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# Texas and the EPA's Clean Power Plan: Water, $CO_2$ Emissions, and Costs

Texas is periodically subject to severe drought. In 2011, the state experienced the worst single-year drought in its recorded history. Demand for electricity was at an all-time high and the water needed to cool the state's coal, nuclear, and gas power plants was in short supply. Texans were warned that rolling blackouts were possible. As of August 25, 2014, 59 percent of the state was still under moderate to extreme drought.

As Texas grapples with these immediate problems, decision-makers in the state must also consider how water use in the state will be affected by a new federal policy—the Clean Power Plan (CPP), which aims to reduce $CO_2$ emissions produced by the power sector. While water is a key part of their conversation, the decision-makers are also concerned about how this policy will affect costs in the Texas power sector.

## The Clean Power Plan (CPP)

The U.S. Environmental Protection Agency (EPA) released the CPP on June 2, 2014. The CPP defines state-specific $CO_2$ intensity rates—that is, the number of pounds of $CO_2$ that can be emitted per megawatt-hour (MWh) of power produced.

The CPP specifies two intensity rates: (1) the final rate, which is a single-year rate that must be achieved by 2029 and (2) the interim rate, which is the average rate between 2020, when the CPP is to come into force, and 2029, the last year of the plan. The rates for each state are determined by EPA analysis.

EPA specifies four "building blocks" to achieve the targets, including (1) gaining efficiency at coal-fired power plants, (2) shifting coal generation to natural gas combined cycle (NGCC) plants, (3) using more renewable energy, and (4) using demand-side energy efficiency. All of the options consume less water for power production than coal, given the same cooling technology. The cost of new capacity for NGCC and wind is also less expensive compared to new coal, and EE is the cheapest option of all.

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## CNA Corporation Model

Using a model created at CNA Corporation, CNA researchers looked at how Texas would fare under this new policy.

We compared two scenarios: a Baseline scenario (i.e., what happens if current policy/trends continue) and the CPP scenario. We looked at a multitude of variables but highlight just three here: water, $CO_2$ intensity, and cost.[1]

### Water

Under the Baseline scenario, we project a 5 percent decline in water consumption between 2012 and 2029. Under the CPP, we expect a 21 percent cut (figure 1). The gain between the two scenarios represents a savings of 66,000 acre-feet of water per year in 2029 compared with the Baseline, which represents a continuation of today's policies. Compared to current water consumption, the savings are 88,000 acre-feet. Water withdrawals (not shown) also decline under both scenarios.

