



U.S. Department of Energy

Office of Electricity Delivery and Energy Reliability

SGIG Metrics and Benefits

North American SynchroPhasor Initiative Meeting

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US DOE






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100 Smart Grid Investment Grant Projects

SGIG Areas of Smart Grid Technology Deployment

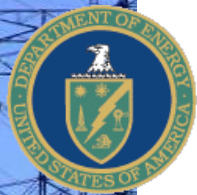
Customer Systems	Advance Metering Infrastructure	Electric Distribution Systems	Electric Transmission Systems	Equipment Manufacturing
				
<ul style="list-style-type: none"> • Displays • Portals • Energy management • Direct load controls 	<ul style="list-style-type: none"> • Smart meters • Data management • Back office integration 	<ul style="list-style-type: none"> • Switches • Feeder optimization • Equipment monitoring 	<ul style="list-style-type: none"> • Wide area monitoring and visualization • SynchroPhasor Technology • Grid optimization 	<ul style="list-style-type: none"> • Energy devices • Software • Business models



13 Grant Recipients Are Implementing Synchrophasor Technology

- Arizona Cooperatives
- American Transmission Company
- Duke Energy Carolinas
- Entergy
- Florida Power and Light
- Idaho Power Company
- ISO New England
- Midwest Energy
- Midwest ISO
- New York ISO
- NV Energy
- PJM
- WECC

Most projects involve many more transmission owner partners



DOE Analytical Approach

What are Smart Grid technologies?

What does the Smart Grid do?

How does it do that?

What "goodness" results?

What is the goodness worth?

Assets

Functions

Mechanisms

Benefits

Monetary Value

Example

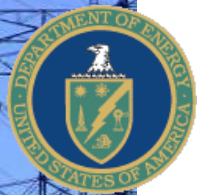
- Capacitor controls
- Distribution Management System

Automatic Voltage and VAR Control

Improves feeder voltage regulation

Reduced feeder losses worth \$60 per MWh

\$6000



Build and Impact Metrics - To Show the Coverage and Influence of Synchrophasor Technology

Build Metrics

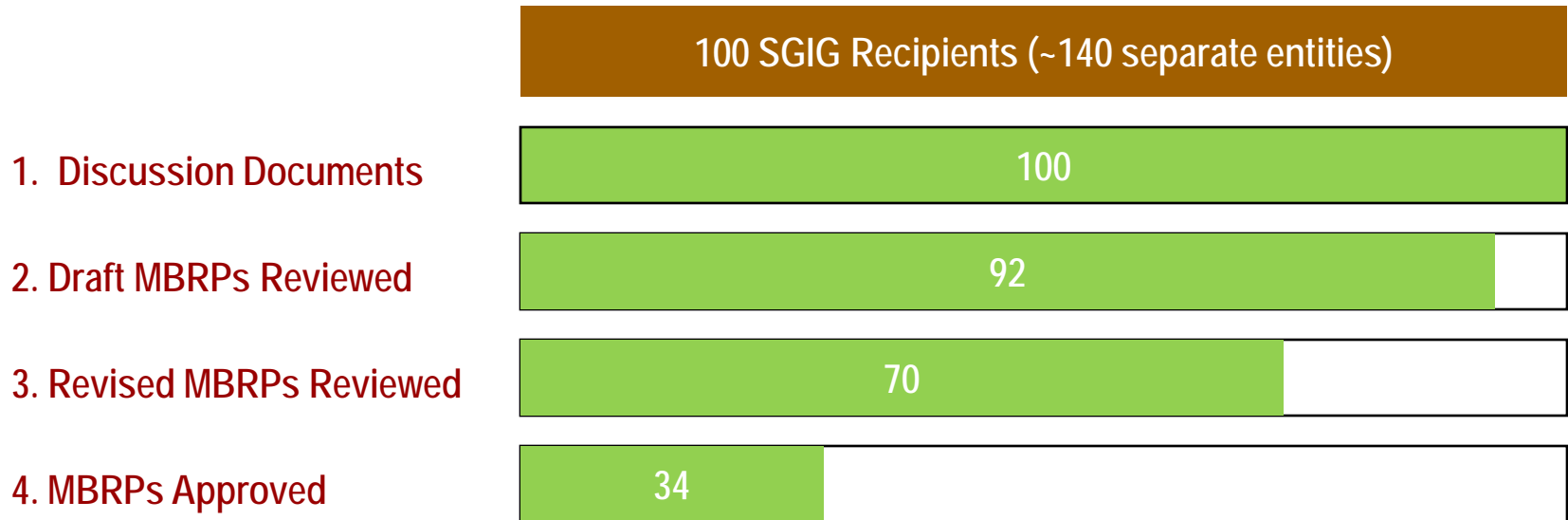
- Phasor Measurement Units
- Phasor Data Concentrators
- Communications Networks
- Advanced Applications

