Electric Fuel introduces practical, zero-emission transportation.

And that's a breath of fresh air.

For years, urban mass transportation has been on a one-way street -- toward more air pollution, an increased incidence of lung diseases, and an ever-greater dependence on imported petroleum. Today, a new path is opening up, led by Electric Fuel Transportation Corporation.

Electric Fuel's revolutionary Zinc-Air fuel cell technology offers zero emissions, high power and long-range functionality for vehicles that are both environmentally friendly and commercially viable.

The product of more than ten years of research and development, and tens of thousands of miles of on-the road testing, Electric Fuel's Zinc-Air system has already set world endurance records, such as powering a 5-ton Mercedes-Benz van from central London to central Paris on a single charge. It has been successfully tested in the German Post Office's fleet of urban delivery vans, and braved the icy winters of Stockholm, Sweden. And because it can power the heavy-duty diesel vehicles that are the worst polluters in our city centers, Zinc-Air fuel cell technology represents the first complete solution to the growing problems of our urban transportation systems.

Electric Fuel is now introducing America's first practical full-size all-electric transit buses. While meeting all industry standards for speed, power and acceleration, the system goes where no battery-powered bus has gone before, offering a full-day's work on a single charge, with a cost structure that can break America's dependence on polluting, petroleum-based fuel.

The Zinc-Air Fuel Cell System for Electric Vehicles

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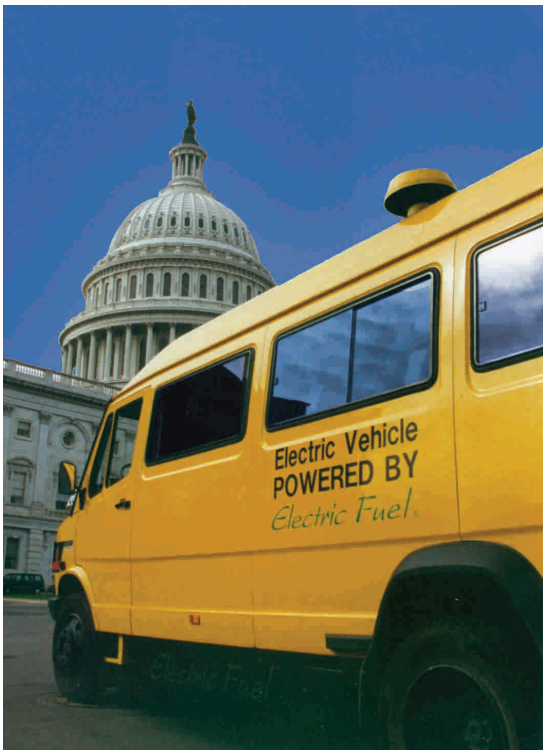


The Zinc-Air Fuel Cell

THE ZINC-AIR FUEL CELL

The revolutionary Zinc-Air fuel cell is the heart of the Electric Fuel Zinc-Air fuel cell energy system.

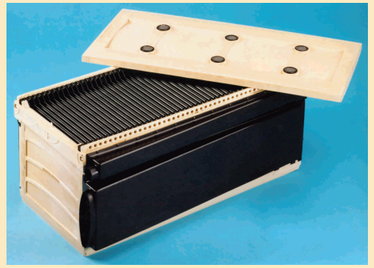
Each fuel cell module contains 47 individual air-breathing zinc-air cells connected in series and can discharge 17.4 kWh before it has to be refueled with fresh zinc fuel. Electric Fuel's transit bus carries three trays of 6 modules each, which means that the bus is fueled with **312 kWh of on-board energy**.

In the center of each individual cell you'll find the zinc fuel: a replaceable anodic fuel cassette made of zinc particles in an electrolyte solution of potassium hydroxide (KOH). The anode, inserted into a separator envelope, is flanked on two sides by high-power oxygen reduction cathodes.

When the fuel cell is in operation, oxygen is extracted from the air by electrochemically reducing it at the cathode to hydroxide ions. These ions then react with the zinc fuel inside the cell, producing the zinc oxide (the same material used in sunblock).

The other end-product of this reaction is energy – and lots of it. The on-board Zinc-Air fuel cell yields a practical specific energy of around 200 Wh/kg and specific peak power of 90 W/kg at 80% depth of discharge.