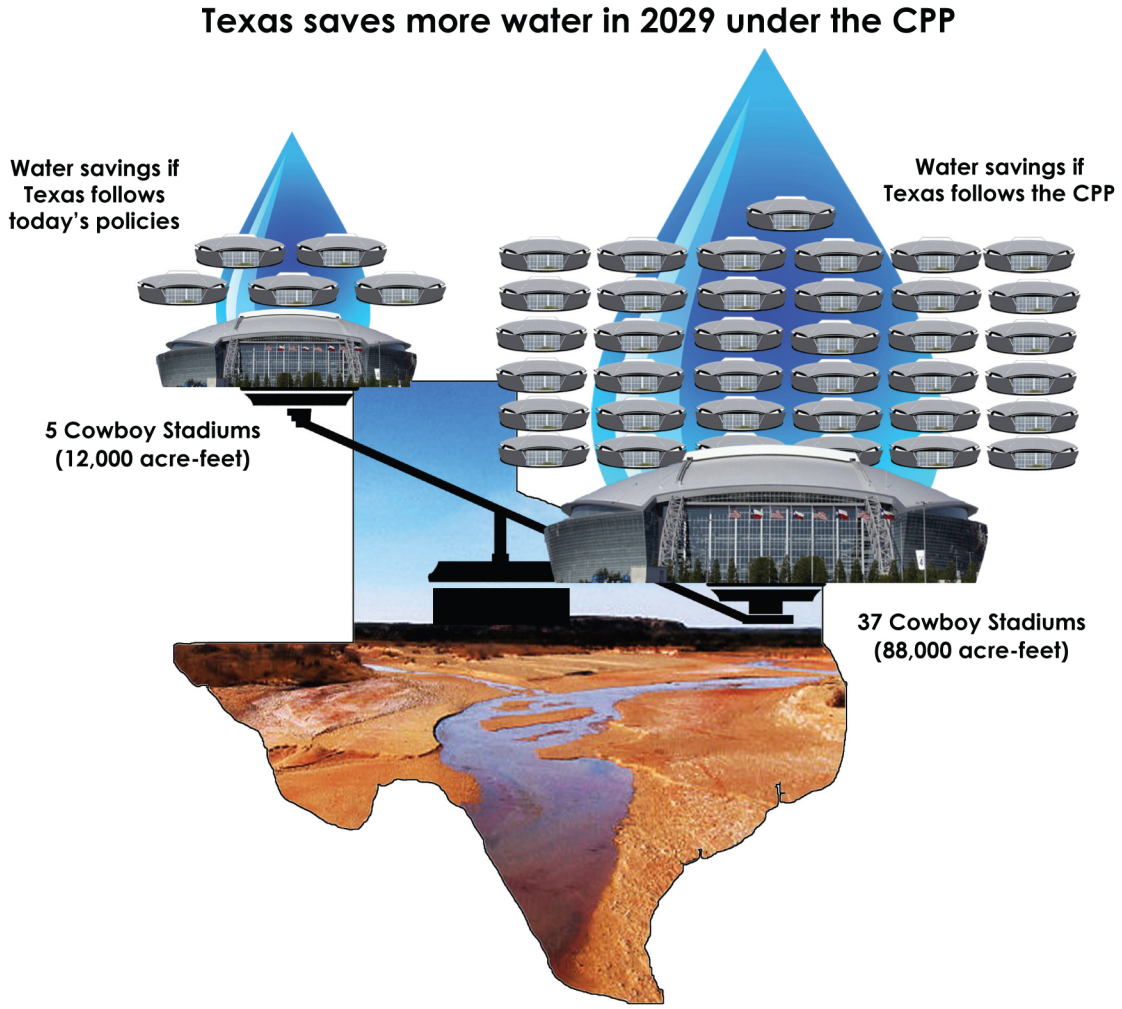


**Figure 1.** Less water is consumed under the CPP than under the Baseline scenario (Units = ac-ft/yr)

[1]For our full findings and details on our model, data, and methodology, please refer to the report available at www.cna.org/research/2014/water-use-texas

## $CO_2$

Under the CPP, the final $CO_2$ intensity rate for Texas is 791 pounds per MWh by 2029, a 38 percent cut from 2012, and its interim rate is 853 pounds per MWh. Because the CPP also calls for demand-side energy efficiency gains of 1 percent per year starting in 2020, there's a 10 percent cut in the 2029 power demand level relative to the Baseline.

In Figure 2, we see that even under the Baseline scenario, Texas will reduce its $CO_2$ intensity rate, producing almost 70 percent of the required cut in the final rate.

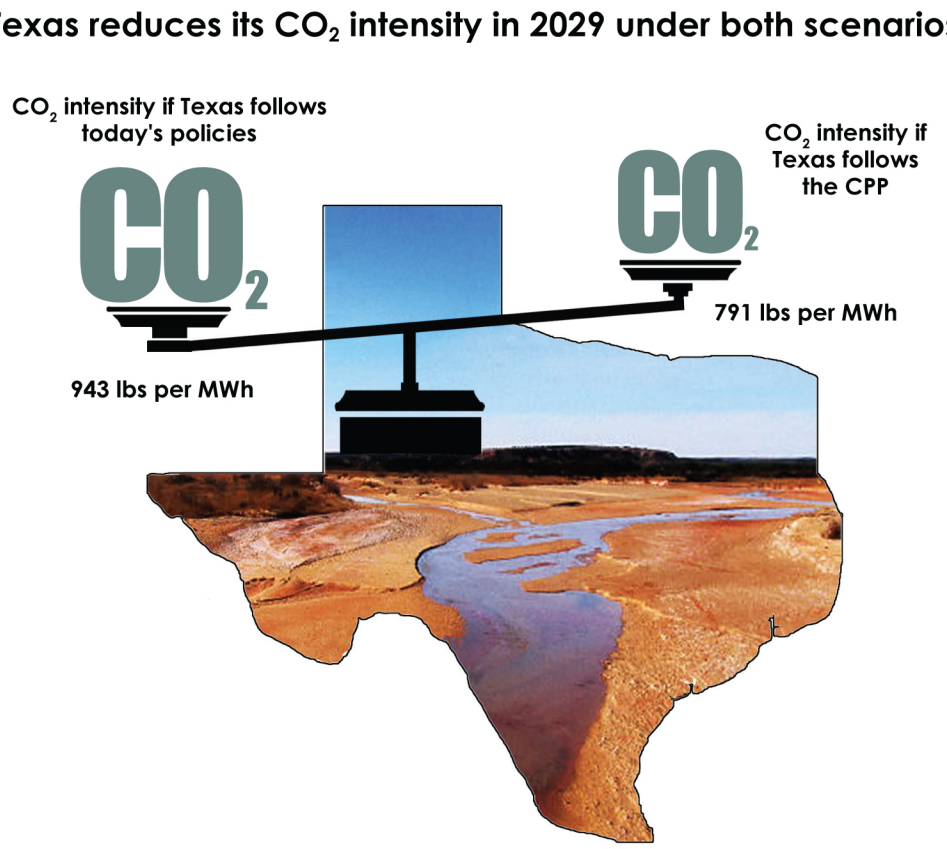


**Figure 2.** Both the Baseline and the CPP scenarios produce large drops in $CO_2$ intensity (Units = lbs/MWh)

In 2012, Texas produced 1,284 pounds of $CO_2$ per MWh. The Baseline shows a final $CO_2$ intensity rate (for 2029) of 943 lbs per MWh, a decline of 26 percent from the 2012 value. The decline is due to the gradual retirement of coal generating capacity, which is replaced by new natural gas and wind power because they are cheaper.

In addition to cuts in $CO_2$ intensity and emissions, we also find large reductions in several other pollutants: nitrogen oxide, sulfur dioxide, particulate matter, and mercury emissions.

## Cost

The difference in cost between the two scenarios is small. Under the CPP, there would be a savings in total system costs between 2020 and 2029 of about 2 percent relative to the Baseline scenario.

The savings are primarily due to demand-side energy efficiency, which reduces the need for new capacity. The savings derive from flat fixed costs because under the Baseline scenario there are higher capacity requirements than under the CPP. In 2029, generating capacity under the CPP scenario would be just 110,000 MW, while under the Baseline scenario generating capacity would be 128,000 MW. This is a difference of 14 percent.

# Conclusions

The results of our analysis lead us to make the following conclusions:

1. EPA's Clean Power Plan (CPP) will produce water conservation benefits for Texas.
2. Texas is positioned to make significant cuts in its $CO_2$ intensity rate even without the CPP.
3. Following the CPP will require modest adjustments for Texas.