



# POWER MARKET OUTLOOK – GRID TRANSFORMATION AND THE IMPACT OF DISTRIBUTED ENERGY RESOURCES

14<sup>th</sup> Annual Platts Utility Supply Chain Management Conference

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# Introduction

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- The influx of Distributed Energy Resources is changing the way utilities operate
- There is tremendous interest in “the utility business model” and what changes mean for all aspects of the utility
- This talk will focus on:
  - What the changes are
  - Impacts to utilities
  - The continuum of regulatory responses
  - What this means for supply chain

# The Hype and the Headlines

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**Business Models Are Changing (Forever! Today!)**

**Utilities Are Facing a Death Spiral, a Mortal Threat!**

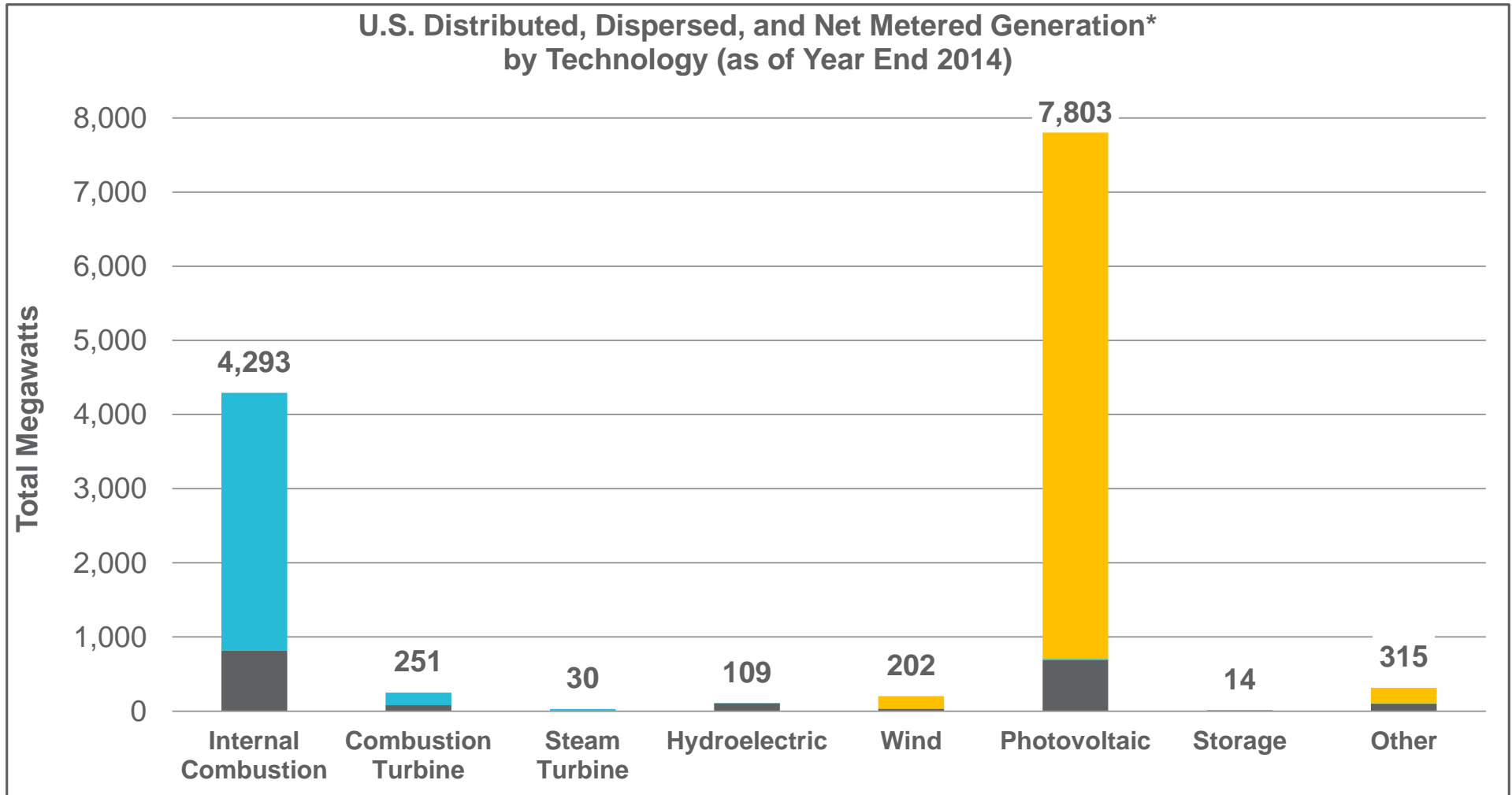
**Solar Panels and a Battery in Every Home**

