

Regulation and Market Design

Coordinated Public Policy and Market Design for the Emerging Smart
Grid

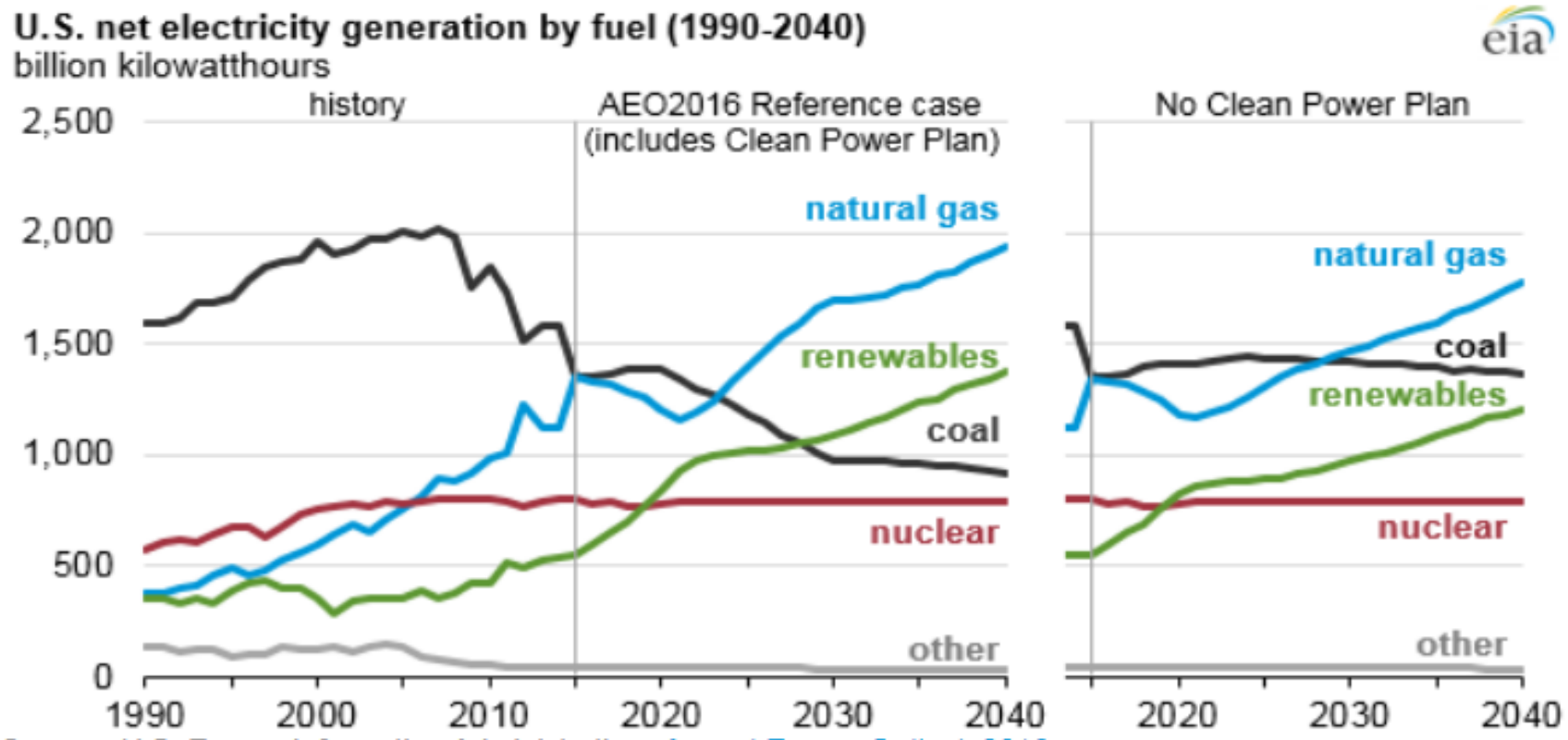
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- AEO US Net Electricity Generation Forecast
- Demand Response The Understated Story
- Transition to Smart Grid –Regulatory Considerations

