VOLVO

Företag/Company name	**Dokumenttyp**/Type of document		
AB Volvo	Position		
Dokumentnamn/Name of document	**Utgåva**/Issue	**Reg nr**/Reg. No.	**Sida**/Page
Volvo Group position on Directive 2014/94/EC	1	AA16600-16-005	1 (5)
Utfärdat av (avd nr, namn, tfn, geogr plac)/Issuer (dept, name, phone, location)	**Sign**	**Datum**/Date	**Infoklass**/Info class
AA16600, 29200, KUGG5		2016-04-12	External
Fastställt av (avd nr, namn, tfn, geogr plac)/Approved by (dept, name, phone, location)	**Sign**	**Datum**/Date	**Giltig**/Valid
AA13000, VHK		2016-04-19	

Mottagare (avd nr, namn, geogr plac)/Receiver (dept, name, geogr plac)

Volvo Group position on Directive 2014/94/EC regarding deployment of alternative fuels infrastructure

1. Summary

This paper focus the need for alternative fuels infrastructure for heavy duty vehicles. It is directed towards Member States development of national targets and objectives concerning deployment of alternative fuels infrastructure.

Both society at large and vehicle customers in general must use their resources wisely. Thus, deployment of new fuel infrastructure should only be done for low carbon fuels that will give environmental benefits for society and increased profitability for vehicle operators compared to conventional fuels. Any national policy framework should also be flexible enough to cover new opportunities that might evolve in the 2030 timeframe.

Firstly, the existing fuel infrastructure must be utilized by blending of renewable fuels into conventional fuels. Secondly, there is an immediate need to deploy new fuel infrastructure for:

- Electricity, preferably from renewable resources for urban applications.
- Methane, preferably from renewable resources.
  - Liquid methane for long distance applications.
  - Compressed methane for urban truck applications.

In the longer run, mainly depending on the production development, we see a need to deploy fuel infrastructure for Dimethyl ether – DME.

2. About the directive

The Directive 2014/94/EC, “Deployment of alternative fuels infrastructure”, establishes a common framework of measures for the deployment of alternative fuels infrastructure in the Union in order to minimise dependence on oil and to mitigate the environmental impact of transport.

Each Member State shall adopt a national policy framework for the development of the market as regards alternative fuels in the transport sector and the deployment of the relevant infrastructure. Member States shall notify their national policy frameworks to the Commission latest by 18 November 2016.

‘Alternative fuels’ means fuels or power sources which serve, at least partly, as a substitute for fossil oil sources in the energy supply to transport and which have the potential to contribute to its decarbonisation and enhance the environmental performance of the transport sector.

'Alternative fuels' include, but are not limited to:
— electricity
— hydrogen
— biofuels (liquid or gaseous fuel for transport produced from biomass)
— synthetic and paraffinic fuels
— natural gas, including biomethane, in gaseous (CNG) and liquefied form (LNG)
— liquefied petroleum gas (LPG)

Each state shall make sure that an "appropriate number" of recharging and refueling points are made available at certain points of time (year 2020, 2025 and 2030) covering electricity, hydrogen and natural gas. The degree of flexibility is high due to the fact that each member state can decide what an "appropriate number" is.

3. General about alternative fuels and commercial vehicles

A widespread move to alternative fuels will only take place when their profitability for the vehicle operators is similar to, or better than, that of conventional and fossil fuels. There is a growing demand for transports by renewable fuels from niche customers. The introduction of environmental zones or similar actions in cities will also be a driver for alternative fuels and propulsion systems. However, even a much expanded alternative fuel infrastructure will not guarantee the use of the alternative fuel.

The key to profitable alternative fuels lies in the cost of producing the fuel and in the taxation of the fuel, two parts that often constitutes 80-90 percent of the fuel price at the filling station. The cost for fuel distribution or infrastructure is normally of less importance for the overall profitability.

Fuel infrastructure for commercial vehicles is less complicated to arrange than for passenger cars. The main reason is that many trucks and buses manage with only one filling station because they return to the same depot every day. For city buses with predetermine driving path is the location of infrastructure of charging points easier than for most the other alternatives.

Some alternative fuels require more expensive vehicle technology which has to be compensated by a lower fuel price compared to the conventional fuel and vehicle. One example is methane that requires significantly more expensive fuel tanks compared to conventional diesel fuel. To compensate for higher vehicle cost, methane fuel must be approximately 30-40 per cent less expensive than conventional diesel fuel.

Incentives for alternative fuels and vehicles may be necessary to stimulate use of new fuels. Such incentives have to be designed so that they are neutral from a technical viewpoint. However, in the long-term all fuels which aim to take a significant share of the market must be successful without specific support.

Energy efficiency and greenhouse effect, well-to-wheel, linked to useful work are two important parameters when evaluation alternative fuels and their possibility to play a major role in the future.

Standardization and harmonisation of the alternative fuel quality are also of great importance. The fuel is an integrated part of the quality assurance system and will influence the technical functionality, performance, emissions and warranty issues.

