

Centre for Business Sustainability,  
IIM Lucknow, Prabandh Nagar, Off. Sitapur Road, Lucknow – 226 013  
E-mail: [cbs@iiml.ac.in](mailto:cbs@iiml.ac.in) Phone: +91 522 2736987, +91 522 2736989

## Business Sustainability News

## International

# Arctic sea ice shrinks to lowest extent ever recorded

by John Vidal,

The Arctic sea ice has hit its lowest extent ever recorded, according to the US-based National Snow and Ice Data Center (NSIDC), the Japanese Aerospace Exploration Agency, and Norwegian, Danish and other government monitoring organisations.

With possibly two weeks' further melt likely before the ice reaches its minimum extent and starts to refreeze ahead of the winter, satellites showed it had shrunk to 4.1m sq km (1.6m sq miles) on Sunday. The previous record of 4.3m sq km was set in 2007. The Guardian reported earlier this month that such a record low was likely to be hit imminently.

NSIDC scientist Walt Meier said: "This is an indication that the Arctic sea ice cover is fundamentally changing."

"The previous record, set in 2007, occurred because of near perfect summer weather for melting ice. Apart from one big storm in early August, weather patterns this year were unremarkable. The ice is so thin and weak now, it doesn't matter how the winds blow," said the NSIDC director, Mark Serreze.

The record is widely seen by scientists at the NSIDC and elsewhere as a strong signal of long-term climate warming.

"The Arctic used to be dominated by multiyear ice, or ice that stayed around for several years," Meier said. "Now it's becoming more of a seasonal ice cover and large areas are now prone to melting out in summer," said Serreze.

"These figures are not the result of some freak of nature but the effects of man-made global warming caused by our reliance on dirty fossil fuels," said John Sauven, the Greenpeace UK director.

"These preliminary figures provide irrefutable evidence that greenhouse gas emissions leading to global warming are damaging one of the planet's critical environments, one that helps maintain the stability of the global climate for every citizen of the world," said Sauven.

Arctic sea ice follows an annual cycle of melting through the warm summer months and refreezing in the winter. It has shown a dramatic overall decline over the past 30 years.

"Record-breaking ice minimums are becoming the new normal," says Clive Tesar of WWF's global Arctic programme. "We're breaking records on a regular basis as the sea ice continues its decline."

According to many scientists, the sea ice plays a critical role in regulating climate, acting as a giant mirror that reflects much of the sun's energy, helping to cool the Earth.

The formation of the sea ice produces dense saltwater, which sinks, helping drive the deep ocean currents. Without the ice, many scientists fear this balance could be upset, potentially causing major climatic changes.



Satellite image of Arctic sea ice. Photograph: Reuters

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## Congress vote on EU carbon tax may block US airlines from paying

By Suzanne Goldenberg, US environment correspondent, for guardian.co.uk



Congress may order US airlines not to pay the emission tax.  
Photograph: Justin Lane/EPA

Congress threatened to bring chaos to European Union airports on Tuesday, moving towards a vote on a measure that would ban US carriers from paying for their carbon emissions.

The Senate's commerce, science and transportation committee cleared the way for a floor vote on a bill that would make it illegal for US carriers to comply with new EU legislation requiring airlines that use European airports to pay for carbon emissions. The measure has already been approved by the House of Representatives.

In Washington's deeply divided political climate, opposition to the EU's aviation scheme remains one of the only areas where Republicans and Democrats agree.

Both parties supported the moves in Congress, and the Obama administration has also been putting pressure on Europe to back down and leave it to the International Civil Aviation Organisation to take measures to reduce carbon emissions.

The Department of Transportation on Tuesday began two days of talk with 16 other non-European countries opposed to the EU law, aimed at trying to get the ICAO to enact a global solution.

American and Asian airlines have said the European emissions scheme is unfair because it counts the entire time the aircraft is in the air – not just the time over European countries.

A senior administration official briefing reporters on Monday said, however, that any overall solution must involve setting aside the application of the European Union scheme.

"If the EU can go and impose their own system around the world in this way, there's nothing to say that five or 10 or 20 other countries wouldn't do the same thing, and I think that creates a risk which is very much a concern, I think, of airlines around the world, that you end up with a kind of patchwork system of different mechanisms, different taxes, and different kinds of policies."

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## Tips :

Electric appliances are the essential part of kitchen. We can save electricity by using electric appliances prudently. Here are some tips to save energy that may prove to be useful.

- Ideally the temperature of refrigerator should be between 35° and 38° Fahrenheit (1.7° to 3.3° Celsius) and that of freezer between 0° and 5° Fahrenheit (-15° to -18° Celsius).
- Ensure that cold air does not escape from door seal. If there is leakage get it fixed by your service provider.
- Remove old items from refrigerator regularly, so that electricity is not wasted in keeping them cold all the time. Also ensure that the items which are not required to be stored in refrigerator are not kept in the refrigerator.
- Do not keep hot food in refrigerator as this will increase the temperature inside which may affect other food items stored in it and also refrigerator will consume electricity for cooling it.
- Use small electric cooker, kettle and toaster etc for smaller quantities instead of your large appliances.
- Preheat your oven only when it is the requirement of the recipe thus you may save electricity.
- If using dishwasher use it to its full load instead of using it several times with small loads.
- Unless its necessary do not heat dry your utensils rather let them "air dry" on their own.

## Climate change the cause of summer's extreme weather, Congress told

By **Suzanne Goldenberg**, US environment correspondent, for guardian.co.uk

Drought, wildfires, hurricanes and heatwaves are becoming normal in America because of climate change, Congress was told on Wednesday in the first hearing on climate science in more than two years.

In a predictably contentious hearing, the Senate's environment and public works committee heard from a lead scientist for the UN's climate body, the IPCC, on the growing evidence linking extreme weather and climate change.



Oklahoma senator Jim Inhofe, a prominent climate sceptic, told the committee: 'The global warming movement has collapsed.'  
Photograph: Axel Schmidt/AFP/Getty

"It is critical to understand that the link between climate change and the kinds of extremes that lead to disaster is clear," Christopher Field, a lead author of the IPCC report and director of global ecology at the Carnegie Institute for Science, said in testimony.

"There is no doubt that climate has changed," he went on. "There is also no doubt that a changing climate changes the risks of extremes, including extremes that can lead to disaster."

He later told the committee that those climate-related disasters would have profound effects on industry and agriculture.

Field was the first IPCC scientist to appear before the committee since February 2009. It was a time when there was real optimism about prospects for action on climate change under the new Obama Administration.

By Wednesday, however, it was universally acknowledged there was no prospect of moving climate change legislation through Congress. There was also little chance the scientists' presentations would persuade the most prominent Republican climate

The Republican's campaign against Obama's green agenda, with their attacks on the Environmental Protection Agency and his clean energy loans, would make their presence a political distraction, she indicated.

But Boxer told reporters before the hearing she had faced growing pressure from the public to air the issue of climate change. The Republican-controlled House has turned down 15 requests from Democrats for a similar hearing.

Field, in his testimony, warned that the devastating extremes of the last year could soon become routine.

"The US experienced 14 billion-dollar disasters in 2011, a record that surpasses the previous maximum of 9," he said. "The 2011 disasters included a blizzard, tornadoes, floods, severe weather, a hurricane, a tropical storm, drought and heatwaves, and wildfires. In 2012, we have already experienced horrifying wildfires, a powerful windstorm that hit Washington DC, heat waves in much of the country, and a massive drought."

He went on to make a point of warning Texans that the future of farming and ranching could be put in jeopardy because of climate change.

The committee also heard from James McCarthy, a Harvard oceanographer and IPCC author, who warned that sea-level rise was occurring about three times faster than scientists believed even a decade ago.

The hearing quickly veered off course from reviewing the latest climate science to the intractable politics surrounding climate change in America.

In one of the liveliest exchanges, Bernie Sanders of Vermont continued his effort to take down Inhofe for his statements that climate change is a hoax and a conspiracy.

Sanders asked the scientists on the panel for their opinions on some of Inhofe's more notorious assertions – that climate change is a hoax, that the planet is actually in a state of cooling, and that such environmental concerns were a conspiracy by the UN, Al Gore, and Hollywood.

The scientists did not support Inhofe's claims.

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## World's First Wind-Powered EV Charging Station Debuts in Spain

*SustainableBusiness.com News*

A frequent gripe of electric vehicle skeptics is that the power used to charge them comes from coal-fired power plants.

General Electric and New York-based Urban Green Energy (UGE) are teaming up to charge electric vehicles using renewable energy.

The companies are creating a system that integrates GE's DuraStation electric vehicle chargers with UGE's 4-kilowatt (KW) vertical wind turbines.



The Durastation is a Level 2 charger, which means it can cut EV charge time to 4-8 hours (from 12-18 hours). The UGE wind turbine is 42 high, and it requires winds of at least 7 miles per hour to generate electricity.

Called Sanya Skypump, the solution is being targeted at commercial and government

customers. The first installation is located near Barcelona, Spain, at the headquarters of Cespa, an environmental services subsidiary of Ferrovial Servicios, the world's biggest private transportation infrastructure investor.

More installations are planned for the US and Australia later this year at shopping malls, universities and other locations. Details on pricing weren't immediately available, but the companies say that it takes less than two hours to install.

"Since launching the Sanya Skypump, we have received inquiries from companies around the world that are looking to embrace sustainability," said Nick Blitterswyk, CEO of UGE. "The Sanya Skypump is one of those rare products that enable institutions to demonstrate their commitment to the environment while providing a really useful service as well."

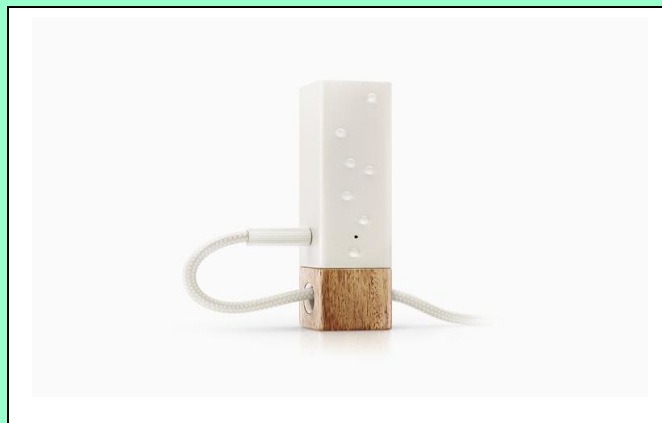
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## Mobile App Acts as Personal Environmental Monitor

*SustainableBusiness.com News*

Want reassurance the vegetables you're eating have been grown without pesticides? Wondering how much radiation or electromagnetic pollution is in your child's room or in your home office?

Soon, you won't have to rely on organic food labels or an expensive monitoring system for those answers. You'll be able to investigate for yourself with a nifty new mobile application from Lapka Electronics LLC.



The company is testing a system of small sensors that collect information about environmental conditions including radiation, electromagnetic fields, and humidity levels.

Sensors feed the data into a mobile app that runs on an Apple iPhone, which alerts you if measurements exceed acceptable levels.

"For example, you can measure radiation on an airplane and a little bit higher level will be okay, because the app knows you won't stay there for 24 hours and that higher radiation is common for planes," the company's creative director, Vadik Marmeladov told Fast Company Co.Design. "But with the same level of radiation in your kid's bedroom it will alarm you and give you an explanation to motivate your further actions. So, people don't have to rely on their knowledge about radiation anymore to protect their family and themselves."

The Lapka "personal environment monitor" also includes a steel probe that tests for nitrates in food or drinking water caused by synthetic fertilizers – a sure sign that what you're eating is not organic.

Currently in prototype testing, the system will cost about \$220 and is due to hit the market in December.

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## Anti-nuclear campaigners launch Japan's first green party

By Justin McCurry in Tokyo, for guardian.co.uk

Anti-nuclear campaigners in Japan have launched the country's first green party, more than a year after the triple meltdown at Fukushima Daiichi power plant created a groundswell of opposition to atomic energy.

Greens Japan, created by local politicians and activists, hopes to satisfy the legal requirements to become an officially recognised political party in time for the general election, which must be held by next summer but could come much earlier.



Members of Greens Japan during their inaugural party meeting. The party wants to emulate other green parties of Europe and influence Japan's energy policy. Photograph: Greens Japan

The party said it would offer voters a viable alternative to the two main parties, both of which have retained their support for nuclear power, particularly after the recent decision to restart two nuclear reactors in western Japan.

The ruling Democratic party of Japan and the minority opposition Liberal democratic party [LDP] both supported the nuclear restart, which came after Japan was briefly left without nuclear power for the first time in more than 40 years.

Akira Miyabe, Greens Japan's deputy leader, said voters had been deprived of the chance to support a party that puts nuclear abolition and other green policies at the top of its agenda. "We need a party that puts the environment first," he said at a launch event in Tokyo.

The 1,000-member party is still a gathering of disparate groups and local politicians, but believes it can emulate green parties in Germany and other

parts of Europe and influence the national debate over energy policy.

Nao Suguro, a co-leader of the party who sits on a local assembly in Tokyo, said the aim was "to create a broad network to accommodate calls for the abolition of nuclear power plants."