**DSO – COMING TO A NEIGHBORHOOD NEAR YOU!**

**Get Paid to Save Energy! See How Much You Can Save!**

**A Microgrid on Every Campus; In Every Community!**

# Distributed Energy Resources

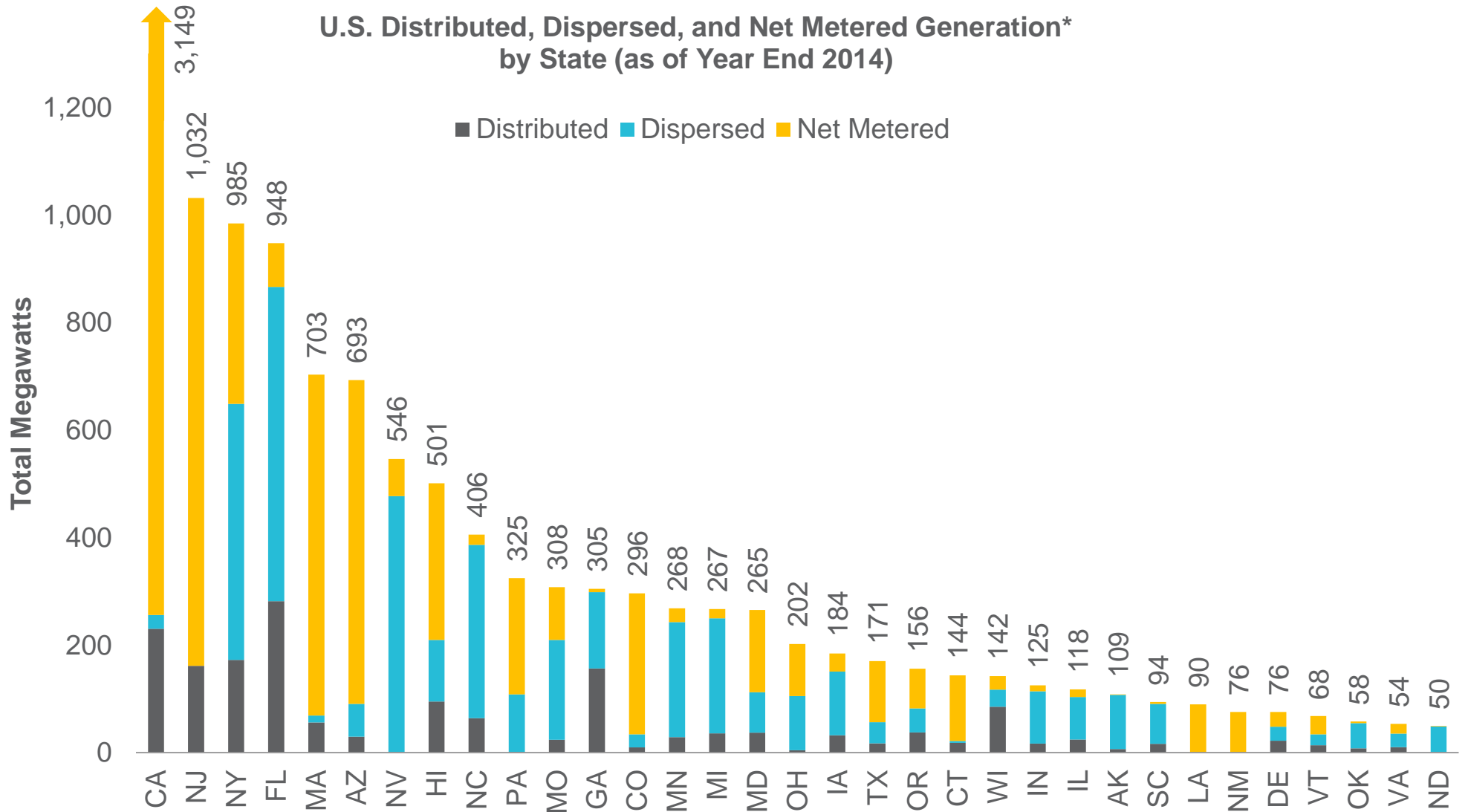


**2014 U.S. Decentralized Capacity: 13,018 MWs**  
**2013 U.S. Electric Generating Capacity (Summer): 1,060,064 MWs**

Notes: \*Distributed and dispersed includes commercial and industrial generators <1 MW; net metered refers to residential, commercial, and industrial generators <2 MW. Distributed and net metered are grid connected and grid synchronized; dispersed