

Low Emission HGV Task Force

Recommendations on the use of methane and biomethane in HGVs

This publication is out of date and has been withdrawn from GOV.UK. It has been superseded by the [Road to Zero strategy](#), published July 2018.

The Department for Transport has actively considered the needs of blind and partially sighted people in accessing this document. The text will be made available in full on the Department's website. The text may be freely downloaded and translated by individuals or organisations for conversion into other accessible formats. If you have other needs in this regard please contact the Department.

Department for Transport
Great Minster House
33 Horseferry Road
London SW1P 4DR
Telephone 0300 330 3000
Website www.gov.uk/dft
General enquiries: <https://forms.dft.gov.uk>

© Crown copyright 2014

Copyright in the typographical arrangement rests with the Crown.

You may re-use this information (not including logos or third-party material) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence, visit www.nationalarchives.gov.uk/doc/open-government-licence **OGL** or write to the Information Policy Team, The National Archives, Kew, London TW9 4DU, or e-mail: psi@nationalarchives.gsi.gov.uk.

Where we have identified any third-party copyright information you will need to obtain permission from the copyright holders concerned.

Contents

Foreword	4
Recommendations	5
Introduction.....	7
Vehicles.....	9
Refuelling infrastructure	12
Supply of Gas.....	14
Potential benefits.....	17
Conclusion.....	21

Foreword

The low emission, fuel efficient HGV Task Force was established under the 2011 Logistics Growth review to identify and promote low emission road freight technologies. The Task Force membership includes the Freight Transport Association, Road Haulage Association, Chartered Institute of Logistics and Transport, the Society of Motor Manufacturers and Traders, Low Carbon Vehicle Partnership and Transport Knowledge Transfer Network and is supported by the Department for Transport, the Office of Low Emission Vehicles and Defra.

This document has been developed in consultation with members of the Low Emission HGV Task Force working group. It contains views and information from a range of sources including industry experts, Government Departments and published research. Unless explicitly stated, the contents of this document do not reflect the views of any one person, organisation or Department. A full list of those who have participated can be found in the annex to this paper.

The Task Force considers that a key action to help reduce carbon emissions from freight operations and contribute to meeting the targets set out in the Carbon Plan is to increase the use of natural gas and biomethane in HGVs. The Task Force highlights that in doing so, there are wider benefits including lower fuel costs for operators, improved energy security (through less reliance on diesel) and potential reductions in air pollution.

To achieve a substantial switch to gas the Task Force considers that the Government should describe a clear framework and strategy for the role of methane in HGV fuels, taking account of wider government policies on all alternative fuels used for road transport.

The Task Force has therefore set out a series of recommendations that it considers should be undertaken to:

- support the early adoption of gas HGVs in the short term
- inform the development of medium and long term strategies for the role of methane in HGVs

The following list of recommendations, some of which are already underway, is prioritised according to the measures that the Task Force considers will have greatest impact on the use of methane in HGVs. This paper provides a summary of the issues raised. Further detail is set out in the annex.

Recommendations

No.	Recommendation	Ref.
Removing financial and legislative barriers		
1.	<p>Review the range of fiscal incentives for methane, biomethane transport fuels and other fuel options</p> <ul style="list-style-type: none"> • Fuel duty differential for road fuel gases extended to 2024 in autumn statement 2013; with a commitment to consider concessions for methanol • DfT will consider how best to take forward incentives provided to biomethane under RTFO in the light of the outcome of negotiations on the EU Renewable Energy Directive 	<p>4.10</p> <p>4.9</p>
2.	<p>Review the opportunities available to promote uptake of low emission HGV technologies (including gas), in particular considering the use of incentives that could improve the business case for operators.</p> <ul style="list-style-type: none"> • In 2013, the Office for Low Emission Vehicles (OLEV) launched a call for evidence on how best to focus £500 million government funding to support ultra-low emission vehicles from 2015 to 2020. 	5.15
3.	<p>Review the case for allowing recognition for the certified use of biomethane as a transport fuel in carbon reporting.</p> <ul style="list-style-type: none"> • Following a review of the Greenhouse Gas Reporting Guidelines, Defra has recently announced that they intend to allow companies to reflect purchases of biomethane if they hold corresponding documents certifying it has been injected into the gas grid and is currently consulting on how this information should be presented in reports. 	4.13
4.	<p>Revise the Construction and Use Regulations to add other types of fuel, including hydrogen, LNG and CNG, and liquefied and compressed biomethane.</p>	2.10
5.	<p>Actively engage in EU discussions to include amendments to Directive 96/53 on weight classes for additional equipment required by gas vehicles.</p>	2.11

