



July 2016

Maryland State Report

1. Planning

- Generation Portfolio Analysis
- Transmission Analysis
- Load Forecast
- Gas Pipeline Information

- **Existing Capacity:** Natural gas represents approximately 27 percent of the total installed capacity in Maryland while coal represents approximately 39 percent and nuclear represents 14 percent. This differs slightly from PJM where natural gas and coal are relatively even at 34 and 35 percent respectively and nuclear represents 20 percent of installed capacity.
- **Interconnection Requests:** Maryland is seeing 3,100 MW of new natural gas generation being built today in the state in addition to 95 MW of new, grid-scale solar *capacity*.
- **Deactivations:** There were no deactivations in Maryland in 2015.
- **Load Forecast:** Maryland and DC load growth is nearly flat, averaging less than 1 percent per year over the next 10 years. This aligns with PJM RTO load growth projections.
- **Natural Gas:** About 74 percent (2,600 MW) of Maryland's natural gas generation is behind a local distribution company. However, 2,200 of those megawatts are dual fuel capable – adding a level of fuel security to the majority of Maryland gas generation.

Planning

Generation Portfolio Analysis

Maryland - Existing Installed Capacity

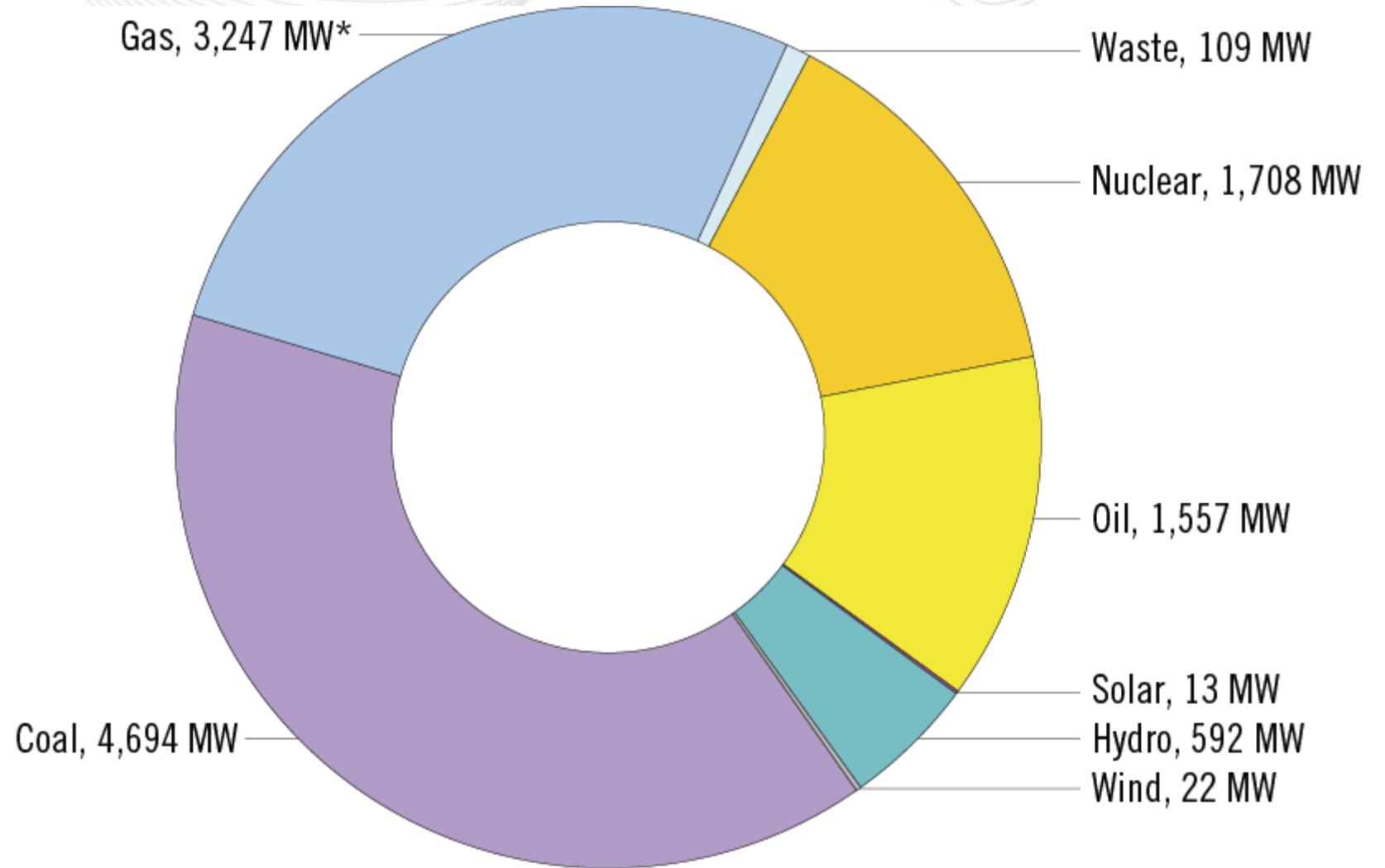
(Capacity Rights, December 31, 2015)

