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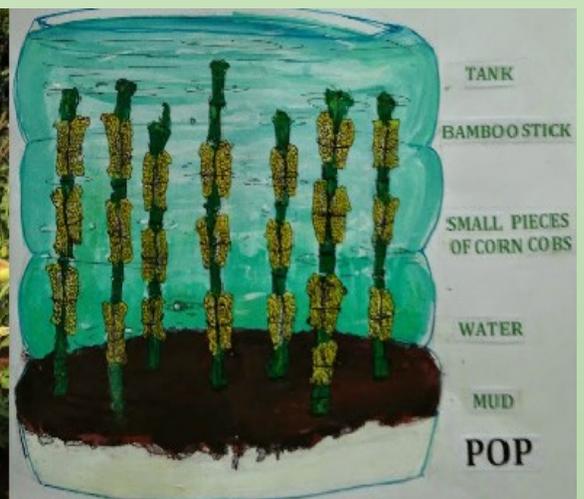
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Trending

- The 2015 United Nations Climate Change Conference, COP 21 will be held in Paris, from 30 Nov to 11 Dec with the aim of keeping global warming below 2°C.
- Police stations in Uttar Pradesh will be made self-reliant for electricity through solar power by March 2016.
- Delhi Metro becomes the first Railway project in the world to be registered by the United Nations under the Clean Development Mechanism.



Water Purifier developed by Odisha School Girl from Waste Corn Cobs



Lalita, a 13-year old student of class 9th from Koraput district of Odisha, has developed a low cost bio-absorbent based water purifier which made her win Community Impact award at ‘Google science fair’. It functions mainly on waste corn cobs. The Corn cob is the least utilized part of the maize plant. Having high mechanical strength, rigidity and porosity, corn cob is a suitable absorbent. This enables contaminants like oxides of salts, detergent, suspended particles, coloured dyes, oil, grease and some heavy metals to be absorbed on the surface of the corn cobs. If the drain pipe of the household is connected to a chamber having different layers of corn cobs in partition layers or to an S-trap pipe having corn cobs, it will separate more than 70-80% of contaminants including suspended particles from the waste water. This cheap and eco-friendly way of purifying water will open up a new market for corn cobs which are discarded as bio-waste.

For experiment, Cobs were collected and

sun dried for a month. The pith was removed to make a hole at the centre of the cob. In it 50 ml of domestic effluent collected from a kitchen drain pipe was poured. This was allowed to pass through the hole. Thereafter, the collected filtrate was tested for purity. This was the pilot stage. After its successful completion, water with several added chemical impurities was passed through five bottles, each containing a different layer for purification. The layers include long pieces of corn cobs, small pieces of corn cobs, powdered corn cobs, activated charcoal made from corn cobs and fine sand. The charcoal layer was observed to absorb most of the coloured substances present in the water, while the chaff layers of both long and small pieces of corn cobs absorbed the suspended particles. The powdered corn cob layer absorbed the gasoline waste. Ponds and lakes can also be cleaned by passing water through different layers of corn cobs.

Source: www.betterindia.com

Transparent Coating cools Solar Cells to boost Efficiency

The crystalline silicon solar cell has an efficiency of around 20%. 23°F of cooling would improve absolute cell efficiency by over 1 percent, a figure that represents a significant gain in energy production. Stanford engineers have developed a technology that improves on solar panel performance by exploiting this basic phenomenon. Their invention shunts away the heat generated by a solar cell under sunlight and cools it in a way that allows it to convert more photons into electricity. This discovery, tested on a Stanford rooftop, addresses a problem that has long bedevilled the solar industry: The hotter solar cells get, the less efficient they become at converting the photons in light into useful electricity.

This solution is based on a thin, patterned silica material laid on top of a traditional solar cell. The material



is transparent to the visible sunlight that powers solar cells, but captures and emits thermal radiation, or heat, from solar infrared rays. Solar arrays must face the sun to function, even though that heat is detrimental to efficiency. Their thermal overlay allows sunlight to pass through preserving or even enhancing sunlight absorption, but it also cools the cell by radiating the heat out and improving the cell efficiency. The same team also developed an ultrathin material that radiated infrared heat

directly back towards space without warming the atmosphere.

