

# Electricity Subsector Cybersecurity Capability Maturity Model (ES-C2M2)

Overview and mapping with Smart Grid  
Interoperability Maturity Model (SG IMM)

Department of Energy  
Office of Electricity Delivery & Energy Reliability

12/05/12

Grid-Interop 2012

# ES-C2M2 Background & Overview

- Challenge: Develop capabilities to manage dynamic threats and understand cybersecurity posture of the grid
- ES-C2M2 Objectives:
  - Strengthen cybersecurity capabilities
  - Enable consistent evaluation and benchmarking of cybersecurity capabilities
  - Share knowledge and best practices
  - Enable prioritized actions and cybersecurity investments



# ES-C2M2 Development and Pilot

- Public-Private collaborative effort
- Leveraged existing guidance and knowledge
- Short timeframe for development
  - Initiated Jan 2012, Ver 1 released May 2012
  - 17 pilot assessments
  - Feedback resulted in significant changes to the model



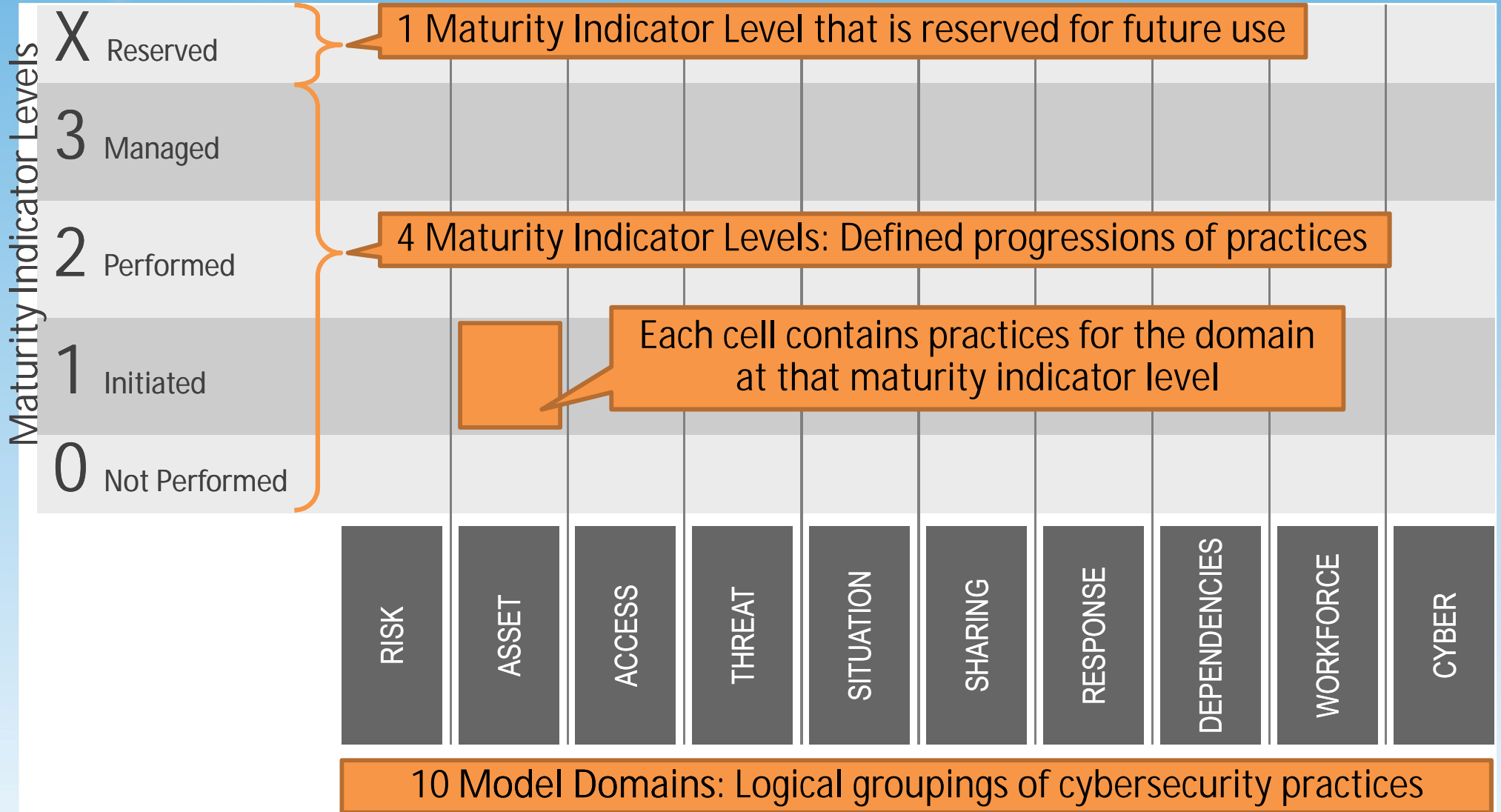
# ES-C2M2 Domains

RISK Risk Management	ASSET Asset, Change, and Configuration Management	ACCESS Identity and Access Management	THREAT Threat and Vulnerability Management
SITUATION Situational Awareness	SHARING Information Sharing and Communications	RESPONSE Event and Incident Response, Continuity of Operations	DEPENDENCIES Supply Chain and External Dependencies Management
WORKFORCE Workforce Management	CYBER Cybersecurity Program Management	<ul style="list-style-type: none"><li>• Domains are logical groupings of cybersecurity practices</li><li>• Each domain has a short name for easy reference</li></ul>	