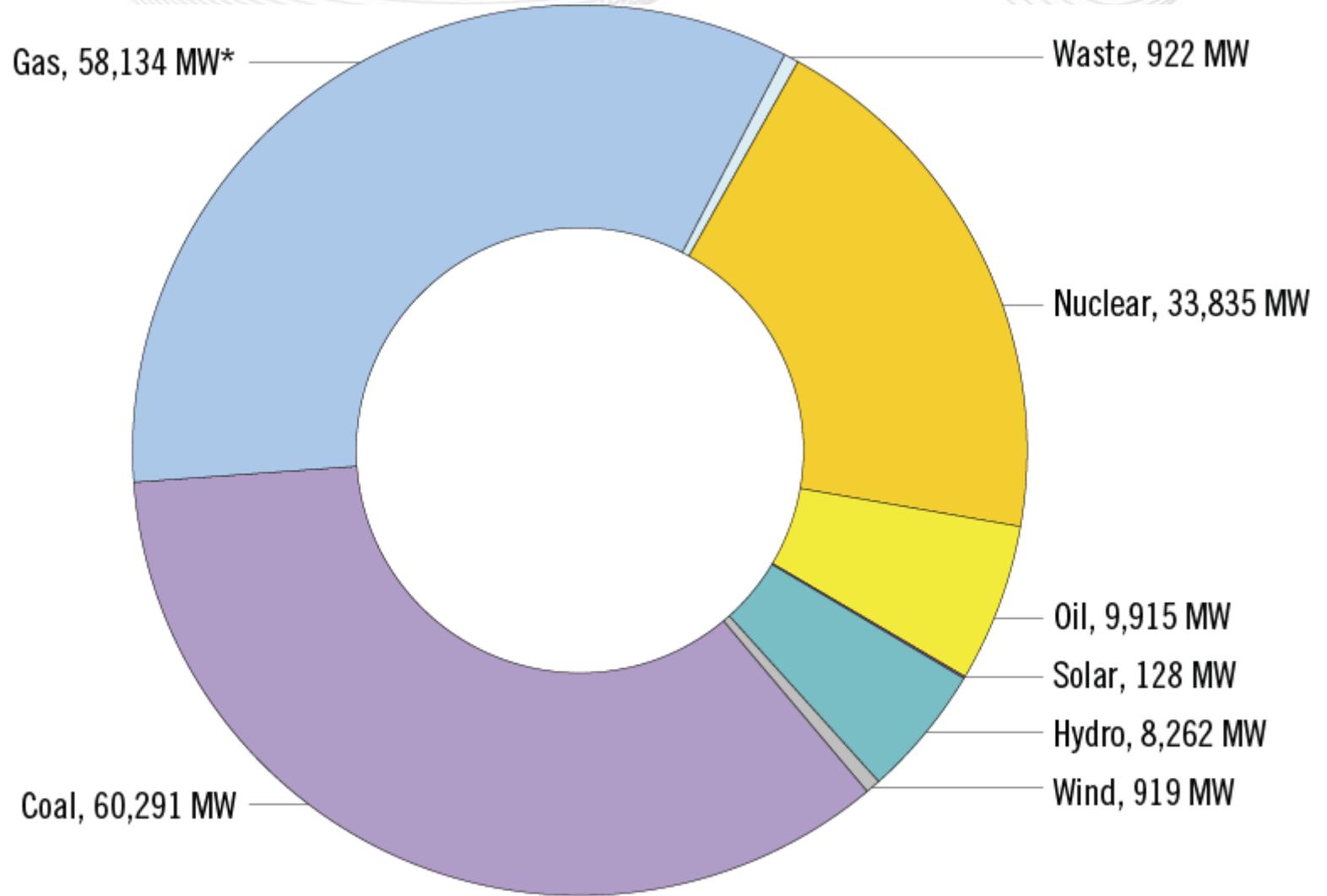
Summary:

Natural gas represents approximately 27 percent of the total installed capacity in Maryland while coal represents approximately 39 percent.

Overall in PJM, natural gas and coal are relatively even at 34 percent and 35 percent respectively.

| * Gas Contains | |
|----------------|----------|
| Natural Gas | 3,243 MW |
| Other Gas | 13 MW |





In PJM, natural gas and coal make up nearly 70 percent total installed capacity.

| * Gas Contains | |
|----------------|-----------|
| Natural Gas | 57,735 MW |
| Other Gas | 399 MW |

