

Laszlo Farkas and His Energy Breakthrough

By Adrienne Papp and Jeff Hall

Transit and school buses can now be converted to run on energy sources that are highly cost effective, save fuel and burn cleanly. Such changes can help us better understand the meaning of community, both at the local level and as global citizens.

SICK OF RIDING BEHIND THE EXHAUST OF A SCHOOL BUS? WORRIED ABOUT CHILDREN'S ASTHMA? FEARFUL OF THE CONSEQUENCES OF GLOBAL WARMING?

SO NOW THAT THE WORLD HAS FINALLY DECIDED IT'S TIME TO GO GREEN, IMPROVE FUEL EFFICIENCY AND REDUCE EMISSIONS, WHAT'S THE RIGHT WAY TO GO?

Push for improved mileage standards from traditional cars with internal combustion engines? Convert everyone to the new hybrids?

Create new fuels out of corn, soybeans or other agricultural products? Make the leap to hydrogen vehicles?

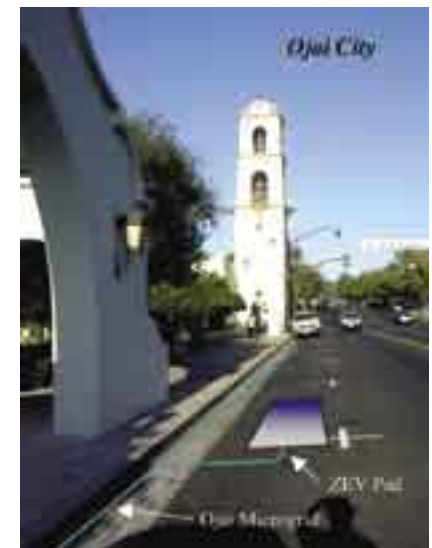
Or is it some combination of "all of the above"?

Enter Laszlo Farkas, Hungarian-born inventor who has developed a system that, according to "Laszlo," as most know him, would revolutionize our public transportation system. And this system isn't just pie-in-the-sky, he says; it can all work, starting today.

To start, Laszlo's plan will convert transit and school buses into all-electric and electric-hybrid buses, all powered from off-vehicle alternative and renewable energy sources, and, in the near future, by hydrogen, even.

Laszlo's system transfers clean energy from the road surface to the vehicle, using wireless power transmission. His buses are recharged invisibly on the go, running 24/7, without visiting traditional fuel pumps.

Sound futuristic? "The technology is here



Proposed Energy-Transport Project

and real," Laszlo assures us, adding that it will be safe, fuel efficient, clean, quiet and comfortable—and far less expensive to operate than current buses.

How It Works

First, let's review the technology so everyone will understand how Laszlo's system works.

The core of Laszlo's enabling technology is the Wireless Energy Transfer system connecting the off-road energy source to the vehicle.

It is like an ultra-thin flat transformer split apart. One half is placed on the road surface, the other on the vehicle undercarriage.

When the bus pulls to a stop just above the transmitter that is embedded in the road surface, power is transmitted through the air, up into the receiver on the underside of the vehicle via an electromagnetic 'beam'.

The transmitter pad can be easily installed into a shallow cavity carved out by a small machine on the surface of the road. In operation, the vehicle just parks over the pad, and then, in few minutes, inaudibly, automatically and without any moving mechanical parts, fully recharges the vehicle.

Battery packs and other storage units onboard "absorb" the transmitted energy. This stored energy provides the propulsion power for the bus until it recharges again at the next stop or layover point.

This whole process can conveniently take place when a bus has stopped to allow passengers to get on and off. In 40-60 seconds the bus gets a partial recharge, enough to replenish the storage bank.

But, where is the energy coming from?

Laszlo's innovative solution is to install mini-generating plants into institutional facilities like schools, hospitals, hotels, office buildings and athletic facilities.

Many institutions already have generators. These mini-power-plants generate power for the host facility and also for the transmitter pads that will "fuel" the transit and school buses that have their stops on adjacent roadways and parking lots.

