

GLIMPSES OF THE FUTURE

A monthly digest of technologies, developments and trends that will shape our lives.

Happy New Year!

Is Nuclear Power Finally Here To Stay?

My objection to nuclear power generation is economic - governments can't tell us how much the overall cost of nuclear power is. But a recent announcement from a Japanese company seems to herald a new nuclear dawn.

Toshiba has developed [a new class of micro size Nuclear Reactors](#) that is designed to power individual apartment buildings or city blocks. The new reactor, which is only 20 feet by 6 feet, could change everything for small remote communities, small businesses or even a group of neighbours who are fed up with the power companies and want more control over their energy needs.

The [200 kilowatt Toshiba designed reactor](#) is claimed to be fail-safe and totally automatic and will not overheat. Unlike traditional nuclear reactors the new micro reactor uses no control rods to initiate the reaction. The new technology uses reservoirs of liquid lithium-6, an isotope that is effective at absorbing neutrons. The Lithium-6 reservoirs are connected to a vertical tube that fits into the reactor core. The whole process is self sustaining and, it is also claimed, can last for up to 40 years, producing electricity for only 5 cents per kilowatt hour, about half the cost of grid energy.

Battery Performance Improves Ten-Fold

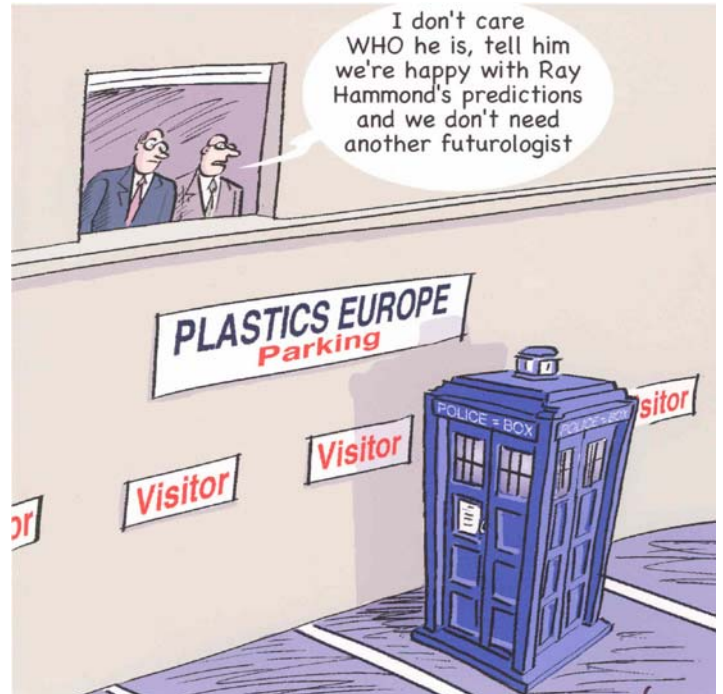
After years of little progress, battery technology is finally leaping ahead (also see story below). Researchers at Stanford University in California have found a way to use silicon nanowires to reinvent the rechargeable lithium-ion batteries that power laptops, iPods, video cameras, cell phones, and countless other devices.

[The new battery technology](#), developed through research led by Yi Cui, assistant professor of materials science and engineering, produces 10 times the amount of electricity of existing lithium-ion, known as Li-ion, batteries. A laptop that now runs on battery for two hours could operate for 20 hours, a boon to ocean-hopping business travelers.

'It's not a small improvement,' Cui said. 'It's a revolutionary development.'

The breakthrough is described in a paper, 'High-performance lithium battery anodes using silicon nanowires,' published online in *Nature Nanotechnology*, written by Professor Cui, his graduate chemistry student Candace Chan and five others.

The greatly expanded storage capacity could make Li-ion batteries attractive to electric car manufacturers. Cui suggested that they could also be used in homes or offices to store electricity generated by rooftop solar panels.



So Amusing...

My recently published book ['The World In 2030'](#) was sponsored by PlasticsEurope and this cartoon by Noel Ford graced the pages of the trade magazine PRW last month. (For overseas readers the blue telephone box is the vehicle used by the BBC TV time-traveller 'Dr Who'.)

Find A Loo With Your Phone - SatLav Arrives In London

A new service promises Londoners they'll never have to spend much time looking for the loo. Westminster City Council, which covers London's bustling Oxford Street, the West End, Big Ben and the Houses of Parliament, [has launched 'SatLav' — a toilet-finding service for cell phone users.](#)

Tourists, theatergoers, shoppers and pub patrons in London's West End can now text the word 'toilet' — and receive a text back with the address of the nearest public facility.

The system, which covers 40 public toilets, pinpoints the caller's position by measuring the strength of the phone signal. The texts cost about 50 cents, and most of Westminster's toilets are free.

NEC Real-time Language Translation On Mobile Phones

NEC has developed software that can understand around 50,000 Japanese words [and translate them to English text](#) on a mobile's display in just a second or two. The software was made compact enough to operate on a small microchip mounted in a cellphone and was designed especially to help users convert common travel phrases. Notably, it would be

Battery Breakthrough Number 2

Toshiba has surprised analysts with a recent announcement of what's pretty much the holy grail in Lithium battery technology – the Super Charge ion Battery, which recharges up to [90% of its energy in just five minutes](#), and has a lifespan of over 10 years (Toshiba again! Quick, let's buy shares.)

Slow charging has been the key hurdle to public acceptance of battery-powered electric vehicles as viable distance travelers, so this breakthrough has all sorts of implications for the automotive industry as well as being a very welcome upgrade to a whole host of other portable devices.