Driving to Grid 2020

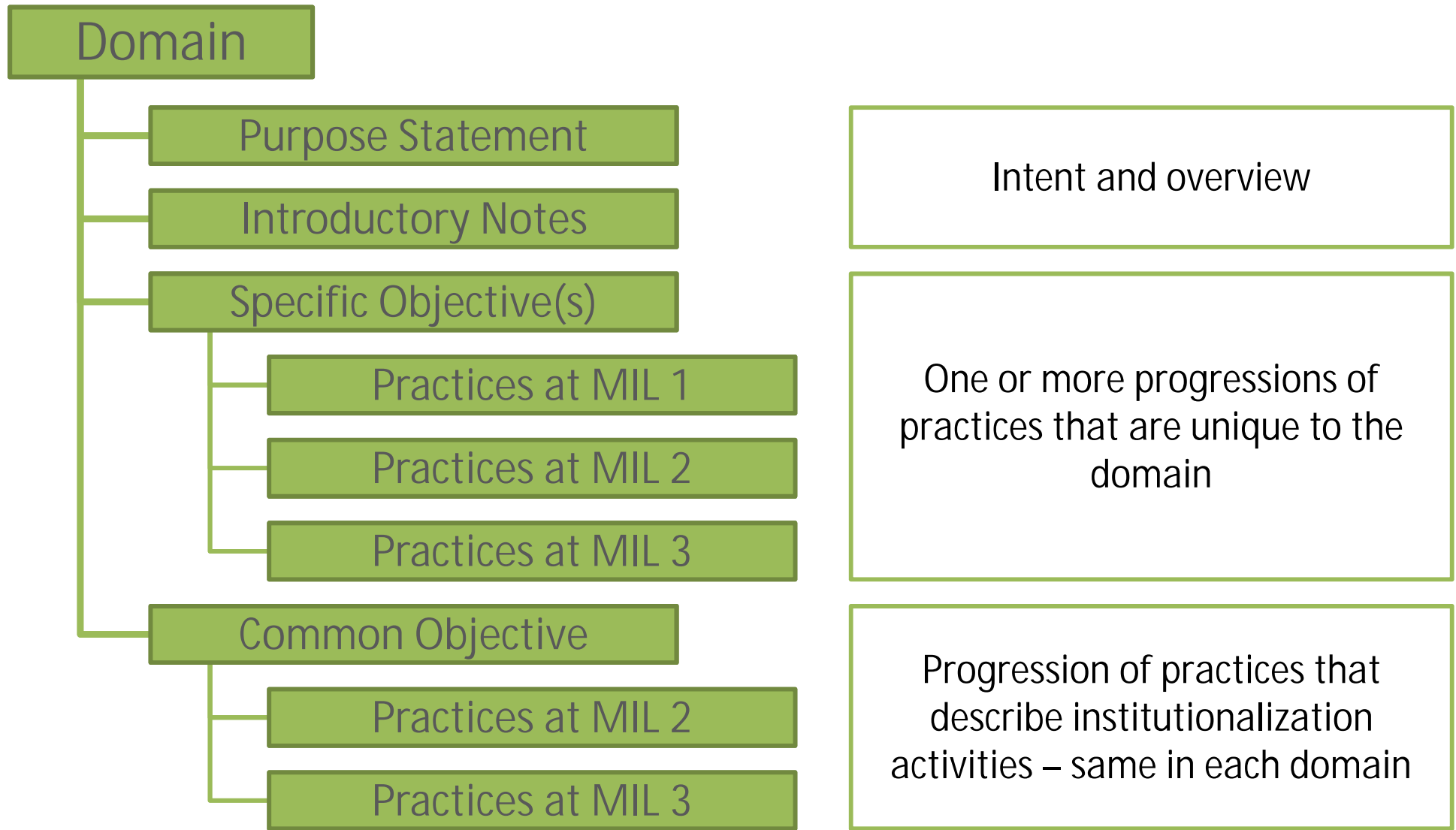
# The Model at a Glance



# Maturity Indicator Level Descriptions

Level	Name	Description
MIL0	Not Performed	<ul style="list-style-type: none"> <li>MIL1 has not been achieved in the domain</li> </ul>
MIL1	Initiated	<ul style="list-style-type: none"> <li>Initial practices are performed, but may be ad hoc</li> </ul>
MIL2	Performed	<ul style="list-style-type: none"> <li>Practices are documented</li> <li>Stakeholders are involved</li> <li>Adequate resources are provided for the practices</li> <li>Standards or guidelines are used to guide practice implementation</li> <li>Practices are more complete or advanced than at MIL1</li> </ul>
MIL3	Managed	<ul style="list-style-type: none"> <li>Domain activities are guided by policy (or other directives)</li> <li>Activities are periodically reviewed for conformance to policy</li> <li>Responsibility and authority for practices are clearly assigned to personnel with adequate skills and knowledge</li> <li>Practices are more complete or advanced than at MIL2</li> </ul>

