



- 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 |

View the full state ranking report at: bit.ly/AIEreport

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

Virginia Savings

The industrial sector—including manufacturing, mining, construction and agriculture—consumes almost one-quarter of electricity generated in Virginia (Figure 1). This energy consumption coupled with growing demand creates significant savings and emissions reductions opportunities.

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

- **Reduce annual carbon dioxide (CO₂) emissions by 2.6-million tons** in 2030;
- **Achieve about 31 percent of Virginia’s emission reductions** called for under the U.S. Environmental Protection Agency’s (EPA) Clean Power Plan (CPP);
- **Save 6.6-million megawatt-hours** of electricity in 2030;
- **Make industrial companies more competitive** by cutting their energy bills; and
- **Save businesses \$4.1 billion** in cumulative cost savings (2016-2030) from avoided electricity purchases.

Figure 1. Share of total energy consumed by end-use sector in Virginia, (2014)²

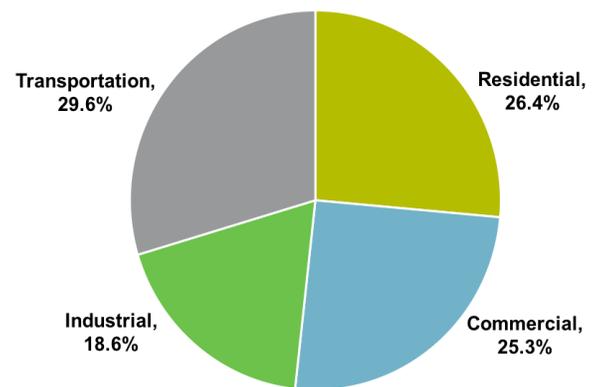


Table 1. Savings in Virginia from IEE, CHP, and WHP

	Annual CO ₂ savings (short tons)	Annual energy savings (MWh)	Cumulative utility bill savings through 2030 (million 2011\$)
IEE	2,016,734	3,577,783	\$2,288
CHP/WHP	549,000	3,065,000	\$1,793
Total	2,565,734	6,642,783	\$4,081

Virginia ranks 26th in the U.S. for potential CO₂ reductions from IEE and CHP/WHP. An annual reduction of 2.6 million short tons of annual CO₂ emissions is equivalent to emissions from nearly **one coal-fired power plant** or 245,786 homes’ energy use for one year.

An [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 each state:

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.



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

² U.S. Energy Information Administration, “Virginia Profile Overview,” <http://www.eia.gov/state/?sid=VA#tabs-2>



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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. Virginia is currently continuing to identify ways to cut emissions in the utility sector.

The CPP requires Virginia to reduce its annual CO₂ emissions by about 8.3 million short tons by 2030. Our analysis shows that industrial energy efficiency and CHP/WHP would result in an annual reduction of 2,565,734 short tons of CO₂ by 2030 – or approximately 31 percent of needed reductions across the state (Figure 2). Thus, IEE and CHP/WHP can play a central role in helping Virginia achieve its compliance targets.³

Market Value of Savings

Under the CPP final rule, industrial hosts can generate revenue by selling credits (emission reduction credits or allowances). As Table 2 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.

Technical Potential for CHP in Virginia

According to the Department of Energy’s latest technical potential survey, Virginia has the eleventh highest CHP technical potential in the nation (4,308 MW).⁴ This represents more than twice the current capacity (1,729 MW). Figure 3 indicates the wide range of deployment opportunities in both the industrial and commercial sectors.

Figure 2. Virginia CPP target achievable through IEE and CHP/WHP

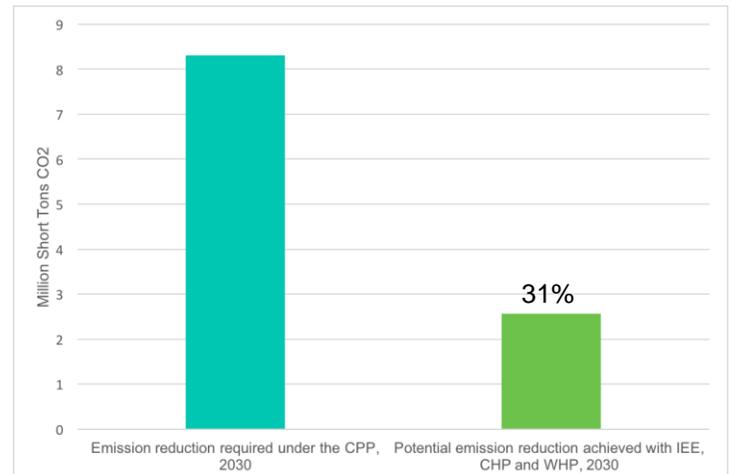
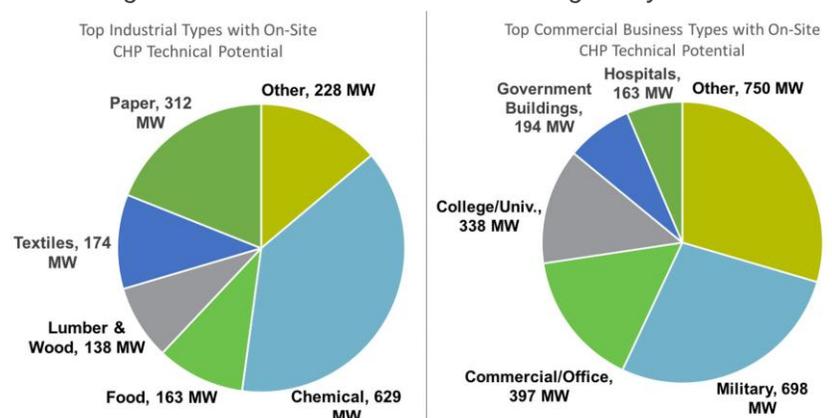


Table 2. Estimated allowance market value if IEE and CHP/WHP savings are realized (2030)

Price per unit of trading	Size of Allowance Market (\$ million)
\$10	\$53.14
\$20	\$106.28

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

Figure 3. CHP Technical Potential in Virginia by Sector



³ There 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/>.

⁴ DOE, “CHP Technical Potential in the United States,” March 2016, <http://energy.gov/eere/amo/downloads/new-release-us-doe-analysis-combined-heat-and-power-chp-technical-potential>