6.	Support discussion with DECC, Defra and CLG on waste policy to assist with removing potential barriers to biomethane supply capacity for freight transport use	4.6
Facilitating implementation and delivery		
7.	Quantify the extent of the issue of unwanted methane emissions and consider what measures are already in place or in development and what further measures are necessary to address this with regard to: (a) vehicles; and (b) refuelling infrastructure and fuel supply,	2.15 3.12
8.	Support the establishment a strategic network of gas refuelling infrastructure, taking account of potential demand from freight operators and other users and the mix of LNG and CNG vehicles in operation.	3.6
9.	Actively engage in the development of EU standards for refuelling infrastructure to promote UK interests.	3.8
10.	Support development and implementation of gas fuel standards	3.10
Improving the evidence base		
11.	Development of model of scenarios for vehicle uptake and biomethane supply for the HGV sector to determine potential GHG savings, costs and benefits in the short, medium and long term.	4.5
12.	Low Carbon Truck Trial and the evaluation of Ten-T funded Gasrec infrastructure to provide evidence on the environmental case for methane, including the extent of methane slip, and provide case studies of real world use of gas.	5.4
13.	Determine and demonstrate ancillary benefits of using gas in HGVs, e.g. air quality and noise.	5.11
14.	Undertake new research to establish gas production pathways in order to inform the calculation of WTW carbon savings for different forms of methane gas fuel	5.7
15.	Improve knowledge of current methane powered vehicle numbers.	2.4

Introduction

- 1.1 This paper considers how best to facilitate the wider take up of methane gas powered HGVs to help reduce carbon emissions from the road freight sector.

1a - Context

- 1.2 Heavy Goods Vehicles (HGVs) contribute 21% of surface transport CO₂ emissions, but make up only 1.5% of road vehicles. The HGV sector needs to make a contribution to meeting the 2050 target for an 80% reduction in overall greenhouse gas emissions based on 1990 levels, set out in the 2008 Climate Change Act. Measures to reduce carbon emissions can also help improve air quality by reducing other pollutant emissions, such as nitrogen oxides (NO_x) and particulate matter (PM). HGVs account for 28% of NO_x emissions and 16% of particulate matter emissions.
- 1.3 The joint Government and Industry Task Force on Low Emission HGV Technologies is considering technological solutions to reduce HGV emissions. An initial report commissioned by the Task Force has identified the long-haul and regional delivery duty cycles account for around 70% of HGV emissions. For both, methane gas engine technologies (CNG, LNG, biomethane) have been identified as having the best potential to deliver the greatest carbon savings from technologies either in or close to market. This paper therefore considers how best to improve the evidence base on the environmental impacts and facilitate the wider take up of methane gas powered HGVs.
- 1.4 This does not preclude development of other carbon reduction technologies for HGVs as part of an overall approach which is technology-neutral, nor does it take account of the contribution that biodiesel can make to reducing carbon emissions. In the longer term other fuel sources may well become technologically and economically feasible for the larger HGVs on these duty cycles. Electric and hybrid power is already in use for smaller HGVs that are mainly used on other duty cycles, such as urban delivery and municipal functions and work to support these vehicles is being pursued separately. The Treasury has recently announced that the Government will consider the need for EU approval to apply a reduced rate of fuel duty to methanol. Currently the high duty rate applied to methanol (relative to diesel and methane) may prevent its being explored as a cleaner road transport fuel.
- 1.5 Activities such as the Logistics Carbon Reduction Scheme (managed by FTA - a voluntary initiative to record, report and reduce carbon emissions) are providing advice and support to operators to take up behavioural and operational measures. The Task Force is also taking

forward other measures such as developing an accreditation scheme to provide information on aerodynamic and low rolling resistance equipment.