The party will struggle to field any candidates if, as some predict, the prime minister, Yoshihiko Noda, calls a snap lower house election. But it said it was prepared to put up about 10 candidates in next summer's upper house elections.

Recent demonstrations in Tokyo suggest Japan's anti-nuclear movement has broken free of its long association with socialist and pacifist movements to include younger campaigners, many of whom are protesting for the first time.

The protests are among the biggest Japan has seen in decades, although they have not succeeded in forcing Noda to reconsider his support for the restart of several reactors to avoid power cuts and lessen Japan's dependence on expensive fossil fuel imports.

While thousands of demonstrators held a candlelit vigil and formed a chain around the parliament building in Tokyo on Sunday night, voters in Yamaguchi prefecture in south-west Japan elected a pro-nuclear governor in a poll that some saw as a litmus test of Japan's enthusiasm for atomic energy.

Shigetaro Yamamoto, a former bureaucrat who was supported by the conservative LDP, defeated three rivals, including Tetsunari Iida, who had campaigned against the proposed construction of a nuclear power plant in the area. That vote came after other recent wins for pro-nuclear candidates in local elections.

The government is currently sounding out public opinion on three options for nuclear energy's share of the country's energy mix in 2030: zero, 15% or 20-25%. Japan depended on nuclear power for about a third of its energy needs before the 11 March disaster.

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# 3 ways to better manage your water risk in an era of scarcity

By Brooke Barton

Water bills make up a tiny fraction of operating costs even for companies that use vast amounts of the stuff, and ample supplies have traditionally been taken for granted. But in many areas of the United States and around the world, fresh water is becoming increasingly scarce, polluted and contested.



Photo of water droplets provided by Mikhail hobotonPopov via Shutterstock

According to a recent study led by McKinsey, the world may face a 40 percent shortfall between forecast global water demand and available supplies by 2030. In this high-risk environment, companies with water-intensive operations and supply chains – energy, mining, manufacturing, food and beverage, electric power – have the most at stake.

Some in the business world are starting to realize this, with companies from Levi Strauss to PepsiCo to IBM acknowledging the challenge and seizing the opportunity to act. Institutional investors including the Norwegian sovereign wealth fund and the California State Teacher's Retirement System are also taking on the issue, asking companies in their investment portfolios to better manage water risks.

To create real, large scale, lasting change, however, these organizations need tools to plan, track and measure success. To help companies and shareholders like these create real, lasting change on a larger scale, Ceres and the World Business Council for Sustainable Development recently released a new roadmap for 21<sup>st</sup> century corporate water management, the *Ceres Aqua Gauge*. It's a practical (and free) self-assessment tool that outlines detailed steps for effective water risk management, from the boardroom to the factory floor to the farm field.

## **3 ways to better manage your company's water risk**

The Aqua Gauge is the result of extensive interviews with leading companies and NGOs and is backed by investors managing \$2 trillion in assets. It emphasizes a strategic approach to water risk, and highlights some of the companies that are leading the way in 21<sup>st</sup> century water management.

These exemplars are:

- **Establishing responsibility and creating incentives at the top.**
- **Improving water performance in the supply chain.**
- **Addressing water risks "beyond the fenceline."**

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## Meteorologists Finally Take a Stand on Climate Change

### SustainableBusiness.com News

After years of hemming and hawing, the American Meteorological Society released its official position on climate change yesterday, saying the Earth is warming and that warming is caused by humans.

Weather forecasters have been criticized for their silence on connecting the dots between the extreme weather they report and climate change, even amidst the drought that has effected most of the US this summer.

The public has indicated that they trust their weather forecasters and want to hear whether they connect weather events to climate change.

The American Meteorological Society position statement states:

"There is unequivocal evidence that Earth's lower atmosphere, ocean, and land surface are warming; sea level is rising; and snow cover, mountain glaciers, and Arctic sea ice are shrinking," they says in the policy statement.

"The dominant cause of the warming since the 1950s is human activities. This scientific finding is based on a large and persuasive body of research. The observed warming will be irreversible for many years into the future, and even larger temperature increases will occur as greenhouse gases continue to accumulate in the atmosphere."

While natural cycles of warming are to be expected, they say, the evidence clearly points to human activity as the cause of the climate change the earth is currently experiencing:

- All of the 10 warmest years in global temperature records up to 2011 have occurred since 1997, with 2005 and 2010 being the warmest two years in more than a century of global records.
- In the US, there have been twice as many record daily high temperatures as record daily low temperatures in the first decade of the 21st century.
- The effects of warming are especially evident in the planet's polar regions, with significant losses to the Greenland and Antarctica ice

sheets and most of the world's glaciers in retreat.

- Freeze zones are rising in elevation, and spring snowpacks are decreasing in volume.
- There have been dramatic seasonal shifts, resulting in earlier springs, longer frost-free periods, longer growing seasons and changes to animal migration patterns.
- Globally averaged sea levels have risen by about 7 inches in the 20th century, with the trend accelerating since the early 1990s.

"It is clear from extensive scientific evidence that the dominant cause of the rapid change in climate of the past half century is human-induced increases in the amount of atmospheric greenhouse gases, including carbon dioxide (CO<sub>2</sub>), chlorofluorocarbons, methane, and nitrous oxide," they write. "The most important of these over the long term is CO<sub>2</sub>, whose concentration in the atmosphere is rising principally as a result of fossil-fuel combustion and deforestation."

Simulations project there will be an increased proportion of global hurricanes that fall into the strongest categories (4 and 5 on the Saffir-Simpson scale), although the total number of storms may not change. Heat waves and cold snaps will continue, but there will be proportionally more extreme warm periods. There will be more droughts and high temperatures that will put pressure on the world's crop systems.

In July, Jeff Masters, director of meteorology at the Weather Underground (just bought by the Weather Channel), said he would take advantage of his larger audience to help educate Americans about climate change.

For the complete statement:

Website:

[www.ametsoc.org/policy/2012climatechange.html](http://www.ametsoc.org/policy/2012climatechange.html)

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## America Needs a Food Waste Diet

SustainableBusiness.com News

Americans waste up to 40% of the food that makes it onto grocery shelves, into their kitchens or that crosses their plates, which makes the potential consequences of the ongoing drought even more painful, reports the Natural Resources Defense Council (NRDC).

That waste costs close to \$165 billion per year. Indeed, the average American family of four throws out about \$2,275 in food every year, reports the NRDC.

Recovering even 15% of that waste would be enough to feed about 25 million Americans a year. What's more, it would address a serious environmental issue: uneaten food accounts for approximately 23% of the methane emissions in the US, as it rots in landfills.

"As a country, we're essentially tossing every other piece of food that crosses our path—that's money and precious resources down the drain," says Dana Gunders, NRDC project scientist with the food and agriculture program. "With the price of food continuing to grow, and drought jeopardizing farmers nationwide, now is the time to embrace all the tremendous untapped opportunities to get more out of our food system."

There are several ways the US could address this problem, says Gunders, including:

- Set national goals for waste reduction, by clarifying date labels on food, encouraging recovery and improving public awareness. A particular focus should be fresh produce: about half of the nationwide supply of fruits and vegetables goes uneaten every year.
- Encourage business to streamline their operations to reduce food losses and save money. For example, the Stop and Shop grocery chain saves an estimated \$100 million annually simply by addressing freshness in its perishables department.

Of course, both measures are probably pointless without changes in peoples' behavior. America doesn't just need to think about farming and producing food more sustainably, it seriously needs to reduce food waste.

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## Recycled Vegetable Oil Powers Whole Foods Commercial Kitchen

SustainableBusiness.com News

The Massachusetts kitchen used to prepare foods for 62 stores in the Whole Foods North Atlantic region is now using its old cooking oil to generate virtually of its electricity.

That includes the lights, appliances and all the other culinary gadgets that go into food preparation.

The 70,000-square-foot facility in Everett relies on a 50 kilowatt (kW) renewable energy system from Lifecycle Renewables of Marblehead, Massachusetts, that runs on LR 100, a renewable diesel fuel made out of waste vegetable oil.

The facility, which produces about 20,000 pounds of food daily, uses roughly the same amount of power required to run 200 American households annually, says Lifecycle Renewables. It supplies stores in Massachusetts, Maine, Connecticut, Rhode Island, New York and New Jersey.

Under its contract with Whole Foods, Lifecycle Renewables collects waste oil from 28 regional Whole Foods locations as well as a number of Boston-area restaurants. That oil is refined in Charlestown, creating the LR100 fuel.

The fuel reduces greenhouse gas emissions by about 80% compared with traditional diesel, says Rory Gaunt, CEO of Lifecycle Renewables.

"It was critical for Whole Foods that they have a base-load reducing (continuous operation) system that provides true power redundancy," says Adi Venni, chief technology officer for Lifecycle Renewables. "From the fuel production to engine customization, emissions controls and operating controls – this is really a set-it-and-forget-it type system."

Lifecycle Renewables' refinery can produce 5 million gallons of LR100 for applications including on-road diesel, commercial heating oil and renewable electricity production. The Whole Foods system requires about 3,000 gallons every week.

The \$400,000 installation was financed by the Massachusetts Clean Energy Center, and National Grid, Zapotec Energy and the Department of Environmental Protection were all involved in the project, reports The Boston Globe.

The system could divert about 156,000 gallons of waste oil a year, while saving 20% of energy and waste-disposal costs.

Whole Foods is one of the largest corporate users of renewable energy. The company seeks to reduce its energy consumption by 25% per square foot by 2015.

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## UC Davis Tops Cool Schools List

### SustainableBusiness.com News

Home to the biggest planned net-zero energy residential community in the US, the University of California, Davis, is at the top of Sierra Magazine's sixth annual "Coolest Schools" list.

The list rates 96 colleges and universities on sustainable infrastructure, transportation, renewable energy use and academics that relate to environmental research and sustainable business studies.

One big part of UC Davis' top rating is UC Davis West Village, a 130-acre net-zero energy development that will house 3,000 people in 662 apartments and 343 single-family homes.

Net-zero buildings produce as much energy as they consume, so the community includes a diverse range of renewable energy and energy-efficiency investments.

For example, it use green building materials such as solar-reflective roofing, radiant barrier roof sheathing, occupancy sensors and daylight harvesting technologies that turn lights off if there is enough natural light to suffice. The first phase cost \$300 million to build and includes 315 apartments. It opened in October 2011.

The plan includes a 4-megawatt (MW) solar system and a biodigester that converts table scraps, animal and plant waste into energy.

Other contributors to the UC Davis ranking were:

- A plan to divert 70% of campus trash from landfills (the current rate is 64%)
- A Climate Action Plan that has reduced campus greenhouse gas emissions below
- A \$39 million Smart Lighting Initiative on track to cut campus electrical use by 60% by 2015 (and cut \$3 million in annual electricity costs)
- A commitment to local and organic foods (20% of the \$5.6 million food budget)
- Four LEED Platinum ratings



UC Davis West Village is a mixed use community that includes 42,500 Square feet of retail space. Photo credit: Karin Higgs

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## Brazil Halts Huge Dam Project in the Amazon

### SustainableBusiness.com News

Score one for the side of human rights. Construction of the world's third-largest dam on the Amazon's Xingu River in Brazil is being suspended because the government didn't get proper approval from the indigenous people it will harm.

Brazil's Regional Federal Tribunal suspended the controversial Belo Monte dam project after finding that the Juruna, Arara and Xikrin tribes in the region were not consulted before the 2005 authorization by the Brazilian Congress, says International Rivers . The project consortium Norte Energia, SA, let by energy company Eletrobras

could be fined up to \$250,000 per day if it fails to honor the suspension. That group is expected to appeal.

“The court’s decision highlights the urgent need for the Brazilian government and Congress to respect the federal constitution and international agreements on prior consultations with indigenous peoples regarding projects that put their livelihoods and territories at risk. Human rights and environmental protection cannot be subordinated to narrow business interests,” says Souza Prudente, the Brazilian federal judge who authored the ruling.

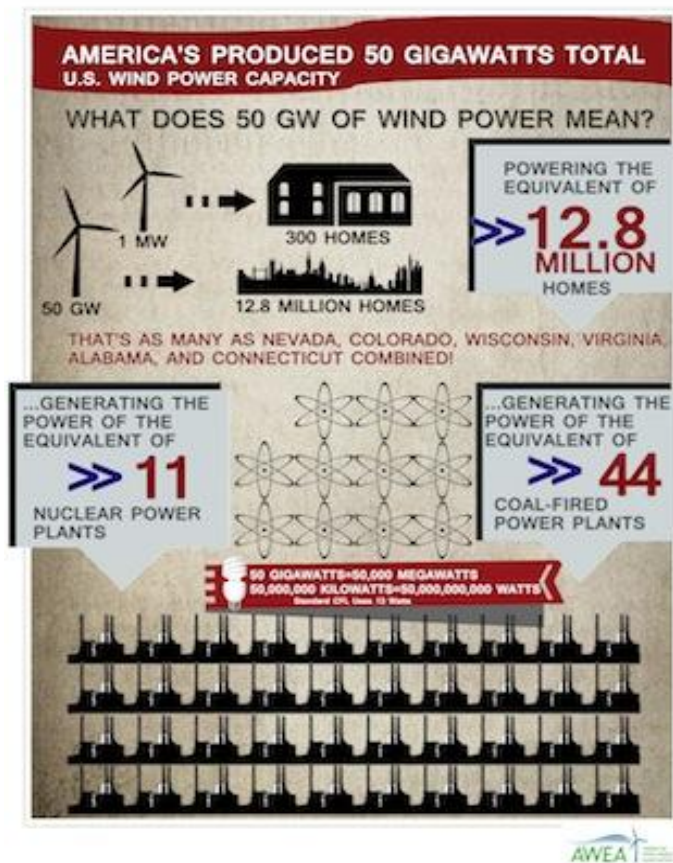
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## US Wind Capacity Surpasses 50 GW

SustainableBusiness.com News

The US now hosts more than 50 gigawatts (GWs) of power generated by wind projects, making it the most successful new energy technology since the 1980s, according to the American Wind Energy Association (AWEA).

