



# Regional Solar Market Outlook Federal Perspective

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Brief overview of PJM

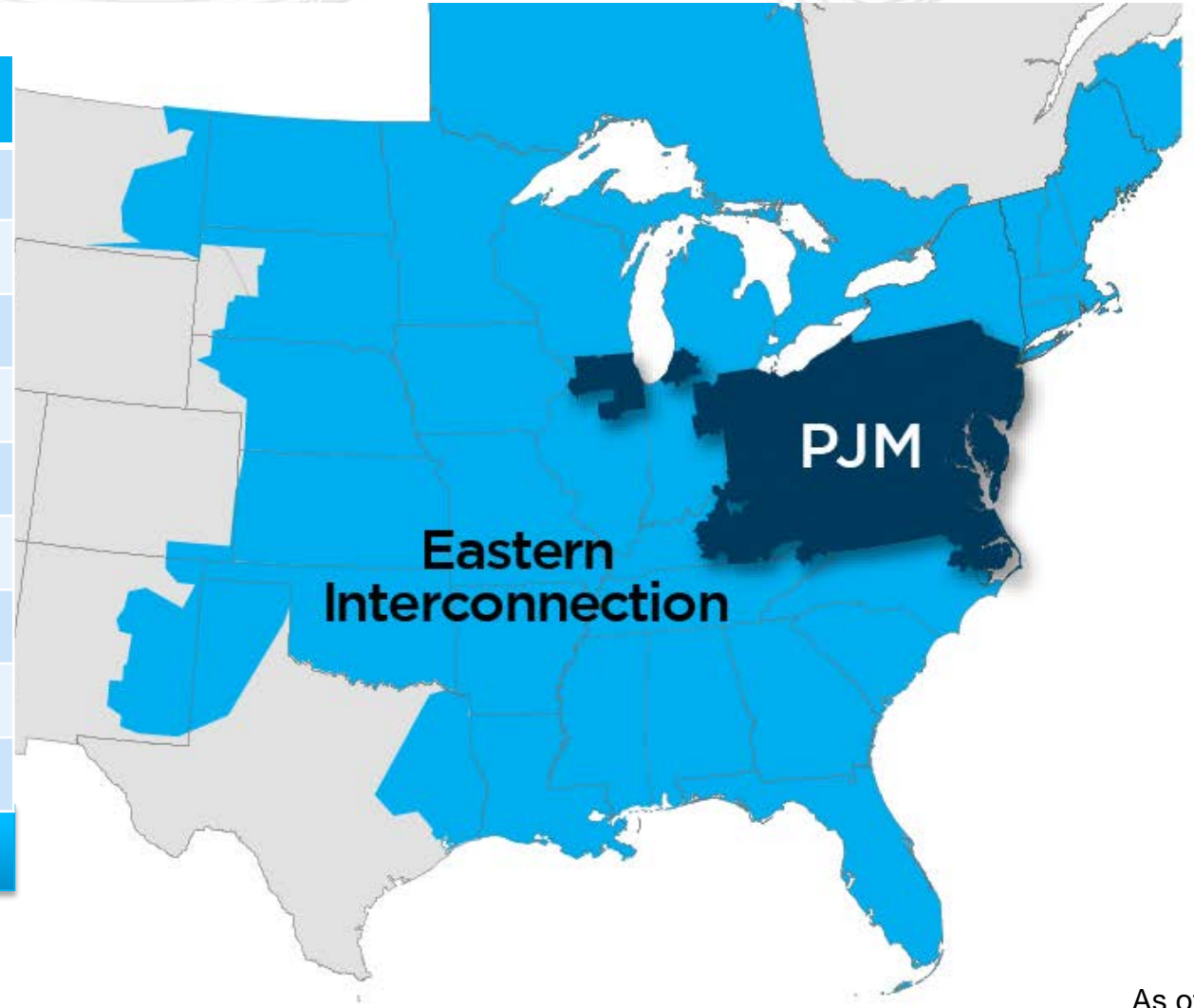
Renewables and DER by the numbers

Current Issues at the Federal Level

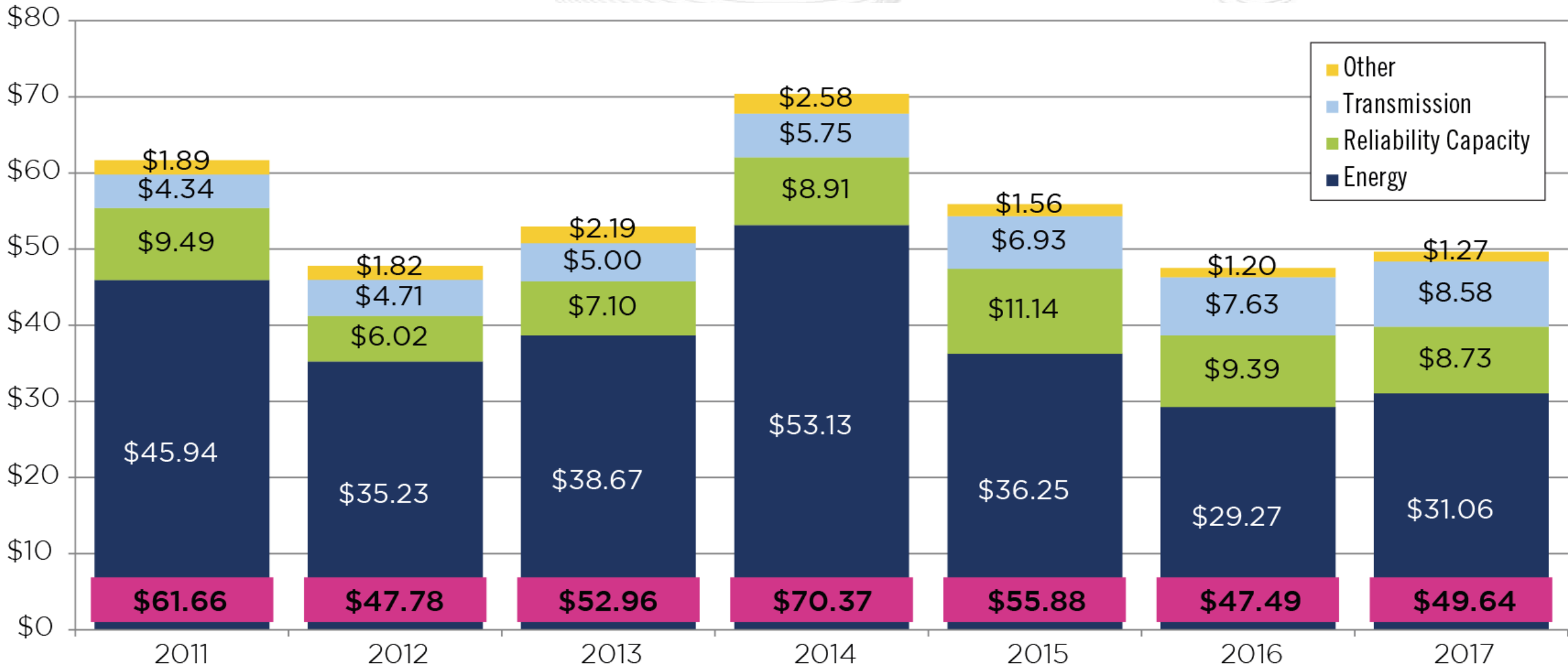
## Key Statistics

Member companies	1,040+
Millions of people served	65
Peak load in megawatts	165,492
MW of generating capacity	178,563
Miles of transmission lines	84,042
2017 GWh of annual energy	773,522
Generation sources	1,379
Square miles of territory	243,417
States served	13 + DC