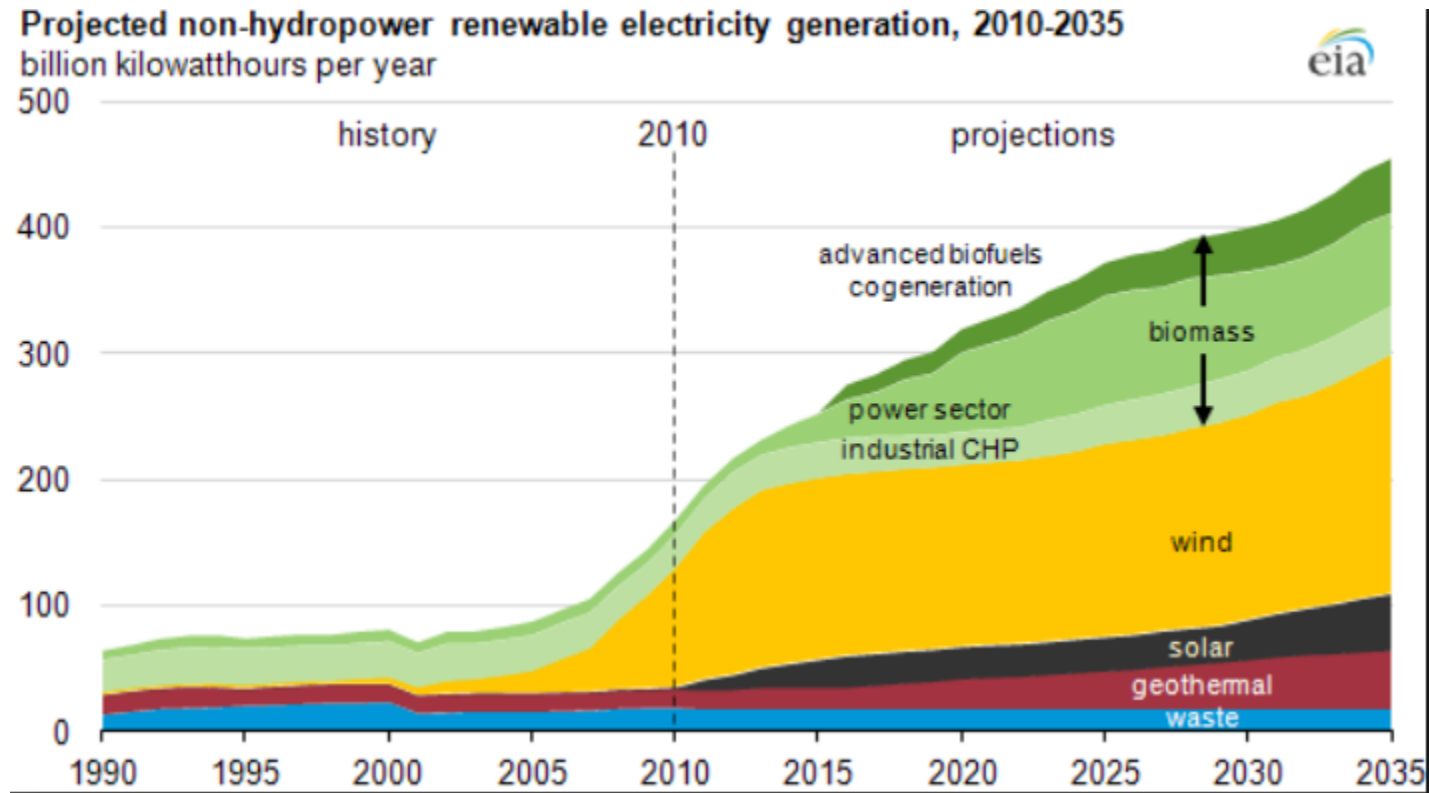
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AEO US Net Electricity Generation by Fuel