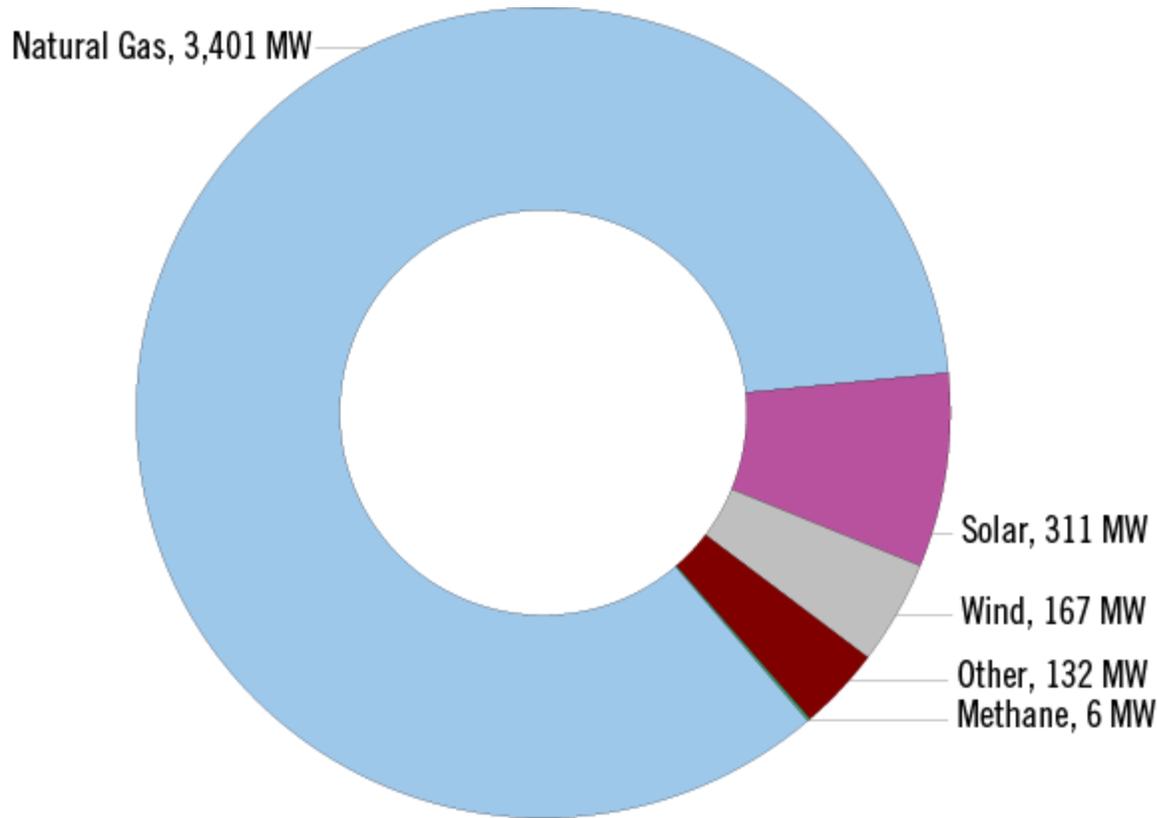


Maryland - Interconnection Requests

(Requested Capacity Rights, December 31, 2015)

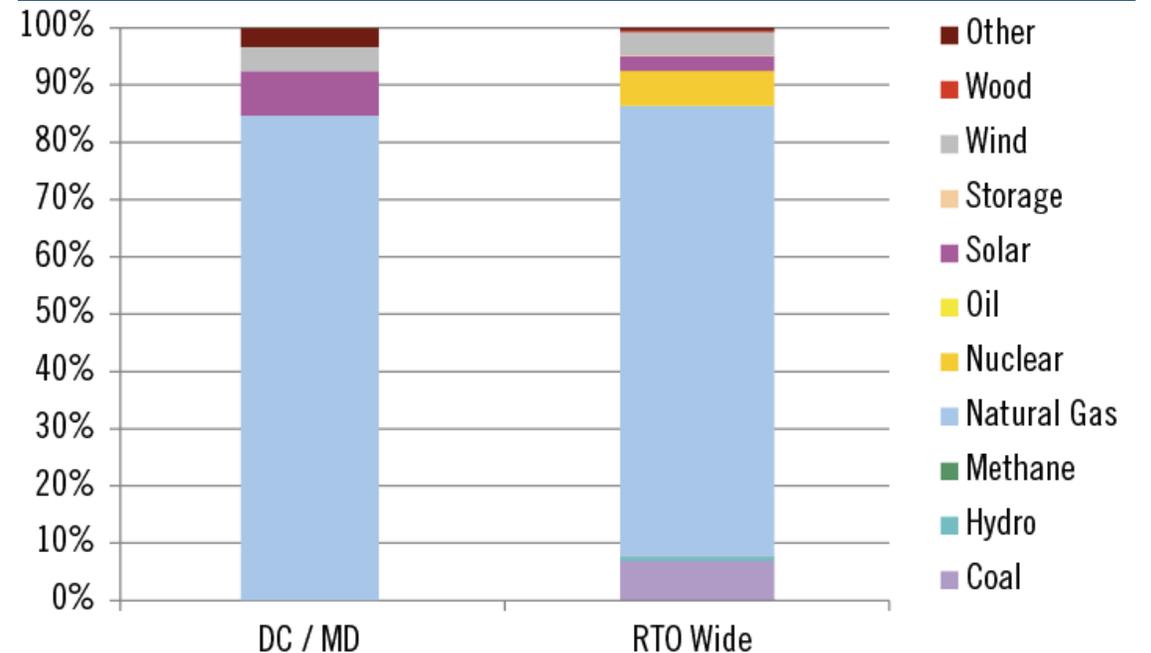
Natural gas represents nearly 85 percent of new interconnection requests in Maryland.