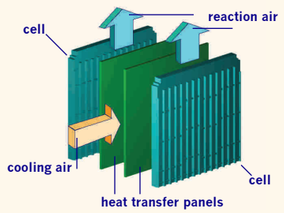
These results are far superior to any battery technology on the market today. For example, conventional electric vehicles run on lead-acid batteries, which typically achieve a specific energy of only 30 Wh/kg. More advanced electric vehicles may use a nickel-metal hydride battery, which can reach a specific energy of 70 Wh/kg. **By outperforming these technologies by 200% to 600%**, Electric Fuel's Zinc-Air fuel cell makes it possible, for the first time, to use clean electricity to power some of the heaviest passenger vehicles on the road.



The Zinc-Air Module

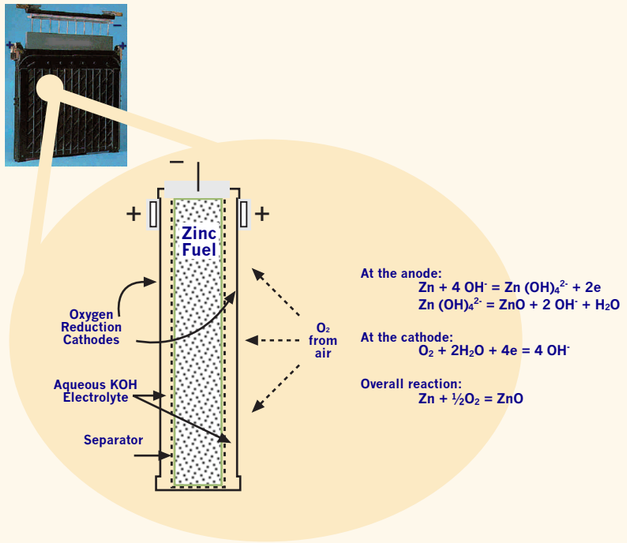
No. of cells	47
Open Circuit Voltage	67V
Operating Voltage	57-40 V
Capacity	325 Ah
Energy Capacity	17.4 kWh
Peak Power	(@80% DOD) 8 kW
Weight	88 kg
Volume	79 liter
Energy Density	200 Wh/kg
Dimensions	726x350x310 mm

Cooling the Fuel Cell



Unlike internal combustion engines, which are water-cooled, the Zinc-Air fuel cell is air-cooled to save weight and energy. Because blowing too much reaction air across the cell face would dry out the cell, Electric Fuel developed a unique method of using a second air flow to cool the reaction air through thin plastic heat transfer panels. The cooled reaction air, in turn, cools the cell. Electric fuel has patented this cooling method in the US and around the world.

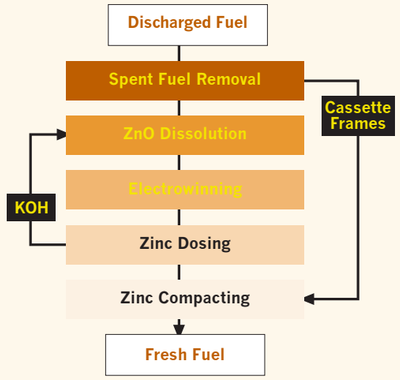
The Zinc-Air Fuel Cell



Regeneration

ZINC FUEL REGENERATION — THE CLEAN FUEL REFINERY

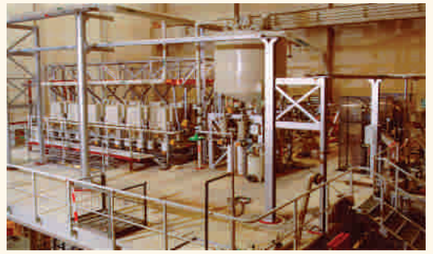
Fleet operators need their vehicles on the go, all the time. To minimize down-time and to take alternative fuel infrastructure off-site, Electric Fuel has pioneered the concept of central **regeneration plants** for spent fuel cells.



Rather than requiring drivers to recharge individual vehicle batteries by plugging them into an outlet, depleted Zinc-Air fuel cell modules are quickly **exchanged** for new ones. And instead of expecting a transit operator to operate an on-site charging facility, the spent cells are transported to a behind-the-scenes recycling facility called a **regeneration plant**.

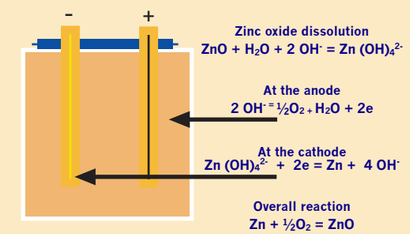
At the regeneration facility, depleted fuel cassettes are **electrochemically recharged**, using off-peak electricity if possible, and **mechanically recycled**. Like oil refineries in today's petroleum-based fuel distribution network, the Electric Fuel regeneration plant provides the fresh zinc fuel which is then delivered back to the fleet.

