



Natural Gas Week

VOLUME 23, NUMBER 46

www.energyintel.com

NOVEMBER 12, 2007

Flat Tank Technology Takes Step Forward; Major NGV Development

The Adsorbed Natural Gas (ANG) tank, a low-pressure natural gas tank that could change the game for natural gas vehicles (NGVs) has taken another step forward.

"This time not in a laboratory, but with a real customer," said Lev Zaidenberg, the CEO of Energtek, a US-based company that specializes in NGV technology.

Energtek, headquartered in Valley Stream, New York, and with subsidiaries in Ukraine, India and Israel, announced last week the successful conversion to natural gas and road testing of an ANG-powered three-wheeler in the Philippines. The technology was developed by Energtek's Is-
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raeli subsidiary, Angstore Technology.

The vehicle is a Honda EMX-155 motorcycle with a sidecar, which is one of the most widely-used motorcycles in the Philippines. Energtek noted in its announcement that two and three-wheeled vehicles represent the fastest growing segment of the worldwide automotive market. Most of these vehicles, around 200 million of them, are found in Asia.

The successful three-wheeler tests follow by less than a month a series of road tests for an ANG-powered scooter in India — on one of the most widely used scooters in that country.

The ANG tank — a version of which is also being worked on by scientists in Missouri (NGW Apr.2,p1) — uses a porous carbon material to store natural gas in a sponge-like manner. Instead of holding the natural gas in place entirely by pressure, the methane is held in place by molecular forces within the nano-sized pores of the material. The resulting low-pressure tank has several advantages. It no longer needs to be cylindrical and can be shaped as needed for the vehicle. In addition, the refueling machinery is significantly less expensive — having only to refill an ANG tank at around 500 psi, instead of a conventional tank at around 3600 psi.

"We hope to have a commercial agreement within the next month or two," said Zaidenberg, speaking from his research lab in Raanana, Israel, a northern suburb of Tel Aviv.

Noting that the testing "was very successful, indeed," Zaidenberg described an ANG tank with real-life capabilities — capable of taking the rider for a maximum of 62 miles before refueling. "No one can ride a bike for more than 100 kilometers [62 miles] at once," he said, adding

that his company has statistics on average driving ranges in various countries and that a 40- to 60-kilometer [25- to 37-mile] range is sufficient for many Asian countries. "Only when you go to some far-off village to see your grandmother" will you get close to the maximum range, he said.

The lifespan of the tank is about ten years, assuming a refill every few days. "If you work with pure methane then you get 10,000 cycles, which is more than the lifespan of a typical road vehicle," he said.

However, "the main issue is low pressure." The tank operates at between 435 psi and 1015 psi, which enables it to have the shape and size necessary for a small vehicle. With a low-pressure tank "refueling infrastructure cost decreases dramatically" — down by as much as 50%, according to Zaidenberg.

And what of the chicken-or-the-egg problem — no refueling stations without vehicles, no vehicles without refueling stations? Zaidenberg has several ideas and the corporate backing to pursue them.

Energtek has patented something called "FIT" — fast interchangeable tanks. In only a few seconds, an empty tank can be swapped with a full tank and the vehicle is back on the road. There would be a single filling station that filled tanks, then distributed them by trucks to retail places like supermarkets. "That is exactly the distribution model we are talking about," said Zaidenberg.

Energtek is backed by MoreGasTech, a French company that has been in business since 1966. MoreGasTech has been in the natural gas fueling station business since the mid-1990s, when it started building NGV fuel stations for Gaz de-France.

Zaidenberg has his hands full with the Asian market right now. The small vehicle market in some countries is growing at 50% every year as environmental concerns and fuel diversification become major issues for countries like China, India, Vietnam, and the Philippines. It is a "huge and growing market" due in part to the very big price difference between gasoline and natural gas. Some of these countries have their own source of natural gas, while most of their crude oil is imported — bolstering the case for NGVs.

Zaidenberg is not as optimistic about the US NGV market but remains hopeful and intends to take to look. NGVs are "not very popular there [in the US]" and there isn't a market because the price of gasoline is around a quarter of European prices, "but life is changing." The same environmental concerns and the natural gas price advantage are "starting to create a market." He is well aware of NGV market developments taking place in California. By next year, he said, "Certainly we'll be looking at the American market."

Michael Sultan, Washington

Energtek Inc.

26 East Hawthorne Avenue · Valley Stream, NY 11580 USA
Tel + 1-516-717-1627 · Fax +1-516-977-3437
energtekoffice@energtek.com · www.Energtek.com