



Testimony

Submitted on behalf of the
Pennsylvania Chamber of Business and Industry

Informational Hearing
PJM's MOPR Proposal and Maintaining Competitive and Reliable Energy Markets

Before the:
Senate Environmental Resources and Energy Committee

Presented by:
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Harrisburg, PA
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Chairman Yaw, Minority Chair Comitta, and members of the committee,

Thank you for the opportunity to provide additional information and perspective regarding recent and pending changes to electricity market rules and how they impact our state and its economy. My name is Kevin Sunday, director of government affairs for the Pennsylvania Chamber of Business and Industry, the largest, broad-based business advocacy organization in the commonwealth, representing more than 9,000 member companies of all sizes, across all commercial and industrial categories.

Pennsylvania is the second-largest energy producing state, the second-leading state in natural gas production, the third-largest coal producing state, and the third-largest electricity producer.¹ Our state is also the largest net-exporter of electricity in the country and is the largest electricity producer on the 13-state PJM grid that provides power to 65 million Americans, thanks to our competitive, diverse fleet of power generation resources, including the second-largest amount of nuclear power of any state in the country. Pennsylvania is also eighth in total manufacturing output, with leadership positions in food manufacturing, refined products, pharmaceuticals, steel, cement, aggregates and pulp and paper.

All of our members are committed to the stewardship of our state and nation's land, air and water, and we seek to provide a thoughtful and balanced approach on ways we can continue to reduce our environmental impacts and grow the economy. An embrace of competitive markets by policymakers in Pennsylvania has led to significant amounts of private capital being deployed to more efficient, cleaner-burning technologies, as well as substantial reductions in electricity costs across the PJM grid.

This testimony will note the enormous benefit competitive markets have had for the state, its economy and the environment. But we are in a period of disruption in the markets in large part because other states have tried to stack the deck for their resources, at great cost to their constituents. These same states in great measure rely on Pennsylvania's electricity exports and our leadership role in driving down costs have also in a number of regulatory actions tried to impair our energy and manufacturing sectors. In turn, federal policymakers at the Federal Regulatory Energy Commission, which oversee the PJM market rules, have attempted in recent years to impose vastly different means to control for these states' subsidies, and the result has been delays to regularly scheduled electricity auctions; disruption to the operations and business planning for energy companies in generation, retail and utility sectors, and a diversion away from the key functions of PJM – reliability and the economic dispatch of power – and instead towards satisfying the mercurial whims of the commissioners at FERC. With massive amounts of private capital being deployed to execute sustainability strategies and embrace low- and zero-carbon resources, we argue policymakers at the state and federal level should leverage market constructs, not mandates and subsidization, to further drive down emissions and electricity costs.

¹ Pennsylvania State Energy Profiles, US Energy Information Administration.
<https://www.eia.gov/beta/states/states/PA/rankings>

Competitive Markets and Private Sector Leadership Have Delivered Significant Environmental and Economic Progress in Pennsylvania and the United States

Among all states, Pennsylvania is the biggest net exporter of electricity in terms of megawatt hours, according to a recent analysis by the U.S. Energy Information Administration (EIA).² Based on an analysis of EIA data, Pennsylvania exported 36 percent of total megawatt hours in 2019. Pennsylvania is also the largest power producer in the 13-state PJM grid, the largest grid in the country and one that delivers power to the homes, schools, and workplaces of more than 65 million Americans. The competitive markets managed by PJM have resulted in significant reductions in NAAQS criteria and greenhouse gas emissions from the power generation sector. Since 2005, carbon dioxide emissions fell across PJM by 34% in large part due to competition among generation and improvements in technology.³ Remarkably, Pennsylvania has remained in a leadership position with respect to power generation and net exports even with a substantial decrease in both tons of emissions and emissions intensity among the portfolio. According to a profile of the state's generation and transmission assets compiled by PJM⁴, Pennsylvania's average CO₂ intensity declined from approximately 1,100 lbs/MWh in 2005 to approximately 720 lbs/MWh in 2020 (a reduction of 34 percent), and SO₂ intensity declined from 10 lbs/MWh in 2005 to less than 1 lb/MWh in 2020 (a reduction of more than 90 percent). Since 2005, only one other state has reduced its energy-related CO₂ emissions more in terms of absolute tons.⁵ Additional reductions from our state's power generation sector are expected to continue, with PJM reporting thousands of new megawatts of natural gas, solar, wind and storage in the queue.

