Please also note this meeting is for informational purposes only. The concepts and ideas presented and discussed do not reflect any final decision making.

As a courtesy to all, please make sure your microphone is muted at this time.
Background and introduction of the rulemaking concept and potential applicability
The Control and Prohibition of Carbon Dioxide Emissions Rule (published 1/3/23)

The rule is expected to reduce CO$_2$ emissions from fossil fuel-fired electric generating units through the application of output-based emission limits.
The Control and Prohibition of Carbon Dioxide Emissions Rule (published 1/3/23)

Applies to new or existing EGU that

- combusts at least 51 percent fossil fuel, alone or in combination with any other fuel, annually;
- supplies at least 10 percent of its annual gross electric output to the grid; and
- has a nameplate capacity equal to or greater than 25 MWe.

A new EGU with a nameplate capacity less than 25 MWe that meets the other two thresholds will be covered by the rules if the unit is located at a facility that has more than one EGU, and the aggregate capacity of those units is equal to or greater than 25 MWe.
The Control and Prohibition of Carbon Dioxide Emissions Rule (published 1/3/23)

<table>
<thead>
<tr>
<th>Compliance deadline for existing EGUs</th>
<th>Emission limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 1, 2024</td>
<td>1,700 lb CO$_2$/MWh gross energy output</td>
</tr>
<tr>
<td>June 1, 2027</td>
<td>1,300 lb CO$_2$/MWh gross energy output</td>
</tr>
<tr>
<td>June 1, 2035</td>
<td>1,000 lb CO$_2$/MWh gross energy output</td>
</tr>
</tbody>
</table>
An owner or operator may request an extension of the compliance date if:

- BPU issues an order determining that the unit is needed to maintain reliable grid operations; or
- The EGU is designated as an RMR unit; or
- PJM or NYISO has requested that the EGU remain operational to maintain reliable grid operations
Rulemaking concept:

Clean Energy Compliance Options for Existing EGUs
Why is the Department considering rulemaking to allow clean energy compliance options for existing EGUs?

• Comments received
• Reliability: dispatchable vs. non-dispatchable sources
• Leakage
• Investment and deployment of clean energy
Allow the incorporation of zero or low emitting electric generation or energy storage into an existing EGU’s total electric output

Lower the unit’s average emission rate (lb./MWh)

Comply with emissions limit
Potential clean energy technologies

- Grid Supply Solar*
- Behind The Meter Solar*
- Energy Storage*
- RNG
- Hydrogen
- Fuel Cells
- Other?
“PJM’s New Services Queue consists primarily of renewables (94%) and gas (6%). Despite the sizable nameplate capacity of renewables in the interconnection queue (290 GW), the historical rate of completion for renewable projects has been approximately 5%.”

PJM Details Resource Retirements, Replacements and Risks | PJM Inside Lines
### Control and Prohibition of CO\(_2\) Emissions Rule

<table>
<thead>
<tr>
<th>Applicability of potential clean energy options?</th>
<th>Compliance deadline for existing EGUs</th>
<th>Emission limit</th>
<th># EGUs with emission rates that exceed the limit based on 2021 data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 1, 2024</td>
<td>1,700 lb CO(_2)/MWh gross energy output</td>
<td>9</td>
</tr>
<tr>
<td>✅</td>
<td>June 1, 2027</td>
<td>1,300 lb CO(_2)/MWh gross energy output</td>
<td>12</td>
</tr>
<tr>
<td>✅</td>
<td>June 1, 2035</td>
<td>1,000 lb CO(_2)/MWh gross energy output</td>
<td>32</td>
</tr>
</tbody>
</table>

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EGUs that emit between 1,300 lb/MWh and 1,700 lb/Mwh (based on 2021 data)

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Unit ID</th>
<th>Operating Time (hours)</th>
<th>CO₂ Emission Rate (lb/MWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sherman Avenue Energy Center</td>
<td>1</td>
<td>186</td>
<td>1,606</td>
</tr>
<tr>
<td>Forked River Power</td>
<td>2001</td>
<td>143</td>
<td>1,599</td>
</tr>
<tr>
<td>Linden Generating Station</td>
<td>8</td>
<td>119</td>
<td>1,563</td>
</tr>
<tr>
<td>Forked River Power</td>
<td>3001</td>
<td>157</td>
<td>1,560</td>
</tr>
<tr>
<td>Linden Generating Station</td>
<td>7</td>
<td>118</td>
<td>1,501</td>
</tr>
<tr>
<td>Linden Generating Station</td>
<td>6</td>
<td>107</td>
<td>1,388</td>
</tr>
<tr>
<td>Linden Generating Station</td>
<td>5</td>
<td>124</td>
<td>1,360</td>
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<tr>
<td>Gilbert Generating Station</td>
<td>9</td>
<td>131</td>
<td>1,337</td>
</tr>
<tr>
<td>Kearny Generating Station</td>
<td>132</td>
<td>448</td>
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<td>Kearny Generating Station</td>
<td>133</td>
<td>618</td>
<td>1,312</td>
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<tr>
<td>Kearny Generating Station</td>
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<td>521</td>
<td>1,306</td>
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<tr>
<td>Kearny Generating Station</td>
<td>134</td>
<td>635</td>
<td>1,301</td>
</tr>
</tbody>
</table>
Discussion points: clean energy compliance options

Pros and cons of each technology?
Is technology economically feasible?
Environmental impacts?
Lifespan of the technology (does it degrade/lose efficiency over time)?
Locational considerations?
Monitoring, recordkeeping, reporting challenges?

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Discussion points:

Emissions calculations and methodology

- What emissions averaging methodology(ies) should the Department use?
- Are there other approaches besides averaging?
- How should peak versus non-peak emission rates be measured for energy storage?
The CO₂ limit for an EGU operating after June 1, 2027 is **1,300 lb/MW-hour**.

An EGU with an average output of 100 MW is operating 500 hours per year, with a CO₂ emission rate of **1,400 lb/MW-hour**.

The annual CO₂ emissions would be:

\[
100 \text{ MW} \times 1,400 \text{ lb/MW-hr} \times 500 \text{ hours per year} = 70,000,000 \text{ lb CO}_2 \text{ per year}
\]

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If the EGU has a qualifying solar capacity of 3.0 MW operating with a 20% capacity factor, the resulting CO₂ emission rate would be:

\[
70,000,000 \text{ lb per year}/((100 \text{ MW} \times 500 \text{ hours per year}) + (0.2 \times 3.0 \text{ MW} \times 8,760 \text{ hours per year})) = 1,270 \text{ lb/MW-hr}
\]

The EGU would be in compliance with the CO₂ emission limit of 1,300 lb/MW-hr.

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Discussion

- General
- Clean energy options
- Locational considerations
- Emissions calculations and methodology
- Other?
Thank you for attending

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