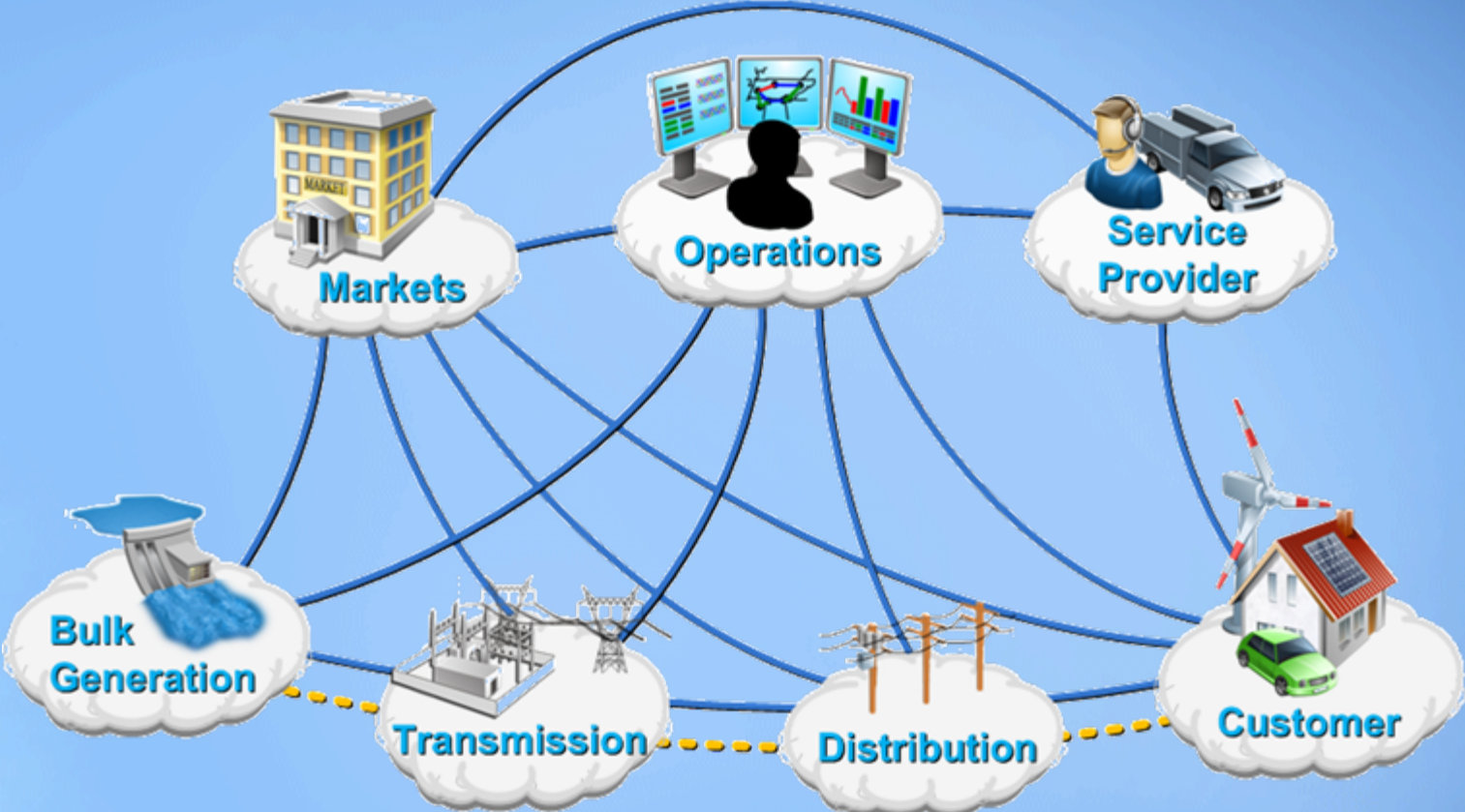







OpenADR (Open Automated Demand Response)

