

**Introductory (Virtual, Not-for-Attribution) White Board Session:**

***Incenting Competitive, New-Build Generation in  
Alberta's Wholesale, Energy-Only Electricity Market***

**Friday, February 26, 2021 12:00 PM - 3:00 PM (MST)**

**Video Conference Call (GoToMeeting) Coordinates:**

Please join the video conference call from your computer, tablet or smartphone.

[Link Emailed to Invited Participants](#)

**You can also dial in using your phone.**

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**AGENDA**

**1) Introductions**

**North American Subject Matter Expert, Industry  
Advisory and Investor Participants (15)**

**REDACTED LIST OF PARTICIPANTS**

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**2) The Challenges of Financing and Building New Baseload/Intermediate Generation Capacity in Alberta's Wholesale, Energy-Only Electricity Market**

- Forward Capacity Market ‘MIA Gap’ – Good, bad, indifferent to attracting competitively-priced capital?
- Relative Regulatory (climate/carbon-constrained) Operating Environment?
- Internal (project specific) Capital Cost Risks?
- Public Policy Considerations (ratepayer/industrial load cost-pass-through impacts)?
- System Flexibility and Longer Term Supply Adequacy?
- Variable Load Demand and Variable Generation Risks?
- Longer Term Industrial Strategy Risks?

Discussion Leads:

➤ **Redacted Developer/Investor Participant #1**

➤ **Redacted Developer/Investor Participant #2**

- Shane Pospisil (NWO; former ADM, Energy Supply and Conservation, Ontario Ministry of Energy; Interministerial Lead, RES-1, RES-2 and CES-1 pre-OPA competitive clean energy supply procurements (Ontario); Lead, Project Sponsor Team on 3 successful PJM capacity auction bids and 3 ERCOT-region renewable/clean energy project build-outs)
- Dixie Thompson (Northern Eagle IP)
- Rob Richard (Ithena AI)
- Open Discussion and Q&A

**3) Ontario: Coal Phase-Out/Lessons Learned**

Discussion Lead:

- Dr. Bryne Purchase (former Ontario Deputy Minister of Finance; Deputy Minister of Energy, Science and Technology; Director, Ontario Financing Authority, Ontario Electricity Financing Authority, Ontario Innovation Trust, Ontario SuperBuild Corporation, and OPG Ventures Corporation; Respected Industry Advisor and Noted Commentator)

➤ **Redacted Developer/Investor Participant #3**

**4) Ontario: Incenting ‘Competitive’ New-Build Generation – What (if any) Lessons Learned?; What to Avoid?; and Potentially-Relevant Best Practices for Alberta?**

Discussion Lead:

- Michael Killeavy (Power Advisory/Toronto ON; Interministerial RFP Development and Evaluation Team Member, RES-1, RES-2 and CES-1 pre-OPA competitive clean energy supply procurements (Ontario); former Contract Manager, OPA and successor counterparty)

➤ **Redacted Developer/Investor Participant #4**

**5) PJM/ERCOT: Incenting ‘Competitive’ New-Build Generation – What (if any) Lessons Learned?; What to Avoid?; and Potentially-Relevant Best Practices for Alberta?**

Discussion Lead:

- Shane Pospisil (NWO; former ADM, Energy Supply and Conservation, Ontario Ministry of Energy; Interministerial Lead, RES-1, RES-2 and CES-1 pre-OPA competitive clean energy supply procurements (Ontario); Lead, Project Sponsor Team on 3 successful PJM capacity auction bids and 3 ERCOT-region renewable/clean energy project build-outs)

➤ **Redacted Developer/Investor Participant #5**

**6) Roundtable Discussion**

- Relative Merits of the Alberta Business Case - Mid-Tier with Risks to be Mitigated?
- 1,000 MW Combined-Cycle Great Spirit Power Project Case Study/Lessons Learned
- Status Quo vs Potential Market-Based ‘Mitigative Responses’ or ‘Incentives’
- Next Steps (if any) in Engaging with Key Public Policy Decision Makers?