The first of Toshiba's groundbreaking SCiB packs will ship in March 2008 to an industrial systems market that Toshiba forecasts being worth 100 billion Yen (\$880 million) by 2015. There's no mention of when the technology is likely to hit the consumer market, but with such rapid charging ability, ultra-long life and high resistance to rupture and combustion, the SCiB looks like the first of a new generation of battery cells that will allow electric vehicle drivers to top up their cells in nearly the same amount of time a petrol vehicle takes to fill.

- And Just In Case You Missed This Remarkable Letter...

As world politicians were meeting in Bali last month to discuss what treaty should follow the Kyoto Protocol, the CEO's of 13 of the world's biggest car makers sent the following [astonishing letter of commitment to the Financial Times](#):

Sir,

As the chief executives of [13 auto companies](#) producing and marketing our products around the world, and board members of the European Automobile Manufacturers' Association (ACEA), we write to give support and encouragement to the UN-sponsored ministerial talks on [climate change](#) opening in Bali, Indonesia, this week. We think it vital that they work towards the kind of comprehensive agreement that our planet needs.

The climate change scenarios described in this year's reports from the Intergovernmental Panel on Climate Change indicate that governments must embrace sound and holistic measures to follow on from the Kyoto agreement. Inevitably any such package, which has to be global in its application, will shape the framework in which our industry alongside many others will make our contributions to carbon reduction. We are proud of our achievements in reducing greenhouse gas emissions from our vehicles and are ready to build on them in pursuit of still better products. We shall be all the more successful if we can develop a partnership with policymakers based on a common vision of what our industry can achieve, how this could be enhanced by other policies and in what time frame. Coherent public policies would, for example, encourage consumers to choose vehicles with carbon-lowering technologies, boosting demand for advanced cars and for sustainable alternative fuels. For our part, much of the €20bn we spend every year on research and development is dedicated to developing vehicles that emit less CO₂ and will **ultimately function wholly or largely without fossil fuels**. We devote these investments without losing sight of other

technically possible to make the English translation vocal, but according to NEC the firm isn't looking into that possibility at the moment.

A Self-Tuning Guitar From Gibson

A Gibson Les Paul is one of the world's finest rock guitars (used by Eric Clapton and many others) and now wealthy beginners can buy [a version which tunes itself](#).

Robotics technology developed by German company Tronical GmbH in partnership with Gibson Guitar Corp. enables Gibson's newest Les Paul model to tune itself in about two seconds.

For users who purchase the add-on technology, the guitar recognizes pitch. Then, its processor directs motors on its six tuning pegs to tighten or loosen the strings accordingly. Tronical has offered its '[Powertune System](#)' online and through retailers in Germany since March, according to the company's Web site.

The Gibson Les Paul guitar model with Blue Silverburst finish and the Powertune System went on sale globally last month.

A Smart Polymer That 'Remembers' Its Shape - Gradually

Researchers at the University of Rochester have [developed a shape-memory rubber](#) that may enable applications as diverse as biomedical implants, conformal face-masks, self-sealing sutures, and 'smart' labels.

The material, described in the journal *Advanced Materials*, forms a new class of shape-memory polymers, which are materials that can be stretched to a new shape and will stay in that form until heated, at which time they revert to their initial shape.

Unlike conventional shape-memory polymers, however, the new material is transparent, rubbery, and most importantly, engineers will be able to control the speed at which it returns to its original shape. Other shape memory polymers use crystallization to hold a temporary shape, which often makes them opaque, hard, and brittle in their frozen states, and this can limit their use.

Crime Scene Handling Of Mobile Phones

Data on mobile phones is frequently used as evidence in criminal court cases but the problem for police has been proving that the data on the phone has not been updated or tampered with since the device's seizure.

Now a '[Phone-Shield](#)', which is effectively a Faraday cage in the form of a soft bag with see through window, has been designed by security firm, Disklabs to ensure that data on a criminal suspects' mobile phone can be investigated without that data being compromised when the phone connects to its relevant network.

[Disklabs](#) used ACPO's guidance on mobile phone seizure and examination as the blueprint for their design, and extensive

important needs and requirements, such as increasing road safety, improving air quality, and continued employment for the millions of workers in the automotive industry.

Widespread further innovations will be required across all sectors to challenge climate change and we are fully focused to contribute. We need to be tremendously inventive: there is not just one sector, technology or measure that will solve climate change; the solutions are multiple and may also differ per region and person. In a framework that will enable us to sustain and increase research and development, we can say with confidence that the automotive industry will meet the expectations of our customers and the societies in which we operate.

Norbert Reithofer, BMW Group
Wendelin Wiedeking, Porsche
Aad L. Goudriaan, DAF Trucks
Christian Streiff, PSA Peugeot Citroën
Dieter Zetsche, Daimler
Carlos Ghosn, Renault
Sergio Marchionne, Fiat Group
Leif Oestling, Scania
Lewis Booth, Ford
Martin Winterkorn, Volkswagen
Carl Peter Forster, General Motors
Leif Johansson, Volvo
Hakan Samuelsson, MAN

(But will these auto makers deliver? Their track record so far has not been good.)

subsequent testing has been successful in proving that the Phone-Shield successfully keeps suspects' mobile phones secure from any incoming communications from the networks at the point of police capture, irrespective of the type of phone, frequency or network.

Not having the mobile phone switched on safeguards against network interference and 'tainting' but it also means that critical time and date stamps cannot be verified, leading to evidence captured being questioned in court. However, the 'Faraday' window on the Phone-Shield allows the police examiner to view the phone in a 'Faraday' condition, thus enabling an 'immediate preview of evidence'.

www.rayhammond.com

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