



THE U.S. AUTOGAS MARKET

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About Autogas for America

VISION

Autogas for America is driving immediate change in the fuel choices of America's public and private vehicle fleets – transitioning from gasoline to clean, economical, domestically produced Autogas. Autogas for America is committed to cleaning up America's air and water.

MISSION

Autogas for America will help eliminate thousands of tons of harmful vehicle emissions and reduce America's dependence on imported petroleum by more than doubling the number of Autogas vehicles in the U.S. within three years – from 200,000 today to 500,000 by mid-2013.

PLATFORM

Foster a sustainable Autogas market in the U.S. by centralizing the national Autogas conversation – Autogas for America is the unified voice of the U.S. Autogas market.

Comprised of Autogas experts, transportation industry specialists and environmental advocates, Autogas for America will leverage industry cooperation to widen recognition of Autogas among the U.S. public, media and government.

WHY AUTOGAS?

- **Environmentally Friendly** - Autogas is a clean-burning alternative fuel that produces substantially lower harmful emissions than gasoline
 - **Economical** - Autogas is significantly less expensive than gasoline or diesel
 - **Energy Independence** - Approximately 90% of Autogas is produced right here in the U.S., reducing our nation's dependence on foreign oil
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LEGISLATIVE PRIORITIES

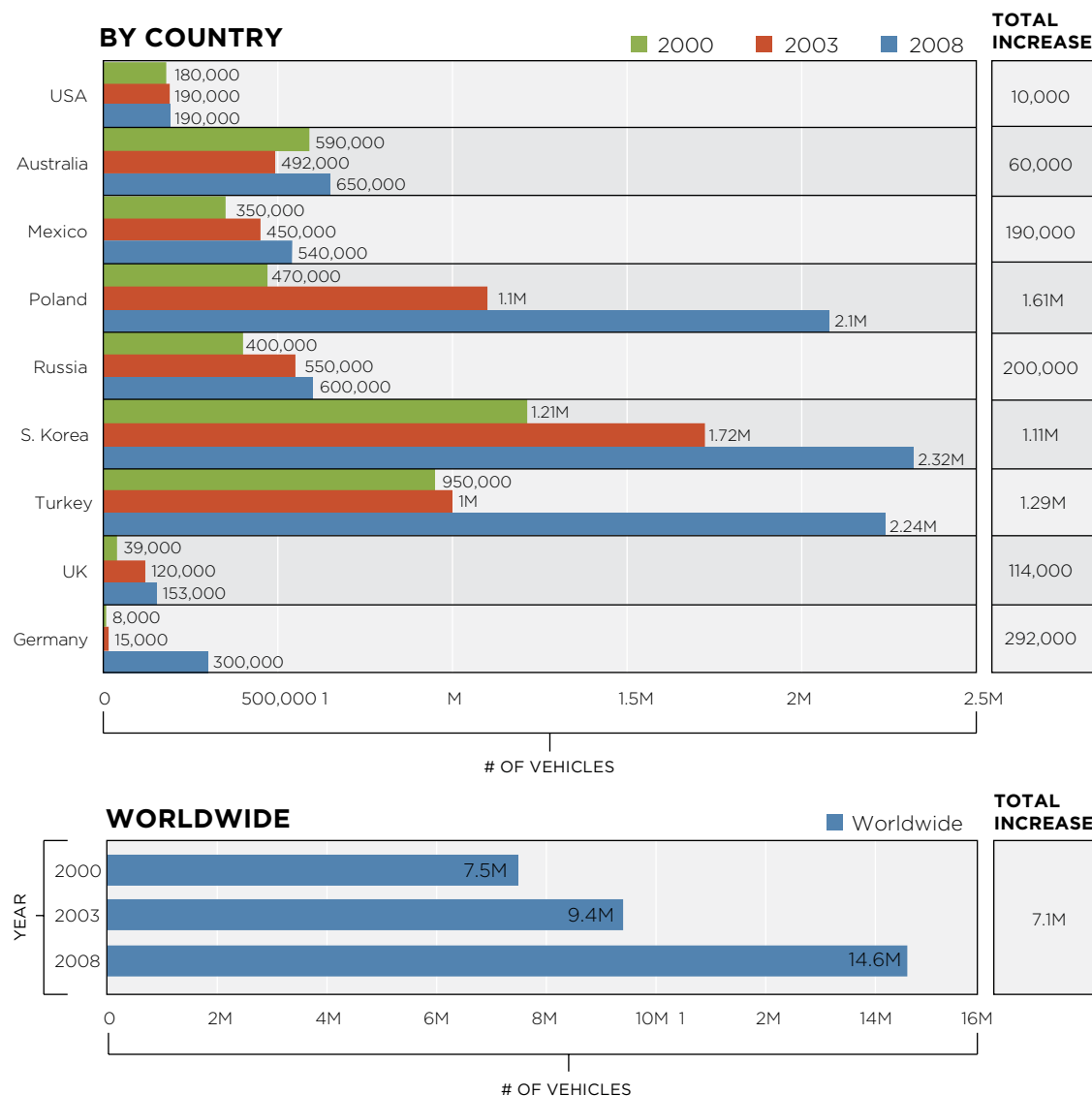
- Secure longer-term incentives so fleets and governmental entities recognize Autogas as a viable vehicle fuel and are confident about making the switch to Autogas
- Streamline the EPA certification process for aftermarket Autogas systems in order to remove barriers to owning and operating bi-fuel vehicles
- Ensure the inclusion of Autogas in all federal natural gas incentives

