

Fiscal Pulse

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The U.S. Clean Power Plan — Final Version Changes

- Though quite different from the June 2014 draft *Plan*, legal challenges are continuing.

The President's final *Clean Power Plan* — estimated to cut the U.S. power sector's carbon dioxide (CO₂) emissions 32% below 2005 levels by 2030 — is the linchpin in Washington's stepped-up commitment to reduce its total greenhouse gas (GHG) emissions 26%-28% below 2005 levels by 2025 (*side table and chart*). Other recent climate change measures include the Environmental Protection Agency's (EPA's) proposed regulations to drop the oil & gas sector's methane emissions 20%-30% below 2012 levels by 2025 as part of an overall 40%-45% methane reduction goal.

The final *Clean Power Plan*, while adjusting substantive details, retains the process of the EPA setting individual CO₂ emissions targets for each of 47 States¹, but then allows each State to design and implement its own plan to achieve its 2030 target. The submission date for individual State plans is pushed back three months to September 2016, with a two-year extension still possible. The start date for mandatory emission reductions is deferred two years to 2022, squeezing the implementation period to eight years. Interim goals are defined, reflecting three compliance periods, 2022-24, 2025-27 and 2028-29. A *Clean Energy Incentive Program* will reward renewable energy and energy efficiency initiatives during 2020-21 with EPA emission rate credits.

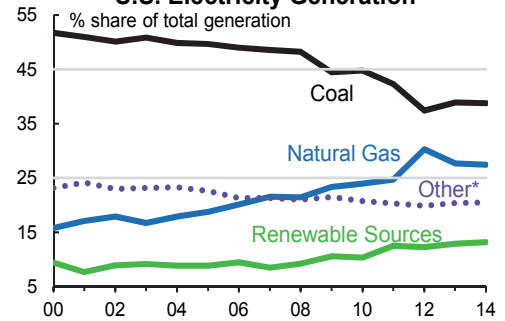
The final *Plan* revises the calculation of each State's CO₂ emissions target. A State may now opt for: an emissions rate-based plan targeting lower carbon intensity by power source but allowing total power-sector emissions to rise with growth; or a 'mass-based' plan setting a ceiling on a State's total power-sector emissions facilitating statewide policies and trading. A third option is a mass-based target for existing facilities with a New (Power) Source Complement (*side text box, pg. 1-2*). The targets incorporate for renewable energy a more ambitious 28% share of U.S. power generation by 2030, reflecting recent cost and technological progress and projected future gains. Addressing prior concerns, State plans must assure system reliability and community engagement. States failing to submit a plan or achieve an interim target will have to comply with the EPA's federal plan, which is expected to

Recent International Climate Change Commitments

| Nation | Target |
|-------------|----------------------------------|
| U.S. | 26-28% below 2005 levels by 2025 |
| Canada | 30% below 2005 levels by 2030 |
| E.U.* | 40% below 1990 levels by 2030 |
| Switzerland | 50% below 1990 levels by 2030 |
| Japan | 26% below 2013 levels by 2030 |
| New Zealand | 30% below 2005 levels by 2030 |
| Australia | 26-28% below 2005 levels by 2030 |

* Norway and Iceland have agreed to the 2030 emissions cut adopted by the E.U. Source: Government Ministries.

U.S. Electricity Generation



* Includes power from nuclear and refined petroleum products. Source: U.S. Energy Information Administration.

The U.S. Final Clean Power Plan — Details

In the final *Clean Power Plan*, the EPA is guided by section 111(d) of the *Clean Air Act*, specifically to set CO₂ emission rates for power plants to reflect the "best system of emission reduction" (BSER).