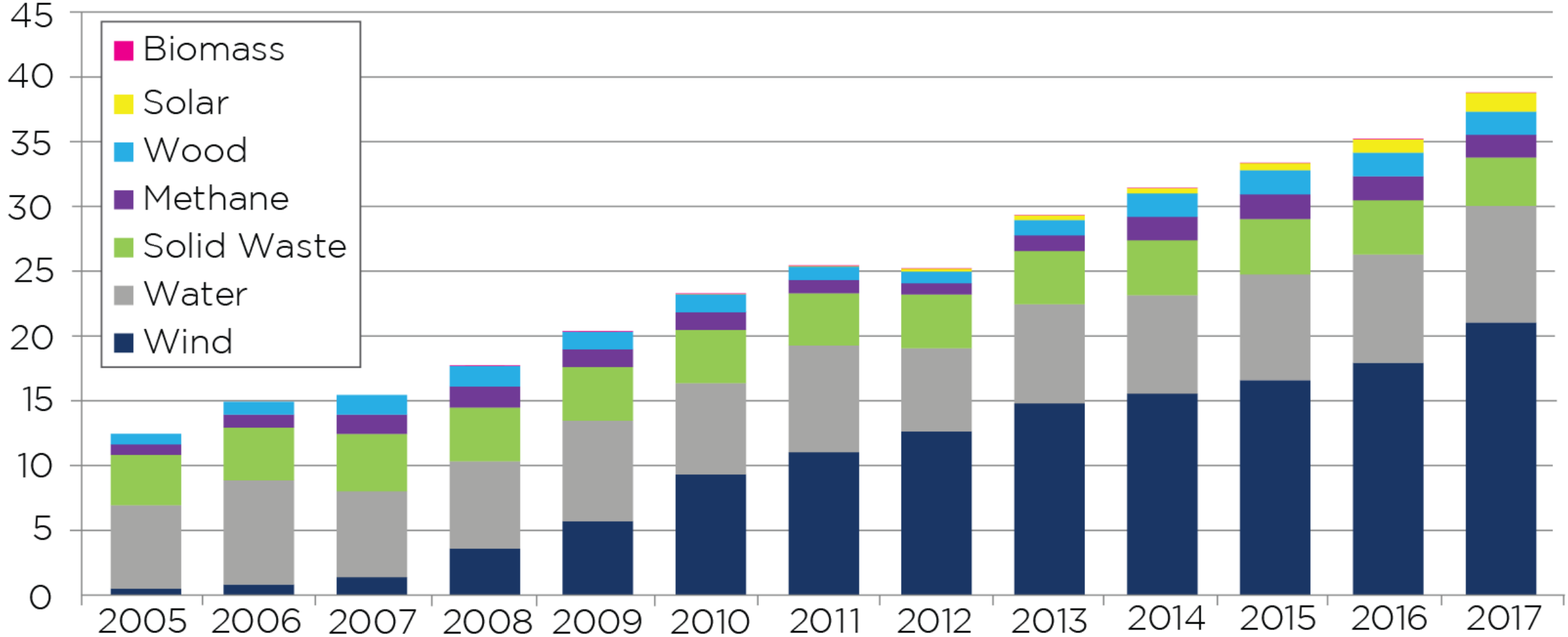
**21% of U.S. GDP produced in PJM**



