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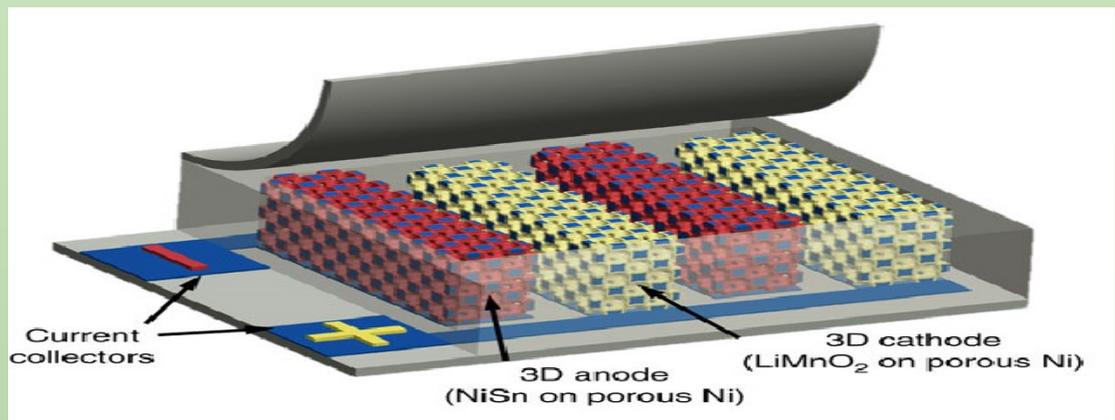
Amazing Energy Facts

- In the average home, 75% of the electricity used to power home electronics is consumed while the products are turned off.
- In the Philippines, geothermal power provides 18% of their energy thanks to the presence of volcanoes.
- Enough sunlight reaches the earth's surface each minute to satisfy the world's energy demands—for an entire year.
- About half of worldwide production of solar panels is consumed by Japan. Their purpose is mostly for grid connected residential applications.

Source : facts.randomhistory.com



Porous 3D Electrode creates Revolutionary Battery



Researchers at the University of Illinois have developed a new lithium-ion battery technology that is 2,000 times more powerful than comparable batteries.

Currently, we can have lots of power or lots of energy but we can't generally have both. Super capacitors can release a massive amount of power, but only for a few seconds; fuel cells can store a vast amount of energy, but are limited in their peak power output. This is a problem because most modern applications of bleeding-edge tech smartphones, wearable computers, electric vehicles require large amounts of power and energy.

It brings us neatly onto the University of Illinois' battery, which has a higher power density than a super capacitor, and yet comparable energy density to current nickel-zinc and lithium-ion batteries. According to the university's press release, this new battery could allow for wireless devices to transmit their signals 30 times farther. If that wasn't enough, this new battery can be charged 1,000 times faster than conventional li-ion batteries.

The new Illinois battery has a porous, three-dimensional anode and cathode. To create this new electrode structure, the researchers build up a structure of polystyrene (Styrofoam) on a glass substrate, electro deposit nickel onto the polystyrene, and then electro deposit nickel-tin onto the anode and manganese dioxide onto the cathode.

The end result is that these porous electrodes have a massive surface area, allowing for more chemical reactions to take place in a given space, ultimately providing a massive boost to discharge speed (power output) and charging. So far, the researchers have used this tech to create a button-sized micro battery.

In real-world use, this tech will probably be used to equip consumer devices with batteries that are much smaller and lighter — imagine a smartphone with a battery the thickness of a credit card, which can be recharged in a few seconds and many more fairy things will come true.

Source : www.extremetech.com

Lockheed announces Breakthrough on Fusion Energy

Lockheed Martin Corp announced that it has made a technological breakthrough in developing a power source based on nuclear fusion, and the first reactors, small enough to fit on the back of a truck, could be ready for use in a decade.

Researchers have been working on fusion energy for about four years, but are now going public to find potential partners in industry and government for their work. Initial work demonstrated the feasibility of building a 100-megawatt reactor.

This project would mark a key breakthrough in a field that scientists have long eyed as promising, but which has not yet yielded viable results. The effort seeks to harness the energy released during nuclear fusion, when atoms combine into more stable forms.

Nuclear fusion is a potential energy source that is safer and more efficient



than current reactors based on nuclear fission. The advantages of fusion over fission are paramount. For one, fusion generates three to four times more energy than fission does. It would use deuterium-tritium fuel, which can generate nearly 10 million times more energy than the same amount of fossil fuels and it is a scope for future reactors and can eliminate radioactive waste completely. Controlling a fusion reaction has proven to be an engineering nightmare. The reaction

at the heart of the process generates so much heat and pressure that containing it, especially at smaller scales, has been an elusive goal.

A high beta fusion reactor is based on principles of so-called “magnetic mirror confinement.” This approach tries to contain plasma by reflecting particles from high-density magnetic fields to low-density ones.

It is a solution to climate change as future planet’s entire electricity production could be carbon neutral. Since no radioactive waste is produced, the dangers of a meltdown are non-existent. Engines fuelled by fusion will radically transform our ability to explore space. Fusion also provides a virtually limitless supply of fuel as sea water is used.