generators are not connected or synchronized to the grid. Figures include both actual and estimated and both utility and customer-owned generation. Due to nature of the data, it is possible some systems may be double counted.

Sources: EIA Form 860 and 861 data; ScottMadden analysis.

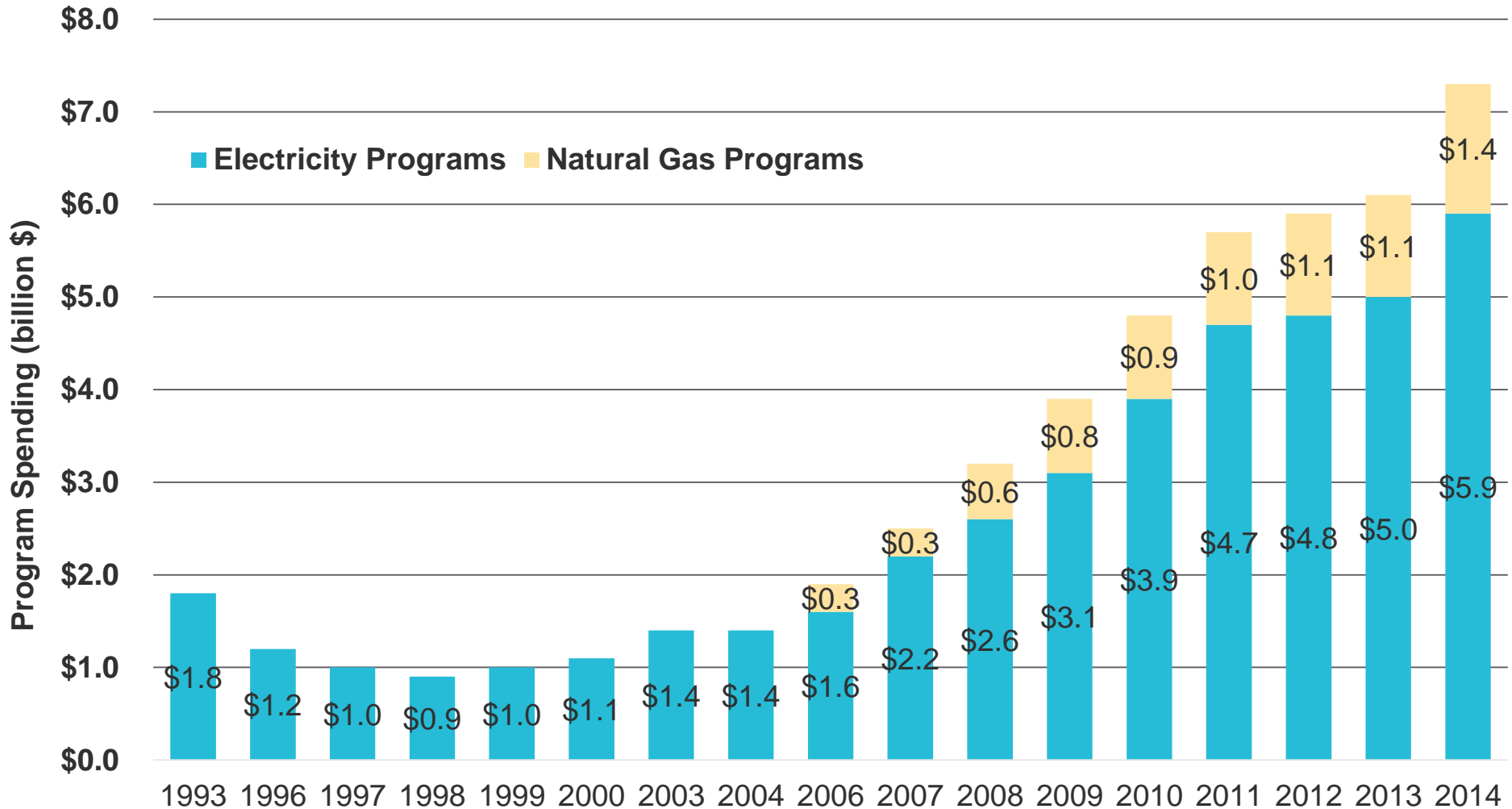
# Distributed Energy Resources



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# Energy Efficiency Programs



Annual electric and natural gas energy efficiency program spending. Natural gas spending is not available for the years 1993–2004.