Laszlo will turn these mini-power-plants into clean, efficient multi-purpose energy providers. With the advent of the 'micro turbine' (see image, next page), which can burn a mixture of traditional and alternative fuels (such as natural gas, bio-diesel, methane, and soon hydrogen), we can cut our fossil fuel consumption and associated pollution, and start making the shift to alternative fuels.

In addition, Laszlo wants to use these

mini-power-plants to produce electricity and heat. Both energy forms are needed for any host facility, and fortunately the micro turbine generates both. Rather than allow the heat of the burning fuel to escape during electricity generation, we can capture it and turn it to useful purposes, such as heating water, swimming pools, rooms, and even using it for absorption chiller-type air-conditioning.

With this scheme most of the energy in the fuel is converted for some useful purpose. We can also combine this energy generation with solar panels on the flat rooftops of school and other buildings. The generators can also be hooked up to the power grid for inexpensive overnight energy. Excess energy produced locally can be sold into the grid.

The result is a fuel-flexible, low cost, low emission, locally manageable energy source, a mini-power-plant for local buildings and vehicles.

"Our combined facility-transit system utilizes more than 75% of the fuel energy content as opposed to 25%-35% of conventional vehicle and power generation units," Laszlo says, "which means the overall system requires about 30%-40% less fuel for all the energy tasks shared between the facility and the vehicles. Less energy for the same task means less pollution."

"To top it all off," he adds, "we put zero emission all-electric buses on our streets. Can you get any better than that?"

"I believe, that these are the energy savings and environmental improvements that California is looking for," says Laszlo. "Our system meets the Governor's goal of doubling vehicle mileage by 2010. We can accomplish this goal now, at least for school and transit buses."

And these buses are the worst polluters of all, according to Laszlo. He notes that there are 25,000 school buses and about 6,500 transit buses in California, and about half a million school buses nationwide.

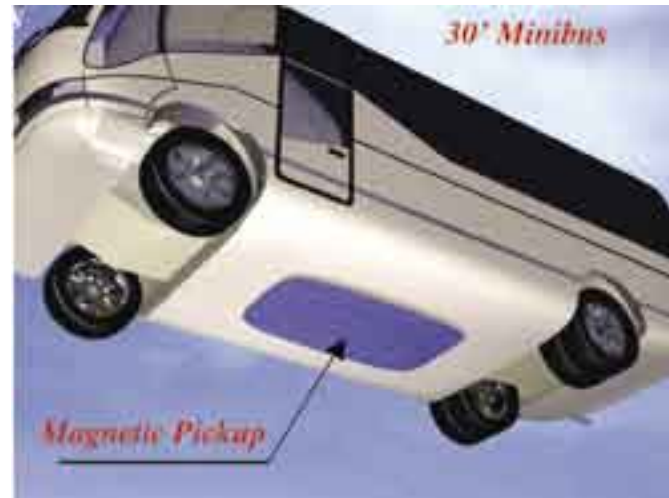
For now, this technology is most beneficial for vehicles running daily on regular routes



Los Angeles Mayor Antonio Villaraigosa with Laszlo Farkas

with stops. The frequent recharge allows small and light energy storage onboard, and there is always enough charge to run an all-electric bus for about 20 more miles.

The electric-hybrid version, which runs in low-emission electric mode most of the day, also receives frequent recharges at stops and layover points. But the hybrid mode bus will have an



Wireless Pickup installed on a Minibus extended range of 120 miles, according to Laszlo, enough for a full day's service.

Laszlo estimates that with the longer life, and lower operating and maintenance expenses, the new, cogeneration powered, all-electric bus fleet system will cost approximately 30-40% less to operate than the same size diesel fleet does today. The additional infrastructure investment will be returned in two to three years based on significant fuel savings.

All the technology described exists today. Laszlo is the first to combine locally generated power (combined heat and power generation) with the wireless energy transfer (the system that "beams" electromagnetic energy up into the



Wireless Energy Transfer [WET] System Block Diagram



Laszlo and his son Leslie at ETT testing their system



The Microturbine (Capstone)

bus) and the new all-electric and electric-hybrid bus that will run with near zero emission.

"The wireless energy transfer technology is completely harmless to human physiology and completely safe in terms of energy storage," according to Laszlo.

