

Advantages of CNG

Economics

Environment

Security

1. I DO support the need for alternative fuel taxes and the revenue it generates
 - a. Not here to criticize or point out blame
 - b. We need to work together on an opportunity that may never present itself again
 - c. Import cost, \$\$, national security, environment, supporting our enemies
2. Illustrate the inconsistencies, ambiguities, shortcomings and errors in the current method of calculating alternative fuel tax:
 - a. Misconception #1 Pa tax is .079 per gallon / it is really .315 per gallon
 - b. Definition of a gallon
 - c. Btu's in a gge
 - d. Current law and definition
 - e. CNG dispensers calculate a GGE based on 5.660 #lbs of weight / no conversion factors needed
 - f. Examples Cited:
 - i. PA Portal / tax rates 2012 -2005 Reference A
 - ii. How Natural Gas is Measured (NAT. Conf. Weights / Measures) Reference B
 - iii. DMF 101 2012 Alt Fuel Tax report Reference C
 - iv. Iowa State University ag-extension Reference D
 - v. GGE – definitions Wikipedia Reference E
 - vi. Motor Fuel Tax Bulletin 2012-01 4-19-12 Reference F
 - vii. International Fuel Tax Agreement (IFTA) Reference G
 - viii. Research online 23 states Alt Fuel Tax, 23 less than Pa (significantly) 18 of those have flat tax exemptions or special incentives
 - ix. IRS 720 excise tax form illustrates favorable rates for cng vs liquid fuels
3. Attempt to provide a framework that levels the playing field for alternative fuel producers, eliminating the unfair advantage foreign oil has under the current system, while maintaining the revenue stream needed to support current infrastructure.
 - a. .315 pa and .183 fed = .494 per gallon
 - b. With \$4.00 per gal diesel fuel .494 is 12.3% tax on a gallon
 - c. With \$2.00 per gal CNG fuel .494 is 24.7% tax on a gallon 2:1 disadvantage over foreign oil

- d. Need to develop clean resources under PA , not promote use of foreign oil.
 - e. Need to promote an “alternative tax” for an “ alternative fuel” not 1 size fits all
 - i. Less damaging to environment
 - ii. Less potential mitigation
 - iii. Less proportional revenue needs diverted for nonexistent clean-up
 - iv. Should be helping to foster growth / not suppress it
 - f. Cost based similar to sales tax
 - g. Flat tax similar to other states
 - h. Incentives and exemptions for cleaner technology
 - i. Don’t want to see producers forced into raising prices to compensate
4. Promote a “Green Revolution” ,locally, regionally and eventually nationally . Bring Jobs, revenue and security to the “Rust Belt” and enhance National Security
- a. We have constructed numerous private fleet stations
 - b. 3 public stations
 - c. 4th to open soon
 - d. Contract negotiations for 17 more
 - e. Investment opportunities for 30 more
 - f. Other states attracting growth vs. Pa
 - g. World Oil vs. North American GAS
 - h. I have “skin in the game”
 - i. Can’t rush to profit , have to be fair
 - j. This is an opportunity that can be shared by all, consumers, retailers, producers, government, environment, and the economic benefit of all. There are no losers if it is done right.
 - k. If greed becomes the motive in any link of the chain , it will not succeed.
 - l. Recently I was examined by Pa Motor Fuels and found to be in compliance, for which I am thankful, some of my colleagues in the CNG industry were not so lucky.
 - m. however it brought to light the need to examine not only our practices, but not to assume anyone else is correct just by virtue of it being written on a piece of paper or published in a regulation.
 - n. Focus needs to be on support of a fledgling industry
 - o. Developing new procedures that streamline a process to be fair and balanced
 - p. Enforcement of regulation on “under the radar operations”



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Alternative Fuels Tax Rates

2012 Alternative Fuels Tax Rates	
CNG	\$0.079/gallon
Propane/LPG	\$0.228/gallon
Ethanol	\$0.208/gallon
Methanol	\$0.154/gallon
E-85	\$0.219/gallon
M-85	\$0.178/gallon
LNG	\$0.182/gallon
Electricity	\$0.0093 KWH

