**Canadian Natural Gas Vehicle Alliance**
**Federal Budget Submission**
**February 2016**

**Introduction**

The Canadian Natural Gas Vehicle Alliance (CNGVA) represents Canada's natural gas vehicle industry. Natural gas vehicle technologies provide proven, commercially available transportation solutions that reduce emissions while using lower cost fuel. The CNGVA's membership includes leading Canadian companies involved in research, manufacturing, fuel and infrastructure supply, vehicle conversion technology and installation, consulting, and international project management. Our mission is to promote the sustainable growth of natural gas vehicles, refueling infrastructure, and renewable gaseous fuels for the benefit of Canada's economy and environment.

Enclosed are a number of recommendations by which the natural gas vehicle industry can work together with government in support of improving the lives of Canada's middle class, growing the economy and protecting the environment.

**1. How can the Government of Canada better support Canada's middle class?**

Canada has been a leader in natural gas vehicle technologies for more than three decades. Today's medium and heavy duty natural gas engine and fuel tank technologies made by Westport and Agility, were developed and designed in Canada, and are sold around the world. Similarly, Canadian compression and gas polishing equipment made by Clean Energy Compression and Xebec, support refueling stations here in Canada and abroad. As an emerging clean technology, Canada's natural gas vehicle sector is already supporting middle class Canadians, and has the potential to have a greater positive impact.

The Government of Canada has demonstrated significant leadership in supporting the deployment of natural gas vehicles with the participation of Natural Resources Canada in developing the vehicle deployment roadmap, and with the participation of Transport Canada in the liquefied natural gas (LNG) marine fuel projects. These initiatives have helped outline opportunities for greater deployment of natural gas vehicles in Canada by reducing fuel costs for the transportation of goods and people and reducing emissions from the transportation sector which account for 25 per cent of greenhouse gas (GHG) emissions in Canada.

The transportation sector accounts for $70 billion per year in economic activity.[1] Rail transport accounts for $7 billion of this activity; while truck transportation and transit each account for $19 billion of the total. The sector employs 900,000 (middle class) Canadians. It is also an economic sector that is subject to considerable government regulation and that ultimately generates relatively small margins and return on investment. Given the key role the industry will play in reducing emissions, it is a sector that needs help from governments in meeting reduction targets.

[1] All economic data sourced from Statistics Canada – National Accounts



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Similarly, industries that support the transportation sector rely on volume sales and small margins and rates of return. Gasoline and diesel retailing, a key transportation sector support industry, has an annual economic output of $6 billion per year. That may seem like a substantial amount, but relative to the 60 billion litres (approximately $60 billion in net sales), this is a small margin. More importantly it does not leave the sector with the available investment capital required for deploying alternative fuels. The transportation support sector, including repair facilities, accounts for $10 billion per year in economic activity, once again it is a sector with relatively small profit margins and with limited financial ability to invest in upgrades to accommodate new fuels and vehicle technologies.

Encouraging innovation in the transportation sector through significant government funding of low emissions technologies such as natural gas powered vehicles, will make the sector cleaner while delivering value to Canadians. The Government of Canada's leadership fostering innovation in the transportation will ensure that the transportation and allied sectors continue to grow. These sectors directly employ a significant number of middle class Canadian families. Given the sector's key role in moving goods, and people, policies that keep transportation costs low, ultimately help to keep all goods purchased by Canadians affordable.

*Recommendation:*
Help Canada's middle class families and small businesses by:

- Allocating $650 million over five years to help de-risk the upfront cost of natural gas vehicles (NGV) through incentives that cover a portion of the incremental cost of natural gas vehicle, marine, or rail engines to encourage deployment.

- Allocating $250 million over five years to provide clean energy infrastructure funds to develop a robust natural gas refueling infrastructure across Canada. Encouraging private investment in natural gas refueling infrastructure will facilitate greater use (CNG, RNG & LNG) as a transportation fuel, but also enable the strategic location of natural gas across Canada for use in applications such as power generation, space and water heating and other uses in remote and off-pipe communities.

