Order 1920 Scenarios
Policy-Driven Deactivation: Methodology

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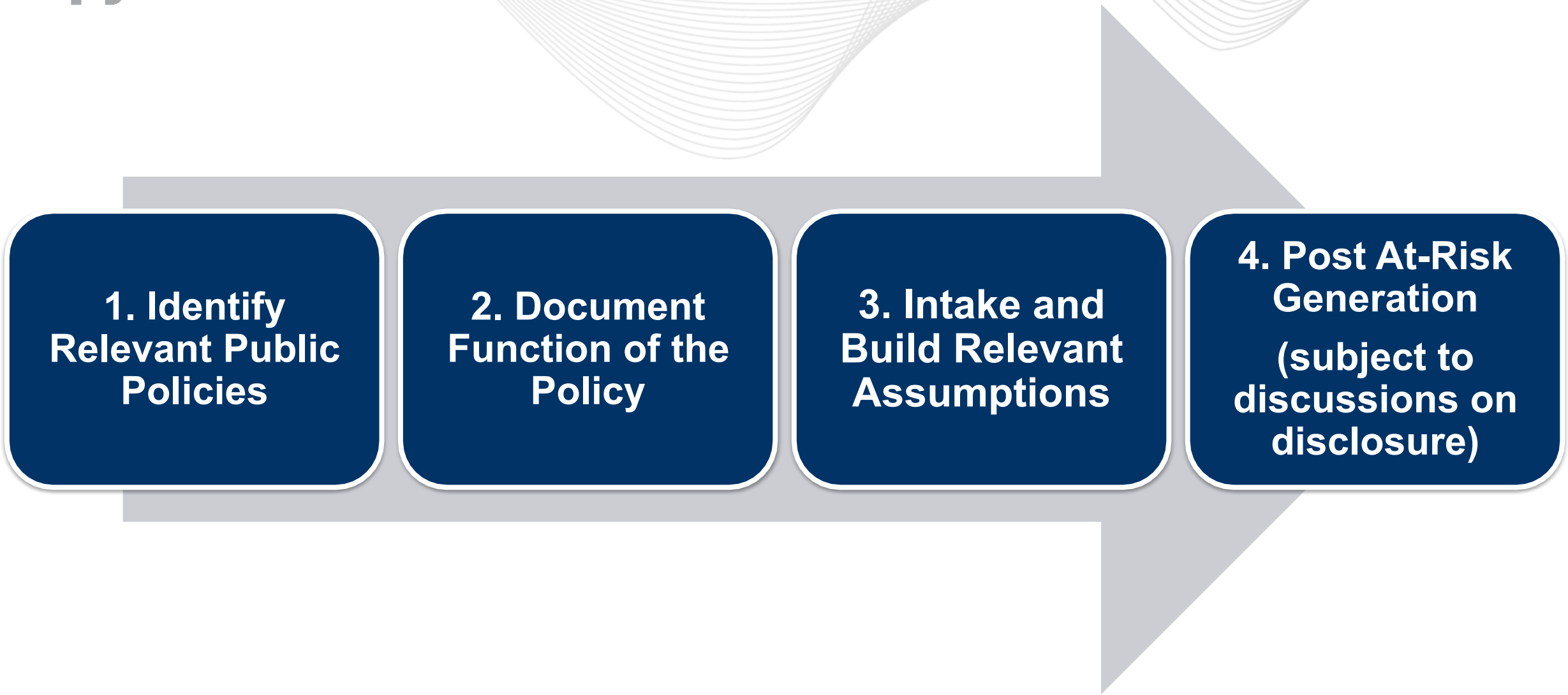
Overview

- Order 1920 scenarios will have to account for unannounced but anticipated resource deactivations. Unannounced deactivations resulting from policies touch on the following Order 1920 scenario factors:
  - **Factor 1:** Laws and regulations affecting future resource mix and demand
  - **Factor 2:** Laws and regulations on decarbonization and electrification
  - **Factor 3:** Integrated Resource Plans and expected supply obligations for LSEs
  - **Factor 5:** Resource retirements
  - **Factor 7:** Utility and corporate commitments and other public policy goals
- PJM will develop a methodology to identify expected deactivations based on federal, state and local laws and regulations, integrated resource plans, and private commitments.
- This presentation provides an overview of state and federal laws and regulations that PJM believes will directly impact specific generation resources' ability to continue operation (necessitate retirement).