2011 Alternative Fuels Tax Rates	
CNG	\$0.079/gallon
Propane/LPG	\$0.228/gallon
Ethanol	\$0.208/gallon
Methanol	\$0.154/gallon
E-85	\$0.219/gallon
M-85	\$0.178/gallon
LNG	\$0.182/gallon
Electricity	\$0.0093 KWH

2010 Alternative Fuels Tax Rates	
CNG	\$0.079/gallon
Propane/LPG	\$0.228/gallon
Ethanol	\$0.208/gallon
Methanol	\$0.154/gallon
E-85	\$0.219/gallon
M-85	\$0.178/gallon
LNG	\$0.178/gallon
Electricity	\$0.0093 KWH

2006-2009 Alternative Fuels Tax Rates	
CNG	\$0.079/gallon
Propane/LPG	\$0.228/gallon
Ethanol	\$0.208/gallon

(B)

How Natural Gas is Measured

Natural Gas is usually measured by volume and is stated in cubic feet. A cubic foot of gas is the amount of gas needed to fill a volume of one cubic foot under set conditions of pressure and temperature. To measure larger amounts of natural gas, a "therm" is used to denote 100 cubic feet, and "mcf" is used to denote 1,000 cubic feet.

To provide greater accuracy in comparing fuels, energy content is measured in terms of "British Thermal Units (BTU's)." A BTU is the amount of heat required to raise one pound of water (approximately a pint), one degree Fahrenheit at or close to its point of maximum density.

The energy content of natural gas differs in various locations throughout the country. For the sake of comparison, one average cubic foot of natural gas about 1,000 BTU's of heat energy. The chart below shows how much heat energy is released in various quantities of natural gas.

HEAT ENERGY PER UNIT OF MEASURE FOR NATURAL GAS

UNIT OF MEASURE	APPROX. HEAT ENERGY
1 cubic foot	1,000 BTU's
100 cubic feet (1 therm)	100,000 BTU's
1,000 cubic feet (1 mcf)	1,000,000 BTU's

How Natural Gas is Sold as Transportation Fuel

Compressed Natural Gas or CNG is sold at the retail level either by mass, energy units or "gasoline gallon equivalents" or gge. The National Conference of Weights & Measurements (NCWM) has developed a standard unit of measurement for compressed natural gas. The standard is defined in the *NIST Handbook 44* Appendix D as follows:

"gasoline gallon equivalent (GGE). gasoline gallon equivalent (GGE) means 5.660 pounds of natural gas."

The chart below shows how much heat energy is released in various quantities of natural gas.

Mass	In terms of kilograms or pounds
Energy Units	Sold in therms, with one therm equaling 100,000 BTU's
Gasoline Gallon Equivalents	Calculated by the NCWM using either mass or energy content
Mass	1 gge = 5.660 lb. natural gas
Energy Content	1 gge = 114,118.8 BTU's = 1.14 Therms

Due to variance of temperature and pressure, a therm in your area may vary from standard. To find out the BTU's per pound, divide your therm into 100,000 BTU's (100 cubic feet or 1 standard therm).

To find the number of BTU's per GGE, multiply the result by 5.66 (1 standard GGE).

For example, if the therm of your area is 4.96 lbs, divide that number into 100,000 and you have the resulting BTU's per lb. of 20,161.29.

To find the BTU's per GGE, multiple that resulting number (20,161.29) by 5.66 (a standard GGE) and you have 114,112.9 BTU's per GGE.



pennsylvania
DEPARTMENT OF REVENUE

BUREAU OF MOTOR FUEL TAXES
PO BOX 280646
HARRISBURG PA 17128-0646

(C)

2012 ALTERNATIVE FUELS TAX REPORT

TAX ID NUMBER (FEIN):

TAX PERIOD:

DUE DATE:

Use this form to calculate and pay liquid fuels and fuels tax on alternative fuels placed into fuel supply tanks of alternative fuel vehicles in Pennsylvania for use on public highways.