Impact Metrics

- Economic
 - Reduced Congestion Cost
- Reliability
 - # Emergency Alerts
- Environment
 - Reduced CO₂ Emissions
- Energy Security
 - # Loss of Load Events
- System Performance
 - % PMUs Networked



Status of Metrics and Benefits Plans

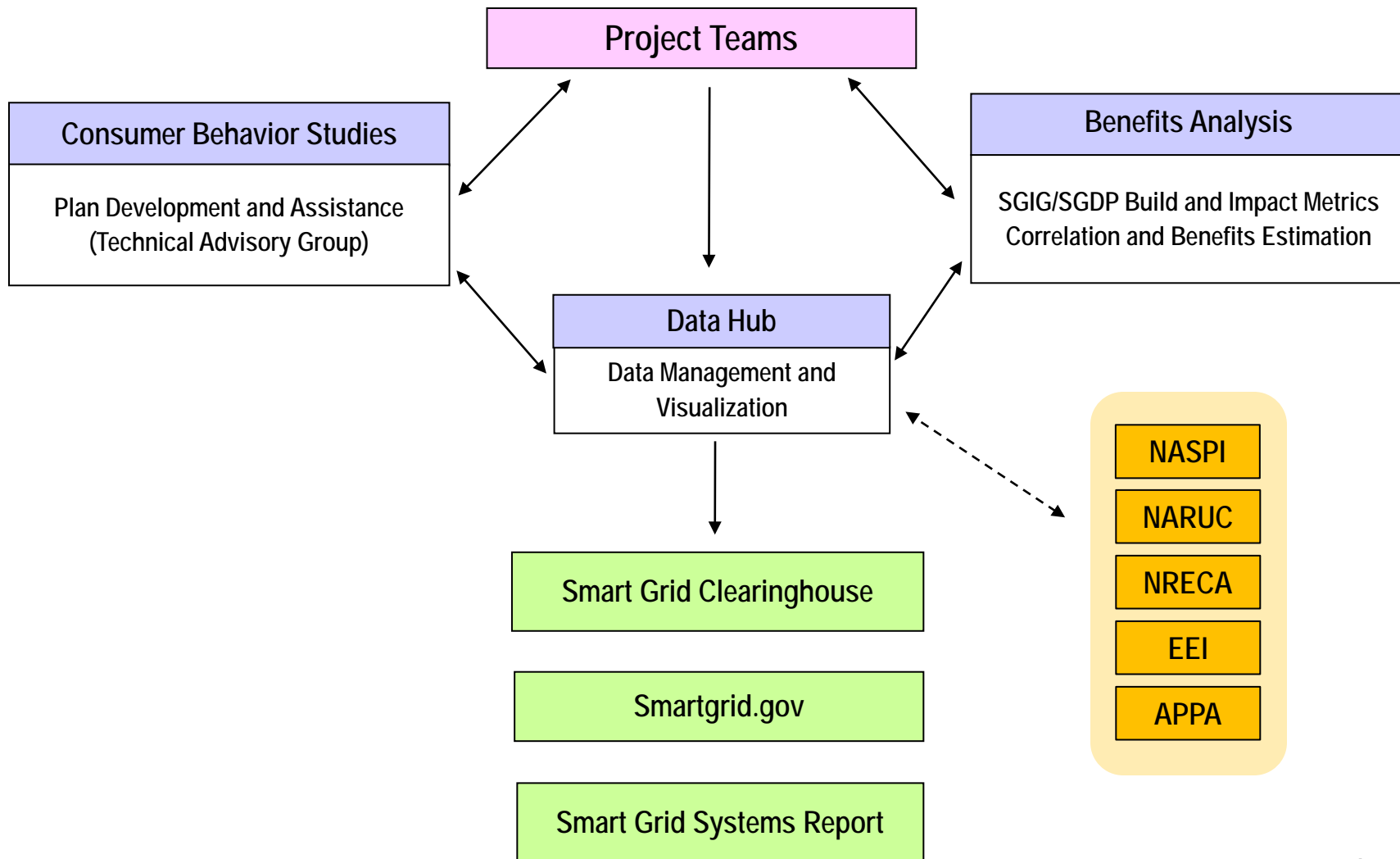


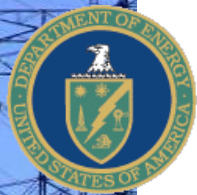
Source: Navigant

We have also conducted >200 calls with 87 of the Recipients to assist them with writing their MBRPs.