## **Handout / ERCOT/PJM: Incenting ‘Competitive’ New-Build Generation**

- What (if any) Lessons Learned?
- What to Avoid?
- Potentially-Relevant Best Practices for Alberta?
  - Discussion Lead: Shane Pospisil

**Other Presenter Handouts  
Available Upon Request  
and Subject to Permission  
Being Granted**

### **Introduction**

Electricity markets are designed to provide reliable, low-cost electricity to all classes of consumers (residential, commercial, industrial, and institutional).

Electricity markets are designed markets. They did not emerge from an unorganized marketplace. Rather, they were designed through a regulatory process in large part because electricity is viewed as an essential service, but also because of its technical properties.

Two primary goals: (1) short term efficiency – making the best use of existing resources – and longer-term efficiency – promoting efficient, pro-competitive investment in new generation and/or demand side management.

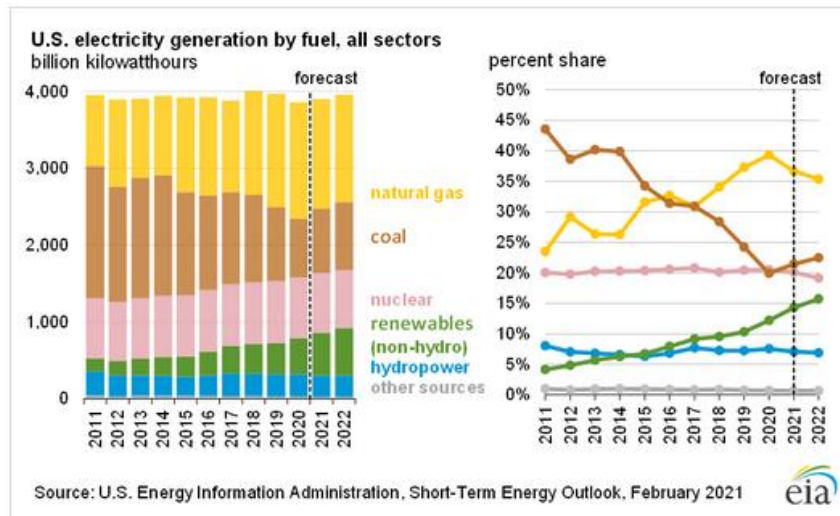
Despite some bumps along the way, some more serious than others as we have recently witnessed in Texas, most North American energy-only and capacity markets – with their various mitigative/risk management add-ons – have largely and for the most part succeeded in the goal of providing reliable electricity at least cost to consumers.

This is no simple task. Every second, supply and demand must balance. Thousands of resource and network constraints must be satisfied. And the market must send the right price signals to motivate efficient generation and investment in new generation resources over time.

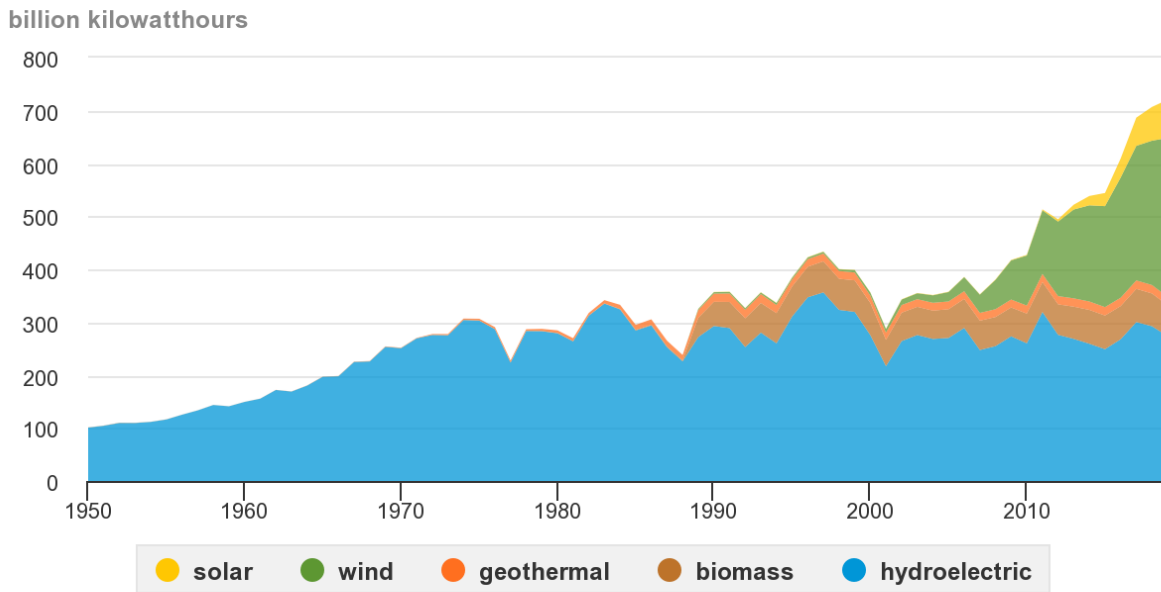
**Overriding (Real/Perceived) Risk Factor Number #1:** In the U.S., thermal electricity generation remains one of the largest (and symbology-exposed) single emitters of carbon into the atmosphere.

