METHANE FOR MOBILITY HIGHLIGHTED AT WGC 2018

IGU affiliated organisation NGV Global organised a current debate on global opportunities in the transportation market during WGC 2018. **By Dr Jeffrey Seisler and David Perry**

Concerns about global climate change are altering the paradigm for petroleum-based transportation technologies. The rise of municipalities choosing to penalise or deny diesel-powered vehicles access into congested city centres, coupled with increasingly stringent emissions regulations for all forms of transport and the slow rise of viable, affordable alternatives means that natural gas is one of the best-positioned, cross-platform fuel alternatives to fill the void. Despite the fossil fuel detractors who advocate that natural gas applications should be limited due to their impact on global warming, international energy analysts and the natural gas industry remain convinced that responsible usage of all forms of natural gas – fossil and renewable – will continue to make a valuable contribution to the long-term global energy mix.

The International Energy Agency (IEA) *World Energy Outlook 2017* cites the "strong environmental dimension" in the case for natural gas and lauds the "multiple roles across the energy system that no other fuel or technology can match". IGU also "supports urgent and increased efforts towards climate change mitigation", maintaining that "natural gas is perfectly positioned to make a significant positive impact to air quality, while reducing carbon emissions". IGU's 2017 edition of *Global Natural Gas Insights* states: "The use of natural gas in transportation is seeing exponential growth, offering significant long-term cost savings, while greatly improving air-quality".

Legitimising methane for mobility

Natural gas vehicles (NGVs) are rightly claiming their place on the agendas of

The MS Texelstroom*, operated by Dutch shipping company TESO, became the first ferry in Europe to run on CNG in July 2017, reducing emissions and increasing fuel efficiency. The ferry connects the island of Texel with the mainland at Den Helder.*

major gas events such as WGC 2018. There were two panels, one session of papers and multiple presentations at the NGV Pavilion in the exhibition hall throughout the four-day event in Washington. One panel convened by NGV Global, *Global Opportunities in the Transportation Market*, reflected the tone of the messages about natural gas in the transport sector throughout the week.

Panellists supported IGU's position that natural gas "has become a natural part of low-emission and economic transportation choices across the globe, for personal and public transport, heavy-duty trucks, as well as marine and rail transport". With more than 26.1 million natural gas vehicles currently operating world-wide, including growing numbers of marine and inland waterway vessels, there is tremendous demand and need for fuelling infrastructures, favourable and balanced government policies, standards development, education/ training and world-leading technology.

The panel of experts comprised: Peter Keller, SEA\LNG Chairman & Executive Vice President of TOTE; Charles A. Silio, Vice President – Strategy, Corporate Development, & Marketing, Agility Fuel Solutions; Enoh T. Ebong, Deputy Director, US Trade and Development Agency; John Hatley, Americas VP Marine Solutions & Director Market Shaping for Wärtsilä North America, Inc.; and NGV Global's session convenor, Diego Goldin.

Enoh T. Ebong, Deputy Director, US Trade and Development Agency, spoke about how the Agency connects foreign project sponsors with American manufacturers and service providers in order to open new export markets and identify commercial opportunities for US companies. The US government has supported a number of collaborative international NGV programmes in Cairo, Israel and Kazakhstan.

Charlie Silio, Vice President – Strategy, Corporate Development, & Marketing, Agility Fuel Solutions, addressed questions about which road fuel is the key winner. He said there is no single winner on a global scale and does not expect one in the next 10 years, because the best fuel choice depends on vehicle type, use case, local conditions and government policy. This is why Agility Fuel Solutions, a global provider of CNG, LNG, propane, hydrogen and electric systems for medium- and heavy-duty commercial vehicles has diversified its portfolio to include an array of fuel options. "That said, while we may see some change-over in the delivery van and transit bus sectors in some

Global Opportunities in the Transportation Market ***brought together*** **(from left to right)** ***John Hatley, Enoh T. Ebong, Charles A. Silio, Peter Keller and moderator Diego Goldin for a wide ranging discussion on the current state and future prospects for the NGV industry.***

In Santa Monica, California, the Big Blue Bus company, whose entire fleet runs on either CNG or LNG, further reduced their environmental footprint and increased sustainability by switching to RNG vehicle fuel created by processing biogas from organic landfill waste.

geographies to electric, we still expect natural gas or natural gas hybrids to remain the best choice for most trucks and for many bus applications," Mr Silio said.

Advances in CNG onboard storage technology have increased the amount of CNG that can be stored on vehicles. CNG trucks in North America can now achieve more than 800 miles (1,287 km) range between refuelling. European CNG cabover trucks can achieve over 500 miles (804 km) range, as is being demonstrated by fleets in the UK.