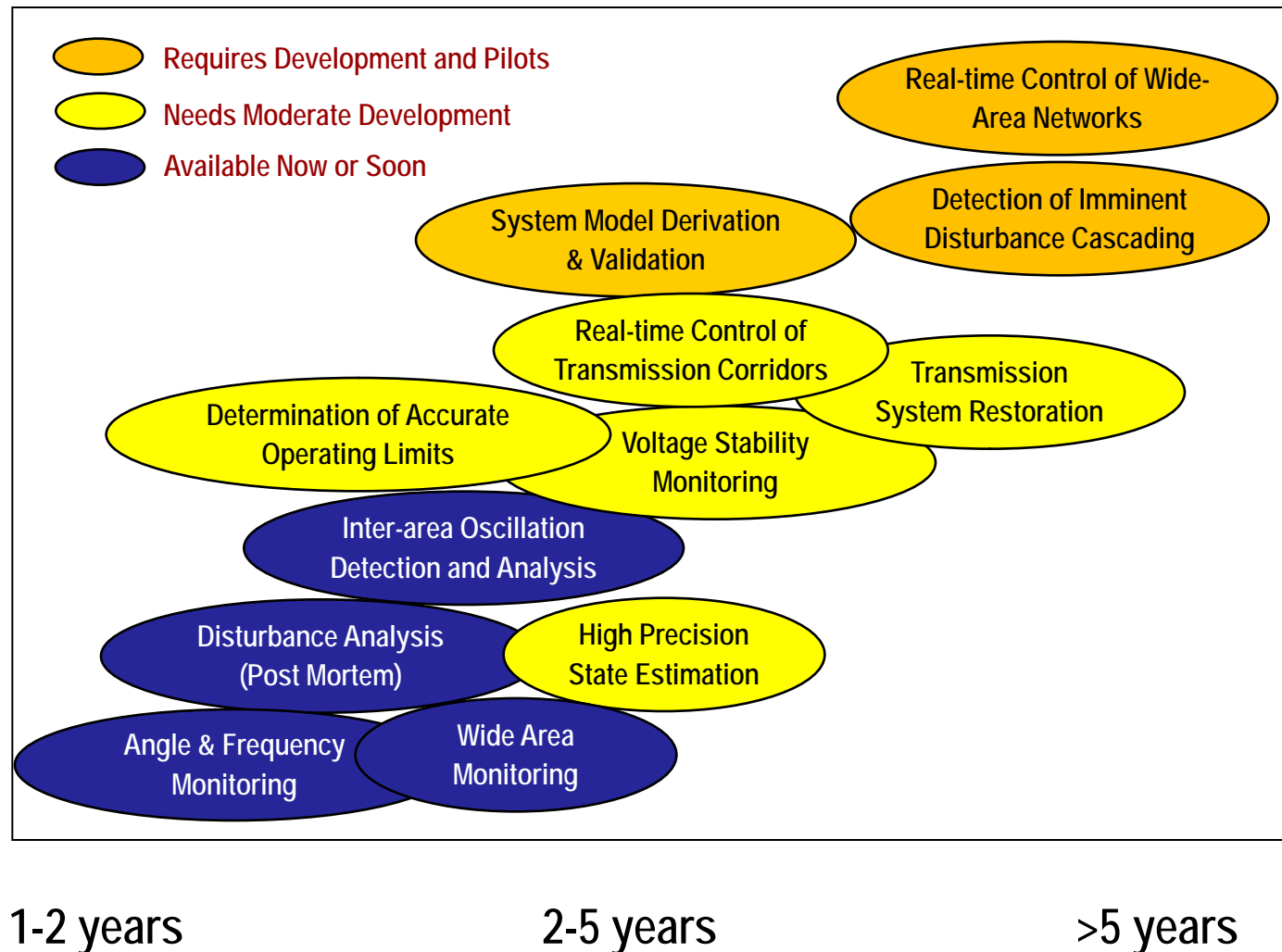
Data Management and Analysis





Advanced Applications Provide Value

Deployment Challenge





Collaboration

- What is the value (e.g., benefits or business case) for synchrophasor technology?
- What organizations need to understand the value?
- What information do we derive from these projects to ascertain the benefits?
- How do we work with the grant recipients and NASPI to advance a framework for estimating benefits?