**2. What infrastructure needs can best help grow the economy, protect our environment and meet your priorities locally?**

Investing in ongoing innovation, development, and deployment will be critical to retaining Canada's edge in the clean technology sector. Already, Canadian firms in the natural gas vehicle industry have brought effective products to market and have improved on their performance. These ongoing clean technology innovations must continue so that Canada can deliver on its promise to be an environmental leader.

With more than 40,000 medium and heavy duty natural gas vehicles operating in North America, this engine technology is proven and delivering significant emission reductions. In the marine sector, natural gas powered vessels are being deployed to meet the North American Environmental Control Area emissions requirements that came into force in 2015. Finally, the North American rail industry is moving



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ahead with codes and standards development in support of deploying natural gas to fuel low emission freight locomotives. Natural gas vehicles technologies are also being applied for use in off-road applications such as mine haul trucks.

There are a number of environmental advantages of using natural gas as a fuel. Natural gas is a less complex chemical compound that contains fewer additional elements than are found in conventional fuels such as gasoline, diesel, propane, and bunker oil. Burning natural gas reduces end-use carbon dioxide emissions relative to gasoline and diesel by 26-27 per cent because it is less carbon intensive than these fuels. Moreover, the latest generation of medium-duty natural gas engines, offered by Cummins Westport is 20 times cleaner than the current United States Environmental Protection Agency and California Air Resource Board emissions standards for oxides of nitrogen (0.2g/bhp-hr NOx vs 0.02g/bhp-hr NOx).[2] These ultra-low NOX engines have been designated by the California Air Resources Board as having achieved Near Zero emissions levels as equivalent to a 100 per cent battery truck using electricity from a modern combined cycle natural gas power plant.

These attributes are particularly significant when older engines using conventional fuels are replaced by new natural gas engines. Using natural gas instead of diesel in the medium and heavy trucking industry could reduce lifecycle GHG emissions by 10 to 25 percent depending on the engines employed.

The emissions gains from the use of dual fuel engines can vary. These engines displace diesel and depending on the duty cycle of the engine it can displace as much as half the diesel fuel. Spark ignited engines are the most common and widely accepted technology and have the potential to deliver emission reductions of up to 16 per cent over diesel on a lifecycle basis.[3] Cummins Westport, the manufacturer of spark ignited engines has already developed improvements to their engine technologies. These engines are expected to enter the North American market in the next 12 to 18 months.

The first generation of compression ignition natural gas engines have been launched and remain in service in Canada. Westport and other companies are working with OEMs to develop and commercialize next generation high efficiency low emission natural gas engines for global markets. Some of these technologies will be suitable to service the higher horsepower needs of fleets in Western Canada as well as parts of Northern Ontario and Quebec.

There are two measures that will support economic growth and clean technology innovations. The first measure is to provide a five-year commitment to research, development and demonstration of next generation clean natural gas vehicle technologies. The second is support for renewable natural gas, which can be a net zero emission opportunity for the natural gas vehicle sector.

[2] Source: Cummins Westport; www.cumminswestport.com
[3] Source: GHGenius with calculations provided by Don O'Connor



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Supporting Innovation and Technology Deployment

Supporting ongoing innovation and deployment will be critical for Canadian firms in the clean technology sector. The Government of Canada plays a role in innovation through a number of support mechanisms that range from support of pure research – National Science and Engineering Research Council grants – to near market demonstrations – Sustainable Development Technology Canada.

*Recommendation:*
Support the greater use of natural gas as an affordable and clean transportation fuel for heavy duty and medium duty trucks, rail, marine, off road and transit by:

- Allocating $100 million over five years to support natural gas vehicle technology innovation to support research, development and deployment of natural gas solutions to challenges that are unique to the Canadian transportation market.

- Providing certainty around maintaining the current federal fuel tax exemption on natural gas (LNG and CNG) as a transportation fuel until natural gas vehicles have a viable share of the fleet market.

Support Production of Renewable Natural Gas (RNG) in Canada

RNG is a 100 per cent renewable natural gas produced from organic waste from manure, landfills, diverted organic waste, and water treatment plants. The gas is captured, cleaned, and injected in pipelines to be used in the same way as natural gas by homes, businesses, institutions, industry, and vehicles. As a $CO_2$ neutral fuel, RNG can assist communities and governments in meeting their GHG emission reduction and energy sustainability targets. Further, because RNG is produced from local waste sources, it supports local economic opportunities in a range of sectors, including agriculture, where it is produced.