The revelation comes as Washington, D.C., prepares for showdown over the wind production tax credit (PTC), set to expire on December 31, 2012. Before breaking for their August recess last week, Senate Democrats voted to support a one-year extension -- which means the battle would have to be fought all over against next year.



What's the big deal over 50 GWs of wind?

For one thing, it means the US is now using wind to replace the generating power of 44 coal-fired or 11 nuclear power plants. That generating capacity has helped to conserve 30 billion gallons of water annually, compared to thermal electric generation, and reduce carbon dioxide emissions to the tune of taking 14 million cars off the road.

"This milestone for wind-energy production marks continued success for this clean, renewable and domestically produced energy source," says Senator Chuck

Grassley (R-IA), father of the PTC, which has helped Iowa become the state with the second most wind power in the nation. "Wind energy has exceeded expectations since I first authored the tax incentive, in 1992, and offers an ideal for expanded production and use of alternative energy sources in the future."

New projects connected to the grid in Nevada, Oklahoma, Idaho, California, Hawaii and Iowa helped put the US over the 50 GW milestone, reports AWEA.

Those projects feature turbines made by General Electric, REpower, Siemens and Vestas and include:

- Pattern Energy's Spring Valley wind farm near Ely, Nevada (151.8 megawatts, or MW), which is the state's first wind power facility
- Enel Green Power North America's Rocky Ridge wind farm in Oklahoma (148.8 MW)
- enXco's Pacific Wind project in Kern County, California (140 MW)
- Utah Associated Municipal Power's Horse Butte project in Idaho (57.6 MW)
- First Wind's Kaheawa Wind II wind farm in Hawaii (21 MW)

There are now utility-scale wind farms in 39 states, reports AWEA. But as series of community wind projects in Iowa also put the US over 50 GW in terms of wind capacity. They are AG Land 5 and 6 (3.2 MW), Cumberland Rose Wind Energy (1.6 MW), Forward Fontanelle Power (1.6 MW), Greenfield Wind Power (1.6 MW), Meadow Ridge Wind Energy (1.6 MW) and Sky Volt (1.6 MW).

It took from 1981 to 2003 to reach 5 GWs of US generating capacity, and just three more years to double it to 10 GW. The US reached 25 GW of capacity in 2008.

The last new energy technology to ramp at this rate was nuclear power in the early 1980s; since then, no new energy technology has been as successful as wind, reports AWEA.

The industry organization figures 37,000 American jobs are at stake if the PTC expires as scheduled at the end of this year, but layoffs at 500 US factories providing wind power components have already begun.

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# Africa at work: Job creation and inclusive growth

By David Fine, Arend van Wamelen, Susan Lund, Armando Cabral, Mourad Taoufiki, Norbert Dörr, Acha Leke, Charles Roxburgh, Jörg Schubert and Paul Cook

Africa is the world's second-fastest-growing region. Poverty is falling, and around 90 million of its households have joined the world's consuming classes—an increase of 31 million in just over a decade. But a new McKinsey Global Institute report, *Africa at work: Job creation and inclusive growth*, shows that the continent must create wage-paying jobs more quickly to sustain these successes and ensure that growth benefits the majority of its people.

Despite the creation of 37 million new and stable wage-paying jobs over the past decade, only 28 percent of Africa's labor force holds such positions. Instead, some 63 percent of the total labor force engages in some form of self-employment or "vulnerable" employment, such as subsistence farming or urban street hawking. If the trends of the past decade continue, Africa will create 54 million new, stable wage-paying jobs over the next ten years—but this will not be enough to absorb the 122 million new entrants into the labor force expected over the same period. However, by implementing a five-part strategy to accelerate the pace of job creation, we estimate that Africa could add as many as 72 million new wage-paying jobs over the next decade, raising the wage-earning share of the labor force to 36 percent.

## Exhibit

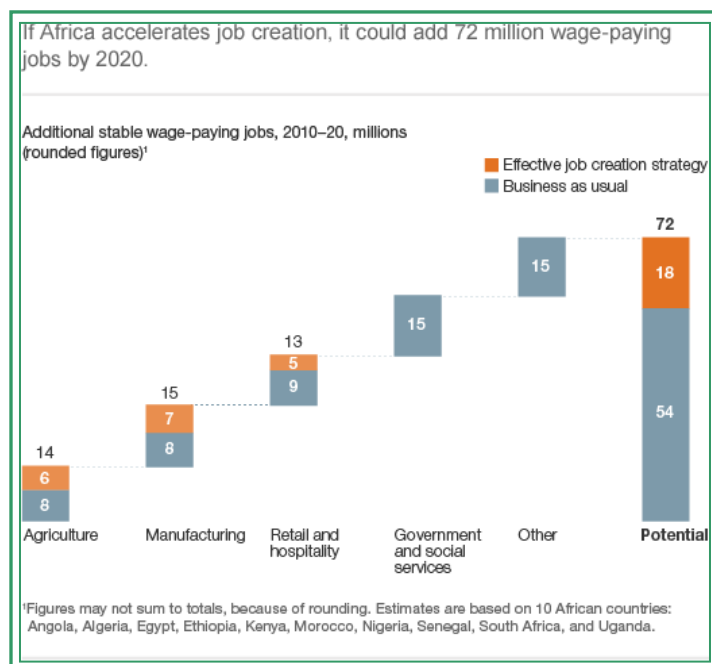
1. Identify one or more labor-intensive subsectors in which an African country has a global competitive advantage or could fill strong domestic demand. Lesotho, for example, capitalized on the African Growth and Opportunity Act (2000), granting some African exports duty-free access to US markets. A landlocked nation surrounded entirely by South Africa, Lesotho developed industrial zones for the apparel industry and built rail links between them, offered incentives to foreign investors, and simplified the regulation of the sector. Today, Lesotho's apparel exports to the United States are almost 100 times as large as South Africa's on a per capita basis, and the sector is the single largest creator of jobs, employing about 40,000 people in 2008 in a country of just two million.

2. Improve access to finance in target sectors. Cape Verde, for instance, encouraged foreign direct investment to ease financial constraints on its tourism sector. To capitalize on the country's beautiful beaches, it offered investors a five-year tax holiday, exemption from import duties, and unrestricted expatriation of profits. Revenues generated by foreign tourism increased from \$23 million in 1999 to \$542 million in 2008, and the sector now employs 21 percent of Cape Verde's workforce.

3. Build a suitable infrastructure. Countries that remove infrastructure constraints in target subsectors, particularly in export-oriented industries, can reap sizable benefits. Mali's exports of mangoes to the European Union, for example, grew sixfold between 2003 and 2008 after a concerted public-private program helped the country build integrated road, rail, and other infrastructure necessary to access export markets. These moves cut the transit time for shipments in half.

4. Cut unnecessary regulations. Removing needless red tape in certain sectors is also important. In Rwanda, for instance, streamlining the procedures needed to open a business dramatically increased the number of new companies, from only 700 a year before the reform to 3,000 a year today.

5. Develop skills in target sectors. Around 40 percent of African workers now have at least some secondary education, and that share will rise to 48 percent by 2020. Few employers in our survey of businesses in Egypt, Kenya, Nigeria, Senegal, and South Africa reported that a lack of skilled workers was a top barrier to growth. Still, Africa's educational attainment lags behind that of other regions, and the continent would undoubtedly benefit from continued improvement. Two things are of particular importance: work readiness among school graduates and, in some countries, specific vocational skills.



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## Ocean Power Wins First US License for Grid-Connected Wave Energy

### SustainableBusiness.com News

The first grid-connected wave power project in the US has cleared a key regulatory hurdle.

The US Federal Energy Regulatory Commission (FERC) is granting a 35-year license to Ocean Power Technologies Inc. (NASDAQ: OPTT) for a 1.5 megawatt (MW) grid-connected wave power station off the Oregon coast.

This is FERC's first license for grid-connected wave energy, although a tidal energy project off the coast of Maine is already under way.

The station at Reedsport, Oregon, will include 10 of the company's PowerBuoy wave energy devices, enough to power about 1,000 homes. Construction on the first buoy is almost complete, and it should be ready for installation in late 2011, says Ocean Power Technologies (OPT).

"The issuance of this license by FERC is an important milestone for the U.S. wave energy industry as well as for OPT," says Charles Dunleavy, CEO of OPT. "It represents the culmination of thorough due diligence and consideration of input from a broad array of groups interested in our Reedsport project. The 35-year term of the license demonstrates the commercial potential of wave power, and this will support initiatives to secure financing for the project."

OPT is funding the first system with money from the US Department of Energy (DOE) and PNGC Power, an Oregon-based electric power cooperative.

An August 2010 settlement between Ocean Power, 11 federal and state agencies and three non-government stakeholders cleared the way for this latest approval. That settlement considered a broad array of issues such as the impact on aquatic resources, water quality, recreation and public safety, and the information in that agreement was considered for the FERC approval.

After the initial PowerBuoy is deployed in Oregon, the construction of the remaining nine units along with the infrastructure to connect them to the grid will be subject to additional funding and other regulatory approvals, says OPT.

The company signed an even bigger wave-energy deal in early July for a 19 MW project in Victoria, Australia, a joint project with Lockheed Marting that will use a grant from the Commonwealth of Australia.

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## US Emissions Decline Reflects Clean Energy Transition

### SustainableBusiness.com News

An analysis of 2010 emissions data from the top 100 power plants in the US shows that three major pollution sources are trending down as the industry transitions to natural gas and renewable energy.

The 2012 Benchmarking Air Emissions report uses 2010-2011 data from the US Energy Information Administration and the Environmental Protection Agency to find trends in four power plant pollutants: carbon dioxide (CO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>) and mercury (Hg).

100 utilities were studied - their 2,500 power plants account for a large majority of electricity generation (86%) and emissions (88%).

Three of the pollutants studied have declined significantly, thanks to closing coal plants and greater reliance on natural gas and renewable energy.

Renewable energy use by these utilities has doubled since 2004, reaching almost 5% of the US electricity supply. And natural gas now supplies about the same amount of energy as coal, about 32%.

Because of this, SO<sub>2</sub> emissions are down 40% and NO<sub>x</sub> emissions are down 35% since 2008 (Trend data for mercury isn't available since reporting requirements are more recent).

Power plants are a key source of these pollutants. In 2010, they were responsible for about 65% of SO<sub>2</sub> emissions overall, 16% of NO<sub>x</sub> emissions, 68% of mercury air emissions and 40% of CO<sub>2</sub> emissions.

And about 40 gigawatts (GW) of coal plants are being closed this year, representing 12% of the US coal-fired capacity.

Meanwhile, natural gas consumption by the electric power sector has risen an average of 4% annually for the past 10 years.

Southern Company, for example, one of the nation's most coal-intensive power producers, will use more natural gas than coal in 2012 for the first time in its 100-year history.

"This is an historic transition for the electric power industry," says Mindy Lubber, president of Ceres, which prepared the report with M.J. Bradley & Associates, Natural Resources Defense Council (NRDC), Entergy, Exelon, Tenaska and Bank of America. "More and more power producers are shifting away from coal-fired generation in favor of lower-emitting natural gas-fired plants, renewable power and energy efficiency. The economic case for cleaner energy is better than it's ever been, and this report shows that the industry is adapting to stronger Clean Air Act emissions standards, state-driven efficiency and renewable energy incentives and the dynamics of the current natural gas market."

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# How airlines are fighting carbon trading

By Amy Westervelt

After losing a court case in 2011, U.S. airlines are working on another way around joining the European Union's carbon trading scheme: domestic legislation that would prohibit them from participating.



The Thune bill will come up for a vote in the Senate later this year (likely in September), and a similar measure has already passed the House. Despite protests from environmental groups, the legislation has broad bi-partisan support.

It would legally prohibit U.S. airlines from participating in the EU's emissions trading system (ETS), thereby weakening the EU's push to regulate aviation-related carbon emissions, and potentially dragging the issue back into court should U.S. airlines refuse to pay fines incurred for flouting the ETS requirements.

"The ETS has provoked a great deal of controversy because of its sweeping extraterritorial impact," says Anita Mosner, an aviation law expert and partner in the Washington, D.C.-based law firm Holland and Knight.

The largest problem -- not only for U.S. airlines, but also for the airline industries in most non-EU countries -- is that of sovereignty. The EU doesn't just want to regulate carbon emitted within its regional borders, but on flights that reach far beyond them as well.