SEE REVERSE FOR INSTRUCTIONS

ALTERNATIVE FUEL	VOLUME			TAX RATE		TAX DUE
CNG (gal)		gals	X	0.079 gal	=	
PROPANE/LPG (gal)		gals	X	0.228 gal	=	
ETHANOL (gal)		gals	X	0.208 gal	=	
METHANOL (gal)		gals	X	0.154 gal	=	
E-85 (gal)		gals	X	0.219 gal	=	
M-85 (gal)		gals	X	0.178 gal	=	
LNG (gal)		gals	X	0.182 gal	=	
ELECTRICITY (kWh)		kWh	X	0.0093 kWh	=	
OTHER			X		=	

Amount Due: _____

Less Discount: _____

Total Due: _____

Make check payable to PA Dept. of Revenue.

I certify the information provided on this form has been examined by me and is, to the best of my knowledge, true and correct.

Print Name	Title	Date
Signature		Telephone Number

Mail this alternative fuels tax report and remittance to the address at the top of this form. To avoid penalty and interest, file by the due date shown.

THIS FORM MAY BE REPRODUCED AS NEEDED



Natural Gas and Coal Measurements and Conversions

Natural gas measurements and conversions

- * 1 cubic foot natural gas (NG) – wet = 1,109 Btu
- * 1 cubic foot – dry = 1,027 Btu
- * 1 cubic foot – dry = 1,087 kilojoules
- * 1 cubic foot – compressed = 960 Btu
- * 1 pound = 20,551 Btu
- * 1 gallon – liquid = 90,800 Btu – HHV *
- * 1 gallon – liquid = 87,600 Btu – LHV *
- * 1 million cubic feet = 1,027 million Btu
- * 1 metric ton liquefied natural gas (LNG) = 48,700 cubic feet of natural gas
- * 1 billion cubic meters NG = 35.3 billion cubic feet NG
- * 1 billion cubic meters NG = .90 million metric tons oil equivalent
- * 1 billion cubic meters NG = .73 million metric tons LNG
- * 1 billion cubic meters NG = 36 trillion Btus
- * 1 billion cubic meters NG = 6.29 million barrels of oil equivalent
- * 1 billion cubic feet NG = .028 billion cubic meters NG
- * 1 billion cubic feet NG = .026 million metric tons oil equivalent
- * 1 billion cubic feet NG = .021 million metric LNG
- * 1 billion cubic feet NG = 1.03 trillion Btus
- * 1 billion cubic feet NG = .18 million barrels oil equivalent
- * 1 million metric tons LNG = 1.38 billion cubic meters NG
- * 1 million metric tons LNG = 48.7 billion cubic feet NG
- * 1 million metric tons LNG = 1.23 million metric tons oil equivalent
- * 1 million metric tons LNG = 52 trillion Btus
- * 1 million metric tons LNG = 8.68 million barrels oil equivalent