Total MW Capacity by Fuel Type



| | MW | # of Projects |
|--------------------|----------------|---------------|
| Active | 537.5 | 50 |
| Under Construction | 3,492.4 | 51 |
| Suspended | 12.2 | 3 |
| Total | 4,042.0 | 104 |

Fuel as a Percentage of Projects in Queue





Maryland - Interconnection Requests

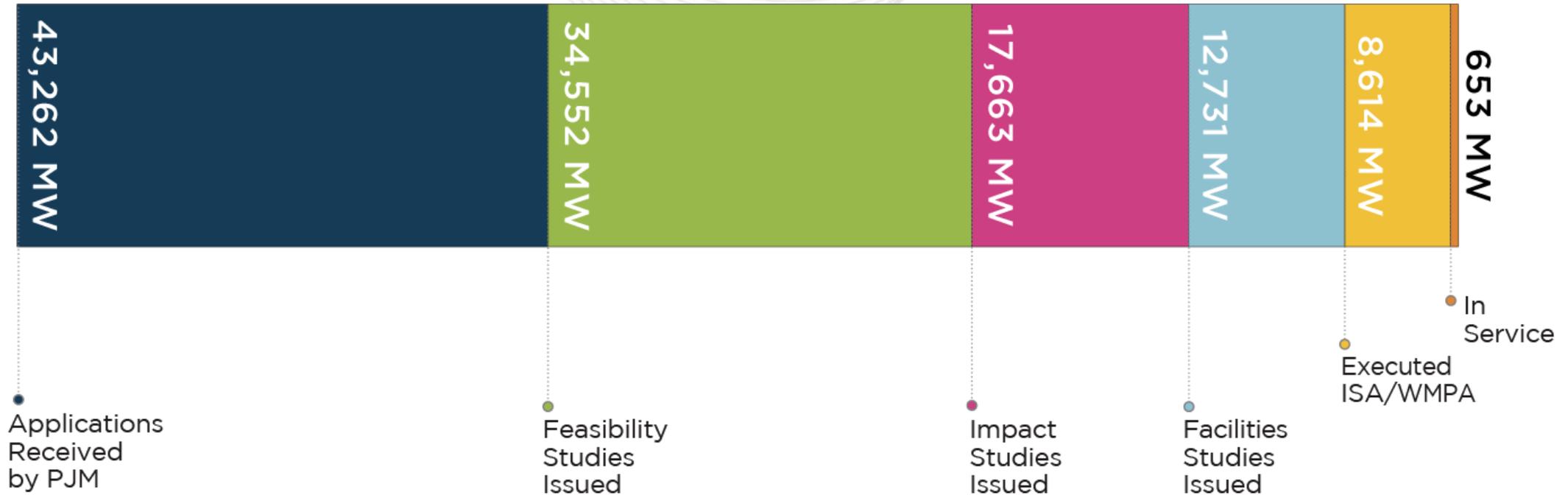
(Requested Capacity Rights, December 31, 2015)

| | Active | | In Service | | Executed final agreement (ISA/WMPA) | | | | May have executed final agreement | | Total Sum | |
|--------------------|--------------|---------------|--------------|---------------|-------------------------------------|--------------------|-----------------|-----------|-----------------------------------|---------------|-----------------|---------------|
| | MW | # of Projects | MW | # of Projects | Suspended | Under Construction | Withdrawn | Total Sum | MW | # of Projects | MW | # of Projects |
| Biomass | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 188.8 | 8 | 188.8 | 8 |
| Coal | 0 | 0 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 3 |
| Diesel | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 1 | 5 | 2 |
| Hydro | 0 | 0 | 60 | 2 | 0 | 0 | 0 | 1 | 73.4 | 3 | 133.4 | 6 |
| Methane | 2 | 1 | 16.5 | 8 | 0 | 1 | 4 | 1 | 4 | 2 | 26.5 | 13 |
| Natural Gas | 208 | 2 | 507.2 | 24 | 4.375 | 1 | 3,189 | 9 | 33,241.1 | 62 | 37,149.68 | 98 |
| Nuclear | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4955 | 4 | 4955 | 5 |
| Oil | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 0 | 2 | 1 | 7 | 3 |
| Solar | 215.1 | 42 | 14.2 | 4 | 0 | 0 | 95.85 | 15 | 398.076 | 70 | 723.226 | 131 |
| Storage | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 20 | 60 | 5 | 60 | 28 |
| Wind | 112.4 | 2 | 40.3 | 5 | 7.8 | 1 | 46.5 | 3 | 176.6 | 7 | 383.6 | 18 |
| Wood | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other | 0 | 0 | 0 | 0 | 0 | 0 | 159 | 2 | 0 | 0 | 159 | 2 |
| Total | 537.5 | 50 | 653.2 | 49 | 12.175 | 3 | 3,494.35 | 50 | 39,103.98 | 164 | 43,801.2 | 316 |

All MWs that enter the queue and either went into service, near operation or withdrew. (43,262 MW)

