President’s column
Smart transportation — re-thinking vehicles, fuels, and how we use them

Adapted from remarks delivered by Peter Boag, President & CEO, at QUEST 2014: Innovation to Implementation conference in Vancouver on December 1, 2014.

Transportation is an indispensable underpinning of our way of life and standard of living. This can be said of almost any country in the world, but it rings particularly true here in Canada. We are among the highest per capita consumers of transportation fuels in the world — not because we are inherently wasteful, but because of Canada’s demographic, geographic and economic circumstances. Our country is enormous, our population is small, and we are a prosperous trading nation.

Over the course of centuries, this has led us to build highly developed, complex and comprehensive transportation systems to move both people and goods. It requires fuel, and a lot of it — 85 billion litres annually, and a growing amount of electricity, natural gas and biofuels. Petroleum fuels power 95 percent of transportation — a sector that accounts for about 30 percent of all energy used in Canada. This can largely be explained by petroleum fuels’ high energy content, portability and high value.

Are there opportunities for more efficient use of transportation fuels? Absolutely, and urban areas offer the highest potential for efficiency gains. We are largely an urban nation — most of us live in cities, many of us in very large ones. Within these cities, transportation of people and goods is essential and will remain so for the coming decades. The ways we get around will change; our need to be mobile will not.

The way we get around will have a huge impact on transportation efficiency and sustainability. Any successful strategy to improve efficiency needs to consider opportunities associated with each of three, often interdependent pillars: vehicle efficiency, fuel choice and vehicle miles travelled, influenced largely by distance and mode choice.

First, there are significant opportunities to improve vehicle efficiency. Today, traditional internal combustion engine (ICE) vehicles are about 75 percent inefficient, with most of that energy being lost as heat. The good news is that within the next decade, vehicles will be 50 percent more efficient than they were in 2008 as a result of regulations coming into play in 2017. That’s a remarkable achievement, powered by innovation, technology development and deployment.

Much of this innovation will focus on improving the efficiency of conventional ICE powered vehicles — engine design, drivetrain changes, lightweight materials and aerodynamics, to name a few. Those changes will only be possible with fuels that evolve in tandem with new vehicles.

The second pillar of transportation efficiency — greater fuel choice — will be made possible by new, alternative vehicle technologies that will enable market growth of hybrids, plug-in electric, natural gas and hydrogen fuel cell vehicles. Electric vehicles are particularly suited to the urban environment because of the shorter distances of urban travel, and natural gas and hydrogen, because of the practicality and timely feasibility of a more centralized fueling infrastructure, notably for “return to base vehicles”.

Fuel switching offers significant promise for both efficiency gains and a greater degree of energy system integration. Electric vehicles connect to the grid and could become part of the overall energy management and storage system. Local sources of renewable natural gas — possibly derived from waste — could be used to power natural gas vehicles. (continued)
The greatest opportunity to improve energy efficiency in transportation rests with the third pillar: reducing vehicle miles travelled. This could be done by reducing commuting distances and moving to more efficient modes, such as public transit, with electricity as the dominant fuel.

To achieve this, we must recognize the direct links between mobility, land-use planning and community design, and integrate transportation realities and urban form. Fixed route systems like subways and light rail are highly efficient, but the population densities, travel patterns and demand needed to make them practical and affordable require early thinking and decision making around land use and its impact on transportation choices.

To conclude, any strategy to improve transportation efficiency in smart energy communities must take into account four cautionary factors. First, it’s impossible to predict with certainty the future of fuel and vehicle technology innovation. Second, the pace of change will be modest and will depend on a range of factors, including price and supply, and public policy — areas where there is considerable uncertainty. Third, consumer preference and choice will always be a wild card — Canadians generally don’t want to pay more for less. Finally, we need to take into account unintended consequences of fuel switching, such as impacts on taxation. Fuel taxes are important revenue sources for governments; as consumption of petroleum fuels declines, so too will tax revenue, which will likely prompt governments to tax alternative fuels, eroding one of the factors that today contribute to their value propositions.

FUEL 2014 ANNUAL REVIEW:
Four experts explain why petroleum is Canada’s fuel

The Canadian Fuels Association is pleased to present its FUEL 2014 annual sector review. In this year’s edition, four diverse and accomplished experts explain how petroleum fuels are enablers of transportation that are continuously adapting to a changing vehicle market, and advancing consumer and environmental expectations.

