



# Energy Headlines

ENERGY NEWSLETTER OF MNIT, JAIPUR

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## DRUK PEMA– RANCHO’S SCHOOL



Located in Leh, Ladakh, in northern India and Designed by international architects Arup Associates the DRUK PEMA school combines the best of traditional Ladakhi architecture with 21st century engineering excellence and acts as a model for appropriate, cost effective and sustainable development.



The school was featured in the movie *3 Idiots*. It was damaged in August 2010 due to flash floods.

Amongst the best green features of the school are -:

- Has spacious and light filled interior with outdoor seating.
- Access to electric lighting, computers and broadband.
- Use of natural resources such as solar radiation, shading, and natural ventilation.
- The facility uses its own energy

and reduces local emissions by using solar panels that take maximum advantage of Ladakh’s high and consistent exposure to direct sunlight.

- The water distribution system reuses water for irrigation and directs any rainfall to planted areas.
- Drinking and irrigation water is gravity fed to gardens and water faucets.
- When not driving the water pump, the solar panels feed batteries used to power the school’s computers.
- Groundwater is pumped by solar power to a tank at the surface.
- The school’s toilets use a “ventilated improved pit” system, an important and affordable breakthrough for improving sanitation
- The roof is made from a combination of mud and local wood.
- Rock wool and felt, added corrugated aluminum sheets and sand to cover the felt to prevent it from melting under the constant sunshine, are used to insulate.

- Use of timber frames to resist seismic loads and ensure life safety in the event of an earthquake



The innovative architecture of the school has won the 2002 World Architecture Awards for Best Education Building, Best Building in Asia, and joint winner for Best Green Building.

Source: [www.designshare.com](http://www.designshare.com)



## AIR BORNE WIND TURBINE



"Our dependence on fossil fuels amounts to global pyromania, and the only fire extinguisher we have at our disposal is renewable energy."—Hermann Scheer

Today's environmental conditions require us to switch to alternate modes of energy like solar energy or wind energy. Many companies today are focusing on innovating various mechanisms to harness such energy sources which are environment



friendly and cost effective. Wind energy is also one such source of natural resources which can prove to be ecologically friendly and a great source of energy production. Traditionally wind mills are placed on the ground, however Makani Power has innovated and designed a wind tur-

bine that can generate energy by flying in the air.

Following a kite's technique, this wind turbine can fly between 800 and 1950 feet above ground level. This will mean that it can remain below the normal and commercial aviation flying range. However it still flies at an altitude range which is above most of the birds. This prohibits it from harming any terrestrial bodies. At an altitude at which this wind turbine flies, winds are strong and consistent. The limited use of overall wind mill material adds to its green attribute. Our nature demands innovation of more such products, which help in saving the planet and are energy efficient.

This wind mill involves a lower environmental impact and flies above deep water offshores. The airborne

wind power produces energy at half the cost of conventional wind mills. And this also does not require addi-



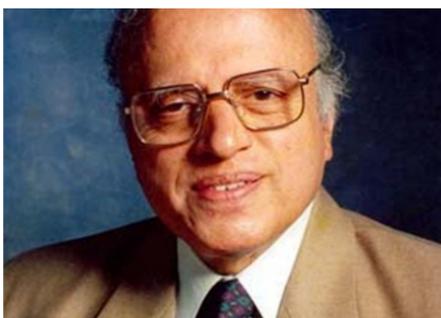
tional space as compared to traditional wind turbines. With increasing environmental hazards by use of synthetic power production mechanisms, this airborne wind mill also will help save cost along with providing positive environmental benefits.

Source: [www.makanipower.com](http://www.makanipower.com)

## M S SWAMINATHAN - FATHER OF GREEN REVOLUTION

Indian geneticist and international administrator, **Maankombu Sambasivan Swaminathan** was born in August 1925. He is renowned for his leading role in India's "Green Revolution," a program under which high-yield varieties of wheat and rice seedlings were planted in the fields of poor farmers.