Draft Process Flow: Determining Policy-Driven Deactivations



State Laws and Regulations Impacting Deactivations

Illinois – Climate and Equitable Jobs Act

- The Illinois Climate and Equitable Jobs Act (CEJA) mandates the phased retirement, or adoption of emission-free technology, for all fossil units in the state.
  - Seeks an emission-free power sector by **2045.**
  - Scheduled phase-out of coal and natural gas generation by specified target dates: 2030, 2035, 2040 and 2045.

Natural Gas

- Private natural gas generators are limited to a baseline emissions level.
- Private natural gas generation phase-out based on emission rate, heat rate and proximity to Environmental Justice communities.

Coal

- By 2030, private, large GHG-emitting units that use coal must reduce CO2 to zero.
- By 2035, public coal must reduce CO2 emissions by 45% and to zero by 2045.

CEJA includes provisions by which individual generators can be granted limited and temporary exceptions to the emissions ceiling if they are deemed necessary to maintain the reliability of the bulk electric system.

New Jersey – DEP CO2 Emissions Rule

- In 2023, the New Jersey Department of Environmental Protection enacted N.J.A.C. 7:27F to reduce CO2 emissions of fossil fuel-fired electric generating units (EGUs) within the state.
- The rule uses a three-tiered compliance approach for EGUs > 25 MW.

Compliance Timeline

- **Phase 1:** on or before **June 1, 2024**, existing EGUs must meet an emission limit of 1,700 lbs. CO2/MWh gross energy output or shut down.
- **Phase 2:** on or before **June 1, 2027**, existing EGUs must meet an emission limit of 1,300 lbs. CO2/MWh gross energy output or shut down.
- **Phase 3:** on or before **June 1, 2035**, existing EGUs must meet an emission limit of 1,000 lbs. CO2/MWh gross energy output or shut down.
- **Permitting new in-state fossil units:** After the rule's operative date, new units must achieve 860 lbs. CO2/MWh gross energy output.

N.J.A.C. 7:27F allows an EGU to apply for an extension if a written request is made by PJM or NYISO for the EGU to remain operational to maintain grid reliability.

Virginia – Virginia Clean Economy Act

- Virginia Clean Economy Act (VCEA) requires the phasing out of fossil fuel generation.

Compliance Timeline

- By **Dec. 31, 2024**, except for any coal-fired electric generating units **(i)** jointly owned with a cooperative utility or **(ii)** owned and operated by a Phase II Utility located in the coalfield region of the Commonwealth that co-fires with biomass, any Phase I and Phase II Utility shall retire all generating units principally fueled by oil with a rated capacity in excess of 500 megawatts and all coal-fired electric generating units operating in the Commonwealth.
- By **Dec. 31, 2028**, each Phase I and II Utility shall retire all biomass-fired electric generating units that do not co-fire with coal.
- By **Dec. 31, 2045**, each Phase I and II Utility shall retire all other electric generating units located in the Commonwealth that emit carbon as a by-product of combusting fuel to generate electricity.

The VCEA allows for Phase I and Phase II Utilities (APCo and DOM) to petition the Virginia State Corporation Commission for relief from the VCEA's requirements to retire on a case-by-case basis if there are threats to reliability.

Methodology – State Assumptions

- PJM will use compliance dates as expected retirement dates, as appropriate.
- To identify resources impacted by state policies, PJM will apply the following criteria:
  - **CEJA**: Analyze each generating unit's publically available emissions data, published heat rate, and proximity to Illinois environmental justice communities and Restore, Reinvest, Renew (R3) zones
  - **NJ CO2 Rule**: Analyze publicly available unit and emissions data
  - **VCEA**: IOUs' Integrated Resource Plans (near-term retirements), VCEA mandates (long-term retirements)

    PJM will also coordinate with the PJM States on identifying impacted resources
- PJM will determine additional methodologies for other state laws and regulations, which necessitate retirement, brought forward by stakeholders for consideration.
- PJM will not consider for identifying retirements those policies that impact market behavior but do not expressly mandate retirement (e.g., Regional Greenhouse Gas Initiative).

