Volvo Group tests alternative fuels

The Volvo Group is studying and evaluating all of the fuels that have the potential to power its products. 'Well to wheel' means that all relevant stages of the fuel chain are considered. This includes the cultivation (including fertilisation) and harvesting of the raw material, its transport to the fuel production plant, production and distribution of the fuel to refuelling stations, and its use in vehicles.

Biodiesel

Biodiesel is produced by the esterification of vegetable oils. Rapeseed oil and sunflower oil are the most common feedstocks in Europe. Biodiesel can be mixed with conventional diesel fuel.

Synthetic diesel

Synthetic diesel is a blend of synthetically generated hydrocarbons produced by the gasification of biomass. Synthetic diesel can be blended with conventional diesel oil without problem.

Dimethyl ether (DME)

A gas that is handled in liquid form at low pressure, dimethyl ether (DME) is produced by the gasification of biomass.

Methanol/Ethanol

Methanol is a product of biomass gasification, while ethanol is produced by fermentation from crops with a high sugar or starch content. Research into the production of ethanol from cellulose is under way at present.

Biogas

Biogas is a gaseous fuel consisting mainly of hydrocarbonated methane. Biogas can be extracted from sewage treatment plants, refuse dumps and other sources of biologically degradable material.

Biogas + biodiesel

Supplied by separate tanks and injection systems, biogas and biodiesel are used in combination. A small percentage (10 percent) of biodiesel or synthetic diesel is used to achieve compression ignition.

Hydrogen + biogas

Hydrogen gas can be mixed with biogas in low concentrations, in this case 8 percent by volume. Hydrogen gas can be produced by biomass gasification or electrolysis of water using renewable electricity. A spark-ignition engine is required.

PERSONAL FILE

- Name: Edward Jobson
- Age: 46
- Previous experience: PhD in catalysis from ETH-Zürich in 1989. Manager at Volvo Technology in combustion, emissions and alternative drives from 1989 to 2006. Professor of catalytic technology at Chalmers University of Technology (CTH), Göteborg since 1998. Environmental manager of Volvo Buses since 2006.
- Family: Wife Carina and three daughters aged 10, 12 and 15
- Tip: www.gapminder.org is a site where data on everything from emission levels and urban populations to incomes and economic development can be displayed and compared.

Volvo Buses Environmental Manager Edward Jobson:

'Our knowledge and understanding of environmental issues offers us major business opportunities'

A Volvo hybrid bus operating in a BRT system, using locally produced biofuel in an environmentally favourable manner. What could be better for the environment asks Volvo Buses Environmental Manager Edward Jobson.

"I believe that our hybrid will be a huge success."

►There is no doubt that a higher level of atmospheric carbon dioxide (CO_2) contributes to global warming. According to a report by British economist Nicholas Stern, about 14 percent of the world's total emissions of greenhouse gases are generated by transport.

"Bus traffic, in turn, accounts for one hundredth of this, or a total of 0.14 percent," says Edward Jobson, who has been environmental manager of Volvo Buses for the last year.

So what can Volvo Buses do?

"We must offer environmentally compatible products. But we must also be involved and use our influence to ensure that public transport enjoys a higher priority than the car. One way is to promote BRT (Bus Rapid Transit) systems with the same capacity as a metro."

THE NEED TO TRAVEL IS BASIC. And public transport is the only solution as more and more people move to our towns and cities:

"In that situation, buses are needed. And I don't say that just because I work here – it's a fact. Although every bus that is cleaner plays a role, the most important thing is to replace cars with buses," comments Edward Jobson.

Public transport systems are currently undergoing expansion in Europe, North America and South America as space for cars simply runs out. In Asia, emissions of carbon dioxide are increasing, due in part to the growing consumer power of India and China. However, the problems are evident, and emissions are causing health problems in Beijing and Shanghai.

"We have had enquiries for environmental buses from Shanghai, and interest in Euro IV or Euro V engines has also been expressed," says Edward Jobson.

That the Volvo Group is part of the problem, but also part of the solution, was the message when the Group recently unveiled seven demonstration vehicles in Stockholm and Brussels to show what can be done using the modern diesel engine as base unit.

The vehicles were powered by fuels that contribute no excess carbon dioxide to the atmosphere since they are produced from renewable raw materials. The quantity of carbon dioxide released is exactly the same as that absorbed by the raw material during its growth.

"Alternative fuels must be climate or CO_2-marked. Otherwise, we will fall into the same trap again," says Edward Jobson.

AS ENVIRONMENTAL MANGER at Volvo Buses, he takes part frequently in outside activities, and meets often with politicians, decision-makers and media people. The Volvo Group organised several seminars in Brussels, where Edward Jobson contributed as an expert to a seminar on urban transportation.

"This was a good debate that provided Volvo Buses with good exposure. Interest in our hybrid buses was also considerable," he recalls.

The current demand for hybrid buses is extremely high and Edward Jobson believes that it can only increase. However, today's hybrids are very expensive. Next year, Volvo Buses will be supplying hybrid buses to London for field trials and the first commercial models are due to appear in two years time.

"Our parallel hybrid is greatly superior to the hybrids available today, and even to modern buses in general. Although the product costs are somewhat higher, these will fall as sales volumes increase. In addition, the fuel costs will be at least 30 percent lower in urban traffic," says Edward Jobson.

"Our knowledge and understanding of environmental issues offers us major business opportunities. And our prospects of beating the competition are high," he adds.

Edward Jobson refers particularly to the new ITS4Mobility system, which is an intelligent, mobility-enhancing transport system and a BRT component. The urban traffic program can help an operator to keep up to date regarding fuel consumption and the location of the vehicles in the system.

THE FOCUS ON IN-HOUSE environmental activities will also increase during the autumn and winter as Volvo Buses develops both the Bus Environmental Management System (BEMS) and an environmental organisation.

"The entire organisation will be responsible for environmental issues, not just myself as environmental manager," emphasises Edward Jobson.

"This is an ongoing task. Our future products must be manufactured in an environmentally compatible manner. We must understand what drives our customers and what they require. And just as importantly, we must help them to identify the right environmental solutions."

LOTTA BÄVMAN

FACTFILE

Volvo Group hybrid system

►A parallel hybrid is a combination of a conventional diesel engine and an advanced electric motor. Coupling these in parallel enables the units to work interactively to power the vehicle. Fuel conservation is the main advantage of the hybrid, particularly on runs involving frequent braking and acceleration, as in the case of a city bus. Calculations indicate a fuel saving of at least 30 percent.

►Nova Bus is currently marketing buses powered by a North American hybrid system.