Overall, Pennsylvania's industrial sources have achieved significant declines in emissions of federally regulated pollutants over the past several decades. According to data available on PA DEP and US EPA's websites, these reductions include decline in annual emissions of NO_x on the order of 65 percent, SO₂ by 90 percent, CO by 69 percent, VOCs by 36 percent and PM 10 by 37 percent. Further, these reductions are yielding a demonstrable improvement in air quality. Every monitoring point in the state is measuring attainment for the 2008 ozone standards of 75 ppb, and in just one year the number of monitoring points measuring non-attainment for the 2015 ozone standard of 70 ppb fell from eight to just four. The state is also measuring attainment at all points for both the annual and 24-hour standards from PM 2.5, and the Allegheny County Health Department announced in February that for the first time in decades its monitors were measuring healthy levels of air quality for all criteria pollutants.

Pennsylvania's contributions to growing the economy while reducing energy prices and emissions have positioned the United States for leadership in sustainable growth. As EPA's Acting Assistant Administrator Joseph Goffman noted in a recent memo to regional offices, "ongoing changes in electricity generation mean that the emission reduction goals that the [Obama administration's Clean Power Plan] for 2030 have already been achieved."⁶ From 2005 to 2019, according to an analysis of

² Today in Energy, December 7, 2020. US EIA. <https://www.eia.gov/todayinenergy/detail.php?id=46156>

³ Emissions Continue to Drop Throughout PJM Footprint. PJM Interconnection, March 4, 2020. <https://insidelines.pjm.com/emissions-continue-to-drop-throughout-pjm-footprint/>

⁴ 2019 Pennsylvania State Infrastructure Report. PJM Interconnection, July 2020. <https://www.pjm.com/-/media/library/reports-notice/state-specific-reports/2019/2019-pennsylvania-state-infrastructure-report.ashx?la=en>

⁵ State Energy-Related CO₂ Emissions by Year, Adjusted (1990-2018). US Energy Information Administration, March 2, 2021. <https://www.eia.gov/environment/emissions/state/>

⁶ Memorandum to EPA Regional Administrators: Status of Affordable Clean Energy Rule and Clean Power Plan. United States Environmental Protection Agency Office of Air and Radiation. Feb. 12, 2021.

World Bank, EIA and International Energy Agency data⁷, the United States' economy grew by 64 percent, to roughly \$21.4 trillion in GDP, while reducing carbon dioxide emissions by 16%. Over the same period, Europe's economy grew at half the same pace (31 percent) yet lagged the United States on emissions reductions on an absolute basis – a reduction of 742 mmt for Europe compared to a reduction of 936 mmt for the United States, or a delta of 210 million metric tons of CO₂. More broadly, over the same 15 year period, OECD countries as a whole reduced on net carbon dioxide emissions by 1,524 mmt – of which the United States can proudly lay claim to having been responsible for more than 60 percent of those reductions. Policymakers must not lose sight of the fact that while these reductions were taking place in the developed world, as the economies of India and China grew, so did their greenhouse gas emissions. India's CO₂ emissions grew by more than 1,200 mmt, or a 115 percent increase, nearly singlehandedly dwarfing reductions in OECD countries. China's emissions grew by 4,400 mmt, or an 81 percent increase – nearly three times the total reductions of OECD countries. Further, as this international comparison in emissions demonstrates, the offshoring of domestic manufacturing as a result of uncompetitive tax, labor and regulatory policy will result in operations in countries that have much higher emissions intensities.

The significant declines in air emissions have also been paired with decreases in the commodity costs within PJM's energy markets. In 2020, prices in the energy markets were the lowest in the 21-year history of the RTO's organized markets. Energy markets provide approximately two-thirds of the weight of wholesale power prices in PJM. Wholesale prices across PJM for 2020 were the lowest in 15 years, according to the Independent Market Monitor's recent annual report.⁸