1b - Scale of the challenge

1.6 So far, there are only a few hundred gas powered HGVs in use in Great Britain. In order to achieve a significant contribution to carbon reduction, there needs to be a step change in the scale of gas HGV usage. There are around 460,000 HGVs over 3.5 tonnes registered in Great Britain in 2012 (DVLA data). The long haul and regional delivery duty cycles, identified as making the greatest contribution to HGV carbon emissions, typically use articulated vehicles up to 44 tonnes and rigid vehicles in the 18 to 26 tonne categories. Around 192,000 registered HGVs are over 18 tonnes, which gives an idea of the scale of the potential market for gas powered HGVs. This will include some vehicles mainly used on other duty cycles (including municipal refuse and some construction vehicles), but these can still make a contribution to carbon reduction. There are a further 90,000 vehicles between 8 and 18 tonnes, where gas may be a more feasible low carbon option than electric power.

1.7 There are three main areas that need to be considered when identifying the way forward to advance a shift to gas vehicles:

- vehicles and vehicle technology;
- refuelling infrastructure and
- gas supply

1.8 These issues are summarised in the following pages. Chapter 5 looks at the potential benefits of increasing the use of gas in HGVs.

Vehicles

2a – Vehicle types

- 2.1** There is already a variety of gas HGVs in operation and available in Great Britain, from a range of vehicle and equipment manufacturers. Most are dual fuel gas / diesel vehicles, with a mixture of OEM and aftermarket conversions available, for both liquefied and compressed methane gas. There are also some dedicated gas engined vehicles, but currently only up to 28 tonnes, so may not be appropriate for long haul or regional operations. All types are likely to be based on Euro V engines. Various manufacturers are working on providing engines that use gas and are compliant with the Euro VI emission standards that will be mandatory from 2014, but these are not yet operating in practice.
- 2.2** No single data source is available to determine the current number of methane gas fuelled vehicles in the UK. A study carried out by the LowCVP¹ indicated there were around 500 gas HGVs operating in the UK in 2012.
- 2.3** The Vehicle Certification Agency (VCA) issues individual Vehicle Special Orders (VSOs) for vehicles run on LNG and shows nearly 300 new registrations over the 12 months to May 2013. Individual orders are not required for CNG vehicles so there are no equivalent figures. DVLA statistics capture alternative fuels but do not distinguish between methane and LPG.

2.4

Recommendation: consider how to improve data on gas vehicles (recommendation 15)

2b – Vehicle costs and reliability

- 2.5** The main barriers to wider use of gas vehicles are cost and confidence in their reliability, as well as availability of refuelling infrastructure (covered below, section 3).
- 2.6** The cost premium of a gas HGV over the comparable diesel HGV is reported to vary greatly from £15,000 to £44,000. Some stakeholders have expressed a view that as greater volumes of gas HGV are

¹ HGV Biomethane Cost Modelling Study (LowCVP 2012)

produced for the UK market this price premium may reduce. LNG vehicles are more expensive than the CNG equivalent due to the cryogenic tank specification. The current lack of a second hand market for these vehicles limits their resale value and the cost premium is unlikely to be recovered until the used vehicle market becomes familiar with and desires gas vehicles. There are also additional maintenance costs, which may be as much as 10% higher than for a diesel equivalent.