Progression History Interconnection Requests

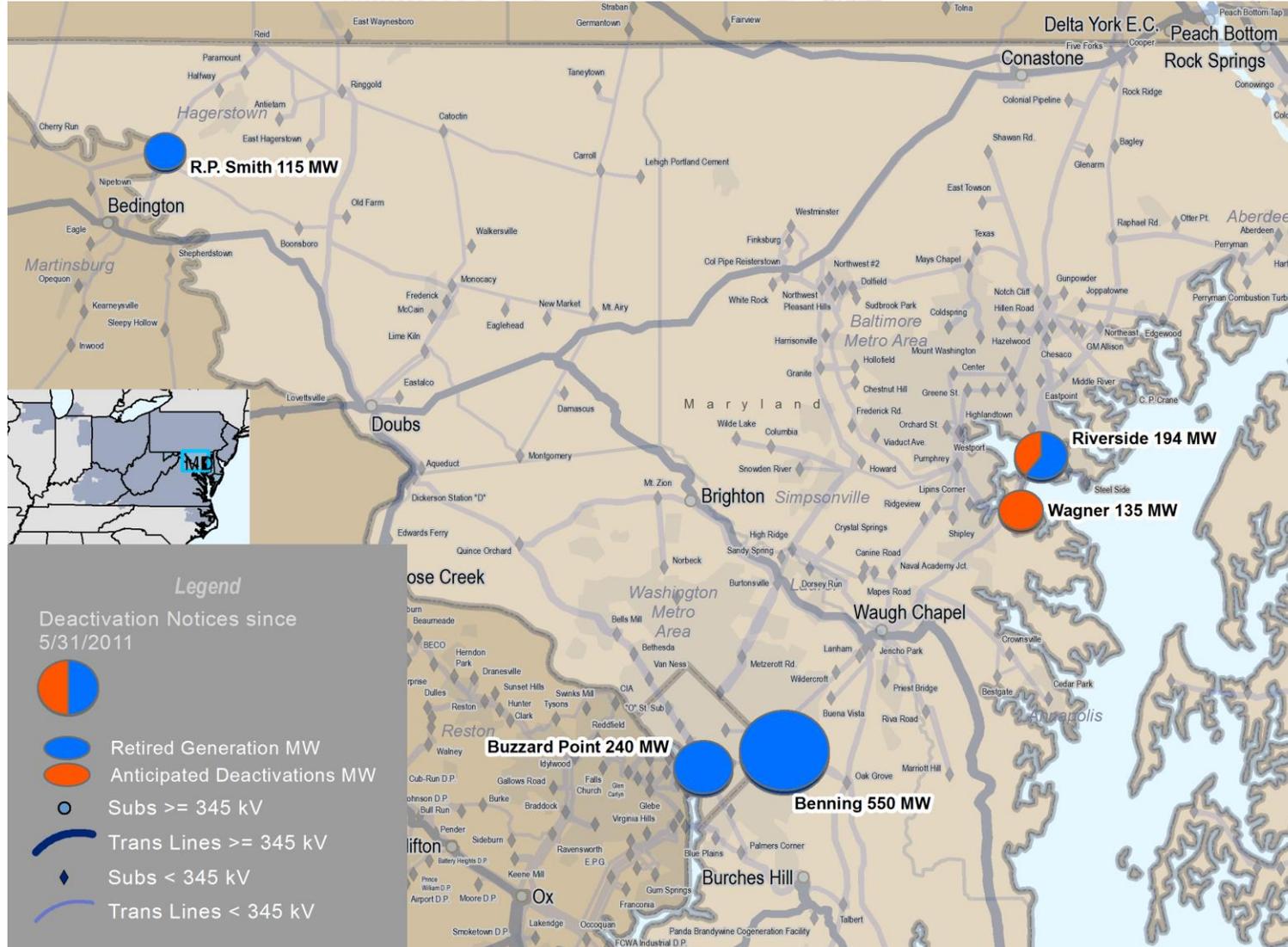
(Requested Capacity Rights, 1999 - 2015)



Following agreement (ISA/WMPA) execution, 4,456 MW of capacity withdrew from PJM's interconnection process. Another 3,505 MW have executed agreements but were no in service as of December 31, 2015. Overall, 2% of requested capacity MW reaches commercial operation. The PJM average is 10%.

Maryland & DC – Generation Deactivations since 2011

(MW Capacity, as of December 31, 2015)



No Maryland units retired in 2015.

Riverside 4 (74 MW) retired on 6/1/2016

Wagner 2 (135 MW) announced in 2015 plans to retire in 2020.

