

# Why Compressed Natural Gas (CNG)?

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## 1 It will cut greenhouse gas emissions.

Natural gas as a vehicle fuel emits between 20-30% less CO<sub>2</sub> than diesel.

It also reduces other emissions substantially:

- ❖ 75% less Carbon Monoxide (CO)
- ❖ 50% less Nitrogen Oxide (NO<sub>x</sub>)
- ❖ 95% less Particulate Matter (PM)
- ❖ 55% less Volatile Organic Compounds (VOCs)

The County's first round of vehicles are estimated to reduce CO<sub>2</sub> emissions by 169 tons per year, which is just the start because it only for County-owned vehicles. In time, other fleets will convert and CO<sub>2</sub> reductions will further increase.

## 2 It makes financial sense.

CNG average retail price in the US is \$2.09/gallon, gasoline equivalent. Fleets with long-term contracts can save 20-30 cents off of retail.

Gas is cheap right now. But as we all know, gas prices are volatile and CNG prices are very steady. CNG prices averaged \$2.09/gallon in the US in 2013, and the price has only changed by a few cents in the past three years. Even if natural gas prices rise 30%, CNG at the pump will only change a few cents. This is because the cost of natural gas is only about 20% of the cost of a gasoline gallon equivalent of CNG, whereas the cost of gasoline or diesel is 80% the cost of the crude oil.

## 3 What about electric vehicles?

Electric passenger cars are getting better and less expensive every year, Tesla is leading the way with vehicles that can go up to 270 miles on a charge. With competition in the market and electric cars starting to be cool (there's even an electric Corvette now!), should we just wait and go to electric?

Unfortunately, when it comes to light trucks and heavy trucks and equipment there is no real electric alternative and it is not likely to happen soon. There are some electric hybrid heavy trucks in development, but they have very narrow use because of the power limitations. There are electric buses in production, but they have limited range; the longest range buses offered now would only make two trips on the RTA route before needing to recharge for several hours.

## 4 It is a first step.

CNG is methane compressed to a high pressure in order to get enough on board a vehicle for a range similar to gasoline or diesel. There are many sources of methane, most of what we use is derived from drilling. However, there are other sources of methane that can be harvested for fuel. For example, in Grand Junction, Colorado the city captures methane from their wastewater treatment plant and pipes it to a CNG station. In this way, they not only have reduced the greenhouse gas emissions from their vehicles by using CNG, but they are also utilizing a methane that otherwise would be released into the atmosphere or flared off (burned). Gas from sources like this are referred to as RNG (renewable natural gas). RNG is a very good alternative fuel because is not only burns cleaner than other sources, it also represents a greenhouse gas (methane) that otherwise would escape into the atmosphere. Methane is 30 times more potent a greenhouse gas than CO<sub>2</sub> for the first 20 years, so using methane that otherwise would be released into the atmosphere can have a positive effect on the environment.

## 5 Renewable sources of natural gas.

Other potential sources of methane capture include:

- ❖ Landfills; many landfills emit methane as buried waste breaks down, some more than others.
- ❖ Livestock waste; animal manure is collected and delivered to an anaerobic digester.
- ❖ Bio-digesters; anything organic can be digested utilizing anaerobic digesting including: food waste, grasses, wood chips (beetle kill and other forest clean-up), and crops grown specifically for fuel.
- ❖ Gasification: organic matter can be converted to methane quickly utilizing high temperatures and pressure.

Many of these sources are already releasing methane into the environment naturally. We would be trying to speed that process and utilize it as fuel before the waste products get emitted.

All of these potential renewable sources of natural gas would be job creators in our local economies. They would create both high-skill jobs and low-skill jobs from biologists and engineers to ranchers, farmers, loggers, and equipment operators.

CNG is not a perfect fuel. It is still a fossil fuel, but it is a step in the right direction. Even if we could get electric vehicles that met our needs for light and heavy trucks, the electricity would still be generated by either a coal or a natural gas power plant with supplementary power possibly coming from wind or solar. The fact is, we are decades from wind and solar becoming a major source of electricity. CNG vehicles reduce emissions now and set up our fleets to potentially use some sort of renewable natural gas. If we have a market for RNG, then developing a source can be a next step.

## 6 Vehicles.

CNG burns similar to gasoline. Engines undergo minor changes in order to deliver the fuel and deal with different combustion, but overall the engines are very similar to gasoline engines.

A CNG light truck costs more than a gas truck, about the same as the difference between gas and diesel trucks. CNG heavy trucks cost more. However, because of the high fuel use of heavy trucks and equipment, the extra cost can be offset faster in fuel-cost savings especially in trucks that operate a lot of miles of stop-and-go like trash trucks and dump trucks.

CNG light- and heavy-duty engines are much simpler than modern diesel engines.

Ford, Chevy, and Dodge all offer CNG trucks. Cummins makes several heavy-duty CNG engines that can be specified in heavy trucks and equipment. Nearly 50% of new trash trucks are being manufactured for CNG use.

*Methane Leakage:*

*There are reports and studies indicating that natural gas is actually worse for the environment than diesel as a fuel. These reports cite methane leaks from wells, pipelines, stations, and vehicles and concludes that because methane is so much more powerful a greenhouse gas than CO<sub>2</sub> that the leaks offset any gains versus diesel. What these studies don't account for though, is that many of the natural gas producing wells are also oil wells, they produce natural gas as well as crude oil, and so eliminating the methane is not possible. Wells that are solely developed for natural gas extraction would happen whether or not natural gas as a vehicle fuel is adopted widely because the use of natural gas for heating and electric production will always far outweigh vehicle use. Also, the pipeline infrastructure to deliver natural gas is already in place, and we use it to heat our homes and cook our food. So the comparison is not complete; the wells and the infrastructure will exist whether we utilize methane as a vehicle fuel or only in our homes, and using it as a vehicle fuel nets no further significant well or infrastructure impact. Further, the EPA estimates leakage in the systems from the well, to the pipeline, to use in your home or vehicle is around 2.4%. Methane leakage is being regulated more stringently, which will hopefully reduce leakage.*