The report also includes a section on Sector Performance, which highlights the refining industry’s performance on environmental, safety and economic parameters and our commitment to continuous performance improvement:

• Fuel refining contributes $5.6-billion to Canada’s GDP and employs 100,000 Canadians.
• Our industry is a leader in manufacturing sector safety performance.
• Aggregate industry air emissions have declined 40 percent since 2002; GHG emissions have declined 16 percent in the last 10 years.
• Water intake is down 22 percent since 2005 and effluent deposits are significantly below allowable limits.
• Since 2009, 828 surplus sites have been remediated, helping municipalities revitalize local communities.
• Refiners have invested $5-billion to reduce sulphur levels in gasoline by more than 90 percent, and 97 percent in diesel since 2005.

Read the full report here: canadianfuels.ca/assets/upload/pdf/en/Publications/FUEL%202014.pdf

Petroleum. Canada’s 21st Century Fuel

In addition to the annual sector review, the Canadian Fuels Association has also published the first of a series of Fill up with Facts infographic booklets. Petroleum. Canada’s 21st Century Fuel provides information and data on petroleum fuels, their importance in the Canadian economy, environmental improvements and their place in Canada’s transportation future.
Montreal Economic Institute study casts doubts on efficiency of electric vehicle subsidies

The number of electric cars on the road worldwide quadrupled from 100,000 to 400,000 between 2012 and 2014, driven largely by government subsidies and incentives aimed at reducing transportation GHG emissions. In Quebec, the 2011–2020 Action Plan for Electric Vehicles sets a goal of having 300,000 electric vehicles on the Province’s roads by 2020, up from the 4,000 electric cars in use today.

The Montreal Economic Institute analyzed the outcomes of electrification programs in Norway, a world leader in the field, in an economic note titled *Do We Need to Subsidize the Purchase of Electric Cars?*. The study found that based on a life-cycle analysis of electric vehicle emissions, taking into account mileage and annual incentives, each tonne of GHG emissions avoided costs $6,925, or 883 times the price of a $7.84 per tonne emissions quota on the European carbon market.

The report found that to achieve its goal of having 300,000 electric vehicles on the roads by 2020, the Quebec government would need to offer incentives amounting to over $12 billion, or $1,560 per tonne avoided.

The Montreal Economic Institute notes that through its participation in the Western Climate Initiative carbon market, Quebec can purchase carbon credits at $11.39 per tonne in 2014. To achieve the same GHG emission reductions as its electrification program, Quebec would need to purchase emission permits amounting to only $88 million, or 1/137 of the cost of subsidizing the purchase and use of 300,000 electric vehicles.

Youri Chassin, one of the authors of the study, concludes:

“Relatively modest environmental benefits, corresponding to around 1% of Quebec’s GHG emissions, do not justify such a program. As the Robillard committee proposes revisions to numerous inefficient programs, it would be appropriate to question the relevance of pursuing this one.”

The math behind fluctuating oil prices

Falling gasoline prices have been generating many conversations over the last few months. In response, petroleum market analysts MJ Ervin & Associates analyzed the factors behind the current market dynamics. According to their report, the price of crude oil is the main factor behind the dip.

The analysis notes that although declining retail pump prices are frequent in the fall season, as demand for fuel tapers down, bringing down refining margins and wholesale prices, this year, markets have also been affected by increased oil production and weakening demand from key markets such as China. U.S. crude oil production has hit a 28-year high, displacing over 3.5 million barrels per day of imports.

According to MJ Ervin & Associates, while OPEC has been moderating world oil supplies over the last few years, Saudi Arabia has recently opposed additional reductions to their crude oil output. Combined with restored oil production in Libya and weaker demand from China and other emerging economies, the market has been in a state of oversupply, bringing down the price of a barrel of crude oil.

Looking toward 2015, MJ Ervin & Associates note crude oil prices will depend on OPEC crude oil output, China’s economic performance and global oil inventories. OPEC is expected to cut its production targets, but the timing and breadth of that adjustment is unknown. MJ Ervin & Associates still expect lower crude prices to last at least until the end of 2014.


Canadian Urban Institute announces 2014 Brownie Awards winners

On October 29, the Canadian Urban Institute announced the recipients of the 2014 Brownie Awards, which are given each year to individuals and organizations that have demonstrated leadership, innovation and environmental sustainability in the redevelopment of brownfield sites across Canada.

The Brownfielder of the Year award went to Eric Pringle, President of the Canadian Brownfields Network (CBN), for his involvement in promoting innovation in brownfield redevelopment, including the B.C. Toolkit for Former Service Station Sites where Canadian Fuels’ members actively contributed to the content.

The Town of Smithers was presented with the award for Best Small/Medium Scale Project for their Bovill Square Legacy Project, a former gas station site on its main street.

The Canadian Fuels Association is a member of the Canadian Brownfields Network, and is engaged in policy discussions in all jurisdictions for sustainable remediation approaches for contaminated sites and the redevelopment of brownfield properties to a productive use. Our member companies have remediated over 800 surplus properties since 2009, making them available for industrial, recreational, residential or commercial use.

