



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.”¹

¹According to the “Propane Supply Outlook” from ICF International, an independent energy and environmental consulting group.



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.

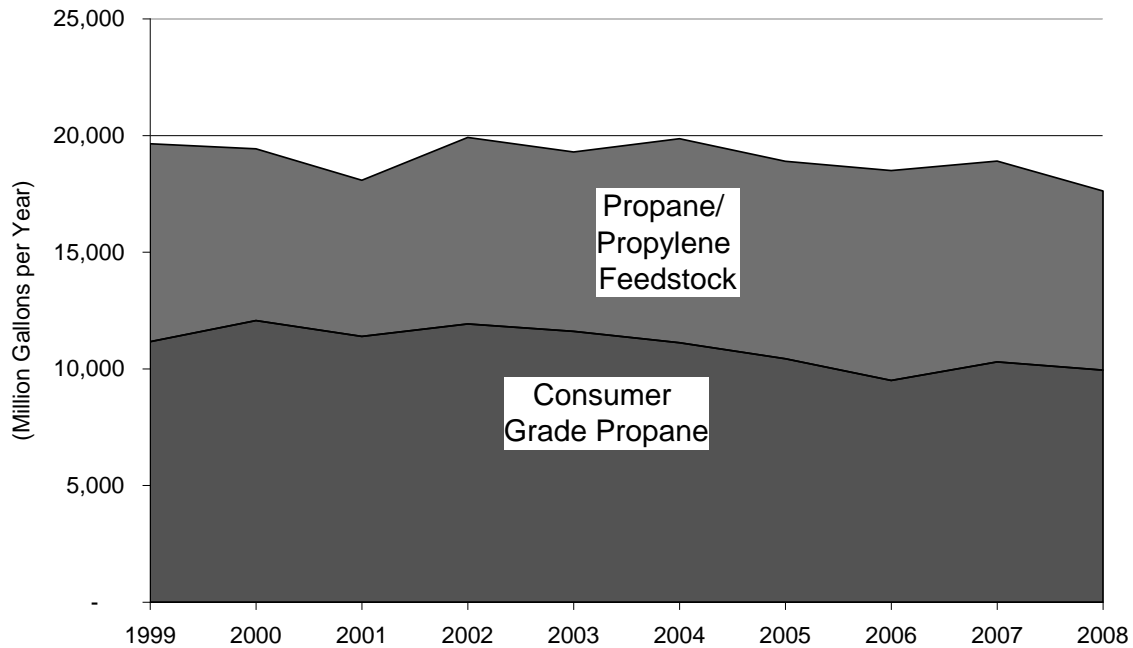
Impact of Potential New Consumer Propane Demand on Propane Markets

- 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



Source: API Survey

- 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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