



Public Utilities
Commission



Ohio Clean Energy Transmission Summit

Todd A. Snitchler
Chairman

Public Utilities Commission of Ohio





PUCO Mission

To assure all residential and business consumers access to adequate, safe and reliable utility services at fair prices, while facilitating an environment that provides competitive choices.



History of Electric Regulation in Ohio



Senate Bill 3

A 1999 law effective January 2001 restructured Ohio's electric industry

- allowed customers to shop for electricity
- provided a five-year market development period



Turn of the century system

- Unbundling of vertically integrated system
- Customers served by generator of choice
- Transmission and distribution remain regulated
- For generation, the rate of return system of regulation replaced by competition





Unbundling



**Generation ("or supply")
Shop for this**

**Transmission
Remains regulated by FERC**

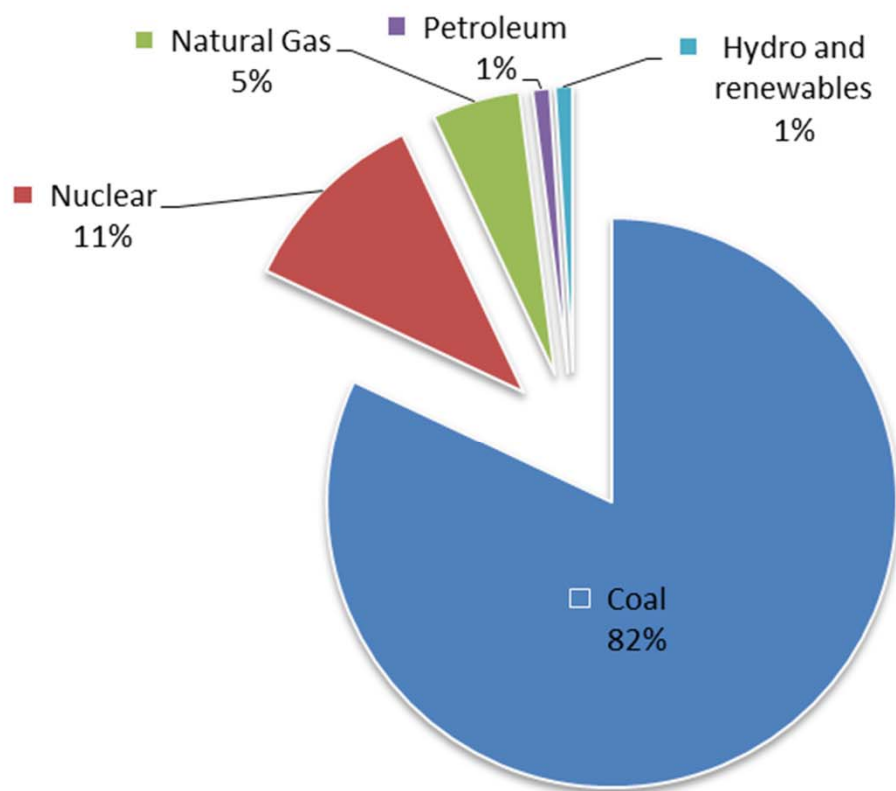


**Distribution
Remains regulated by PUCO
and provided by your local
utility.**



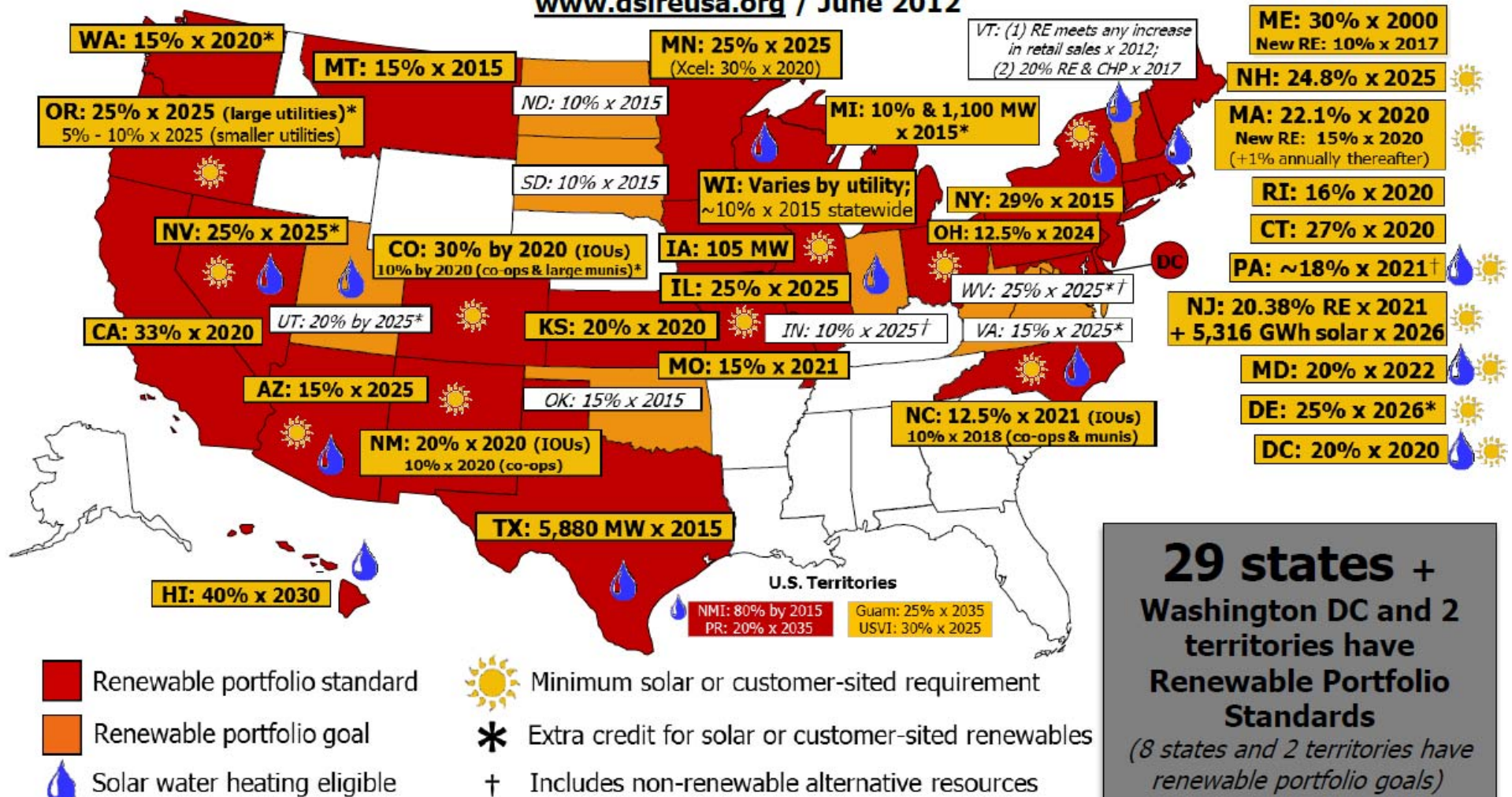


Ohio's Electric Generation Resource Mix



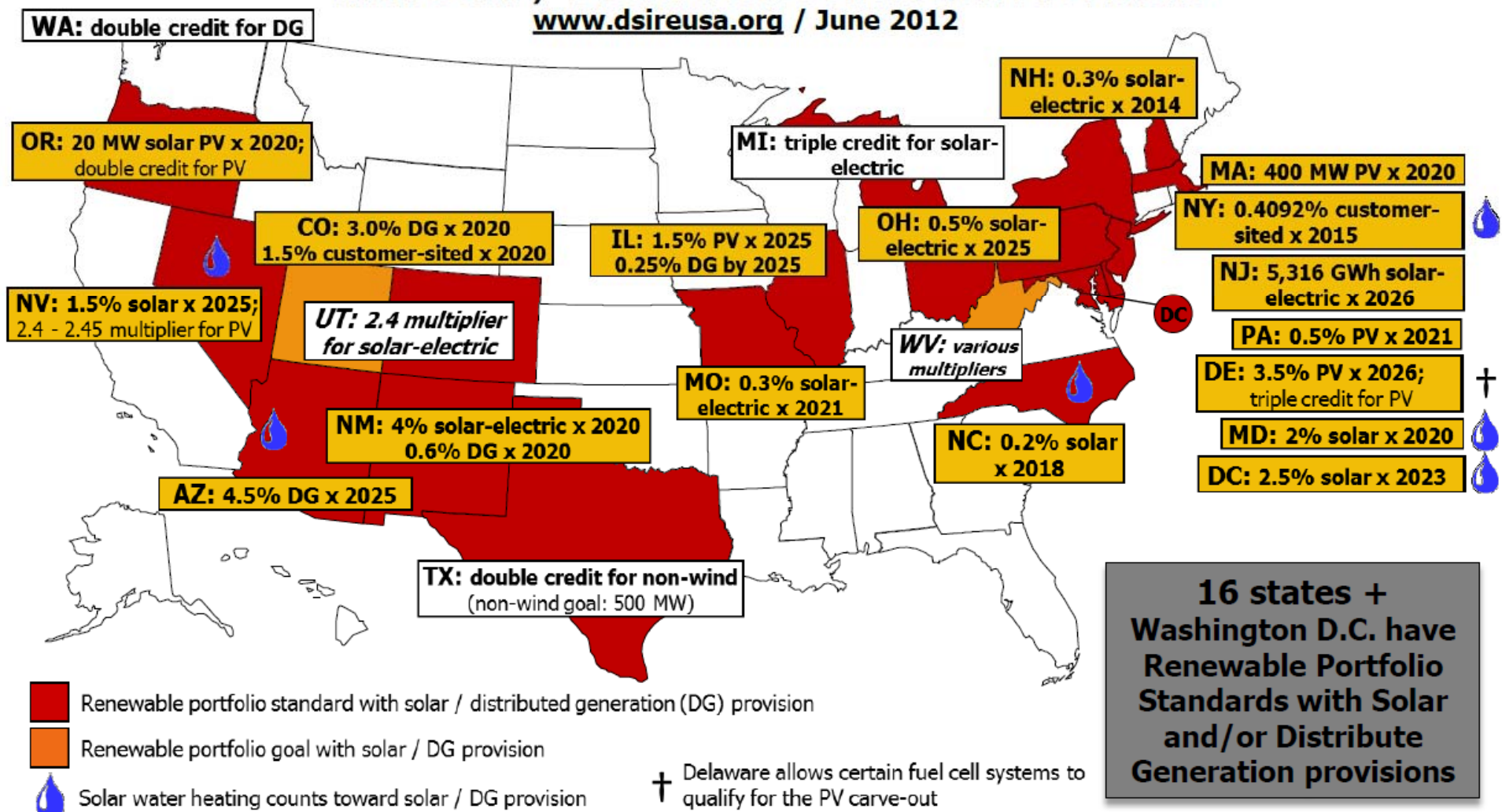
Renewable Portfolio Standard Policies

www.dsireusa.org / June 2012



Renewable Portfolio Standard Policies with Solar / Distributed Generation Provisions

www.dsireusa.org / June 2012





Ohio Alternative Energy Portfolio Standard



- 25% of retail electricity sold by:
 - Ohio's electric distribution utilities – American Electric Power, Dayton Power & Light, Duke Energy, and First Energy, or;
 - Competitive retail electric service companies (CRES)
- Must be generated from **alternative** sources:
 - **Renewable** energy sources
 - **Advanced** energy technology





Ohio Alternative Energy Portfolio Standard



25% (of total kWh) by 2025

- Half may be from advanced energy resources
- At least half must be from renewable; .5% solar
- At least half of the renewable must be from facilities located in the state; the remainder is deliverable from out of state
- Compliance payments/forfeitures
- Cost of compliance not to exceed three percent of otherwise acquired generation





SB 315

- Passed this summer, effective in September, 2012
- Further enhancements for cogeneration systems
- Includes Waste Energy Recovery as renewable
- Provides further expedited processes for PUCO and OPSB
- Green Power Pricing Programs



