

The Smart Grid – Seeing the Trees for the Forest

Dan Delurey
Demand Response and Advanced Metering Coalition

NARUC
Energy, Resources and the Environment
Committee
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Smart Grid – Why We Get It

- Present state of outage management
 - Rolling the trucks
 - Waiting for the calls
- When the wind stopped blowing in Texas
- Cranking up the AC during peak period regardless of wholesale costs
- Supply resources in one place and demand in another
- Technological Developments

Smart Grid – Why They Will Get It

- Using info to make informed purchases
- Choices in purchasing
- Home networks – even if they don't have one
- Sensors and controls
- Open communications (see: Internet)
- Connected to information networks (see: cable, ATM, mobile phone)
- Information feedback (see: Prius effect)
- Optimize energy usage between different options (see: Hybrid Autos)

Smart Grid – Groping the Elephant

- Smart Grid, i.e. as in *THE* Smart Grid
- Smart Grid, i.e. as in *A* Smart Grid
 - Regional
 - State
 - Service Territory
 - Local
 - Micro
- Smart Grid, i.e. as in the concept
- Smart Grid, i.e. as in the design principle
- Smart Grid, i.e. as in the operating mode
- Smart Grid, i.e. as in the type of technology
- Smart Grid, i.e. as in the religion

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Title 13 Section 1301 – Statement of Policy

- It is the policy....to support....which together characterize a smart grid:
 - Digital information and controls
 - Dynamic optimization with cyber-security
 - Distributed Resources and DG, including renewable energy
 - Demand Response and Energy Efficiency
 - Smart technologies for metering, grid communications and distribution automation
 - Smart appliances and consumer devices
 - Advanced storage and peak-shaving technologies, including PHEVs and thermal-storage A/C
 - Information and control options to consumers
 - Standards for communication and interoperability
 - Identification and lowering of barriers

Smart Grid – According to Wikipedia

- Smart Grid is a transformed electricity transmission and distribution network or "grid" that uses robust two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability and safety of power delivery and use..... The term **Smart power grid** may best be defined as using communications and modern computing to upgrade the current electric power grid so that it can operate more efficiently, reliably and safely. **Such an upgrade is equivalent to bringing the power of the Internet to the transmission, distribution and use of electricity** - it will save consumers money and reduce CO2 emissions..... The development of modern micro-electronics, and especially the entry of the microprocessor, opened new ways to significantly improve power grid control. The evolutionary integration of intelligent, distributed, and highly-adaptive control systems made available with microelectronics is being referred as **the smart grid** in Title XIII of the U.S. Energy Independence and Security Act of 2007.[\[1\]](#)