Sources: Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; CEE 2012, 2013, 2014, 2015; Gilleo et al. 2015.

# What the Heck Does That Mean??

## A working definition:

- The changes driven by the emergence of **distributed energy resources (DER)** in **all major functions** of electric utilities

### Distributed Energy Resources (DER)

Energy Efficiency  
Demand Response  
Distributed Generation  
Storage  
Electric Vehicles  
Microgrids

### All Major Functions of Electric Utilities

Regulatory  
Operations  
System Planning  
Customers  
Stakeholder Management  
Revenue Generation  
Pricing  
Supply Chain

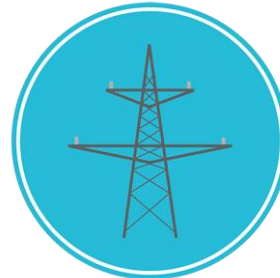
**The degree of impact to these major functions driven by DER varies significantly by state and region.**

# Complexity and Uncertainty



## Stakeholders

- Who gets a say?
- For what issues?



## System Planning

- What resources will be where, when?
- How do I know it will be reliable?



## Operations

- Who operates what, where, when, and how?
- What's actually out there anyway?



## Pricing

- How do we price the products we offer?
- What are customers willing to pay?



## Regulatory

- What are the rules?
- How and when will they change?



## Customers

- What do they *really* want?
- What services?
- How much control?
- How much information?



## Revenue Generation

- How does the utility make money?



# A Continuum of Responses

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# Market is King



## Key Characteristics:

- **Complete wholesale deregulation for IOUs:** wires companies that earn an ROE on T&D
- **Munis and Coops:** remain fully integrated

## What this means:

- Utility scale renewables (wind and solar) have grown as they have been able to compete effectively in the ERCOT market
- Retail energy service providers create products that customers will buy in IOU territories; mainly compete on price with limited DER offerings
- Munis and coops have led the state in innovation providing utility scale and DER alternatives; largely because they retain the connection to the customer and can provide holistic offerings to customers

# Reforming the Energy Vision: Tracks 1 and 2

## Track 1

- Demonstration Projects
- Distributed Systems Implementation Plan (DSIP)
- Benefits Cost Analysis (BCA) Framework
- Energy Efficiency Transition Implementation Plan (ETIP)
- Non-Wires Alternatives (NWA)
- Interconnection Processes
- Microgrid Configurations
- Consumer Protections
- Consolidated ESCO Billing

## Track 2

- Earnings Impact Mechanisms (EIMs)**  
New performance incentives that are tied to desired outcomes; initially, positive only or symmetric only
- Market Based Earnings (MBE)**  
Opportunities for utilities to increase revenue by acting as the platform to supplement rate-based revenue
- Rate Design and DER Compensation**  
Determining the value of D (LMP + D), continuing net energy metering, and modifying existing rate designs
- Scorecard Mechanisms**  
Metrics that are to be tracked but not monetized at this time; to be considered as future EIMs