There is no end to the ways such an energy source could radically transform the world.

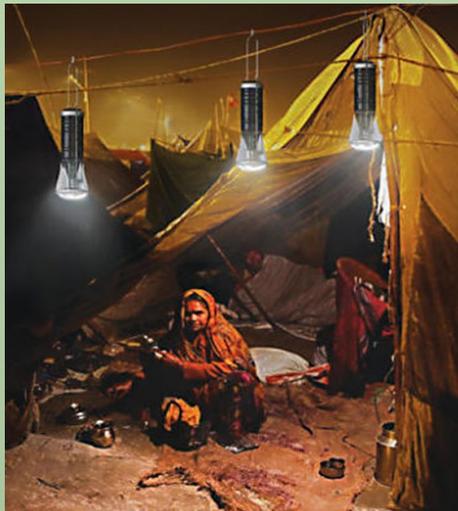
Source: The Guardian

Discarded Water Bottles become Cheap Solar Lights

In big cities we take for granted how easy it is to use electrical light, but over a billion people living in developing countries and rural areas don't have access to the power grid. In rural India, if someone wants to study at night or walk home in the dark, they'll often have to light a kerosene lamp, which is expensive to maintain and smoky, plus it's a pretty dangerous fire hazard if it's accidentally tipped over.

So designers at Designnobis, a firm based in Turkey, have come up with ‘Infinite Light’, a lantern made up of a flexible solar panel, some batteries, and an empty plastic bottle.

The solar panel sits inside the bottle and collects sunlight during the day, and at night, the lantern switches over to battery power when the solar energy has been exhausted. A simple



frame holds everything together, and includes a handle at the top that allows the lantern to be held and carried around, or strung up from a ceiling or an outdoor post.

The team aimed to create a sustainable lamp with minimum cost. The lighting unit does not require any infrastructure, and it is a ready-to-use

package that can be placed in a discarded plastic bottle.

Because plastic bottles are accessible to even the very remote communities around the world, people interested in setting up these solar lanterns will just need the internal parts to be shipped to them. This helps keep the initial costs down, and also means that rubbish that was destined to become landfill can now enjoy a continued existence as a useful appliance.

The design won the Green Dot Award, which is an initiative that encourages businesses to produce environmentally friendly products, and the team at Designnobis is now working on getting their solar lanterns on the market.

Source : www.sciencealert.com

Water and Sunlight: The Formula for Sustainable Fuel

Scientists have replicated one of the crucial steps in photosynthesis, opening the way for biological systems powered by sunlight which could manufacture hydrogen as a fuel.

Water is abundant and so is sunlight. It is an exciting prospect to use them to create hydrogen, and do it cheaply and safely. Hydrogen offers potential as a zero-carbon replacement for petroleum products, and is already used for launching space craft. However, until this work, the way that plants produce hydrogen by splitting water has been poorly understood.

The team created a protein which, when exposed to light, displays the electrical heartbeat that is the key to photosynthesis. The system uses a naturally-occurring protein and does not need batteries or expensive metals, meaning it could be affordable in developing countries.



This research opened up new possibilities for manufacturing hydrogen as a cheap and clean source of fuel. This is the first time they have replicated the primary capture of energy from sunlight. It's the beginning of a whole suite of possibilities, such as creating a highly efficient fuel, or to trap atmospheric carbon, and also we know that carbon free cycle is essential and indefinitely sustainable. Sunlight is extraordinarily abundant, water is everywhere and the raw materials we need to make the fuel.

And at the end of the usage cycle it goes back to water.

The team of researchers modified a much-researched and ubiquitous protein, Ferritin, which is present in almost all living organisms. Ferritin's usual role is to store iron, but the team removed the iron and replaced it with the abundant metal, manganese, to closely resemble the water splitting site in photosynthesis.

The protein also binds a haem group, which the researchers replaced with a light-sensitive pigment, Zinc Chlorin. When they shown light onto the modified ferritin, there was a clear indication of charge transfer just like in natural photosynthesis.

Modified E. Coli has the gene to create ready made artificial photosynthetic proteins. It would be a self-replicating system and all you need to do is shine light on it.

Source: www.anu.edu.au/media

The Forest Man of India: Jadav Payeng

Since 1979, forestry worker Jadav Payeng has been cultivating a forest in northeast India that now spans 550 hectares. Thirty-four years ago when he began to plant trees, no one, including him, had the slightest idea that his effort would give birth to an entire forest.

It all began with a dream he had in 1979 to plant trees on barren land for small animals and birds to build their homes on the tree tops. Chasing his dream, Jadav Payeng, then a young lad, belonging to the Mishing tribal community in Jorhat district, in the north eastern state of Assam, began to plant trees regularly.

Decades later, the trees have transformed into a lush forest covering 550 hectares of land, home to wild elephants, tigers, rhinos and deer.

Similarly, he is growing trees on another 150 hectares of land, which is



adjacent to the first forest he helped plant.

Payeng's work has been credited with significantly fortifying the island, while providing a habitat for several endangered animals which have returned to the area; a herd of nearly 100 elephants (which has now given birth to an additional ten), Bengal tigers, and a species of vulture that hasn't been seen on the island in over 40 years.