Qualified Renewable Resources



Solar



Wind



Hydro



Biomass



Fuel Derived
from Solid Waste



Storage



Fuel Cells



Abandoned Coal
Mine Methane



Waste
Energy



CHP System



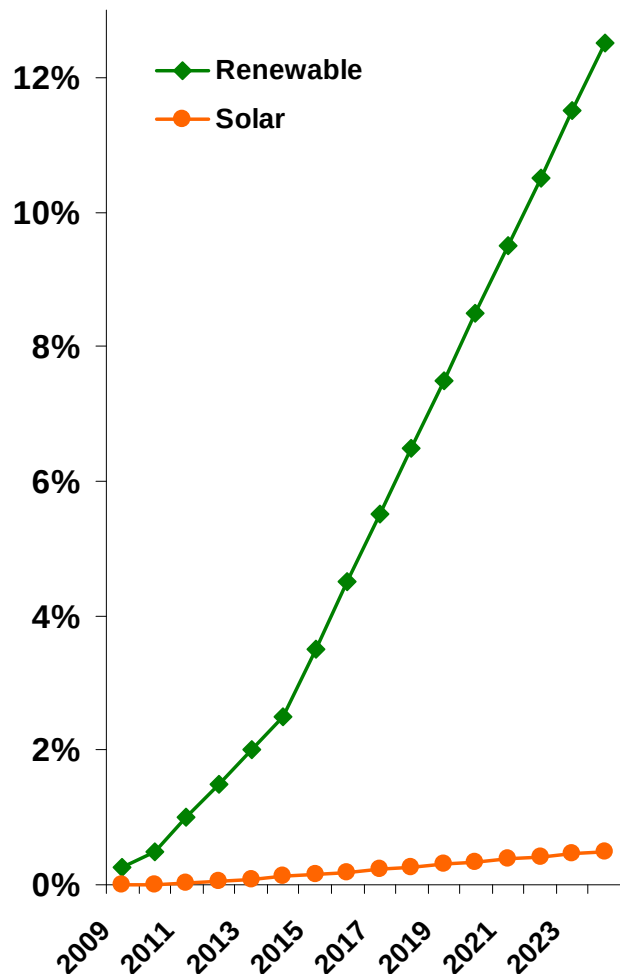
CHP System



Impact

- Ohio ranks 4th among states in retail electric sales
- Ohio ranks 6th in net generation





By end of year	Renewable Energy	Solar Energy
2009	0.25%	0.004%
2010	0.5%	0.01%
2011	1%	0.03%
2012	1.5%	0.06%
2013	2%	0.09%
2014	2.5%	0.12%
2015	3.5%	0.15%
2016	4.5%	0.18%
2017	5.5%	0.22%
2018	6.5%	0.26%
2019	7.5%	0.3%
2020	8.5%	0.34%
2021	9.5%	0.38%
2022	10.5%	0.42%
2023	11.5%	0.46%
2024 +	12.5%	0.5%





Renewable Energy Credits

- New Ohio Renewable Energy Credit (REC) trading market created by new law in 2009
- 1 REC = 1 mWh of electricity generated
- Utilities may own renewable facilities or purchase RECs to meet the renewable portion of the standard
- PUCO certifies resources; established tracking systems will issue and track RECs
- RECs have a 5-year lifetime following their acquisition
- Energy and RECs may be sold as separate commodities





Renewable Applications



Year	Filings
2009	187
2010	1,072
2011	3,264
2012	779
Totals:	5,302

Applications Filed as of 7/2/2012



Harnessing wind energy choices

Wind farms in Ohio can help provide renewable resources to meet Ohio's Alternative Energy Portfolio Standards

A small wind generator owned by a retail customer may enable the customer to use a renewable resource to offset his electrical demand and potentially earn a credit for net metering on his electric bill.





Advanced Energy Resources



- Clean coal
- Nuclear
- Fuel cells
- Customer Co-generation
- Advanced solid waste conversion
- Utility generation plant or demand-side management efficiency measures
- RECs not created from advanced resources



