

WDNR and PSCW Questions on EPA's Clean Power Plan Proposal
American Transmission Co. Responses
August 28, 2014

American Transmission Co. (ATC) appreciates the WDNR and PSCW seeking the company's thoughts on their questions related to EPA's proposed emission rules under 111(d) of the Clean Air Act. We are providing answers to just those questions that impact the transmission system or where the company believes it can provide information that may be helpful to the state in considering the proposed rule. We also want to convey that the company could be a resource to the state in its efforts related to the proposed 111(d) rules. As well as our views, ATC is willing to provide power flow (reliability), PROMOD (economic) and other analysis to address questions and issues that arise in the review of the rule and development of compliance plans regarding the impacts on the transmission system and transmission's role in implementation plans.

Question I.A ATC Response: ATC and other transmission owners should be included in developing state compliance plans so that reliability impacts (such as voltage, thermal and deliverability concerns) are adequately considered. Reliability issues could arise from retirement of generation, greater use of existing natural gas-fired generation (Building Block #2), development of new natural gas-fired generation, and development and siting of zero-carbon generation (Building Block #3).

The proposed rule discusses the ISOs and RTOs being involved in modeling the system-wide effects of the state plans. However, transmission owners and developers have a great knowledge of individual systems and in planning cost-effective and efficient transmission and should be involved in developing state compliance plans to pro-actively address possible reliability issues. Furthermore, transmission owners operate under mandatory NERC standards and have the obligation to maintain the reliability of their systems.

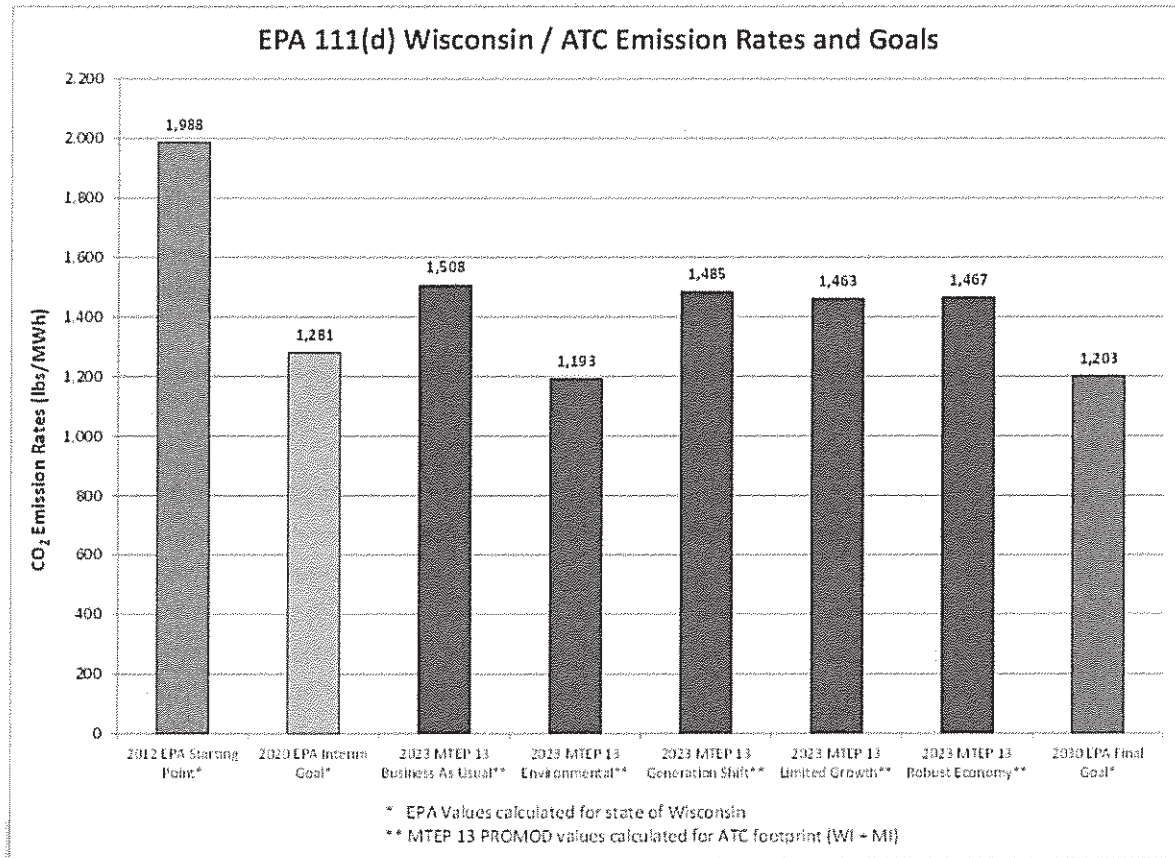
In general, the EPA relies upon "the integrated nature of the electricity system" in developing its proposed Base System of Emissions Reduction. It is important to keep in mind that it is ultimately the responsibility of the transmission owners and planners to maintain the reliability of their system throughout the implementation of the states' compliance plans and after.