Terry Saxton
OpenADR Task Force

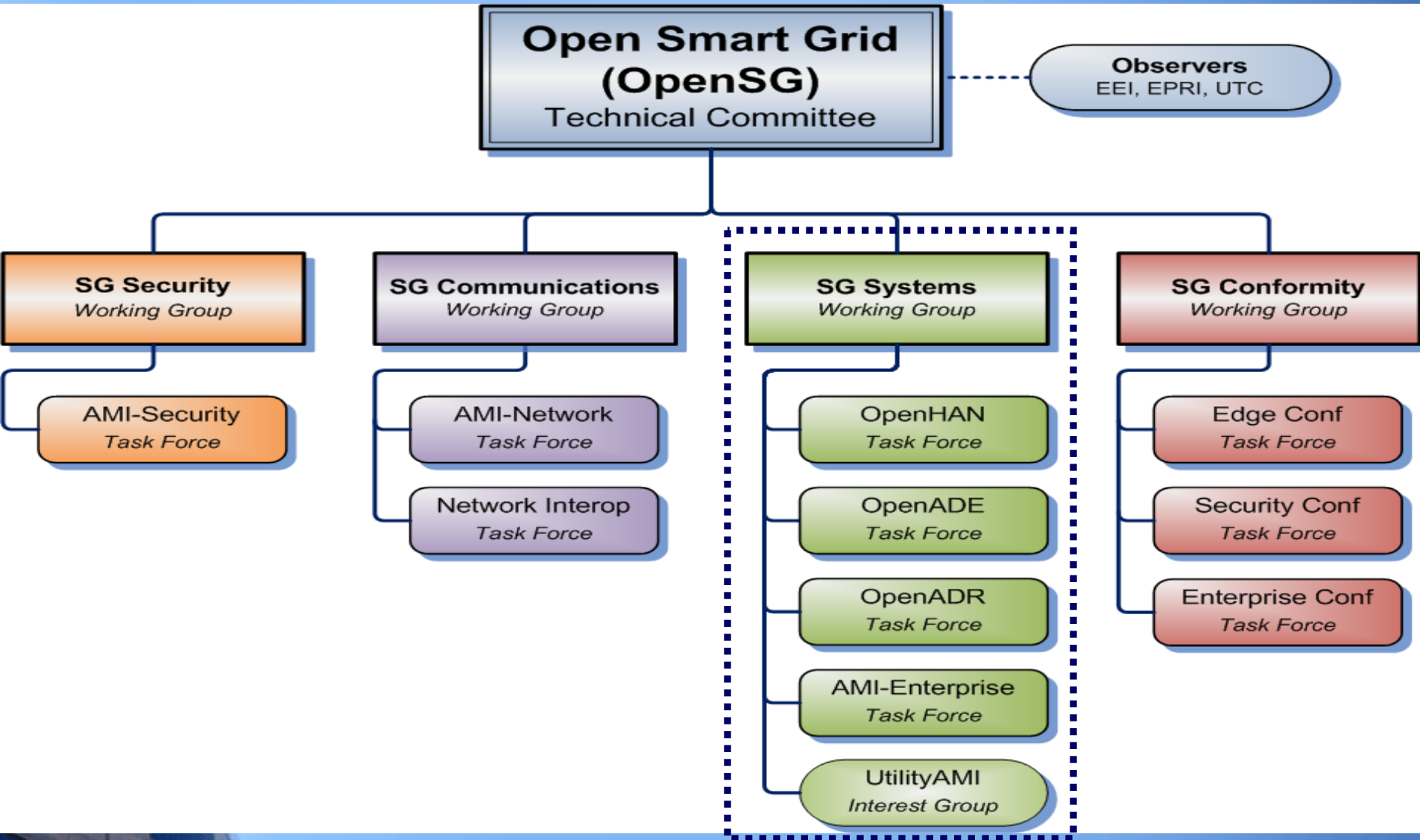
NIST Conceptual Model



	Secure Communication Interface
	Electrical Interface
	Domain

[Source: NIST Interim Roadmap]

OpenSG Subcommittee Organization



Our Focus: Finding/Developing *Best Practices* & Making Them into Vetted *"Industry Best Practices"*

Utility's
Projects
- Design &
Implementations

Utility's
Architecture

Industry Best Practices
Interoperability Testing

Industry Best Practices

Standards Conformance &
Interoperability Testing

Industry Standards

- Local Utility Projects
- Consortia & User Groups like OpenSG (business requirements) & CIMug (optimization & implementation support)
- Standards Development Organizations (SDOs) like IEC TC57 Working Group 14 for the IEC 61968 series of standards