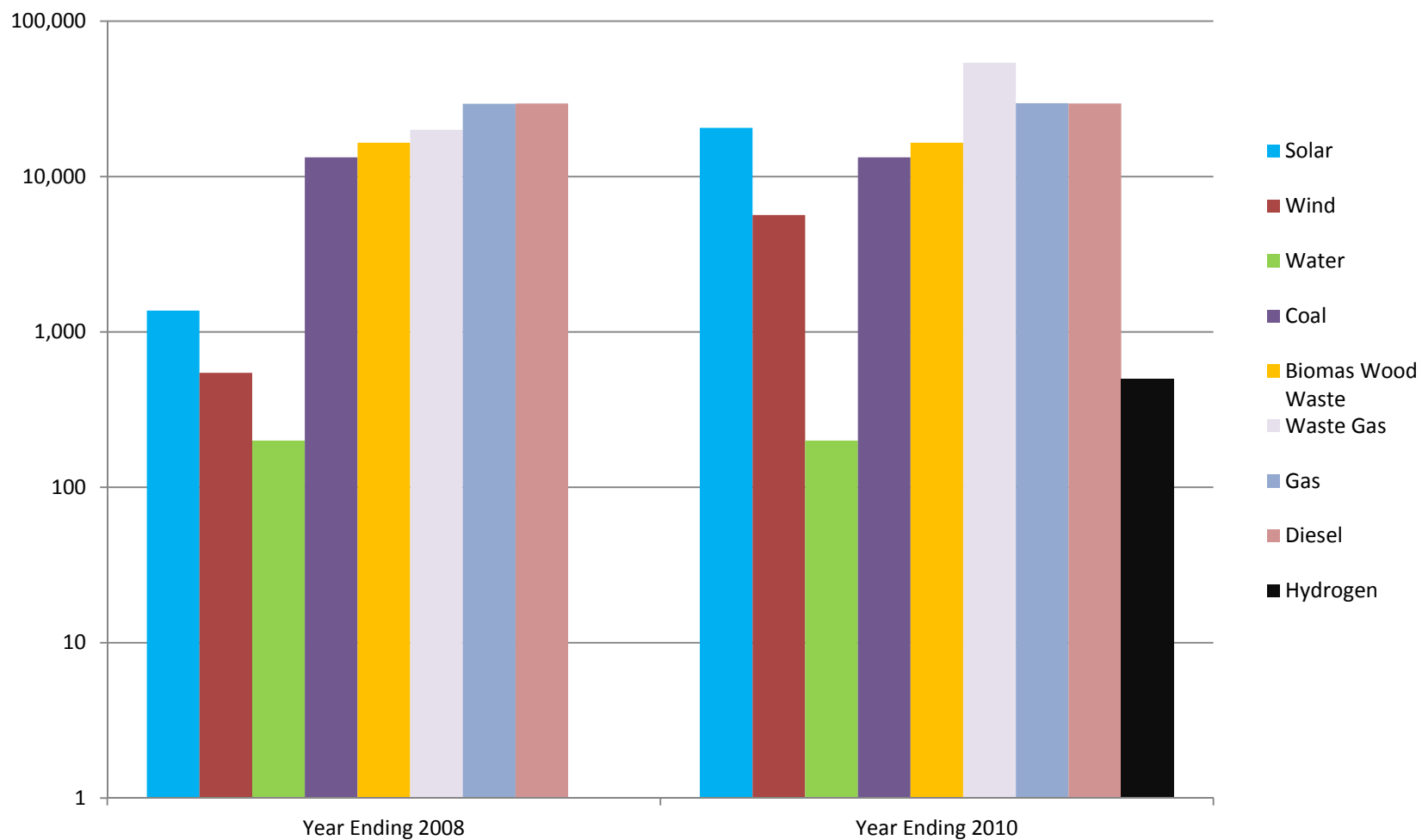
Other Efforts

- *Ohio Biomass Program*
- PUCO Response to The Energy Policy Act of 2005
- The Commission opened an investigation (PUCO Case No. 05-1500-EL-COI) in the matter of a review of Congress's amendments to the Public Utilities Regulatory Policy Act of 1978 (PURPA) in the new Federal Energy Policy Act 2005 (EPACT05) regarding
 - Net metering
 - "Smart" metering and demand response
 - Stand-by power for cogeneration and power production and
 - Interconnection
- Combined Heat and Power Workshops ongoing





Distributed Generation (kW)





Financial Considerations

Incentives

- Ohio's leadership understands the significant and far-reaching benefits associated with the wise development of energy infrastructure within the state.
- To facilitate this objective, the state offers many incentives which could be applied to certain projects.





Ohio Energy Incentives

- Federal tax credits; state RECs
- State Advanced Energy Fund: grants for renewable generation projects; funding taken out of electric ratepayer bills (AEP, DP&L, FE, Duke)
- Ohio Air Quality Development Authority: provides financing assistance, including state and federal tax incentives; issues project revenue bonds; finances power purchase agreements on a tax-exempt basis
- State/federal rules to promote grid interconnection





Transmission

- The transmission system is critical to getting the power to market.
- In the deregulated environment, transmission serves as a transportation system to facilitate wholesale market competition.
- Increases in wholesale energy transactions across the transmission system have created new and different loading on the transmission system.





Transmission Planning In the Competitive Environment

- Bulk transmission planning is driven by market needs to meet transmission service requirements.
- Available transmission capacity is a fundamental component for resource adequacy.
- Coordination between regional market needs and local area transmission requirements is key.





Transmission Expansion

- Provides for load growth and economic development;
- Interconnecting new generation and load, and
- Provides for transmission service requests.





Reliable Operations

For the bulk power system to operate reliably:

- Total generation at any moment must equal total load plus losses
- Electricity is allowed to flow through the transmission system in accordance with physical laws
- System must be designed with reserve capacity in generation and transmission to allow for uninterrupted service when contingencies occur





Benefits of Adequate Regional Transmission Planning

- Access to generation resources
- Enhanced reliability
- Efficient utilization of resources
- Ability to dispatch intermittent generation





Consequences of Inadequate Regional Transmission Planning

- Increased reliance on local power sources
- Potential inefficient use of available generation resources
- More installed plant required to meet given load demand
- Higher energy costs





Signs of Inadequate Regional Transmission Planning

- Uneconomic dispatch
- High levels of congestion
- Transmission maintenance scheduling difficulty
- Generation/Load interconnection delays and difficulty
- Reliability/system problem incidents





Constraints on Transmission System

- Thermal limits
- Voltage stability
- Dynamic Stability
- Other system operating constraints





What Happens

- Reliability consequences
- Interruption of service
- Financial impacts to utility and customer
- Customer/User satisfaction
- Regulatory implications
- Unstable LMP Prices
- Hampered economic growth or economic loss of existing business



PJM Territory Served

Legend

ZONE

	Allegheny Power Systems
	American Electric Power Co., Inc.
	American Transmission Systems, Inc.
	Atlantic Electric Company
	Baltimore Gas and Electric Company
	ComEd
	Dayton Power and Light Co.
	Delmarva Power and Light Company
	Dominion
	Duke Energy Ohio and Kentucky
	Duquesne Light

	Jersey Central Power and Light Company
	Metropolitan Edison Company
	PPL Electric Utilities
	PECO Energy
	Pennsylvania Electric Company
	Potomac Electric Power Company
	Public Service Electric and Gas Company
	Rockland Electric Company



Ohio's Transmission System

Ohio Transmission Company (*Ohio Power*)

- 2,819 Circuits
- 8,973 Miles (23 kV - 345 kV)

American Transmission Systems, Inc.