U.S. vs. Worldwide Autogas Vehicles

KEY STATISTICS

Autogas has proven to be a cleaner, safer and cheaper fuel than gasoline or diesel. Numerous countries have been leading the way in advancing Autogas-powered vehicles – the United States is not among them. According to studies released in 2005 and 2009 by the World Liquid Petroleum Gas Association (WLPGA), the global Autogas industry authority, the U.S. Autogas market has remained largely unchanged over the last decade. In contrast, most countries saw a substantial increase in Autogas vehicles, even those that had little to no Autogas vehicle market in 2000.¹

The rise in Autogas-powered vehicles is a global phenomenon, increasing by millions over the last decade. Its environmentally friendly characteristics, coupled with our nation's need for energy independence and stability, make Autogas an essential component of sustainable transportation in the U.S.



¹ World Liquid Petroleum Gas Association, Key Autogas Data, <http://www.worldlpgas.com/gain/key-autogas-data/>

Propane Autogas Supply & Demand Analysis

As the Autogas market develops, can propane supply keep up with demand? Forecasting the supply of this fuel requires a close look at three core issues:

1. Current propane supply and demand
2. The future impact of new consumer propane demand
3. Future U.S. propane production capabilities

Propane supply has increased in recent years, and current supply is greater than demand. The U.S. was a net exporter of propane in 2009. Total demand for consumer grade propane has been gradually falling, and is now down about 20% from peak levels in 2000. Similarly, demand for propylene feedstock is significantly lower than at the turn of the century.

Existing propane supply and distribution networks were designed for a much larger market than exists today. The infrastructure is already in place to support significant new demand for both consumer grade propane and propylene. At the same time, improvements in propane appliance efficiency will significantly offset demand increases (e.g., the tankless water heater).

Currently, approximately 60% of U.S. propane supply is derived from natural gas. In the future, this percentage is expected to increase alongside growth in total propane supply, as domestic natural gas production increases, supplying both the propane and propylene markets.

Propane supply CAN keep up with demand as the Autogas market develops.

AS DEMAND INCREASES, WILL PRICE INCREASE?

