MEMO *Published August 27, 2018 • 5 minute read*

Analyzing Trump's "Affordable Clean Energy" rule using the EPA's own data

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President Trump's proposed Affordable Clean Energy rule is neither affordable nor clean. In reality, it's a gift to coal barons and a case study in just how far-reaching the damages of bad policy can be. We dug through the Environmental Protection Agency's (EPA) own technical analysis and even *they* concluded that this plan would create **roughly zero new jobs** and kill 1,400 Americans per year from increased air pollution, compared to the Clean Power Plan (CPP) that it would replace.

Our own calculations based on EPA's public rule and a conservative analysis of the health effects of increased coal use reveals that this rule will kill **one person for every three coal mining jobs saved, and sicken 16 children for every one coal mining job saved.** This poorly devised policy protects the interests of Trump's donors at the expense of public health, climate, and clean energy technologies. Let's take a closer look at some key aspects of the Affordable Clean Energy rule, using information from the Trump Administration itself.

1. It will not create a landmark revival of coal.

Using the Administration's own analysis, Trump's Affordable Clean Energy rule will still lead to a decrease in coal power ranging from 0.3% - 2.3% by 2030 compared to doing nothing. Obama's Clean Power Plan (CPP) would have only decreased coal power 3% by 2030 compared to doing nothing (Table 3-22). The reason why both plans see such a minimal additional decrease in coal power is that they are both relatively weak climate policies that barely outstrip emissions reductions occurring from existing market trends. Coal is dying a natural death mainly due to cheap natural gas and renewables. The Affordable Clean Energy rule will not save coal.

Table 3-22   Percent Change in Total Generation Capacity by 2025-2035, Relative to No CPP Scenario

	No CPP	Base Case (CPP)	2% HRI at $50/kW	4.5% HRI at $50/kW	4.5% HRI at $100/kW
2025					
Coal	--	-3.1%	-1.1%	-0.3%	-2.4%
NG Combined Cycle (existing)	--	0.0%	0.0%	0.0%	0.0%
NG Combined Cycle (new)	--	50.1%	13.5%	5.6%	32.1%
Combustion Turbine	--	-0.3%	0.0%	0.0%	0.0%
Oil/Gas Steam	--	0.4%	0.7%	1.5%	2.6%
Non-Hydro Renewables	--	1.5%	0.8%	0.7%	1.4%
Hydro	--	0.3%	0.0%	0.0%	0.0%
Nuclear	--	3.0%	-0.3%	-2.0%	-0.9%
Other	--	0.0%	0.0%	0.0%	0.0%
Total	--	0.1%	0.0%	0.0%	0.0%
2030					
Coal	--	-3.1%	-1.0%	-0.3%	-2.3%
NG Combined Cycle (existing)	--	0.0%	0.0%	0.0%	0.0%
NG Combined Cycle (new)	--	29.3%	3.1%	-7.4%	1.7%
Combustion Turbine	--	-1.5%	0.5%	0.7%	1.1%
Oil/Gas Steam	--	0.4%	0.6%	1.5%	2.5%
Non-Hydro Renewables	--	2.1%	0.1%	-0.2%	0.0%
Hydro	--	0.1%	0.0%	0.0%	0.0%
Nuclear	--	3.6%	-0.3%	-2.1%	-0.9%
Other	--	0.0%	0.0%	0.0%	0.0%
Total	--	0.3%	0.0%	-0.1%	-0.1%
2035					
Coal	--	-2.7%	-1.2%	-0.2%	-3.5%
NG Combined Cycle (existing)	--	0.0%	0.0%	0.0%	0.0%
NG Combined Cycle (new)	--	12.7%	1.1%	-3.8%	0.4%
Combustion Turbine	--	-2.3%	0.6%	1.0%	2.3%
Oil/Gas Steam	--	0.4%	0.6%	1.5%	2.5%
Non-Hydro Renewables	--	2.2%	0.0%	-0.3%	-0.1%
Hydro	--	0.0%	0.0%	0.0%	0.0%
Nuclear	--	2.1%	-0.3%	-2.1%	-1.0%
Other	--	0.0%	0.0%	0.0%	0.0%
Total	--	0.3%	0.0%	-0.1%	-0.1%

(Reprinted from the EPA's Technical Analysis – August 21, 2018)

2. It will create zero net new jobs.

Acting EPA Administrator Andrew Wheeler's statement on the rule says it "supports economic growth and job creation." But the only reference to an EPA analysis on jobs is in Chapter 5 of the EPA's technical analysis which makes a different claim. "There may still be employment effects, negative and

positive, for groups of affected workers, even if the overall net effect is small or zero" (Chapter 5, page 9). So as far as the EPA's own analysis is concerned, the net impact on jobs is somewhere between zero and negligible.

