



# Electric car **bumps** into ethanol in Sweden

Sweden has set itself the goal of being the “world leader” in reducing CO<sub>2</sub> emissions. But its cars belong to the oldest and most fuel-inefficient in Europe. Moreover, heavy state support for ethanol hinders the advent of the electric car.

| by Reiner Gatermann

The Swedish motor vehicle industry association, headed by Volvo, Scania and Saab is optimistic: ‘The dependence of road traffic on oil can be overcome by 2020 and all new motor vehicles should then be fossil-free’, it has said.

The government is following the same line: ‘By 2030 Sweden should have a fleet of motor vehicles which has no reliance on fossil fuels’, it has said. This would mean that no more petrol or diesel vehicles would be sold from around 2015. How do the Scandinavians propose to achieve this?

Swedish industry has really latched on to the climate and security of supply question and there is a long list of schemes which involve automakers and energy suppliers as well as the farmers who want to contribute by producing biogas. Experiments with ethanol incorporation began at the start of this decade. In 2005 the government took the decision, still controversial today, to compel petrol

stations to offer an alternative fuel. While most countries opted to use ethanol merely as an additive, Sweden decided to push ethanol as a full-fledged substitute for petrol. More recently, the government has mandated the installation of at least one pump offering biofuels in every petrol station with sales of more than 1000 m<sup>3</sup>. The natural choice for the oil companies has been to offer ethanol (E85), as it was cheapest to set up. By now over 1400 out of a total of 3245 petrol stations offer E85. When the plan is fully implemented the number will reach 2400.

## Bizarre |

Of course the motor vehicle manufacturers for the most part also made the change to the new fuel, although some, like Volkswagen, delayed the decision for a long time, and others, like Toyota, have never offered ethanol-petrol/diesel hybrids in Sweden at all. Sceptics see in the government policy the hand of the

two large domestic carmakers, Volvo and Saab. Sweden even managed to get approval from Brussels to exempt imports of ethanol from tax duties until 2015. It has classified the ethanol hybrids as “miljöbil”, or environmentally-friendly cars, as a result of which they can make use of various lucrative financial and fiscal incentives.

The environmental systems analyst and one of Sweden’s leading experts on the environment Per Kägeson, in his book *Miljöbil på villovägar* (the environmentally-friendly vehicle on the wrong course), constantly places the word “miljöbil” in quotation marks, as he believes that an ethanol/petrol/diesel hybrid is anything but environmentally-friendly. He points out that the government does not set any mileage standard for these cars. Every ethanol hybrid is considered a “miljöbil”, even if it mainly runs on petrol, as happened in 2008, when the ethanol price



was significantly higher than that of petrol, despite the fact that ethanol is exempt from fuel taxes. According to Kågeson, the government fails to put any pressure on Swedish manufacturers to develop more fuel-efficient cars. As a result, in 2005 Swedish road traffic produced 10 percent more CO<sub>2</sub> emissions than the European average. One reason for this was that, due to the powerful engines in the large Swedish cars, energy consumption was 20 percent higher than in the rest of Europe. Kågeson argues that the definition of a “miljöbil” is bizarre. “They are defined as cars run on alternative fuels whose fuel consumption per 100 km does not exceed the equivalent of 9.2 litres of petrol. This corresponds to 218 g of CO<sub>2</sub> emissions per kilometre. At the same time, however, a car which is run on fossil fuels alone is

not allowed to emit more than 120 g per kilometre.’ And no other country in the world offers higher subsidies for “environmentally friendly” cars than Sweden, the critical environmental expert says.

The preferential treatment of ethanol, which according to Kågeson is described by foreign environmentalists as “national greenwashing”, is not set to change much in the future however. “The government and parliamentary parties are clearly prepared to pay several tens of billions of kronor for misguided subsidies for ethanol cars and E85,” writes Kågeson, while energy efficiency continues to be ignored.

### McDonalds |

Despite the strong government support for ethanol, the Swedes have started to discover the possibilities of electric cars.

Volvo and Scania, which dominate the Swedish truck market with a 40 percent share each, have been working on hybrid vehicles for a long time. In the case of buses, they are focusing on electric-ethanol hybrids. For delivery vans, they are looking to electric-diesel variants.

