Eric Lightner, Annex 1 Lead (U.S. DOE) 
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Annex 1 Participants

- Australia
- Belgium
- Canada
- China
- Finland
- France
- Ireland
- Italy
- Japan
- Korea
- The Netherlands
- Russia
- Spain
- Sweden
- Switzerland
- United Kingdom
- United States

All 22 ISGAN signatories contributing data and information to Annex 1

Operating Agent (as of August 2011)
Task 1: Unified ISGAN framework for assessment of national-level motivating drivers and technology priorities for smart grids (completed with delivery of summary report)

Task 2: Development and population of the initial project inventory with data content exchangeable with those in other existing smart grid databases (in progress)

Task 3: Quantitative analysis on select inventory projects, using key performance indicators (to start in Q4 2012)
>24 drivers in 7 categories  
>50 technologies in 5 categories  

>400 combinations of driver/technology pairs to select and prioritize
Web-based survey tool for use by each country:

- Top 1-6 motivating drivers
- Top 1-5 smart grid technologies contributing to each top-ranked driver

Up to 5 surveys allowed to reflect stakeholder/geographic diversity

Using survey results to identify driver and technologies that are top-ranked by countries for cooperation in qualitative and quantitative assessments.
### Status, as of September 30

<table>
<thead>
<tr>
<th>Survey Status</th>
<th># of Surveys</th>
<th># of ISGAN Countries</th>
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<tr>
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<td>Rejected</td>
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</table>

- **7 countries with multiple surveys**
  (5 validated surveys being the most from a country)
Excel Macros

National Surveys
From each survey
- 6 Drivers
- 30 Driver-technology pairs

Apply weighting schemes to drivers and driver-technology pairs

Code national results by
- Economies
- Continent

Perform functions of
- Filtering
- Summing
- Sorting
- Ranking

Multinational Assessment Results
- All
- By economies
- By continent
System Efficiency Improvements
Reliability Improvements
Power Restoration Improvements
Enabling Customer Choice and Participation
Enhanced Power System Resiliency to Natural and Human Threats
Regulatory Compliance

National-Level Assessment Results from the U.S.: Composite results of 5 surveys

Top 6 Ranked Drivers
Documented prioritized assessment of smart grid motivating drivers and technologies by 19 ISGAN countries

Documented multinational-level analysis results of all 19 countries, developed and developing economies, and 4 continents

Top 6 Ranked Drivers of 19 Countries

- Renewable energy standards or targets
- System efficiency improvements
- Reliability improvements
- Enabling customer choice and participation
- Enabling new products, services, and markets
- Energy efficiency improvements

Top 5 Ranked Technologies of 19 Countries

- Advanced metering infrastructure (AMI)
- Large size variable renewables energy sources integration
- Demand response
- Wind
- Distributed energy resources

Completed Task 1 with Delivery of Summary Report of Analysis Results
Top 6 Ranked Drivers

15 developed economies

- Renewable energy standards or targets
- System efficiency improvements
- Enabling customer choice and participation
- Enabling new products, services, and markets
- Energy efficiency improvements
- Reliability improvements

4 developing economies

- Reliability improvements
- System efficiency improvements
- Reducing operating and maintenance costs
- Optimizing asset utilization
- Renewable energy standards or targets
- Revenue collection and assurance improvements

- **Common motivating drivers:**
  Renewable energy standards or targets, System efficiency improvements, and Reliability improvements

- **Other motivating drivers of priority:**
  - Developing: lean toward current operational improvements
  - Developed: lean toward enabling characteristics of smart grid
Top 5 Ranked Technologies across All Drivers

15 developed economies

- Advanced metering infrastructure (AMI)
- Demand response
- Distributed energy resources integration
- Residential consumer energy management
- Large size variable renewables energy sources integration

4 developing economies

- Condition-based monitoring and maintenance
- Advanced metering infrastructure (AMI)
- Distribution management systems and outage management systems
- Tools for planning, operation, analysis
- System wide monitoring, measurement, and control

- **Common technology of priority**: AMI
- **Other technologies of priority**:
  - *Developing*: supporting current operational improvements
  - *Developed*: supporting enabling characteristics of smart grid
Task 2: Web-based Project Inventory

ID of Inventory Projects

- Selection criteria
- List of ≤10 projects from each country

Build and Management of ISGAN Project Inventory

- Template for inputting project data & information
- Input of project information
- Analysis and reporting
Developed Project Selection Criteria

• Demonstration and/or deployment
• Supported by Government or regulator
• Supporting drivers and technologies of national priority
• Addressing ISGAN focus areas
• Near term (w. c/b analysis by 2017)

Compiling lists of projects

• Project lists from 12 countries received
• Lists from the remaining 10 countries to be submitted
1\textsuperscript{st} filter using the individual country’s prioritized assessment framework

Task 2: Up to 10 projects with data/information housed in a sharable data repository in each country

2\textsuperscript{nd} filter using the clusters of driver/technology pairs of high priority to many ISGAN countries

Task 3: 2 Smart Grid Projects tracked and reported on by each member country
Eric M. Lightner
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