



Automobile Assembly Plants

US Automobile Assembly Plants

NAICS: 33611

- 44 Assembly Plants
- 13 Companies
- 13 States with Plants
- 10 ENERGY STAR Plants

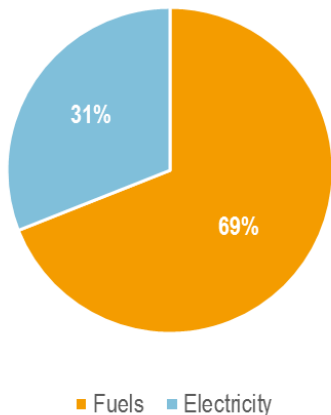
Automobile assembly plants produce the final product in the manufacture of passenger vehicles and light trucks. Vehicles are assembled from components produced in, and transferred from, other plants, painted, and prepared for shipping. Assembly plants consume the most energy of all plant types within the motor vehicle sector, which includes casting, stamping, engine and transmission plants.

The US Environmental Protection Agency's ENERGY STAR partnership has worked with the motor vehicle sector since 2002 to promote energy efficiency and best practices within the sector through the ENERGY STAR Motor Vehicle Industrial Focus initiative.

Energy Use Profile

Natural gas and electricity are the predominant energy sources used in assembly plants. Landfill gas is used at several plants, while coal largely has been phased out. Fuels typically account for 60 to 69 percent of the total energy use.¹

Energy Use Distribution



Electricity and fuel use in assembly plants varies by geographic location and the types of vehicles produced. The table below shows the range of annual energy use by consumption level.¹

Plant Energy Use	Electric (MWh)	Fuels (MMBtu)
Small	~78,700	~473,930
Medium	~121,000	~851,560
Large	~188,000	~1,636,000

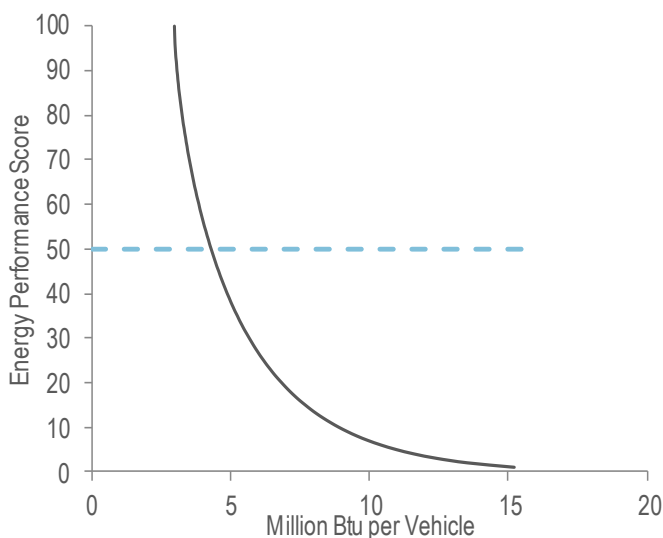
Electricity is the largest energy cost, representing 62% of energy costs. In 2011, assembly plants spent over \$441 million on electricity and over \$273 million on fuels.²

Electric Costs (62%)

Fuel Costs (38%)

Distribution of Energy Performance

EPA, through the ENERGY STAR Motor Vehicle Industrial Focus, has benchmarked the energy performance of U.S. automobile assembly plants. The curve below, generated by the ENERGY STAR Energy Performance Indicator (EPI) for Auto Assembly Plants benchmarking tool, shows the normalized distribution of energy performance for a representative plant in the sector. A dashed line corresponding to the performance of an average plant is provided for reference. An Energy Performance Score (EPS) of 75 or higher is used by EPA as the benchmark for efficient plants.



This curve shows the greatest energy efficiency opportunities are in plants in the lower percentiles (< 30%). The range of performance for more efficient plants in the upper percentiles (> 50%) is much narrower, and performance improvements are likely to focus on optimizing systems and operations or new technology upgrades.