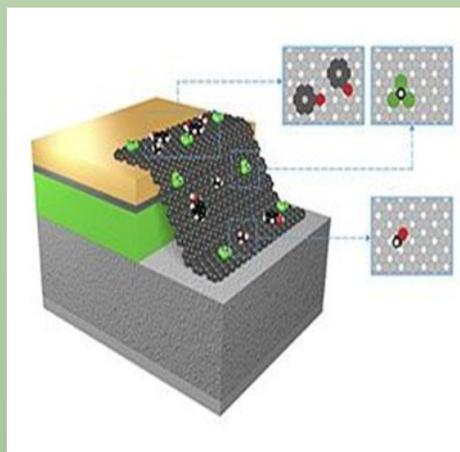
The Stanford team tested their technology on a custom-made solar absorber - a device that mimics the properties of a solar cell without producing electricity, covered with a micron scale pattern designed to maximize the capability to dump heat, in the form of infrared rays, into space. Their experiments showed that the overlay allowed visible light to pass through to the solar cells, and it also cooled the underlying absorber by as much as 23°F.

Researchers strongly believe they can scale things up so that commercial and industrial applications are feasible, perhaps using nanoimprint lithography, which is a common technique for producing nanometre scale patterns in manufacturing industry.

Source: www.sciencenewsline.com

Revolutionary New Weapon in Air Pollution Fight

The researchers at RMIT University in Melbourne have developed a low-cost and reliable method of detecting nitrogen dioxide (NO₂), which is a major air pollutant emitted from the exhaust of vehicles. At present in India, the diesel engines used in cars and other heavy duty vehicles are certified mainly on the basis of carbon emission and particulate matter emission. Since currently available NO₂ detection units are very expensive, we fail to put a check on the NO₂ emission. The gas accelerates the risk of respiratory diseases in children and senior citizens. According to the World Health Organization (WHO), toxic air pollution is the cause of more than 7 million premature deaths every year. The negative impact of nitrogen dioxide can be prevented by access to



personalized and highly sensitive monitoring systems that could detect harmful level of the gas. The newly evolved technology promises a cost effective solution to this problem.

Researchers have transformed Tin disulphide, a yellowish — brown pigment, into flakes, just a few atoms thick. The large surface area of these flakes has a high affinity towards

nitrogen dioxide molecules that allows its highly selective absorption. The sensors, which operate physically by absorbing nitrogen dioxide gas molecules onto the flakes of tin disulphide, not only increase the level of sensitivity towards accepted EPA (Environmental Protection Agency) standards, but also outperform any other nitrogen dioxide sensing solutions in the market.

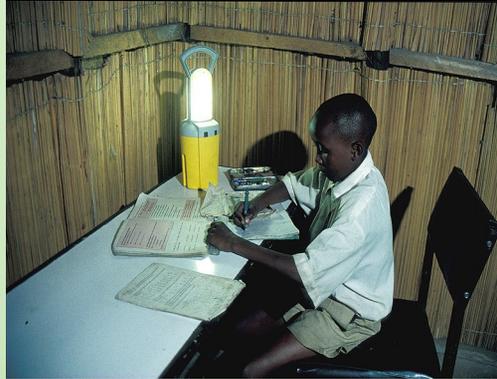
The revolutionary method they have developed is a great start towards creating a handheld, low-cost and personalized NO₂ sensor that can even be incorporated into smart phones. The researchers are hopeful that an app to support the method will be developed soon.

Source : www.sciencealert.com

Cheap Solar Energy for the Poor in Africa

An innovative business model combining solar power and cellphones is electrifying parts of rural Africa that are far from the grid. It's called M-KOPA. The 'M' stands for mobile, and 'KOPA' means to borrow.

The company's customers make an initial deposit, roughly \$30, toward a solar panel, a few ceiling lights, and charging outlets for cell phones — a system that would cost about \$200. Then they pay the balance owed in installments through a widely used mobile banking service, based on how much energy they use. The solar units are cheaper and cleaner than kerosene, the typical lighting source, and once they're fully paid for after about a year the electricity is completely free. Thus, it is lessening the gap between poor and rich in Africa in order to energy access and



closing the gap by agreeing on Sustainable Development Goals, including goals on ending extreme poverty and ensuring adequate access to energy.