For example, if a state were to rely on dispatching more natural gas-fired generation (i.e. Building Block 2), transmission owners and planners would need to assess the transmission system to determine whether transmission upgrades or additions would be necessary to maintain reliability. Similarly, if a state were to rely on interconnecting more renewable generation, the transmission owners and planners would need to assess system modifications needed to maintain reliability and to interconnect the level of renewable generation that would be anticipated to meet the goal.

It is also important to note that substantial emissions reductions would need to take place by 2020 in order to meet the 2020-2029 interim goals, even with system averaging over that time. Estimates show

that – even with averaging over the 2020-2029 period – over 70% of the reduction must be complete by 2020 across the U.S. For Wisconsin, 79% of the reduction needed by 2030 must be complete by 2020. Given that the rule does not call for plans to be complete until June of 2016 (without extension) and possibly as late as June of 2018, ATC wants to ensure that accomplishing over 70% of the required reduction does not negatively impact the transmission system. For instance, ATC would be concerned about impacts on system reliability to the degree to which an adequate amount of time was not provided to plan, permit and construct needed transmission upgrades that were being relied upon to meet the EPA requirements.

Question II.b ATC Response: ATC has general comments on the Building Blocks chosen by EPA. The work MISO has done with their stakeholders can provide some insights into the CO₂ reductions that might result from other types of actions. Below is a chart of the CO₂ rates for study year 2023 in the ATC footprint (which includes portions of Wisconsin and Michigan) under the various scenarios MISO developed for MTEP 13, which also include ATC study updates implemented as a part of ATC’s annual Economic Planning process.



Though these scenarios were not designed to meet the proposed 111(d) goal, they can provide some information on the impact on carbon reduction from a given set of assumptions. All of the futures show a decline in the CO₂ emission rates from the 2012 baseline, but ATC does think it is instructive to compare varying levels of emission rates depending on the scenario and the relation to the Wisconsin

interim and final goals. It is important to note again the MTEP data provided above is for the ATC footprint, which, again, does not include all of Wisconsin and includes the U.P. of Michigan.

A general description of MISO's MTEP 13 futures is provided below.¹ In all futures, the transmission system is assumed to include all existing and planned projects, i.e., all of the approved MTEP Appendix A projects, including the Multi-Value Project portfolio, are included. Also, the assumptions in these analyses are just that – assumptions. The assumptions within each future involve actions that have not been taken yet; in some cases they are actions that will be undertaken and in other cases, the actions would need to be undertaken in the future to achieve the CO₂ rate reductions. Here are the assumptions that correspond to each of the MTEP 13 scenarios:

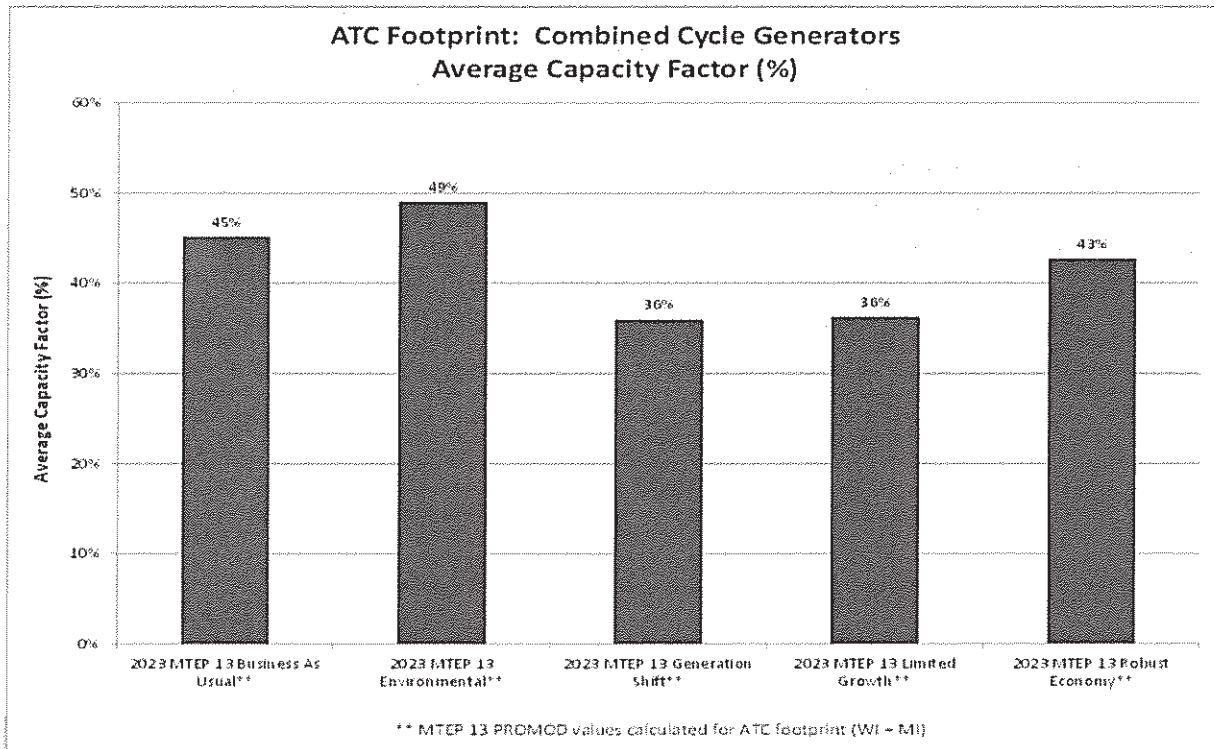
- Business as Usual: considered the status quo future and continues current economic trends. This future models the power system as it exists today with reference values and trends. Renewable portfolio standards vary by state and 12.6 GW of coal unit retirements are modeled.
- Environmental: considers a future where policy decisions have a heavy impact on the future generation mix. Mid-level demand and energy growth rates are modeled. Potential new EPA regulations are accounted for using a carbon tax and state-level renewable portfolio standard mandates and goals are assumed to be met. A total of 23 GW of coal unit retirements are modeled. (More details of this future are provided below.)
- Limited Growth: models a future with low demand and energy growth rates due to a very slow economic recovery and impacts of EPA regulations. This can be considered a low side variation of the BAU future. Renewable portfolio standards vary by state and 12.6 GW of coal unit retirements are modeled. (Note: if the low energy growth rates were due to energy efficiency programs rather than economic conditions, the overall CO₂ rate in this future would be lower than shown.)
- Generation Shift: considers a future with low demand and energy growth rates due to a very slow economic recovery. This future models a changing base load power system due to many power plants nearing the end of their useful life. In addition to the 12.6 GW of coal unit retirements modeled as a minimum in all futures, this future also models the retirement of each thermal generator (except coal or nuclear) in the year that it reaches 50 years of age or each hydroelectric facility in the year that it reaches 100 years of age during the study period. Renewable portfolio standards vary by state.
- Robust Economy: considered a future with a quick rebound in the economy. This future models the power system as it exists today with historical values and trends for demand and energy growth. Demand and energy growth is spurred by a sharp rebound in manufacturing and industrial production. Renewable portfolio standards vary by state and 12.6 GW of coal unit retirements are modeled.