3. It will kill at least one American for every three coal jobs it saves.

We were curious ourselves if the rule will end up killing a similar amount of people as coal jobs saved, relative to the CPP. After crunching the numbers, the results are stunning and only reinforce what truly abysmal policy making this is. The Trump Administration's roll-back of the power plant pollution rule will kill one person for every three coal mining jobs saved. We are doing all of this to save 3,721 coal jobs in total, to say nothing about jobs lost in other energy sectors, and this is coming at the expense of 1,400 Americans dying prematurely. And on top of that, this plan will sicken 16 children for every coal mining job saved. [1] Policies always come with trade-offs. But shouldn't the benefits outweight the costs?

4. It will have other disastrous consequences for human health.

This rule will result in significant forgone human health benefits compared to the CPP because it will increase the level of dangerous pollutants such as $PM_{2.5}$, SO_2, and NO_x (Table 4-3). Relative to the CPP, Trump's replacement plan could result in up to 1,400 premature deaths, 430 non-fatal heart attacks, 48,000 cases of exacerbated asthma, 500 cases of acute bronchitis, 42,000 lost work days, and 60,000 school absence days annually by 2030 (Table 4-6).

Table 4-6	Estimated Incremental PM2.5 and Ozone-Related Premature Deaths and Illnesses in 2030*			
	No CPP	2% HRI at $50/kW	4.5% HRI at $50/kW	4.5% HRI at $100/kW
Avoided premature death among adults				
$PM_{2.5}$ Krewski *et al.* (2009)	470 (320 to 630)	410 (280 to 550)	410 (280 to 550)	350 (240 to 470)
Lepeule *et al.* (2012)	1,100 (540 to 1,600)	940 (470 to 1,400)	940 (470 to 1,400)	800 (400 to 1,200)
Ozone Smith *et al.* (2009)	24 (12 to 36)	38 (19 to 57)	16 (8 to 25)	12 (6 to 18)
Jerrett et al. (2009)	86 (29 to 140)	140 (47 to 230)	59 (20 to 98)	43 (14 to 71)
PM2.5- related non-fatal heart attacks among adults				
Peters et al. (2001)	490 (120 to 860)	430 (100 to 750)	430 (110 to 760)	360 (89 to 640)
Pooled estimate	53 (20 to 140)	46 (17 to 120)	47 (17 to 120)	39 (15 to 110)
All other morbidity effects				
Hospital admissions—cardiovascular ($PM_{2.5}$)	120 (53 to 230)	110 (46 to 200)	110 (47 to 200)	91 (40 to 170)
Hospital admissions—respiratory ($PM_{2.5}$ & O_3)	130 (210 to 250)	110 (26 to 210)	140 (35 to 280)	87 (24 to 170)
ED visits for asthma ($PM_{2.5}$ & O_3)	250 (-50 to 620)	210 (-37 to 530)	280 (-51 to 690)	170 (-34 to 410)
Exacerbated asthma ($PM_{2.5}$ & O_3)	44,000 (-31,000 to 110,000)	40,000 (-29,000 to 96,000)	48,000 (-34,000 to 120,000)	29,000 (-20,000 to 69,000)
Minor restricted-activity days ($PM_{2.5}$ & O_3)	290,000 (200,000 to 370,000)	230,000 (160,000 to 310,000)	300,000 (210,000 to 390,000)	190,000 (140,000 to 250,000)
Acute bronchitis ($PM_{2.5}$)	570 (-130 to 1,300)	500 (-120 to 1,100)	500 (-120 to 1,100)	420 (-99 to 940)
Upper resp. symptoms ($PM_{2.5}$)	10,000 (1,900 to 19,000)	9,000 (1,600 to 16,000)	9,000 (1,600 to 16,000)	7,700 (1,400 to 14,000)
Lower resp. symptoms ($PM_{2.5}$)	7,200 (2,800 to 12,000)	6,300 (2,400 to 10,000)	6,300 (2,400 to 10,000)	5,400 (2,000 to 8,700)
Lost work days ($PM_{2.5}$)	48,000 (40,000 to 55,000)	42,000 (35,000 to 48,000)	42,000 (35,000 to 48,000)	35,000 (30,000 to 41,000)
School absence days (O_3)	31,000 (11,000 to 71,000)	60,000 (22,000 to 140,000)	21,000 (7,700 to 48,000)	16,000 (5,600 to 35,000)