(*Ohio Edison, Toledo Edison, and The Illuminating Company*)

- 794 Circuits
- 6,734 miles (69 kV - 345 kV)





Ohio's Transmission System

Dayton Power & Light Company

- 240 Circuits
- 1,837 Miles (69kV - 345 kV)

Duke Energy - Ohio

- 165 Circuits
- 1,837 Miles (69kV - 345 kV)

Ohio Valley Electric Corporation

- 12 Circuits
- 414 Miles (345 kV)

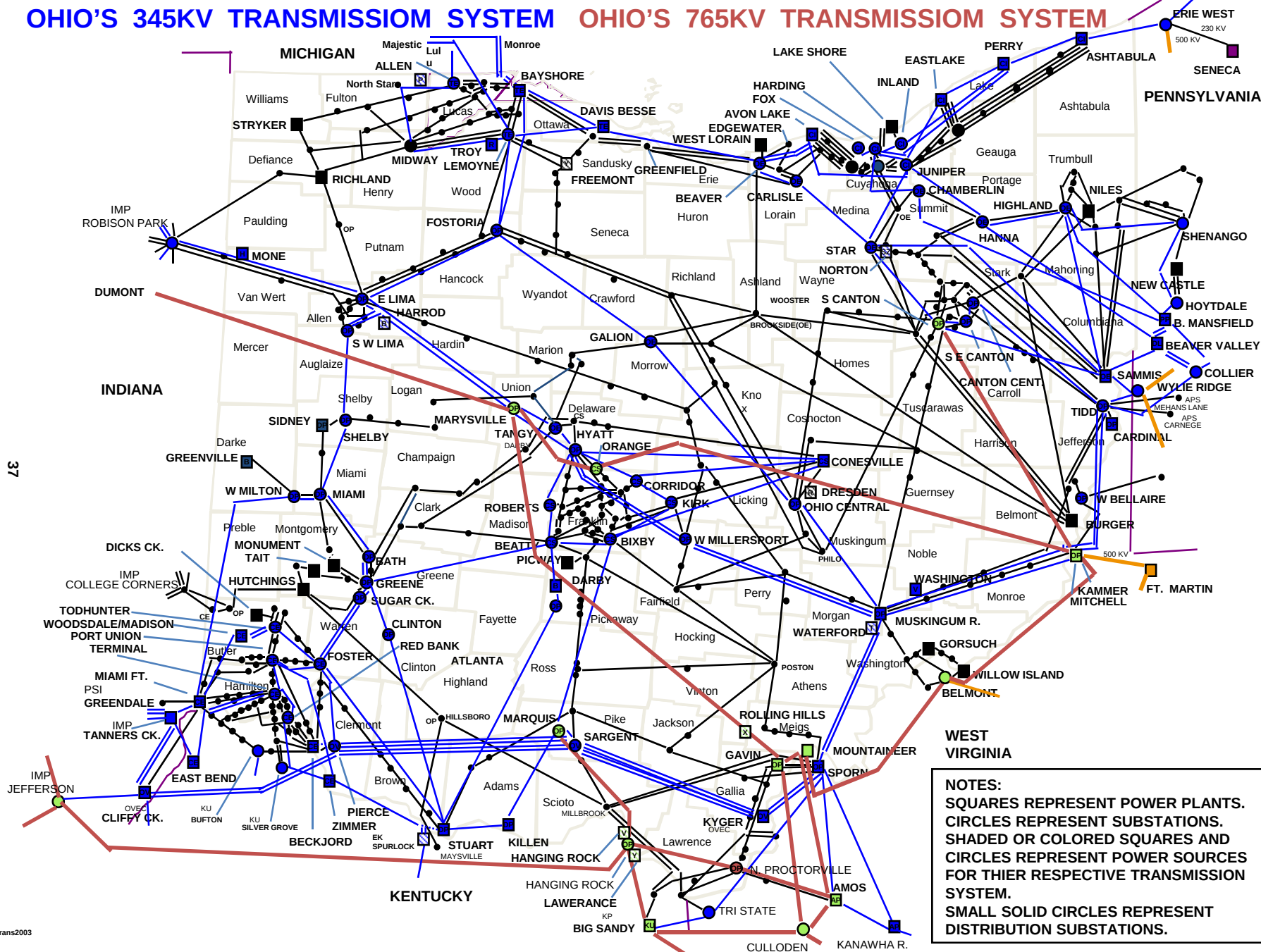


OHIO'S 138KV TRANSMISSION SYSTEM

OHIO'S 345KV TRANSMISSION SYSTEM

OHIO'S 765KV TRANSMISSION SYSTEM

Graph No. 4





Utilization of Existing Assets

- Ensure existing transmission is used effectively and efficiently
- Generation dispatch
- Real-time pricing
- Locational pricing
- TLRs
- VAR Control
- Demand-side management options



Upgrade Existing Infrastructure

- Reconductoring
- Improved communications
- Use of other technologies, for example
 - Phase Angle Regulators
 - Flexible AC Transmission Systems
 - Storage Technologies



Infrastructure Expansion

- Investment in additional transmission lines
- Investment in new technologies, such as superconductivity
- Investment in new generation

