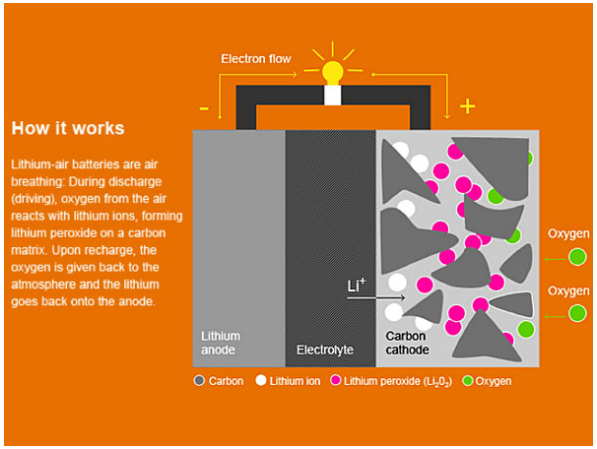
Lithium Air Carbon Cells

IBM LiO^2 Carbon Cells

IBM came up with a mixture of an ethylene glycol derivative (tetra(ethylene) glycol dimethyl ether) and a complex lithium salt, LiCF3SO3. that works well at room temperature and, perhaps most significantly, they found it went through oxygen reactions so quickly that they couldn't detect any reactive oxygen intermediates. "Equally importantly, the peak corresponding to LiCO3+ (one of the most likely products of electrolyte decomposition) is not seen," the researches note.

The calculated capacity of this chemistry is nothing short of jaw-dropping. At a high discharge rate, it can handle up to 13,500Wh/kg compared to current cells that provide 150Wh/kg. Even assuming a reduction factor of one order of magnitude due to the weight of the ancillary components, such the cell case, current collectors and electrolyte, the practical energy density may be estimated at 10 times as high as that offered by the present lithium-ion batteries.

Time to release of this technology for the EV market; 2020 at the earliest.



LiO^2

Continuing on with the series of latest generation Lithium based Battery chemistries comes this IBM development. Lithium-air batteries have the potential to be the next big leap in battery technology because they get rid of a lot of the weight and complexity involved in standard cells. That's because, instead of having all the battery components stored inside the battery itself, lithium-air batteries use oxygen in the atmosphere to bring some electrons to the party.

Conventional LiO cells can only handle a few charge discharge cycles before the Li electrode starts to decay. But researchers have now found an electrolyte material that doesn't react with oxygen, allowing stable performance over multiple charging cycles. And the theoretical capacity of the battery was staggering, possibly more than ten times that of the lithium-ion technology on the market.

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Stromos on a WAVE

The WAVE (World Advanced Vehicle Expedition) is the brainchild of Louis Palmer, the first man to circumnavigate the globe in a solar powered car (Taxi). Louis organised the first WAVE last year to demonstrate that EV technology is mature enough for everyday, consumer use. To prove his point the cars in the rally will go far beyond the normal envelope of operation, running up to 300km a day over a fortnight of solid driving, some of which will involve crossing the Alps twice…

17 different vehicles will run from Genoa Italy to The Hague Holland, most vehicles have been designed with fast charging in mind, and can obtain a full charge in 2 hours. The WAVE will take place from September 9 to 22. The actual route will be dependent on the available charging point for the various ranges of the vehicles.

German E-Cars

The Stromos from German E-Cars (a subsidiary of the FRÄGER group of Immenhousen) is a neat little plug in electric.

Seeing a market opening the Fraeger transmission engineering group decided to launch German E-Cars that employs their Electric power trains to retrofit brand new Suzuki Splash ICE cars. It's a very small car, built on the Swift's platform with a shortened wheelbase. The base model has a 48-kW one-liter engine, and it sells for 9,990-euros in Germany ($14,000). German E-Cars is buying quite a lot of them, so I'm sure they're getting a better price. E-Cars add lithium-ion cells, replace the fuel tank inlet with a plug-in socket and the ICE engine with a 56-kW electric motor. With 140Nm of torque, this electric car has more power and torque than the original. Top speed is electronically limited at 130kmh, and range is 100km. The price does go up a bit from the original Suzuki donor price at, ahem, 41,900 euros ($59,620). However this top dollar pricing is not fazing corporate buyers from setting up fleets of these little city commuters Siemens, Sap and SIXT seem to appreciate the fact that the EV conversion is locally made, even if the base car is a Suzuki, built outside of Germany.