Key Collaboration Concept for the SG-Systems Working Group

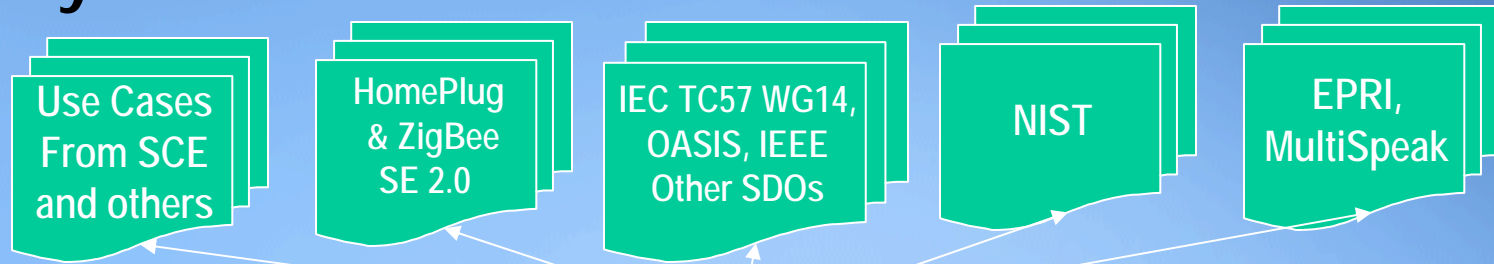


- **Standard building blocks** are defined by IEC, other Standards Development Organizations, and industry groups:
 - e.g., OASIS, Open Applications Group (OAG), MultiSpeak, OGC
- **Requirements (use cases)** are gathered from helpful sources
 - Utilities
 - Industry initiatives
- The SG-Systems WG articulates *Industry Best Practices* (see next slide) that satisfy **requirements** through the use of **standard building blocks**.
 - Recommended extensions and changes to **standard building blocks** are provided back to appropriate standards bodies.