- 1 million metric tons oil equivalent = 1.111 billion cubic meters NG
- 1 million metric tons oil equivalent = 39.2 billion cubic feet NG
- 1 million metric tons oil equivalent = .805 million tons LNG
- 1 million metric tons oil equivalent = 40.4 trillion Btus
- 1 million metric tons oil equivalent = 7.33 million barrels oil equivalent
- 1 million barrels oil equivalent = .16 billion cubic meters NG
- 1 million barrels oil equivalent = 5.61 billion cubic feet NG
- 1 million barrels oil equivalent = .14 million tons oil equivalent
- 1 million barrels oil equivalent = .12 million metric tons of LNG
- 1 million barrels oil equivalent = 5.8 trillion Btus
- 1 trillion Btus = .028 billion cubic meters NG
- 1 trillion Btus = .98 billion cubic feet NG
- 1 trillion Btus = .025 million metric tons oil equivalent
- 1 trillion Btus = .2 million metric tons LNG
- 1 trillion Btus = .17 million barrels oil equivalent
- 1 short ton = 53,682.56 cubic feet
- 1 long ton = 60,124.467 cubic feet
- 1 cubic foot = .028317 cubic meters
- 1 cubic meter – dry = 36,409 Btu
- 1 cubic meter – dry = 38,140 megajoules
- 1 cubic meter = 35.314 cubic feet
- 1 pound = 10,377 Btu
- 1 pound of coal = 10,948 megajoules
- 1 short ton (2,000 lbs.) of coal = 20,754,000 Btu
- 1 short ton = 21,897 megajoules
- 1 short ton = .907 metric tons
- 1 metric ton = 22,877,388 Btu
- 1 metric ton = 24,137 megajoules

Coal measurements and conversions

- 1 pound = 10,377 Btu
- 1 pound of coal = 10,948 megajoules
- 1 short ton (2,000 lbs.) of coal = 20,754,000 Btu
- 1 short ton = 21,897 megajoules
- 1 short ton = .907 metric tons
- 1 metric ton = 22,877,388 Btu
- 1 metric ton = 24,137 megajoules

Fuel - Liquid, US Gallons	GGE	GGE %	BTU/Gal	kWh/Gal
Gasoline (base)^[2]	1.0000	100.00%	114,000	33.41
Gasoline (conventional, summer) ^[2]	0.9960	100.40%	114,500	33.56
Gasoline (conventional, winter) ^[2]	1.0130	98.72%	112,500	32.97
Gasoline (reformulated gasoline, ethanol) ^[2]	1.0190	98.14%	111,836	32.78
Gasoline (reformulated gasoline, ETBE) ^[2]	1.0190	98.14%	111,811	32.77
Gasoline (reformulated gasoline, MTBE) ^[2]	1.0200	98.04%	111,745	32.75
Gasoline (10% MBTE) ^[3]	1.0200	98.04%	112,000	32.83
Gasoline (regular unleaded) ^[4]	1.0000	100.00%	114,100	33.44
Diesel #2 ^[4]	0.8800	113.64%	129,500	37.95
Biodiesel (B100) ^[4]	0.9600	104.17%	118,300	34.80
Bio Diesel (B20) ^[4]	0.9000	111.11%	127,250	37.12
Liquid natural gas (LNG) ^[4]	1.5362	65.10%	75,000	21.75
Liquefied petroleum gas (propane) (LPG) ^[4]	1.3500	74.04%	84,300	24.75
Methanol fuel (M100) ^[4]	2.0100	49.75%	56,800	16.62
Ethanol fuel (E100) ^[4]	1.5000	66.67%	76,100	22.27
Ethanol (E85) ^[4]	1.3900	71.94%	81,800	24.04
Jet fuel (naphtha) ^[5]	0.9700	103.09%	118,700	34.44
Jet fuel (kerosene) ^[5]	0.9000	111.11%	128,100	37.12

GGE calculated on Non-Liquid Fuels

Fuel - Non Liquid	GGE	GGE %	BTU/unit	kWh/unit
Gasoline (base)^[2]	1.0000	100.00%	114,000 BTU/gal	33.41
Compressed natural gas (CNG) ^[4]	126.67 cu ft (3.587 m ³)		900 BTU/cu ft	
Hydrogen at 101.325 kPa	357.37 cu ft		319 BTU/cu ft ^[6]	
Hydrogen by weight	0.997 kg (2.198 lb) ^[7]		119.9 MJ/kg (51,500 BTU/lb) ^[8]	
Nitromethane	~2.3	41.23%	~47,000 BTU/gal	
Electricity	33.40 kilowatt-hours		3,413 BTU/(kW·h) ^{[9][10]}	33.40

Electricity Costs for 1 GGE



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MOTOR FUEL TAX BULLETIN 2012-01

Issued: April 19, 2012

RESPONSIBILITY FOR COLLECTION AND PAYMENT OF ALTERNATIVE FUELS TAX

This bulletin reminds all persons who are, or plan to be, engaged in the sale and/or use of alternative fuels in Pennsylvania of the licensing, tax, and reporting responsibilities related to alternative fuels.