"The world's carriers would not necessarily oppose the application of ETS solely within European airspace, or for portions of international flights operated within European airspace," said Mosner. "The real sticking point is that under ETS, the Europeans would impose their tax on flight operations quite distant from European airspace. For example, on a Doha-London flight, the EU would tax the entire journey, whereas only a small portion of the total elapsed time for such a flight might be within European airspace."

Non-EU airlines have been pushing instead for application of the ETS only on flights within the EU, but so far that proposal has been rejected by European legislators.

In the lead-up to April 2013, when the European law requiring airlines to participate in the ETS goes into effect, we may either see the EU bend its requirements, or non-EU airlines come up with a solution that works for all involved.

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## \$20 Million in Financing for Food Composting Technology Company

### SustainableBusiness.com News

Startup company Totally Green has received \$20 million for its innovative composting technology that works off what seems to be the model of the day - solar leasing.

The company wants to make composting easy for large food waste producers like commercial kitchens and food processing plants. Its ORCA Green Machine digests up to 2,400 pounds of organic food waste a day.

Like solar leasing, Totally Green plans to place its machines at no upfront cost to customers. Instead, they'll sign service contracts that reduce waste hauling costs for customers while creating a recurring revenue stream for Totally Green.

Toronto-based York Plains Investment Corp made the investment. Organic waste and foods account for over 30% of the 250 million tons of waste generated every year in the US. Companies and cities can't reach high waste-diversion or zero-landfill goals without composting.

"Our partnership with Totally Green allows us to leverage our experience and existing strong ties to the commercial services business," says Shawn Dym, managing director at York Plains.

"This includes support for Totally Green's transition from a sales to a service model, which we are confident will be highly successful given similar programs we advanced with past business ventures and the successful pilot of the ORCA Green machine in Toronto." This leasing model is even being tried to make geothermal systems more attractive.



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## Europe looks to open up Greenland for natural resources extraction

By Fiona Harvey, for guardian.co.uk

Europe is looking to open a new frontier in the ever more urgent quest for new natural resources – the pristine icy



European commission chairman, Jose Manuel Barroso (right), and Greenland prime minister, Kuupik Kleist. The EU sees potential in a massive opening up of mining operations across the world's biggest island. Photograph: AFP/Getty Images

wastes of Greenland.

Oil and gas have been the focus of exploitation so far – but the EU sees just as much potential in a massive opening up of mining operations across the world's biggest island, according to Antonio Tajani, the European commission's vice-president and one of the most powerful politicians in the union. He called the move "raw material diplomacy".

Latest satellite data reveal that 97% of the surface of the Greenland ice sheet underwent surface melting over four exceptionally warm days in July, indicating natural resources will become more available for extraction in the coming decades.

The potential gold rush is being welcomed by some in Greenland, but has raised fears of environmental damage, pollution and despoliation across the Arctic that could destroy one of the world's last wildernesses.

Tajani said: "Greenland is hugely important in terms of natural resources, it has vast opportunities. We are currently working very hard with the prime minister of Greenland on this – we are working on our own agreement with Greenland on raw materials."

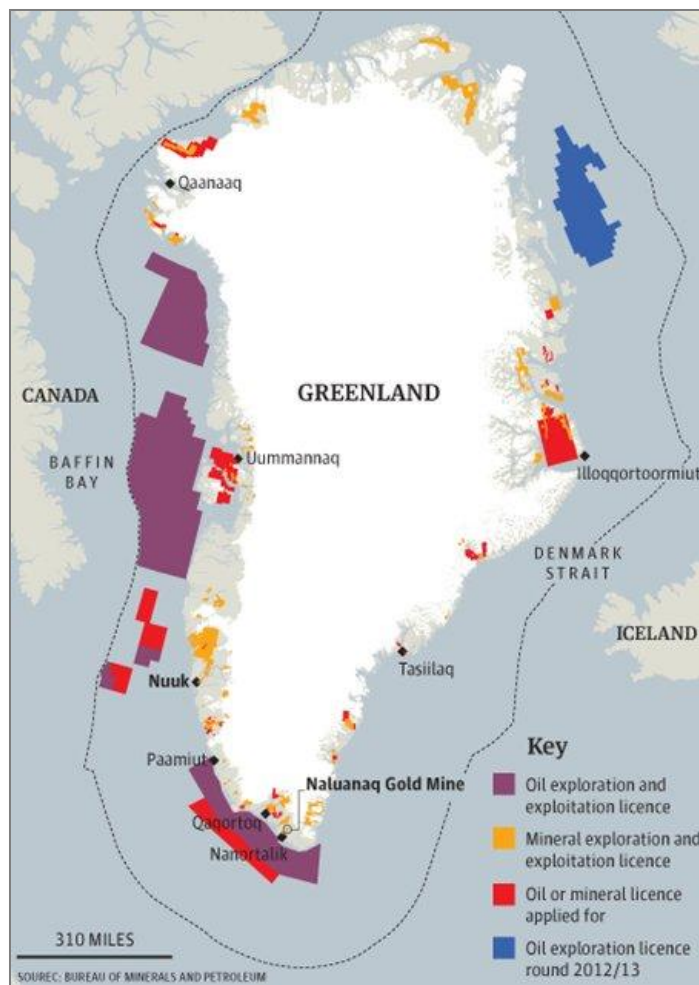
He said: "This is raw material diplomacy. We have allies working on this worldwide."

Greenland's government is keen to exploit the island's natural wealth in order to alleviate some of the serious poverty and social problems that blight the indigenous population.

Henrik Stendal, of the Greenland government's mineral extraction department, told the Guardian: "The government would like to have another source of income – currently there is just fishing, and a little from tourism, so this is a big opportunity for us. These explorations can be done sensitively, we believe."

Only one company is currently operating a productive mine in Greenland, producing gold. But at least five are in the advanced stages of setting up new mines, and more than 120 sites are being explored. Greenland is thought to contain vast mineral wealth, including rare earth metals, gemstones and iron ore.

As competition from developing world pushes up price of energy, metals, minerals and other raw materials, finding new sources of supply is at a premium – putting densely populated



Europe at a disadvantage, with little opportunity to expand its oil and gas supplies or mining operations.

But Greenland – with strong historical ties to the EU through Denmark, though the island now has home rule – represents a vast and largely untapped resource.

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## Electric cars: is now the time to plug in?

By **Miles Brignall**, for The Guardian



Charging a Vauxhall Ampera, which can go 50 miles on £2.50 of electricity and is exempt from tax. Photograph: Alamy

Climb behind the wheel, hit the “power” button and a host of lights on the dashboard leap into life. The car’s range in electric mode, you immediately learn, is 50 miles, plus a further 310 in petrol-powered reserve. You shift the automatic lever into drive, and it moves silently out into the traffic. The lack of any engine noise apart, this car goes like any other executive car – albeit with a slightly smaller interior than most. Welcome to the Vauxhall Ampera, hailed by its fans as the first “e-car” that, crucially, has the range to take you any place you care to go.

This week Guardian Money examines the host of super-green cars to hit UK showrooms in the past few months and assesses whether they are now a serious alternative to conventional cars or remain rich people’s toys.

The petrol savings are eye-watering. Charging an Ampera to go 50 miles will set you back around £2.50–£3, or nothing at all if you can access council-installed charging posts. Unlike other electric cars, this one has a petrol engine that will keep the wheels turning after the charge runs out. There’s no vehicle tax or congestion charge to pay. But the purchase cost is very high; £30,000 after the government’s £5,000 grant still makes it twice the price of the cheapest Ford Focus or £10,000 more than a standard Ford Mondeo. The hours spent recharging will also put many people off. Overall, our analysis suggests that while the Ampera can, for some drivers, deliver financial gains, most average motorists will find that a Toyota Yaris hybrid, at under £15,000, is a more realistic option.

The Ampera – voted UK Car of the Year 2012 – was launched in the United States as the Chevy Volt, and sales initially tanked, delighting right-wing commentators who derided it as the “Obama-car”. But more recently, especially in California, sales have begun rising, although sales of other electric cars, such as the Nissan Leaf have been miserable.

Will e-cars catch on in the UK? Money did the number-crunching and found that someone currently driving a 35mpg petrol car 80 miles every working day (around 20,000 miles a year) should save around £3,000 a year in petrol by switching to an Ampera – but, crucially, they will need somewhere to charge the car at work and at home.

Anyone living in a flat, or even a terraced house without a drive, will find it impractical to charge up the car unless they live in areas such as Brighton, Birmingham and large parts of London, where free charging posts are now relatively common (they are even popping up at motorway service stations). Run the car for a decade, though you will easily make enough savings on petrol to justify the initial price tag.

The alternative is to buy a hybrid (petrol/electric) car, available for less than £15,000 – not much more than it costs to buy a new standard diesel model.

“Range anxiety” has long been the issue (after price) that deters buyers. The all-electric Nissan Leaf can only cover 90 miles before a recharge, and then it’s not like filling up at a petrol station – it will take four hours or more. This is Ampera’s trump card, as it can be driven on as an electric-only car – for the cost of just a few pounds in electricity – and still be taken on a 300-mile trip with the help of its petrol back-up.

If you’re wondering why the Ampera qualifies as an electric car rather than a hybrid it’s because the Ampera is always powered electrically. Its 1.4-litre petrol engine only comes life when the battery becomes depleted, feeding enough power back to the battery to keep the car going.

Crucially, it’s the electric engine only that drives the car. In a hybrid, the petrol engine drives the car above certain low speeds.



Whoosh: Mark King and the BMW Mini E. Photograph: Katia King

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## Protesters challenge Vedanta on human rights

By Simon Goodley, for The Guardian

Campaigners highlighting environmental and human rights breaches by mining group Vedanta Resources have been intimidated by police forces and subjected to trumped up charges, it was claimed on Tuesday.

The allegations were made by the human rights campaigners



Human rights protesters outside mining company Vedanta's annual meeting in London. Photograph: Martin Godwin for the Guardian

Amnesty International at the FTSE 100 group's annual meeting, which was notable for requiring its own police presence as well as for the dissenting voices from City fund managers in addition to the protest groups. An Amnesty report claimed: "An ongoing inquiry by India's Human Rights Commission [has found] that the police in both the framing of false charges and the suppression of dissent have acted to promote the interests of the company".

Amnesty's Peter Frankental asked the meeting: "Do you take these findings and allegations seriously and what are you going to do about them?" After a testy exchange, Vedanta non-executive director Naresh Chandra said: "Give us the information and we will have it investigated".

Shareholders supportive of the management frequently clashed with critics of the company's record on human rights, safety and the environment.

Standard Life Investments, which holds 9m Vedanta shares, said it would abstain on the re-election of members of the nominations committee because the board contained too few independent directors. Aviva said it was "pleased to note considerable progress ... [while] concerns over the company's environmental and social record remain". Aviva added that those concerns had depressed the share price of Vedanta, which mines predominantly in India, Zambia and Australia.

Among the other campaign groups attacking the company was Survival International which continued to highlight Vedanta's efforts to mine bauxite in India's Niyamgiri hill, which an indigenous tribe considers to be sacred.

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## How Ikea's partnership with the UN is helping child refugees

By Tim Smedley, for guardian.co.uk



Pakistani children walk along a path in a refugee camp in Peshawar, Pakistan. Photograph: Greg Baker/AP

It started with a tent. In 2009 the IKEA Foundation – the philanthropic arm of Ikea – partnered with the United Nations High Commissioner for Refugees (UNHCR) with the idea of designing a new tent for emergency refugee accommodation.

Given the foundation's core aim to improve opportunities for children in developing countries, and that half of all refugees are children, it seemed a good fit. Not just that, but designing flat-packed home and furniture solutions was something that Ikea knew it could do well.

At any given time, UNHCR has the capacity to respond to an emergency involving up to 600,000 people, within 72 hours. Currently, the tents it provides are only suitable for six months. In reality, many refugee camps remain for several years. Children literally grow up in them. As such, routinely replacing tents comes at a big cost.

"Because Ikea's core competence is about improving homes we thought it would be a very interesting way to co-operate," says Olivier Delarue, the UNHCR's senior advisor on private sector partnerships. "Flat-packing ... is so critical for UNHCR in terms of reduction of cost and efficiency for loading aircraft or trucks."

Per Heggnes, CEO of the IKEA Foundation explains: "We are looking to develop a solution that fits the same requirements in terms of cost and weight, size and packaging, because they need to be airlifted out to people at very short notice. So we are trying a more lasting solution, a shelter that would last for many years ... which would ultimately solve a big financial problem."

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## Poo power celebrated as solar toilet wins

By **Mark Tran**, for guardian.co.uk

A solar powered toilet that breaks down water and human waste into hydrogen gas for use in fuel cells has won first prize in a competition for next-generation toilets to improve sanitation in the developing world.

The California Institute of Technology in the US received the \$100,000 (£64,000) first prize for its design. Loughborough University in the UK took the \$60,000 second prize for a toilet that produces biological charcoal, minerals and clean water, and Canada's University of Toronto came third, winning \$40,000 for a toilet that sanitises faeces and urine, and recovers resources and clean water.

The winners took part in a Reinvent the Toilet challenge set by the Bill and Melinda Gates Foundation, which asked designers to break with a sanitation model that has changed little since it was developed by Alexander Cummings more than 200 years ago. It is a model that depends on piped water, sewer or electrical connections that poor countries can ill afford.

