THIRD WAY

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Nuclear Energy: A Key Tool to Comply with EPA's Greenhouse Gas Rules

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The EPA rolled out draft greenhouse gas regulations for the electric power sector on June 2, seeking to reduce carbon emissions by 30% under 2005 levels by 2030. [1] Attention went straight to how coal was treated. Even when the focus went beyond fossil fuels, the role of nuclear energy rarely entered the discussion. But instead, EPA chose to highlight, in the rollout as well as the proposed rule, the importance of nuclear energy as part of a carbon reduction strategy that states should consider as they draft their implementation plans. It is clear from EPA's rule that it believes existing nuclear plants should continue to be available to provide cost-effective carbon abatement.

The EPA considers nuclear a zero carbon power source.

The EPA assumes in its greenhouse gas rule that utilities will keep all nuclear power plants operating through 2030. A utility's decision to close a plant in any state would need to be offset with further reductions in carbon emissions beyond what EPA has already calculated it believes states can reasonably achieve.

In its assumptions about a state's potential generation mix in 2030, the EPA includes nuclear plants under construction and excludes plants that have announced they will close. [2] That means states cannot count plants under construction as extra progress towards emissions reduction targets (though the EPA is seeking comment on this). [3] It also means states with nuclear power plants that are planned to be shuttered, will have to consider the carbon intensity of the plants that will make up for the lost power. This gives states an added incentive to keep nuclear plants that may be at risk for closure operating.

Maintaining nuclear power is a highly-cost-effective climate strategy.

The EPA acknowledges the economic rationale for closures of nuclear plants; reactors at risk of closing—5.7 GW or 6% of the fleet [4] —are losing up to $6/MWh on produced electricity. [5] The agency estimates that the cost of keeping at-risk units online is $12–$17/metric ton CO2 abated. [6]

That's actually highly cost-effective. By comparison, EPA estimates that adding renewable capacity costs $10–$40/metric ton CO2 avoided. [7] Increasing natural gas combined cycle power plant utilization rates to 70% costs $30/metric ton CO2, [8] and implementing demand-side management programs costs $16-$24/metric ton CO2. [9] Only coal plant efficiency improvements, at $6–$12/metric ton CO2, [10] come more cheaply than nuclear.

The government should adopt policies that support nuclear energy.

From a climate perspective, it's cost-effective to keep economically at-risk nuclear reactors online and operating. For states seeking to lower carbon emissions, it is entirely rational to craft policies with this in mind. Congress can and should support states in this endeavor. For example, many reactors could safely generate more electricity by producing more heat through a process called uprating. [11] The government could provide low-interest loans to help utilities uprate nuclear power plants. [12] The government risk in these loans would be small, and utilities would be able to service the debt from their total power sales once the uprating was complete. The regulatory burden for nuclear plants could also be reduced to help eliminate unnecessary costs on operators without compromising safety. [13] The government should also work more closely with the private sector to educate the public about the role of nuclear energy, particularly as key tool in reducing carbon emissions while providing baseload power. [14]

Conclusion: Nuclear energy is a climate solution.

The EPA's greenhouse gas rule for existing power plants seeks to reduce carbon pollution by 30% from its 2005 levels. This will require a reasonable, but significant shift from fuels that emit carbon to those, like natural gas and efficiency, that emit less or those, like renewables, nuclear, and hydro, that are zero emissions. As the EPA made explicitly clear in its proposed rule, policymakers and advocates who support this goal should embrace every power source that can help the US achieve this goal. There are a hundred carbon-free nuclear reactors operating in the United States today. To simply meet the EPA's targets, we need to have at least a hundred in 2030 as well.

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END NOTES

1. United States, Environmental Protection Agency, â€œOverview of the Clean Power Plan,â€ EPA Fact Sheet, June 2, 2014. Accessed June 10, 2014. Available at:Â http://www2.epa.gov/sites/production/files/2014-05/documents/20140602fs-overview.pdf.

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2. â€œFor this reason, we are proposing that the emission reductions achievable at affected sources based on the generation provided at the identified nuclear units currently under construction should be factored into the state goals for the respective states where these new units are locatedâ€ and â€œWe therefore propose that the emission reductions supported by retaining in operation six percent of each stateâ€™s historical nuclear capacity should be factored into the state goals for the respective states.â€ See United States, Environmental Protection Agency, â€œCarbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,â€ proposed rule, June 2, 2014, pp. 215, 218. Accessed June 9, 2014. Available at:Â http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule.

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3. â€œWe therefore take comment on whether it is appropriate to reflect completion of these units in the state goals and on alternative ways of considering these units when setting state goals.â€ United States, Environmental Protection Agency, â€œCarbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units,â€ proposed rule, June 2, 2014, pp. 215, 218. Accessed June 9, 2014. Available at:Â http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule.

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4. EPA writes that â€œâ€¦we view this 5.7 GW, which comprises an approximately six percent share of nuclear capacity, as a reasonable proxy for the amount of nuclear capacity at risk of retirement.â€ The 5.7 GW represents the EIA Annual Energy Outlook estimates for additional projected capacity reductions to the nuclear fleet. Ibid, p. 217

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5. â€œâ€¦nuclear units may be experiencing up to a $6/MWh shortfall in covering their operating costs with electricity sales.â€ Ibid, p. 217

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6. â€œâ€¦one can estimate the value of offsetting the revenue loss at these at-risk nuclear units to be approximately $12 to $17 per metric ton of CO2.â€ Ibid, p. 218.

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7. â€œâ€¦the cost to reduce emissions through RE [renewable energy] ranges from $10 to $40 per metric ton of CO2.â€Â Ibid, p. 207.

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8. â€œâ€¦a 70 percent NGCC utilization rate, comparison to the business-as-usual case indicates that the average cost of CO2Â reductions achieved over the 2020-2029 period was $30 per metric ton of CO2.â€Â Ibid, p. 189.

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9. â€œThe EPA found that the average cost of the CO2Â reductions [from demand-side energy efficiency] ranged from $16 to $24 per metric ton of CO2.â€Â Ibid, p. 236.

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10. Ibid, p. 169.

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11. United States, Nuclear Regulatory Commission, â€œPower Uprates for Nuclear Plants,â€ February 4, 2011. Accessed June 11, 2014. Available at:Â http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/power-uprates.html.

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12. Powerbook, â€œNuclear Power Uprating,â€ Accessed June 9, 2014. Available at:Â http://powerbook.thirdway.org/filter-web-app/nuclear-power-uprating.

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13. Third Way and Idaho National Laboratory, â€œThe Future of Nuclear Energy: A White Paper,â€ January 2011, Page 9. Accessed June 10, 2014. Available at:Â http://content.thirdway.org/publications/370/Third_Way-INL_-_The_Future_of_Nuclear_Energy_A_White_Paper.pdf.

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14. Ibid.