Not only are the electric vehicles powered by the Zinc-Air system 100% emission-free, regeneration of zinc fuel is a clean, non-polluting industrial process. In fact, an Electric Fuel regeneration facility, like the one operated in Bremen, Germany, has minimal environmental impact – a far cry from the environmental damage associated with oil refineries.



Electrowinning section of Electric Fuel's regeneration plant in Bremen, Germany

The Electrowinning Cell Regenerating the Zinc



Refueling

RAPID REFUELING — FOR MORE TIME ON THE ROAD

Battery-based electric vehicles need a recharge from time to time. But if an EV has to spend long hours plugged into a wall, it's going nowhere fast. Electric Fuel's Zinc-Air fuel cell technology allows a zero-emission electric vehicle to be fully refueled and back on the road in minutes.

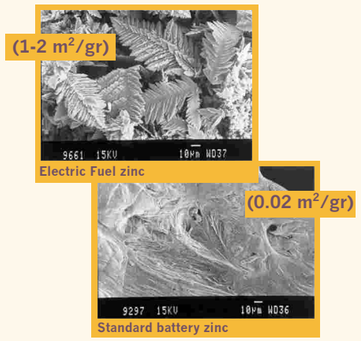
Electric Fuel's Zinc-Air system was devised with **rapid turn-around** in mind. Fuel cell modules are removed from the vehicle and "refueled" – by mechanically exchanging spent zinc fuel with fresh components in a zinc fuel "refueling station".

The Zinc-Air fuel cell's unique, modular design allows for complete refueling in ten minutes or less. The zinc fuel and current collector frame are mounted within a detachable "cassette" which is removed and replaced in a simple, automated process. The spent fuel is later recycled at a central facility called a zinc fuel regeneration plant. In the meantime, **the bus is already back on the road**.

Refueled Zinc-Air fuel cell modules ready for installation on bus

For most fleet operations, Electric Fuel recommends that refueling the fuel cells takes place at an Electric Fuel regeneration plant – this means that all a fleet operator has to do is swap out the discharged fuel cell modules for freshly fueled modules!

The Difference is in the Zinc



The electron microscope photo at bottom right shows standard battery-grade zinc, with a typically low surface area (per unit of zinc weight). The photo at top left shows the intricate stricture of Electric Fuel's patented zinc fuel particles, with up to 100 times the surface area. Since the zinc-oxygen reaction takes place only at the surface of the zinc, having so much surface area gives the Electric Fuel Zinc-Air fuel cell a big power and energy advantage.

About Electric Fuel

Electric Fuel Corporation, a publicly traded company (Nasdaq: EFCX) incorporated in Delaware, develops, manufactures and markets high-capacity, high-power Zinc-Air fuel cells for portable consumer electronic devices, as well as for electric vehicles and defense applications.

Electric Fuel Transportation Corporation (EFTC) is the wholly-owned Electric Vehicle subsidiary of Electric Fuel, formed in order to focus resources on commercializing Electric Fuel's zinc-air fuel cell technology for electric vehicles. EFTC's mission is to bring about the deployment of commercial numbers of zero-emission zinc-air electric buses in fleets of transit systems and school districts at reasonable costs during this decade.

Ongoing Programs

United States

The Zinc-Air Electric Transit Bus Program was initiated in late 1998, with funding from the Federal Transit Administration, to demonstrate the ability of Electric Fuel's patented zinc-air fuel cell system to power a full-size, all-electric transit bus, providing a full day's range including air conditioning for heavy-duty city and suburban routes, under all weather conditions.

Phase 1 of the program ended in July 2000 with the successful integration and first driving tests of the bus. The current phase of the program focuses on additional track and on-road testing, and integrating ultracapacitor technology.

Germany

In 2000, an industry consortium funded in part by the German Federal Science Ministry initiated a 4 year, DM24 million program to develop an all-electric hybrid vehicle using Electric Fuel's Zinc-Air fuel cell system as the primary energy source. The vehicle design is based on a DaimlerChrysler cargo van and will also use high power Varta AG batteries and ultracapacitors under development by Dornier GmbH and EPOC AG.

The consortium builds on the success of a 2-year field test of postal fleet vehicles powered by the Electric Fuel Zinc-Air fuel cell system in Germany in 1996-98. During the field test, which was sponsored by the German Postal Service, the 5-ton postal vans drove more than 40,000 miles in all weather conditions around the city of Bremen. The vehicles were serviced at an Zinc-Air regeneration plant built specially for the field test.

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