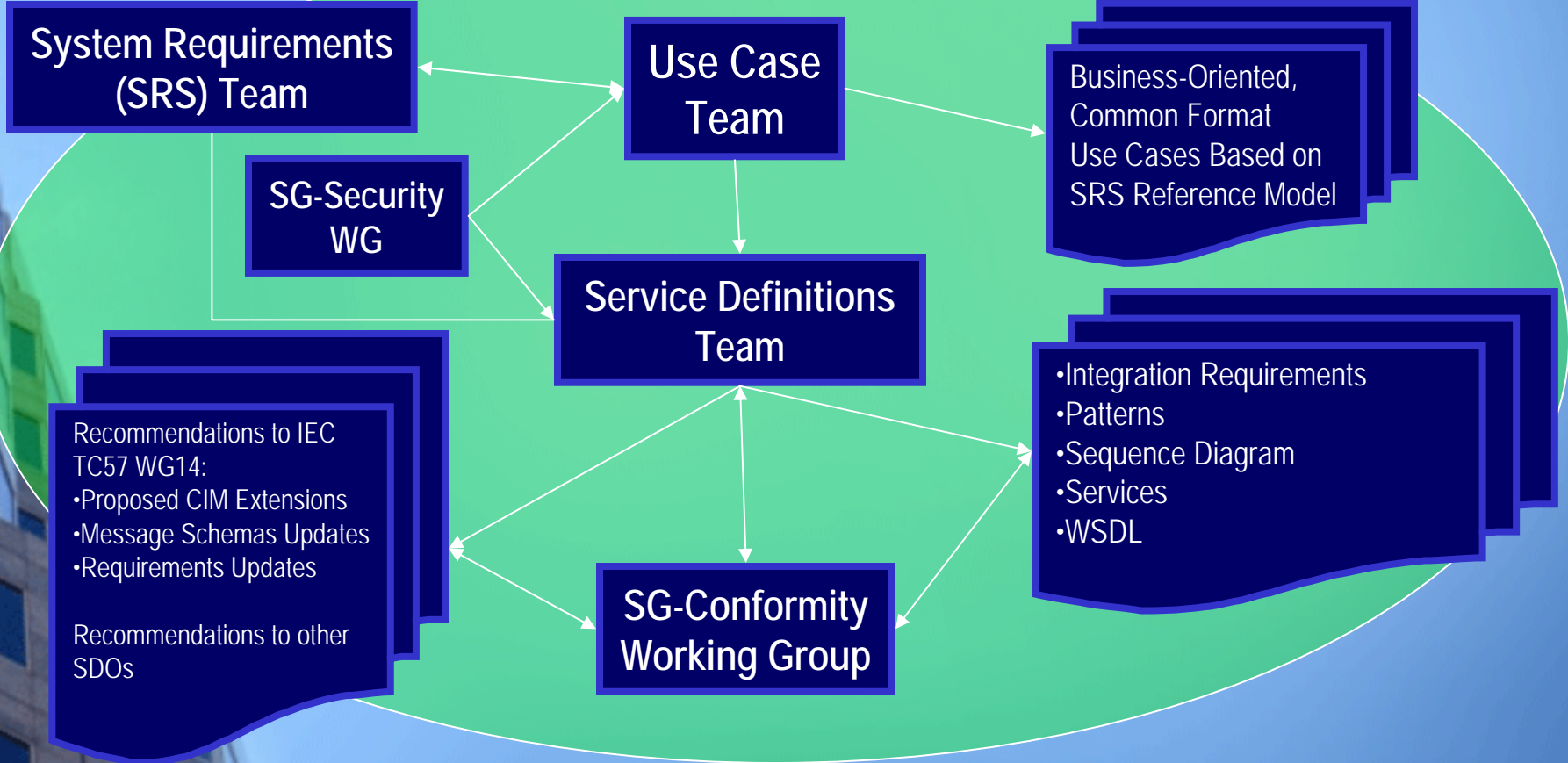
SG-Systems WG Scope

- SG-Systems WG:
 - The SG-Systems Working Group defines requirements, policies, and services, based on utility industry standards such as the Common Information Model (CIM), required for information exchange from and to utility enterprise back office systems and between these back office systems and data acquisition and control servers (e.g., MDMS, AMI Head Ends, SCADA, etc.).
 - Task forces are established on an as needed basis to accomplish these goals for specific functional areas. In addition to work performed by their 'vertical team,' Task Force Chairs act as matrix managers to ensure their functional requirements are met through the 'horizontal teams' supporting them.
 - 'Horizontal Teams' are ongoing, providing consistent artifacts for each increment of functionality that is requested of them by the functional (vertical) teams.