Efforts to address climate change will no doubt continue to shift generation from fossil fuels to wind, solar, nuclear, and other non-emitting generation sources.

Electricity market design must be able to handle this transformation. And this task is certainly material from a risk/reward thermal project investment perspective, as the main renewable resources – wind and solar – are intermittent sources of supply and with a zero marginal cost of production.



**U.S. electricity generation from renewable energy sources, 1950-2019**



Note: Electricity generation from utility-scale facilities. Hydroelectric is conventional hydropower.  
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 7.2a, March 2020 and *Electric Power Monthly*, February 2020, preliminary data for 2019

Projected energy margins from existing NE-6 PE assets (recently influenced by low gas prices and low market heat rates), an efficient generating fleet and new (largely tax-incentivized) wind generation – continue to form a relatively low and flat – but still ‘within-range ROI’ – supply curve.

**CONFIDENTIAL INVESTMENT PLACEMENT DISCUSSION:**

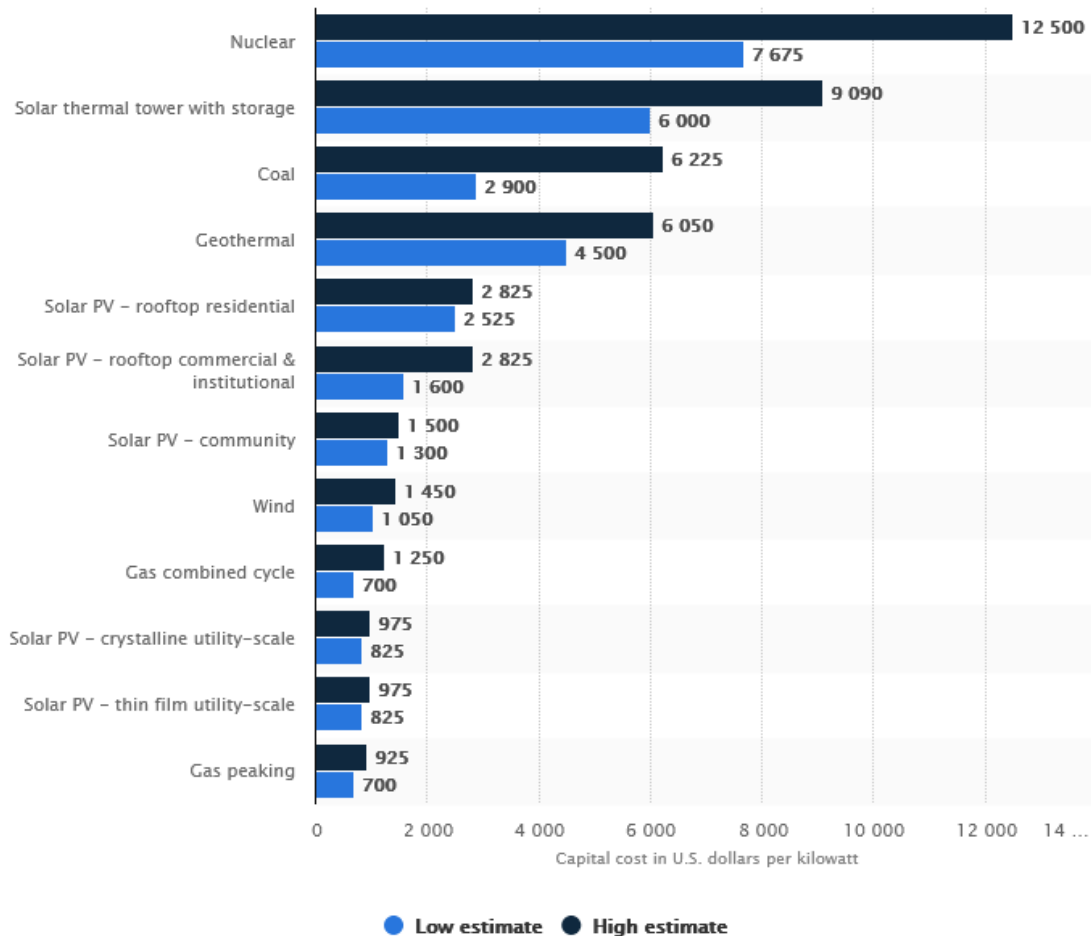
**December 14-16, 2020 Northern Eagle Unitholders and Prospectus Holders Video Conference (Houston TX - Edmonton AB - New York NY - Washington DC)**