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Transport Canada winter tire tips

Once again, winter has unmistakably arrived. Black ice and slush have replaced fall’s heaps of golden leaves, and commute times seem to grow longer and longer.

While winter tires are mandatory only in the province of Quebec, experts agree that they can improve grip and handling in Canada’s harsh winter conditions. They are made of a softer rubber than all-season tires, enabling them to remain supple in sub-zero temperatures and maintain grip on asphalt. Their treading is also different, with thousands of tiny channels that draw water away faster than regular tires. They also allow the tire to “bite” into the snow, while the treading of all-season tires can easily become clogged with snow, significantly reducing grip and increasing the risk of skidding.

Here is additional information on winter tire safety from Transport Canada and the Rubber Association of Canada to enjoy a safe winter driving season.

Vehicle handling will be improved when tires of the same type, size, speed rating and load index are installed on all four wheels. View a demonstration video showcasing the benefits of using four winter tires of the same type, size, speed rating and load index by visiting visit www.rubberassociation.ca/wintertirevideos/wintertirevideos.html.

Snow tires

Tires marked with the pictograph of a peaked mountain with a snowflake meet specific snow traction performance requirements, and have been designed specifically for use in severe snow conditions.

If you intend driving in severe winter conditions, install four winter tires that meet the “snow tire” designation on your vehicle. These snow tires will assist you to control your vehicle safely in slippery conditions.

Other tires

Tires marked “M + S” — or “mud and snow” tires, also known as “all-season” tires — continue to provide safe all-weather performance, but may not always be suitable for severe snow conditions.

Wide, high performance tires, other than those that are specifically designed as snow tires, are not suitable for use on snow covered roads.

What snow tires are available

You can contact tire dealers or manufacturers to obtain information on which models meet this new designation.

Remember:

- Install four winter tires — To help maintain control and stability of your vehicle in icy conditions, Transport Canada and the Rubber Association of Canada recommend that you install winter tires in sets of four.
- Mixing tires with different tread patterns, internal construction, and size degrades the stability of the vehicle and should be avoided.
- As a tire wears, snow traction is reduced. Tires that are worn close to the tread-wear indicators have reduced traction and should not be used on snow-covered roads or in severe snow conditions.
- Proper air pressure extends tread life, improves safety, and reduces fuel consumption — all vital factors in saving energy and protecting the environment. Tire pressure decreases as temperatures drop, so be sure to check the pressures at least once a month when the tires are cold, preferably after the car has been out all night. (For more information on proper tire inflation, please see our publication “Riding on Air” at www.tc.gc.ca/eng/motorvehiclesafety/tp-tp2823-menu-200.htm.)

Installing winter tires is an excellent first step to make your daily commute safer and less nerve-racking, but driving and planning also come into play. Below are additional tips for safe winter driving:

- Tire traction decreases and braking distance increases when driving in winter conditions, so check the weather before hitting the road, slow down and keep a safe distance from other vehicles.
- Winter can defeat even the sportiest SUV. Four-wheel drive vehicles will not help you stop or prevent you from skidding.
- If you skid, release the accelerator, avoid braking and gently steer towards the direction of the skid.
- Avoid using cruise control during winter, as it can prevent you from detecting loss of traction and wheel overspin.
Low carbon emission vehicles coming to a future near you

Transportation is one of the main sources of greenhouse gases (GHGs) in Canada, accounting for 24 percent of total emissions. Passenger automobiles and light trucks such as vans and SUVs make up 53 percent of transportation GHGs. The sector has considerable carbon mitigation potential, which prompted the federal government to introduce new regulations for light-duty vehicles aimed at significantly improving their efficiency and aligning Canada with U.S. standards. Regulations will take effect for the 2017 model year and will become gradually more stringent until 2025.

As a result, 2025 model year light-duty vehicles will emit 50 percent less GHG emissions than 2008 models. According to Environment Canada estimates, regulations will save 75 billion litres of fuel over the lifetime of 2017–2025 model year vehicles, amounting to fuel savings of over $50 billion. This translates to GHG reductions of 174 megatons of CO$_2$ equivalents, the same as the annual emissions of nearly 37 million vehicles.\(^1\)

New vehicle efficiency regulations will require complex technology development and re-engineering, such as improvements to engines and drivetrains, lightweight materials and improved aerodynamics, as well as cleaner fuels to enable that evolution. Vehicle efficiency regulations and reduced sulphur in gasoline will also significantly reduce smog-forming emissions and improve air quality.

\(^1\) Assuming current average emissions of 4.75 metric tons CO$_2$e /vehicle/year, as per U.S. EPA estimates.  
www.epa.gov/cleanenergy/energy-resources/ref.html