“Despite the decline in U.S. demand, propane/propylene prices have remained closely linked to the international oil price and propane prices. This price relationship is likely to continue regardless of foreseeable increases or decreases in domestic demand for propane/propylene.”²

² “Propane Supply Outlook” from ICF International, an independent energy and environmental consulting group. See Appendix III

Benefits of Autogas

KEY EMISSIONS AND EFFICIENCY DATA

Propane Autogas is a nontoxic, clean-burning fuel. Compared to conventional gasoline vehicles, Autogas-powered vehicles generally experience substantial emissions reductions in particulate matter and greenhouse gases, including carbon monoxide, carbon dioxide and nitrogen oxide. Autogas has emissions benefits comparable to CNG and ethanol, and it produces significantly lower emissions than gasoline, diesel and electricity on a per-Btu basis.³

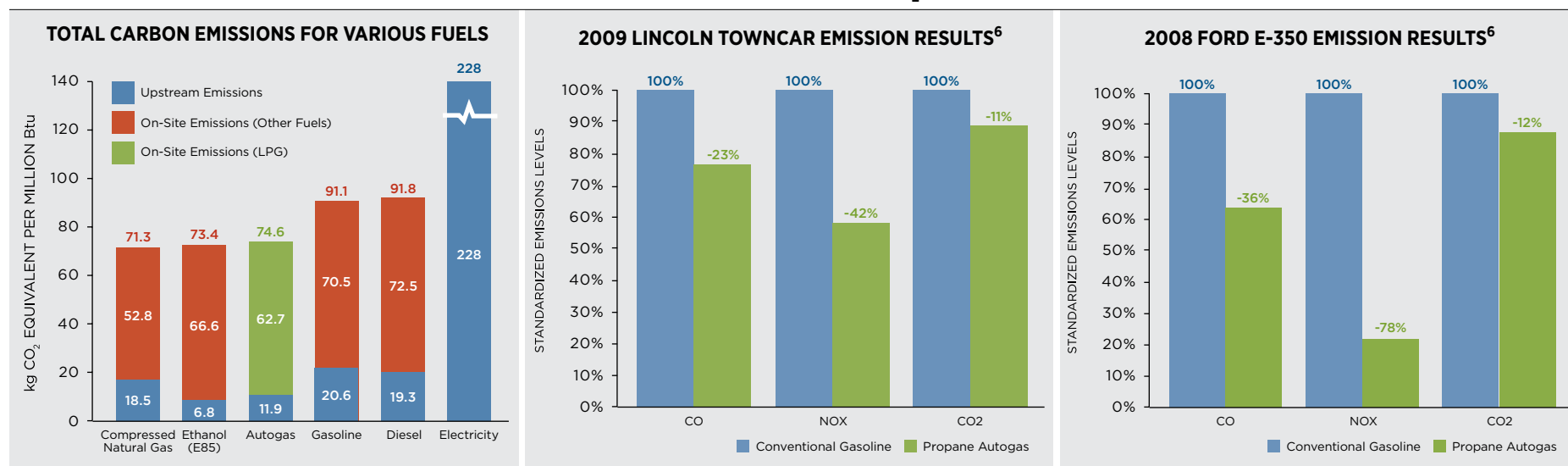
Autogas fleet vehicles experience an average of 19 percent lower greenhouse gas emissions compared to gasoline.⁴

GREENHOUSE GAS DISPLACEMENT DATA

When Autogas for America reaches its goal of 500,000 on-road Autogas vehicles, the total amount of reduced emissions will be drastic. Assuming that 500,000 light-duty Autogas vehicles, each traveling approximately 50,000 miles annually, replaced the same number of conventional gasoline vehicles, the emissions reductions would include approximately:⁵

- 150,212 tons (300,425,714 lbs) of carbon monoxide
- 8,579 tons (17,159,301 lbs) of volatile organic compound
- 18,180 tons (36,360,064 lbs) of nitrogen oxide emissions
- 28 tons (55,174 lbs) of fine particulate matter

In all, more than 2.64 million tons (5,296,761,905 lbs) of greenhouse gases and CO₂ equivalent would be displaced



³ Propane Education and Research Council, Research and Development, <http://www.propanecouncil.org/ResandDev.aspx>

⁴ Roush, Propane-Powered Vehicles, <http://www.roushperformance.com/propane.shtml>

⁵ Based on DOE Argonne National Laboratory emissions benefit tool, http://www.transportation.anl.gov/modeling_simulation/AirCred/

⁶ Roush, 2009 Lincoln & 2008 E-350 emissions compare LPG vs. GAS

Benefits of Autogas

COST SAVINGS

- Historically, Autogas costs significantly less than gasoline or diesel
- Running a vehicle on Autogas requires less vehicle maintenance, with fewer oil changes, and extends engine life

