

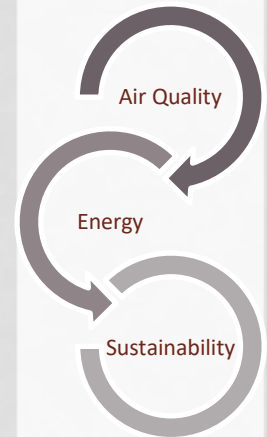


STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION



DIVISION OF AIR QUALITY
AIR QUALITY, ENERGY, AND SUSTAINABILITY

ELECTRIC GENERATING
UNITS



ENERGY MASTER PLAN

Strategy 2:

Accelerate Deployment of Renewable Energy and Distributed Energy Resources

ENERGY MASTER PLAN

p. 94:

“New Jersey’s transition to a clean energy future requires the substantial growth of carbon-free generation resources ...”

ENERGY MASTER PLAN

p. 98 (emphasis added):

- **“Legacy gas generation can complement renewable energy variability, without additional investment required until 2035.** The Integrated Energy Plan shows that utilization of existing gas-fired generation capacity falls steadily, but that gas generation resources are valuable during lulls in wind and solar output, particularly as those renewables gain market share.”

ENERGY MASTER PLAN

p. 105 (emphasis added):

“Modeling for the Integrated Energy Plan found that by 2050, assuming annual demand increased by a factor of two to roughly 165 TWh due to increased end-use electrification, **New Jersey could most cost-effectively meet its electricity demand by building 32 GW of in-state solar, 11 GW of offshore wind, and 9 GW of storage.**”

GOALS

1. To establish CO₂ emission limits, in pounds per megawatt hour (lb/MW-hour) for all electric generating units (EGUs) that are powered by fossil fuels.
2. To use these limits to accelerate deployment of renewable generation, by allowing EGUs to:
 - a) Allocate new renewable electric capacity/generation to those EGUs and;
 - b) Allow EGUs to include that renewable generation when complying with the CO₂ emission limits.

TOPICS FOR DISCUSSION

1. Establishment of appropriate output-based CO₂ emission limits (in lb/MW-hour) for new and existing EGUs.
2. Timing for implementation of those limits for new and existing EGUs and reduction of these rates over time, to achieve 100% carbon neutral power generation by 2050.
3. How to allocate renewable capacity/generation to an EGU.

WHAT IS AN ELECTRIC GENERATING UNIT?

- “Electric generating unit” or “EGU” means a combustion or steam generating source used for generating electricity that delivers all or part of its power to the electric power distribution grid for commercial sale.
- Combustion sources result in greenhouse gas (GHG) emissions, primarily carbon dioxide (CO₂), but also methane (CH₄) and nitrous oxide (N₂O). CH₄ and N₂O are generally less than 1% of EGU GHG emissions on a CO₂ (equivalent) basis.
- Nuclear power plants do not produce GHG, so they would not be subject to the new rule.

EXISTING LIMITATIONS ON GHGS

Currently, EGUs have GHG emission limits, in tons per year of CO₂(e), and CO₂ emission limits, in lb/MW-hour), if they:

1. Were initially permitted since January 2, 2011 and;
2. Are subject to Federal Prevention of Significant Deterioration Requirements

EGUs that do not meet these criteria do not have GHG or CO₂ emission limits

COMPLIANCE WITH GHG LIMIT

Compliance with the CO₂ limit (in lb/MW-hour) for an EGU would be determined by the following formula*:

$$\frac{\text{(EGU CO}_2 \text{ emissions)}}{\text{(EGU power output + allocated renewable power output)}}$$

The EGU GHG emissions, EGU power output, and allocated renewable power output would be over the same time period.

*Assume 860 lb/MWhr is the current allowable value.

COMPLIANCE EXAMPLE

Say the CO₂ limit for an EGU with a rated capacity of 400 MW is **860 lb/MW-hour**, and the EGU by itself has a CO₂ emission rate of **900 lb/MW-hour**.

If the EGU operates with a **75% capacity factor**, the annual CO₂ emissions would be:

$$0.75 \times 400 \text{ MW} \times 900 \text{ lb/MW-hr} \times 8,760 \text{ hours per year} =$$

2,365,200,000 lb per year

COMPLIANCE EXAMPLE CONTINUED

If the EGU has an allocated new solar capacity of **100 MW** operating with a **15% capacity factor**, the resulting CO₂ emission rate would be:

$2,365,200,000 \text{ lb per year} / (0.75 \times 400 \text{ MW} \times 8,760 \text{ hours per year} + 0.15 \times 100 \text{ MW} \times 8,760 \text{ hours per year}) =$

857 lb/MW-hr

The EGU would be in compliance with the CO₂ emission limit of **860 lb/MW-hr**.

DISCUSSION TOPIC – CO₂ EMISSION LIMITS

1. What limits are appropriate?
2. Should there be different limits for new units?
3. Should there be different limits for peaking units?

DISCUSSION TOPIC – TIMING ISSUES

1. How to reduce the CO₂ limits over time, to achieve 100% carbon-neutral power generation by 2050.
 - a. Applicability to NEW EGUs
 - b. Applicability to EXISTING EGUs

2. Timing for implementation—How much time is required before the new renewable capacity is constructed and operating?

DISCUSSION TOPIC - HOW TO ALLOCATE RENEWABLE GENERATION TO AN EGU

1. Install new renewable generation at the facility?
2. Build new renewable generation elsewhere in New Jersey?
3. Become a partner in new renewable generation projects in New Jersey?

DISCUSSION TOPIC--ALLOCATION

1. How would renewable capacity/generation be allocated to an EGU owner/operator?
2. How would an owner or operator sub-allocate their total allocation to each EGU under their control?
3. Would renewable capacity/generation be allocated to facilities or to individual units?

REQUEST FOR COMMENTS

- By September 17, 2020, please send comments and/or technical support information to:

NJairrulesstationary@dep.nj.gov

- Please use the following heading in the Subject Line of the email:

“NJ PACT: EGUs”