



Top Ten States for CO₂ Emission Reductions:

- | | |
|-----------------|---------------|
| 1. Texas | 6. Kentucky |
| 2. Ohio | 7. Michigan |
| 3. Illinois | 8. California |
| 4. Indiana | 9. Georgia |
| 5. Pennsylvania | 10. Alabama |

Carbon Dioxide Pollution could be Dramatically Reduced with Industrial Energy Efficiency and Combined Heat and Power

National Savings

The industrial sector—including manufacturing, mining, construction and agriculture—consumes about one-third of electricity generated in the United States, making it the economy’s largest energy user (Figure 1).¹ This energy consumption coupled with growing demand creates significant emission reduction opportunities.

By increasing industrial energy efficiency (IEE), including combined heat and power (CHP) and waste heat to power (WHP), states can:

- **Reduce annual carbon dioxide (CO₂) emissions by 174.5-million tons** in 2030;
- **Achieve nearly one-third (29 percent)** of the national emission reductions called for under the U.S. Environmental Protection Agency’s (EPA) Clean Power Plan (CPP);
- **Save 396-million megawatt-hours** of electricity in 2030;
- **Make industrial companies more competitive** by cutting their energy bills; and
- **Save businesses \$298 billion** in avoided electricity purchases (cumulative cost savings 2016-2030).

This [Alliance for Industrial Efficiency](#) analysis (using the American Council for an Energy-Efficient Economy’s [SUPR 2](#)¹ calculator) estimates savings in a scenario where:

1. The industrial sector ramps up to an annual 1.5% energy savings target by 2030; and
2. The commercial and industrial sectors install a portion of the technical potential for new CHP and WHP.

Figure 1. Share of total U.S. energy consumed by end-use sector in the United States (2015)

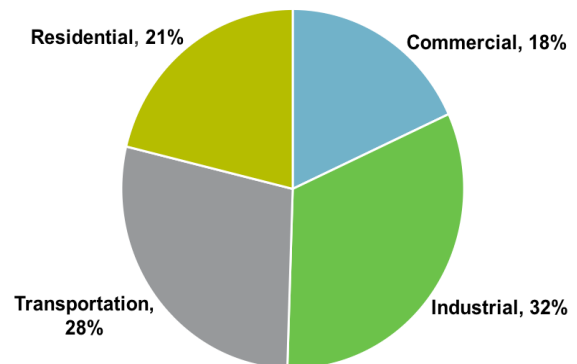
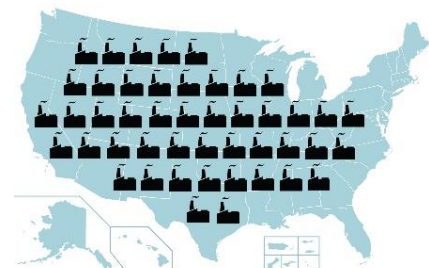


Table 1. Savings from IEE, CHP, and WHP

	Annual CO ₂ savings (short tons)	Annual energy savings (MWh)	Cumulative utility bill savings through 2030 (million 2011\$)
IEE	141,866,557	212,480,929	\$157,750
CHP/WHP	32,625,000	183,855,000	\$140,590
Total	174,491,557	396,335,929	\$298,340

*A national annual reduction of 174 million short tons of annual CO₂ emissions is equivalent to the emissions from approximately **46 coal-fired power plants** or 16.7 million homes.*



¹ ACEEE, *State and Utility Pollution Reduction Calculator Version 2 (SUPR 2)*, Jan. 19, 2016 (<http://aceee.org/research-report/e1601>).



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State Ranking – CO₂ Emission Reductions

The ten states with the greatest potential for CO₂ emission reductions from the industrial sector and CHP/WHP – shown in Table 2 – are generally states with heavy manufacturing industries located in the Southeast and Midwest. These states can also achieve significant percentages of their Clean Power Plan targets from industrial energy efficiency and CHP/WHP.

In this scenario, 40 percent of the total 2030 emissions reductions come from the Southeast and 34 percent come from the Midwest (Figure 2). Significant contributions are also possible in Texas and California. The large industrial sectors in these regions contribute to the large potential energy (and related emission) savings.

Figure 3 summarizes the state ranking for potential CO₂ emission reductions from IEE and CHP. The darker the state, the higher its ranking.

Table 2. CPP target that industrial energy efficiency would meet for top ten states for total CO₂ reduction

State	CO ₂ Reduction Required Under the CPP, 2030 (short tons)	Industrial Sector Annual CO ₂ Reduced, 2030 (short tons)	CPP Target IEE Would Meet (%)
Texas	62,259,493	16,424,917	26%
Ohio	28,665,011	10,277,039	36%
Illinois	35,731,028	9,919,055	28%
Indiana	34,446,081	9,164,632	27%
Pennsylvania	30,167,435	7,646,666	25%
Kentucky	29,649,708	7,589,721	26%
Michigan	22,316,390	6,912,665	31%
California	1,310,093	6,203,406	>100% ²
Georgia	16,496,203	5,744,788	35%
Alabama	18,691,307	5,570,862	30%