Other states within PJM have reacted to these massive wholesale cost reductions (and the significant economic activity that has occurred in Pennsylvania with the construction of new natural gas-fired power plants) by raising costs on their constituents through subsidization of preferred resources within their borders. While many factors play into the cost of electricity, including fuel costs, labor, regulation, and economic growth, it is possible these subsidies will have a downward effect on electricity prices for consumers, including industrial and commercial users, in Pennsylvania, as these subsidized resources are being compensated apart from the electricity capacity markets, resulting in a commensurate decrease in bid prices. To the extent these subsidized resources are renewables, which do not have fuel costs and operate at low to no marginal costs, they may also reduce energy market prices as well. In the short-term, this would be positive for ratepayers; in the long-term, excessive state subsidies that distort markets signals may serve to divert investment in the power generation sector away from Pennsylvania. Further, in order to ward off a reliability issue due to market structures no longer supporting the economic dispatch of power for resources with firm fuel supply that can ramp (such as gas and battery storage) in response to intermittent resources (such as wind and solar), it may be prudent for policymakers, stakeholders and the grid operator to open a further discussion on additional changes in market rules, so as to compensate for resources that support flexibility, reliability and resiliency.

⁷ World Bank Open Data, March 9, 2021. <https://data.worldbank.org/>
International Energy Statistics, US EIA. <https://www.eia.gov/international/data/world>
CO₂ Emissions from Fuel Combustion, International Energy Agency.
http://wds.iea.org/wds/pdf/Worldco2_Documentation.pdf

⁸ 2020 State of the Market Report for PJM. Independent Market Monitor, March 2021.
https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2020/2020-som-pjm-sec1.pdf

Significant Private Capital is Being Deployed to Low- and Zero-Emissions Energy Technology

We would be hard-pressed to identify a company among our membership who operates in the energy or manufacturing space that is not executing a sustainability strategy. In consultation with financial institutions, management, shareholders, vendors and employees, companies – both public and private – are establishing goals to reduce water use, waste, and emissions. Depending on the company, these goals may look different – for example, a food processor or pulp and paper manufacturer may be adopting combined-heat and power for efficient, on-site generation; a data center may be offsetting emissions through a renewable power-purchase agreement and carbon capture credits; and a steel manufacturer may be looking to adopt electric furnaces along with partnering with gas exploration and production companies on carbon capture and hydrogen production. The technology solution will vary by company and industry.

Entrepreneurs are also transferring knowledge and human capital from legacy industries to new energy systems, including battery technology, hydrogen production, carbon capture and geothermal. Importantly, many of these disciplines will continue to require both infrastructure and a knowledge base from disciplines such as oil and gas development and pipeline construction. Significant amounts of private capital are being committed to low- and zero-carbon energy technologies. According to Bloomberg's New Energy Finance report, last year VC and PE firms raised more than \$5.9 billion, a 51% year-over-year increase.

As the images appended to this testimony note, the lower cost of natural gas and renewables technology is spurring continued innovation by producers and increased adoption by users. Among generation in the queue for Pennsylvania, solar represents 53% of new generation, along with substantial amounts of new gas and storage. Across PJM's entire footprint, of a total of 105 GW seeking interconnection to the grid, more than 56% is solar (59 GW), 26% is natural gas (28 GW), and 10% is storage (10 GW). While not all of this generation may ultimately be constructed, it is telling that even in an extremely competitive market with historically low energy prices low and zero-carbon emission resources continue to clear at impressive rates. In the most recent PJM capacity market auction for the 2022/2023 delivery year, which was conducted under the existing MOPR rules (which FERC has ordered to be re-written because it believes PJM's rules are prohibited state-subsidized resource from clear) 22% more wind cleared compared to the prior auction, solar increased its cleared generation by 165% and natural gas and nuclear both increased their cleared amounts. Perhaps most notably, the cost threshold for a new generation source to enter the market fell by an astounding 19% over the prior auction year.

The Implications of FERC Continuing to Direct PJM and Stakeholders to Repeatedly Rewrite Market Rules: Disruption, Delay and Diversion from Principal Obligations

Regional transmission organizations like PJM were established with the goal of prioritizing reliability and dispatching generation on an economic basis. As noted, these markets have resulted in significant reductions in both emissions and commodity costs for ratepayers. Pennsylvania's embrace of competitive markets has resulted in billions of new economic activity in the state. Other states, such as New Jersey, have reacted to low energy prices by attempting to heavily subsidize preferred resources, in an attempt to gain market share. This was not the only policy action New Jersey and other states in the mid-Atlantic have taken in an attempt to disadvantage Pennsylvania's energy and manufacturing sector. States have filed regulatory petitions to EPA requesting overly burdensome requirements on

manufacturing and energy infrastructure despite Pennsylvania attaining NAAQS requirements at nearly every monitoring point; pushing for a moratorium on energy exploration within the Delaware River Basin Commission; and attempting to halt construction of new interstate pipelines despite local gas utilities in receiving states noting a significant need for fuel during winter.

