

Minnesota Low Carbon Fuels Policy

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Reducing Global Warming Pollution
Promoting Next Generation Transportation Fuels

A Low Carbon Fuels Policy...

Does not pick favorites

A LCFP is designed to establish benchmarks and allows the market to decide how best to achieve the emission reductions.

Focuses on the fuel

It does not conflict or overlap with vehicle GHG emissions standards or transit and land use policies.

The LCFP is based on the life cycle of a fuel, incorporating emissions in other sectors besides transportation that would be otherwise overlooked.

Is achievable

The University of Minnesota Center for Transportation Studies has suggested multiple scenarios in which industry could achieve the goals of a LCFP.



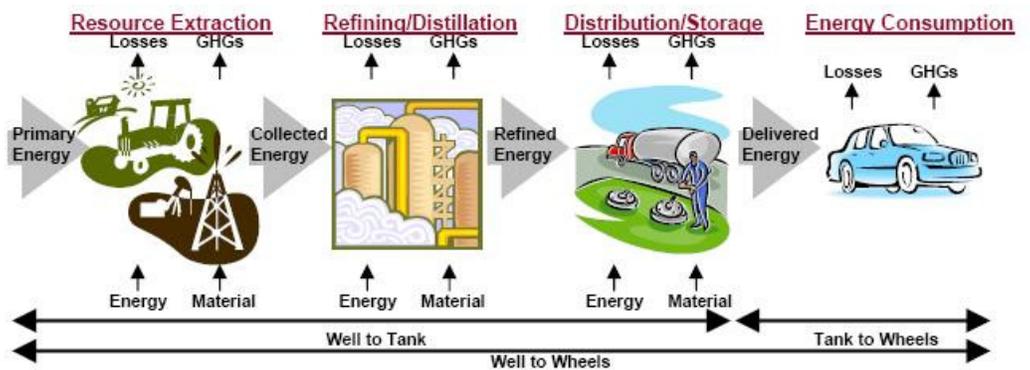
To effectively reduce greenhouse gas (GHG) emissions produced by the transportation sector, energy policies must concentrate on:

- 1) Activity - Vehicle Miles Traveled (VMT)
- 2) Vehicles – Efficiency and GHG standards
- 3) Fuels – Life cycle emissions

A Low Carbon Fuels Policy (LCFP) focuses on the pollution from the production and use of transportation fuels. This policy will help grow Minnesota's clean energy industry, reduce global warming emissions, diversify the transportation fuel supply, and reduce risks to the economy from global energy price shocks.

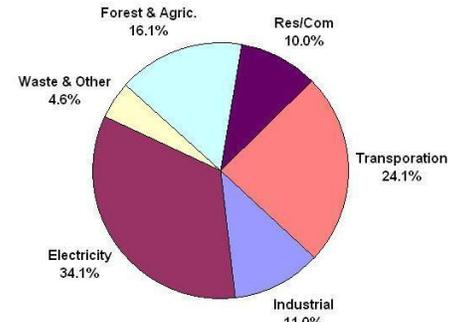
The Minnesota Climate Change Advisory Group (MCCAG), the Next Generation Energy Board, and the Midwest Governors Association have all recommended a low carbon fuels policy as an option worthy of further attention.

A Low Carbon Fuels Policy takes a big picture look at the fuel used in a vehicle. It accounts for the global warming emissions associated with every aspect of a fuel's "full life cycle", either from a well-to-wheels or well-to-tank perspective. Life cycle accounting acknowledges that different fuels have different global warming emissions depending on how they are grown/extracted, transported, and processed into transportation fuel.



Currently, California has established a standard to reduce the well-to-wheels emission intensity of its transportation fuel at least 10% by the year 2020. In addition to this, other state, regional and national policy-makers are also developing similar policies

MN Emissions by Sector: 2005



Source: MN GHG Inventory and Reference Case Projections 1990-2025, Center for Climate Strategies, March 2008. Transportation sector based on tailpipe emissions, not full lifecycle

- Direct tailpipe emissions produce almost one quarter of Minnesota's GHG emissions in 2005.
- A life cycle analysis accounts for both tailpipe emissions and emissions due to the entire production process.
- The GHG impact of a fuel can be captured in all sectors, not just transportation.

