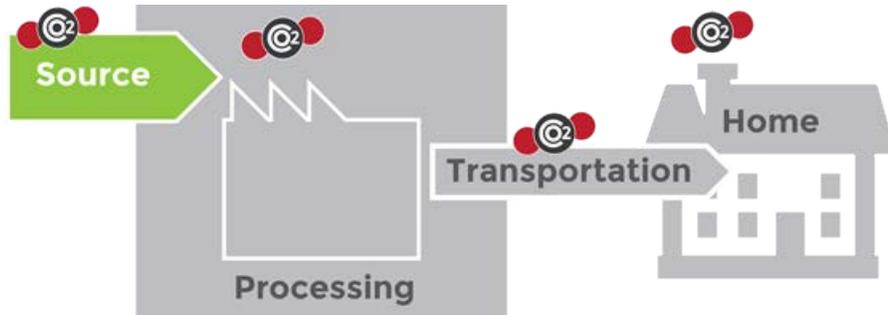




Gasoline and Diesel

Gasoline and diesel make up this category, which is focused on fueling household vehicles. These liquid fuels are distinct from home fuels because they are rarely delivered to your home or consumed inside the house. Carbon dioxide forms when these fuels are burned. Their contribution to your household carbon footprint begins at the source.



PETROLEUM	BIOMASS
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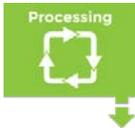
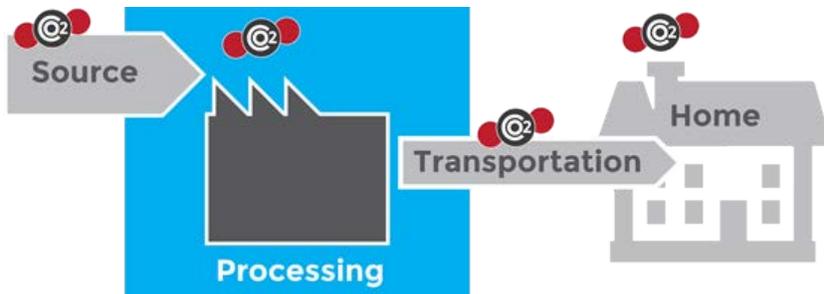
Both gasoline and diesel come from crude oil (petroleum). Crude oil is a mixture of liquid hydrocarbons found in natural underground deposits. Small amounts of volatile hydrocarbons like natural gas may be present with the oil. If no gas-gathering system exists at the production site, those gases will be flared (burned on-site). Even though flaring natural gas adds a little CO₂ to your carbon footprint, it's much better than releasing it as natural gas, which has a greenhouse gas value more than 20 times greater than CO₂.



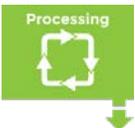
PETROLEUM	BIOMASS
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Biofuels are processed from biomass (plant matter)—typically corn for ethanol and soybeans for biodiesel. The growing of the plant material for ethanol and biodiesel requires the operation of farm implements (e.g., diesel-powered tractors) and fertilizers (e.g., mining, manufacturing) that contribute to their carbon footprint.

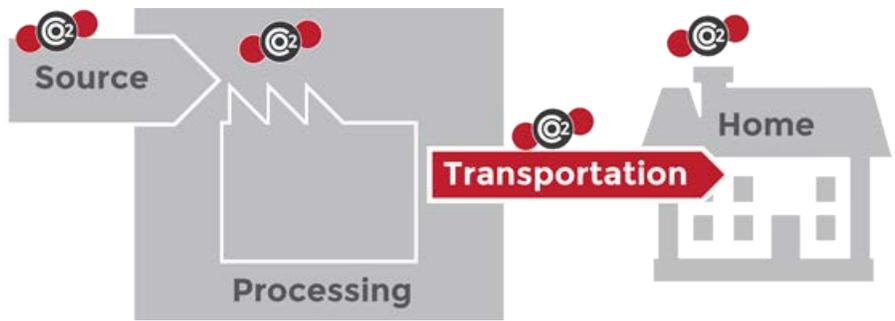




REFINERY	BIOREFINERY
<p>At the crude oil refinery, the liquid and gaseous hydrocarbons are separated into many different products, including the gasoline and diesel used as transportation fuels and fuel oil used in some North Dakota homes for space heating.</p> <p>Refineries emit CO₂ as they burn hydrocarbons to supply energy for the refinery processes. They also remove and release the naturally occurring CO₂ gas that may be present in the crude oil.</p> <p>Trucks, trains, and/or pipelines might be involved in transporting crude oil to the refinery. The fossil fuels used in transport, those burned during processing, and the release of natural CO₂ gas all contribute to your household carbon footprint.</p>	
	