4. Volvo Group position on deployment of alternative fuels infrastructure

4.1. Alternative fuels that can utilize existing infrastructure

Some of the alternative fuels can utilize the existing fuel infrastructure and do not require any new infrastructure.

- Biodiesel (FAME)
- Synthetic diesel
- HVO (Hydro Treated Vegetable Oils)
  - All three fuels above should be blended into conventional diesel fuel within existing diesel fuel standards. For specific applications and customers, separate refuelling points with pure fuels (100 %) can easily be arranged within normal business agreements with the fuel providers.
- Biomethane
  - Available volumes could be blended into the existing natural gas network. However, for biomethane there is also a need to further expand the infrastructure, see chapter 4.3.
- DME
  - DME could be blended into the existing distribution network for propane/LPG up to approximately 20% without any modifications.

4.2. Basic demands regarding deployment of new alternative fuels infrastructure

Before Member States establishes their common framework of measures for the deployment of alternative fuels infrastructure for commercial vehicles there is a need to consider the following two areas:

- **Viable business case for the end customer**
  The commercial aspects for the use of the alternative fuel, both short and long term, must be carefully considered before mandating or incentivising a deployment of an alternative fuel infrastructure.

  — Important factors to evaluate are:
    - ♦ Fuel quality and standardisation
    - ♦ Fuel production cost and potential volumes
    - ♦ Fuel taxes
    - ♦ Additional vehicle cost (tanks, batteries, maintenance etc.)
  — Incentives may be necessary in order to reach a viable business case. However, in the long-term all fuels which aim to take a large share of the market must be successful without specific support.
  — Taxation and incentives need to be known at least five years in advance.

- **Low carbon fuels**
  - Alternative fuel infrastructures should be focused on fuels that contribute to decarbonisation and enhance the environmental performance. Energy efficiency and greenhouse effect, well-to-wheel, linked to useful work by the vehicles are two of the most important factors to evaluate.

The conclusion is that deployment of fuel infrastructure should only be done for low carbon fuels that bring environmental benefits and give vehicle operators a profitability that is similar to, or better than, that of conventional and fossil fuels. This is valid for all alternative fuels.

4.3. Deployment of new alternative fuels infrastructure

The Volvo Group has identified two alternative fuels with an immediate need for deployment of new fuel infrastructure:

- Electricity, preferably from renewable resources for urban applications.
- Methane, preferably from renewable resources.
  - Liquid methane for long distance applications.
  - Compressed methane for urban truck applications.

4.3.1. Electricity, preferably from renewable resources, for urban applications

- Deployment of electricity infrastructure for urban applications with plug-in or full electric vehicles is needed, initially for public transport services by city buses and as a second step, for distribution trucks and inter urban buses.
- The infrastructure must be adapted to heavy duty vehicle recharging requirements, for example regarding technical specifications and safety.
- There is an urgent need to establish European or global technical standards for recharging stations for heavy duty vehicles, especially city buses, in order to build up open systems possible to use by all OEMs. For city buses Volvo Group supports Combo 2 for overnight charging and OppCharge (Automatic Conductive Charging Interface) for charging at end stations. Specific national standards and solutions should be avoided.
- Incentives, both for building recharging points and for purchase of plug-in and fully electric buses and distribution trucks will be needed when competing with other low carbon alternatives with subsidies.
- Support to the development and demonstration of dynamic charging should also be included in the 2030 perspective.

4.3.2. Methane, preferably from renewable resources

- Liquid methane is needed for long distance applications in order to get an acceptable driving range (500-1 000 km). Compressed methane is suitable for urban and short distance truck applications.
- Expanded infrastructure for compressed methane is needed in urban areas, at least one refuelling point every 50 km. Main applications are refuse and distribution trucks.

- Expanded infrastructure for liquefied methane is mainly needed along the Trans-European Network for Transport (TEN-T) and in connection to major distribution centres, at least one refuelling point every 100-150 km. The interest to use LNG in the maritime sector could be beneficial for the LNG availability along coast lines and inland waterways.
- Filling stations need to be adapted to heavy duty vehicles, both regarding filling capacity and space suitable for heavy duty trucks with semitrailers and trailers.
- Methane filling stations must be designed to minimize methane emissions via leakage and ventilation.
- European or global technical standards for fuel quality (CNG/CBG and LNG/LBG), delivering properties (pressure/temperature/flow/ventilation), safety and nozzle standard must be established. Specific national standards and solutions should be avoided.
- Incentives, both for building refueling points and for purchase of methane powered vehicles will be needed.

4.3.3. Dimethyl ether - DME

- Deployment of a DME infrastructure will probably be needed. However, the first and foremost need is increased production of DME, preferably from renewable source. This should be stimulated via reasonable taxation and support to fuel production investments.
- Infrastructure development is comparably inexpensive and will follow.

Abbreviations

CBG – Compressed BioGas
CNG – Compressed Natural Gas
DME – Dimethyl ether
FAME – Fatty acid methyl esters (Biodiesel)
HVO – Hydro Treated Vegetable Oils
LBG – Liquefied BioGas
LNG – Liquefied Natural Gas
LPG – Liquefied Petroleum Gas
OEM – Original Equipment Manufacturer