A year ago, the Gates Foundation issued a challenge to universities to design toilets that can capture and process waste without piped water and transform human waste into useful resources such as energy and water.

"Imagine what's possible if we continue to collaborate, stimulate new investment in this sector, and apply our ingenuity in the years ahead," said Bill Gates as he announced the winners on Tuesday in Seattle, Washington state. "Many of these innovations will not only revolutionise sanitation in the developing world, but also help transform our dependence on traditional flush toilets in wealthy nations."

Sanitation and hygiene are the laggards in the millennium development goals (MDGs) of reducing extreme poverty. Basic sanitation, covering toilets, latrines, handwashing and waste, is not an MDG but a target under MDG seven on ensuring environmental sustainability.

Sanitation and hygiene have been the poor cousins in the global water, sanitation and hygiene work and programmes, outfunded by as much as 13 to one, even though most water-related diseases are really sanitation-related diseases.

In March, the UN announced that the world had reached the goal of halving the number of people without access to safe drinking water, well ahead of the 2015 deadline. However, the world is still far from

meeting the MDG target for sanitation, and is unlikely to do so by 2015.

Only 63% of the world population has access to improved sanitation, a figure projected to increase to only 67% by 2015, well below the 75% target in the MDGs. Currently 2.5 billion people lack access to an "improved sanitation facility", which hygienically separates human waste from human contact.



A solar powered toilet designed by the California Institute of Technology for the Reinvent the Toilet challenge. Photograph: Michael Hanson/Gates Foundation

As Ban Ki-moon, the UN secretary general, has acknowledged, sanitation is a sensitive and unpopular subject. It is not a high-profile issue, although the UN declared access to water and sanitation a fundamental right in 2010 and there is a UN rapporteur on the human right to safe drinking water and sanitation.

At the current rate, the world will miss the sanitation MDG target by 13 percentage points, meaning there will be 2.6 billion people without access to improved sanitation, according to the 2010 report by the World Health Organisation (WHO) and Unicef joint monitoring programme for water supply and sanitation (pdf). If things carry on as they are, the MDG target will not be met until 2049.

As many as 1.2 billion people practice what the UN describes as "open defecation". They go to the toilet behind bushes, in fields, in plastic bags or along railway tracks. The practice poses particular problems for women and girls, who can be subject to physical and verbal abuse or humiliation.

According to the WHO, improved sanitation delivers up to \$9 in social and economic benefits for every \$1 invested because it increases productivity, reduces healthcare costs, and prevents illness, disability, and early death.

The Gates Foundation is spending about \$80m a year on water, sanitation and hygiene, according to Reuters. The \$370m it has committed so far is a small portion of its development funding. Since 1994, the foundation has handed out, or is committed to, more than \$26bn in grants.

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## EU AMPS UP E-WASTE COLLECTION RULES FOR COMPANIES, CONSUMERS

By James Murray

Stringent new EU e-waste rules officially came into effect yesterday, paving the way for a fundamental overhaul of how technology companies, retailers, recycling firms, and consumers handle waste electronic equipment and devices.

The updating of the Waste Electrical and Electronic Equipment (WEEE) directive, which first came into effect in 2003, will impose a series of ambitious new e-waste recovery and recycling targets on the IT and electronics industry while also introducing stringent new penalties for companies and member states who fail to comply with the rules.

The original WEEE directive represented the world's first comprehensive e-waste legislation, placing a "producer responsibility" on manufacturers that made them legally and financially responsible for the safe collection and disposal of old equipment.

However, the directive has been widely criticised in recent years for struggling to sufficiently promote the re-use and recycling of valuable electronic resources and failing to crack down on the illegal export of old equipment to developing countries for scrap.

The updated directive, which was approved by the European Parliament last month, significantly strengthens a range of e-waste regulations and imposes new targets that will require member states to collect 45 per cent of electronic equipment sold for approved recycling or disposal from 2016, rising to 65 per cent of equipment sold or 85 per cent of electronic waste generated by 2019, depending on which goal member states choose to adopt.

*Photo of recycled e-waste provided by Gts via Shutterstock*

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## Green Plants Reduce City Street Pollution Much More Than Previously Believed

Author Pugh, et al.

Source ACS

Trees, bushes and other greenery growing in the concrete-and-glass canyons of cities can reduce levels of two of the most worrisome air pollutants by eight times more than previously believed, a new study has found. A report on the research appears in the ACS journal *Environmental Science & Technology*.

**Thomas Pugh** and colleagues explain that concentrations of **nitrogen dioxide (NO<sub>2</sub>)** and microscopic **particulate matter (PM)** - both of which can be harmful to human health - exceed safe levels on the streets of many cities.

Past research suggested that trees and other green plants can improve urban air quality by removing those pollutants from the air. However, the improvement seemed to be small, a reduction of less than 5 percent.

The new study sought a better understanding of the effects of green plants in the sometimes stagnant air of city streets, which the authors term "urban street canyons".

The study concluded that judicious placement of grass, climbing ivy and other plants in urban canyons can reduce the concentration at street level of NO<sub>2</sub> by as much as 40 percent and PM by 60 percent, much more than previously believed.



Judicious placement of grass, climbing ivy and other plants in city streets can reduce NO<sub>2</sub> concentration at street level by about 40% and PM by 60%.

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## Engineers Develop Sustainable Technique to Remove Arsenic from Water Supplies

**Yale** Researchers at Yale University have developed a novel approach that can remove arsenic from water with high efficacy and has the potential to be implemented sustainably.

Inorganic arsenic, which can contaminate water supplies via runoff from industrial manufacturing and mining processes, is known to cause cancer and death in humans as well as disruption in biological ecosystems. Several approaches have been used to remove arsenic from water in the laboratory, but most have proved to be inadequate for wide-scale use, and especially for sustainable implementations.

Now, researchers at **Yale University** have developed a novel approach that can remove arsenic from water with high efficacy, and has the potential to be implemented sustainably.

Researchers have previously used aluminum oxide and titanium dioxide in nanopowder form to remove two forms of arsenic - arsenite and arsenate - from water. But, says **Julie Zimmerman**, Associate Professor of Chemical & Environmental Engineering and Forestry & Environmental Studies, “The use of nanopowders requires post-treatment filtration, which can be energy intensive.”



Zimmerman Lab developed chitosan beads impregnated with titanium dioxide and aluminum oxide. These beads are used for the removal of heavy toxic metals, like arsenic and selenium, from water.  
(Photo Credit: Harold Shapiro)

To address that limitation, Zimmerman and her colleagues developed a system using chitosan, a biopolymer derived from shell-fish exo-skeletons. **Chitosan** is an abundant waste product that's readily available. By forming it into beads and impregnating them with nanoparticles of titanium dioxide and aluminum oxide, the researchers developed a sustainable technique that removes both arsenite and arsenate with the same efficacy as the nanopowders, but without the post-treatment filtration requirements. Further, by using titanium dioxide and aluminum oxide in combination, significant synergies are realized.

“When titanium dioxide is exposed to ultraviolet light, it generates hydroxyl radicals,” explains Zimmerman. These are very effective oxidizers which react with arsenite, the more toxic of the two arsenic types, to transform it to arsenate. The arsenate then sorbs to the aluminum oxide, effectively removing it from the drinking water.

“One of the things we try to do broadly is to design systems to inherently have desirable characteristics, rather than continually needing to control the circumstances,” says Zimmerman. “For example, the chitosan beads separate by density, so we don't need to add any additional energy or materials to separate the purified drinking water from the arsenic-laden sorbent.”

The beads can then be regenerated by washing them with a slightly basic solution to remove the sorbed arsenic, and re-used without any noticeable decrease in performance for at least five cycles.

In addition to arsenic removal, Zimmerman notes that the chitosan bead technique has further potential applications in treatment of water supplies.

“There are lots of other metal contamination issues in aqueous systems that are appropriate for this type of system, making it a platform technology. For example, we're completing a study on selenium, which is of interest since there is recent activity by the **Environmental Protection Agency** in setting new water quality criteria limits,” she explains. “We can dope this system with nanopowders or other potential sorbents that are specifically targeted to the contaminant or contaminant mixtures of concern. Further, chitosan, itself, has been shown to be effective at removing certain aqueous contaminants. In this way, the chitosan can be an active, not passive, impregnation matrix.”

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## Carbon Capture and Storage Likely to Cause Earthquakes

**Author** Mark Zoback and Steven Gorelick

**Source** Stanford University

**Stanford geophysicists say earthquakes triggered by underground CO2 storage, while probably too small to cause major damage, could release stored CO2 into the atmosphere.**

**Carbon capture and storage**, or **CCS**, is a major component of the world's greenhouse gas reduction strategy. Involving injecting and storing carbon dioxide in underground geologic reservoirs, the method is used at several oil and gas exploration sites worldwide to prevent the gases from entering the atmosphere.

But to significantly reduce emissions, CCS would need to operate on a massive scale, potentially sequestering upwards of 3.5 billion metric tons of CO2 each year. A new technical hurdle may mean CCS won't be able to get anywhere near that volume.

In a paper appearing in the journal 'PNAS', **Stanford** Geophysics Professor **Mark Zoback** and Environmental Earth Science



Norway's Utsira formation, under the Sleipner Gas Field, was host to the world's first commercial carbon storage project. One million metric tonnes of carbon dioxide have been injected into the undersea reservoir every year since 1996.  
(Photo: Oyvind Hagen / Statoil)

Professor **Steven Gorelick** argue that, in many areas, carbon sequestration is likely to create pressure build-up large enough to break the reservoirs' seals, releasing the stored CO2.

"Almost all of our current climate mitigation models assume CCS is going to be one of the primary tools we use," said Zoback. "What we're saying is, not so fast."

### Induced Seismicity

Intraplate earthquakes - earthquakes that occur far from the boundaries between tectonic plates - can occur nearly anywhere in continental interiors, due to what the researchers describe as "the critically stressed nature of the Earth's crust". Small pressure build-ups near potential faults reduce friction, increasing the likelihood of a fault slip.

It's been known for a half-century that human activities can increase pressure to the point of inducing small temblors. In the

1960s, the injection of wastewater into a well near Denver triggered a series of small earthquakes. Last year, similar quakes were induced in Arkansas, Ohio, and on the border of Colorado and New Mexico.

Reviewing field stress measurements and laboratory studies of shear displacements, Zoback and Gorelick say injection of massive quantities of CO2 would be likely to produce the same result.

Zoback has previously described wastewater-induced quakes as manageable, low-risk events. Carbon injection is unlikely to trigger large, destructive earthquakes, the professors argue, but "the implications are different if you're trying to store carbon for thousands of years," Zoback said.

Zoback and Gorelick state that even a fault slip of a few centimeters could allow stored CO2 to reach the surface - a serious concern, since the researchers argue that carbon repositories need a leak rate of less than 1 percent every thousand years to be effective.

"The bar is much higher in this case," Zoback said.

### Where to put it

The areas where CCS is already practiced successfully follow a very specific geologic profile. Ideally, the reservoirs themselves are formed from porous, weakly cemented materials that slow pressure build-up, but are isolated from the surface by an impermeable rock layer.

The **North Sea's Sleipner Gas Field**, for example, makes use of the Utsira formation - a porous sandstone structure under impermeable shale.

It's an open question as to whether there are enough low-risk geologic formations to engage in CCS at the necessary level.

The authors say that approximately 3,500 Utsiras would be necessary to contribute significantly to reductions. But some scientists say fewer would suffice.

"Of course, you need to pick sites carefully," said **Sally Benson**, Stanford Professor of Energy Resources Engineering and Director of Stanford's Global Climate and Energy Project. "But finding these kinds of locations does not seem infeasible."

She argues that only 600 such sites would be necessary, and that existing formations in Texas and the Gulf Coast, the Middle East, the North Sea and Western Australia provide promising sequestration reservoirs. Pressure build-up in other areas can also be managed, she says, by controlling injection rates and well design.

Zoback says there will continue to be a use for CCS at a small scale, in regions that are near both CO2-producing plants and ideal geologic formations.

"But for the U.S. and the world to be considering CCS one of the potential solutions to the greenhouse gas problem - it's a very high risk endeavor," he said. "We need options that are practical, don't cost literally trillions of dollars, and aren't vulnerable to moderate size earthquakes."

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## Unique CHP System Powers, Heats and Fertilizes Tomato Greenhouses

### SustainableBusiness.com News

A 125-acre tomato grower in California is using a first-of-its kind combined heat and power (CHP) system to provide electricity and hot water for its greenhouses, as well as carbon dioxide (CO<sub>2</sub>) for fertilizing the plants.

The installation at Houweling's Tomatoes in Camarillo, California, employs two GE 4.36-megawatt (MW) Jenbacher J624 two-staged turbocharged natural gas engines in combination with a GE-designed CO<sub>2</sub> fertilization system.

Fueled by natural gas, the system generates 8.7 MW of electricity and 10.6 MW of hot water for heating the large-scale glass greenhouses on-site.

GE has installed more than 800 gas-fired CHP units in greenhouses around the world, but this is the first one in the US. The system will contribute power during peak daytime demand periods; the thermal energy can be transferred when it is

needed, either applied immediately when the weather is cool or kept in reserve in storage tanks when it isn't necessary.

