Energy Headlines

ENERGY NEWSLETTER OF NIT, JAIPUR

This Issue

INDIA'S FIRST SMART MINI-GRID SYSTEM

India has commissioned a first of its kind Renewable Energy Based Smart Mini-Grid System at TERI Retreat in Gurgaon.

"The country must have strong safeguards so that it gets the best technology and also develops it indigenously", said Farooq Abdullah, Union Minister of New and Renewable Energy.

"Renewable energy is important as it reaches unreachable areas," said Shri Sushilkumar Shinde, Union Minister of Power. He said that smart mini-grids will be very useful for stand-alone projects in villages and inaccessible areas.

A Smart Mini-Grid (SMG), or Micro-Grid, is an intelligent electricity distribution network, operating at or below 11 KV, where the energy demand is effectively and intelligently managed by diverse range of Distributed Energy Resources (DERs) such as solar PV, micro-hydro power plants, wind turbines, biomass, small conventional generators such as diesel gensets etc. in combination with each other through smart control techniques.

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Advanced sensing, communication and control technologies are used in smart grids these days for not only generation and transmission of power but also distribution and utilization of electricity in a more intelligent and effective manner.

Such an application will not only foster the effective inter-connection and utilization of multiple renewable energy resources but would also help in advancing access to energy to the last mile in the most optimum way by improving the efficiency of the overall system.

The Smart Mini-Grid system has a great potential in large commercial and industrial complexes, hospitals, shopping malls/ complexes, apartments, residential complexes, educational institutions, remote un-electrified as well as electrified locations to ensure maximum flexibility, reliability and safety.

Source: http://articles.economictimes.indiatimes.com

BLUE JEANS FOR SOLAR PANELS

Researchers at Cornell University have discovered a way to use the molecules typically found in blue jean dyes to make an organic, flexible framework that researchers hope to translate to better solar cells.

Today's solar cells are mostly made from silicon, but they can be heavy, inflexible and inefficient. The researchers organized the dye molecules into a "covalent organic framework," or COF, a bonded material that's incredibly light, porous and strong. The research is published in the journal *Nature Chemistry*.

The process used an acid catalyst to reorder the molecules into a two-dimensional sheet. The sheets were then stacked on top of each other to make a cross-hatched framework pathway to conduct the electrical charge. The scientists used phthalocyanine, a molecule used to make blue and green dyes in plastics and jeans.

The blue jeans all of us wear today was invented by Levi Strauss and Jacob Davis in 1873 and were initially sold to the people who worked in mines.

The structure by itself is not a solar cell, but it is a model that will significantly broaden the scope of materials that can be used in COFs, Dichtel told ScienceBlog. The next step is to begin testing ways of filling the crosshatched framework with other organic molecules that could lead to a flexible, lightweight material for solar cells.

Source: news.discovery.com

NEW PROCESS TO REMOVE CARBON DIOXIDE FROM THE AIR

"A leader has the vision and conviction that a dream can be achieved. He inspires the power and energy to get it done. ."
-Ralph Lauren

Most people are familiar with the concept of CO2 scrubbers that capture carbon dioxide from smoke stacks of power plants and other industrial processes.

Christopher Jones at the Georgia Institute of Technology in Atlanta is testing carbon capture materials that are based on amines, the same chemicals used to capture carbon from smokestack emissions, on CO2 concentrations similar to those found in the atmosphere.

Unlike liquid amine solutions, the solid materials that Jones is using require 75% less energy, as they release their stored carbon dioxide at a temperature of 110° Celsius, allowing for easy reuse of the materials. So far a pilot plant has been tested that is able to capture 2 tons of atmospheric carbon dioxide per day, but it's estimated that a commercial scale facility could capture up to 1 million tons daily.

Once emitted carbon dioxide can remain in the atmosphere for over 100 years.

Before we start celebrating, however, it should be noted that even at 1 million tons per day, this is still a very tiny fraction of our daily carbon dioxide output, and that a large number of these facilities would need to be built to just keep pace with our current emissions, before they could even put a dent in the amount of carbon dioxide we've already put into the atmosphere. This is a fascinating breakthrough and will certainly hold a place in our climate change mitigation actions, but is by no means a silver bullet allowing us to keep polluting the atmosphere.

The costs associated with this plan dwarf the modest costs required for simple conservation and efficiency.