* Values rounded to two significant figures

(Reprinted from the EPA's Technical Analysis – August 21, 2018)

5. It will hamper the development of cleaner energy sources.

The Affordable Clean Energy rule does not just support dirty, dying coal; it also hurts the development of zero-carbon energy sources. At best, generation from renewables (excluding hydroelectric) could increase by a mere 0.1% under Trump's rule, compared to no policy at all. At worst, renewables fall by 0.2%. In comparison, renewables would increase by 2.1% under the CPP. Carbon-free nuclear could decrease between 0.3%-2.1% under Trump's rule; whereas, under the CPP, nuclear generation was expected to increase by 3.6%. Trump's plan could cause natural gas generation to decrease by as much as 7.4% or increase by only 3.1%; whereas it would have grown by 29.3% under the CPP (Table 3-22). In each case, we see cleaner sources of fuel decreasing under Trump's rule compared to the CPP, all in a futile effort to save coal.

6. It will increase climate change.

Relative to the CPP, Trump's rule will result in 3% more CO2 emissions. Compared to no rule at all, Trump's rule will only manage to reduce emissions by 1% (Table ES-5). Relative to the CPP, the forgone domestic climate benefits of Trump's rule will range from $59 million-$430 million in the year

2030 and increase annually (Table 4-2). This is also a low estimate of the impact on climate change, considering this calculation only includes domestic costs but the emissions from our coal plants have global impacts. The forgone global climate benefits in 2025, as calculated by the EPA, could range between $1.4 billion-$2.6 billion annually. In 2035, those numbers increase to between $3.6 billion-$4.8 billion annually (Chapter 7, Page 7).

Table ES-5 Projected CO₂ Emission Impacts, Relative to Base Case (CPP) Scenario

	CO₂ Emissions (MM Short Tons)			CO₂ Emissions Change (MM Short Tons)			CO₂ Emissions Change Percent Change		
	2025	2030	2035	2025	2030	2035	2025	2030	2035
No CPP	1,829	1,811	1,794	50	74	66	3%	4%	4%
Base Case (CPP)	1,780	1,737	1,728	--	--	--	--	--	--
2% HRI at $50/kW	1,816	1,798	1,783	37	61	55	2%	3%	3%
4.5% HRI at $50/kW	1,812	1,797	1,787	32	60	59	2%	3%	3%
4.5% HRI at $100/kW	1,799	1,785	1,772	20	47	44	1%	3%	3%

(Reprinted from the EPA's Technical Analysis – August 21, 2018)

Conclusion

The Trump Administration is implementing a policy that will not bring back coal, fails to create jobs, endangers human health, hampers the development of clean energy, and increases climate change. This places the priorities of coal lobbyists before the health and prosperity of everyday Americans. What we need are modern, progressive, and community-oriented policies that allow the U.S. to harness a diverse range of carbon-free technologies.

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ENDNOTES

1. The most favorable case for coal consumption is the case where plants can improve their heat rate under ACE by 4.5% at an average cost of $50/kW. This results in 113 million MWh more coal generation in 2030 relative to maintaining the CPP. That equates to 54.4 million short tons of additional coal consumption or 7.5% of total coal mined in the US (of all ranks). Based on the average productivity of US coal mines in 2016 (short tons mined per average employee or FTE), that would mean 3,721 U.S. coal miners would keep their jobs, relative to the CPP implementation scenario. So we're doing all this to save 3,721 coal jobs. For comparison, the U.S. coal mining sector shed 35,960 jobs since the Great Recession (2009 to 2016), or nearly 10 times that number.