- 2.7 The additional purchase and maintenance costs of gas vehicles (and any infrastructure costs - see below section 3) are usually offset by the significant savings in the cost of the fuel itself.
- 2.8 Anecdotal evidence from fleet operators using gas trucks suggests that there is little difference in performance and reliability between gas trucks and conventional diesel trucks, with some reporting that drivers rate some aspects of performance more highly than for diesel vehicles, including e.g. engine noise and refuelling. However, operators who do not have this current experience may not be willing to risk using a technology which to them is new and unproven.
- 2.9 As well as providing firm evidence on carbon and other emissions performance, one of the main aims of the low carbon truck trial is to demonstrate the operational feasibility of using such vehicles. This should help address misconceptions and build wider confidence in the use of this lower carbon technology. It will also provide evidence on operational and maintenance costs.

2c – Vehicle regulation

- 2.10 The Road Vehicles (Construction and Use) Regulations do not allow for the use of any gas fuels other than LPG. This means that the current fleet of gas fuelled HGVs are only permitted to operate through vehicle special orders. A general order permits the construction and use of vehicles using CNG but individual orders are required for vehicles running on LNG. Vehicles operating on special orders are exempted from annual testing requirements. As the current fleet is small this has not been a problem but as numbers increase it will be necessary to remove the need for special orders to maintain roadworthiness and reduce burdens on industry and Government.

2.11

Recommendation: Revision of the Construction and Use regulations to add other types of fuel, including hydrogen, LNG and CNG, and liquefied and compressed biomethane, which will mean that vehicle special orders will no longer be required (recommendation 4)

2.12 The additional weight of gas tanks will affect the available payload of a vehicle and is especially important when considering vehicles in lower weight classes. The European Commission has proposed a series of amendments to Directive 96/53/EC of 25 July 1996 laying down for certain road vehicles circulating within the Community the maximum dimensions in national and international traffic and the maximum weights in international traffic. One proposal is to increase weight limits by one tonne for electric and hybrid lorries and coaches to accommodate their heavier power trains. Given the increased weight of gas tanks, this provision should be extended to include increased weight limits for gas powered vehicles.

2.13

Recommendation – actively engage in EU discussions to include amendments on weight classes for additional equipment required by gas vehicles. (Recommendation 5)

2d - Methane emissions

2.14 An important issue to consider is methane slip, i.e. unburned methane gas emitted from the tailpipe. Even a very small amount of gas escaping can have a significant negative impact in terms of real CO₂ equivalent emissions. The global warming potential of methane is significantly higher than that of CO₂. Methane is also an ozone precursor and there are target and long term objectives for ozone concentrations. Unlike NO_x and PM, ozone is also a problem in rural areas. There are technical solutions to minimise this issue including engine technology which ensures that all methane is burnt or the installation of a methane catalyst. However, methane catalysts add around £5000 to the cost of the vehicle.

2.15 The low carbon truck trial will also be considering the extent of methane slip from vehicles and during refuelling. Emissions testing will help to evaluate the scale of the problem and the effectiveness of potential solutions.

2.16 Venting of LNG from vehicle fuel tanks has also been identified as potentially impacting on greenhouse gas emissions.

2.17

Recommendation – Quantify the extent of the issue of unwanted methane emissions from vehicles and consider what measures are already in place or in development to address and what further measures are necessary to address this (recommendation 7a).

Refuelling infrastructure

- 3.1 Operators tend to have a preference for either liquefied or compressed gas, depending on their location, operations and routes, including return to base frequency. CNG use normally requires access to the gas grid, while LNG stations can be located more flexibly in line with demand as they are supplied by road tanker. LNG can also be evaporated and delivered in CNG form at LNG refuelling points. Therefore a range of infrastructure for both LNG and CNG refuelling is required.
- 3.2 Different set-ups can be more or less energy intensive and contribute to the overall carbon footprint of using a particular fuel.
- 3.3 Presently there are a limited number of gas refuelling stations across the UK; larger operators tend to use their own on-base refuelling stations. A better public refuelling infrastructure would enable operators who are unable to establish their own refuelling facilities to use gas vehicles, and would also allow those operators who generally refuel at base to increase payload or cover longer distances.