As of 2/2018

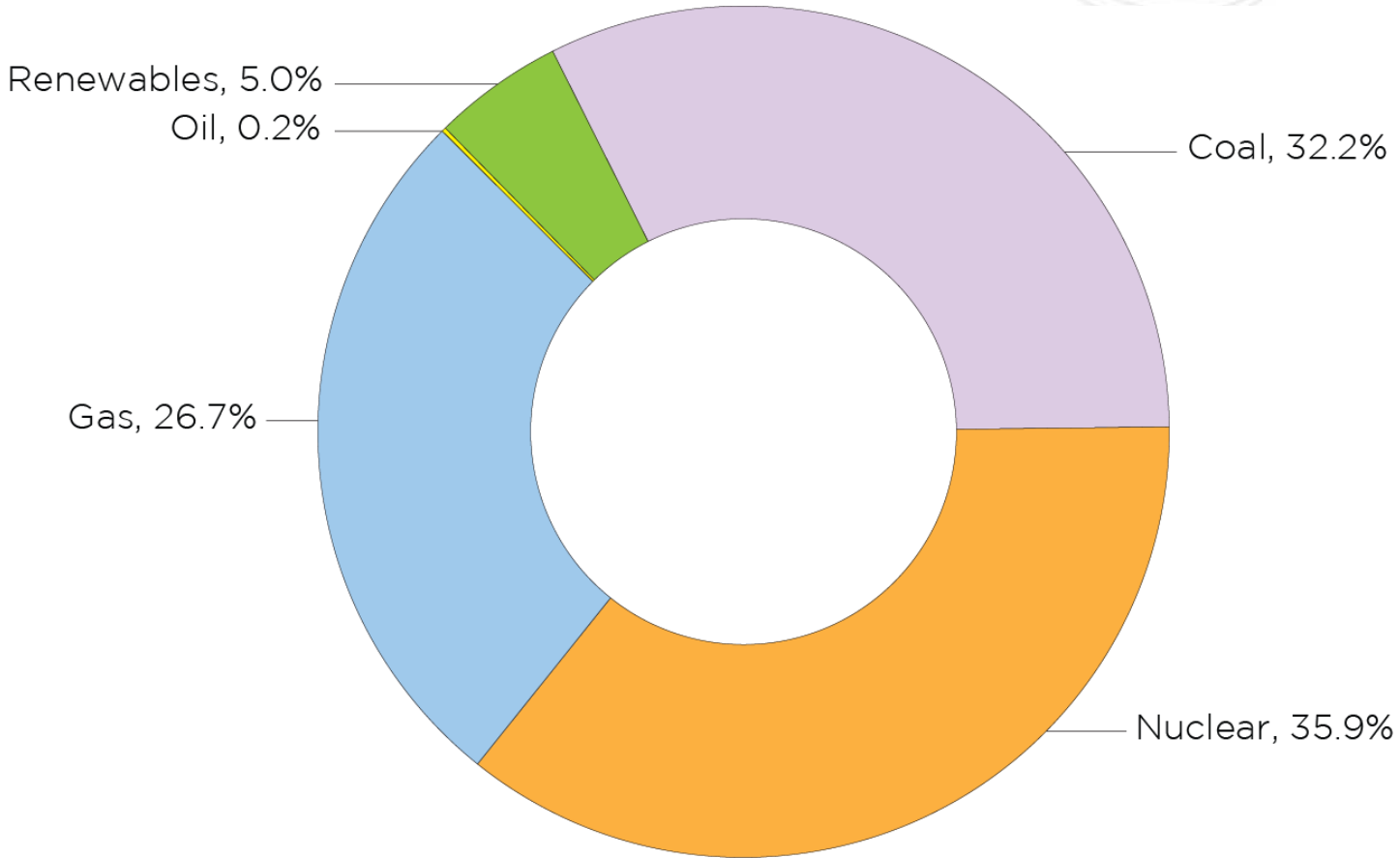


MWh (millions)