Projected non-Hydropower Renewable Forecast



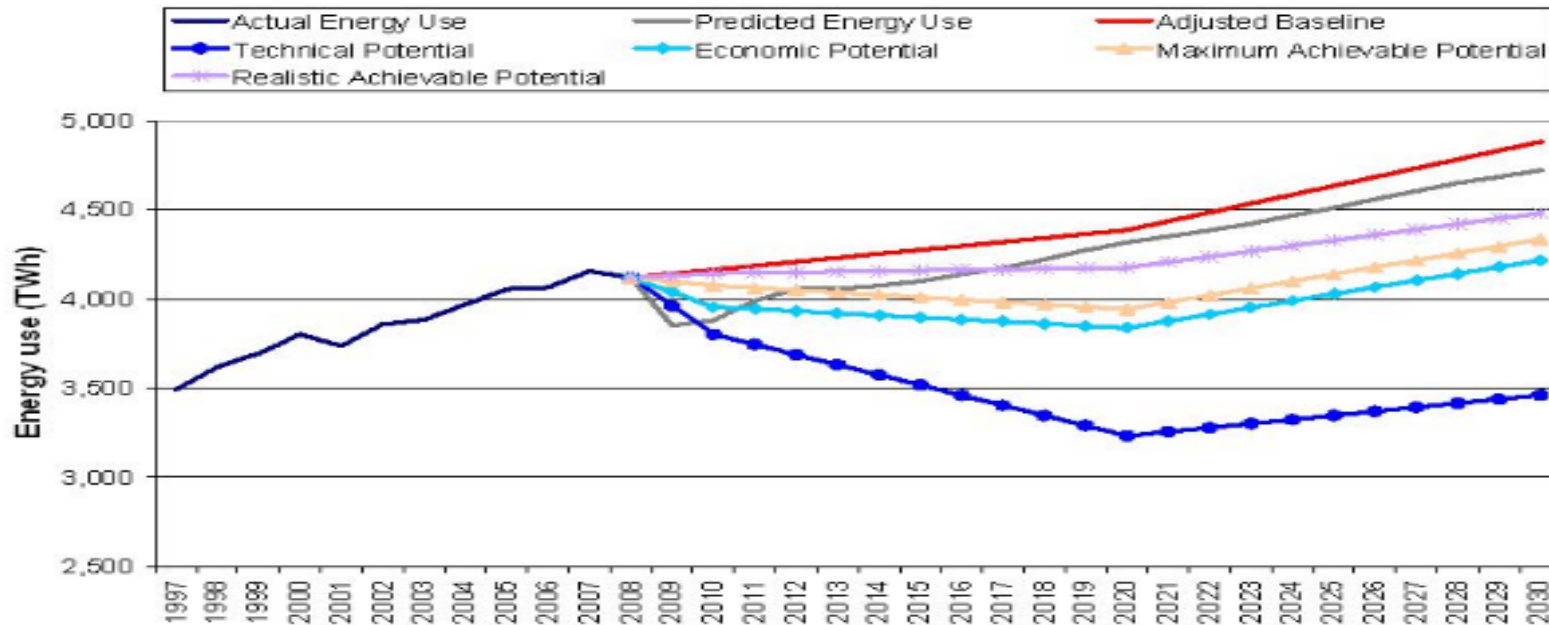
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DR Impact on US Electrical Consumption