In the passenger car sector, Volvo Car Corporation, a Ford subsidiary, and the state utility Vattenfall have taken a different approach. Together they have formed the V2 (the 2 means squared) Plug-in Hybrid Partnership with the aim of developing a production-ready passenger car by 2012 whose batteries can be charged from a standard power point. Both companies are contributing to the project with a 50 percent investment amounting to SEK 2 to 3 billion or €200 to 300 million. Three test



Photo: Volvo Cars



Sweden's Minister for the Environment Anders Carlgren (right) with EU Commissioner for the environment Stavros Dimas. Photo: Fredrik Sandberg/EPA

vehicles, each one a Volvo V70, are already on the road, equipped with a 100 hp electric engine which drives the rear wheels and a five-cylinder diesel engine with 205 hp. The 150 kg lithium-ion battery can be charged from a standard power point in 4 to 6 hours, a quick charge can be realised in 1.5 to 2.5 hours. The operating range of the electric engine is 50 km. Göran Lundgren, Head of Business Development at Vattenfall Pan Europe, points out that '80 percent of all journeys made are less than 50 kilometres.' Vattenfall has also recently embarked on a collaboration with McDonald's. In Skärholmen, south of Stockholm, the first charging point for electric vehicles at a McDonald's Restaurant was set up. As was the case in the Volvo project, Vattenfall promises to supply it with electricity from renewable sources only. Finally, Volvo together with Midroc New Technology, the Belgian research centre OCAS and Energimyndigheten, the Swedish Energy Agency, has formed Powercell Sweden AB. Together the partners will invest SEK 200 million or €20 million in the development of fuel cells. The company, which previously was run single-handedly by the Volvo subsidiary Volvo Technology Transfer, is based on two patented components: a fuel converter (reformer) and a PEM fuel cell. The fuel converter produces hydrogen gas from

biofuels such as ethanol, DME (dimethyl ether), biogas methanol and biodiesel, but also from regular diesel or gasoline. The PEM fuel cell then converts the hydrogen gas into electricity.

Maria Wårnberg from the industry organisation Svensk Energi, does not foresee any problems resulting from the additional demands which will be placed

*'The government fails to put any pressure on Swedish manufacturers to develop more fuel-efficient cars'*

on the electricity suppliers in the future. 'Even if all cars were converted to electricity today, the suppliers could cope.' However, she expects that the electricity producers will face a different problem in the future: 'If the government sticks to its objective of increasing wind energy to 30 TWh by 2020, we will need a corresponding increase in back up energy, which in fact could only be obtained from hydropower. We as suppliers want to use rivers more efficiently, but we are coming up against resistance both from local populations and from the so-called vattendomstolar, Water Courts, which

issue rulings on usage rights and building permits.' Even if all companies which have set out on the path towards sustainable mobility are sure that they can solve the problems they face from a technological perspective, they admit that without financial support from the state as well as certain legal parameters the projects could not be realised. Bertil Moldén, Chief Executive of the industry organisation Bil Sweden, identifies '3 conditions' for a successful transition: sufficient raw materials, a Europe-wide infrastructure and appropriate prices. He refers to the aid programmes of other countries such as the US, Germany and France and to their schemes subsidising the scrapping of old cars. Sweden has the second oldest fleet of cars in Europe, 'we have 325,000 passenger cars without catalytic converters', he points out. He would also like to see the abolition of the "penalty tax" on diesel vehicles, which he believes is the reason for a diesel car market share of only 10 percent. Others want subsidisation of the demonstration phase for new vehicles and - not least - higher prices for diesel and petrol. To date the government has offered only a five-year tax exemption instead of the previous discount on the purchase of a new environmentally-friendly car. However the tax exemption works out to be less

than the discount. The energy authority, Energimyndigheten, has sided with the industry. It proposes a state contribution over 4 years of more than SEK 250 to 500 million or €25 to 50 million to support the launch of electric cars and plug-in hybrids. General Director Tomas Käberger justifies this demand saying that these vehicles make just as large a contribution in environmental terms as other "so-called environmentally-friendly cars" such as ethanol and biogas cars, yet they receive much less support. Precisely the point made of course by Kågeson. ■