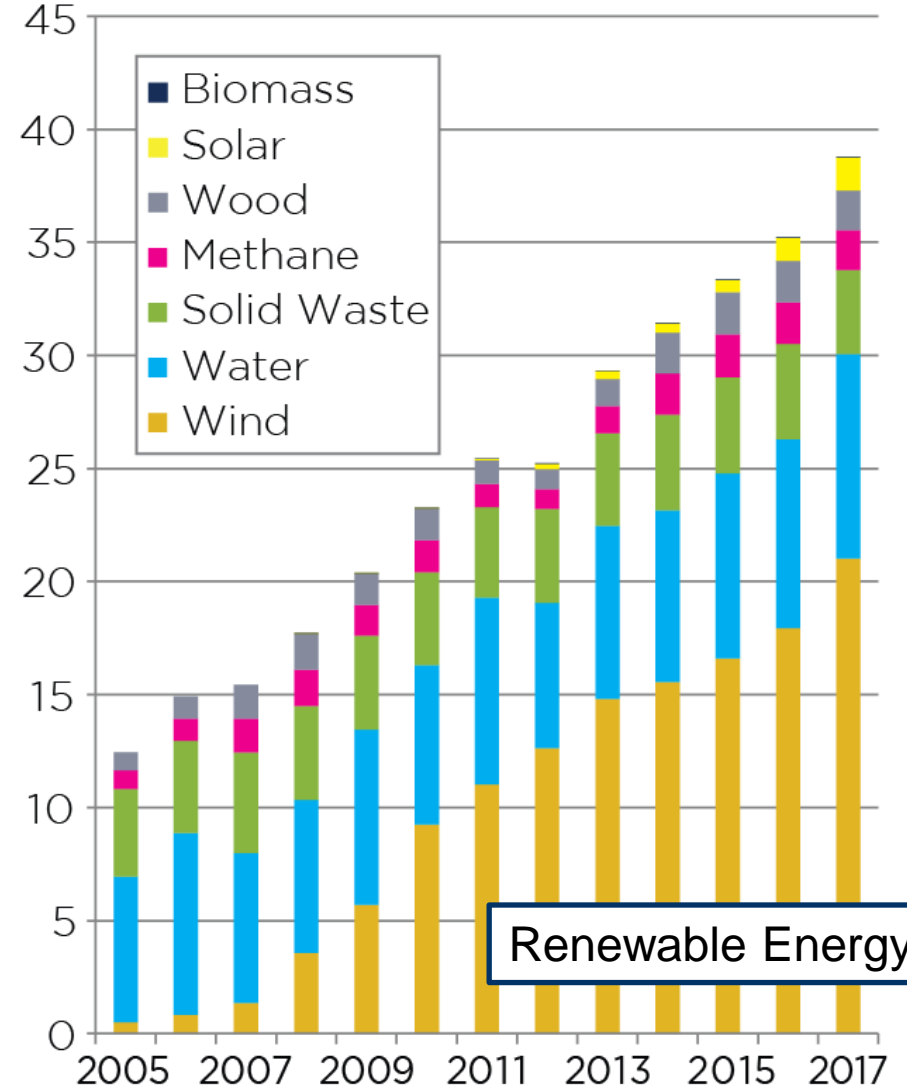


# Percentage of Renewable Energy is Small but Growing