In appreciation of his single handed

efforts, the Assam government has named the forest he helped grow after him, as Mulai Kathoni Bari or the forest of Mulai, Payeng's pet name.

"Payeng is a true conservationist who is working generously on the issue, and he has shown what an ordinary person with good motive and will power can do," said Assam chief minister Tarun Gogoi.

India's premier educational institution, the Jawaharlal Nehru University (JNU) named him the 'Forest Man of India'.

Payeng's story of afforestation brims with country wisdom that needed no alarming statistics about the ill effects of deforestation, shrinking animal habitats and providing sanctuaries for natural wealth to survive, but only homespun instinct.

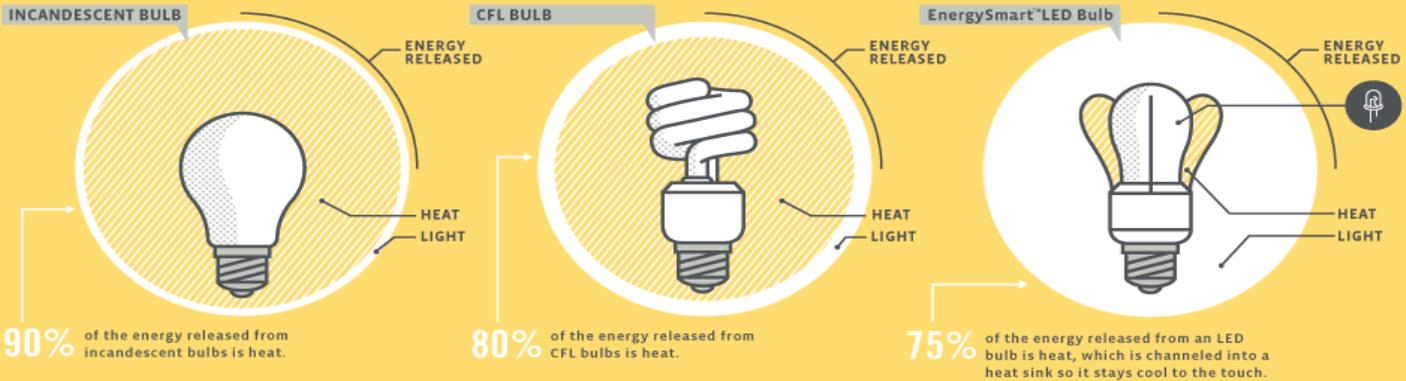
Source : Al Jazeera

WHAT'S AN LED?

LEDs (or light-emitting diodes) are small sources of light that work when the movement from electrons illuminate semiconductor material. This longer lasting technology is usually found in traffic lights and exit signs, but now consumers can find options like LED light bulbs and even Christmas lights. Companies like GE are working to make LED technology more affordable and practical for homes. The Department of Energy estimates that rapid adoption of LED lighting in the U.S. over the next 20 years can reduce lighting electricity demand by 33% by 2027.

LED Benefits

- Directs light more efficiently
- Has compact size
- Resists breakage
- Long lifetime
- Turns instantly on
- No infrared or UV emissions

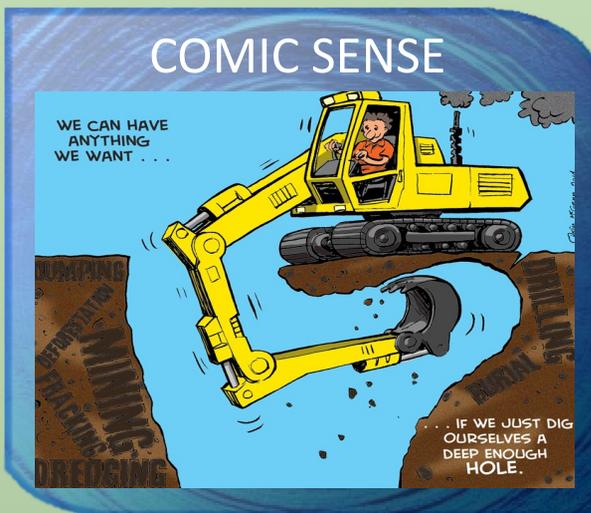


What's The Estimated Lifetime For Common Light Sources?



GE imagination at work A collaboration between GOOD and Deeplocal

[Source: U.S. Dept of Energy]



CRACK IT

Scrambled words are given below that have something to do with energy. Unscramble the words and write down the answers in given space.

- 1) DNMLILW _____
- 2) LCRCTEETIY _____
- 3) LOCA _____
- 4) NAGTUARASL _____
- 5) RREAWLOOPS _____
- 6) THOGLAMEER _____

For more crosswords, puzzles see our Facebook "ENERGY HEADLINE" page.

QUIZ

1. On which date World Environment Protection Day is celebrated?
2. The 'thickness' of stratospheric ozone layer is measured in?
3. When was Royal society for the Protection of Birds was formed?

Send your entries to mnit.energyheadlines@gmail.com

Winning entries to win exciting prizes.

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