SG-Systems WG Process Overview



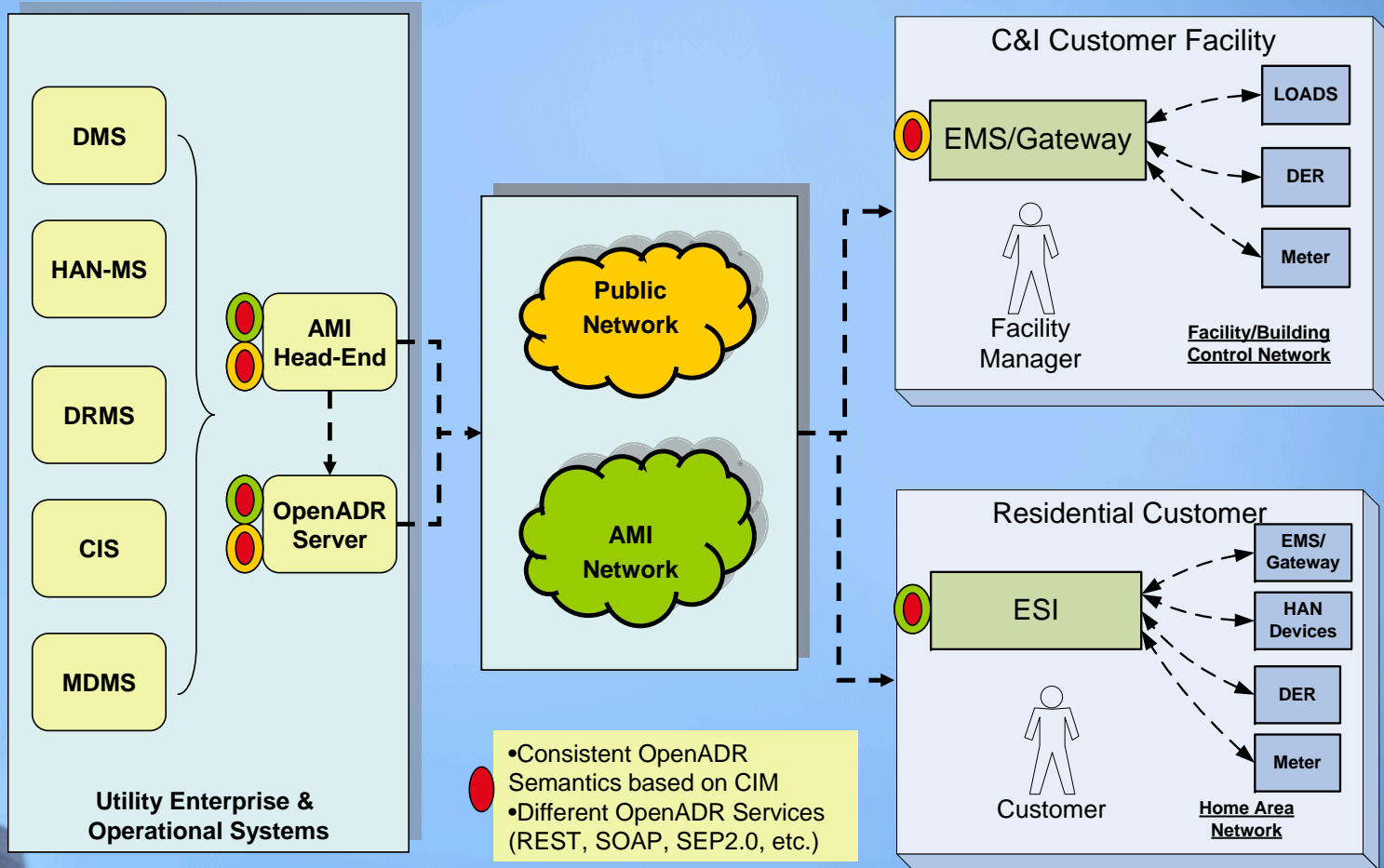
Task Forces



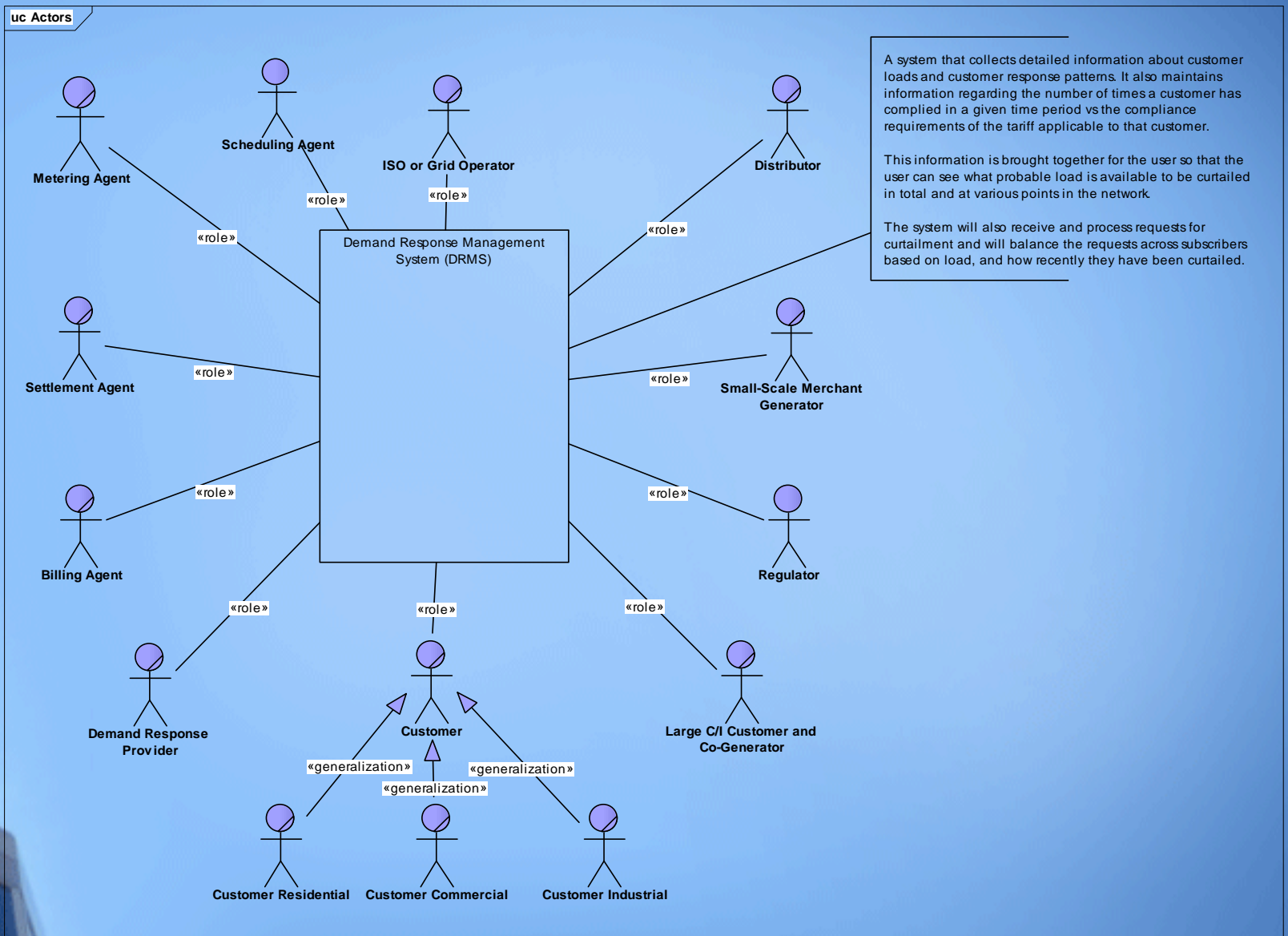
OpenADR

- OpenADR Task Force defines systems requirements, policies and principles, best practices, and services, required for business and data requirements for standardizing control and pricing signals for Demand Response (DR) and Distributed Energy Resources (DER) as part of the Smart Grid implementation
- OpenADR
 - Open user group forum
 - Developing set of utility-ratified requirements and specifications for utilities and 3rd Parties to adopt and implement
 - End-state of this effort will contribute to the development of open and interoperable Demand Response solutions and standards
 - Building on work of
 - The Demand Response Research Center and funded by the California Energy Commission (Energy Commission), Public Interest Energy Research (PIER) Program in development of the Open Automated Demand Response Communications Specification, also known as OpenADR or Open Auto-DR..
 - Requirements Specifications for Wholesale Standard DR Signals - for NIST PAP09, Requirements Specifications for Retail Standard DR Signals - for NIST PAP09