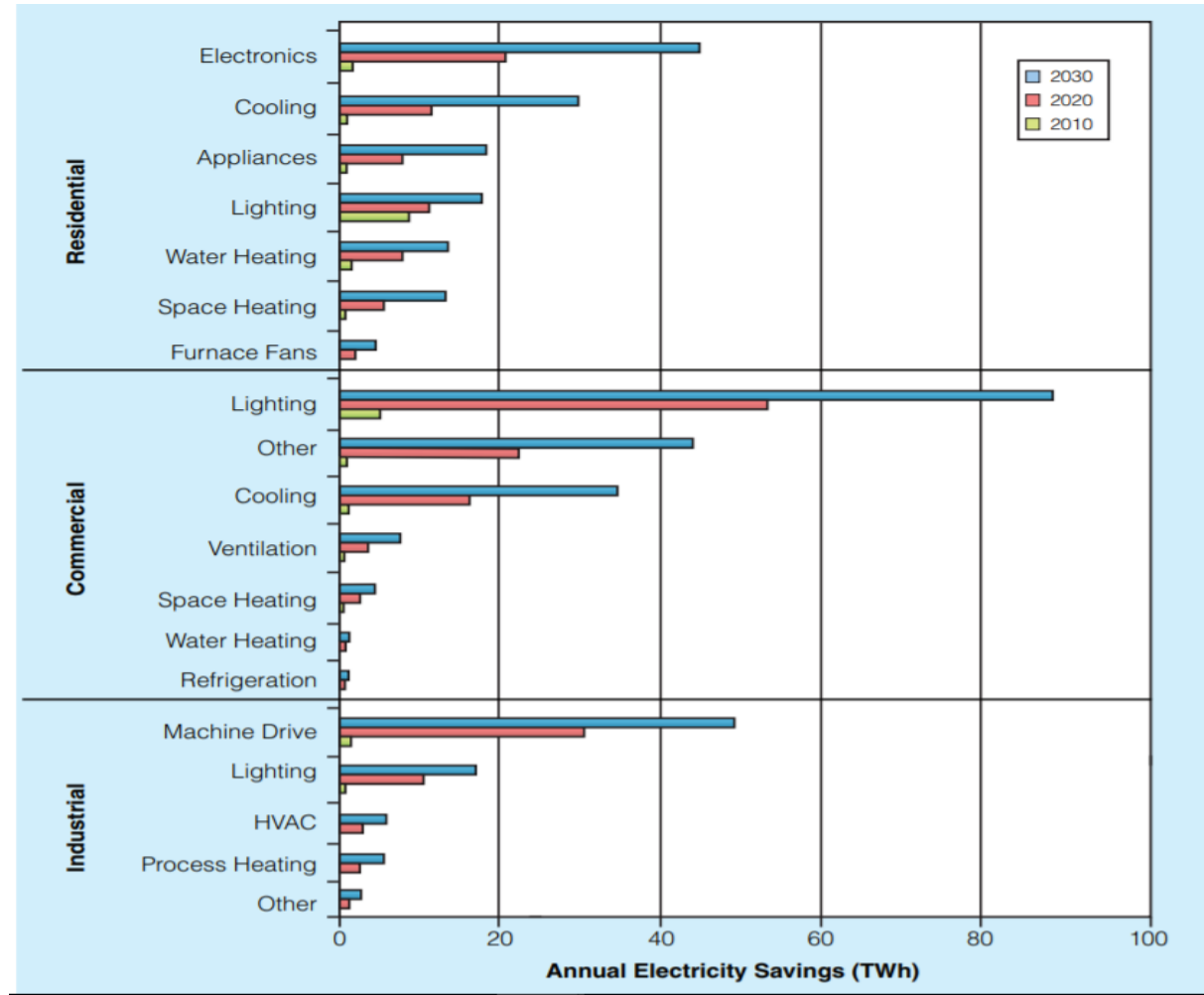
The economic potential scenario yields a reduction of 664 TWh in 2030

Historic and Forecasted Energy Use in the U.S.,
with EPRI energy efficiency reductions



Source (Actual Energy Use): EIA Electric Power Annual 2008
Source (Predicted Energy Use): EIA Annual Energy Outlook 2010
Source: EPRI Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S.

Realistic Achievable Potential by End-Use



EPRI Assessment of Achievable Potential from Energy Efficiency and Demand Response Programs in the U.S. (2010–2030)