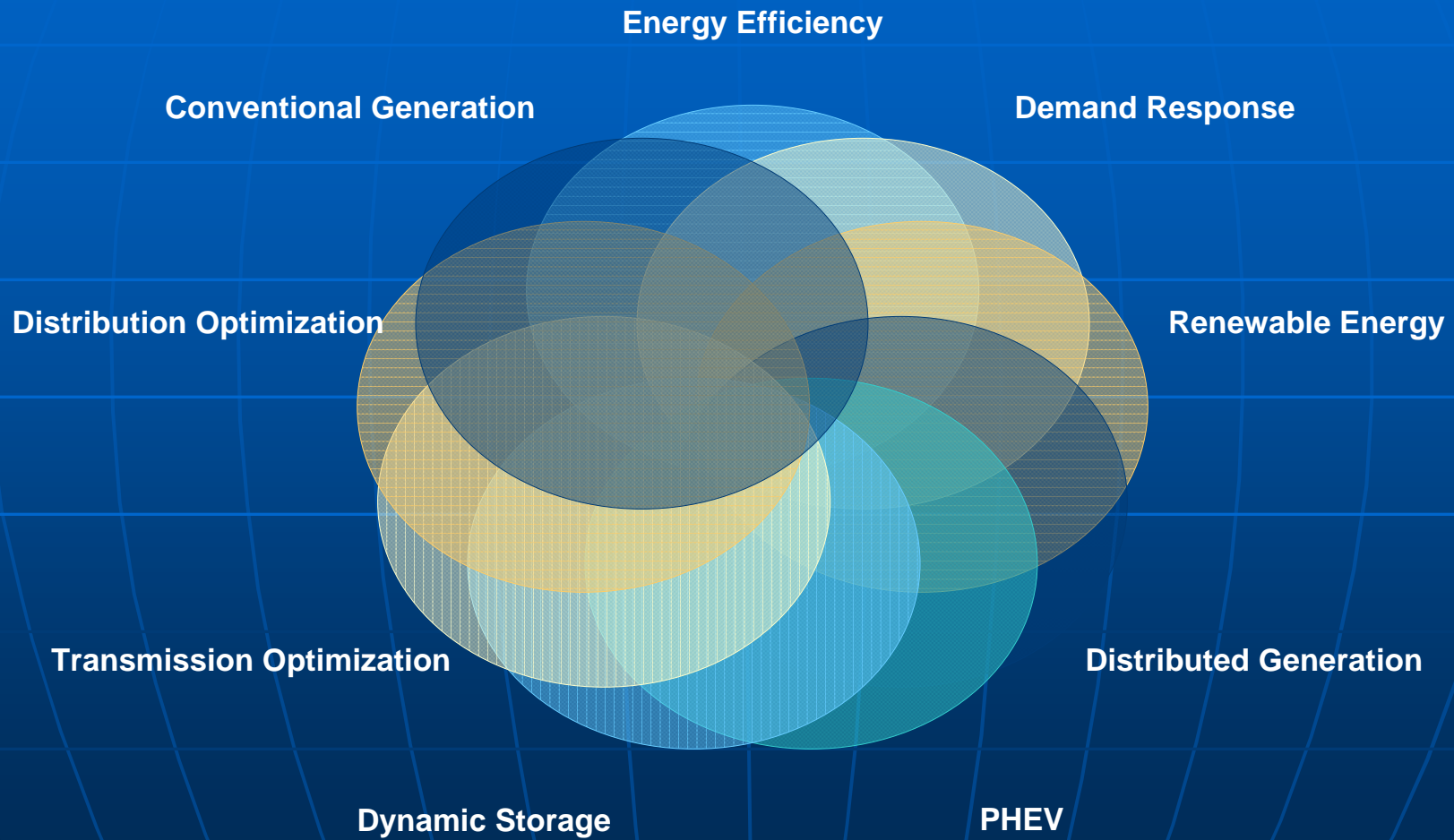
Smart Grid a.k.a the Electranet?

Societies of the future will rely on small, diversified and renewable sources of energy, ranging from windmills and solar photovoltaics to second-generation ethanol-and biodiesel-production facilities. Widely dispersed throughout the countryside, these streamlined facilities will make the industrialized world more secure and less dependent on unstable and threatening oil-producing nations. Off-grid applications of renewable power sources can provide energy for the 3 billion people now stuck in poverty.

In the industrialized world, these systems will require a newly designed distribution grid. An "electranet," or smart grid, will be flexible and allow homeowners and businesses to sell or buy electricity on to and off of the grid. It will allow individuals and families to monitor their consumption much as they monitor budgets and bank accounts today.