ADR Systems in Scope

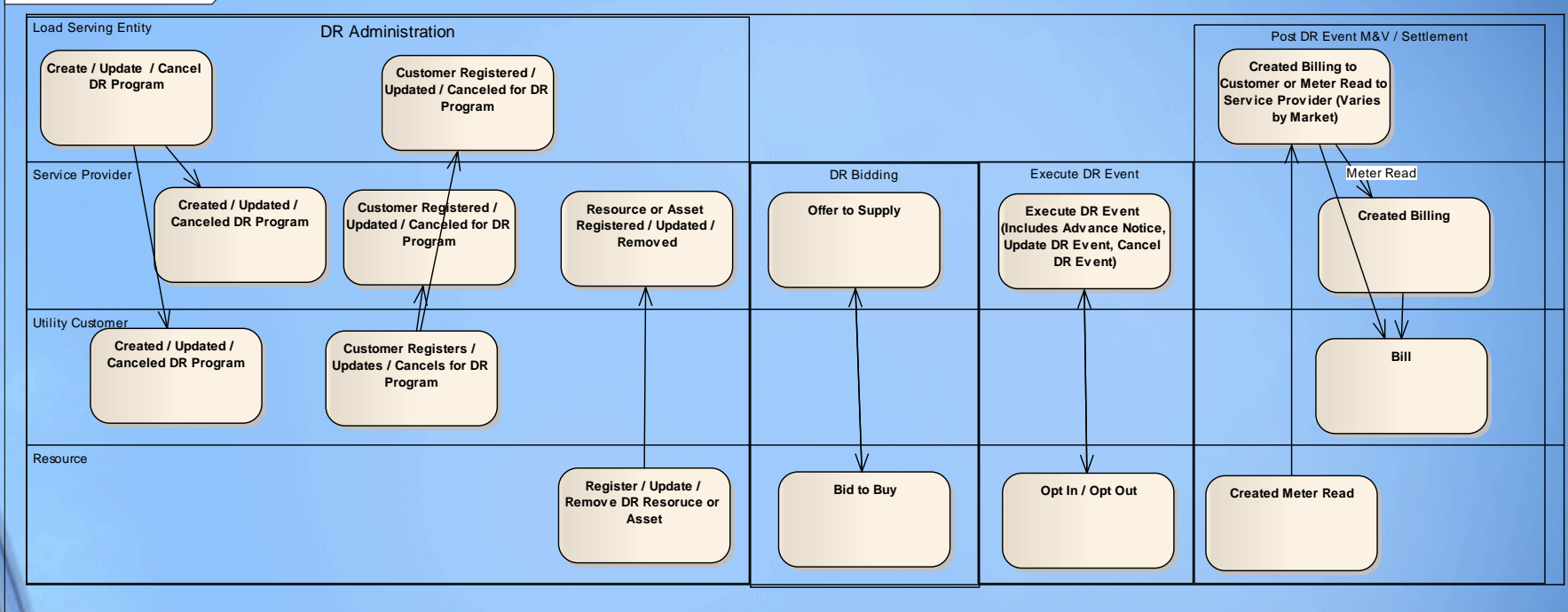


Open ADR Stakeholders (Actors)