Swaminathan is known as the "Father of the Green Revolution in India", for his leadership and success in introducing and further developing high-yielding varieties of wheat in India. He is the founder and Chairman of the MS Swaminathan Research Foundation. His stated vision is to rid the world of hunger and poverty. Dr. Swaminathan is an ad-



vocate of moving India to sustainable development, especially using environmentally sustainable agriculture, food security and the preservation of biodiversity, which he calls an "evergreen revolution"

In 1999, *Time* magazine placed him in the *Time 20* list of most influential Asian people of the 20th century.

Of the many honors that he has received, some of the most prestigious of those are

- UNESCO Mahatma Gandhi Gold Medal
- Ordre du Merite Agricole, Govt of France
- Highest award for International Cooperation on Environment and Development, Govt of China
- Global Environmental Leadership Award
- Charles Darwin International Science and Environment Medal
- Commandeur of the Order of the Golden Ark of the Netherlands

Source: [en.wikipedia.org](http://en.wikipedia.org)



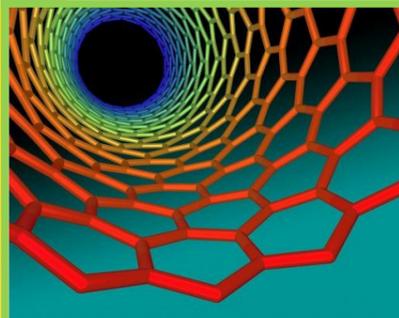
## 8 clean tech innovations that can change the world



power conversion efficiency up to 75 %. If these panels were placed on just 12 sq. km of land, 10 percent of Israel's population could live on the energy.

Curved mirrors developed by Israeli company **Zenith Solar** can collect **5 times more energy** than ordinary solar collectors. This technological can improve overall solar

RTI International researchers have invented breakthrough lighting technology that is five times more energy efficient than incandescent bulbs and does not contain mercury, making it more eco-friendly than CFLs. Best yet, the lighting gives off a warmer, more aesthetic light than CFLs.



increased porosity and "nanofluidic" properties, which can "suck up" target molecules — in this case, CO<sub>2</sub>.

Is there anything nanotubes can't do? The company Porifera has now developed a way of using nanotechnology to viably sequester carbon. It works by utilizing specially designed nanotubes with

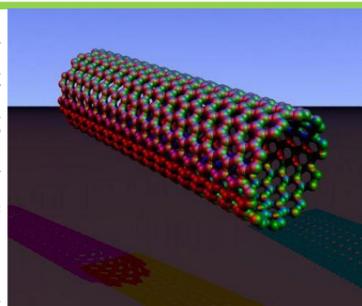
There wouldn't be the need to use open spaces to build solar farms if everyone placed solar panels on their roofs. Now, thanks to technology developed by Dow Chemical Co., a roof shingle that doubles as a solar panel, that possibility is closer to reality. They can be installed by roofing contractors with no specialized solar panel skills.



Not only does the rotation allow for the precise amount of light to hit each of the plants, it also uses far less water than conventional farming methods.

The company Valcent, brought out an idea to build croplands like skyscrapers i.e. straight up. It has pioneered a farming system that grows plants in rotating rows, one on top of another.

MIT researchers developed an energy technology that produces DC voltage by sling shooting electrons through a carbon nanotube. In more practical terms, a thermal power device made of carbon



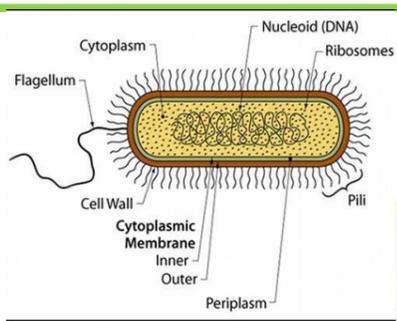
nanotubes could provide the same energy output as a lithium-ion battery but at 1/100th the size. Imagine your laptop being powered by something the size of your fingernail



greatly improve the high cost of going solar .