- Market-Based Political Risks?
- Market-Based Regulatory Risks?
- Climate Change Symbolism, Unchallenged Ideological Spin, and Ideological Indoctrination.
- Investment Criteria for New Gas-Fired Capacity Additions, Capacity Retirements, and Repowering Projects?
- Comparator Market Outlook for New Investment, Resource Adequacy, Cost of Capital, and Long Term (Sustainable) Rate of Return?
- Communicating Public/Private Interest Alignment in Lowering the Cost of Capital
- Evaluation of Comparator Jurisdiction Policy Options – What options might be available to enhance favourable investment outcomes for longer-term (and competitive) resource adequacy across various jurisdictions?
- Comparator Jurisdiction ‘Hurdle Rates of Return’ and ‘Return Sustainability Index’ on New-Build Investments, Commensurate with Perceived Jurisdiction-by-Jurisdiction Risk Profiles?

***\*Alberta Benchmark: Updated Financials/Business Case on Previously Withdrawn/Cancelled 1,000 MW Combined Cycle Great Spirit Power Project (Lake Wabamun AB).***

- Pros/Cons of Resource Adequacy Requirements, Reliability Targets or Shift to a Capacity Market?
- Potential Role of ‘Public Interest Counterparty’ Reliability/Cost of Capital Mitigation PPAs?
- Alberta’s Renewable Electricity Program (REP) – 2017/2018
- Bilateral Industrial/Load Serving Entity PPAs?
- Forward Contracts? Fuel Input Offsets or Hedging Strategies?
- Levelized Cost of Electricity/Levelized Avoided Cost of Electricity Analysis?

**Capital Cost in U.S. Dollars per kilowatt (NWO Analytics, November 2020)**



- NE-6 PE internal Rate of Return to Exceed ‘Proxied After-Tax Weighted-Average Cost of Capital (PATWACC)’ of 8.8% in ERCOT and 9.6% in PJM.

**Note(1):** Large diversified investors with hedging options and the ability to finance plants on their balance sheet might be able to invest at lower returns, with estimates as low as 7.4% for efficiently hedged and diversified merchant generation investments.

**Note(2):** Hurdle Rate of Return targets based on the NERA Capital Asset Pricing Model (‘CAPM’) framework for the assessment and comparison of interjurisdictional or technology-specific hurdle rates.