Overview of Open ADR Business Process Flows

act High Level Activity Diagram

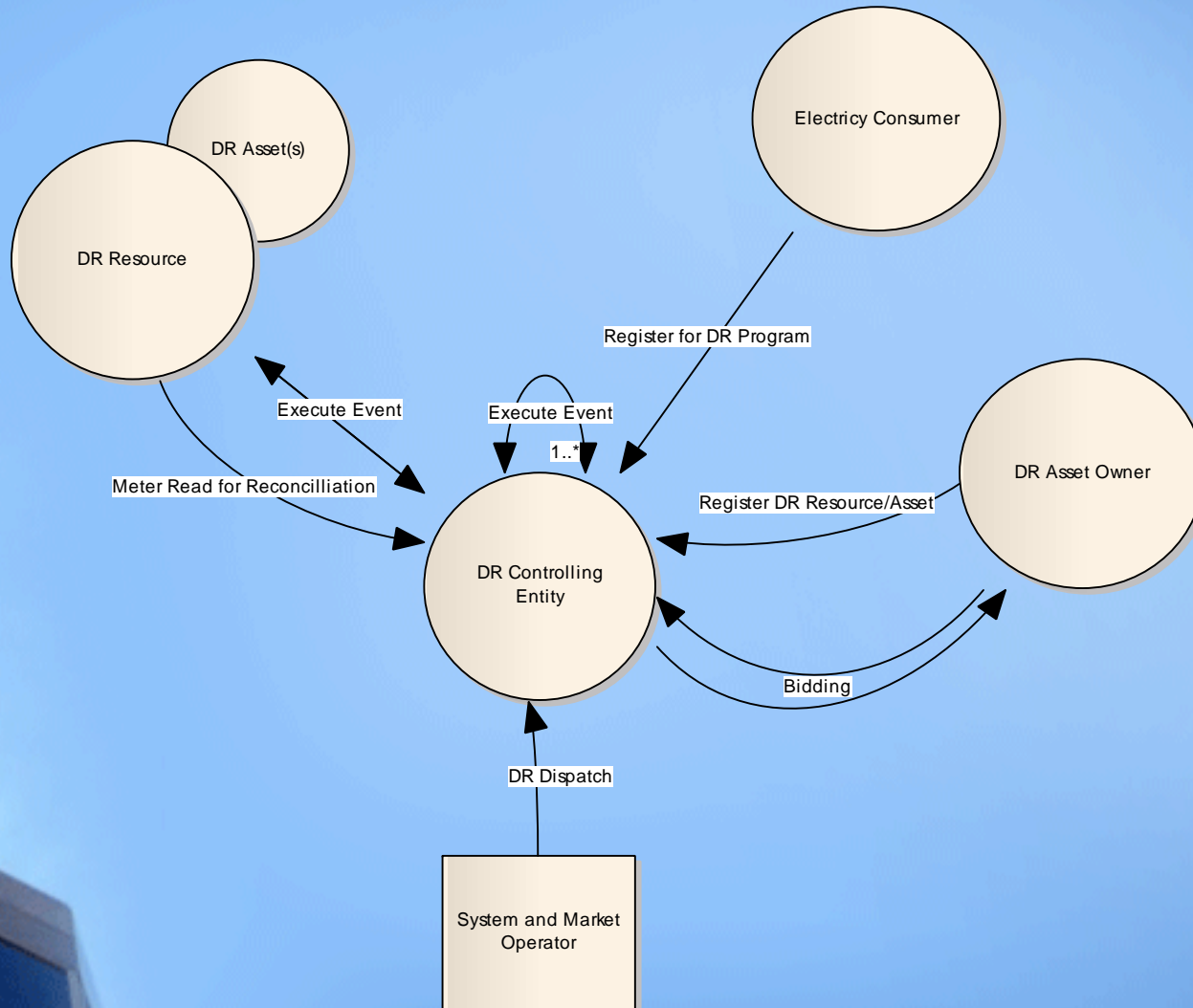


OpenADR Functional Requirements

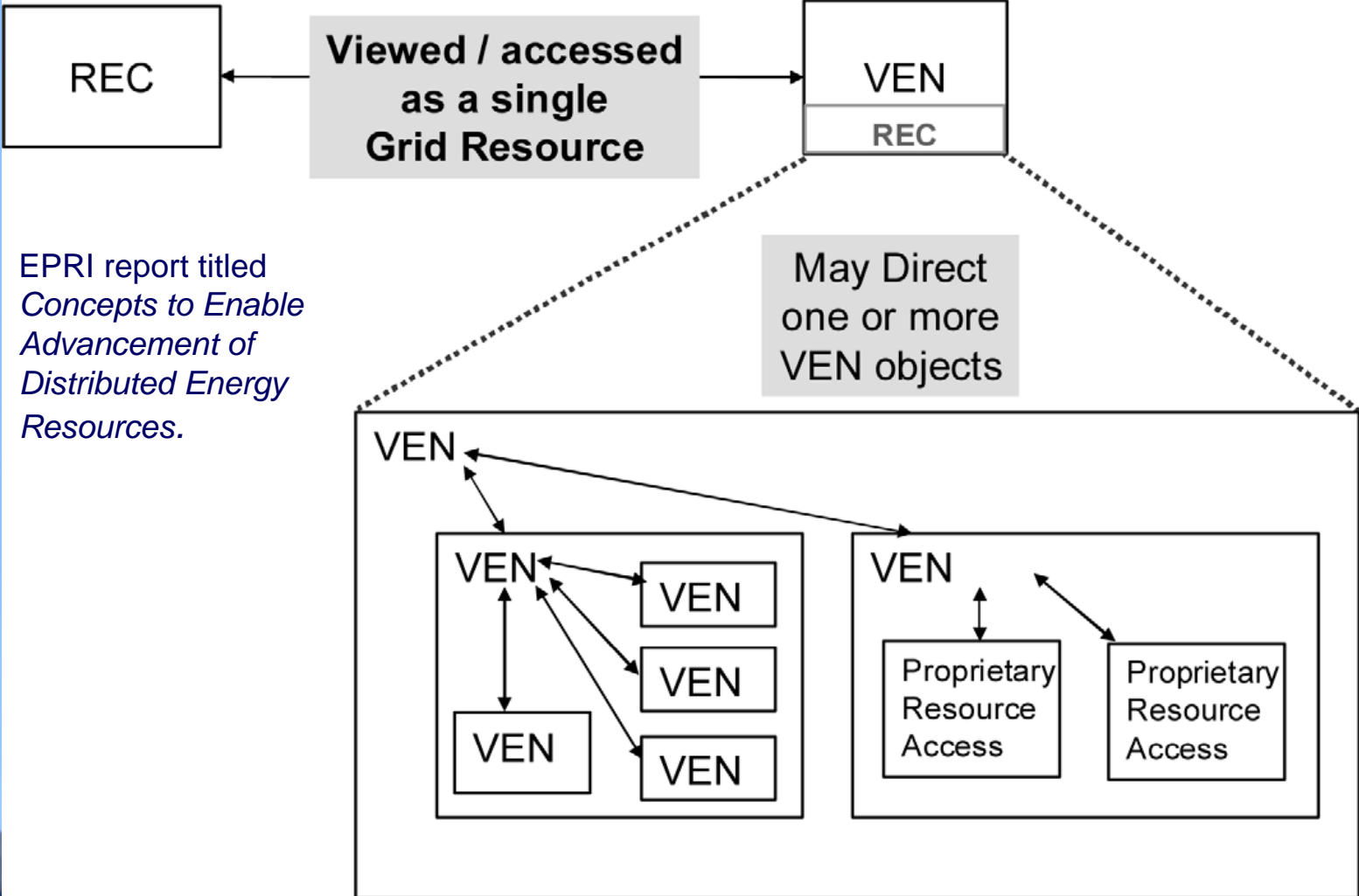
- Administrate Customer for DR (Limited to data required to support DR Signals)
 - Register / Enroll Customer for DR Program
 - Remove Customer from DR Program
- Administrate DR Resource (Limited to data required to support DR Signals)
 - Administrate Distribution DR Resource
 - Update DR Resource
 - Register DR Resource
- Administrate DR Asset (Direct Load Control)
 - Register DR Asset
 - Update DR Asset
 - Remove DR Asset
- DR Bidding
 - DR Bid to Supply (Retail Offers)
 - DR Bid to Buy
- Execute DR Event
 - Notify DR Event
 - Advanced Notification for DR Event
 - Update a DR Event
 - Cancel a DR Event
 - DR Resource Confirmation
 - Dispatch DR Objectives [\[TS1\]](#)
 - DR Direct Load Control
 - Monitor DR Event (DR Resource)
 - Monitor DR Event (DR Asset)
 - DR Real Time Pricing (RTP)
 - Operational Coordination
 - Post DR Event Management (out of scope, handled by other groups: AMI and if only meter reads and billing?)