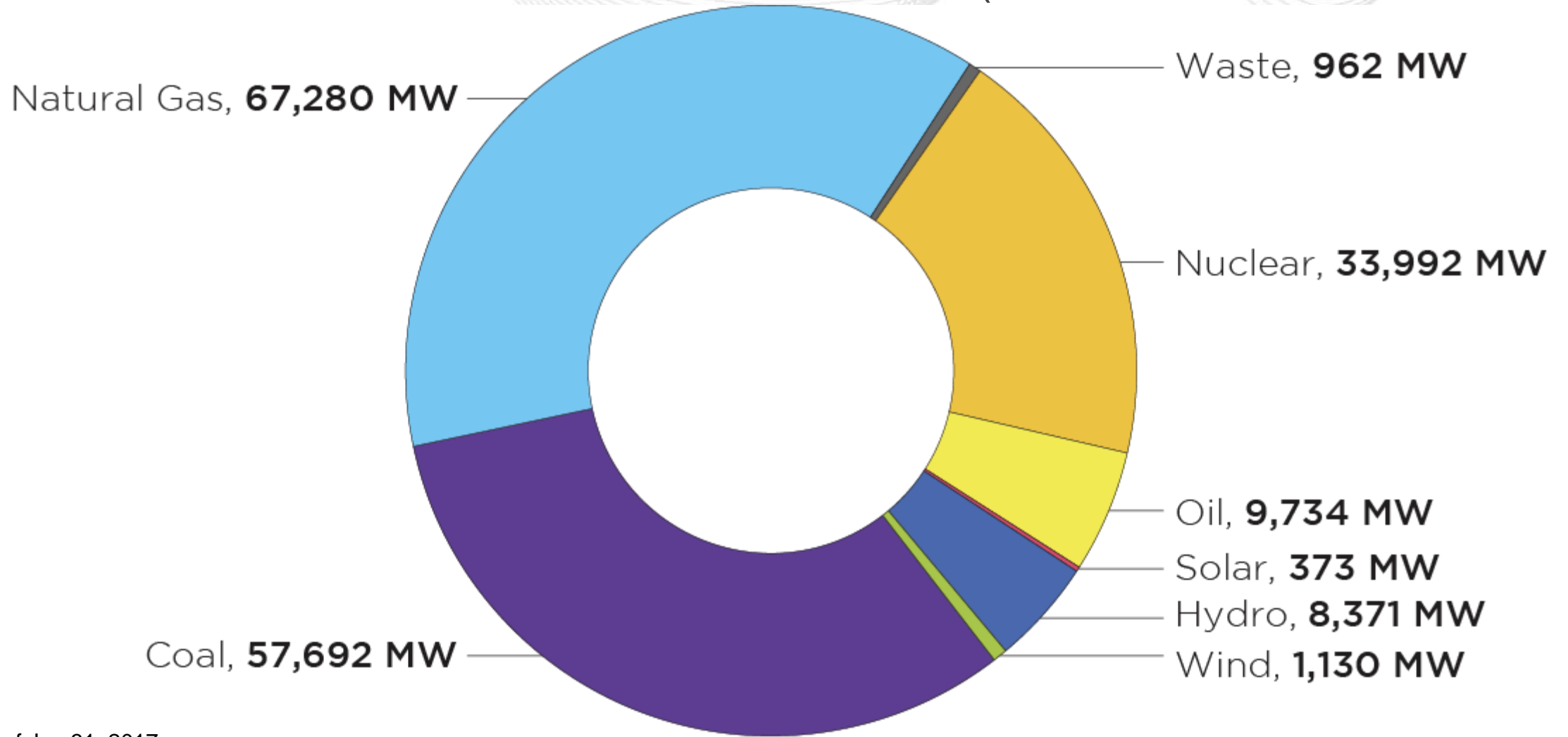
## PJM Generation Mix – 2017 Annual Energy



MWh (millions)