RESOURCES

"Biofuels, an Important Part of a Low-Carbon Diet"

Union of Concerned Scientists
www.ucsusa.org/clean_vehicles/vehicles_health/biofuels-low-carbon-diet.html

"Energy Basics: Where Does My Gasoline Come From?"
Energy Information Administration
[http://www.eia.doe.gov/bookshelf/brochures/gaoline/index.html](http://www.eia.doe.gov/bookshelf/ brochures/gaoline/index.html)

"Reducing Greenhouse Gas Emissions from Transportation Sources in Minnesota"
University of Minnesota – Center for Transportation Studies
<http://www.cts.umn.edu/Publications/ResearchReports/pdfdownload.pl?id=936>

"Driving It Home: Choosing the Right Path for Fueling North America's Transportation Future"
Natural Resources Defense Council
<http://www.nrdc.org/energy/drivingit/home/drivingithome.pdf>

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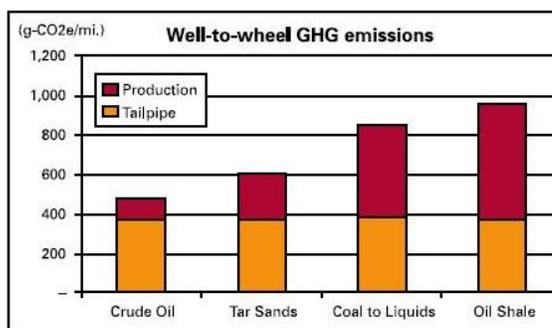
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Ways to Meet the Benchmark

A Low Carbon Fuels Policy does not pick technology winners and losers; instead it sets a benchmark and lets the market decide how best to meet it. Various available transportation fuels could be used to comply, such as:

- Biodiesel
- Ethanol
- Electricity
- Hydrogen
- Compressed natural gas (CNG)
- And more...

Even conventional fuels like gasoline and diesel could help meet the standard through technology improvements and lower carbon methods of production. Regional innovators are already leading the way with many of these changes.

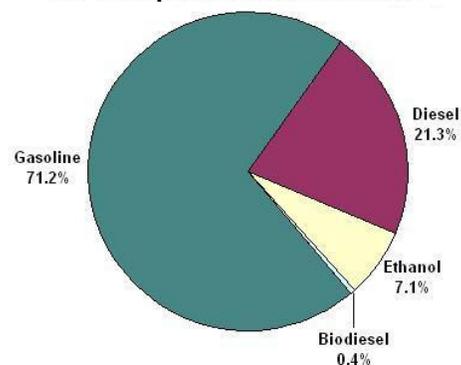


Source: NRDC June 2007
Note: Values based on averages and do not indicate uncertainties

Pathways for success

- **Improving current ethanol production practices...**
Ethanol facilities are utilizing biomass in place of natural gas or coal for their heat input when producing ethanol.
- **Utilizing next generation feedstock...**
Algae and waste products are being evaluated by the biodiesel industry. Wood-to-ethanol facilities are planned in northern Minnesota, while researchers study the use of prairie grasses from southern Minnesota.
- **Advancing refinery technology...**
Oil refineries are beginning to lower emissions by limiting flaring, recycling waste streams and using renewable feedstocks.
- **Advancing CNG, electricity, and other fuels...**
Compressed natural gas is already used in industrial and residential settings and fuels 14% of US public transit vehicles. Multiple electric and plug-in hybrid vehicles will be available by 2010.

MN Transportation Fuel Use: 2007



Source: MN Dept. of Revenue Petroleum Tax Division 2007 and standard blending estimates

By focusing on the life cycle of a fuel, a Low Carbon Fuels Policy can distinguish between similar fuels produced by different means. This analysis captures the effects on the climate and environment that would otherwise be unaccounted for.

Currently, alternative fuels make up less than 8% of Minnesota's transportation fuel mix.

A Low Carbon Fuels Policy can help promote innovation, improve the availability of energy sources, and strengthen Minnesota's leadership in the development of clean energy industries.