3a - National refuelling infrastructure

- 3.4 The first public access bio-LNG / CNG station opened by Gasrec at Daventry (DIRFT) in May 2013 can refuel up to 250 trucks per day, with plans to increase that capacity to around 700 vehicles per day. Further stations around the country are planned.
- 3.5 The Royal Borough of Greenwich council, in partnership with the Transport Knowledge Transfer Network and other organisations, has produced a gas vehicle website which provides a comprehensive map of existing and planned refuelling infrastructure. It includes stations that will be set up as part of the low carbon truck trial.
- 3.6

Recommendation: Support the establishment a strategic network of gas refuelling infrastructure, taking account of potential demand from freight operators and other users and the mix of LNG and CNG vehicles in operation (recommendation 8).

3b - Standards

3.7 It is important that all storage and refuelling facilities, including private ones at an individual operator's depot adhere to appropriate safety and technical standards. These can be aimed at minimising accident risks and for example related to greenhouse gas emissions from the escape or venting of methane. Some standards are already required, through the planning system and safety regulation. Others have yet to be developed. The EU's Clean Power for Transport proposals contain common technical specifications and reference to standards and regulations. A general approach is expected to be adopted in December 2013.

3.8

Recommendation: Actively engage in development of EU standards for refuelling infrastructure to promote UK interests (recommendation 9).

3.9 There are strict gas specifications for the GB network. Any new fuel specification would need to be aligned to the current gas specification used in the network – or adapted at exit points. Currently gas quality standard regulations for the network are overseen by OFGEM and the Health and Safety Executive.

3.10

Recommendation: Support development and implementation of gas fuel standards (recommendation 10).

3.11 For liquefied gas, venting can be a particular issue if it is stored without being used or the storage container being refilled, as it is subject to thermal evaporation, or boil-off. Various solutions have been developed, some may be more energy intensive than others and this should be taken into account in assessing overall GHG emissions.

3.12

Recommendation: Quantify the extent of the issue of unwanted methane emissions from refuelling infrastructure and fuel supply and consider what measures are already in place or in development to address and what further measures are necessary to address this (recommendation 7b).

Supply of Gas

4a - Natural gas

4.1 Currently the UK's natural gas supply is made up of a mix of domestic supply and imports. In 2011, domestic supply covered around half of the UK's demand for gas, and the remainder of demand was met by imports. By 2030 the UK will require up to 28GW of new gas plant, in part to replace coal, gas and nuclear plant as it retires off the system. As the UK transitions to a low carbon economy, and with a decline in domestic oil and gas production, the UK will become increasingly reliant on imported energy.

4b - Biomethane supply

4.2 Biomethane can be produced from a variety of feedstocks and has been developed and encouraged as a new and renewable energy source over recent years. Currently the only source of biomethane used directly as a road fuel is landfill waste, although this is a declining resource as due to stricter waste management policies aimed at avoidance of landfill.

4.3 The Government has committed to promote an increase in the generation of energy from waste through anaerobic digestion. Defra and DECC developed with stakeholders a Strategy and Action Plan – published in 2011 - to tackle the barriers to AD uptake. Almost all the actions have now been delivered. However, there is a finite amount of available waste feedstock for AD and Government is not looking to increase AD from crops. The Government's Anaerobic Digestion Strategy estimated production of between 3 and 5 TWh of electricity from AD by 2020 (less than 1% of the total UK gas demand in 2012) based on realistic assessments of the amounts of feedstock that may be available. The ADBA has estimated that if all available feedstock were treated through anaerobic digestion then up to 33.8 TWh of energy would be available by 2020. However this figure includes a significant contribution from food waste and ADBA notes that a lack of separate food waste collection prevents the use of this feedstock with only 7% of UK household food waste being sent to AD in 2011.

4.4 There are different processes for upgrading raw biogas to biomethane and some processes may offer a more efficient pathway than others. Upgrading of biogas to biomethane tends to be economically viable for larger plants only, while liquefaction of biomethane is only deemed cost effective at even larger quantities. However, technology for more efficient upgrading and liquefaction for smaller capacity biogas production is being developed, which would bring a greater proportion of biogas production into scope for potential use as a transport fuel.