"This CHP system will provide the



necessary heat, power and CO<sub>2</sub> for the growth of our fresh greenhouse tomatoes," says Casey Houweling, owner of the greenhouse facility. "However, the impact of this project on the region goes far beyond the vegetables produced in the greenhouse. This ultra-high-efficiency CHP plant also will provide flexible power to our local utility with a very short response time."

The technology will also help the greenhouse, which produces millions of tomatoes annually, save water – about 9,500 gallons per day. That's because Houweling's can reuse the water condensed out of the exhaust gas generated by the CHP system.

Houweling's was approved interconnection with the local electric utility.

The CO<sub>2</sub> produced by the engine exhaust is being purified and piped into the greenhouse to fertilize the plants during the daylight photosynthesis process using other GE technology that removes unwanted carbon monoxide and nitrous oxides with special catalytic reduction equipment.

Western Energy Systems, GE's authorized U.S. distributor of Jenbacher gas engines and part of the Penn Power Systems organization, engineered and installed the cogeneration plant.

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## Algae Biofuel Technologies Ripe for \$1.6 Billion Market By 2015

### SustainableBusiness.com News

Private sector investments, regulatory support and strategic partnerships are driving commercial production of biofuels derived from algae.

That activity will fuel compound annual growth of 43% for algae biofuels technologies, driving the market to \$1.6 billion by 2015, according to new SBI Energy research.

"Strategic partnerships from ExxonMobil, Chevron, BP, Dow Chemical, Desmet Ballestra and many others will drive the investment needed to successfully commercialize algae biofuels," says Shelley Carr, publisher of SBI. "Private investment and venture capital will also provide funding through 2015."

The high yield per acre (up to 5,000 gallons of renewable oil per year on a single acre) and minimal environmental impact of algae biofuels make them one of the most viable and attractive biofuels. Government grants have been a major source of funding in the past. For example, in 2009, the sector received more than \$100 million in funding from the U.S. Department of Energy.

But the landscape began shifting amid the weak economy and federal budget cuts, with the private sector picking up some of the slack.

One example is the joint venture announced in April between Solazyme Inc. (NASDAQ: SZYM) and global agribusiness Bunge (NYSE:BG) to build and operate a commercial-scale oils production plant in Brazil. In 2011, San Francisco-based Solazyme was the first algae biofuels company to make its IPO.

The US Renewable Fuel Standard (RFS2) requires the production of 21 billion gallons of renewable fuel annually by 2022; originally focused on ethanol, the standard was updated last year to cover all advanced biofuels, including cellulosic, algae, and other technologies.

The US military has been one of the biggest proponents of biofuels, citing the need to improve domestic production and improve the defense agency's energy "security."

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## Fukushima disaster paves way for new geothermal plants

By **Justin McCurry** for guardian.co.uk

Before last year's triple disaster in north-east Japan, Tsuchiyu Onsen drew tens of thousands of tourists in search of the recuperative qualities of its piping hot spring water.

Almost 18 months after the nuclear accident at nearby



Kazuya Ikeda explains the future location and logistics of a geothermal plant in Fukushima prefecture, Japan. Photograph: Jeremy Sutton-Hibbert for the Guardian

Fukushima Daiichi power plant, that same natural resource is about to turn this spa resort into a trailblazer for the country's push towards renewable energy.

By spring 2014, Tsuchiyu, 9 miles (15km) from Fukushima, will be generating 250 kilowatts of electricity – about a quarter of the city's total needs – at a geothermal plant hidden away in the surrounding mountains.

The plant will be the first to be built inside a national park, a controversial move that only became possible after the environment ministry recently relaxed regulations on developing protected areas.

If all goes to plan, the project could not only help the town become self-sufficient in power generation, but revive its role as a tourist destination after visitor numbers plummeted amid lingering fears over radiation. In the past, hot-spring operators have been among the fiercest opponents of geothermal energy, an obvious source of energy given Japan's huge subterranean reserves of volcanic water.

Many fear the plants would affect the flow and quality of the water, which is pumped up from the depths and then cooled for the benefit of Japan's enthusiastic bathers.

In Tsuchiyu, however, where half a dozen hotels remain closed with earthquake damage, spa owners are among the new geothermal generator's keenest backers. "The plant won't affect the water quality or the temperature," said Kazuya Ikeda, general manager of the Tsuchiyu Onsen

Tourist Association. "We have surveyed opinion in the town, and no one has raised any objections."

The move also makes economic sense. Under a new feed-in tariff system introduced last month, utilities are required to pay premium prices for renewable energy – 42 yen (34p) per kilowatt for geothermal power.

"The structure itself will be quite small and unobtrusive," Ikeda added. "And with the feed-in tariff, we should be able to cover our initial costs in about seven years."

The 300m-yen (£2.5m) facility will use water pumped from below ground and combine it with an ammonia-like substance with a lower boiling point than water to propel a turbine.

Resistance to geothermal power, coupled with the pre-Fukushima faith in nuclear, means that until now Japan has failed to tap into a resource that energy experts believe has huge potential. Its 18 geothermal plants account for 0.2% of electricity output, according to the trade and industry ministry, and no new plants have been built for a decade.

Scientists believe the sector's share could rise enormously thanks to the feed-in tariff, new subsidies to fund feasibility studies and test-drilling, and official recognition that nuclear's heyday has passed.

According to one estimate, Japan's geothermal capacity could reach 24m kilowatts – the third biggest in the world after the US and Indonesia – compared with less than 550,000 kilowatts now. Tsuchiyu has other compelling reasons to embrace geothermal power. Visitor numbers dropped dramatically after the Fukushima nuclear disaster, and while a recovery is under way, fears of radiation persist, even though recorded levels here pose no health threat.

Profits from the venture will be used to repair three damaged hotels and rebuild three others that were destroyed in the earthquake.

In the long term, Ikeda believes Tsuchiyu will become a model for other small towns struggling to find clean and stable sources of energy, while experts debate if nuclear has any role to play in Japan's future energy mix.

If the experiment works, it should allay anxiety among other Onsen operators about potential damage to hot-spring water flows – the financial lifeblood of countless similar resorts around Japan.

Eventually, the geothermal plant will be capable of generating 1,000 kilowatts, according to Ikeda. That is a tiny fraction of the capacity of just one of Fukushima Daiichi's now crippled reactors. But with opposition to nuclear restarts unlikely to waver, towns such as Tsuchiyu have no choice but to turn to alternatives, he said.

"If it hadn't been for the nuclear disaster, we would never have given this project a second thought."

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# 'Don't let waste go to waste': WM shifts approach

By Marc Gunther

Reduce. Reuse. Recycle.

It sounds simple. It's not.



Just ask Bill Caesar. He runs the recycling and organic growth units of Waste Management, America's biggest trash company, which had \$13.3 billion in revenues last year.

It's hard to get many cities and towns to embrace recycling.

It's hard to get homeowners to figure out which plastics go into which bin.

It's expensive to build out the infrastructure needed to separate materials, and ship them to customers.

And now, to make matters worse, the prices that buyers are willing to pay for cardboard, used paper, metals and plastics have fallen, on average, by about a third. A ton of solid waste used to yield about \$150 in recycling revenues, more or less. Today, it's closer to \$100. Here's a chart.

"The commodities are global in nature," Bill told me the other day. "When the French stop buying things, the Chinese stop making things, and when that happens, they need fewer boxes and the price of recovered paper in the US falls."

Who would have thought that the EU's troubles would slow progress towards zero waste?

Bill and I met this week to after he spoke at Wastecon, the big convention organized by SWANA in the Gaylord National Resort and Convention Center outside Washington, where I came across the recycling robot. (Of course you know SWANA as the Solid Waste Association of North America. Some time ago, garbage became solid waste and the city dump turned into a sanitary landfill).

Waste Management still takes most of the garbage municipal solid waste that it collects to dumps sanitary landfills -- it owns more than 250 active landfills -- but Bill's job is keep stuff out of the ground. His unit looks for ways to extract more value from waste, either by recycling, or composting organic waste, or turning waste into energy.

*Photo of waste in blue storage bags provided by Parys Ryszard via Shutterstock*

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## Feeding nine billion people in 2050 – discussion best bits

By Oliver Balch

By 2050, the world's population will have reached 9 billion. If all these people are going to have enough to eat, increases in food production and changes in consumer patterns of behaviour will both be needed. But what will these look like? And what's the best way to make them happen?

To discuss these questions, Guardian Sustainable Business brought together a range of experts from across the food security and sustainable agriculture debate. The online panel included Richard Perkins, senior commodities adviser at environment charity WWF; Dawn Rittenhouse, director of sustainability for US chemicals firm DuPont; Louise Fresco, a sustainability expert at the University of Amsterdam; Justin Smith, head of sustainability at South African retailer Woolworths; Santiago del Solar, an Argentine agronomist and farmer; and Jan Kees Vis, global director sustainable sourcing development at consumer goods firm Unilever.

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## Green businesses unite to pressure PM into supporting renewable energy

By **Fiona Harvey**, for The Guardian

David Cameron has been urged to stand up for renewable energy against what environmental campaigners see as attacks by the Treasury.

More than 170 green businesses signed a letter to the prime minister, drafted by the Renewable Energy Association, calling for a public declaration of support for green energy and a resolution of the uncertainty that surrounds government plans for renewable power subsidies.

The signatories include Frances O'Grady, deputy secretary general of the TUC, Sir Tim Smit of the Eden Project, and Penny Shepherd, chief executive of the Sustainable Investment and Finance Association of investors, as well as veteran green campaigners Jonathon Porritt and Tony Juniper, adviser to Prince Charles.

They are worried that recent government U-turns on support for renewables are putting off much-needed investment in the sector. They point to the recent decision on future subsidies, which was long delayed and left significant issues unresolved so creating uncertainty for investors. For instance, although offshore wind subsidies are now clear until 2017, those for onshore wind face another review, and solar subsidies are likely to be reviewed again next year. This was confusing and scaring off financial backers for renewable energy projects, they said.

The letter to Cameron invoked the Olympic spirit. It: "We urgently need you to deliver a united 'Team GB' effort to secure the UK's place as a world leader in green skilled jobs and technology. Massive investment in renewable energy is taking place across Europe and Asia and the UK cannot afford to miss out – neither can we afford to miss our carbon targets."

Martin Wright, chairman of the Renewable Energy Association, said: "Renewables must not be treated like a political football, kicked between the Department of Energy and Climate Change and the Treasury. Government shouldn't squander this once in a generation opportunity to transform our energy system into one fit for the future, with all the jobs and inward investment this will bring."



Wind turbines in East Somerton, Norfolk: David Cameron has been told to stop using green power as a political football. Photograph: Richard Osbourne/Blue Pearl Photographic/Alamy

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## BMW revs up EV car sharing in San Francisco

By **Derek Top**

Luxury car maker BMW wants to become a "mobility services" company.



This week, executives from BMW came to San Francisco to showcase a flexible, premium car-sharing program featuring the all-electric BMW ActiveE.

Starting with a fleet of 70 vehicles, the program, known as DriveNow, allows enrolled drivers to take a car from one

point to another and leave it, unlike other car-sharing programs which require vehicles to be returned to the same pick-up location.

Under the program, drivers can reserve a car online or through a smartphone app after registering as DriveNow members. They can pick up their cars at one of eight DriveNow stations in the San Francisco Bay Area, with plans to open more in the near future, and return vehicles to the nearest station.

Board member Ian Robertson proclaimed BMW a "mobility service provider" as part of the announcement with a focus on "developing and delivering new services to help meet the increasing need for flexible mobility solutions in our cities."

Indeed, San Francisco Mayor Ed Lee backed the commitment calling the BMW car-sharing program part of a broad citywide strategy to embrace the "sharing economy, cities as solutions and sustainable mobility."

San Francisco is the first US city for the DriveNow program and the only global BMW car-sharing program that includes electric vehicles exclusively. The program was initially launched last year in Munich, Berlin and Düsseldorf and currently has 45,000 members.

But BMW is not the only automaker to launch an electric vehicle car-sharing program here in the States.

Last year, Daimler introduced a Car2Go car-sharing service in Austin and San Diego, and has since expanded to Miami, Calgary and Toronto. With more than 50,000 members, Car2Go allows renters to locate, pickup and drop-off cars within a geographic radius and includes a sizable network of 200 to 300 Daimler Smart Fortwos in each location.

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## Beer industry raises a glass towards cutting water consumption

By **Bruce Kennedy**

Next time you down a beer, think about this: it took a lot of water to create that brew sitting in front of you.

According to a 2010 study by the SABMiller brewing company, the World Wildlife Federation and the German international development agency GIZ, up to 60 to 180 liters of water can be used to produce one liter of beer. Those figures cover the entire process -- from crop cultivation through the brewing process to packaging and, finally, to your thirsty self. The amount of water consumed depends on how it's used along the supply chain.

In recent years, most brewers have been using about a five-to-one water-to-beer ratio to make their beverages. But those figures are evolving rapidly. As water demand soars and supplies become limited, beer makers are rethinking their supply chains and sustainability goals. Two powerhouse companies -- MillerCoors and Heineken -- are focusing the best ways to reduce their respective water footprints. In its newly-released "Great Things on Tap" sustainability report, MillerCoors highlights some of its environmental stewardship and sustainability results. These include:

- Reducing their water-to-beer ratio to less than 4:1 at five of their eight breweries..
- Cutting water consumption by 100 million gallons per year at their Milwaukee brewery, through the use of a new cooling system that uses re-circulated water.
- Saving 124.5 million gallons of water -- while increasing barley yields -- during the first year at its Showcase Barley farm.