**Note(3):** NE-6 PE currently targeting weighted-capital third party financial institution Discount Rates in the range of 7%-8% and Debt-Equity Ratios of 60%-65%/40%-35% (reflective of project risk profiles and FID risk tolerance parameters).

**Note(4): It is what it is!** – Alberta project finance parameters ‘mid-range competitive’ in a North American merchant generation context, reflective of higher cost of capital and operating risk profile drivers.

While today's markets can handle a moderate share of renewable generation, what if generation is dominated by renewables? Are adjustments to market design needed to handle such major shifts in the generation mix?

- Market Evolution?
- Establishing Greater Certainty and Predictability in Policy and Market Governance?
- Pros/Cons and Trade-offs Between Energy-Only and Capacity Market Designs?
- Reliability/Risk Mitigation Variants on Market Design?
- Day Ahead/Forward Markets?
- Real Time Market Guard Rails?
- Ancillary Services?
- Historically Concentrated Markets? Role of Incumbent Firms?
- Market Power Mitigation?

## **ERCOT**

ERCOT is an energy-only market, which relies solely on price signals from the day-ahead and real time markets to induce sufficient resources to reliably meet load.

- 24 million Texas-based customers.

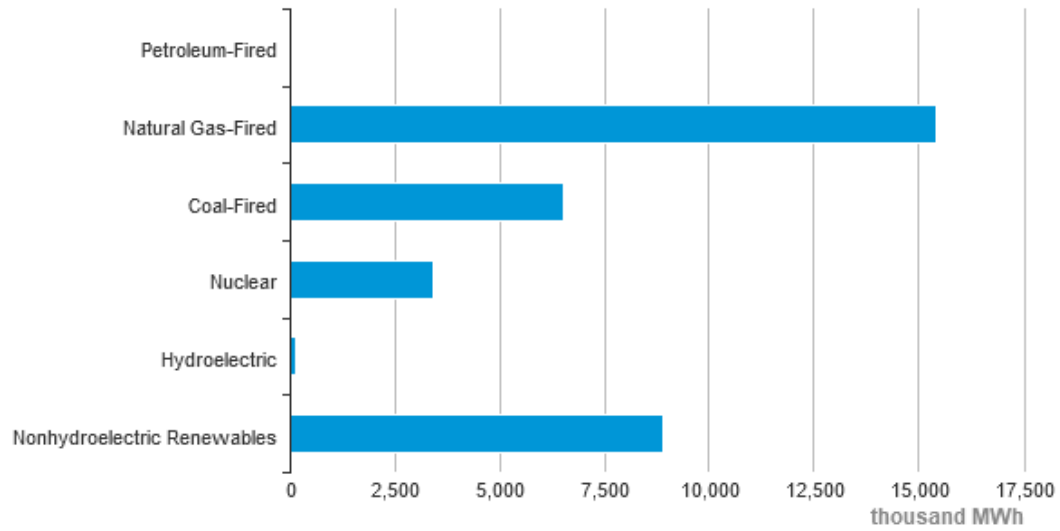
The challenge with an energy-only market is that it typically takes several years to build new generation capacity.

- Scarcity Pricing?
  - The administrative approach used in ERCOT to implicitly express load's preference for reliability.
  - The higher the scarcity pricing, the stronger is the investment signal.
  - More generation is economically built, which improves reliability.
  - The higher scarcity pricing also motivates demand response to avoid the high prices.
  - It now appears, however, that the increase in zero marginal cost renewables capacity is beginning to undermine the (previous) overall effectiveness of scarcity pricing.