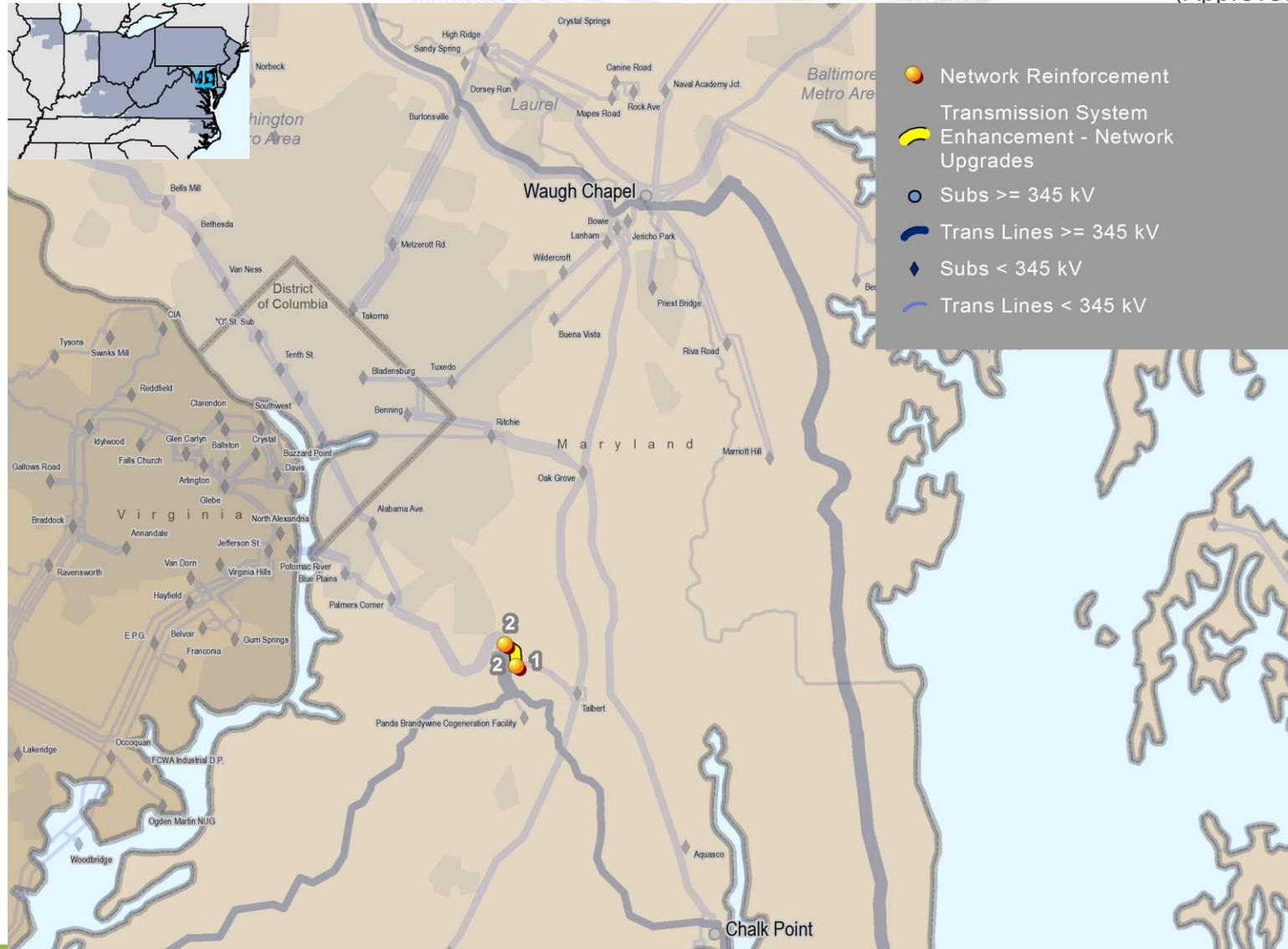
Blue circles represent generation already deactivated in the region

Planning

Transmission Infrastructure Analysis

Maryland & DC - RTEP Network Projects

(Approved in 2015, greater than \$10 million)



Network Projects are transmission upgrades identified as part of the interconnection process System Impact Studies. Network upgrades are necessary to interconnect new generation and merchant transmission facilities to the existing transmission grid or to provide new long-term firm transmission service.