I. HOW DOES PENNSYLVANIA DEFINE ALTERNATIVE FUELS?

Pennsylvania defines "alternative fuels" as including: natural gas, compressed natural gas (CNG), liquefied natural gas (LNG), liquid propane gas and liquefied petroleum gas (LPG), alcohols, gasoline alcohol mixtures containing at least 85% alcohol by volume, hydrogen, hythane, electricity, and any other fuel used to propel motor vehicles on the public highways which is not taxable as fuels or liquid fuels under Title 75. For taxation, each alternative fuel is converted to a gasoline gallon equivalent, and the tax rate applied to the gasoline gallon equivalent equals the current gas tax. Note that biodiesel is not an alternative fuel. Under Pennsylvania law, biodiesel is considered the same as petroleum-based diesel for purposes of taxation.

II. WHO IS RESPONSIBLE FOR REPORTING AND PAYING THE ALTERNATIVE FUELS TAX?

The point of taxation is at the retail or end-user level for alternative fuels. This is due to the fact that most alternative fuels have many uses other than as a fuel for propelling a vehicle on the public highways; therefore, until they are placed into a vehicle they do not qualify as an alternative fuel.

The Pennsylvania Vehicle Code, Title 75, defines an alternative fuel "dealer-user" as "any person who delivers or places alternative fuels into the fuel supply tank or other device of a vehicle for use on the public highways."

Alternative fuels are taxed at the rate of the Commonwealth's Liquid Fuels and Fuels Tax, plus the Oil Company Franchise Tax using a gasoline gallon equivalent calculation using a BTU conversion factor for each alternative fuel. The Department publishes revised tax rates each December for the following calendar year.

For 2012, the tax rates for alternative fuels are as follows:

Alternative Fuel	Rate of Conversion (BTU/gal of alternative fuel)	Amount Equivalent to One Gallon of Gasoline @ 114,500 BTU per gallon	Tax Rate per Gallon of Alternative Fuel
Ethanol	76,400	1.499	\$0.208
Methanol	56,560	2.024	\$0.154
Propane/LPG	83,500	1.371	\$0.228
E-85	80,460	1.423	\$0.219
M-85	65,350	1.752	\$0.178
Compressed Natural Gas (CNG)	29,000 @ 3,000 PSI	3.948	\$0.079
Liquefied Natural Gas (LNG)	66,640	1.718	\$0.182
Electricity	3,412 BTU / KWH	33.558 KWH	0.0093 / KWH

Examples (CNG)

- (1) The driver of a passenger vehicle refuels the vehicle at a retail CNG pump. The retailer (e.g., owner of the pump) collects from the driver the alternative fuels tax of \$0.079 per "liquid gallon"¹ of CNG delivered to the passenger vehicle's fuel supply tank. The retailer must report and pay this tax to the commonwealth. The retailer must hold a PA alternative fuels license.
- (2) A trucking company owns a fleet of CNG-powered vehicles. The company purchases CNG from a major gas pipeline and stores the gas in bulk storage tanks. As needed, trucks fill their CNG supply tanks from the CNG bulk tank. The trucking company, because it is placing an alternative fuel in to the supply tank of a vehicle for use on the highways, becomes an alternative fuel dealer-user. Accordingly, the trucking company must hold an alternative fuels license and report and pay the \$0.079 alternative fuels tax for each "liquid gallon" of CNG placed into its vehicles.