Former Vice President Al Gore, Newsweek "My Turn"
December 18, 2006

Smart Grid - Resources



Smart Grid – The Definition Chase

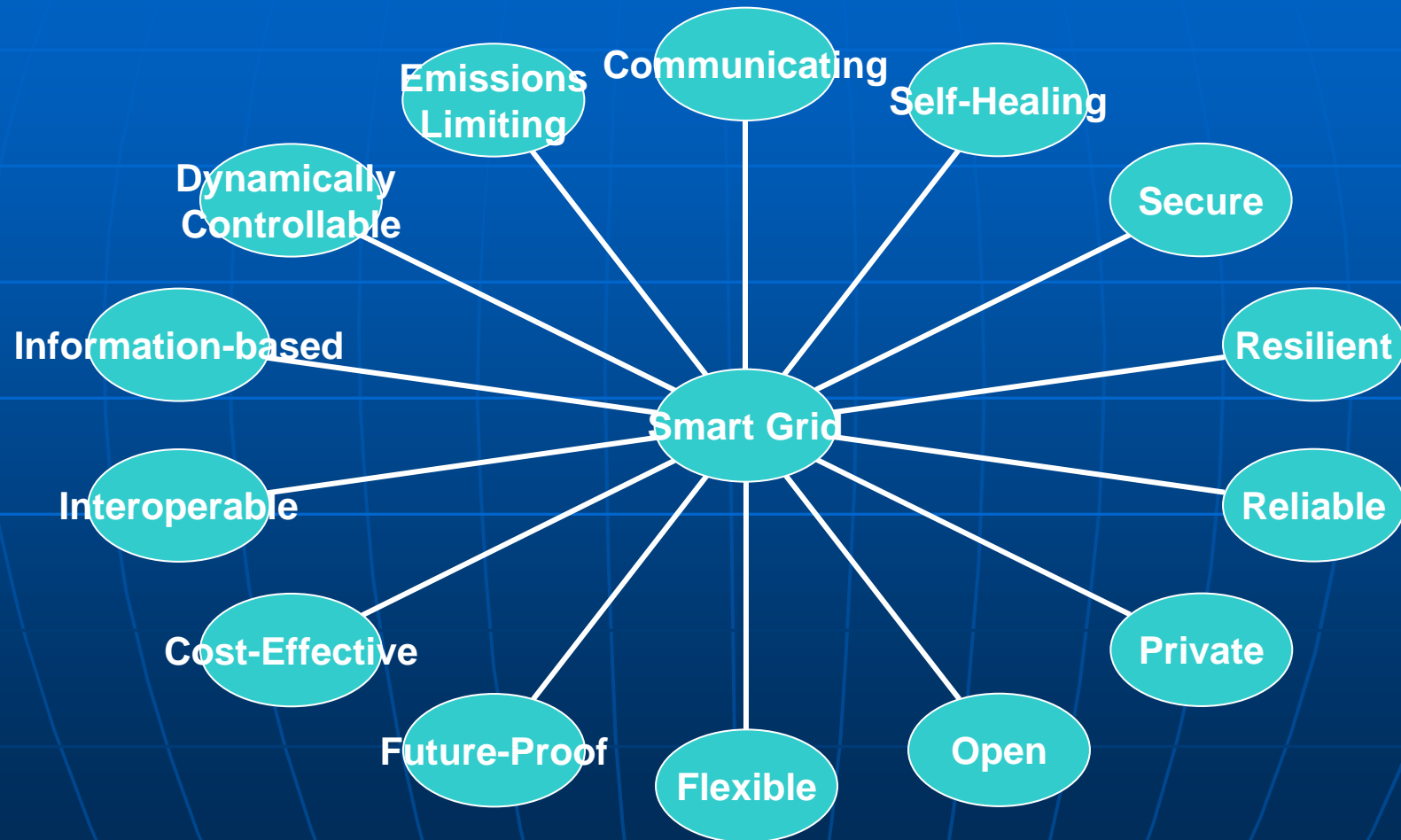
- The Holy Grail.....

