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Natural Gas Demand: Rhetoric and Reality under the Final Clean Power Plan

The Clean Power Plan (CPP) is the centerpiece of President Obama's strategy to address "carbon pollution" and meet internationally-agreed U.S. targets to reduce greenhouse gas emissions.¹ The CPP, promulgated under the Clean Air Act (CAA), requires deep reductions in CO2 emissions from power plants, which account for roughly one-third of total U.S. greenhouse gas emissions. These reductions can be achieved largely by downsizing the U.S. coal plant fleet, which has already shrunk significantly, and by replacing electricity generated from coal with electricity generated from natural gas and renewables.

This paper examines whether the final CPP adopted by EPA on 3 August 2015 favors renewables over natural gas as a replacement for coal, as some observers have alleged. We conclude that the CPP reflects a largely rhetorical shift by the Obama Administration from its earlier support for natural gas as expressed in the 2014 proposed CPP and elsewhere. However, the final CPP also includes several provisions that favor renewables and could distort the market. These provisions may lead to renewables taking a larger share of the market than would otherwise have occurred, especially in the out-years.

Assessing the CPP's impact on gas demand is complicated by the role of the states. The CAA allows EPA to set targets but leaves how those targets are to be met up to the states. The State Implementation Plans are not due until late 2018 (or later depending on the Supreme Court appeal). Moreover, the CPP will not deliver the reductions necessary to meet the recent international commitments; further reductions achieved by regulation and beyond any rhetorical shift, will be needed and may further impact demand for natural gas.

Over the next 15 years, or the current life of this iteration of a CPP, other forces, including the market as influenced by technological advances, the price of gas and renewables, and the state of the U.S. economy, as

¹ On February 9, 2016, implementation of the CPP was stayed by the U.S. Supreme Court pending resolution of legal issues raised in litigation filed by utility companies, coal companies and more than half the States. A Federal Court of Appeals is scheduled to hear oral arguments in June with a ruling likely in late 2016. That ruling will be followed by an appeal to the Supreme Court which is expected could resolve the matter in 2017 or 2018. The Supreme Court could in its final decision extend the compliance deadlines. However, it is not clear how the Courts will rule or how, assuming the CPP is finally upheld, the delay would impact implementation of the Plan.

well as new regulation to implement future greenhouse gas emission reduction commitments, could be at least as influential as the current iteration of a CPP in determining the U.S. energy mix.

Design of the CPP. The CPP is designed, above all else, to drive a shift from coal to natural gas and renewables. Specifically, the CPP is intended to reduce power sector emissions of CO₂ by 32 percent below 2005 levels by 2030. Compliance with the CPP will begin in 2022, with emissions progressively declining toward the final goal over the following 8 years.

To reach the overall target, EPA has assigned emission reduction targets (expressed as an emission rate reduction for coal and gas-fired plants) to each of the states based on its generation mix. The states must develop state implementation plans (SIPs) to achieve their EPA-imposed targets, but have broad discretion in selecting the mix of strategies by which they will reduce emissions. For example, they can choose greater reliance on natural gas, nuclear, renewables or hydropower; increased energy efficiency and reduced electricity use; lower coal plant emissions; and/or more reliance on Combined Heat and Power (CHP) facilities.

Even though the CPP will not be implemented for years, the shift away from coal is already well underway with gas so far filling most of the gap created by the retirement of coal plants. In the near term, this shift is expected to accelerate under the CPP though not as quickly or as dramatically as it might have under the proposed CPP. Still, in the near to mid-term, many States will continue to turn to gas as the more reliable, low-cost compliance option. As time goes on, for a number of reasons it is quite possible there could be a shift to renewables under the CPP. For example, EPA may not approve a SIP that includes new natural gas generation (which adds to the CO₂ inventory) as part of the state planning process discussed above. This may lead states to adopt plans that rely on renewables for out-year demand growth. In addition, the EPA cost modeling assumes an unrealistic constraint on domestic gas supply and thereby assigns a relative cost advantage to renewables. Finally, the CPP includes a modest program of incentives for renewables development. These provisions may help renewables fill some portion of electricity demand that would otherwise have been filled by natural gas.

EPA Projections of the Future Fuel Mix. EPA made projections of the future mix of fuel sources in the power sector that it thought would result from full implementation of the CPP. These projections were part of EPA's methodology for calculating its national and state emission reduction targets. To set the targets, EPA identified a set of "building blocks"— i.e. cost-effective, proven strategies to reduce the carbon footprint of the power plant fleet – and then analyzed the level of reductions each building block could be expected to deliver. The building blocks in the final CPP were:

- Improving the thermal efficiency of coal-fired units (EGUs) so their emissions per unit of electricity output are lower;
- Increasing the utilization of natural gas-fired units to replace power production from higher-emitting coal-fired units, which would then be retired or operated at lower capacity factors; and
- Replacing power from coal units with increased generation from non-hydro renewable sources (mainly wind and solar).

EPA had included a fourth building block – end-use energy efficiency – in the proposed CPP but dropped it from the final rule for legal reasons.² Since the Obama Administration did not want to reduce the overall stringency of the CPP, this change required a recalculation of the projected benefits of the three remaining building blocks so they would predict the same or a greater aggregate amount of emission reductions as the proposed rule.

In making this recalculation, EPA projected (with little basis) a significantly larger role for renewables and a smaller role for natural gas than under its proposal. Specifically, the recalculation predicted that, by 2030, the CPP would:

- Increase the natural gas share of total power generation to 32 to 33 percent versus the 33 to 40 percent predicted in the proposed CPP;
- Increase the renewable share to 28 percent, as compared to 22 percent under the proposal; and
- Reduce the coal share to 27 percent, as against 31 percent in the proposal.

² While EPA has allowed energy-efficiency (EE) measures to count as part of compliance plans under previous air-pollution rules, it had never used demand-side measures to set the stringency of a regulation. Building block 4 was therefore legally controversial.

This recalculation, which still shows a basic shift toward natural gas filling the gap created by coal plant retirements, has contributed to the perception that the Obama Administration has reduced its support for natural gas and embraced renewables. Adding to this perception is a change in tone by senior Administration officials. For example, the President's press conference announcing the CPP touted the potential of renewables but was conspicuously silent about the enhanced role of natural gas. We believe this election year change in tone has occurred as part of an effort to address environmental NGO concerns over a "rush to gas." Natural gas, though half as "polluting" as coal, is still demonized by some as a fossil fuel, the environmental benefits of which are questionable due to methane emissions that occur in the natural gas production and distribution chain.

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³ Geography plays a major role in determining a state's energy mix. In 2015, according to the U.S. Energy Information Administration (EIA), hydroelectric power was the dominant source of electricity in the western states of Washington, Oregon and Idaho. In the Midwest, coal was the most prolific energy source. Seven-eighths of the electricity generated in Wyoming and West Virginia came from coal. The Gulf Coast states rely primarily on natural gas; two-thirds of Florida's power originated from natural gas in 2015. Hawaii remains the last state still relying on petroleum products for the majority of its energy needs. However, we note that EPA cost methodology and modeling might influence States to steer away from natural gas.

⁴ Despite EPA's flexibility, a few states have indicated that they do not plan to cooperate. If a state refuses to develop its own State Implementation Plan, EPA has authority to impose a Federal Implementation Plan to achieve the same level of emissions reduction. In a FIP EPA would have greater ability to force a state to rely more heavily on renewable energy.

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