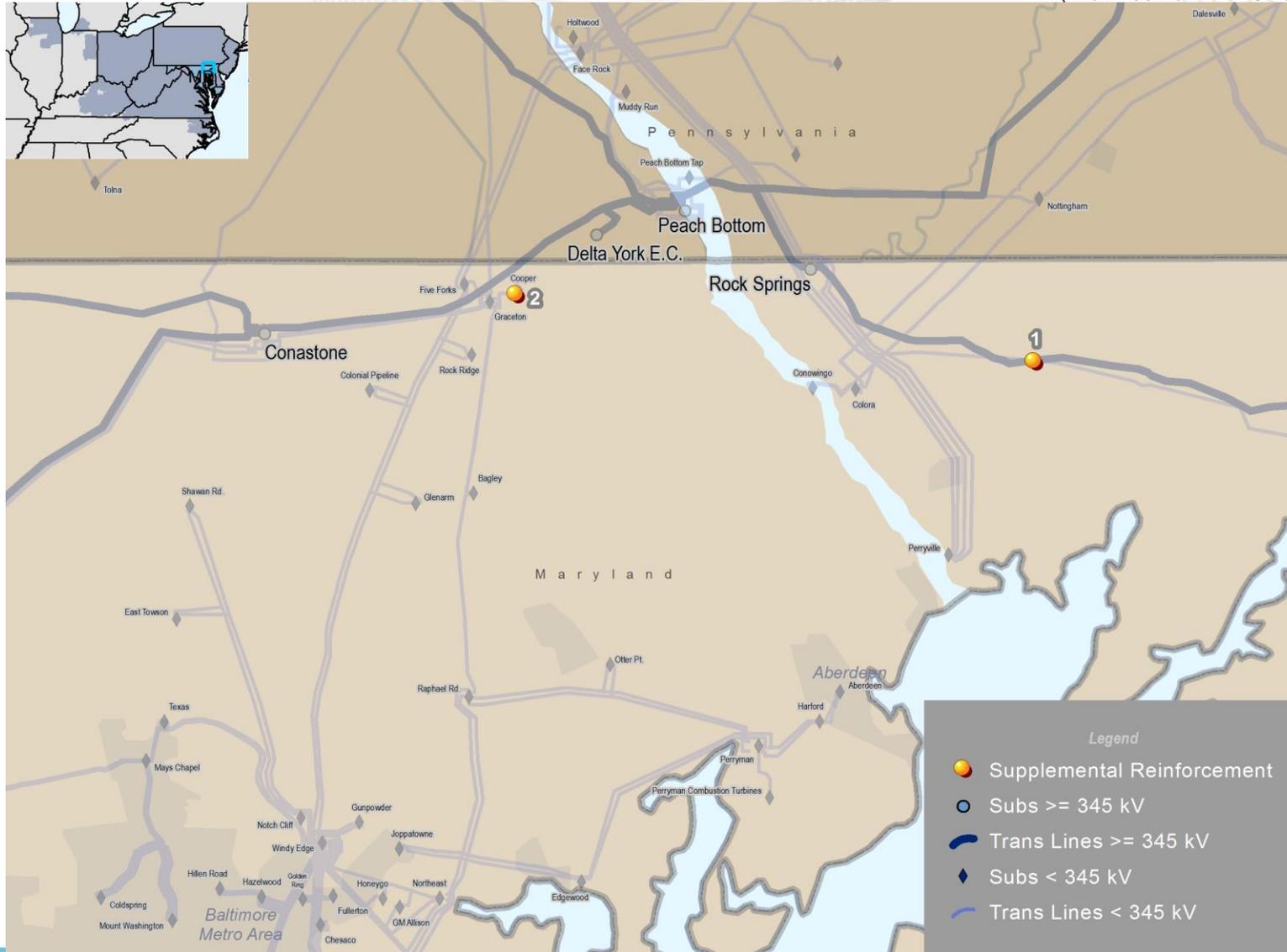


Maryland & DC - RTEP Network Projects

(Approved in 2015, greater than \$10 million)

| Map ID | Project ID | Project | DC MD Network Project Drivers | | | Date | Cost (M) | TO Zone(s) | 2015 TEAC Review |
|--------|------------|--|-------------------------------|---------------------------------------|-------------------------------------|----------|----------|------------|------------------|
| | | | Generation Interconnection | Merchant Transmission Interconnection | Long-term Firm Transmission Service | | | | |
| 1 | n4303 | Attachment facilities (switchyard) – To be built along Pepco right-of-way. Final location to be determined by the developer. | X3-087 | | | 6/1/2016 | \$20.30 | PEPCO | 9/10/2015 |
| 2 | n4309 | Construct underground portion of the transmission line from tower number N1085NA to the Burches Hill substation. | X3-087 | | | 6/1/2016 | \$16.20 | PEPCO | 9/10/2015 |

(Notification in 2015, greater than \$10 million)