JAN - DEC 2009

GASOLINE	\$1.84	\$1.98	\$2.00	\$2.11	\$2.31	\$2.68	\$2.59	\$2.68	\$2.63	\$2.61	\$2.71	\$2.67
PROPANE AUTOGAS	\$1.87	\$1.80	\$1.70	\$1.62	\$1.64	\$1.73	\$1.65	\$1.73	\$1.81	\$1.88	\$1.98	\$2.08
AUTOGAS LESS 50¢ TAX CREDIT	\$1.37	\$1.30	\$1.20	\$1.12	\$1.14	\$1.23	\$1.15	\$1.23	\$1.31	\$1.38	\$1.48	\$1.58
TOTAL DIFFERENCE	\$0.47	\$0.68	\$0.80	\$0.99	\$1.17	\$1.45	\$1.44	\$1.45	\$1.32	\$1.23	\$1.23	\$1.09
	JAN '09	FEB '09	MAR '09	APR '09	MAY '09	JUNE '09	JULY '09	AUG '09	SEPT '09	OCT '09	NOV '09	DEC '09

JAN - NOV 2010 & OVERALL AVERAGE

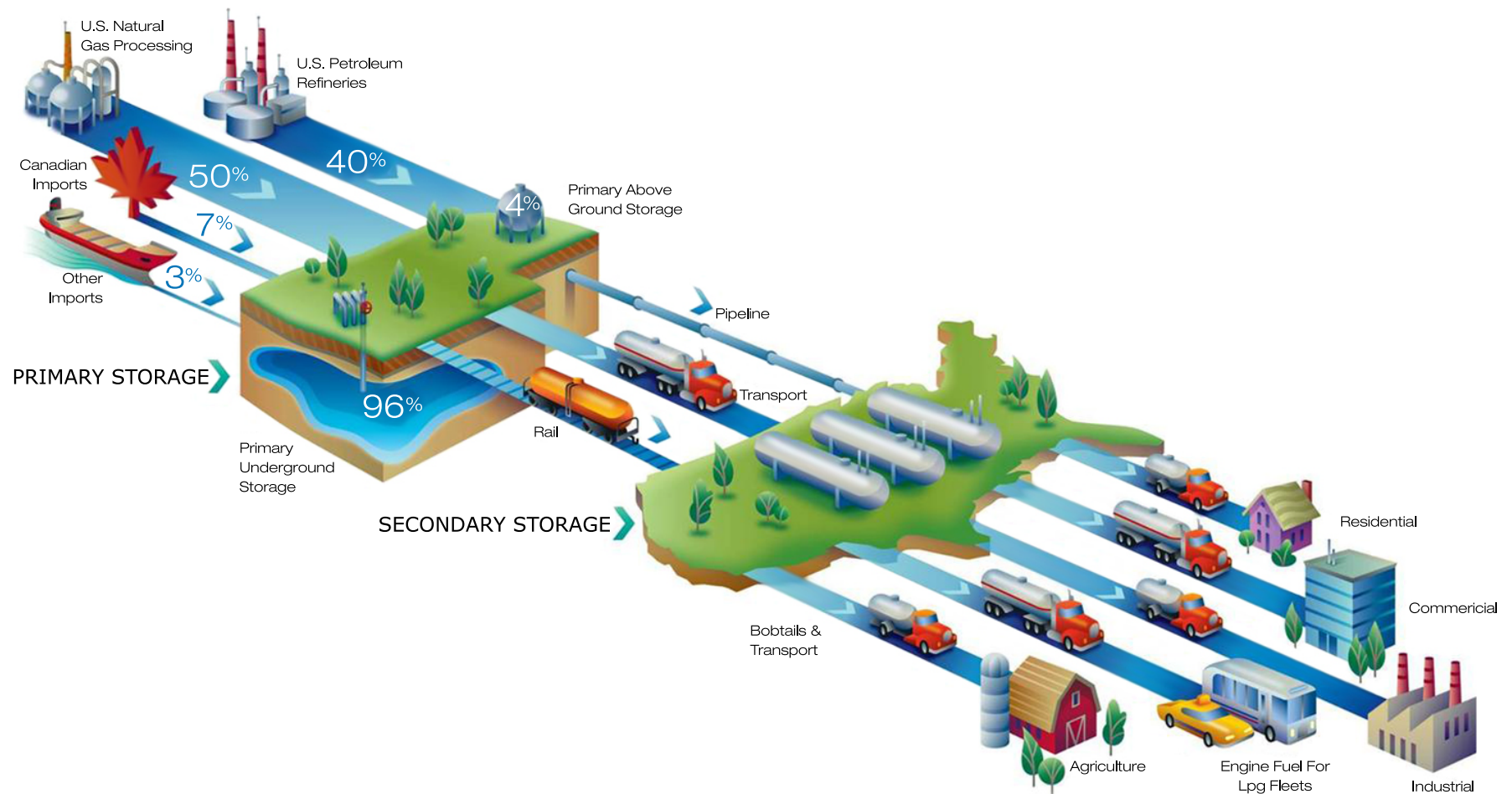
GASOLINE	\$2.78	\$2.71	\$2.83	\$2.91	\$2.92	\$2.78	\$2.78	\$2.80	\$2.75	\$2.84	\$2.90	\$2.60
PROPANE AUTOGAS	\$2.22	\$2.19	\$2.06	\$2.03	\$2.00	\$1.94	\$1.90	\$1.97	\$2.04	\$2.14	\$2.16	\$1.92
AUTOGAS LESS 50¢ TAX CREDIT	\$1.72	\$1.69	\$1.56	\$1.53	\$1.50	\$1.44	\$1.40	\$1.47	\$1.54	\$1.64	\$1.66	\$1.42
TOTAL DIFFERENCE	\$1.06	\$1.02	\$1.27	\$1.38	\$1.42	\$1.34	\$1.38	\$1.33	\$1.21	\$1.20	\$1.24	\$1.18
	JAN '10	FEB '10	MAR '10	APR '10	MAY '10	JUNE '10	JULY '10	AUG '10	SEPT '10	OCT '10	NOV '10	AVERAGE