4.5

Recommendation: Develop of model of scenarios for vehicle uptake and biomethane supply for the HGV sector to determine potential GHG savings, costs and benefits in the short, medium and long term (recommendation 11).

4.6

Recommendation: Support discussion with DECC, Defra and CLG on waste policy to assist with removing potential barriers to biomethane supply capacity (recommendation 6).

4c - Availability of biomethane for transport use

4.7 There are several incentive regimes for the use of renewable energy in different sectors. Lots of factors will influence potential biomethane producers' decisions on where to supply biomethane but some industry members have raised concerns about the current range of incentives which may have the effect of diverting biomethane away from use as a transport fuel.

4.8 The Renewable Heat Incentive (RHI) provides an incentive for biomethane (excluding biomethane from landfill) to be injected into the grid, while the Renewable Transport Fuel Obligation (RTFO) provides an incentive for the supply of biomethane directly as a transport fuel i.e. not via the grid. However, when looked at on the basis of the typical value of financial support per unit of gas, the RTFOs offer less support.

4.9 The European Commission proposed a Directive in October 2012 to amend some aspects of the Renewable Energy Directive relating to biofuels. Negotiations are ongoing. Waste-derived fuels, including biogas, receive double rewards under the RTFO. The European Commission is currently considering reviewing the Renewable Energy Directive and whether to count sustainable biofuels, such as biomethane derived from waste, more highly - potentially double or quadruple counting - towards the 10% target for renewable transport energy. Various proposals are under discussion, including some which set national targets for the supply of more sustainable biofuels. Following these negotiations, the government will consider the case for reviewing the support offered for more sustainable biofuels such as biomethane.

4.10

Recommendation: Review the range of fiscal incentives for methane, biomethane transport fuels and other fuel options (recommendation 1)

4d - Biomethane supplied through the national transmission system

4.11 Some operators are prepared to pay a premium for a biomethane certificate which demonstrates that a given amount of biomethane has been produced and supplied but where the operator is not physically able to use the biomethane in its vehicles, using instead natural gas. Operators believe this will help encourage the production and use of biomethane as a road fuel and want to be able to use biomethane conversion factors when reporting their companies' total carbon emissions. There are currently two schemes in place for tracking and certifying biomethane used in this way: the Biomethane Certification Scheme (BMCS) and the Green Gas Certification Scheme.

4.12 At present freight operators who wish to support biomethane in this way are unable to apply Defra's biomethane conversion factor in carbon emissions reporting.

4.13

Recommendation: review the case for allowing recognition for the certified use of biomethane as a transport fuel in carbon reporting (recommendation 3)

Potential benefits

Summary of benefits associated with using methane and biomethane

Potential benefits of methane	Added benefits of biomethane
Reduced carbon emissions	Greater reduction in carbon emissions
Reduction in air pollutant emissions affecting local air quality	Reduced reliance on imported gas
Reduction in fuel costs for HGV operators	Sustainable waste management and reduction of methane emissions
Greater fuel security and reduced reliance on imported diesel	Job creation and economic growth from increase in biomethane production
Reduction in noise levels from dedicated gas engines	Production of co-products: bio-fertilizer

5.1 Three of the key benefits identified above (greenhouse gas emissions, air quality and fuel costs) are outlined below in further detail.