Over the past few years, as the composition of FERC has changed, federal regulators have imposed vastly different visions on PJM for how it ought to account for these state subsidies through changes to PJM's tariff for its capacity market, dubbed the Minimum Offer Price (MOPR). FERC has gone from an agency that sought to engage in thoughtful decisions about power markets and infrastructure siting to one whose very actions have been as big of a disruptor as any to the nation's energy system.

As a result, market auctions have been repeatedly delayed, resulting in significant disruption in the operations of power generators and retail electric companies. These delays and questions over what constitutes a subsidy in the context of bid adjustments has also impeded electric utilities' timely procurement of default service for non-shopping customers. It has also thrown a massive wrench into competitive generators and retail power providers' ability to engage in long-term planning. Reliability, which ought to come first above all considerations, has now been relegated behind continual rearrangements to the operations of the country's largest organized grid to meet the ever-changing whims of FERC. Investment decisions in the energy space are made with long time horizons; they will be delayed and distorted to the extent the policy environment remains unsettled.

The ultimate direction of FERC will be determined by the United States Senate as it works to confirm Commissioner Willie Phillips Jr. to the fifth and swing seat at the commission. It is our hope that the Senate will strongly encourage him to take a moderate and pragmatic approach to overseeing the construction of new gas and electric transmission projects and the operation of electricity markets. With a stable regulatory environment, the private sector will continue to invest in low- and zero-carbon resources. This includes modernization and expansion of the natural gas pipeline system, infrastructure that is very much needed to meet energy needs and address climate change, in part through hydrogen production and carbon capture and through the export of LNG to nations abroad in need of fuels as an alternative to charcoal and manure. As researchers at Columbia University have noted, "investing more in the domestic natural gas pipeline network could help the US reach net-zero emission goals more quickly and cheaply. Fortifying and upgrading the system could prepare the existing infrastructure to transport zero-carbon fuels as they become available."

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In closing, thank you for the opportunity to present our perspective on this matter. We maintain our natural resources and infrastructure should be a key pillar of economic recovery and vitality to the state in the wake of this historic pandemic. Appended to this testimony are additional tables and graphics noting recent energy pricing, market and power generation data (including pricing, emissions and exports) from the state's Independent Fiscal Office and from PJM which underscore the success competitive markets have yielded to Pennsylvania's economy.