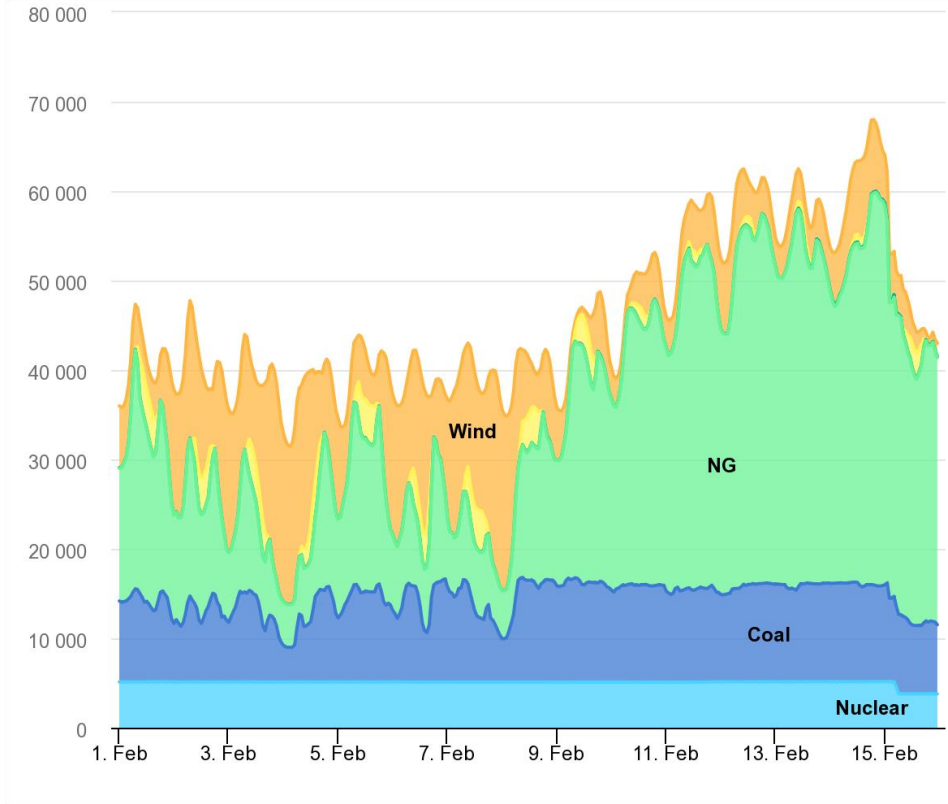


**Texas Net Electricity Generation by Source, Nov. 2020**

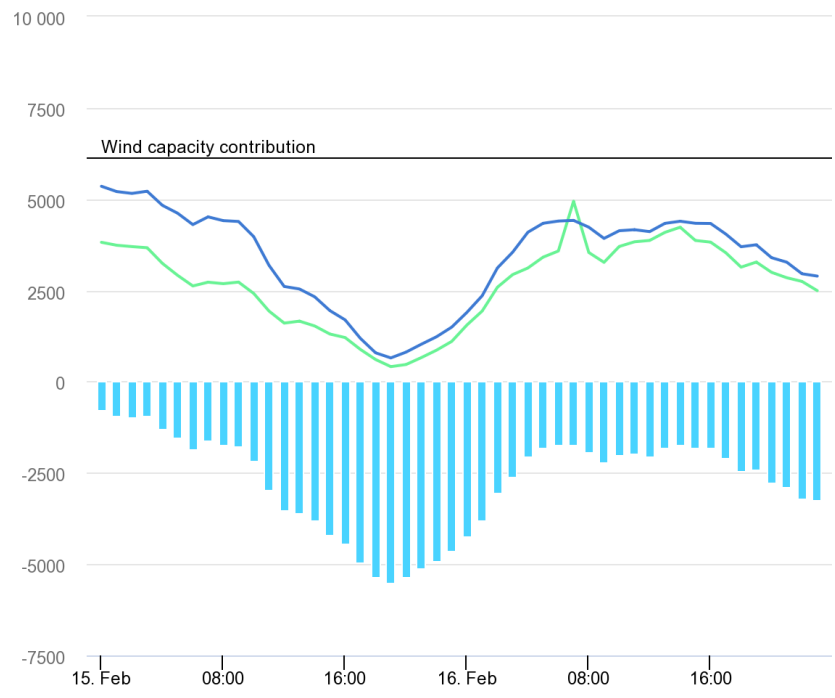


 Source: Energy Information Administration, Electric Power Monthly

**Generation by Fuel Type, ERCOT, February 1-15, 2021**



**Wind Generation, ERCOT, February 15-16, 2021**



## PJM

PJM operates a competitive wholesale electricity market and manages the reliability of its transmission grid.