Major Energy Uses

Fuels are used primarily for heating, paint booth curing ovens, steam and hot water production. Electricity is used in many different applications. Major energy users³ are:

Use / Process	Share of energy use
Paint Booths	30—50%
HVAC	11—20%
Lighting	15%
Compressed air	9—14%
Welding	9—10%
Material handling / tools	7—8%
Metal forming	2—9%
Miscellaneous / other	4—5%

Companies report conducting energy projects in all of the areas listed above. Additionally, many companies employed operational and behavioral strategies focused on shift, weekend, and holiday shut down practices, and compressed air use and leaks.

ENERGY STAR Resources

The ENERGY STAR Motor Vehicle Industrial Focus is a collaboration between EPA and the industry that has produced the following tools for energy efficiency in assembly plants:

Energy Performance Indicator (EPI): Benchmarks and rates plant energy performance.

Energy Guide: Technical guidance on energy saving opportunities.

Lighting level best practice study: Documents the most efficient lighting level by plant and shop type.

ENERGY STAR Certified Plants

EPA's ENERGY STAR program certifies Automobile Assembly plants that demonstrate energy performance in the top quartile nationally. In 2014, 10 plants earned ENERGY STAR certification by scoring 75 or higher on the Automobile Assembly EPI:

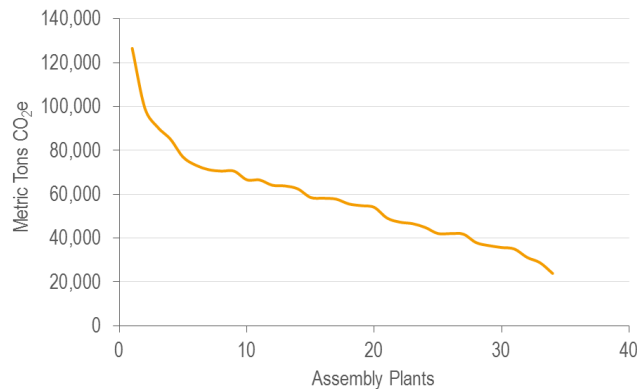
References:

1. Based on data used to develop the Auto Assembly EPI. For more information, see: *Assessing Improvement in the Energy Efficiency of U.S. Auto Assembly Plants* available at energystar.gov. The Plant Energy Use table was compiled to show plant-level consumption for representative small (10th percentile), medium (median), and large (90th percentile) plants.
2. Annual Survey of Manufacturers 2011.
3. *ENERGY STAR Energy Efficiency Improvement and Cost Saving Opportunities for the Vehicle Assembly Industry*
4. EPA Greenhouse Gas Reporting Program Database (ghgdata.epa.gov)
5. Estimate based on 2012 Economic Census and EPA's Flight database.

Greenhouse Gas Emissions

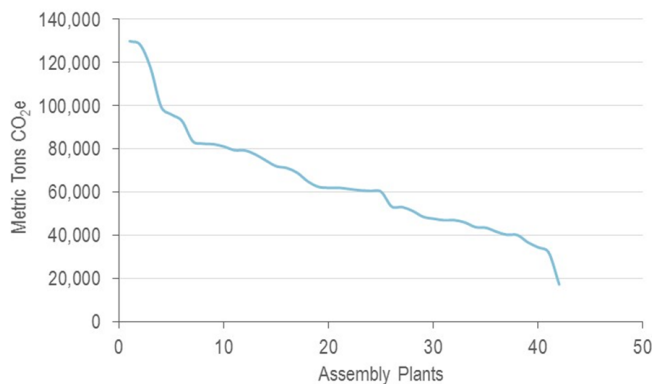
Thirty-four plants reported direct emissions from fuel use to EPA's Greenhouse Gas reporting program in 2012. Plants are required to report if they have annual emissions of 25,000 metric tons of CO₂e (mtCO₂e) or higher. Annual emissions ranged from 125,678 to 23,793 mtCO₂e and averaged around 60,000 metric tons.³ Eight plants operating in 2012 did not report. Total direct emissions from assembly plants in 2012 were reported at 1,968,694 metric tons.⁴

Direct Emissions Distribution



Indirect emissions from electricity purchases are higher than direct emissions, totaling around 4.4 million mtCO₂e, with an estimated annual plant average of 83,000 mtCO₂e.¹

Indirect Emissions Distribution



Total direct and indirect emissions from the sector were approximately 6.4 million metric tons CO₂e in 2012.⁵ Emissions from electricity purchases are the largest source of carbon emissions.

GHG Emissions by Source