¹ **Conversion factors** - To convert CNG into liquid gallon equivalents, use the following formulas: (1) **CNG in standard cubic feet (scf.)**: Multiply CNG (scf.) units by 0.0314 to convert to liquid gallons; (2) **CNG in pounds (lbs.)**: Multiply CNG (lbs.) units by 0.7087 to convert to liquid gallons. Once the equivalent gallonage is determined, that amount is multiplied by the \$0.079 rate per gallon for CNG to determine the total tax amount.

INSTRUCTIONS FOR COMPLETING THE ALTERNATIVE FUELS TAX REPORT

F

Pursuant to Chapter 90 of the Pennsylvania Vehicle Code, the Liquid Fuels and Fuels Tax Act requires an alternative fuel dealer-user to pay tax on alternative fuels whenever such fuels are placed into the supply tank of an alternative fuel vehicle in Pennsylvania for use on public highways. Alternative fuels are taxed on a gallon-equivalent basis. Applicable definitions include the following.

Alternative fuel. Natural gas, compressed natural gas (CNG), liquified natural gas (LNG), liquid propane gas and liquified petroleum gas (LPG), alcohols, gasoline-alcohol mixtures containing at least 85 percent alcohol by volume, hydrogen, hythane, electricity and any other fuel used to propel motor vehicles on the public highways which is not taxable as fuels or liquid fuels under Chapter 90.

Alternative fuel dealer-user. Anyone who delivers or places alternative fuel into the fuel supply tank of an alternative fuel vehicle in Pennsylvania for use on public highways.

Gallon-equivalent basis. The amount of any alternative fuel containing 114,500 BTUs as determined by the department. Such fuel shall be taxed at the rate of the commonwealth's liquid fuels and fuels tax and the oil company franchise tax. The tax is imposed on an adjusted rate basis using a BTU conversion.

Conversion factors – To convert CNG into liquid gallon equivalents, use the formulas below.

* **CNG in standard cubic feet (scf):**
Multiply CNG (scf) units by 0.0314 to convert to liquid gallons.

* **CNG in pounds (lbs):**
Multiply CNG (lbs) units by 0.7087 to convert to liquid gallons.

To determine tax due for all fuels except electricity, multiply the liquid gallons by the appropriate tax rate. For electricity, multiply kilowatt hours used by \$0.0093. If the report and payment are submitted by the due date, a discount, calculated as follows, may be applied:

2 percent	on amount due up to \$50,000;
1.5 percent	on amount due of \$50,000.01 to \$75,000;
1 percent	on amount due of \$75,000.01 to \$100,000; or
0.5 percent	on amount due in excess of \$100,000.

To prepay tax on an alternative fuel, provide a letter stating the alternative fuel(s) on which estimated tax is calculated and the period for which the tax is prepaid (quarterly, semiannually or annually). For those prepaying on an annual basis, the period should be a calendar year. To determine the tax due for all alternative fuels except electricity, multiply the estimated liquid gallons by the appropriate tax rate to arrive at the estimated tax. If tax is estimated on a fuel not shown on the front of this form, provide a letter indicating the fuel type, the BTU content of the alternative fuel and other data as necessary to support the estimated tax reported. Complete the line for "OTHER."

For electric powered vehicles, estimate total annual miles and divide by the manufacturer's suggested or actual (if known) kilowatt/mile usage factor to arrive at estimated kilowatt/hours. Multiply the estimated kilowatt hours by the tax rate to determine the estimated tax. Forward the return and payment as otherwise instructed.

Sign, date and mail the report to the PA DEPARTMENT OF REVENUE, BUREAU OF MOTOR FUEL TAXES, PO BOX 280646, HARRISBURG, PA 17128-0646.

The Alternative Fuels Tax Report (DMF-84, DMF-89, DMF-91, DMF-94, DMF-100 or DMF-101) may be reproduced and used for subsequent reporting. Please feel free to copy this form.

In January, the department will mail a one-year supply of alternative fuels tax reports to each alternative fuel dealer user.

Questions regarding this form or the taxation of alternative fuels should be directed to the address above or 717-783-9355.