 - Post DR Event M&V / Settlement (No Open Retail)
 - Post DR Event M&V / Settlement (Open Retail)

Logical Components and Data Objects

dfd Domain Diagram



Embraces ERPI REC-VEN Concepts



SG-Systems Organization Structure

SG-Systems WG

Chair: Brent Hodges
Co Chair: Greg Robinson

AMI-Ent TF

Chair: Mark Ortiz
Co-Chair: Greg Robinson

OpenADE TF

Chair: Dave Mollerstuen
Co-Chair: Steve Van Ausdall

OpenADR TF

Chair: Albert Chiu
Co-Chair: Ed Koch

OpenHAN TF

Chair: Erich Gunther
Co-Chair: Mary Zientara

Use Case Team

Chair: Ralph Martinez
Co-Chair: Kay Stefferud



Underway

Underway
With NAESB



SRS Team

Chair: Joe Zhou



Underway

Underway
With NAESB



Service Definitions Team

Chair: Jerry Gray
Co-Chair: Shawn Hu



Planning

Collaboration
With SE 2.0
& OASIS

Collaboration
With SE 2.0

SG Conformity WG

Chair: Bruce Muschlitz
Co-Chair: Zahra Makoui

Planning

Planning

Collaboration
With SE 2.0
& OASIS

Collaboration
With SE 2.0

SG Security WG

Chair: Darren Highfill
Co-Chair: Matt Carpenter

Underway

Underway

Collaboration
With SE 2.0
& OASIS

Collaboration
With SE 2.0