# Domain Structure



# Example Objective: ASSET-3

Electricity Subsector Cybersecurity Capability Maturity Model **Version 1.0** **ASSET DOMAIN**

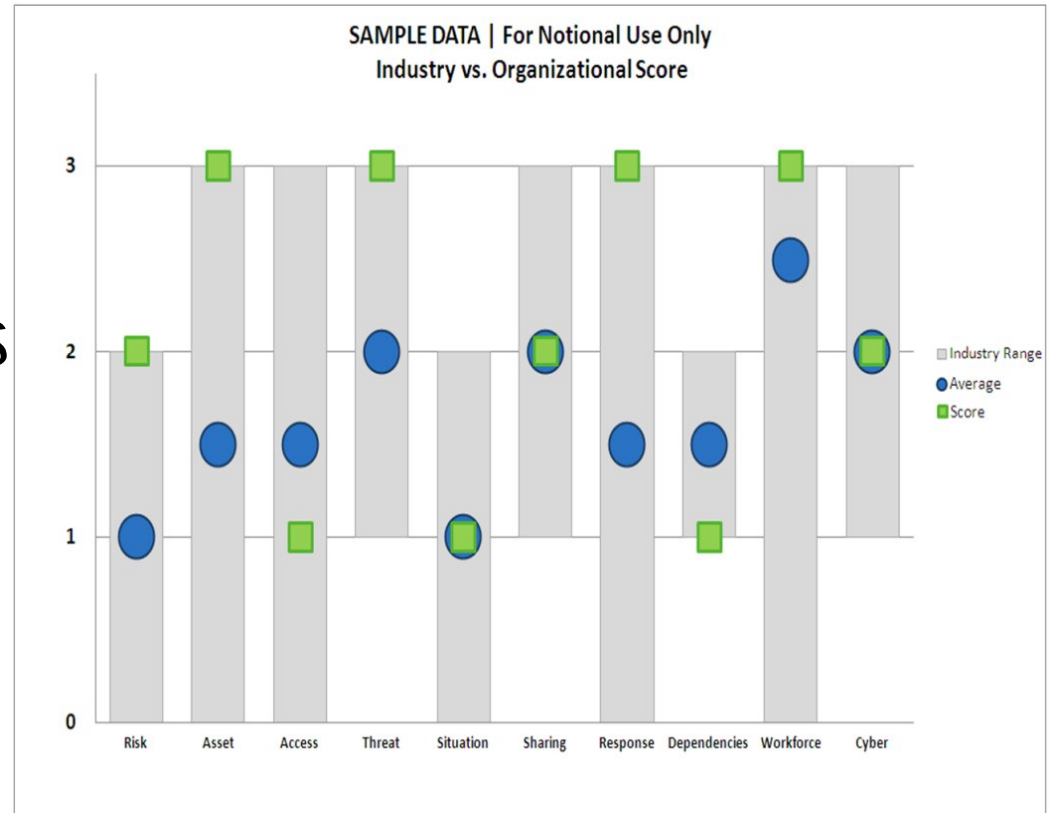
## 3. Manage Changes to Assets

<b>MIL1</b>	a. Changes to inventoried assets are evaluated before being implemented b. Changes to inventoried assets are logged
<b>MIL2</b>	c. Changes to assets are tested prior to being deployed, whenever possible d. Change management practices address the full lifecycle of assets (i.e., acquisition, deployment, operation, retirement)
<b>MIL3</b>	e. Changes to assets are tested for cybersecurity impact prior to being deployed f. Change logs include information about modifications that impact the cybersecurity requirements of assets (availability, integrity, confidentiality)



# Program Goals

- Enable consistent evaluation and benchmarking of cybersecurity capabilities
- Share Knowledge and Best Practices
- Prioritize Actions and Investments



# ES-C2M2: Industry Use and Adoption

- Over 153 requests
  - 77+ utilities, 63+ non-utilities
  - 13+ international organizations
- Facilitated self assessments are continuing
- Utilities have begun self assessments
  - Identification of desired baselines
  - Prioritization of investment based on comparison of results to desired baseline

# Mapping with SG IMM

## ES-C2M2 Domain practices

SG IMM General Interoperability Category Goals & General Cross-cutting Issue Goals

KEY:

- Not Connected
- Somewhat connected
- Strongly Connected

	RISK	ASSET	ACCESS	THREAT	SITUATION	SHARING	RESPONSE	DEPENDENCIES	WORKFORCE	CYBER
Organizational (O) goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Informational (I) goals	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technical (T) goals	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Configuration and evolution (CE) goals	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operation and performance (OP) goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Security and safety (SS) goals	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

# Links and Contact Info

## ES-C2M2 Model

<http://energy.gov/oe/downloads/electricity-subsector-cybersecurity-capability-maturity-model-may-2012>

## ES-C2M2 Self-Evaluation Tool Requests, Questions, or Requests for Facilitation

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