.....But few exist in other areas

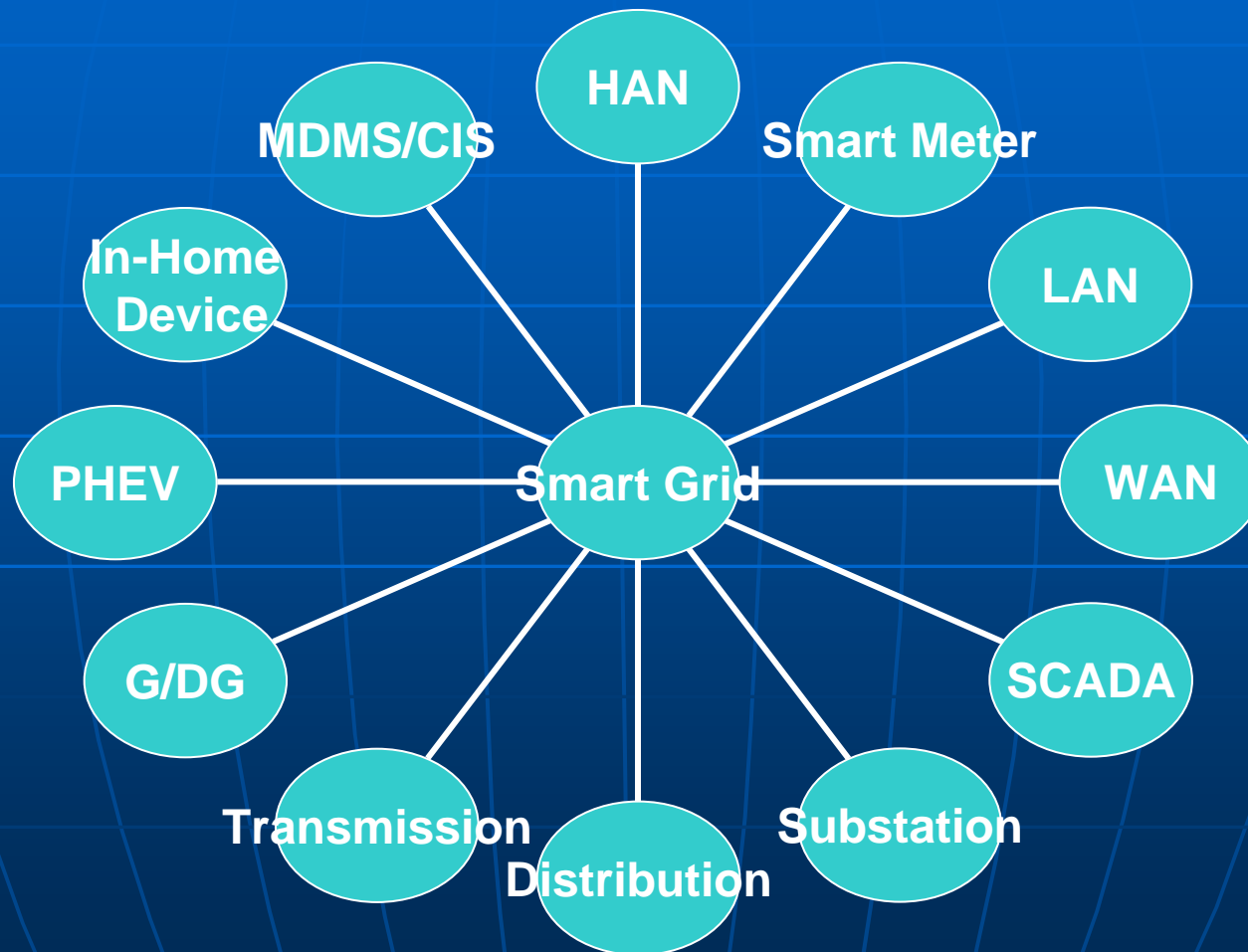
- Demand Response
- Distributed Generation
- Renewable Energy
- Energy Efficiency

