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Experts: We must continue integrating alternatives to gasoline in public transport

Israeli target is to reduce oil in transportation sector by 30% in 2020 and 60% by 2025

• By SHARON UDASIN

In order to combat the effects of ever-rising fuel prices and air polluting carbon dioxide emissions, it is critical to begin integrating alternative fuel choices in public transportation, experts agreed at a seminar on Monday.

Israeli and international experts from various public transportation fields convened on Monday at the Holon Institute of Technology, for a conference entitled "Electric Buses and Natural Gas-Based Transportation" – organized jointly by the institute, the Alternative Fuels Administration of the Prime Minister's Office, the Transportation Ministry and the Industry, Trade and Labor Ministry.

While electric buses may not yet be economically feasible en masse, in future years they will become increasingly so – and until then, many other financially and environmentally friendly solutions exist around the world, the experts explained.

The seminar comes the day after the Israeli government approved a plan drafted by Eyal Rosner at the Alternative Fuels Administration, which mandates that the years 2013 to 2025 become a transition period for Israel's shift to non-petroleum based transportation sources. More specifically, the program's goal is to reduce the oil in Israel's transportation sector by 30% by 2020 and by 60% by 2025.

"In the beginning we will be focused more on the natural gas derivatives, like methanol and CNG, but as time goes by we will see other solutions like electric vehicles and biofuels," Rosner said at the conference.

While there is "no optimal solution yet" as to which type of fuel public transportation companies should be using in their systems, they do currently have many choices – diesel, biodiesel, CNG, diesel hybrid, electric overhead cables for trolleys, hydrogen fuel cells, fast-loading small electric batteries and slow-loading big electric batteries, explained Ruud Bouwman, director of the Netherlands-based firm Advanced Public Transportation Systems (APTS).

Perhaps the biggest barrier toward fully integrating electric vehicles in the transportation sector is the battery that powers the vehicles, many experts said. The large size, the expensive cost, the accompanying infrastructure and the necessity to recharge frequently are all obstacles to the electric bus's widespread entrance into the global public transportation market.

An average hybrid bus costs around \$200,000 and an electric bus even more – both much higher than prices for typical diesel buses, explained Eyal Solomon, of the Alternative Fuels Section in the Motor Vehicles and Maintenance Services Department at the Transportation Ministry.

"The biggest challenge for electric driving technologies is the cost premium over a conventional bus or a CNG bus," Solomon said. "This premium is maintained in hybrid buses."

In order to even pay off the cost of the vehicle itself, hybrid buses need to show a fuel economy savings of 40%, Solomon added. That being said, because the costs will eventually come down, the Transportation Ministry

is acting to promptly carry out the necessary standards and infrastructure for the import of electric vehicles, he continued. Already, the ministry has approved six hybrid buses for Haifa's future bus rapid transit BRT system, according to Solomon.

Developments on electrical vehicles and their batteries are moving so fast, however, that within five years it may be possible to drive them at the same price as diesel buses, Bouwman added.

"A hybrid vehicle is always a good idea to use, independent of which fuel we use," said Ulf Gustafsson, from Volvo Buses in Sweden.

Despite the expensive nature of the hybrid buses, Volvo has been able to sell them to 20 different countries, as they reduce carbon dioxide emissions by 75 to 80%, Gustafsson explained. In addition to developing hybrid buses, Volvo has also sold 800 fully electric buses in China.

"But there are still a number of hurdles to be overcome until we have a system of electric buses that is good enough," Gustafsson said. "We don't want to transport batteries, we want to transport passengers."

The Israeli public transportation company Dan has purchased fully electric buses from Chinese firm BYD (Build Your Dreams) imported by Clal Motors, which will begin trials on Tel Aviv city roads soon. While the battery has a long life of 6,000 cycles, the battery alone and its charger cost around \$400,000 and has a charging time of six hours. These buses can travel 250 kilometers without recharging, according to Clal Motors CEO Doron Vadai.

While Yossi Cohen, head of the technical department at Egged, said he is not against electric buses in principal, he stressed that there are certainly disadvantages to employing them as well.

"It's possible to reduce buses to zero emissions, but then none of them would run," Cohen said, noting, however, that Egged does also have a plan to test out a BYD bus in the future.

Looking at an entirely different type of electric buses, the German company Vossloh Kiepe is creating a new generation of trolley buses, electric buses that are connected to catenaries – overhead wires. A trolley bus can be optimal due to its excellent climbing abilities as well as its minimal vibration and overall cleanliness, said Erik Lenz, from Vossloh Kiepe.

While many actually view the overhead wires as an advantage with its constant visual presence in public areas, there are certain situations where the cables are not optimal – such as in parks or historical sites, according to Lenz. The company is therefore in the process of developing a "catenary-free" operation, where supercapacitors would recharge extremely quickly as passengers board at bus stops, he explained.

Elbit Systems in Israel is in the process of creating a similar system, where supercapacitors are "supercharging" at bus stops in 20 to 25 seconds, said Erez Schreiber, senior director of the energy and power department there. Each bus would cost only about \$100,000 and would only need minimal infrastructure, he explained.

"In this case we could have all the advantages of electric buses," Schreiber added.