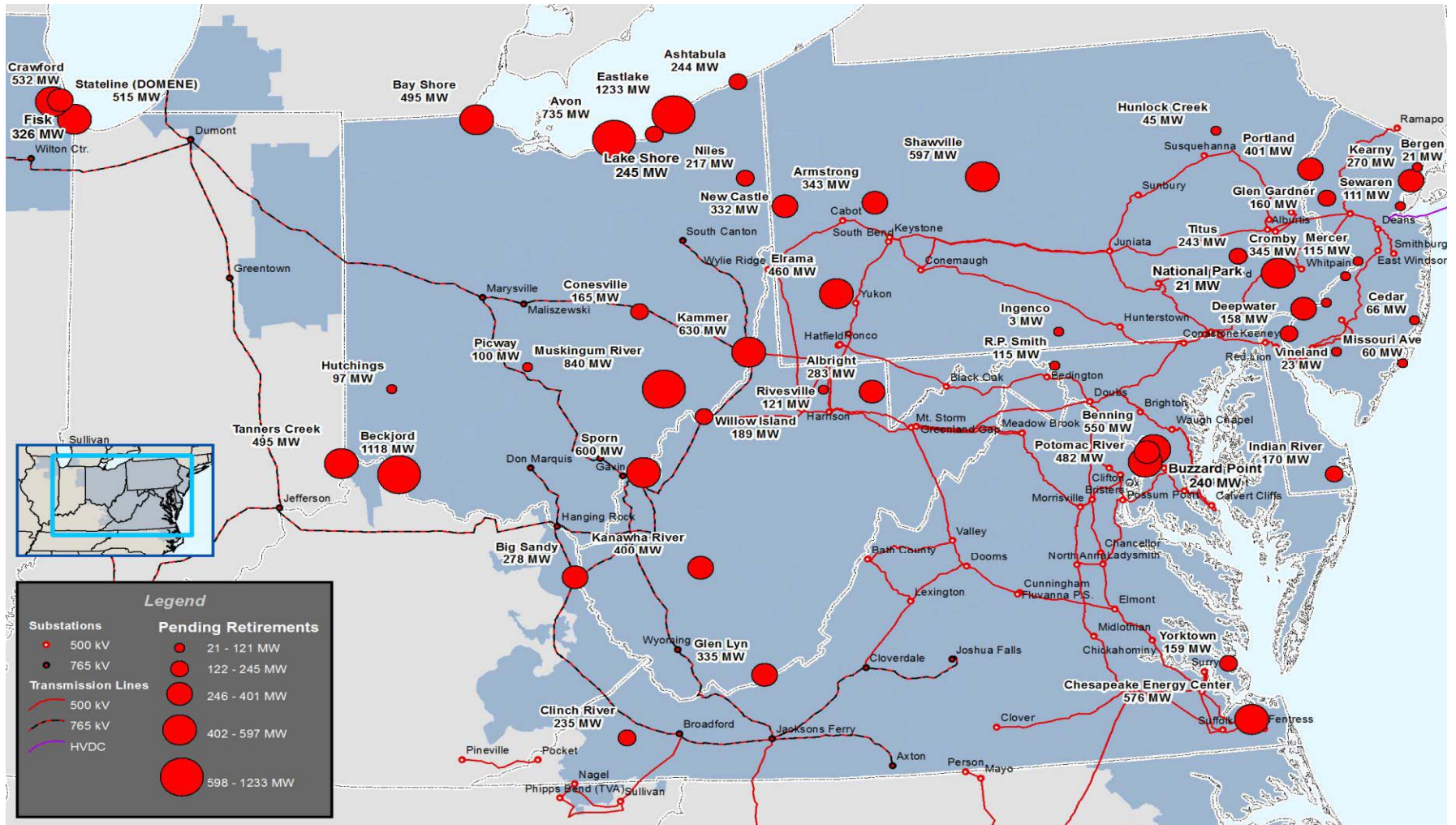


Overview

- Ohio currently has one of the most robust transmission systems in the country.
- We are a crossroads for markets
- However, we are hearing a lot about transmission recently
- Much is due to the current reality facing Northeast Ohio ratepayers due to MATS