For its part, Heineken has selected a new software system to support the company's "Green Gauge" initiative -- to accumulate, analyze and transmit sustainability performance data across their 250 brands and 140 breweries in more than 70 countries.

*Photo of beer pouring into glass by Bashutskyy via Shutterstock.*

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## Prototype of electric London black cab unveiled

By **Gwyn Topham**, transport correspondent, for guardian.co.uk

The prospect of London's black cabs going electric has come a step closer with the unveiling of a prototype that will be trialled on the capital's streets as early as next year.



The Nissan NV200 has a range of 200 miles and is expected to go on sale by 2014.

Nissan has promised that its new London taxi, a van-like vehicle, can eliminate 20% of the capital's exhaust pollution caused by its 22,000 black cabs. But the carmaker warned that it was now down to politicians to make electric traffic a practical reality.

The London mayor, Boris Johnson, has pledged that a zero-emission taxi fleet will be in service by 2020, although London assembly members have queried the slow rate of installing charging points for electric vehicles.

The NV200 taxi will also be produced in a diesel engine version that Nissan claims is 50% more fuel-efficient than existing cabs. The vehicle retains the distinguishing features of London cabs -- the for-hire light and the 25-foot turning circle reportedly required to drive to the Savoy hotel's

front door -- but also has aesthetically questionable tinted sunroofs and sliding doors.

The taxis, expected to be on general sale to cabbies by 2014, will be built in Barcelona but the electric versions will have the batteries and motors produced in Sunderland.

Andy Palmer, executive vice-president of Nissan, said the vehicles had a potential range of 200 miles a day, based on an overnight charge and a 30-minute fast charge at one of the anticipated future network of charging points.

While Nissan is also adapting the same model for Tokyo and for New York's yellow fleet, it held out the prospect of London's hackney carriages winning the race for a fully electric future.

Palmer said: "The ball was in the manufacturers' court. Now it's with the cities to see who can get the infrastructure in place.

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## Unilever, DHL extend carbon-cutting partnership

By James Murray

Two of the world's largest global brands, consumer goods giant Unilever and logistics powerhouse DHL, this week announced an extension of their existing partnership designed to accelerate the adoption of greener business models and technologies.

Unilever, which has earned plaudits from green groups for its commitment to halve its environmental impact by 2020, said it will develop a Joint Business Development Plan (JBDP) with DHL as part of its program to ensure key suppliers are taking steps to cut greenhouse gas emissions and improve their environmental performance.

The new plan will see the two companies work together to ensure they are delivering on both Unilever's Sustainable Living Plan and DHL's GOGREEN initiative, with a particular focus on cutting emissions, enhancing efficiencies across the supply chain, and reducing waste levels through the use of new technologies.

Precise details of how the two firms will co-operate are yet to be finalized, but a spokeswoman for DHL said the companies had identified a number of areas of potential joint interest, including plans to develop a blueprint for sustainable warehouse designs, methodologies for accurately measuring supply chain emissions, and strategies for reducing waste levels and boosting recycling rates.

She also revealed that the companies could jointly explore how emerging green transport technologies such as electric or alternative fuel vehicles could be used to slash the environmental footprint of supply chains.

Pier Luigi Sigismondi, chief supply chain officer at Unilever, said the partnership was a prime example of how the firm planned to work with suppliers to help improve environmental performance right across the supply chain.

"For Unilever it is essential that we work closely together with our strategic suppliers in order to reach our ambition to double the size of the company and halve our environmental impact -- we cannot do this alone," he said. "DHL and Unilever have worked together for many years now and both organizations share the same values, passion and goals. This is why we have chosen DHL as a global supply chain partner to support our plans to sustainably grow our business."



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## Call to improve anti-corruption, carbon emissions reporting

By GLOBE-Net Staff



Sustainability reporting experts are calling on professionals and organizations to help improve the way companies report on anti-corruption and greenhouse gas emissions, by providing feedback on draft guidance before Nov. 12, 2012.

The Global Reporting Initiative (GRI) is asking the public to comment on sustainability reporting guidance developed by expert working groups, helping improve sustainability reporting on these issues.

GRI produces a comprehensive sustainability reporting framework that is widely used around the world. GRI is now working on the next generation of its Sustainability Reporting Guidelines - G4. An Exposure Draft of G4 is currently available for feedback until Sept. 25. As part of the development process, an additional public comment period is now open for organizations and individuals to share their views

and help shape reporting on anti-corruption and greenhouse gas emissions.

Proposed new guidance from GRI's Anti-Corruption Working Group will enable companies to report information on their policy, their publicly stated commitment to zero tolerance of corruption, their training of employees, governance bodies and business partners on anti-corruption, and their collective action initiatives towards combating corruption.

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## Tiger population of India facing 'total disaster' due to tourism ban

By **Helen Pidd**, for [guardian.co.uk](http://guardian.co.uk)

It is not difficult to guess which animal the town of Sawai Madhopur has tethered its fortunes to. Fancy a drink? Pop into the Tiger bar at the Taj hotel. Want to rest your head? Try the Tiger Moon Resort. Want to shop? There are tiger-print pyjamas, aprons, tablecloths, bedspreads. Little in this Rajasthani town has not succumbed to tiger mania.

Sitting cross-legged on a stage by the main road last Saturday, Yadendra Singh handed over his business card, decorated, of course, with orange and black stripes. Since 1992 he has run Tiger Eye Adventure Tours, taking visitors from around the world on safari inside the nearby Ranthambore national park.

But for the past three weeks, Singh has not been allowed in the park to check on the 27 adult tigers and 25 cubs who call it home. No one has, after India's supreme court issued an order banning tourism in all core tiger habitats.

The decree was temporary, until 22 August, when the court meets again to assess whether tigers and tourists can co-exist in India. The decision will have ramifications not just for India's approximately 1,700 tigers, but for the tens, if not hundreds, of thousands of Indians whose livelihoods depend on the big cats.

"I couldn't believe it," said Singh. "I've spent 20 years, half my life, doing this. And suddenly I'm supposed to find a new job."

But Singh, and many environmentalists and conservationists, insist the real losers will be the creatures who have helped pay his bills for two decades. "If the ban on tourism continues, it will be the end of the tiger in India," he said. "We're the ones who put energy into tracking them. We deter poachers. Tourists are only allowed in the park for six hours every day, but we guides take it in turns to patrol the park from sunrise to sunset. Voluntarily."

Belinda Wright, executive director of the Wildlife Protection Society of India, based in New Delhi, said a tourist ban would be a "total disaster".

Stressing she was pro-tiger rather than pro-tourist, she said: "There is no way the forestry department alone can protect tigers from poachers and local encroachment on the land."

The Corbett Foundation, another wildlife protection charity in India, agrees. "While in principle, we all agree that wildlife tourism in India needs to be controlled and strictly regulated, placing a complete ban on any kind of tourism activities in the core areas will certainly not help the wildlife of the tiger reserves," it said in a statement.

Since the court's judgment on 24 July, Singh has not earned a penny. Along with dozens of other guides and drivers who feed their families by servicing the tiger tourists who flock to Ranthambore every year, he has been holding a roadside protest to remind the authorities how integral tigers are to the town.

There are no reliable figures to show how many tourists visit Sawai Madhopur each year, but in 2011, 288,000 tickets were sold to enter the national park. Demand is much higher, say locals, but numbers are restricted so a maximum of 40 vehicles carrying a total of 520 tourists are in the park at any one time.

The interim order has hit hard, said Goverdhan Singh Rathore, a doctor who runs a free hospital from the profit made from his guest house, Khem Villas. "We've already had 10% of bookings for next season cancelled," he said, sitting in the courtyard of his house, which is decorated with orange and black striped tiles. "Forty per cent of guests have asked us to let them know what happens on the 22nd. If the ban is extended, next season is over." He would have to close the hotel, and the hospital, which treated 90,000 patients last year, he added.



Tourists watch a tiger on safari in Ranthambore national park.  
Photograph: AFP/Getty Images

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## India's power blackout: An opportunity for sustainable energy?

By Bruce Kennedy



Following the largest power outage in history, the blame game is underway in India.

The recent blackout in the northern part of the country left more than 600 million people -- or about 10 percent of the world's population -- without electricity for several days.

Officials are looking at a variety of factors for the outage, including low water levels at hydro-electric dams (blamed on lower rates of rainfall) and reports that some Indian states were drawing off too much power.

But a newly released analysis by Standard and Poor's Rating Services takes the debate a step further, saying that India is playing a risky game. It's trying to satisfy its ravenous domestic hunger for electricity while playing catch-up with its over-taxed utilities.

"The blackout was, in our view, a consequence of capacity growth and infrastructure improvements that severely lag the country's mushrooming demand for power," said S&P analyst Rajiv Vishwanathan.

Along with calls for greater investment and reform in the way India's energy grid is maintained and managed, the paralyzing blackout brought attention to experts' beliefs that now is the time for the country to make the shift towards more sustainable power sources.

"Decentralized renewable energy sources like wind, solar and microhydropower plants are the answers here," said environmental activist and energy consultant Shailendra Tshwant, in an interview with *The New York Times*.

By concentrating on energy efficiency and working closely with their end-users, said Mark Feasel, director of energy solutions business for Schneider Electric, utilities "can communicate the status of their grid in real-time, and tap capacity from their users when grid issues prevent normal operation."

### Concerns regarding power and the capacity for growth

The blackout is also underscoring concerns about the future of India's economy and its capacity for growth. "It goes without saying that an outage of this scale translates to huge losses for business and profits," said Feasel. "In our fast and instantaneous world, just a few minutes of downtime can translate to millions, if not billions of dollars."

"All major organizations in India are equipped with the requisite power backup system that ensures smooth functioning of day-to-day business operations," said Ellen Morgenstern, manager of GE's citizen communications, in an email to GreenBiz. "However, the reality is that there remains a very strong demand for power in India and the government along with key industry players is working towards creating a healthy power demand and supply equilibrium."

The country's lack of fuel security is also a "major constraint" to its capacity to generate power, Vishwanathan said. "The slow pace of tariff reforms is hindering infrastructure investment at the state level," he added.

Photo of *Indian Flag* by *Vividz Foto* via Shutterstock.

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## India Cancels GMO Cotton License

### SustainableBusiness.com News

The Indian state of Maharashtra has revoked Monsanto's license to sell genetically engineered cotton seeds while it investigates farmer suicides, reports *Environment News Service (ENS)*.

The cancellation affects 28 Indian seed companies that sell cotton seeds using technology from Mahyco Monsanto Biotech, a joint venture of Mahyco and Monsanto Holdings Pvt.

"We have given fair chance to the company and all charges of unfair trade practice have been proved," says Sudam Adsule, the director of inputs and quality control for Maharashtra, India's biggest industrial region, in the ENS article. "Hence, under the existing cotton seed act, we have taken action and it can't be revoked."

The move comes amid an investigation into the rising suicide rates among Maharashtra farmers that have been planting the seeds. Some have suggested the high cost of the seeds, which have failed to repel cotton pests as promised, and the debt incurred by farmers as a result has been a contributor to more than 8,200 suicides in the past decade in the Vidarbha region of the Indian state.

Kishore Tiwari with the farmer advocacy group Vidarbha Jan Andolan Samiti told ENS: "Bt cotton seed has played a key role in the Vidarbha farm suicide saga since June 2005.

Across India, more than 250,000 people took their lives between 1995 and 2010.

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# Will Tata Motors Soon Bring 'Air Car' to Market?

SustainableBusiness.com News

There has been a flurry of chatter this past week about the AIRPod, a tiny urban car being tested by India's largest automobile company Tata Motors that runs on compressed air.

If you've ever been around a scuba diving operation, you know compressed air is a pretty powerful thing. Just crack open the valve on the top of a tank if you don't believe me. But is it really powerful enough for a passenger vehicle?

The two companies behind AIRPod, Tata and Motor Development International (MDI) from Luxembourg, think so. From a layperson's perspective, the engine works by injecting compressed air into the combustion chamber where it heats and expands, pushing the piston down.

The AIRPod is actually a series of cars being tested by Tata and MDI for a variety of urban use scenarios, such as passenger transportation or package delivery. It has just three wheels, two doors and is controlled by a joystick, not a steering wheel.

The vehicle has been under development for several years, but the buzz is that the commercial version should be available in the "near



future" for about \$10,000, reports design magazine Core77. Other reports point to August 2012 as the release date, but there has been no official update from Tata Motors.

The standard model of the AIRPod weighs about 485 pounds, and it has four passenger seats that accommodate three adults and one children. MDI also is working on a cargo edition outfitted for making deliveries and a "baby" edition with just two front passenger seats.

MDI's and Tata's tests so far show that the vehicle's 175-liter storage tank will propel it to top speeds of about 43 miles per hour for distances of up to 125 miles, reports Core77.

The companies are also pitching the rapid "charging" time: it takes just under two minutes to fill an air tank. The current average price for a compressed air fill is about \$1.24, says MDI.