FRÄGER E-Mobility

German company "The FRÄGER Group" from Immenhousen have released a range of E-Mobility Electric vehicle motor/differential units and matching Motioncontrollers (err speed controllers).
The 3 phase motor / transmissions are available in 14/28kW; 27/54kW & 34/68kW versions. Torque ranges from 44 to 170Nm with one or two speed transmissions with ratios from 1:4 to 1:16.

The Motioncontroller has a maximum input voltage of 420VDC and can handle a nominal output of 65kW and 100kW peak for induction or synchronous motors.
German E-Cars use this unit in their Stromos EV. We'll find out how well it does next month after a 2600km EV rally through Europe, doing up to 300km per day.
http://europe.wave2012.net/

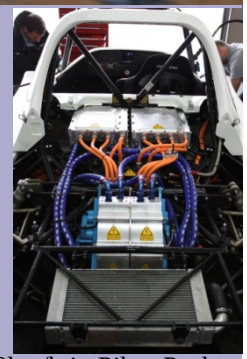
ZOCO Centre Drive E-Bike

For those out there who enjoy zipping along on the flat with a trusty treadly but don't enjoy climbing hills the ZOCO may be worth a look.
ZOCO Electric Bikes use a unique High Torque Central Drive System which increases the torque created by the motor to a massive 109 N.M. at the crank. The Patented Two Level Reducer changes the RPM of the high-speed motor from 1500 RPM to 65 RPM. The NuVinci™ N360 Internal Hub is then used to adjust and transfer this torque to the rear wheel - this gives the rider the ability to navigate hilly terrain with ease - something Hub motors do not have the ability to do.

The NuVinci N360 is a constantly variable transmission that allows the rider to adjust for the correct amount of torque to climb that annoying hill at the end of the ride.
Specification:
The motor is a street legal 200 watt brushless high torque crank motor
Battery, 36V 10Ah Lithium Polymer
Charger 240V "Smart Charger" - allows you to plug your bike into any power outlet to charge.
Pedelec System Engages the motor when the rider starts to pedal, the motor stops assisting when the rider stops pedalling, or when the brakes are applied.
There are 3 levels of power assistance Low, Med & High.
Or throttle only use of the Twist throttle located on the left hand grip. No need to pedal let the motor do all the work.
Speed 32kmh for a 30 to 40 km range.
Price $1787 delivered.

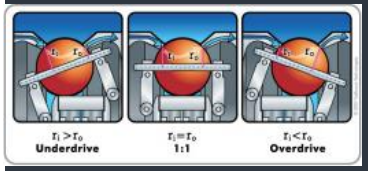
Look What EV's Have Done Now!!

Toyota's Pikes Peak EV Record



Another auto racing institution has fallen to the EV-NICE side.
Toyota Motorsport GmbH (TMG) made history once again by setting a new electric record at the Pikes Peak International Hill Climb. TMG's rally driver Fumio Nutahara set a time of 10 minutes 15.380 seconds, less than 30 seconds behind outright winner Rhys Millen and over two minutes faster than the previous electric record of 12 minutes 20.084s, this time placed them sixth overall.
For those not familiar with Pikes Peak the idea is to climb from 2,800m to the 4,300m summit over a distance of 19.99km in as fast a time as possible, oh yes and you have to try not to fall off the sheer cliffs on some of the more daring corners, so all in all this was an amazing effort.
Based on a Radical SR8 chassis, the TMG EV P002 has a top speed of 240km/h in Pikes Peak configuration with a 2.5:1 single speed reduction ratio, with combined maximum power of 350kW from its two axial flux motors. The motors are powered by two TMG inverters divvying up the energy from a 42kWh Lithium ceramic (maybe NanoSafe) battery pack, maximum torque output is 900Nm and RPM maxes out at 5000.

This Month's Q&A Technology Tip



Not a tech tip but this technology is quite fascinating in its operation and application for electric bikes.
The *NuVinci N360* is neither a derailleur system nor an internally-geared drivetrain. Rather it offers an infinite amount of seamless, gear-free shifting within its ratio range and via a easy-to-use cable operated interface. Unlike conventional "geared" drivetrains, the *N360* continuously variable planetary drivetrain (CVP) uses a set of rotating and tilting balls positioned between the input component (coming from the chain) and the output component (going to the wheel) of the transmission. Available from www.bicyclestore.com.au for $519 or Ebay.