Calculating Rate-Based CO₂ Emissions Targets

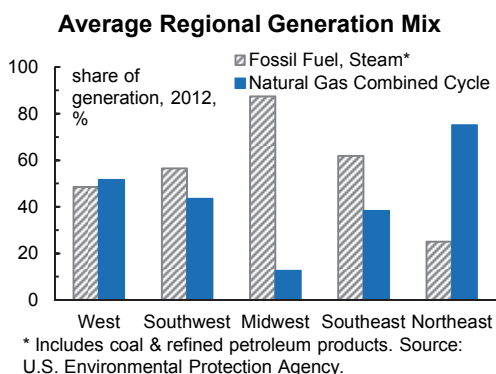
The EPA divided all U.S. coal, oil and natural gas power plants into two broad categories: coal & oil/steam and natural gas combined cycle (NGCC). The average emission rates in 2012 for each category was calculated for the three main electric-grid regions in the U.S. — the Eastern Interconnection, spanning the eastern States, the Western Interconnection and the Electric Reliability Council of Texas. The EPA determined that power plants can cut their CO₂ emission rates by three different methods, labelled "Building Blocks".

¹ Exempt are Vermont and Washington DC because they have no fossil-fuel power plants, and Alaska and Hawaii due to their unique grid situations until alternate plans are released.

incorporate cap-and-trade, in line with the “trading” assumptions throughout the final *Plan*. Pricing carbon is integral to the *Plan* and the EPA is committed to working with States to provide support for tracking CO₂ emissions and allowances to facilitate multi-state trading.

Like the draft *Plan*, under the final *Plan* the U.S. power generation profile by 2030 depends upon the State plans, and the national CO₂ emissions cut may be more or less than the estimated 32%. The importance of the *Plan* hinges on the major changes it requires for a nation still relying upon coal for almost 39% of its power generation in 2014. The *Plan*, therefore, adds to Washington’s credibility as the Paris climate change summit approaches in December.

The continuing legal challenge from a number of States led to the final *Plan* omitting specific demand-side energy efficiency provisions, and the *Plan*’s renewable energy assumptions could be another source of contention. Other considerations are emerging, including the significant expense inherent in the *Plan* related to the adjustments required to each State’s power generating capacity and transmission grids.



Building Block 1: Raising Coal /Oil Plant Efficiency

Heat rate improvements allow more electricity to be produced by burning less coal or oil products, resulting in lower CO₂ emissions. The draft *Plan* assumed 6.0% improved efficiency nationwide; the final *Plan* uses 2.1% to 4.3% gains, depending upon the region.

Building Block 2: Natural Gas Combined Cycle (NGCC)

Industry feedback indicated that a net summer capacity operating rate of 75% could be assumed, replacing the draft *Plan* assumption of NGCC plants running at 70% of their nameplate capacity. The aim is to run NGCC plants more, given their considerably lower CO₂ emissions per megawatt hour (MWh), and coal & oil/steam plants less.

Building Block 3: Increased Renewables

Based on research indicating what growth of clean energy (i.e., wind, solar, biomass, geothermal, hydro) was possible in each region given factors such as local costs, grid reliability and historical trends, the EPA’s projections raise renewable power’s share of total U.S. power generation to 28% by 2030. Nuclear generation capacity, either under construction or expanded in the future, can be incorporated into state plans, represents a potential key factor for mass-based plans.

Applying the three Building Blocks to obtain reasonable emission targets for coal & oil/steam and NGCC plants (with clean energy outside of the power plant factored in), the least stringent Eastern Interconnection standard was applied nationwide. For the average coal & oil/steam plant, CO₂ emissions are targeted to fall from 2,160 pounds of CO₂/MWh in 2012 to 1,305 pounds in 2030. For an average NGCC plant, CO₂ emissions are targeted to fall from 894 pounds/MWh to 771 pounds. The power plant targets were then applied to each State in proportion to the State’s power mix.

Calculating Mass-Based CO₂ Emissions Targets

In order to ensure equality across the rate-based and mass-based options, the EPA begins with each State’s rate-based target excluding the renewable energy enhancement. The emissions ceiling is then calculated using the power plant emission targets and the potential afforded by renewable energy expansion.

Calculating Mass-Based & New Source Complement Targets

The EPA determines the incremental generation growth to 2030 needed to meet a State’s projected power demand.

From the projected incremental growth is subtracted:

- Anticipated generation from projects under-construction; and
- Estimated generation growth from existing power plants and renewable sources.

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