

Comparison of Annual CO2 Emissions and Fuel Savings

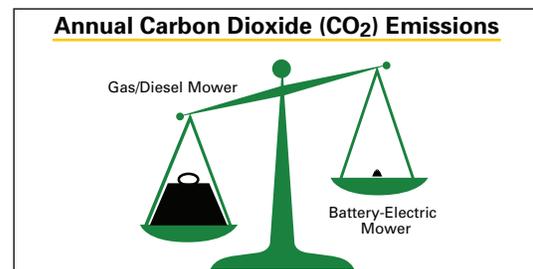
Gas/Diesel RIDING Mower vs. Battery-Electric RIDING Mower

Enter Your Data

Operating hours per week	<input type="text"/>
Operating weeks per year	<input type="text"/>
Fuel consumption (gallons per hour) <small>(Typical residential riding mower = 0.6, Commercial = 1.0)</small>	<input type="text"/>
Fuel cost per gallon	<input type="text"/>
Electricity consumption (kW per hour)	<input type="text"/>
Electricity costs (per kWh)	<input type="text"/>

Annual Savings Using Battery-Electric Mower

Fuel cost savings	<input type="text"/>	Yearly
CO2 savings (Tons)	<input type="text"/>	Yearly



Calculations

Gas/Diesel Mower

Operating hours per year <small>=hours per week X weeks per year</small>	<input type="text"/>	
Annual fuel use (gallons) <small>=hours per year X gallons per hour</small>	<input type="text"/>	
Annual fuel cost <small>=gallons per year X \$ per gallon</small>	<input type="text"/>	
Annual CO2 emissions per ACRE <small>=0.28 gal per acre X 20lbs CO2 per gallon</small>	<input type="text"/>	lbs
Annual CO2 emissions <small>=gallons per year X 20lbs CO2 per gallon (converted to tons)</small>	<input type="text"/>	Tons

Battery-Electric Mower

Operating hours per year <small>=hours per week X weeks per year</small>	<input type="text"/>	
Annual electricity use kWh <small>=hours per year X electricity consumption</small>	<input type="text"/>	
Annual electricity cost <small>=kWh per year X \$ per kWh</small>	<input type="text"/>	
Annual CO2 emissions per ACRE <small>=0.77 kWh per acre X 0.26 lbs CO2 per kWh</small>	<input type="text"/>	lbs
Annual CO2 emissions <small>=kWh per year X .26lbs CO2 per kWh (converted to tons)</small>	<input type="text"/>	Tons

The assumptions and explanations for the values used in this interactive PDF can be found on the following page.



MowElectric.org

Notes / Assumptions

Default Values Apply to a “Commercial” Riding Mower: While the fuel consumption “per ACRE” will be approximately the same for both residential mowers and commercial RIDING mowers, the “default” values used in this SAMPLE calculator are based on a COMMERCIAL (aka “professional”) RIDING mower.

Residential WALK-BEHIND Mowers: Small residential electric walk-behind mowers offer significant advantages over their gas-powered counterparts, including lower noise, zero-tailpipe emissions, no handling of gas, no engine servicing/repair, etc. And while the COMBINED CO₂ emissions of lots of walk-behind mowers operating in a particular region is significant, this calculator is NOT designed to compare the CO₂ emissions from residential walk-behind mowers.

Fuel Consumption Rates: Fuel consumption rates for gas-powered lawn mowers are typically not published by the manufacturers. However, based on anecdotal observations, this SAMPLE calculator assumes a fuel consumption rate of 1 gal/hr for a gas-powered commercial RIDING mower (e.g. 24 to 36 hp). and .60 gal/hr for a gas-powered residential RIDING mower (e.g. 10 to 20 hp).

CO₂ Emissions Associated with Fossil Fuel: According to EPA data, approximately 19.64 lb of CO₂ is emitted per gallon of GASOLINE burned, and 22.4 lb of CO₂ is emitted per gallon of DIESEL fuel burned. For simplicity, this calculator uses an average of 20 lb for both residential and commercial mowers with internal combustion engines.

Electricity Use for Battery-Electric Riding Mowers: The amount of electricity consumed by electric riding mowers will vary by make, model, and operating conditions. However, this SAMPLE calculator assumes battery-electric riding mowers will use approximately 2.8 kWh per operating hour.

CO₂ Emissions Associated with Electricity: The CO₂ emissions associated with electricity is largely determined by the source of that electricity. For example, renewable sources such as wind, solar and hydro have minimal CO₂ emissions compared to the electricity generated by burning fossil fuels. The Vermont Agency of Natural Resources (ANR) recently estimated that each kWh of electricity consumed in Vermont is associated with the release of approximately 0.26 lb of CO₂, which is one of the lowest CO₂ emissions ratings in the US. Since the Mow Electric! Campaign is being rolled out in Vermont, this calculator uses the value of 0.26 lb of CO₂ generated per kWh consumed.

Life-Cycle Cost Savings: Beyond the lower CO₂ emissions and the cost of electricity compared to the emissions and cost of gas or diesel, battery-electric mowers also provide significant cost savings due to their considerably lower maintenance and repair costs. These “Life-Cycle” cost savings are demonstrated in the interactive “Life-Cycle Cost Savings Comparison” calculator at this link <https://mowelectric.org/savings-co2-impact-calculators/>.

An interactive Excel spreadsheet that allows for a more detailed comparison of the **CO₂ Emissions and Electricity/Fuel Costs** for a battery-electric RIDING mower versus a gas-powered RIDING mower can be found at <https://mowelectric.org/savings-co2-impact-calculators/>



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