

### Calculating Your Fleet's Lifecycle Greenhouse Gas Emissions

In Washington State, transportation activities contribute nearly half of our greenhouse gas emissions. More and more, fleets are expected to evaluate the greenhouse gas emissions of their operations, or to consider the potential greenhouse gas impacts of different fuel or technology options. To aid in this endeavor, Western Washington Clean Cities has prepared a reference guide. We put together this guide with the best available information and tools, and we're committed to keeping this tool up-to-date for our members.

### From Wells-To-Wheels: Understanding the Lifecycle Impact of Your Fuels

While tailpipe emissions of greenhouse gases are fairly straightforward to calculate, increasingly there is an interest in understanding the broader lifecycle "wells-to-wheels" impacts of different fuels. A wells-to-wheels analysis takes into account the greenhouse gas emissions generated from the production, distribution, and use of a fuel – not just the tailpipe emissions. This kind of lifecycle analysis provides a more comprehensive measure of a fuel's potential impact on the climate.

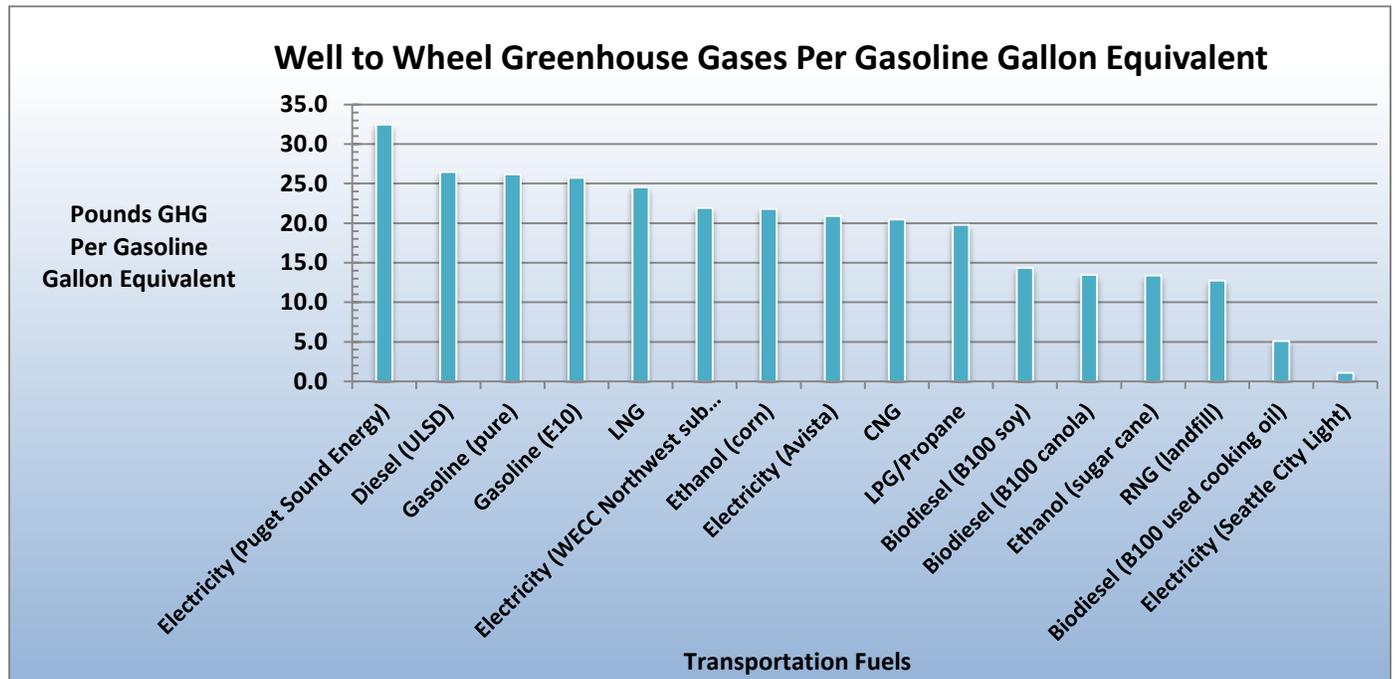
There is no single source of comprehensive greenhouse gas lifecycle emission factors for our region, so we compiled the most reliable collection of emission factors relevant to our region (relying heavily on the CA GREET model). The emission factors in our guide represent the most likely production scenarios for traditional and alternative fuels available in our Western Washington. Because the CA GREET model is used as part of a large regulatory program, we anticipate this to be the most regularly-updated and highly-scrutinized tool for creating emission factors. By normalizing each fuel to a gasoline gallon equivalent, we are providing an apples-to-apples comparison.

#### How To Use This Guide

Our reference graph and table provides a quick overview of the greenhouse gas emissions of different fuels based on a gasoline gallon equivalent of energy.

With our accompanying Excel tool, you can calculate the greenhouse gas emissions of specific quantities of fuel based on your own fleet fuel profile. This can be especially helpful for fleets that track annual greenhouse gases, and those with greenhouse gas reduction goals.

At a glance, the emission factors in our library:



Fuel Type	g CO2e / MJ	Well to wheel lbs. CO2e / gasoline gallon equivalent
Electricity (Puget Sound Energy)	124.7	32.5
Diesel (ULSD)	101.7	26.5
Gasoline (pure)	100.7	26.2
Gasoline (E10)	99.0	25.8
LNG	94.3	24.5
Electricity (WECC Northwest sub region)	84.3	21.9
Ethanol (corn)	83.8	21.8
Electricity (Avista)	80.4	20.9
CNG	78.7	20.5
LPG/Propane	76.0	19.8
Biodiesel (B100 soy)	55.3	14.4
Biodiesel (B100 canola)	51.8	13.5
Ethanol (sugar cane)	51.5	13.4
RNG (landfill)	49.0	12.7
Biodiesel (B100 used cooking oil)	19.7	5.1
Electricity (Seattle City Light)	4.2	1.1