Figure 1 – Pennsylvania Existing Installed Capacity

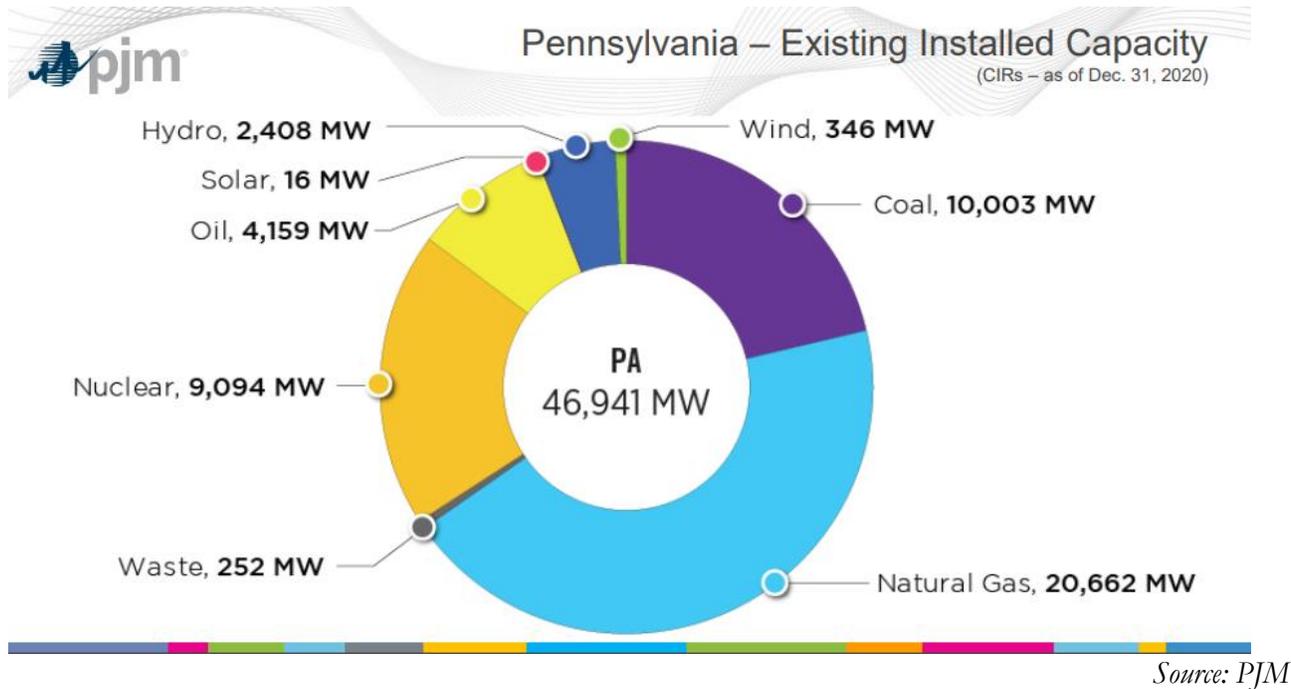


Figure 2 – New Generation in Queue, by Fuel Source, PJM-Wide