His company, Energy Transport Technologies, in cooperation with Ross Transportation Technologies, has tested the wireless energy transfer system and has obtained a number of patents covering this entire range of innovations.

Getting the Deal Done

Like many who are hoping to make it big in the new energy arena, Laszlo is facing a bit of a challenge getting people in positions of authority to listen to him.

It's not because he's not smart—he seems quite brilliant, actually—or that his ideas aren't good, for they certainly make sense.

But it takes a while to explain how his system works. And, even after one has had a chance to ask all the right questions, which Laszlo patiently answers, non-technology types tend to get a little overwhelmed.

Most public policy makers, venture capitalists and others who could green light Laszlo's ideas haven't yet found the time to properly focus on and understand his proposals. Or they are reviewing so many options they have a hard time deciding what option or options are truly best.

And then they need to figure out where to find the money for whatever idea eventually gets adopted.

Laszlo estimates that to get a local demonstration system up and running with a couple of new 42 feet Express buses (See image of a candidate NABI bus design on the right) might require about \$3 million to \$4 million, and one and a half years to complete.

The completion of a demonstration system would prove the technology and the business model. A successful test would give prospective backers enough confidence to continue their support.

Presently Laszlo and his associates are in serious discussions with local officials in La Jolla for an all-electric Super Loop Transit System for San Diego. Laszlo also recently proposed a comprehensive energy-transportation project for the city of Ojai (see insert on the previous page).

Laszlo thinks the Westside of Los Angeles could be particularly fertile territory for such a school or transit bus system. The Big Blue Bus system in Santa Monica, he believes, should be interested; the City of Beverly Hills might want a local shuttle service; and there are lots of school kids being bused all over the Westside.

In recent months, Laszlo has met briefly with Los Angeles Mayor Antonio Villaraigosa and Governor Arnold Schwarzenegger. Both of these elected officials said they were interested in Laszlo's concepts and urged him to follow up with their staffers who handle energy initiatives for both the city and the state.

Both Villaraigosa and Schwarzenegger have stated that energy efficiency is a top priority. Indeed, the Mayor says he wants to make LA the world's leading city in energy innovations.

Community Angle is Important

Though Laszlo's company and his technology associates stand to gain financially if his technologies are adopted, one senses that this is not his key motivation.

The notion of community is very important to Laszlo. This is not just about technology, he says. He believes that since his energy-transportation system is so localized in nature, that people at the grass roots level should be involved in its local application and oversight.

"What makes a community is free participation in areas of mutual interest, sharing ideas, concerns, duties and responsibilities for the sake of doing something valuable and meaningful together for our own benefit, and for the benefit of our environment," says Laszlo.

"We share this globe with other communities," he continues. "Her air, energies and beauty. The way we use her limited resources, and



NABI 42.5 feet Express Bus for Electrification

exploit her marvelous life-sustaining powers, is an ethical issue just as much as a technological issue," he adds.

"Community ethics and environmental ethics go together; one is local the other is global. How we relate to our fellow human beings and to nature properly belongs to small cities and communities. Environmental and community values should be part of education," Laszlo concludes.

"That is why I start with energy efficient schools and school buses."

Moving Forward

Laszlo Farkas has been at this a long time. Before he got to his present 'clean energy for schools and school buses' project, Laszlo worked for decades in the U.S. Space Shuttle and Hydrogen Fusion Energy programs. For the last ten years Laszlo has been working on his energy-transport project, and he knows he's on to something.

This is a guy who, many years ago, climbed over the Alps to Austria to escape communist rule; now, he is using his 'renewed energy' to climb away from another tired system run by

fossil fuels.

This is the guy who once went kayaking off Newport Beach and just kept paddling till he got to Catalina – the first kayaker to reach the island. Now, this same guy is striving for another adventure – one in which the energies of sun and wind will 'paddle' the vehicles of the future.

Readers are invited to visit website www.ettek.com for a full animated video on the technology, for details on the wireless energy transfer, and information about the company, Energy Transport Technologies, Inc., and its associates.

Readers are also invited to send in comments, observations or just write in a few words in support. You may also call 805-798-3455, and speak to Laszlo Farkas directly.



California Governor Arnold Schwarzenegger with Laszlo Farkas