Federal Laws and Regulations Impacting Deactivations

EPA Good Neighbor Plan

- Requires 23 states to meet the Clean Air Act's "Good Neighbor" obligation by reducing emissions that significantly contribute to ground-level ozone ("smog") in downwind states.
- As it relates to the PJM region, requires generating units in certain states to meet stringent limits on nitrogen oxides (NOx) emissions. For certain units this will require investment in selective catalytic reduction to reduce NOx.
- The Supreme Court issued a Stay of the rule in June 2024.

EPA Coal Combustion Residuals (CCR)

- Regulates the disposal and management of waste generated by combusting coal in power plants (i.e., disposal of coal ash).
- The EPA sets national minimum criteria for existing and new CCR landfills and existing and new CCR surface impoundments.
- Units may elect to cease operation by a date certain.

EPA Effluent Limitation Guidelines (ELG)

- **Effluent Guidelines** are national wastewater discharge standards that are developed by the EPA on an industry-by-industry basis.
- Updated in 2020 and more recently in 2024, the wastewater discharge standards apply to coal-fired power plants.
  - "The rule establishes more stringent discharge standards for three wastewaters generated at coal fired power plants: flue gas desulfurization wastewater, bottom ash transport water, and combustion residual leachate. The rule also establishes a new set of definitions and establishes new effluent limitations for various legacy wastewaters." (Source – EPA)
- Impacted units are able to avoid meeting 2020 ELG rules if they cease combustion of coal by the end of 2028 (announced).
- Units that meet 2020 regulations may avoid 2024 ELG rules if they cease combustion of coal by 2034.

EPA Greenhouse Gas Power Plant Rule

- Implemented in 2024, the EPA's GHG rule establishes new CO2 emission guidelines for existing coal, oil and gas-fired steam generating units, as well as for new gas-fired combustion turbines.

Existing Coal Units

- **Long-term units** (plan to operate on or after Jan. 1, 2039): standard based on 90% capture of CO2 with a compliance deadline of Jan. 1, 2032
- **Medium-term units** (plan to operate on or after Jan. 1, 2032, with a commitment to cease operation before Jan. 1, 2039): standard based on 40% co-firing with natural gas with a compliance deadline of Jan. 1, 2030
- Units that commit to cease operation by **Jan. 1, 2032** are not subject to the rule

New Gas Units

- **Base load turbines** (>40% capacity factor): initial "phase one" standard based on efficient operation of combined cycle turbine; "phase two" standard based on 90% capture of CO2 with a compliance deadline of Jan. 1, 2032
- **Intermediate turbines** (between 20% and 40% capacity factor): standard based on efficient operation of simple cycle turbine
- **Low load turbine** (less than 20% capacity factor): standard based on low-emitting fuel

Standards for existing oil and natural gas-fired steam EGUs are based on routine operation and maintenance, with different levels of stringency for base load, intermediate, and low load units

Methodology – Federal Assumptions

- Except when federal preemption applies, federal laws and regulations cannot directly mandate the shutdown of state-regulated power plants. Instead, states are afforded the option to comply with the relevant federal regulation (e.g., State Implementation Plans).
- PJM's assumption has been the owners of units impacted by identified federal laws and regulations will not make the necessary investments needed to be compliant and will instead deactivate by the compliance timeline.
- For resources whose deactivations are affected by both federal and state laws and regulations, the earliest retirement date will apply.

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Policy Deactivation Methodology

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Appendix

Sources for Current Deactivation Methodologies

Policy	References
Illinois – Climate and Equitable Jobs Act (CEJA)	CEJA; EPA Clean Air Markets Program Data; Illinois Solar for All Environmental Justice Communities map; Restore, Reinvest, Renew
New Jersey – NJ Department of Environmental Protection CO2 Emissions Rule (N.J.A.C. 7:27F)	N.J.A.C. 7:27F; EPA Clean Air Markets Program Data; EIA-923 Electric Power Data
Virginia – Virginia Clean Economy Act (VCEA)	VCEA; Dominion IRP; Appalachian Power Company IRP
EPA – Good Neighbor Plan	Good Neighbor Plan; EPA Clean Air Markets Program Data
EPA – Coal Combustion Residuals	EPA CCR Part A Implementation
EPA – Effluent Limitation Guidelines	Effluent Limitation Guidelines
EPA – Greenhouse Gas Power Plant Rule	Greenhouse Gas Power Plant Rule