Note: The figures above are based on national averages for Autogas and gasoline prices (as listed by the U.S. Energy Information Administration) and based on a standardized average for state-level taxes on Autogas (propane as a vehicle fuel); many states allow the purchase of a vehicle decal to take the place of paying state level Autogas taxes.

Benefits of Autogas

ENERGY INDEPENDENCE

- Over 90% of Autogas is produced in the U.S., with 7% coming from Canada
- Replacing gasoline-powered vehicles with Autogas vehicles reduces U.S. dependence on foreign oil and creates green-collar jobs



Benefits of Autogas

GASOLINE DISPLACEMENT DATA

Average Fleet Vehicle Description

- Vehicle travels 16 mpg on gasoline, 14 mpg on Autogas; this is the average for both smaller vehicles like a Ford Crown Victoria Police Interceptor and larger vehicles like the Ford F-350⁷
 - Traveling 50,000 in a gasoline-powered vehicle uses 3,125 gallons, while traveling 50,000 on Autogas uses 3,571 gallons
-

CONCLUSIONS

For every 50,000 miles a fleet vehicle drives on Autogas, it offsets 3,125 gallons of gasoline.

When Autogas for America achieves its goal of 500,000 Autogas vehicles on American roads, we will have **offset more than 1.56 billion gallons of gasoline annually.**

That's equivalent to taking more than 2.8 million gasoline vehicles off the road.⁸

CNG COMPARISON DATA

Autogas offers significant advantages over CNG.

