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As I write this article we are seeing strife in the Middle East and North Africa. Riots in Egypt toppled the Government and similar public strife has occurred in other countries in the region. Most recently we have seen serious public outrage in Libya. Libya only produces about 2 % of the world's oil but the chaos has quickly pushed the price of oil up to and around \$100 / bbl. Somewhere I read that for every \$1.00 increase the price of gasoline goes up around a penny a litre. That's probably about right as this recent \$10 per bbl increase is showing up around 10 cents more per litre.

It's topical then to write about transportation and alternative fuels. Much of the unrest in the Middle East and North Africa can be linked to the cost of food. With a difficult year in world weather we have seen food shortages and thus translated into higher food prices. In countries with big disparities between rich and poor, the poor become very unsettled when they cannot even afford to sustain themselves. One has to wonder about Bio Fuels if the unintended consequence is that land is used for something else other than food production and invariably food prices continue to rise.

The Oil and Gas Industry sees one of the important ways forward is to move transportation to natural gas.

Natural gas vehicle development in Canada has had its share of ups and downs. Oilweek ran a very interesting piece in the March 2011 edition called NGV Snakes and ladders in which the ups and downs of the issues were interested. This is an interesting piece worth repeating here.

On the Positive Side:

- In 1985, the city transit authority in Hamilton, Ont., converts seven diesel buses to compressed natural gas (CNG) operation, creating the world's first CNG transit buses. (Government grants provide up to 75 per cent of the vehicle cost and 100 per cent of the station capital costs.)
- Shale gas revolution unlocks vast natural gas reserves. Natural gas is lower carbon fuel than gasoline or diesel and burns cleaner.
- The Canadian government, in consultation with industry, released the Natural Gas Use in the Canadian Transportation Sector Deployment Roadmap in January 2011.
- The U.S. brings in incentives to spur the adoption of natural gas technology in transportation.
- The shift to NGVs usage could stimulate the economy and firm prices for natural gas.
- NG provides greater range required by long-haul applications.
- Canadian NGV technology manufacturing flourishes with the help of some government support.
- There are more than 1100 NGV fuelling stations in the U.S. – and about half of them are open to the public. California has the nation's most extensive natural gas fuelling infrastructure.

- NGV numbers grow dramatically world-wide, particularly in jurisdictions committed to improving air quality, energy security or diversification of fuel sources, and with high natural gas/diesel or gasoline differentials.
- The Guinness Book of World Records recognizes Singapore's C-Nergy CNG filling station as the largest in the world with 46 refueling hoses.
- Honda Civic GX is currently the only NGV passenger vehicle available for sale in North America and only in the U.S.
- Compressed natural gas across Canada costs 20-30 percent less than gasoline or diesel. The discount is even higher at private filling stations.
- Fiat leads the NGV market in Europe, holding 80 percent of the market for passenger cars and 55 percent for light commercial vehicles. It sold 127,000 NGVs in Europe last year.
- Today, Canadian NGV manufacturing is known worldwide, including natural gas engines by Westport Innovations Inc. in Vancouver; CNG refueling infrastructure components by IMW Industries Ltd. in Chilliwack, B.C.; FTI International Group Inc. in Toronto; Kraus Global Inc. in Winnipeg; Viridis Technologies Inc. in Markham Ont.; CNG storage cylinders by Dynetek Industries Ltd. in Calgary; and heavy-vehicle fuel systems by Enviromech Industries Inc. in Kelowna, B.C.
- The transport sector accounts for about 30 percent of Canada's GHG emissions. One-third of transportation emissions are produced by less than four percent of on-road vehicles—essentially commercial trucking. Converting this segment to NGVs could have a substantial impact on air quality.
- There are over 11 million NGVs worldwide. The Asia-Pacific region is leading with 5.7 million NGVs followed by Latin America with almost 4 million vehicles. In Brazil, 40 percent of cars run on natural gas.
- Gasoline vehicles can be converted to a bi-fuel (gasoline/CNG) mode.
- FuelMaker is bought by an Italian company and resumes manufacturing in Italy.

On the Negative Side:

- Compressed gas filling stations cost more to build than liquids stations and require costly annual maintenance and certification.
- First-generation natural gas vehicles (NGVs) lack performance and have reliability issues.
- Fast-changing emission standards and dropping oil prices hurt NGV in the mid-1990's NGV R & D drops off. Cost of compliance rises and original equipment manufacturers pull out.
- Lack of competition among original equipment manufacturers, low market volumes and high U.S. incentives lead to high prices for NGVs and depressed market interest in Canada.
- Early NGVs lack performance and are more costly to maintain. NGVs cost more than gasoline powered vehicles to purchase (40 per cent or more).
- Currently, no LNG is made specifically for transportation in Canada.
- Diesel engines typically cannot be converted to natural gas fuel.
- CNG storage takes up space and typically provides shorter range than gasoline or diesel vehicles.

- The number of NGVs on Canadian roads drop to 9,500 vehicles today from 30,000 a decade ago. The number of filling stations drop to 71 from 250 (compared to 17,000 liquids fuelling stations across the country).
- FuelMaker Corporation, a Canadian-based Honda-owned company manufacturing a home natural gas refueling appliance, goes bankrupt in 2009. T. Boone Pickens is approached but isn't interested in the company.
- Calgary has three public filling stations. Edmonton has five.

The challenges certainly lie ahead but many things point to Natural Gas as a viable replacement for gasoline in our transportation system over time.

From the Thursday Files

It is no coincidence that in no known language does the phrase 'As pretty as an Airport' appear.

- **Douglas Adams**