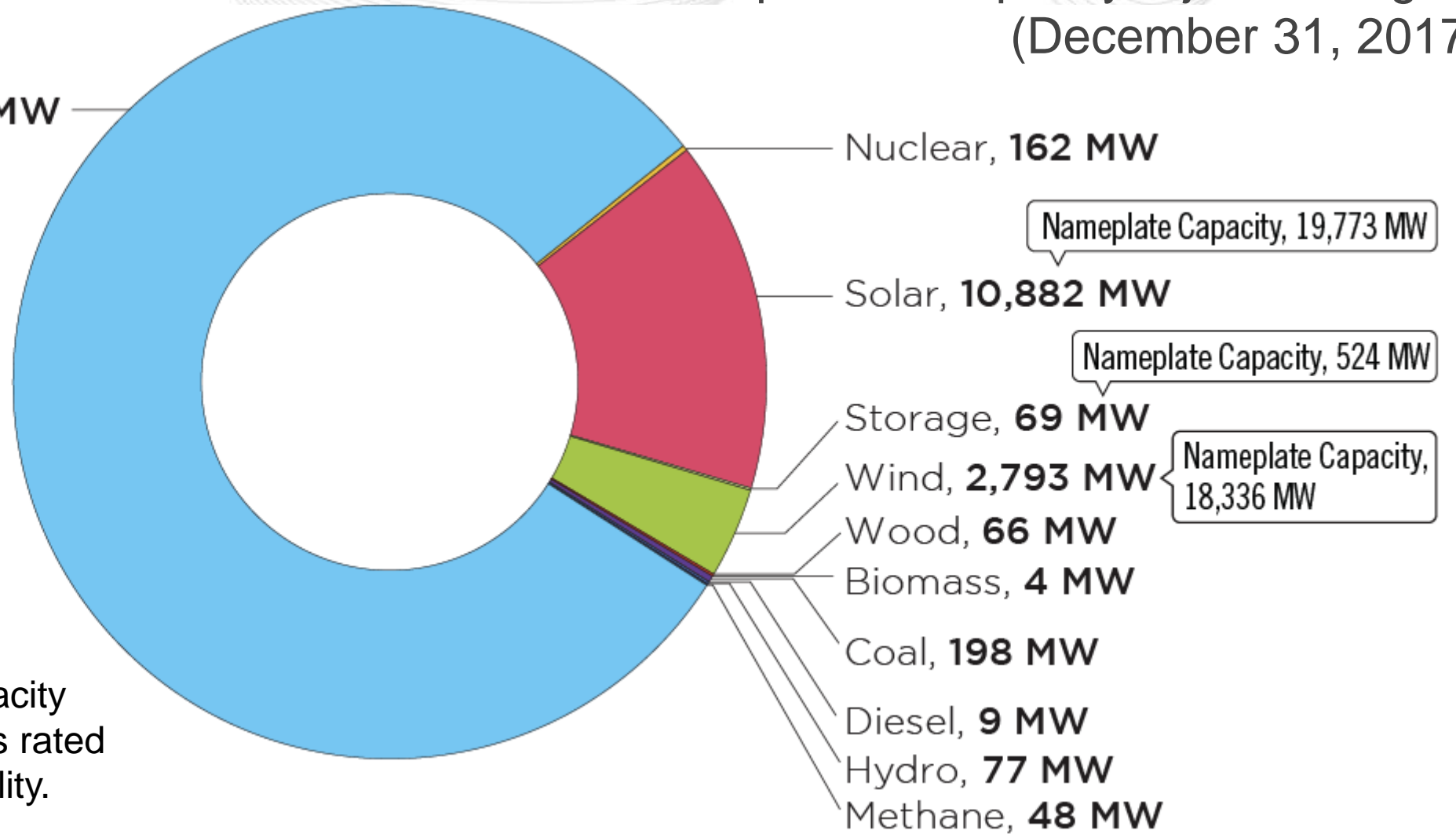
# Existing Installed Generation (CIRs, December 31, 2017)



As of Jan 31, 2017

# Queued Generation Fuel Mix- Requested Capacity Injection Rights (December 31, 2017)

Natural Gas, **57,778 MW**



**NOTE:** Nameplate Capacity represents a generator's rated full power output capability.



## Wholesale DER

### 1 GW

### Demand Response

#### Customer-sited generation:

Offers into capacity, energy and/or ancillary services markets

74%	24%	2%
Diesel	Natural Gas	Other

Remaining ~8 GW of DR is load modification without any generation (e.g., industrial process management)

### 1 GW Generator

#### Front-of-the-meter generation:

Offers into capacity, energy and/or ancillary services markets.  
Can be sited at customers.