Efficiency/Range

- Autogas can achieve up to 90 percent of gasoline's miles per gallon, compared to CNG which achieves 40 percent of gasoline's miles per gallon

Infrastructure Cost

- An Autogas refueling station, servicing 30-40 vehicles, costs about \$15,000 for complete implementation, while a CNG refueling station typically costs \$350,000 or more

Safety

- Autogas is safer to maintain than CNG because it requires a lower storage pressure – Autogas has an operating pressure of 175 psi, compared to CNG's operating pressure of 3,000 psi

⁷Based on average city miles per gallon for fleet vehicles, including cars and light-duty trucks

⁸Americans consume about 380 million gallons of gasoline per day, and there are approximately 249 million gasoline vehicles in the U.S. – that averages about 1.5 gallons of gasoline per vehicle per day, or 557 gallons per vehicle, per year

Appendix I – Fuel Safety

Autogas is a safe, proven alternative fuel. Thousands of school buses and taxicabs across the U.S. are already safely fueled by Autogas.

STATE-OF-THE-ART TANKS

- Autogas vehicle tanks are tested to four times their standard operating pressure
- Autogas tanks are 20 times more puncture resistant than gasoline tanks and can withstand four times the pressure when compared to conventional gasoline vehicle fuel tanks
 - Autogas vehicle tanks are constructed from carbon steel under code developed by the American Society of Mechanical Engineers
 - Properly installed Autogas vehicle fuel tanks can actually add to the structural integrity of a vehicle

LOW FLAMMABILITY

- Autogas has the lowest flammability range of all alternative motor fuels and even gasoline
 - The ignition temperature of Autogas is 920-1020 degrees Fahrenheit versus 495-536 for conventional gasoline
 - Autogas will only burn with a fuel-to-air ratio between 2.1 and 10.1 percent and will rapidly dissipate beyond its flammability range in the open atmosphere, making ignition unlikely

NONTOXIC

- Unlike gasoline, diesel, methanol and ethanol, Autogas is nontoxic, nonpoisonous and is insoluble in water
- Should a rare accidental release of Autogas occur, Autogas would dissipate into the atmosphere with no harmful contaminants released into the air, soil or water

Appendix II – Federal Tax Incentives⁹

The U.S. Department of Energy has endorsed Autogas as a viable vehicle fuel. The American Recovery and Reinvestment Act of 2009 will help fund the development of more than 250 Autogas refueling stations and over 3,000 Autogas vehicles. The federal tax credits outlined below demonstrate that Autogas vehicles are not only economically feasible, but also affirm that Autogas is an important part of America's energy equation.

ALTERNATIVE FUEL VEHICLE REFUELING PROPERTY CREDIT: EFFECTIVE DECEMBER 31, 2005 to DECEMBER 31, 2011

- The credit allows companies to claim a 30% tax credit for the cost of installing an Autogas vehicle refueling station to be used in a trade or business of the taxpayer, or installed at the principal residence of the taxpayer

VOLUMETRIC EXCISE TAX CREDIT – EFFECTIVE OCTOBER 1, 2006 – DECEMBER 31, 2011

- The gross alternative fuel tax credit is 50 cents per gallon of Autogas sold by the taxpayer for use as a motor fuel in a motor vehicle or motorboat
- This credit has been recently renewed through 2011

ALTERNATIVE MOTOR VEHICLE CREDIT – EFFECTIVE DECEMBER 31, 2005 – DECEMBER 31, 2010 (EXPIRED)

- The credit applied toward the purchase of a new Autogas vehicle or the cost of converting a conventionally-fueled vehicle to run on Autogas (must be a dedicated Autogas vehicle)
- The credit was 50 percent of the incremental cost (the difference in purchase price between a gasoline- or diesel-fueled vehicle and an Autogas-powered version of the same model)
- The credit excluded bi-fuel Autogas vehicles
- Autogas for America supports the renewal and extension of the Alternative Motor Vehicle Credit

⁹ U.S. Department of Energy http://www.afdc.energy.gov/afdc/laws/fed_summary

Appendix III – ICF Propane Supply Outlook



Propane Supply Outlook

The propane supply outlook is very positive. The percentage of odorized propane produced from North American hydrocarbons has been increasing for the last few years, from 75 percent in 2007 to 81 in 2009. This trend is expected to continue as recent changes in domestic natural gas supply outlook are expected to increase the volume of propane produced from natural gas processing facilities.

