

Is it Only Natural? Using Natural Gas as a Vehicle Fuel Source

While natural gas prices remain well below the price of gasoline, it begs the question, why aren't more vehicles run off of natural gas?

There are currently two options in using natural gas as fuel, compressed natural gas (CNG) and liquefied natural gas (LNG). Each comes with their own challenges. CNG must be stored between 3000 and 5000 psig while LNG must be kept below -159°C.¹ These challenges have not stopped fueling stations from being constructed, but that, and the lack of demand, are the reasons there aren't a vast abundance of them.

Canada currently has approximately 80 public CNG refuelling stations, 11 of which are located in Alberta. There are currently only two LNG refuelling stations in Canada, both of which are private but this is expected to change as more heavy trucks are being converted to LNG. LNG also has the added difficulty of needing special training to dispense the fuel safely, gloves and face shields must be worn.²

So yes, the lack of fueling stations may be an issue but if you happen to live near one of these stations is it worth it for you to switch over? Or better yet, why rely on a public fuel station?

It seems pretty straight forward, the majority of Canadians have a natural gas line straight to their home. You park your car at your home. Ergo, install a compressor and never worry about those pesky but tempting, "buy seven hot dogs and get a free coffee," deals again. Unfortunately, installing a pressurized CNG tank in your home is unsafe and illegal.³ That's ok, you still have an option, cut the tank out of the system and you're good to go... if you have up to 16 hours on your hands.

Sarcasm aside, this is a viable option if you're willing to spend the money on a higher end compressor, around \$15,000,⁴ the fill time reduces to around 7-8 hours. This is designed with the idea that you plug it in when you get home in the evening and the car is filled and ready to go the next morning, with an automatic cut-off to boot.

Now the matter of actually switching your vehicle over.

Essentially all you need is a new fuel tank, regulator and some re-programming of the fuel injectors and you're ready to go.⁵ Natural gas has only 25% of the potential energy of gasoline,¹ therefore, a larger tank is required to travel a reasonable distance. This will cut into your trunk space, back seat or truck bed. There are a variety of companies available that will complete this conversion for you but it can run from \$8,000 - \$14,000. There are no current requirements that must be met for aftermarket conversions so do your homework on who you are using to get this done. There is also the bi-fuel option that allows your vehicle to run on either its original fuel or CNG. Currently, FortisBC offers an incentive program to switch to CNG but the national program ended in 2006.

There are many benefits to switching to CNG, besides the obvious fuel cost savings. Natural gas is safer than both gasoline and propane as it is lighter than air it dissipates if a leak occurs. It offers 20% lower carbon emissions and a 25% reduction in greenhouse gases⁵ and is easier on your engine, there is also no power loss when switching to natural gas due to its higher octane rating.⁶ The initial cash sink is the de-motivating factor for most. The conversion could cost \$7,500 - \$10,000 which means a savings on gas would not be seen for 6 – 10 years,^{7,8,9} depending on your type of vehicle and the amount you drive.

As with any “new” technology (CNG really isn’t new but only seems to have garnered North American attention in recent years,) as demand increases the costs will decrease. In the end, it really depends on your motivating factor behind switching over to determine if it makes sense for you.

References

- 1) Schmidt, L. Politylo J., Pinto S., (2005 November). *Natural Gas Vehicles in Alberta*. Retrieved from <http://www.transportation.alberta.ca/Content/docType57/Production/NGVBrief.pdf>
- 2) Canadian Natural Gas Vehicle Alliance. *Natural Gas Refuelling Stations*. Retrieved from <http://www.cngva.org/en/home/vehicles-stations/natural-gas-refuelling-stations.aspx>
- 3) Alberta Boilers Safety Association. *What Are the Codes and Standards Adopted Under the Act for Pressure Equipment Safety?* Retrieved from <http://www.absa.ca/faq/CodesAndStandardsWhat.aspx>
- 4) CNG United. *H5 2.2 GGE CNG Refueling Compressor*. Retrieved from <http://store.cngunited.com/h5-2-2-gge-cng-refueling-compressor/>
- 5) Wojdyla, B. (2012, February 10). *Should You Convert Your Car to Natural Gas?* Retrieved from <http://www.popularmechanics.com/cars/how-to/maintenance/should-you-convert-your-car-to-natural-gas>
- 6) CNG California. *CNG Frequently Asked Questions*. Retrieved from <http://www.cngcalifornia.com/cng-faqs.asp>
- 7) US Department of Energy (2015, January 27). *Model Year 2013 Fuel Economy Guide*. Retrieved from <http://www.fueleconomy.gov/feg/pdfs/guides/FEG2013.pdf>
- 8) Natural Resources Canada (2012, January 11). *2009 Canadian Vehicle Survey Summary Report*. Retrieved from <http://oee.nrcan.gc.ca/publications/statistics/cvs09/chapter2.cfm?attr=0>
- 9) Average car (used Mazda 3) is 27 mpg which equals 11.5 km/L. Using 16,000 km as an average equals 1391 L/year. At \$1.15/L for gas equals \$1600/yr. At \$0.33/L for natural gas equals \$460/yr. Savings per year equals \$1140.
- 10) Vaughan, M. (2013, August 29). *Will natural gas work for your car?* Retrieved from <http://www.theglobeandmail.com/globe-drive/culture/technology/will-natural-gas-work-for-your-car/article13999009/>