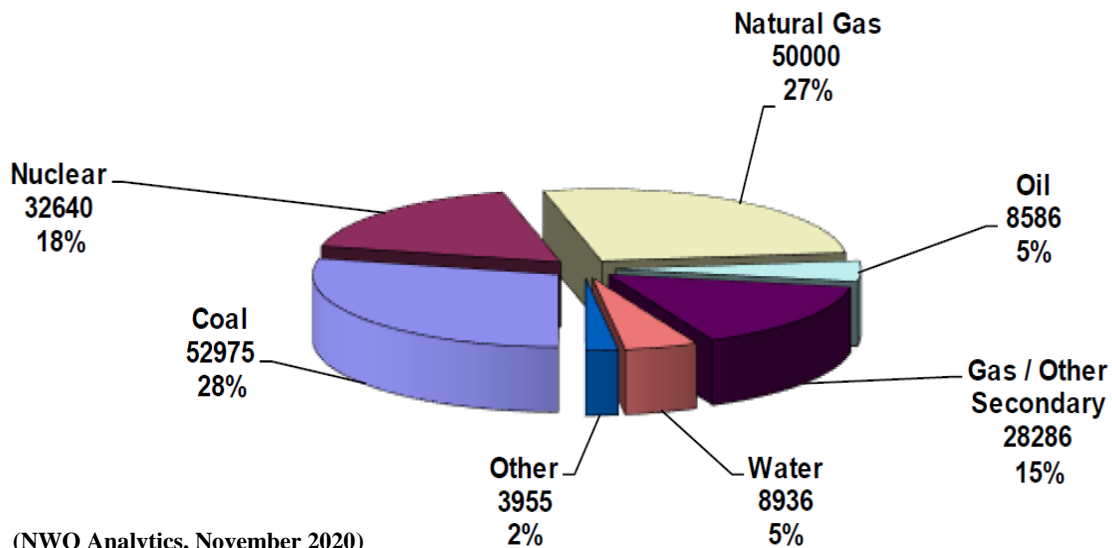
PJM services all or part of 13 States (Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia), as well as the District of Columbia.

- 65 million regional customers.

## PJM RTO

(MidAtlantic, AP, ComEd, AEP, Dayton, Duquesne, Dominion, ATSI, DukeOK, EKPC, & OVEC Regions)

Capacity By Fuel Type -- 185,378 MW installed generation capacity



PJM's markets include energy (day-ahead and real-time), capacity and ancillary services. PJM includes a long-run investment market for capacity. The capacity market coordinates new investment and retirements to ensure that adequate resources are available to reliably meet load.

Each year, PJM holds a competitive auction to obtain commitments for these future power supplies at the lowest cost.

In an energy-only market, firms are paid solely based on the provision of electricity in hourly wholesale markets.

In capacity markets, electricity generating firms are also paid for providing generation capacity, reflecting the potential to provide electricity at some point in the future.

The essential elements of the PJM capacity market are:

- 1) Procurement of capacity three years before it is needed through a competitive auction process.
- 2) Locational pricing for capacity that varies to reflect limitations on the transmission system.
- 3) A variable resource requirement curve, which is the demand formula used to set the price paid to market participants for capacity, in addition to the overall amount of secured longer-term capacity.

Capacity market participants offer power supply into the market that provide supply or reduce demand. These resources include new or existing generators, upgrades for existing generators, demand response (consumers reducing electricity use in exchange for payment), energy efficiency and transmission upgrades.

- Capacity market called the Reliability Pricing Model or RPM.

The commitment to make resources available when they are needed gives consumers the assurance of reliable power in the future. In return, generators and owners receive a more certain and bankable income flow to help maintain their existing assets, attract investment in new resources, and to support the development of new technologies and sources of electricity.

