

7 energy wonders



Design Continuum

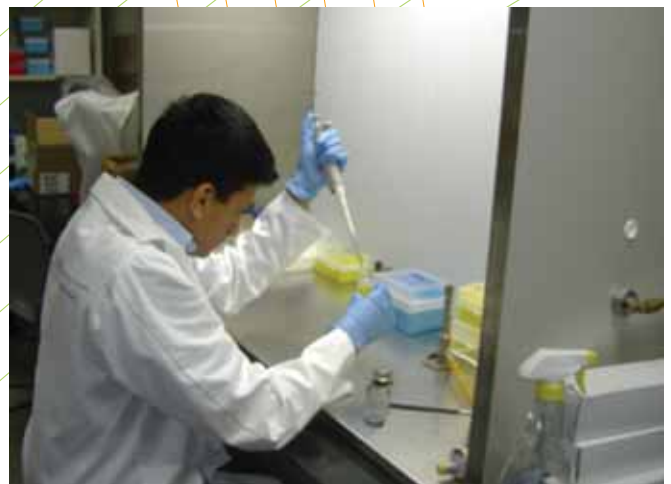
Low-powerbook

No it's not a wind-up. Or, rather, it is. This laptop, costing less than \$100, has been designed for use in parts of developing countries without electricity. The paperback-size, rubber-encased machine can be recharged by winding a crank, uses flash memory instead of a fragile hard drive, and requires very little power. Its designer, Professor Nicholas Negroponte of the Massachusetts Institute of Technology, has set up a non-profit body – One Laptop Per Child – to market and develop it in order to help bridge the technology and information gaps.

Touch the sky

Is it a bird? No, it's a plane! Helios, NASA's 75-metre-long, solar-powered aircraft, can fly higher than any conventional plane. Its single wing is covered with 62,000 photovoltaic cells, generating electricity to run 14 small propeller motors which hold the ultra-light, remote-controlled plane aloft in very thin air. It won't revolutionize air travel, but could be used for investigating the surface of Mars, studying Earth's atmosphere for data on climate change and ozone layer depletion, and carrying telecommunications equipment without having to launch costly satellites.

Nick Galante/PMRF/NASA DFRC



Kartik Madiraju

Charged bugs

Sixteen-year-old Kartik Madiraju, from Montreal, has invented his own clean, renewable energy source. He read about magnetic bacteria – which have minuscule crystals of magnetite in their bodies and are found in water worldwide – in a science journal. He placed the bacteria into tiny boxes with metal strips on the sides, causing them to spin and generate an electric current about half the voltage of an AA battery for 48 hours. There are many potential uses for this technology, but Kartik hopes it might someday help generate green energy in developing countries.

Racing green

Emissions-free motoring is a great idea, but doesn't it seem just a little bit boring? Not any more. Greens longing to put the pedal to the metal can look to BMW's Hydrogen Racer H2R. In September 2004, the single-seater, hydrogen-fuelled 12-cylinder racing car broke nine speed records at France's Miramas Proving Grounds, zooming to 100 kilometres per hour in six seconds, and reaching a top speed of 302.4 kilometres per hour. And all while emitting only water vapour. BMW plans to market a similar vehicle that will run on both hydrogen and petrol.

BMW AG



Solar Century

Hot roof

It keeps out the showers, while heating your shower. The Complete Solar Roof by Solar Century provides electricity and hot water using standard-size roof tiles with built-in photovoltaic and solar thermal technology. Each roof can produce about 60 per cent of the hot water of a three-bedroom home and 800 kilowatt hours of electricity a year in UK conditions. Solar Century hopes that the tiles will make it easy for architects, developers and contractors to build renewable energy into the design of new buildings.

Small is beautiful

Some like, some loathe the look of the giant modern wind turbine with its three blades – but everyone agrees that it is impractical in cities, where its power is most needed. Step forward XCO2's Quiet Revolution – an innovative wind turbine which looks like a high-tech egg-whisk. Just 3 metres wide – tiny compared to a standard wind turbine – it generates 6 kilowatts, enough to power five energy-efficient homes. And it even doubles as an illuminated billboard that can project public art or advertising.



D1 Oils/www.d1plc.com

Living well

Jatropha curcas is a living oil well. Long cultivated as a hedge plant in the tropics and subtropics, its seeds are already used to make soap, cosmetics and fuel for oil lamps. But it is now coming into its own because its oil also makes excellent biodiesel. It is easy to grow, matures quickly and lives more than 30 years – and can produce up to 2,700 litres of oil per hectare. It thrives on marginal land – even on sandy, stony or saline soils – and even helps reverse desertification by improving soil quality.



Quiet Revolution/XCO2