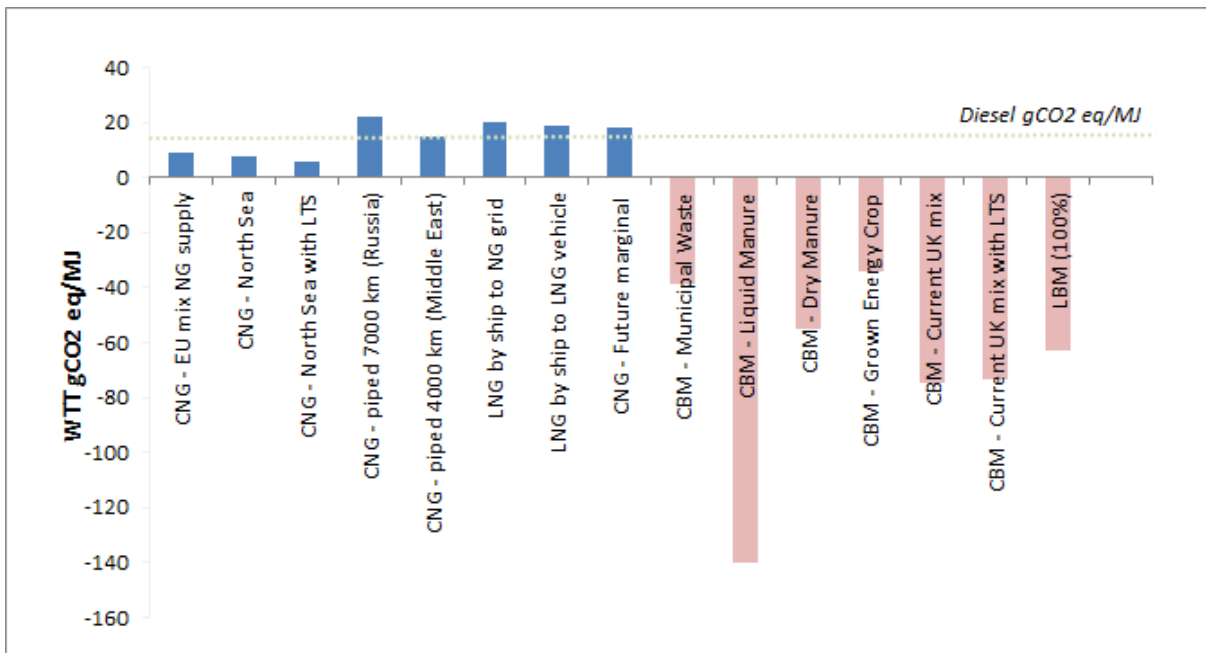
5a - Greenhouse Gas Emissions

5.2 The greenhouse gas emissions relevant to methane gas vehicles are carbon dioxide and methane.

5.3 Tank-to-wheel (tail-pipe) CO₂ emissions vary depending on the HGV gas engine technology with the range of CO₂ emissions savings compared to an equivalent diesel estimated to range from 0 to 14% improvement. There is a lack of real world CO₂ emissions data for dedicated gas and dual fuel HGV; this information would be useful for giving confidence in the potential saving achieved by different gas engine technologies.

5.4 One dis-benefit associated with using methane and biomethane as a transport fuel is the potential for methane leakage from gas infrastructure and combustion slip i.e. unburned methane gas emitted from the tailpipe due to incomplete combustion. The global warming potential of methane is 25 times that of CO₂, therefore even small amounts of methane escaping can have a significant negative impact in terms of real CO₂ equivalent emissions.

- 5.5 The Low Carbon Truck Trial evaluation will consider the levels of methane emitted from vehicles and infrastructure, and will help inform future policy regarding gas vehicles.
- 5.6 Well-to-tank (WTT) CO₂ and methane emissions (CO₂eq emissions) are influenced by where and how natural gas and biomethane are produced, in combination with the method of transmission and distribution. CO₂eq emissions are highly variable along these pathways. Diagram 1, provided by the Low Carbon Vehicle Partnership² is an indicative presentation of CO₂eq emissions associated different WTT pathways for natural gas and biomethane. The data clearly illustrates that in some cases the WTT pathway for natural gas can be higher than diesel. Biomethane gas has lower greenhouse emissions, achieving significant benefits compared to diesel. This is primarily a result of production of biomethane capturing methane which would otherwise be released to atmosphere during the decomposition of organic waste.
- 5.7 Diagram 1 – Indicative Well to Tank CO₂(e) emissions for natural gas and biomethane



- 5.8 It is important to consider the impact of well to tank emissions as well as the tank to wheel emissions in order to be clear about the overall (well to wheel) emissions associated with using gas in HGVs instead of or as well as diesel.