In North America the NGV market has shifted almost entirely to 250 bar (3,750 psi) CNG, including for long-haul trucks. Europe has a mix of 200 bar (3,000 psi) CNG in urban applications, and for long-haul trucking a mix of 200 and 250 bar CNG in the UK and Ireland as well as LNG.

In China, electric buses, supported heavily by government policy, have largely displaced natural gas transit bus sales. However, government support has also driven a large LNG-fuelled truck market, now approaching 10% of all truck sales.

Mr Silio added, "India's rapid transition to Bharat Stage VI emissions regulations (similar to Euro VI) and recent approval of Type 4 composite cylinders opens up new opportunities for both LNG and CNG in commercial transport applications there."

Peter Keller, Chairman of SEA\LNG, a multi-sector industry coalition created to accelerate the widespread adoption of LNG as a marine fuel, spoke enthusiastically about natural gas as a safe, clean alternative to diesel that addresses the main issues for the marine industry: air quality and global affordability. LNG almost eliminates SOx and particulate matter, while also considerably reducing NOx and CO_2. He commented how amazingly clean the engine rooms that use natural gas are versus diesel/heavy fuel oil, which still dominate the market today. There are great expectations that the changes to the emissions regulations of the International Maritime Organisation (IMO) will drive a significant portion of the shipping market toward natural gas.

According to SEA\LNG, "As regards to greenhouse gases (GHGs) in the maritime sector, reductions of up to 20% are achievable now with LNG. As technology improves, these reductions

will increase. Furthermore, LNG, in combination with efficiency measures being developed for new ships in response to IMO's Energy Efficiency Design Index (EEDI), will provide a way of meeting IMO's decarbonisation target of a 40% decrease by 2030 for international shipping."

John Hatley, Americas VP Marine Solutions & Director Market Shaping for Wärtsilä North America, Inc. reinforced the message that natural gas is the best alternative to help the marine industry meet the environmental and economic challenges today and into the future. Considering that some ships burn 40,000 gallons (151,416 litres) of fuel per day, changing one ship to LNG is one of the most corporately responsible things for a marine operator to do today. Estimating there are 60,000 ships that could be converted, natural gas is a proven way for marine ships to do their part in helping reduce worldwide pollution in ports and on the open sea.

With the implementation of Emission Control Areas (ECAs), seas with stricter control for airborne emissions – currently in the Baltic, North Sea and on both coasts of North America (and the Caribbean) – Wärtsilä says that large numbers of LNG-fuelled vessels are forecast to be built during the next decades. Europe currently is leading the market. On the other hand, while LNG in road transport has been implemented slowly in Europe and North America, there is also tremendous potential for LNG as a truck fuel. China has an estimated 170,000 LNG-fuelled vehicles compared to some 5,000 in Europe and North America combined. Other high-horsepower applications such as locomotives are also prospective LNG consumers.

Call for policy harmonisation

One policy change to help drive adoption of natural gas in transportation would be a streamlining of gaseous engine emissions approvals. Currently engines approved in the US and EU (and shortly India) are not reciprocally approved for use in other countries with similar or less stringent emissions requirements. As a result, investment decisions on gaseous engine development must rely on potential sales volumes in one market at a time.

Additionally, the costs of re-certifying a retrofitted natural gas engine in what are today niche markets – especially in medium- and heavy-duty vehicles – make it hard to justify investment in new gaseous engine platforms. Certification costs ultimately will be passed on to customers. This in turn leads to a lack of availability of natural gas and propane engines in many applications, and adds to the cost of gas engines where they are available.

More widespread implementation of the IMO rules on NOx emissions and on the sulphur content of diesel fuel will have two positive impacts on LNG in the marine sector: 1) increased demand for low-sulphur diesel fuel will make it very expensive relative to the price of natural gas; and 2) bunker fuel in ports within ECAs ultimately will be prohibited. The future expansion of ECAs to the Mediterranean and the coasts of China, Japan and other important shipping areas (all undetermined at this time) would have additional positive impacts for LNG on the sea.

NGV Global

IGU and NGV Global have resolved to work together more closely in the future to motivate momentum for the development of CNG, LNG and renewable natural gas (RNG or biomethane) as a fuel of choice for all mobility markets.

NGV Global is the international trade association advocating for natural gas as a long-term contributor to a cleaner, low-carbon future. The association encompasses fossil and renewable methane – CNG and LNG – for all mobility applications in road, rail or marine operations. Members include the range of stakeholders including fuel and equipment suppliers as well as other associations supporting methane as a fuel for all transportation sectors.

Dr Jeffrey Seisler, CEO of Clean Fuels Consulting is responsible for NGV Global's international regulatory activities at the UN Economic Commission for Europe. David Perry is NGV Global's Business Manager. Contact NGV Global at admin@ngvglobal.org or visit www.ngvglobal.org.