It is clear that we cannot tackle poverty successfully without tackling climate change, as climate change hits the poorest people the hardest. The poor are more likely than the rich to live in places vulnerable to climate related weather events and more frequently suffer from diseases that

can be exacerbated by climate change. World Health Organization predicted last year that in 2030 climate change will lead to 48,000 additional deaths due to diarrhea, 60,000 from malaria 95,000 from childhood under nutrition.

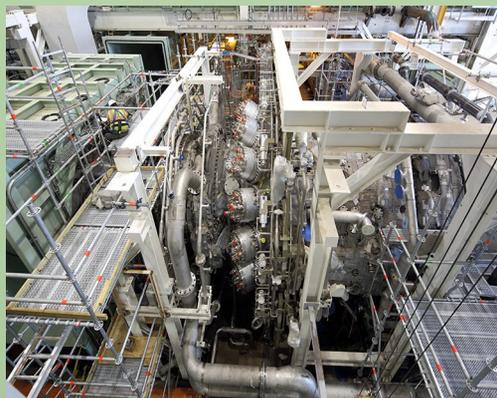
M-KOPA is only a start to bridge the divide between the global rich and global poor in a low-carbon way. Today, this is in Africa, tomorrow, if this were global, it will help in reducing poverty all over the world and improving the quality of life of poor globally. Investing in sustainable infrastructure in areas like energy and land uses is safe and secured option. The biggest advantage associated with the investment is that the investors will pay for themselves in the long run with such investment.

Source : www.m-kopa.com

World's Largest Gas Turbine to tackle Power Crisis in Pak

In an effort to avoid blackouts and meet the power needs of nearly 190 million people, the government in Pakistan is working to install the world's largest gas turbine at Bhikki power plant in Punjab province. The new plant will be a key weapon in Pakistan's arsenal to roll back crippling electricity shortages that have plagued the country for years.

Presently, Pakistan is facing huge power crisis. In fact, there is a term "load-shedding", used by local people to refer electricity shortages. For many Pakistanis, it's a critical piece of information that determines how they plan their days, like the weather forecast in the U.S. or Europe. The Load-shedding turns ubiquitous in the sweltering summer heat, when power shortages often exceed 12 hours a day. The Bhikki plant will be the first



power installation to use the turbines in the Middle East.

The power plant consists of a pair of General Electric's air-cooled gas turbines, the largest and most efficient gas turbines on the planet today. They will become the beating heart of the Bhikki Combined Cycle Power electricity generation plant. Each turbine is constructed from materials like single-crystal fan blades and ceramic matrix composites, many