....and yet we seem to know what we are talking about

Smart Grid – The Desirable Attributes



Smart Grid – Disassembled



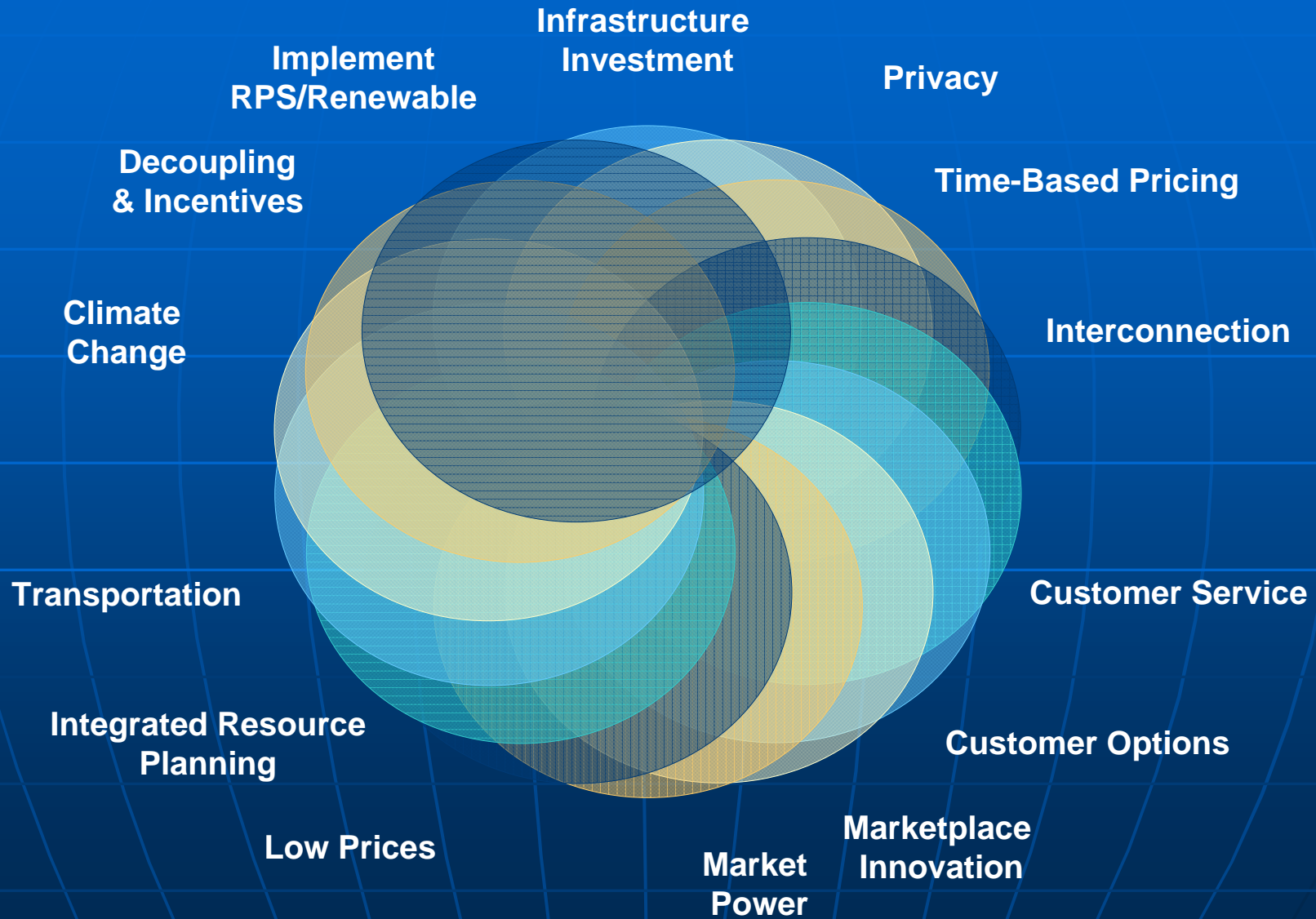
Smart Grid - Myths

- The Smart Meter is being superseded by the Smart Grid
- The Smart Grid will happen in one big bang
- The Smart Grid is a brand or certification

Challenges for Policy Makers

- Connecting Resources to Demand (Interconnection)
- Ensuring Reliability
- Ensuring Least Cost Planning and Operations
- Introducing Time-Based Prices
- Approving Infrastructure Investments
- Ensuring Privacy
- Ensuring Openness and Flexibility
- Ensuring Marketplace Innovation
- Getting into the Transportation Business
- Providing Incentives for Action
- Keeping Prices Low
- Mitigating market Power
- Giving Customers Options for Bill Control
- Implementing Integrated Resource Planning
- Implementing RPS
- Using Demand Response and Smart Grid to address Climate Change

Challenges for Policy Makers



Smart Grid “Vehicles” for State Regulators

- EPACT

- PURPA 14
- PURPA 15

- EISA

- PURPA 17
- PURPA 18
- PURPA 19
- PURPA 20
- National DR Assessment
- National DR Action Plan
- National Survey of Smart Grid Deployments

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Title 13 Section 1307 – State Considerations

- New PURPA Standard (17) Smart Grid Investments
 - Utilities must consider smart grid investments before proceeding with “traditional” investments
 - Utilities are authorized to recover costs of smart grid investments
 - Utilities are authorized to recover remaining book value of infrastructure made obsolete

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Title 13 Section 1307 – State Considerations

- New PURPA Standard (18) Smart Grid Information
 - Purchasers shall be provided direct access, in writing or electronically, to information including:
 - Prices
 - Usage
 - Intervals and Projections
 - Sources and emissions

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Title V – Efficiency and Demand Response

- New PURPA Standard (19) – Integrated Resource Planning (IRP)
 - Integrate Efficiency into IRP
 - Adopt policy establishing efficiency as a priority resource

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Title 5 – Efficiency and Demand Response

- New PURPA Standard (20) – Decoupling
 - Align utility incentives with energy efficiency (rate design)
 - Promote energy efficiency investment
 - Removing throughput incentive
 - Adopt rate designs to encourage efficiency
 - Offer customers info and services in energy efficiency and demand response

Smart Grid “Vehicles” for State Regulators

- Utility Rate Cases
- Freestanding Proceedings
 - AMI
 - Microgrid
 - Demand Response
 - Energy Efficiency
 - Rates
- Implementing Regulations for State Legislation

Smart Grid : Seeing the Trees for the Forest

Thank You

Dan Delurey

www.dramcoalition.org