Mostly solar but also other fuels

## Non-Wholesale DER

### ~7 GW DER

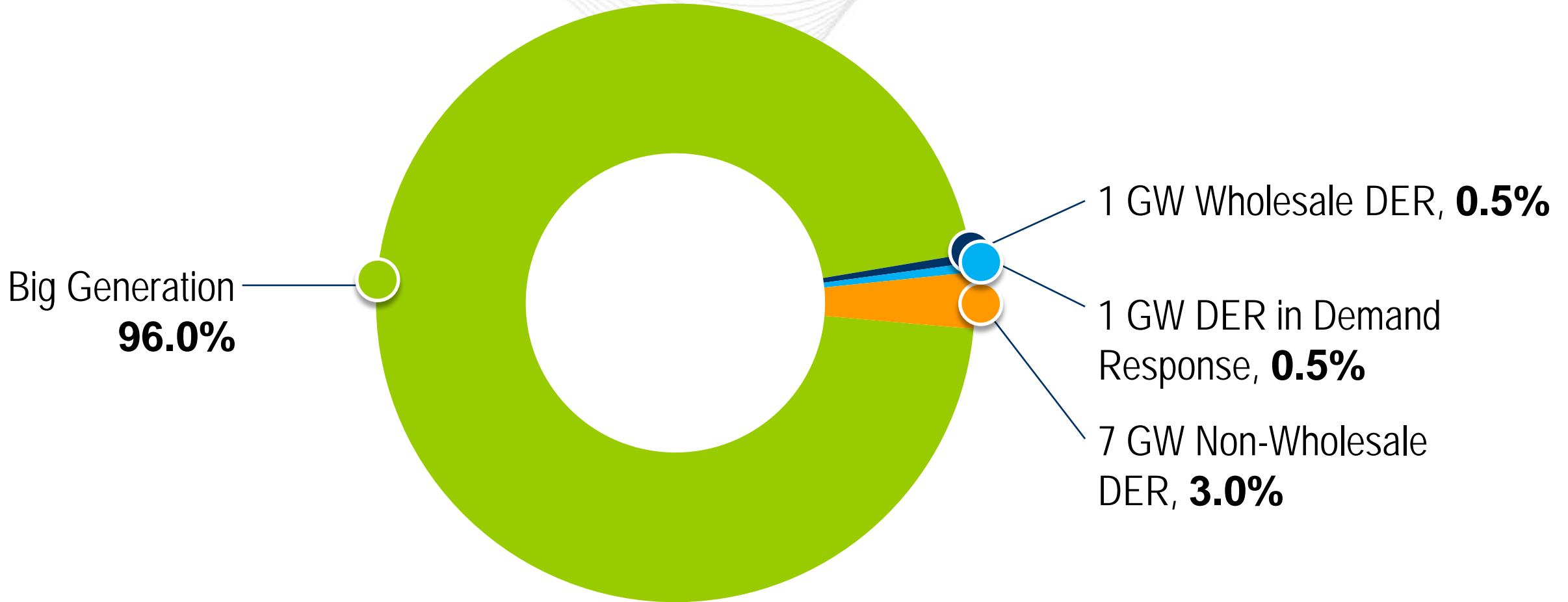
**Solar PV DER:** Retail/rooftop solar

**Municipal DER:** Municipal electric company distribution-level generators

**Process DER:** Industrial generators, combined heat and power

**Resilience DER:** Emergency backup

**Qualified Facilities:** Direct sales to distribution utilities



# What's Happening at the Federal Level – State Public Policies and Wholesale Markets

- Increasingly states taking action promote development or retention of specific types of resources
- FERC held technical conference on this in May, 2017
- PJM began looking at this in late 2016
  - Culminated in a PJM filing at FERC in April, 2018
  - On June 29 FERC found PJM identified a problem where certain of its rules are no longer just and reasonable and established a process for PJM and others to define just and reasonable rules
  - Initial submittals on Oct 2 – Reply submittals due Nov 6
  - PJM anticipates FERC will issue an initial order in the beginning of new year with final order in time for application to next capacity auction

- Prompted by PJM's Capacity Performance rules requiring 100% annual resources starting with the 2018/2019 Delivery Year
  - PJM established certain aggregation rules in its initial filing in 2015
  - In November 2016, PJM filed to enhance those rules – which FERC accepted.
- Complaints to retain a sub-annual product to account for renewables and DR
  - FERC granted complaint; held technical conference in Apr 2017
  - PJM's post tech conference comments showed we still saw increase in sub-annual products aggregating and participating
  - PJM also work on other solutions – such as peak shaving methods

- FERC rulemaking proceeding to address DERs
  - Held technical conference in February, 2017
  - No further action on that front
- Meanwhile, PJM has an ongoing stakeholder process
  - Important issues:
    - Visibility
    - Forecasting and measurement
    - Incentivising participation
      - Looking at interconnection rules
      - Operational rules