Light absorbing nanomaterials which can be sprayed to almost any surface like paint works as solar cells. These are 10,000 times thinner than a strand of hair which make this unfathomable

A proteobacteria called a geobacter that can generate electricity from oil-based pollutants and radioactive material. Not only it can clean up harmful pollutants, it can actually turn those pollutants into



clean energy. Researchers are currently working to create geobacter-based fuel cells. Not bad for a microorganism.

Source: [www.mnn.com](http://www.mnn.com)

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## ALTERNATIVE ENERGY : MYTHS AND FACTS ABOUT SOLAR ENERGY

**Myth:** Solar energy can only serve a tiny fraction of world electricity needs.

**Fact:** Solar photovoltaic (PV) technology can meet electricity demand on any scale. Bear in mind, the market capitalization for pure-play solar companies has jumped from \$1 billion in 2004 to over \$118.3 billion today.

**Myth:** Solar energy cannot significantly offset global warming.

**Fact:** If the industry continues to grow by 25% per year (the current prediction), PV in the United States will offset 10 million metric tons of

"Don't believe everything you read!"



CO<sub>2</sub> per year by 2027. That's equivalent to the annual increase emitted by U.S. electricity generation from fossil fuels.

**Myth:** A solar device requires more energy to manufacture than it will produce in its lifetime.

**Fact:** A PV system will produce

much more energy than it consumes over its lifetime. In the worst case, the energy payback for PV is less than four years. A PV module's lifetime is typically more than 20 years.

**Myth:** Solar is too expensive to catch on.

**Fact:** Every solar panel purchased makes the next one cheaper. As opposed to non-renewable sources, which become scarcer and more expensive with every ton that is burned. When all is said and done, each cumulative production doubling drops the price by about 20%.

Watch out the next issue where we'll burst out the MYTHS & FACTS about ELECTRIC CARS

**2<sup>nd</sup> National conference of IBPSA-India on Simulation of Building for Energy Efficiency & Better Built Environment**  
21-22 December, 2012  
Organised by  
MNIT, Jaipur

With the aim of sharing of latest technological Innovations in the engineering disciplines of -:

- Thermal Simulation
- Simulation of Natural Ventilation
- Daylight Simulation
- Simulation of Passive Cooling
- Building Integrated PV Systems.
- Simulation for Code Compliance

**Invited Speakers**

- Prof. Godfried Augenbroe, Atlanta, USA  
Ar. Tanmay Tathagat, EDS Global, New Delhi  
Er. Shishir Gupta, Mechertes India, New Delhi

**Hands on training workshop**

Day long hands-on simulation training workshops are going to be conducted by international and experienced trainers. IES-Virtual Environment is one widely used simulation tools worldwide that handle energy, ventilation, passive cooling, HVAC systems and CFD analysis. Training will be imparted through hand-on exercises and examples.

**Registration Fees for Conference:**  
Faculty members and professionals: 2000 /-, Students: 500/-  
For more Information visit:  
[www.mnit.ac.in](http://www.mnit.ac.in)

credits

- |   |  |
|---|--|
| Navdeep Agarwal   | (3 <sup>rd</sup> Yr. Mechanical Engg.) |
| Ibrahim Katthawala  | (3 <sup>rd</sup> Yr. Mechanical Engg.) |
| Anshuman  | (2 <sup>nd</sup> Yr. Mechanical Engg.) |
| Dherya Mehta  | (2 <sup>nd</sup> Yr. Architecture )    |
| Kuldeep Bhati   | (2 <sup>nd</sup> Yr. Chemical Engg.)   |
| Dr.-Ing. Jyotirmay Mathur,<br>Head, Centre for Energy and Environment |  |

Quiz

First 2 correct entries will fetch a Parker

- 1) Which company is involved in building up of tidal power plant in Kutch in collaboration with Gujarat State Government ?
- 2) In which two Indian states Magneto-telluric investigations are going on for locating the sites of geothermal power plants?
- 3) Which project is a renowned psychiatrist and aeronaut Bertrand Piccard working on?

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