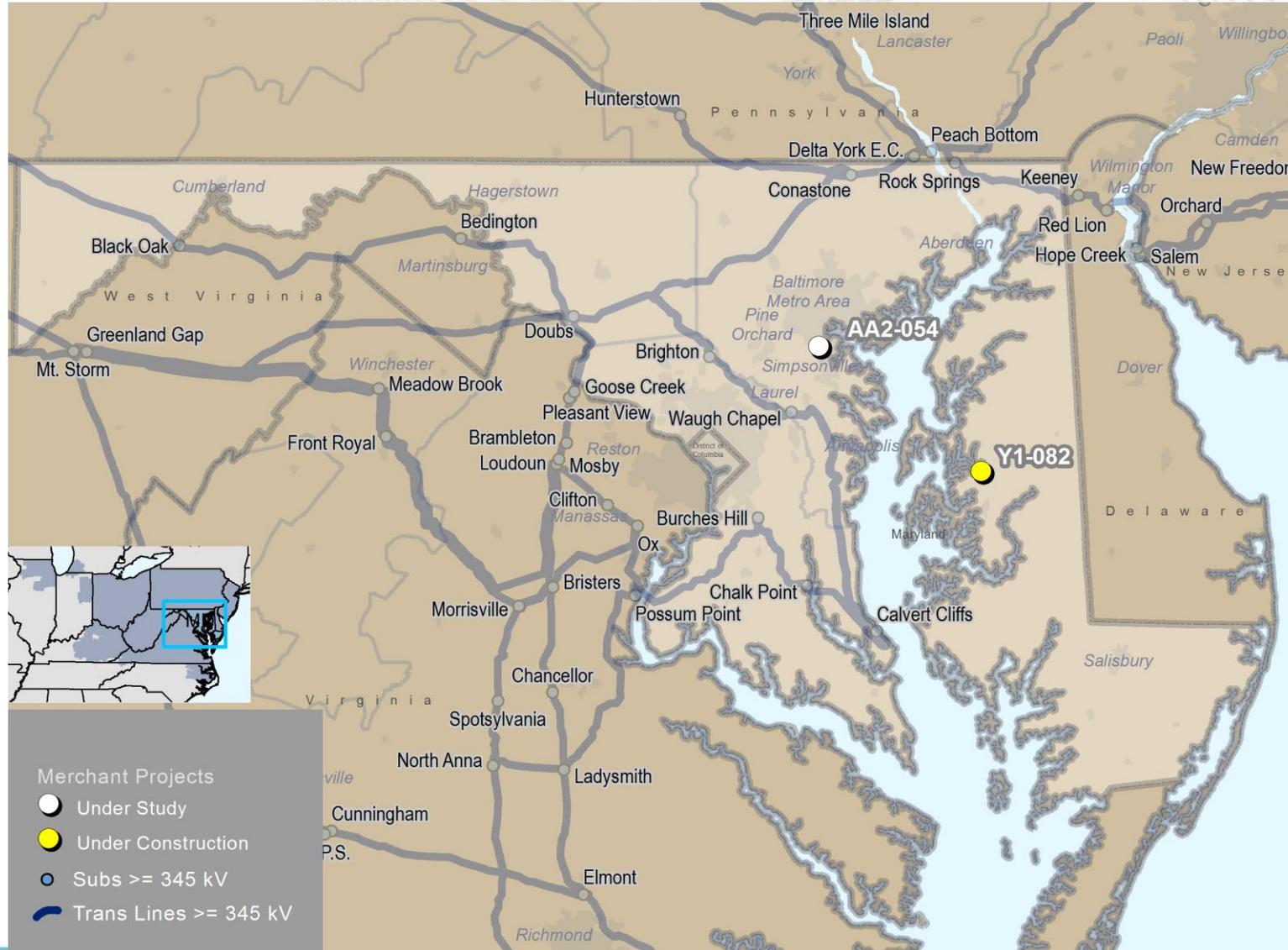


Maryland & DC - TO Supplemental Projects

(Notification in 2015, greater than \$10 million)

DC MD Supplemental Projects

| Map ID | Project ID | Project | Date | Cost (\$M) | TO Zone(s) | 2015 TEAC Review |
|--------|------------|---|------------|------------|------------|------------------|
| 1 | s0982.1 | Build a new 230/34 kV substation (Crest substation) and loop the Cecil-Colora 230 kV circuit into the new substation. | 12/31/2018 | \$17.33 | DPL | 7/29/2015 |
| | s0982.2 | Install four 230 kV breaker ring bus configuration at Crest substation. | 12/31/2018 | | DPL | 7/29/2015 |
| | s0982.3 | Install six 34 kV breaker – breaker and half configuration at Crest substation. | 12/31/2018 | | DPL | 7/29/2015 |
| | s0982.4 | Install two 230/34 kV transformers at Crest substation. | 12/31/2018 | | DPL | 7/29/2015 |
| 2 | s1003 | Expand Cooper substation with additional 230/34 kV transformer. | 12/1/2016 | \$10.40 | PECO | 7/29/2015 |



Planning

Load Forecast



Maryland & DC - 2016 Load Forecast Report

(December 31, 2015)

| Transmission Owner | Area | Summer Peak (MW) | | | Winter Peak (MW) | | |
|------------------------------------|----------------------|------------------|---------|-----------------|------------------|---------|-----------------|
| | | 2016 | 2026 | Growth Rate (%) | 2015/16 | 2025/26 | Growth Rate (%) |
| Potomac Electric Power Company | District of Columbia | 2,200 | 2,313 | 0.5% | 2,205 | 2,168 | 0.4% |
| Allegheny Power | Maryland | 1,340 | 1,453 | 0.8% | 1,296 | 1,494 | 1.1% |
| Baltimore Gas and Electric Company | Maryland | 6,945 | 7,220 | 0.4% | 5,941 | 6,199 | 0.4% |
| Delmarva Power and Light | Maryland | 1,191 | 1,234 | 0.4% | 1,019 | 1,238 | 0.7% |
| Potomac Electric Power Company | Maryland | 4,993 | 5,247 | 0.5% | 5,005 | 5,373 | 0.4% |
| PJM RTO | | 130,243 | 140,912 | 0.8% | 152,131 | 161,891 | 0.6% |

* PJM notes that Allegheny Power and Delmarva Power serve load other than in Maryland. The Summer peak and Winter Peak MW values in this table each reflect the estimated amount of forecasted load to be served by each of those transmission owners solely in Maryland. Estimated amounts were calculated based on the average share of each transmission owner's real-time summer and winter peak load located in Maryland over the past five years.

Operations

Gas Pipeline Information

| Gas Generators[±] | Dual Fuel Capable (MW) | Total Generator (MW) |
|---------------------------------------|-------------------------------|-----------------------------|
| Connected to Interstate Pipelines | 300 | 900 (26%) |
| Behind the Local Distribution Company | 2,200 | 2,600 (74%) |
| Total Gas Fired Generators | 2,500 | 3,500 |

| Interstate Pipelines | Local Distribution Companies |
|---------------------------------|-------------------------------------|
| Columbia Gas Transmission (COL) | Baltimore Gas & Electric |
| Dominion Transmission (DTI) | Washington Gas & Light |

[±] *There is no wholesale generation currently sited in D.C.*