Figure 2. Potential reduction in CO₂ emissions by region

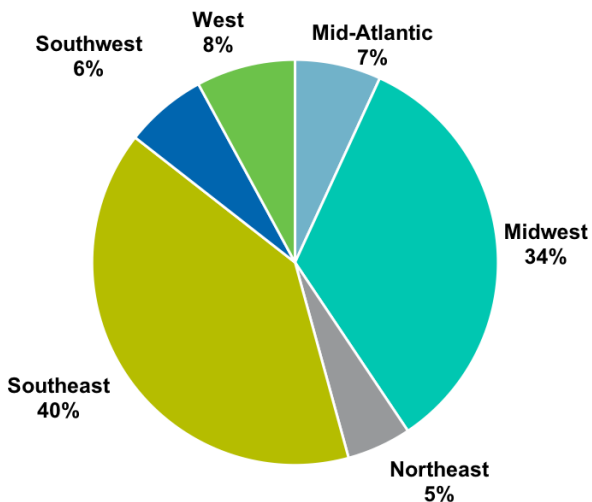
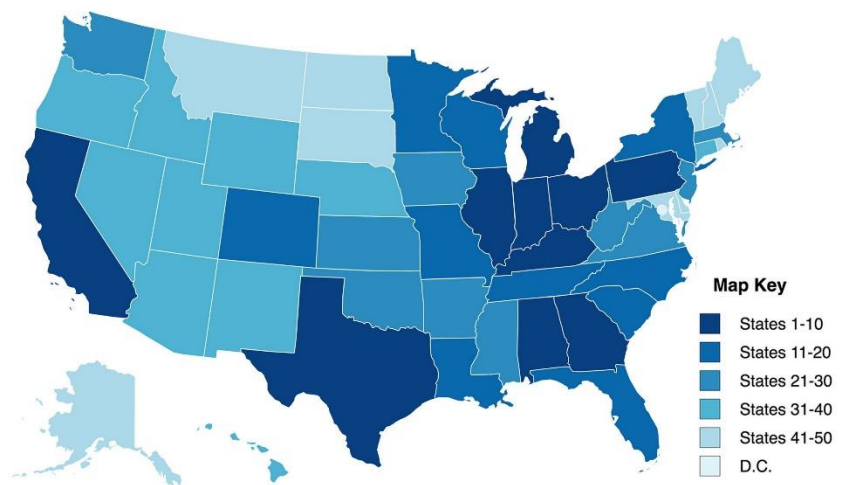


Figure 3. State ranking of potential CO₂ emission reductions



² California can exceed its CPP target through IEE and CHP alone due to the extensive policies that the state has already implemented to reduce CO₂ emissions as well as the tremendous remaining potential for further emission reductions in the industrial sector.



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Clean Power Plan

The Clean Power Plan (CPP) establishes customized targets for states to reduce the carbon pollution produced from power plants that reflect each state’s energy mix. In February 2016, the Supreme Court stayed implementation of the CPP pending judicial review. Despite the stay, some states are choosing to continue to work to cut CO₂ emissions from power plants and explore pathways to compliance.

In total, the CPP requires states to reduce their annual CO₂ emissions by more than 586 million short tons by 2030. Our analysis shows that industrial energy efficiency and CHP/WHP would result in an annual national reduction of 172 million³ short tons of CO₂ by 2030 – or approximately 29 percent of needed reductions across the United States (Figure 4). Thus, IEE and CHP/WHP can play a central role in helping states achieve their compliance targets.⁴

Market Value of Savings

Under the CPP final rule, industrial hosts can generate revenue by selling credits (emission reduction credits or allowances). As Table 3 shows, the size of the allowance market is huge. Note that the table shows the market value of savings in a single year; investments would generate a value stream that lasts for many years.

Figure 4. National CPP target achievable through industrial energy efficiency and CHP/WHP

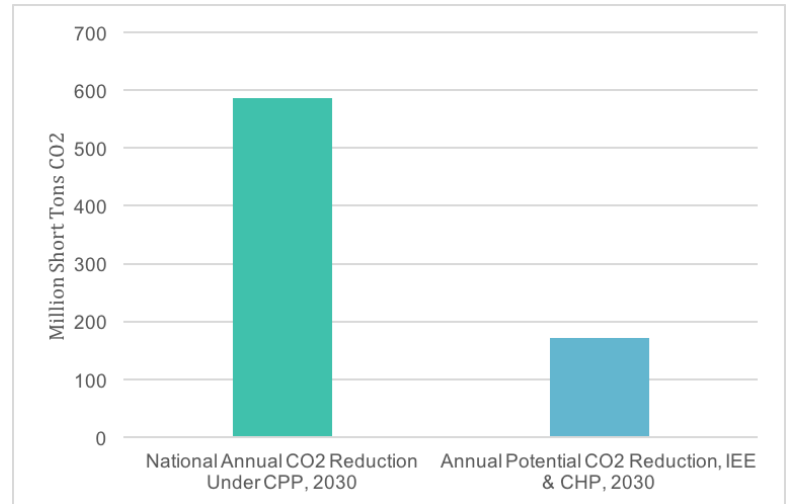


Table 3. Estimated allowance market value if IEE and CHP/WHP savings are realized (2030)

Price per unit of trading	Size of allowance market (\$ billion)
\$10	\$3.171
\$20	\$6.341

Note: We apply the price per trading unit to combined annual energy savings in 2030., 1 MWh = 0.8 short tons of CO₂.

To view the complete “State Ranking of Potential Carbon Dioxide Emission Reductions through Industrial Energy Efficiency” report, visit:

<http://alliance4industrialefficiency.org/resources/state-industrial-efficiency-ranking/>

³This figure does not include Alaska, Hawaii, Vermont, or the District of Columbia, which do not have CPP targets.

⁴There is a wide range of IEE activities available to manufacturers. For examples, visit the Alliance for Industrial Efficiency’s industrial energy-efficiency program case study series at <http://alliance4industrialefficiency.org/resources/casestudies/>.