Rate Cases

AMI

# Building Blocks

**Distribution Resources Plans  
(R.14-08-013)**

**Integrated Demand-Side  
Management  
(R.14-10-003)\***

**Storage  
Procurement  
(R.15-03-011)\*\***

**Net Energy  
Metering  
(R.14-07-002)**

**Alternative  
Fueled Vehicles  
(R.13-11-007)**

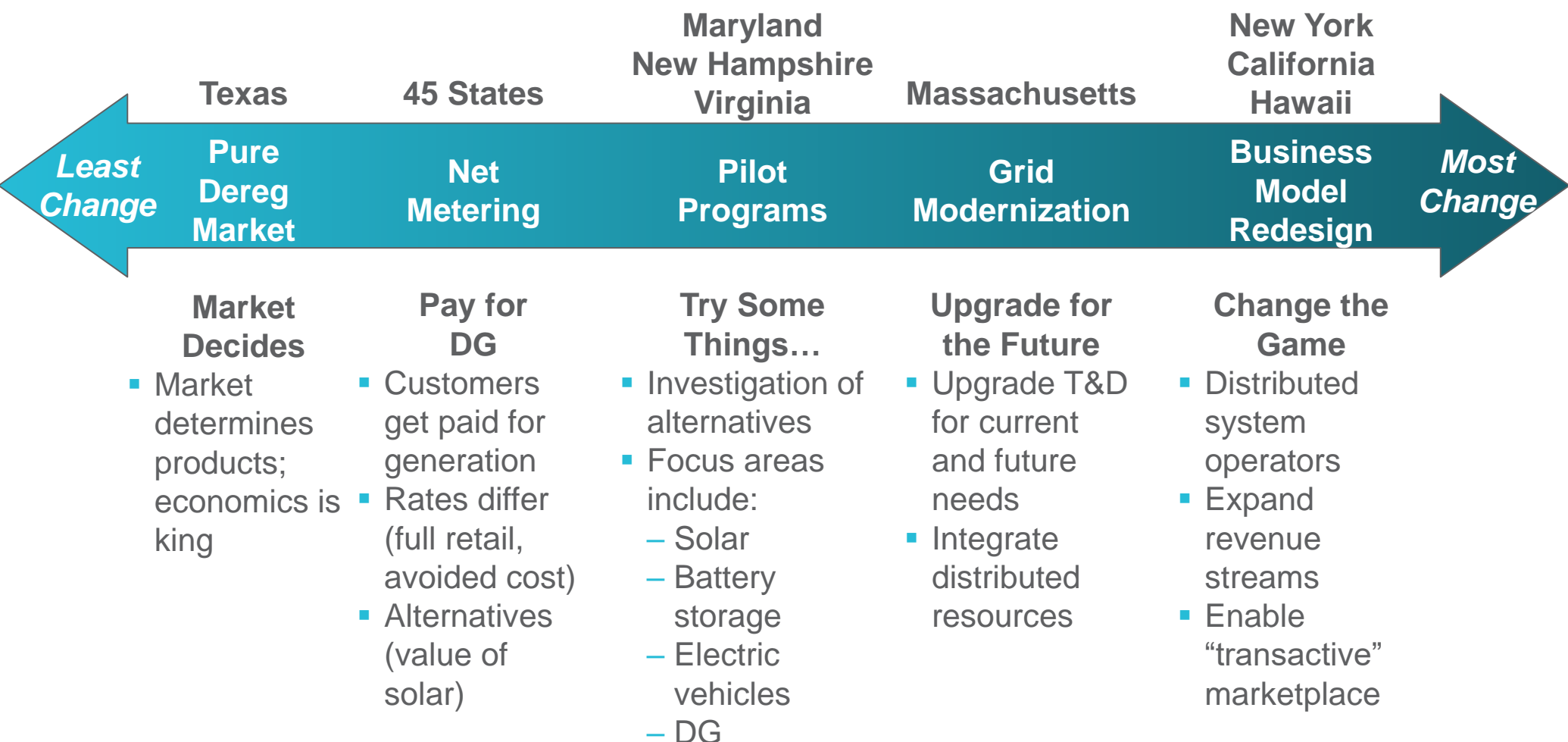
**Energy  
Efficiency  
(R.13-11-005)**

**Renewable  
Portfolio  
Standard  
(R.15-02-020)**

**Residential Rate Reform (R.12-06-013)**

**General Rate Cases**

# A Continuum of Responses



# Grid Transformation's Impact on Supply Chain

Several forces will conspire to pressure supply chain organizations to adapt and incorporate a more sophisticated approach. Supply chain organizations will face **complex sourcing** requirements and multi-step RFP solutions, such as Qualifications-Based Selection (QBS).



- The number of parties supply chain will have to interact with  
**will increase**
- Sophisticated contracting needs  
**will increase**
- Pace of change  
**will increase**
- Specialization of programs  
**will increase**
- Switching costs  
**will increase**
- Unclear variables that influence pricing  
**will increase**

These are characteristics of complex markets and indicate that alternative sourcing mechanisms should be considered.

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