The Environmental future also includes the following assumptions for the entire MISO footprint:

¹ Source: MISO MTEP 2013 Report, Section 5.2
(<https://www.misoenergy.org/Library/Repository/Study/MTEP/MTEP13/MTEP13%20Full%20Report.pdf>)

- Effective demand and energy growth rates of 0.76% and 0.81%, respectively; this includes both economic growth rates and DSM programs scaled to reflect state-level energy efficiency and/or demand response mandates and goals.
- Natural gas prices of ~\$4 nominal/MMBtu in 2013 to ~\$11-12 nominal/MMBtu in 2028.
- Renewable Portfolio standard that includes 9,000 MW of wind and 1,725 MW of solar; both of these are incremental to what was in place in 2013.

Question II.b.ii ATC Response: Below is a chart that shows the capacity factors of the combined cycle generators for each of the MISO MTEP13 futures for the 2023 study year in the ATC footprint. This analysis also includes ATC study updates implemented as a part of ATC’s annual Economic Planning process.



The modeled combined cycle generators in the ATC footprint ran at a maximum average capacity factor of 49% (Environmental future) in the 2023 study year. As can be seen, none of the futures modeled – and the corresponding assumptions – led to the combined cycle generators running at 70% in this timeframe in the ATC footprint. The availability of natural gas itself is unconstrained in these models. Note that ATC in no way is suggesting a level of capacity factor for combined cycle generators that should be assumed to achieve the EPA’s 111(d) emission rate goals. The company is only supplying readily available information about the projected capacity factors observed under certain assumptions and scenarios.

Question II.b.ii.2 ATC Response: In terms of reliability of the Bulk Electric System, it is possible that electrical reliability issues could result if NGCC capacity isn't available for increased dispatch upon demand. If a generating unit is assumed to be dispatched to meet load and then cannot be dispatched, this could possibly result in a reduction in load or increased generation from another unit. Depending on the locations of the initial unit and the reduced load/increased generation and the transmission system in those locations, there may or may not be reliability issues. In terms of transmission planning, this would be equivalent to a generator outage (of some magnitude) and would need to be studied by ATC to determine if reliability issues would arise.

Question II.b.iv ATC Response: The timeline proposed by the rule for meeting the emission rate goals could create some potential challenges for using Building Block 3b – Increased Generation of Renewable Energy. Because of the short time frame (2-4 years) between the development of the state's plan and the interim goal period and the significant amount of CO₂ reduction required by the start of the interim goal period, ATC would want to ensure that if transmission is needed to support additional renewable resources there would be adequate time allowed to plan, permit and build the needed facilities.

Question II.b.v ATC Response: As with all of the building blocks, ATC encourages the state and stakeholders to consider and address the potential impacts on the reliability of the transmission system from the use of energy efficiency as a building block. For energy efficiency to be relied upon, ATC believes that resource should be verifiable and the level of load reduction achieved should be sustained on an ongoing basis. If the transmission system is planned for a certain level of energy efficiency and it does not materialize or is not sustained, the increased usage could cause reliability impacts on the system.