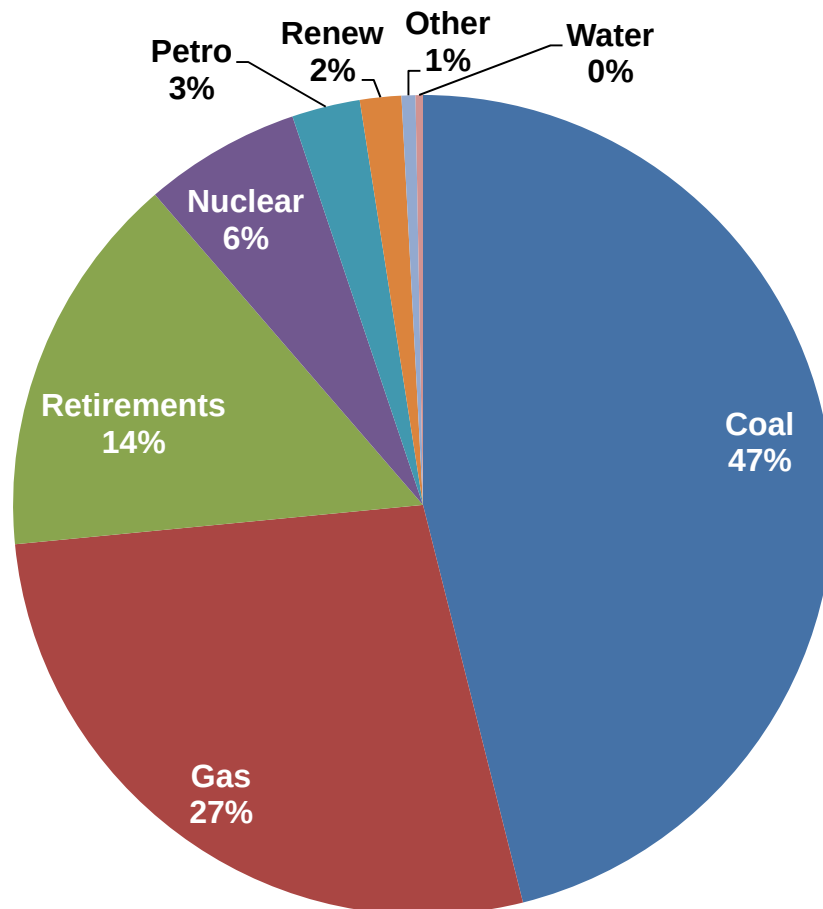


Generation Retirements





Ohio electric generating plant capacity including 2012 - 2015 plant retirements



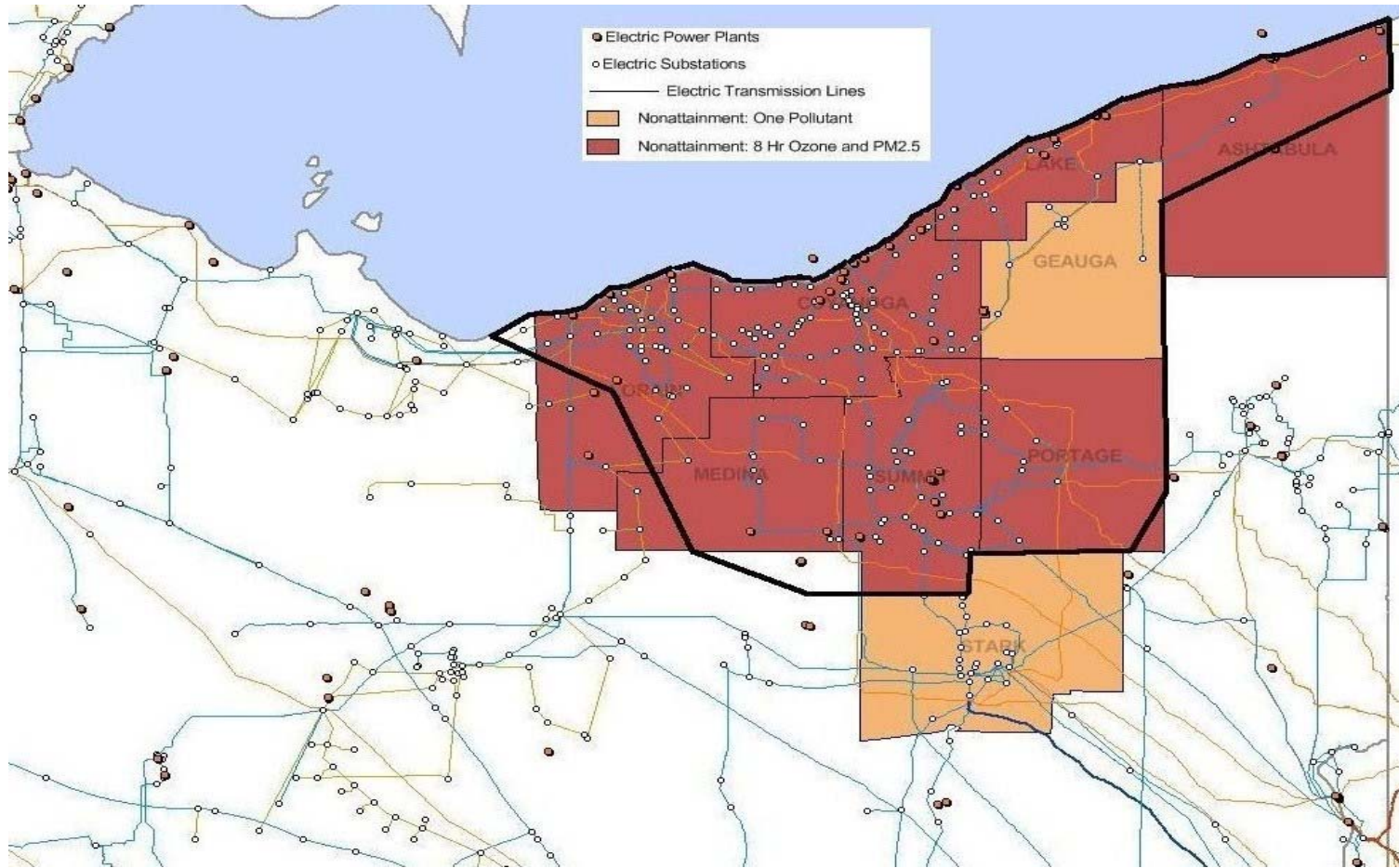


Capacity Market Results

- 2014 – 2015 price is \$126 per MW-day for all Ohio, including the ATSI LDA.
- 2015 – 2016 price is \$136 per MW-day for all of Ohio except the ATSI LDA.
- 2015 – 2016 price is \$357 per MW-day for the ATSI LDA.



Cleveland Constrained Area and Generation Construction Challenges



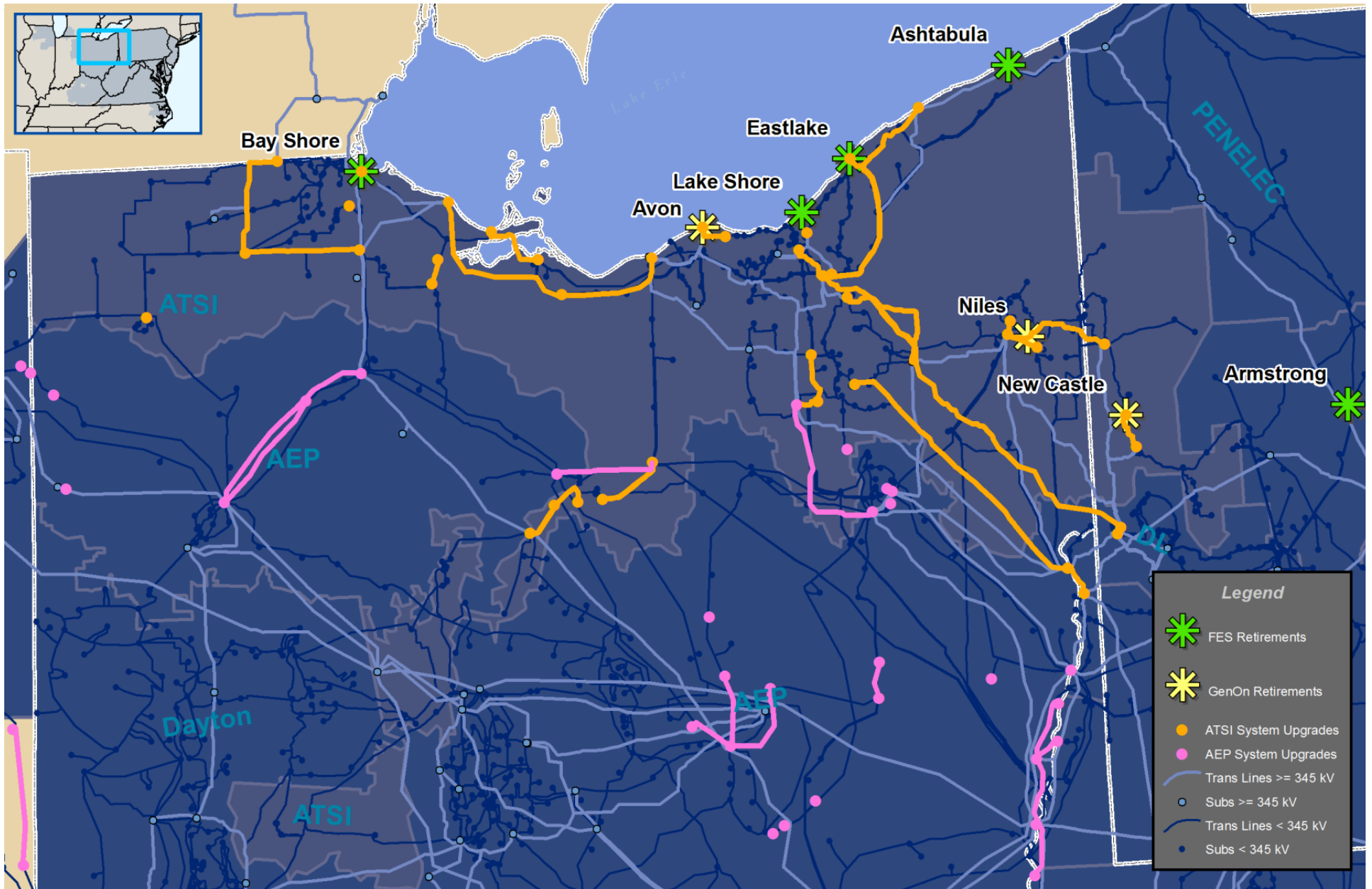
- The colored areas represent the underlying non-attainment areas surrounding Cleveland, OH.
- The black line represents the PJM defined constrained market.
- New construction projects can be limited by non-attainment new source review in these areas.



