EPA 111(d) PROPOSAL
REGULATING GHGs

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MDEQ
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BACKGROUND

- Supreme Court Decision—EPA has the authority to regulate GHGs
- EPA regulated GHG emissions from autos
- EPA proposed 111(b) regulation of new power plants (NSPS)
- 111(b) proposal triggers 111(d) for GHGs
OVERVIEW OF EPA PROPOSAL

- State Goals: Building Blocks
- Alternative Blocks Available
- Planning for 111(d) and Timeline
- Plan Requirements
- Questions
Four Building Blocks

• Block One—Heat Rate Improvement, 6%
• Block Two—Natural Gas Combined Cycle, 70% utilization and dispatch
• Block Three—Renewable Energy, Regionally 15% in 2012
  — Alternatives
    • State assessment of technical and market potential
      — Quantify each technology
      — Market potential for each of the technologies
    • Nuclear capacity increase
• Block Four—Demand Side Energy Efficiency
Building Block 1 in Michigan

**PROPOSAL**

Heat Rate Improvements at Coal Plants
6% through both O&M and plant upgrades

**EPA ESTIMATED EFFECT**

About 53 TWh of Coal (2012) from 2,255 to 2,120 lbs/MWh
- Adjusted goal 1,720 lbs/MWh
# Building Block 2 in Michigan

<table>
<thead>
<tr>
<th>PROPOSAL</th>
<th>EPA ESTIMATED EFFECT</th>
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<tbody>
<tr>
<td>Increased Utilization of Existing Natural Gas Plants</td>
<td>From 19 TWh Natural Gas Combined Cycle increased to 31 TWh</td>
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<tr>
<td>Dial up existing Natural Gas Combined Cycle to 70% capacity factor</td>
<td>1,511 lbs/MWh</td>
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Building Block 3 in Michigan

PROPOSAL

Zero or low carbon substitution of power from more carbon intensive EGUs

6% at risk nuclear and Renewable Energy at 7.4% (assumes a 6% annual growth rate)

EPA ESTIMATED EFFECT

1,339 lbs/MWh
<table>
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<tr>
<th><strong>Building Block 4 in Michigan</strong></th>
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<tbody>
<tr>
<td><strong>PROPOSAL</strong></td>
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<tr>
<td>Relies on Energy Optimization by assuming a reduction in demand for electricity at 11.77%</td>
</tr>
<tr>
<td><strong>EPA ESTIMATED EFFECT</strong></td>
</tr>
<tr>
<td>1,161 lbs/MWh – final goal</td>
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Alternative Blocks

• Fuel Switching at Individual Units
• Carbon Capture and Sequestration
• New Natural Gas Combined Cycle
• Assessment of Heat Rate Improvement at other than coal-fired units
• Co-firing lower carbon fuels
• Combined Heat and Power
• Distributed Generation
• Retirements
Timeline for 111(d)

- June 2014: Draft rule issued
- June 2015: Rule finalized
- June 2017: State plan due (with 1 year extension)
- June 2018: Multi-state plans due (with 1 year extension)
- January 2020-29: Interim goal in effect
- January 2030 onwards: Proposed goal in effect

- October 2014: Deadline for comments to EPA
- June 2016: State plan due
- June 2017: State plan due (with 1 year extension)
- January 2030 onwards: Proposed goal in effect
Rate vs. Mass

• EPA Goals are proposed as a rate-based
  – lbs of CO2/GWh

• Conversion to a mass-rate
  – lbs of CO2/yr
  – Not straight forward
  – EPA guidance is lacking

• Uncertainty on how to make future adjustments with mass-based approach
State Plan Development

• Goals in the Blocks can shift to accommodate the State plan
• “Remaining useful life” of units should be considered.
• Rate-based or Mass-based
• Direct or Portfolio Approach
  – Direct means limits apply to individual EGUs
  – Portfolio means enforceable obligations on a 3rd party other than the owner/operator of the EGU
State Plan Requirements

• Enforceable measures to reduce CO2
• Projected CO2 reduction or equivalent actions to meet EPA established goals
• Quantifiable and verifiable emission reductions
• Reporting process on implementation progress toward goals and implementation of corrective actions, if necessary
QUESTIONS?