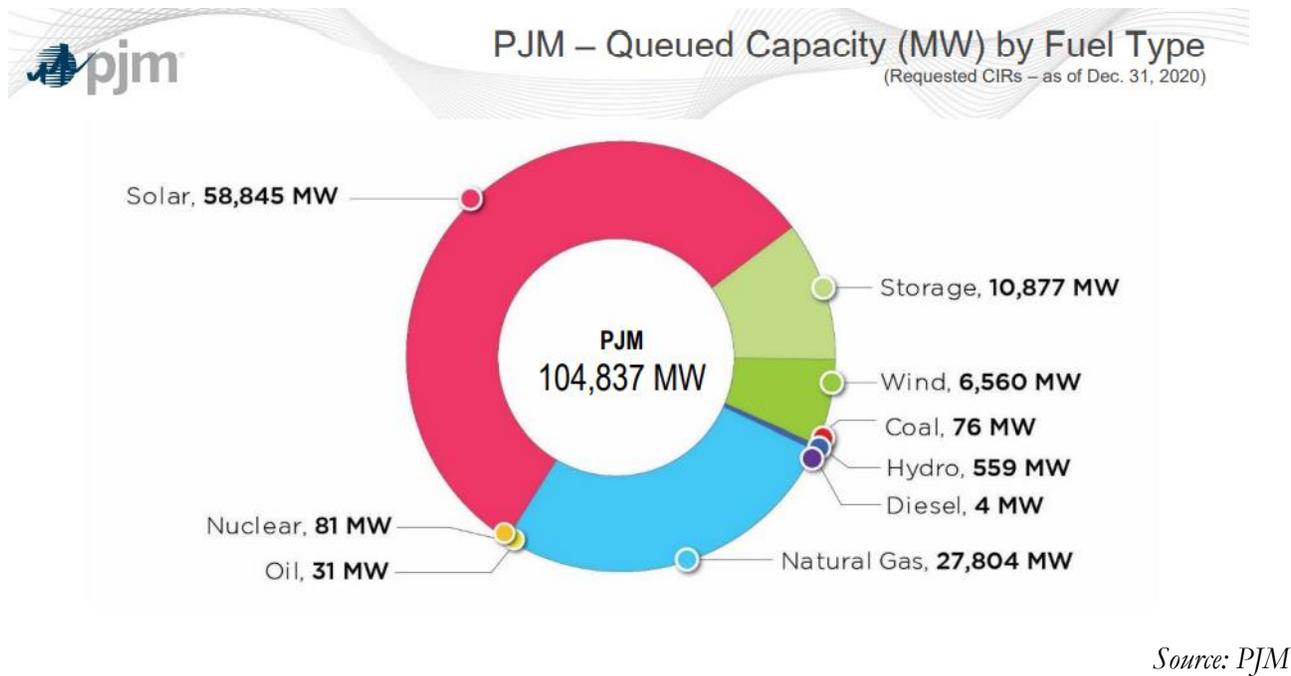
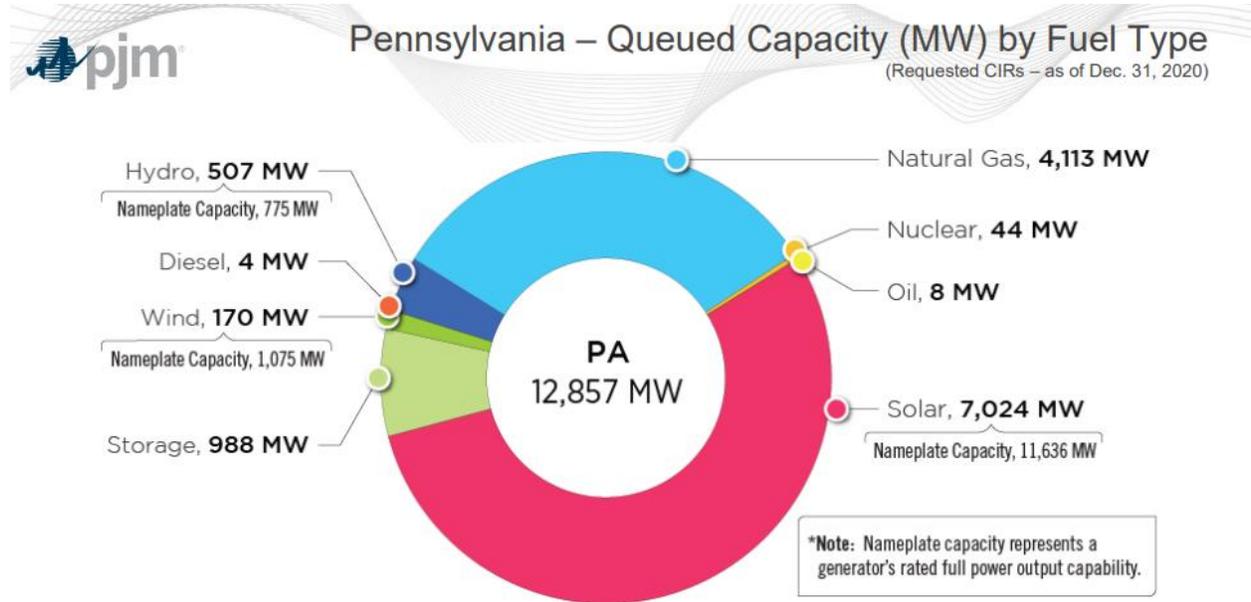
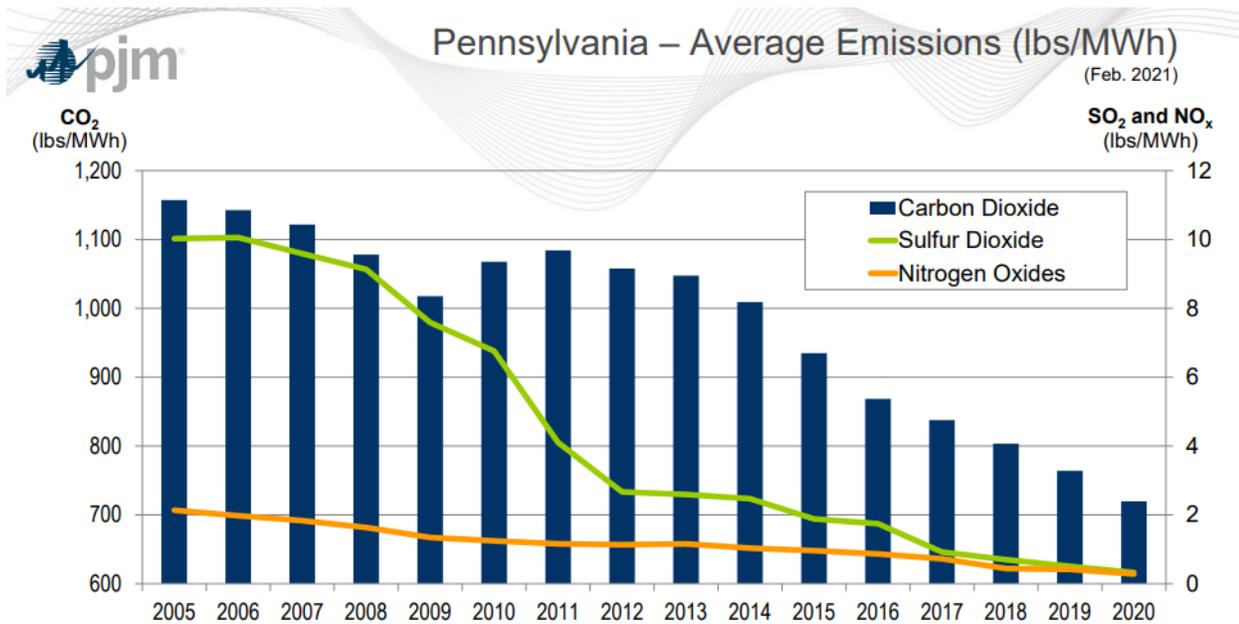