5.9

Recommendation: Undertake new research to establish gas production pathways in order to inform the calculation of WTW carbon savings for different forms of methane gas fuel (recommendation 14).

² *Data sources: Well to Tank Report Version 4 (EUCAR/CONCAWE 2013) and Low Carbon Bus Technology Roadmap (LowCVP 2013)

- 5.10** As noted at section 2d, in order to ensure the highest levels of WTW greenhouse emission reductions, best practice measures need to be in place to avoid methane emissions.

5b - Air Pollution Emissions

- 5.11** Displacing diesel with gas is expected to help to deliver reductions in emissions of nitrogen oxides (NO_x) and particulate matter (PM) and therefore benefit air quality. Further work is necessary to develop emissions factors for gas and dual fuelled vehicles. Although the focus of this report is long haul and regional delivery cycles, establishing the infrastructure to support gas as an alternative fuel will provide opportunities for gasification of fleets outside long haul and into local deliveries in towns and cities where the impact of air pollution is greatest. This will help to support local measures and low emission strategies to promote gas vehicles.
- 5.12** Current dual fuel (LNG or CNG) engines meet Euro V standard and manufacturers are working gas engines that are compliant with the Euro VI emission standards that will be mandatory from 2014; these are not yet operating in practice.
- 5.13**

Recommendation: Determine and demonstrate ancillary benefits of using gas in HGVs, e.g. air quality and noise (recommendation 13).

5c - Fuel Cost Savings

- 5.14** A biomethane HGV cost modelling study undertaken by LowCVP demonstrated that with average vehicle duties and access to large capacity refuelling stations an HGV operator should make a cost saving against an equivalent diesel vehicle within the first-user lifetime of the vehicle. This would be for all types of gas vehicle (whether dedicated or dual fuel) and for all vehicle weights. Depending on vehicle type cost savings for the first-users ranged between £7,000 and £51,000 compared to the diesel equivalent at 2010 prices. This means a break-even time for paying back the additional capital cost of the vehicle compared to diesel operation of between 2.8 and 6.6 years, and potentially longer for the heaviest vehicles.
- 5.15** The modelling showed that the cost saving varies by vehicle, and is proportionally less for lighter vehicles than for heavier vehicles. Heavier HGV typically cover more miles and undertaking higher annual mileages improves the cost saving against the diesel equivalent and quickens the

time to break-even. The cost of operating dedicated or dual fuel truck are most attractive where operators can access a 10,000kg/day refuelling station (sufficient for 50-100 trucks), with 5,000kg/day stations also returning similarly attractive values.

- 5.16** Fuel duty is levied on gas at an energy adjusted rate which is around 70% lower than the diesel duty rate. This duty differential has been guaranteed on a rolling 3 year basis, a provision that has been in place for over 10 years. Operators stated that this 3 year period has not provided them with sufficient long-term certainty about the recovery of additional investment costs in gas HGVs through fuel cost savings to make the business case and encourage significant uptake. Operators also found the uncertainty had knock-on effects for investment in infrastructure too. It has recently been announced in the Autumn Statement 2013 that the fuel duty differential will be maintained until 2024 with a review in 2018.

5.17

Review the opportunities available to promote uptake of low emission HGV technologies (including gas), in particular considering the use of incentives that could improve the business case for operators (recommendation 2).

Conclusion

There is potential for a breakthrough in the take up of methane gas HGVs, but there are many challenges which need to be addressed to create the conditions for road freight operators to invest in new technologies and infrastructure. In addition, work needs to be done to understand the long term environmental case for moving to methane gas.

The Task Force considers that these recommendations will help support the use of methane in HGVs and contribute to the development of a robust evidence base to help inform future Government policy.