- The propane supply outlook is primarily dependent on North American natural gas and crude oil production trends. More than 80 percent of the odorized propane consumed in the U.S. is produced from natural gas and crude oil produced in North America.
- The U.S. EIA is projecting domestic crude oil production to increase steadily over the next 10 years, increasing by more than 17 percent between 2009 and 2020.
- ICF and most other industry experts are projecting U.S. natural gas production to increase substantially in the next 10 years. ICF is projecting U.S. natural gas production to increase by about 33 percent between 2009 and 2020. The growth in natural gas production is expected to result in significant growth in liquids production.
 - U.S. reserves of natural gas liquids have been increasing steadily since 2003, with a total increase of about 25 percent from 2003 through 2008.
- Most of the growth in natural gas production will come from the new shale gas resource base. Much of the shale gas resource base is “wet” gas with a high proportion of natural gas liquids.¹
 - ICF estimates that shale gas resources that would be economically producible at \$5.00 per Mcf (slightly above today’s natural gas prices) exceed 600 TCF, and include more than 20 billion barrels of natural gas liquids. These new resources are roughly equivalent to the total level of existing proven reserves for U.S. natural gas liquids production, and are expected to result in steady growth in natural gas liquids production as these resources are developed.
- On a \$/Btu basis, the value of natural gas liquids currently is well above the value of the natural gas itself. Given recent changes in natural gas supply outlook, this disparity is expected to continue.
 - As a result, the economics of natural gas exploration and development have shifted in favor of “wet” gas with a higher percentage of liquids – and a higher percentage of propane.

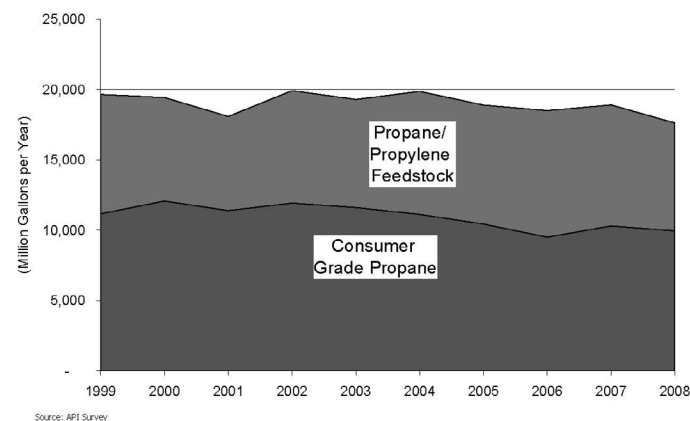
Impact of Potential New Consumer Propane Demand on Propane Markets

- Since 2004, domestic production of propane and propylene has been relatively stable, while total demand has been falling.
 - Consumption of consumer grade propane has fallen by almost 20 percent from peak demand levels in 2000.
 - Demand for propane/propylene used as a petrochemical feedstock has varied from year-to-year around the long term average.

¹ Different shale gas plays have different amounts of natural gas liquids. Certain areas of the Marcellus and Barnett shales are very dry, while other areas within the same formations have a very high level of natural gas liquids. Overall, it is too soon to determine if produced shale gas will have a higher percentage of liquids than the conventional natural gas resources that are being phased out.

- Since 2004, propane/propylene imports have been declining, while propane/propylene exports have been increasing.
 - In 2009, excluding Canadian imports, the U.S. was a net exporter of propane/propylene.

U.S. Demand For Propane/Propylene



- These trends are expected to continue in the future.
 - Continuing improvements in end-use propane efficiency due to higher appliance energy standards and improved building efficiency codes are likely to offset most if not all growth in consumer propane demand in the next few years.
 - Propane production from natural gas is expected to grow steadily as natural gas production increases, providing additional propane supply for both the petrochemical and consumer propane markets.
- The existing propane supply and distribution infrastructure was designed for a significantly larger market than exists today, and remains generally sufficient to support significant growth in propane demand.
 - Regional changes in demand and supply patterns are likely to require new infrastructure investment regardless of potential growth in demand.
- Despite the decline in U.S. demand, propane/propylene prices have remained closely linked to the international oil price and propane prices. This price relationship is likely to continue regardless of foreseeable increases or decreases in domestic demand for propane/propylene.



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