REFINERY	BIOREFINERY
<p>Energy from fossil fuels is used to transport the raw corn and soybeans to the processing plants. Fossil fuels also provide energy for processing the source material into biofuel. Both contribute to the CO₂ footprint of biofuels.</p> <p>North Dakota has one biodiesel manufacturing plant and five corn ethanol plants.</p>	
	



TRANSPORTATION	DISTRIBUTION
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The gasoline and diesel are transported from the refinery to distribution hubs by pipeline.¹ This is the most carbon-efficient way to transport liquids.

Ethanol and biodiesel are transported from the biorefinery to distribution hubs by truck or rail. The diesel powering these vehicles contributes to the carbon footprint of biofuels.

¹www.pipeline101.com/Why-Do-We-Need-Pipelines/Refined-Products-Pipelines (accessed July 13, 2015).



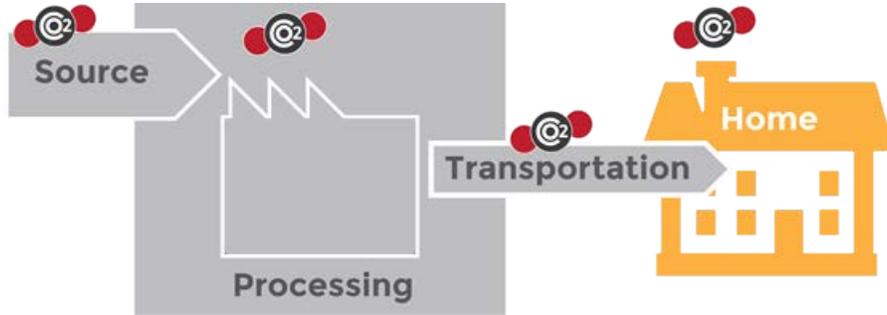
TRANSPORTATION	DISTRIBUTION
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At the hub, petroleum-based gasoline and diesel may be blended with ethanol or biodiesel, respectively, before being taken by truck to fueling stations. Most gasoline in North Dakota contains 10% ethanol but higher blends are available at select stations.¹ Biodiesel is available from select vendors.²

¹www.e85locator.net/State%20Pages/NorthDakotaE85stationlocations.html (accessed July 13, 2015).

²biodiesel.org/using-biodiesel/finding-biodiesel/retail-locations/retail-map#map (accessed July 13, 2015).





TRANSPORTATION	SMALLER ENGINES
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Gasoline and diesel fuel the internal combustion engines in cars and trucks. In North Dakota, rural vehicles travel an average of 16,612 miles a year while urban vehicles travel an average of 12,045 miles a year.¹ The more vehicles a household has, the more miles driven and the more CO₂ released. Still most driving tends to be done with only a couple of the vehicles.² Fuel economy is increasing—see [how your vehicle compares](#).



¹www.ugpti.org/pubs/pdf/DP265.pdf (accessed July 13, 2015).

²www.eia.gov/todayinenergy/detail.cfm?id=20832 (accessed July 13, 2015).



TRANSPORTATION	SMALLER ENGINES
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Gasoline and diesel also fuel engines for yard tools and recreational vehicles like lawn mowers, snowmobiles, and boats. Overall, recreation and lawn care are minor uses of fuel and emitters of carbon compared to transportation. For example, a family with a third-acre lawn will use about 18 gallons of nontransportation fuel each year, mainly in mowing.¹



¹www.safelawns.org/blog/2011/03/your-lawn-fossil-fuel/ (accessed July 13, 2015).

