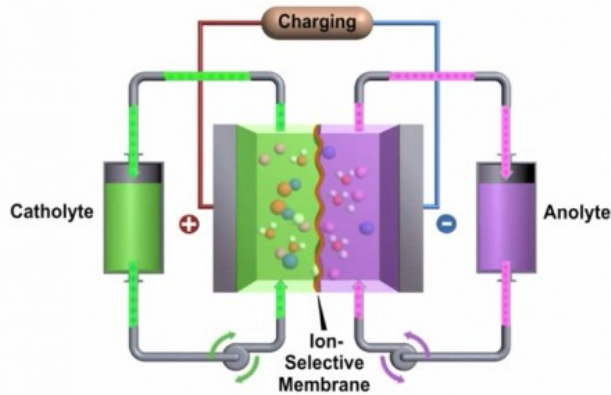


Pacific Northwest National Laboratory

Because of this, flow cells are mainly used where space is not at a premium, such as to store large amounts of energy from renewable sources in open spaces. PNNL researchers led by Wei Wang have now developed a prototype, high-performance zinc-polyiodide flow battery with a high energy density of 167Wh/l (watt-hours per litre), a number that could almost double to 322Wh/l with further optimizations.

This is a significant step up from the state-of-the-art 70Wh/l zinc-bromide flow batteries. For comparison, lithium iron phosphate batteries commonly used for EV conversions, put out about 233Wh per litre.

As well as being able to store more energy in a smaller space, the zinc-polyiodide battery is also reportedly safer than other flow batteries through the absence of acidic electrolytes, it's non-flammable, and it can operate at temperature ranges of -20°C to +50 °C,



High Performance Flow Battery

Pacific Northwest National Laboratory (PNNL) has designed a new redox flow battery that more than doubles the amount of energy that this type of cell can pack in a given volume, so much so that it is approaching the numbers of lithium-ion batteries. If the device reaches mass production, it could find use in fast-charging transportation, portable electronics and grid storage. A flow battery is formed by two liquids with opposite charge (electrolytes) which turn chemical energy into electricity by exchanging ions through a membrane. The electrolytes are stored in two external tanks and this makes the system easy to scale up, potentially very quick to charge (the electrolytes can simply be replaced) and resistant to extreme temperatures. Currently the best flow cell out there only packs less than a third of the energy per unit volume as a lithium-ion battery.

Magna International

Magna has used this process previously on the Mercedes-Benz SLS AMG and Aston Martin Rapide. The MILA Plus uses an extruded aluminum spaceframe that is lighter than steel but adaptable to a variety of drivetrains and configurations. It is also 100% recyclable.

Cameras replace the side mirrors for reduced aerodynamic drag, although they are not legal for use in the US at present. Tesla also wants to eliminate side mirrors to reduce drag, though legislation will be required to make that happen. The images are fed to two high resolution displays mounted to the interior of the car.

As an aside, there are rumours Apple has approached Magna to build its upcoming electric car but that rumor is offset by news last week that Magna has sold its battery division to Samsung.



Mila Plus Concept

This year's Geneva motor show motor (March 5-15) has a few surprises in store. Not the least of which is the Mila Plus Concept; produced by MAGNA International, an Austria-based company that is usually content to be a sub-contractor, making mechanical and electronic components for others. This year, its concept car is a two-seater sports coupe called the Magna MILA Plus. It features weight saving production techniques and a unique hybrid drivetrain consisting of a three-cylinder gasoline engine augmented by an electric motor driving the rear wheels, and a second electric motor for the front wheels. Total horsepower is said to be 270 galloping ponies, with 420 lb-ft of torque to play with too. That's enough to propel the 3,400 lb car to 62 MPH in 4.9 seconds, while still managing an electric driving range of about 43 miles. The prime purpose of the concept is to showcase Magna's proprietary bonding process called cold mechanical joining that is supposedly stronger yet less expensive than traditional techniques.



Custom Zero Motorcycle



There's no question that the sleek, modern design of Zero motorcycles inspires incredible custom designs. This is just the latest awesome entry, designed by Bruno Gallardo and built by Hollywood Electric. The custom Zero S features a free back wheel with limited rear fender clutter, window-type treatments of core components, and an aggressive posture reminiscent of gas-bike street fighters. It's a major departure from any of Zero's production models, especially moving the rear suspension linkage closer towards the battery, giving the seat a "floating" effect. It has a very cyberpunk feel to it, like something out of Blade Runner with its exposed battery packs and see-through flaring's. Nice looking beastie!



Bustech



Australian bus manufacturer, Bustech has been chosen as the lead design and manufacturing partner for a \$170 million electric bus project. Announcing the project, Bustech CEO Michael McGee said the project would position Bustech as an innovative regional leader in the use of renewable energy for buses. "The E-Bus project is an international research and development project co-funded by the Malaysian and Australian players and governments, which aims to develop an electric bus for trial operations in Malaysia," he said. Bustech, part of Transit Australia Group, has partnered with the Malaysia Automotive Institute (MAI) (a Malaysian government body), Swinburne University of Technology and AutoCRC and a

private Malaysian company to develop and test the E-Bus project in Malaysia. Swinburne University is providing the electric bus technology to the project and will work closely with Bustech throughout the trials of the prototype vehicle. On the Gold Coast to inspect the Bustech facility, Malaysian Automotive Institute CEO M Madani Sahari said if successful, the electric bus could be exported to other countries. Mr Sahari said that Malaysian industry was spending 500 million ringgit (SAUD170 million) on establishing an electric bus public transport system, including infrastructure such as charging stations. The first bus is planned to roll off the production line in July 2015, with trials to begin in September.

The *SHAPE* of Things to Come, Again??

QUANT e-Sportlimousine



This is one prototype that refuses to disappear. Quant has been around since 2003; however this year sees an all new car on display in Geneva, this time with an unbelievable flow battery supplying the electrons. The beating heart of the new Quant is its Nanoflowcell power storage, a very specific formulation of flow battery. The electrolytes contain a mix of metal salts and other ingredients. Nanoflowcell explains that its technology boasts five to six times the storage capacity of other flow cell designs or lithium-ion batteries, making it primed for vehicular use. It credits that superior energy density to "an extremely high concentration of ionic charge carriers in the cell system's electrolyte" and translates it into a 400 to 600km driving range estimate. Nanoflowcell lists a 2.8-second 0-62 mph (100 km/h) time and a potential 380kmh top speed. Those numbers come due to the 4 wheel motors providing gobs of torque being cranked out at each wheel. The car weighs 2,300kg and total power is listed at 912BHP. Two rear mounted 200 liter tanks hold the electrolyte that is pumped to the central cell, energy is transferred to supercaps and finally to the 4 three phase motors. Efficiency 80%

This Month's Technology Review



I was strolling through EBay the other day and came across a plethora of especially designed ceramic fan heaters for demisting cars. Most come from China/Hong Kong, but they are all 12v units with 100W to 200W heating cores. That's 8Amps to 16 Amps to drive the. Mounting in general, is for the dashboard, but as they cost only \$13 to \$30, depending on model, they could be worth a try as a component source and retrofit its internals in the existing heater box. Cheap alternative for demisting compliance for AD's. Just go to EBay and search for "Car Fan Heater"