Or, otherwise stated, the old adage of "an ounce of prevention is worth a pound of cure", except in this case it's very likely worth several thousand tons of cure.

Source: www.greengeek.ca

PROFILE OF AN ENERGY COMPANY - BALLARD

Ballard Power Systems, Inc. is a global leader in PEM (proton exchange membrane) fuel cell technology. We provide clean energy fuel cell products enabling optimized power systems for a range of applications. Ballard offers smarter solutions for a clean energy future. We are actively putting fuel cells to work in high-value commercial uses every day. In fact, Ballard has designed and shipped over 100 MW of hydrogen fuel cell technology to date.

Current Business Focus

Ballard has a multi-market growth focus in fuel cell products. This drives greater revenue and margin potential, while lowering risk for all stakeholders. Fuel cell applications are expected to broaden in the mid-term, although our focus today remains sharply on commercial opportunities in backup power, distributed generation, material handling and bus applications. Ballard's two supporting business segments are material products and contract automotive.

Corporate Transformation

Ballard Power Systems, Inc. was founded in 1979, under the name "Ballard Research Inc.", to conduct research and development on high-energy lithium batteries. In the course of investigating environmentally clean energy systems with commercial potential, the Company began developing fuel cells in 1983.

Over time Ballard entered into a number of strategic alliances related to fuel cell R&D, including an alliance with Daimler AG and Ford Motor Company. The company undertook a major corporate transformation from 2007 to 2009. Strategic focus shifted from long-term, high cost automotive fuel cell R&D technology development to clean energy fuel cell products for near-term commercial markets.

Headquarters– Burnaby, Canada
Key people-John Sheridan, President and CEO
Revenue– US$ 68.436 mil
Total Assets- US$ 184.46 mil
Employees- 440.0

Source: www.ballard.com

One wind turbine can require two tons of rare earth magnets.

WIND POWER WITHOUT THE BLADES

Noise from wind turbine blades, inadvertent bat and bird kills and even the way wind turbines look have made installing them anything but a breeze. New York design firm Atelier DNA has an alternative concept that ditches blades in favor of stalks. Resembling thin cattails, the Wind stalks generate electricity when the wind sets them waving.

The proposed design calls for 1,203 "stalks," each 180-feet high with concrete bases that are between about 33- and 66-feet wide. The carbon-fiber stalks, reinforced with resin, are about a foot wide at the base tapering to about 2 inches at the top. Each stalk will contain alternating layers of electrodes and ceramic discs made from piezoelectric material, which generates a current when put under pressure. In the case of the stalks, the discs will compress as they sway in the wind, creating a charge.

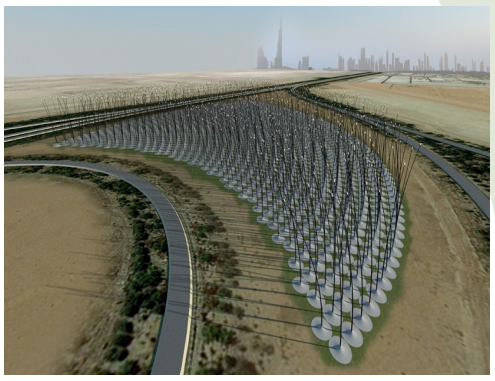
The system is very efficient with no friction loss associated in comparison to other mechanical systems such as conventional wind turbines.

Each base is slightly different, and is sloped so that rain will funnel into the areas between the concrete to help plants grow wild. These bases form a sort of public park space and serve a technological purpose. Each one contains a torque generator that converts the kinetic energy from the stalk into energy using shock absorber cylinders.

Wind isn't constant, though, so Núñez-Ameni says two large chambers below the whole site will work like a battery to store energy. The idea is based on existing hydroelectric pumped storage systems. Water in the upper chamber will flow through turbines to the lower chamber, releasing stored energy until the wind starts up again.

The top of each tall stalk has an LED lamp that glows when the wind is blowing -- more intensely during strong winds and not all when the air is still.

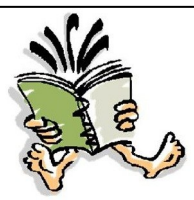
After completion, a Wind stalk should be able to produce as much electricity as a single wind turbine, with the advantage that output could be increased with a denser array of stalks.