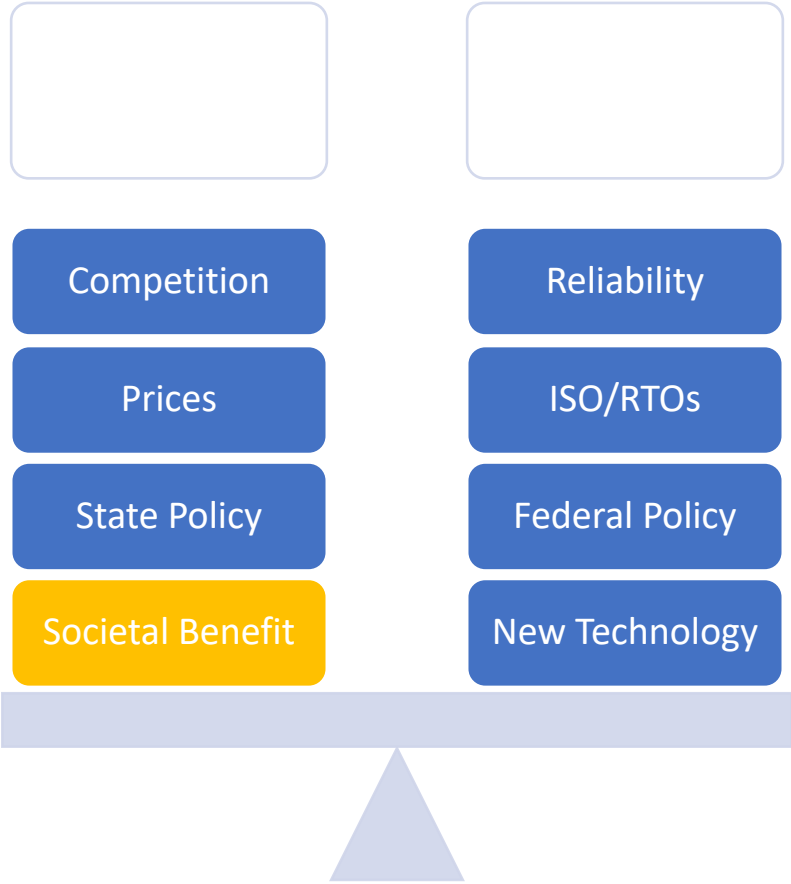
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Transition to Smart Grid –Regulatory Considerations