ATSI Transmission Upgrades



- In order to ***maintain reliability***, transmission upgrades are needed.
- The cost of these upgrades for ATSI is expected to be around \$ 900 million.
- Any delays in construction, including PJM queue congestion and adversarial proceedings can cause further reliability problems and resulting cost increases
- These upgrades ***may not eliminate the constraints***, causing the capacity market separation in pricing



PJM Image



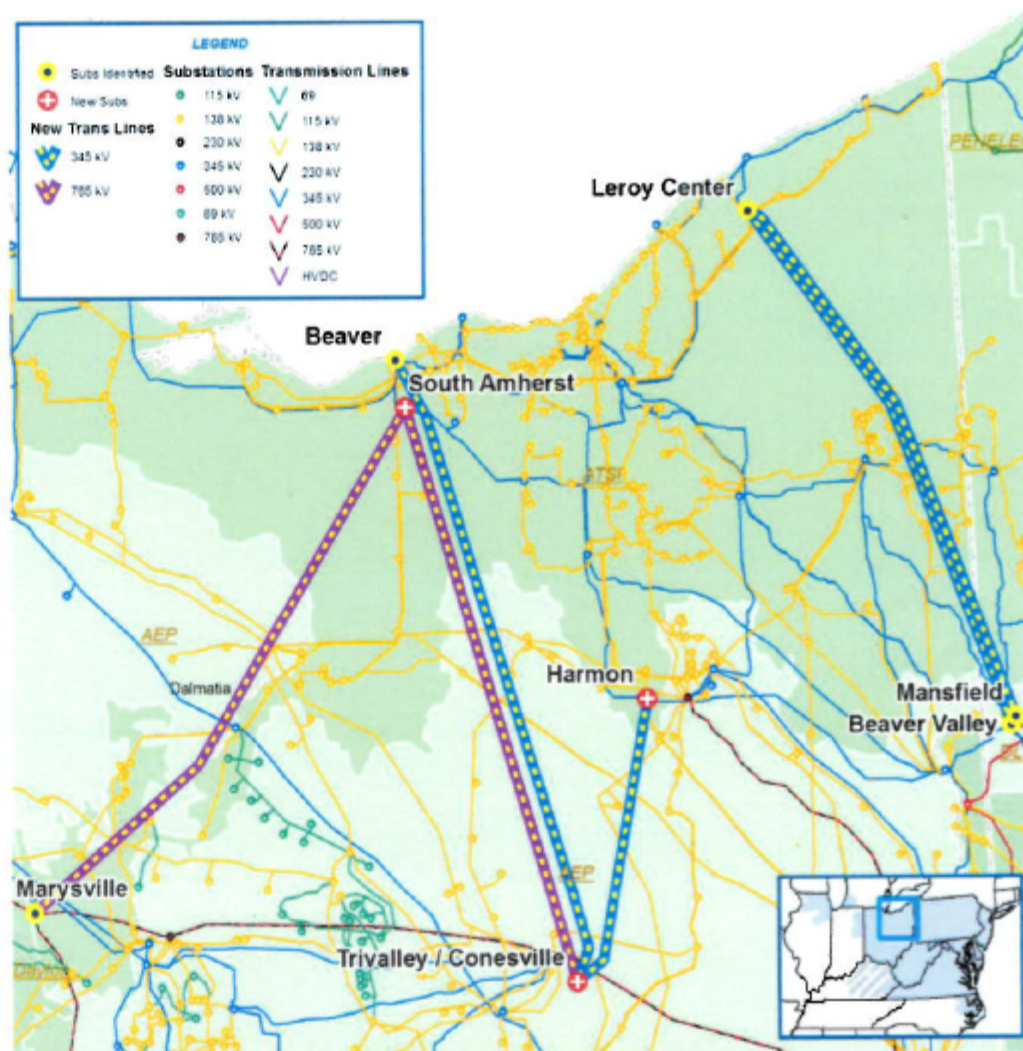
Solutions

- PJM not only approved a transmission solution involving ATSI but also for AEP
- One outstanding resolution is a potential 120 mile 765 kV line from central Ohio to Lake Erie



Retirement Upgrade Alternative Analysis

- Marysville – South Amherst 765 kV
 - Also includes 2-5 miles of 345 kV from South Amherst – Beaver 345 kV
- Trivalley – South Amherst 765 kV
 - Trivalley will intersect Kammer – Vassell 765 kV near Conesville 345 kV
 - Also includes 2-5 miles of 345 kV from South Amherst – Beaver 345 kV
- Conesville – Beaver 345 kV
- Conesville – Harmon 345 kV
- Beaver Valley - Leroy Center 345kV + Mansfield – Leroy Center 345kV line





Reliability Must Run Contracts

- Bilateral agreements between the generation owner and the RTO.
- The costs of agreements will be passed along to customers in a cost plus form.
- Current FirstEnergy plants announcing “delayed closings”:
 - Ashtabula 5, Lake Shore 18, Eastlake 1-3





Wholesale Energy Market

- The deactivations (retirements) will cause an expected increase in congestion costs and/or transmission loss components of locational marginal pricing.
- A stable and low cost natural gas market may offset the price increases associated to these components.