Núñez-Ameni also reports that the firm is currently working on taking the Wind stalk idea underwater. Called Wave stalk, the whole system would be inverted to harness energy from the flow of ocean currents and waves. The firm's long-term goal is to build a large system in the United States, either on land or in the water.

Source: news.discovery.com

FROM READER'S PEN



Date of issue of the stamps - **22nd July, 2007**
Number of stamps printed - **0.8 million each.**
Miniature sheet - **0.2 million.**
Print process - **photogravure**
Printed at Indian Security Press, Nasik.

100 WAYS TO SAVE THE ENVIRONMENT — In Your Home – Conserve Energy

1. Clean or replace air filters on your air conditioning unit at least once a month.
2. If you have central air conditioning, do not close vents in unused rooms.
3. Lower the thermostat on your water heater to 120.
4. Wrap your water heater in an insulated blanket.
5. Turn down or shut off your water heater when you will be away for extended periods.
6. Turn off unneeded lights even when leaving a room for a short time.
7. Set your refrigerator temperature at 36 to 38 and your freezer at 0 to 5 .
8. When using an oven, minimize door opening while it is in use; it reduces oven temperature by 25 to 30 every time you open the door.
9. Clean the lint filter in your dryer after every load so that it uses less energy.
10. Unplug seldom used appliances.
11. Use a microwave when- ever you can instead of a conventional oven or stove.
12. Wash clothes with warm or cold water instead of hot.
13. Reverse your indoor ceiling fans for summer and winter operations as recommended.
14. Turn off lights, computers and other appliances when not in use.
15. Purchase appliances and office equipment with the Energy Star Label; old refrigerators, for example, use up to 50 more electricity than newer models.
16. Only use electric appliances when you need them.
17. Use compact fluorescent light bulbs to save money and energy.
18. Keep your thermostat at 68 in winter and 78 in summer.
19. Keep your thermostat higher in summer and lower in winter when you are away
20. Insulate your home as best as you can.
21. Install weather stripping around all doors and windows.
22. Shut off electrical equipment in the evening when you leave work.
23. Plant trees to shade your home.
24. Shade outside air conditioning units by trees or other means.
25. Replace old windows with energy efficient ones.
26. Use cold water instead of warm or hot water when possible.
27. Connect your outdoor lights to a timer.
28. Buy green electricity - electricity produced by low - or even zero-pollution facilities.

CONFERENCES ALERT

Conferences Abroad

Solar Energy and Environment
website: http://www.sinergie-afrique.com **Date:** April 27-30, 2011 **Location**: Dakar, Senegal

International Renewable Energy & Environment Conference 2011
website: http://warponline.org/conferences.htm **Date:** June 24-26,2011 **Location**: Kuala Lumpur, Malaysia

Conferences within India

International Conference on Environmental Knowledge for Disaster Risk Management
website: http://www.nidm.gov.in/PDF/ekdrm2011.pdf **Date:** May 9-10, 2011 **Location**: New Delhi, India

International Conference on Environmental Knowledge for Disaster Risk Management
website: http://www.nidm.gov.in/PDF/ekdrm2011.pdf **Date:** May 9-10, 2011 **Location**: New Delhi, India

QUIZ

1. Where is the largest geothermal power plant of the world located?
2. Which country is most dependent on nuclear power?
3. What is EEG with reference to energy resources?
4. What does ISEO stand for?

Send your entries to ***mnit.energyheadlines@gmail.com***

Answers to the Quiz in Volume 3 Issue 6

1)Sarnia Photovoltaic Power Plant, Ontario, Canada 2) Harish Hande & Neville Williams, 1995
3)International Energy Agency (IEA). 4) Twelve

We received a lot of correct entries. Following are the first two correct entries.
Chandan Murmu, IV Yr. B.Tech,
Shashank Jhajharia, VI Yr. B.Tech.

COMIC SENSE

credits

Dr. –Ing. Jyotirmay Mathur (Mech. Dept.)
Saurabh Mittal (7th Sem, Mech Engg)
Shubham Khandelwal (5th Sem, Mech Engg)
Anshul Sharma (5th Sem, Mech Engg)
Ankur Kumar (5th Sem, Mech Engg)
Soumya Mukherjee (5th Sem, Comp. Engg)

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Also follow us on our facebook page **https://www.facebook.com/EH.MNITJaipur.in?ref=ts&sk=wall**