Traditional Regulatory Prism

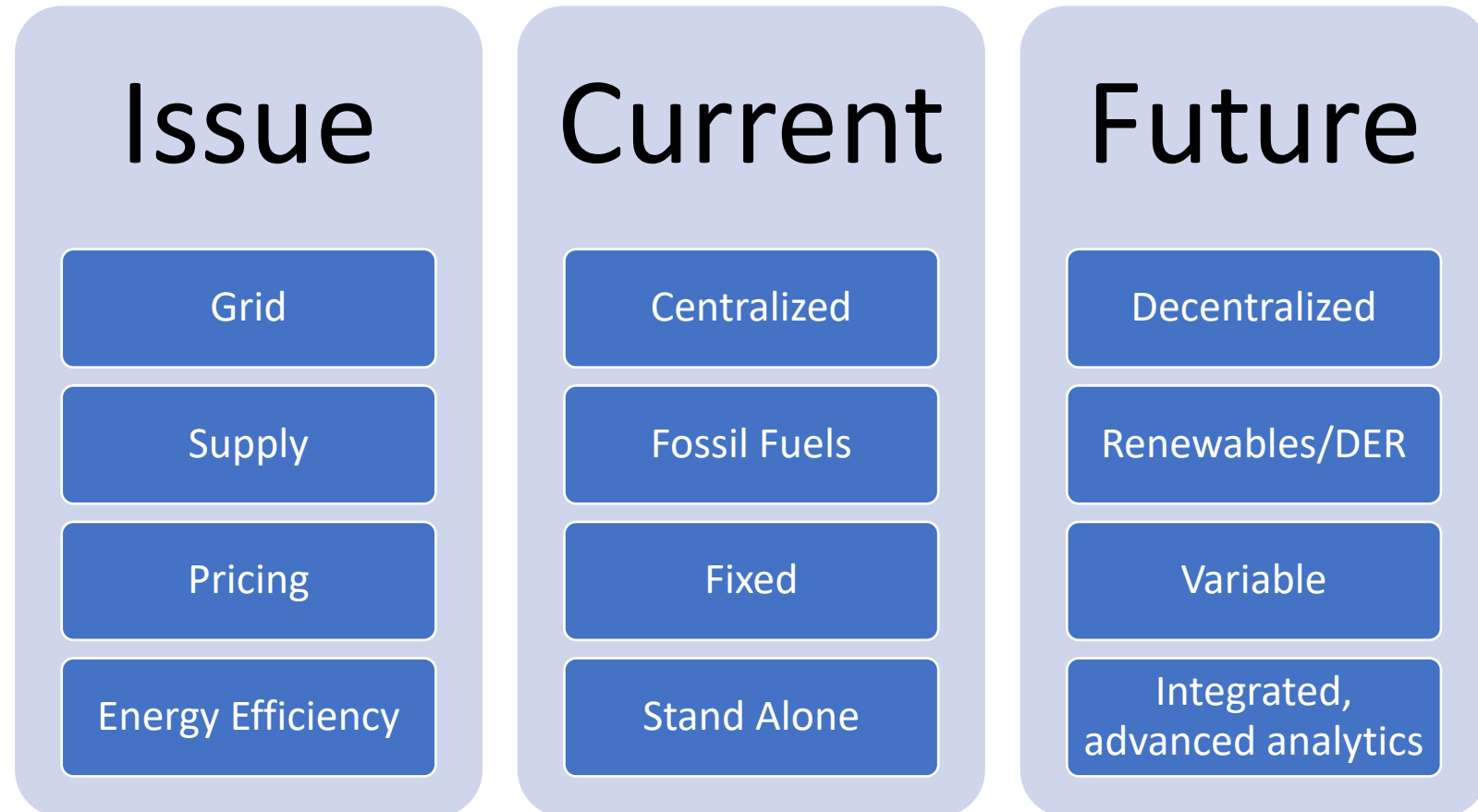
- **FERC:**

- Mission: Reliable, Efficient and Sustainable Energy for Customers.
Assist consumers in obtaining reliable, efficient and sustainable energy services at a reasonable cost through appropriate regulatory and market means

- **State**

- [PUC Texas] Mission: We protect customers, foster competition, and promote high quality infrastructure.

Challenges to the Existing Regulatory Models



Emerging Regulatory Challenges

- Federal traditional policy conflicting with state policy initiatives
 - Minimum Offer Price Rule (i.e. PJM: D.C. Circuit's July 2017 decision (*NRG Power Marketing, LLC v. FERC*))
 - FERC Order 750 (Affirmed by Supreme Court)
 - REV (Renewing the Energy Vision NY)
- New market entrants
 - Big data companies and related analytics challenging the traditional models (i.e. centralized dispatch and control)
 - DER/DR companies having greater impact on the future smart grid (UK BEIS, see renewables overtaking gas by 2020 and number one source of generation, including less than half as much new gas capacity by 2035 as expected last year)¹
- Impact of renewables to grid reliability
 - DOE NOPR; Cost recovery status for coal and nuclear
 - NERC 2017 Long-Term Reliability Assessment; Impact of DER on local distribution grids and system planning
- Carbon Initiatives Impacts
 - Ontario instituted a carbon tax on January 1, 2018
 - Repeal of Clean Power Act (NOPR EPA Oct 10, 2017)
- Risk to regulatory certainty
 - Dec 2015 Nevada PUC decision to disallow net metering for new and existing solar (partially reversed for existing solar, Nevada State District Court for Carson City Sep 2016)

¹Jan 2018, CarbonBrief

New Paradigms for Regulations and Market Design

- Traditional regulatory constructs require rework:
 - MOPR and capacity markets
 - ISO/RTOs, States, FERC and Courts grapple with a rapidly changing energy landscape
 - Innovation: ISONE; CASPR
 - Rapidly increasing DER and impact on local distribution grids and system planning
 - NYISO pilot program integration DER technologies into its wholesale market systems.
 - Build operational DER experience among the NYISO, utilities and market participants, and demonstrate market and grid operational coordination to integrate DER and DER aggregations – aligned with NYISO DER Roadmap and in spirit of New York's REV objectives
 - Increased use of DR and DR acting as resource
 - DRAM in CA (launched 2014 with the IOUs)
 - Pilot programs (i.e El Paso Electric 2017 -thermostats, National Grid won the NARUC inaugural Utility Industry Innovation in Gas Award -gas demand response pilot program -2017)
- Assessment and integration of 'smart grid' regulatory risk on business model for the transition to Smart Grid