Figure 3 – New Generation in Queue, by Fuel Source, Pennsylvania



Source: PJM

Figure 4 – Average Emissions for CO₂, NO_x and SO₂ from Power Generation, Pennsylvania



Source: PJM

Figure 5 – Electricity Exports by State, 2020

State	Net Generation				Total	Total Consumption	Net Exports
	Nat. Gas	Coal	Nuclear	Other			
Pennsylvania	120.3	23.8	76.5	10.3	231.0	151.8	79.1
West Virginia	50.2	2.8	--	3.8	56.8	34.0	22.8
Connecticut	23.5	0.0	15.7	2.0	41.2	29.5	11.6
New Jersey	30.7	0.9	26.7	3.1	61.5	77.1	-15.6
North Carolina	41.7	20.8	42.3	19.1	124.0	139.7	-15.8
New York	53.0	0.1	38.5	40.4	132.0	148.8	-16.8
Virginia	62.1	3.8	30.1	6.3	102.3	124.8	-22.5
Maryland	14.0	3.4	15.1	3.6	36.1	62.0	-25.9
Ohio	52.6	45.0	18.2	5.3	121.1	149.2	-28.1
Massachusetts	14.0	--	--	4.4	18.4	53.0	-34.6

Note: Amounts in millions of megawatt hours. Total consumption includes 2019 amounts for direct use and line losses, which are not yet available for 2020.
 Source: U.S. Energy Information Administration.

Source: IFO analysis of US EIA data

Figure 6 – Residential Electricity Prices by State, 2016 vs. 2020

State	2016	2021	2016 Ratio	2021 Ratio
Connecticut	20.01	22.21	1.44	1.68
Massachusetts	19.00	22.09	1.37	1.67
New York	17.58	18.83	1.27	1.42
New Jersey	15.72	16.10	1.13	1.21
Pennsylvania	13.86	13.26	--	--
Maryland	14.23	12.62	1.03	0.95
Ohio	12.47	12.38	0.90	0.93
West Virginia	11.44	12.00	0.83	0.91
Virginia	11.36	11.98	0.82	0.90
North Carolina	11.03	11.37	0.80	0.86

Note: Cents per kilowatt hour. Prices for 2021 are through June.
 Source: U.S. Energy Information Administration.

Source: IFO analysis of US EIA data

Figure 7 – Electricity Generation (million MWh), GHG Emissions (mmt) and Emissions Intensity

State	Generation		Emissions		Emissions per Unit	
	2010	2019	2010	2019	2010	2019
New York	137.0	131.6	41.6	24.8	0.30	0.19
Connecticut	33.4	40.1	9.2	9.5	0.28	0.24
New Jersey	65.7	71.0	19.2	18.9	0.29	0.27
Virginia	73.0	96.8	39.7	30.0	0.54	0.31
Maryland	43.6	39.3	26.4	13.1	0.60	0.33
Pennsylvania	229.8	229.0	122.8	77.4	0.53	0.34
North Carolina	128.7	131.2	73.2	47.4	0.57	0.36
Massachusetts	42.8	21.5	20.3	8.5	0.47	0.40
Ohio	143.6	120.0	122.0	68.1	0.85	0.57
West Virginia	80.8	63.9	74.3	56.8	0.92	0.89

Note: Generation in million megawatt hours. Emissions in million metric tons.
 Source: U.S. Energy Information Administration.

Source: IFO analysis of US EIA data