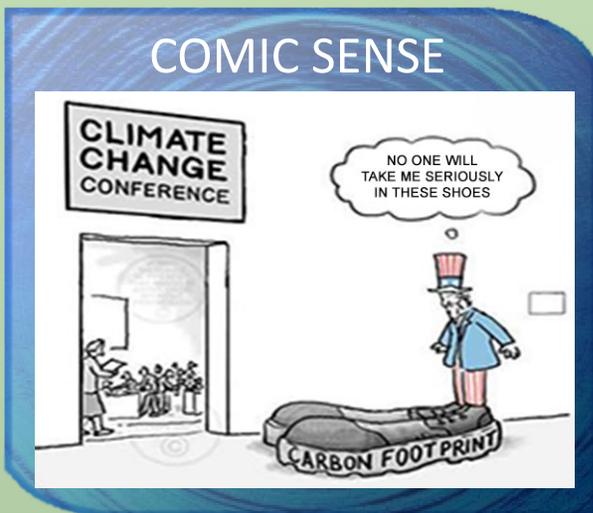
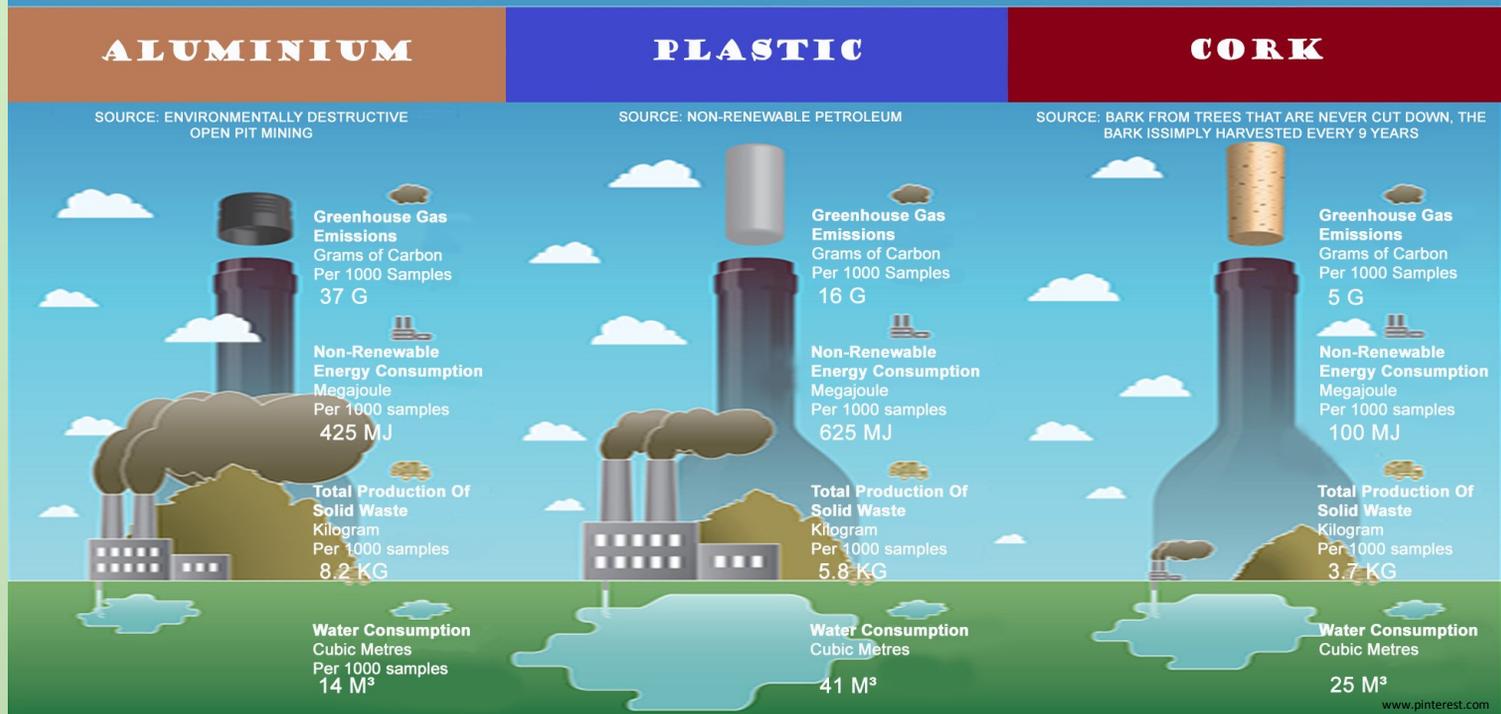
of which were designed to operate under higher temperatures (and therefore produce more energy per unit time) without breaking down, allowing it to hit a staggering 61 % energy production efficiency. It will cover thousands of miles by sea and land from the place of their birth in Belfort, France, to the farming town of Bhikki in Pakistan's Punjab province.

The two units at Bhikki will be operated on imported "re-gasified" liquefied natural gas (RLNG), but will be able to use substitute fuels if price or availability of RLNG starts to fluctuate. Together, they will add more than 1.1 GW to the national grid by 2017 – the equivalent power needed to supply more than six million Pakistani homes.

Source: www.gereports.com

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A MOMENT OF PRIDE

Energy Club, MNIT Jaipur has been conferred the 8th India Power Awards by the Council of Power Utilities in the category "Establishment of Societies/ Clubs to promote Energy Efficiency and Conservation"

QUIZ

- Which payment mode is being used by customers to access solar power from M-KOPA Company?
- Which surface material allows selective absorption of NO₂ molecules?
- Which layer absorbs colored substances in water purification using corn cob?

Send your entries to energyclub@mnit.ac.in
Winning entries to get exciting prizes.

Previous Quiz Winner:- Amit Prakash

CREDITS

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 • Dr. Kapil Pareek
 (Faculty Co-ordinators)

Disclaimer:

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