The RNG production potential for Canada is significant. Estimates in a report completed by the Alberta Research Council suggest Canadian potential is equivalent to 1,300 billion cubic feet per year – more than enough to displace all of the diesel currently used in Canada. Blending 10 per cent of Canada's RNG potential into the natural gas supply would increase potential GHG reductions by 1 megatonne. The potential gains from using RNG in the transportation sector could reduce medium and heavy vehicle emissions by 40 MTs achieving net zero emissions in the sector.[4]

Canadian natural gas utilities are well positioned to be leaders in supporting RNG using the existing gas pipeline infrastructure and natural gas equipment without significant new investment. Several Canadian gas utilities have partnered with provincial governments, the private sector, or municipalities to build RNG facilities. These include landfill and farm-based projects in British Columbia, a waste water project in Ontario, and landfill and municipal digester projects in Quebec. Indeed, Canada has the opportunity to be a world leader in the production of RNG as well as improving and deploying this clean energy technology here and abroad.

[4] Alberta Research Council, "Potential Production of Methane from Canadian Wastes", 2008.



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In Canada's transportation sector, CNGVA members in the waste hauling and environmental services industry are already producing RNG for use in transportation. Unfortunately, much of this RNG for transportation is being sold in the United States and California, where Low Carbon Fuel Standards and other regulatory mechanisms, including production and emissions credits are encouraging the use of renewable fuels. Much has occurred in the biofuels industry, Canadian clean tech products are being sold in the United States, but are not being widely used in Canada. This is one example where greater leadership form the Government of Canada can go a long way toward meeting our economic and environmental objectives.

*Recommendation:*
Support the increased production of RNG in Canada by:

- Allocating $75 million in clean energy infrastructure funding to partner with natural gas utilities and municipal and provincial governments to increase the development of new RNG facilities.

- Allocating innovation funding to support the development of RNG technology.

**3. How can we create economic growth, protect the environment and meet local priorities while ensuring that the most vulnerable don't get left behind?**

As was noted, the cost of transportation – moving goods and people – drives through the Canadian economy. Not unlike the cost of home heating and electricity, the cost of transportation has the most significant impact on the lowest income earners. When transportation costs increase due to soaring fuel prices, carbon taxes, cap and trade regimes, or failing infrastructure, it affects the price of essential goods such as food, transit fares, and other necessities. The risk to remote and Northern communities is even higher. Canada's vast and challenging geography is well understood, but less understood is the significantly higher costs for essential goods that are paid by Canadians in remote communities.

Any environmental measure that the Government of Canada considers must take into account the significant impact on transportation costs that may result. It is for this reason that the CNGVA believes the Government of Canada has a responsibility to reduce the costs and risks associated with deploying new alternative fuel vehicles and other environmental measures in the transportation sector. Providing incentives that offset risks for fleets that adopt natural gas vehicles, and that require repayment when those risks decline, will be critical in keeping transportation costs low.

Providing a suite of natural gas vehicle adoption support measures will help keep the costs of Canadian transportation and by extension essential goods within the reach of low-income Canadians.

**4. Is the implementation of these new priorities and initiatives realistic? Will it help us grow our economy?**

Implementation of the six measures proposed will support a balanced transformation of Canada's transportation industry to a lower carbon future. At present there are available technologies that are incrementally more expensive in terms of upfront costs, but that over time are offset by lower fuel costs.



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Reducing the financial risks of a new motor fuel will get Canada's transportation industry over the first critical tipping point and will lead to widespread adoption.

Competitive transportation costs will be critical to our long-term economic prosperity. Traditionally Canada has relied on abundant inexpensive local resources to offset the cost deficits that result from our geography. In assuming a leadership role in the global fight against climate change, the Government of Canada must follow through in supporting cost effective low carbon solutions like natural gas, or risk putting the economy at a significant cost disadvantage relative to global competitors.

Supporting Canadian clean technology innovations will be essential for the Canadian government's aspirations to harness our intellectual resources. In the case of Canada's natural gas vehicle industry, we lead the world in technology development. We now have an immediate opportunity to adopt these technologies in Canada for the betterment of our economy and environment.



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