

# **EPA's Building Block #1**

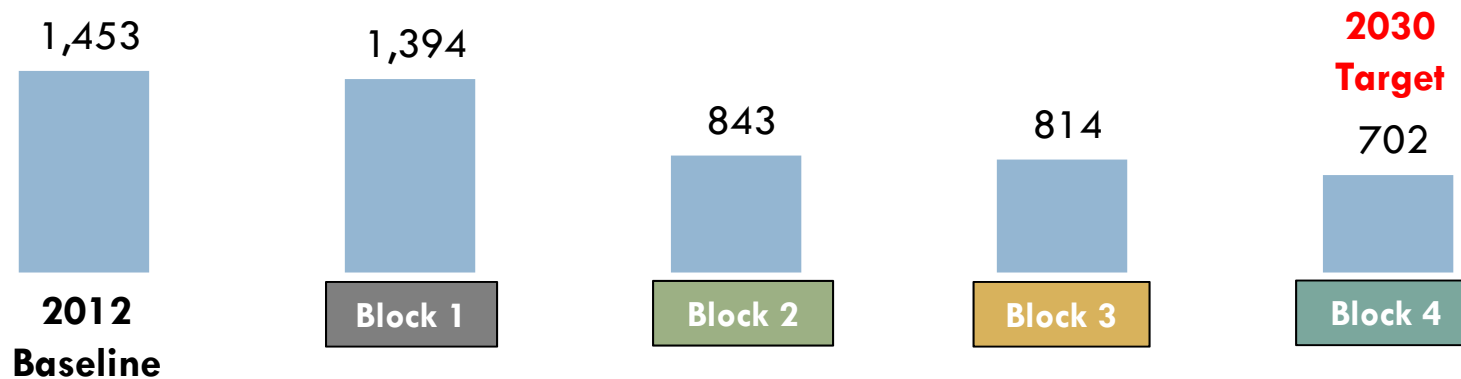
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# EPA Building Blocks

## EPA Assumptions for Arizona Emission Rate Reduction (CO<sub>2</sub> lbs / MWh)



### Block 1

- Heat rate improvement of 6% across all coal-fired facilities

### Block 2

- Up to 70% capacity factor (53% for AZ) from all combined cycle natural gas facilities (existing and under construction)

### Block 3

- Achieve regional renewable energy target
- 5.8% MWh from nuclear facilities "at risk"/under construction

### Block 4

- Achieve state's energy efficiency standard

# Building Block 1 - Background

- EPA assumes 6% improvement in heat rate (i.e., plant efficiency) is possible at each coal-fired unit
  - ▣ 4% from “best practices” for operation and maintenance
  - ▣ 2% from equipment upgrades
  
- Concerns about EPA approach:
  - ▣ EPA’s use of 884-unit “study population”
  - ▣ EPA’s use of 2009 Sargent & Lundy report
  - ▣ Economic heat rate improvements have already been achieved
  - ▣ Improvements depend on individual unit characteristics (age, design, maintenance history, type of coal, etc.)
  - ▣ Other EPA regulations and emission controls will degrade heat rate

# Building Block 1 - Challenges for Arizona

- No coal generation remains after EPA applies Building Block 2
- If any coal units can remain online in Arizona, they will likely be the most efficient units
- There is limited opportunity for heat rate improvements on these units
- For example, in a recent study for Coronado Generating Station (CGS), Sargent & Lundy found:
  - ▣ No opportunities to improve heat rate based on “best practices”
  - ▣ Units could achieve 1% improvement at most, but that improvement is negated by the addition of Selective Catalytic Reduction