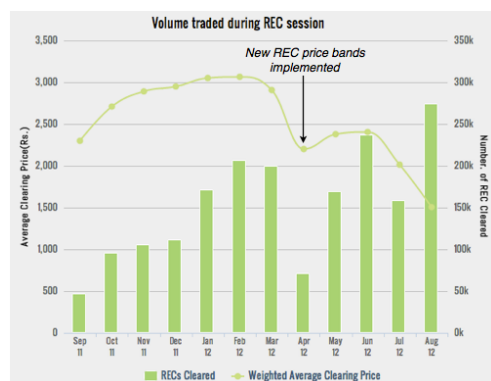
MDI was founded by mechanical engineer Guy Negre, who invented the compressed air technology that is used in several AIRPod predecessor vehicles. The company has been working on cars that use compressed air since 1996.

Tata Motors signed an exclusive license for the AIRPod line in India back in 2007. The giant Indian automotive company sells its vehicles in Europe, Africa, the Middle East, South Asia, South East Asia and South America. Aside from its status as the top seller of commercial vehicles in India, Tata Motors is the world's fourth largest truck and bus manufacturer.

Aside from the compressed air technology, Tata Motors is also manufacturing electric vehicles for Europe.

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## Aug 2012 REC Trading: Non-solar RECs prices fall 25% on high volumes; solar RECs hold ground



**Climate Connect News, New Delhi, 29 August 2012:** The 18th trading session of Renewable Energy Certificates (RECs) was concluded on 29th August at the Indian Energy Exchange Limited (IEX) in New Delhi and the Power Exchange India Limited (PXIL) in Mumbai. Of the total RECs offered for trading 44 percent were redeemed. The total transaction value at both the exchanges was over Rs 41.7 crore, 30 percent rise over the previous session.

During August, the central nodal agency, National Load Dispatch Centre (NLDC), had issued 2,73,893 non-solar RECs. Combined with the 3,97,941 non-solar RECs which remained unredeemed in July 2012, a total of 8,41,113 non-solar RECs were available for trading during the 18th session. However, only 6,27,310 non-solar RECs were actually offered for trading by the project developers. NLDC also issued 190 solar RECs in August, combined with the 370 solar RECs unredeemed after June trading session, 560 solar RECs were available and offered for trading.

IEX received buy bids for 2,48,168 non-solar RECs and sell bids for 5,68,097 non-solar RECs against which 2,48,168 non-solar RECs were cleared at Rs 1,500 per MWh. PXIL received buy bids for 35,150 non-solar RECs and sell bids for 59,213 non-solar RECs against which 25,725 non-solar RECs were cleared at Rs 1,555 per MWh.

IEX received buys bids for 1,728 solar RECs and sell bids for 310 solar RECs against which 129 solar RECs were cleared at Rs 12,850 per MWh. PXIL received buy bids for 603 solar RECs and sell bids for 250 solar RECs against which 250 solar RECs were cleared at Rs 12,850 per MWh.

[<Source>](#)

# National Conference On Environmental Issues and Challenges - The Himalayan perspective

October 4-5, 2012

A National conference titled “**Environmental Issues and Challenges - The Himalayan perspective**” is being organized during October 4-5, 2012. The conference is organized by Institute of Mountain Environment, Bhaderwah Campus & P.G. Department of Environmental Sciences, University of Jammu Jammu.

The proposed conference is expected to discuss issues related to biodiversity crisis, landscape degradation, climate change, mountain disasters, water quality and health, rural livelihoods, energy crisis, pollution, as well as cross-sectoral issues with particular emphasis on natural resources of the Himalayan region. A galaxy of renowned scientists from academia and research institutes, have been invited to deliver keynote addresses and plenary lectures.

### Topics for Deliberations:

- Biodiversity conservation and management in Himalayas
- Forest resource management in Himalayas
- Wildlife resources and Protected Area Network in Himalayas
- Water quality and health in Himalayas
- Alternative energy resources in Himalayas
- High altitude watershed Management
- Climate change and extreme weather events like cloud bursts, flash floods etc
- Ecosystem health of Mountain Ecosystems
- Hazards and disasters associated with Himalayas
- Tourism and its associated implications in Himalayas
- Urbanized Himalayan environment
- Emerging technologies for Mountain ecosystems
- Alternate rural livelihood options in Himalayas
- Community participation for natural resource conservation
- Environmental education and mass awareness
- Environmental pollution and its impact on Himalayan natural resources
- Remote sensing and GIS application in natural resource management
- Green economy and green marketing

[<See brochure>](#)

### “India Carbon Market Conclave 2012 (ICMC 2012)”

The **Federation of Indian Chambers of Commerce and Industry (FICCI)** is organizing the “**India Carbon Market Conclave 2012 (ICMC 2012)**” on September 12-13, 2012, at New Delhi. This would be the sixth edition of the ICMC conclave that features a two-day Conference, a Master-Class on PoA Development, and an Exhibition to showcase services, technologies, projects and products.

The India Carbon Market Conclave has outlined its objectives to address the prevailing issues and future challenges in carbon markets. It provides a platform to carbon market stakeholders to engage in knowledge sharing, discussions on national and international policies, and networking across a global carbon market community. **ThinktoSustain.com** is the Media Partner for the event.

*“The twin issues – a wavering macro-economic scenario and an unresolved future of the Kyoto Protocol - are likely to raise business risks for big-ticket CDM projects. Industry needs to take an informed decision before embarking on CDM projects, while the government must take strong policy action with global players to clear the stalemate at the earliest,”* says **G V P Rajan**, Vice President, Sustainable Strategies at ThinktoSustain.com.

FICCI’s event focusing on a host of issues related to carbon markets comes at a time when the Indian industry needs clarity and direction.

*“The India Carbon Market Conclave is uniquely positioned to take stock of the negotiations mid-stream towards the year-end culmination at the Conference of Parties which would be in Doha this year. The Conclave helps industry and government to come together to brainstorm on the policy and market issues, brings stakeholders up to speed on what is happening in the carbon market and outlines their expectations from the international climate regime,”* says **Rita Roy Choudhury**, Director and Head, Environment, Climate Change, Renewable Energy at FICCI.

Check the following link for more details about this event:

[<View details>](#)

[<See Brochure>](#)

### **MBA – Energy and Environment at Symbiosis Institute of International Business (SIIB), Pune**

This is a two-year full-time residential programme that concentrates exclusively on the Energy & Environment sector in the global context and addresses current needs of the industry. SIIB recognizes the pivotal role Energy and Environment play in substantial development.

The programme will focus on both these crucial aspects and furnish aspiring managers with the managerial, economic, legal and relevant technical competence required in these fields. These managers will play a vital role in organizations, as they would serve as the link between the technological world, business world and the environmental world. The programme is hands-on in its approach and incorporates a blend of theory and practice, which prepares the students to meet the contemporary global requirements.

[<For details please visit>](#) or [<visit SIIB website>](#)

### **MBA in Natural Resource Management**

at

**Amity School of Natural Resources & Sustainable  
Development (ASNRSD),**

**NOIDA**

**MBA in Natural Resource Management** is a 2 Years programme. This unique new course provides students with management skills coupled with sound knowledge of sustainable Natural Resources Management. Subjects having great demand like carbon market, GIS, EIA, etc., are special attractions of this course. Such types of courses are quite popular abroad and every good university in USA or Western Europe has a full-fledged division of NRM or similar courses. But there are only two institutes of repute in India which have this kind of course. One is the **Indian Institute of Forest Management (IIFM)**, Bhopal (that offers **Post Graduate Diploma in Forest Management**) and the other is Amity School of Natural Resources & Sustainable Development which offers MBA in Natural Resource Management. The curriculum of this newly developed MBA-NRM programme is being applauded because it is a good blend of application of management techniques in sustainable management of natural resources.

[<For details please visit>](#) or [<ASNSRD website>](#)



# PGDM – Sustainable Development Practices at BIMTECH, Greater Noida

As observed by national surveys and also by the International Commission on Education for Sustainable Development Practice (ICESDP), the McArthur Foundation and The Earth Institute, Columbia University, need of such professionals who act as change agents in social development, understanding the complex underpinnings of natural sciences, health sciences, social sciences and management. It is a well established fact that there is acute need for professionals to carry forward the agenda of sustainable development and inclusive growth. With this in view, BIMTECH has started a 2 years course “Masters in Sustainable Development Practices (SDP)”.

The SDP programme envisages two terms of field training with a national or international organization. Graduates should get challenging and meaningful opportunities for employment with diverse range of institutions and organizations.

The programme on Sustainable Development Practices is in response to paradigm shift in social changes, national and international policies on development goals and livelihood, dynamics of national and international priorities and responsible business and its operations which necessitate new capabilities and tools for administrators and managers. The graduates of this programme may be looked at as experts who will address the technical issues of social development in practical solutions in exceptional manner.

[<For details please visit>](#) or [<BIMTECH website>](#)

*The Times of India, Delhi dated August 03, 2012*

# Green step: All traffic lights in Noida to run on solar power

TIMES NEWS NETWORK

Noida: In about two weeks, all traffic signals in the city will run on solar power. The decision was taken by Noida Authority and the district traffic police in a bid to minimize traffic snarls. At present, 38 of the total 79 signals are powered by solar energy.

The matter was recently approved in the Authority's board meeting. The procedure is expected to be completed within a fortnight. The plan was initially proposed about five years back and about 25 traffic signals that are maintained by the Authority were powered by so-

lar energy at the time. However, following the recent collapse of major power grids and the resultant failure of traffic signals, authorities have decided to take a step forward to ensure a "100 percent power back-up arrangement."

"Frequent power disruption in Noida often leads to non-functioning of traffic signals at various intersections causing inconvenience to both commuters as well as the traffic police. Once all signals are run by solar energy, this problem will be solved," said Sanjiv Saran, CEO, Noida Authority. While the cost of converting a traffic signal into a solar powered one

is between Rs12 lakh and Rs15 lakh — much more than the cost of installing a regular traffic signal — in the long run, solar panels offer significant savings on energy consumption and costs. Solar panels bank on a renewable source of energy and light up the signals uninterruptedly, thus preventing traffic chaos. "These are easy to maintain and eventually they turn out to be more economical," Saran added.

Meanwhile, to streamline traffic flow, "particularly during peak hours," traffic police has proposed to upgrade its computerized area traffic control system.

## NATURE POWER

*The Economic Times, New Delhi dated August 4, 2012*

# Young Drivers of the Renewable Energy Bandwagon

Renewable energy in India has always been a risky business, be it due to high input cost, unsteady market or lack of government support. But these seven young entrepreneurs defied all this and much more. At a time when even big companies are reluctant to enter the renewable energy market due to the huge costs involved, they have come up with innovative solutions to develop clean energy, which brings down the costs and is accessible by the commons, even village folks, reports Shreya Jai.

## ‘Swades’ story in Real

**Siddharth Malik, 30**  
**Megawatt Solutions, Delhi**

AN engineering and management degree from University of Pennsylvania, a flourishing career with energy-focused companies in the US where the base package is a sinful \$1,00,000 per annum. What more can you ask for? Well, Siddharth Malik had ideas. This passionate 30-year old left all this to come back to India and start his own renewable energy venture amalgamating high-performing solar-thermal systems with fossil fuels. He started Megawatts Solutions in 2010, which provides concentrated solar-thermal solutions. “At least when sun is shining, fossils need not be fired,” says Malik, adding, “this simple idea creates long-term economic value for industry owners.” Its 0.5-mw pilot project in Guragon provides a hybrid solution by integrating solarthermal with fossil fuel that offers considerably higher value than stand-alone solar thermal plants. “It has resulted in up to 25% more efficient performance than competing technologies, which makes a drastic improvement in economics of solar,” adds Malik. MS’ solutions are based on home-grown concentrated solar thermal technology and its role ranges from designing to manufacturing, installing and commissioning industrial-scale solar thermal projects. It has four projects in the pipeline including a 3 mw solar thermal heating project in Gujarat – the largest ever in India.



## Solar Cells Blooming Like Sunflowers!

**Raghuram Kondubatla, 31 & Bhagwan Reddy, 31**

**SmartTrak Solar Systems, Andhra Pradesh**

WHAT if one solar panel is built like a sunflower which sense and tracks sunlight the whole day in place of four panels kept in different direction? USreturn software engineers Raghuram and Reddy developed this very idea to clock a turnover of Rs 2 crore just one year for their joint venture ‘SmartTrak Solar Systems’. A solar tracker is an electro-mechanical platform fitted with panels, which follows the sun ensuring that maximum amount of sunlight strikes the panels throughout the day. “In conventional means, to increase the production by 25%, one has to set-up more solar PV panels. But with the solar tracker, the same amount of extra energy is produced



with less than 10% of additional cost. It can lead to an increase in generation capacity by 25-40%,” explains Raghuram. “A cost analysis of a 5 mw solar PV unit with 80 lakh units of output requires about Rs 47.5 crore and a tracking system based solar PV plant can achieve this output by setting up a 4 mw plant with an outlay of Rs 38 crore.” The duo have their hopes pinned at the AP’s state policy on Renewable Energy Certificates regime, which they hope will change the scene.

**Powering the Roots Nikhil Jaisinghani, 36 & Brian Shaad, 37**

**Mera Gaon Power, New Delhi**

A Foreign Service officer of USAID and an international development practitioner comes together for a venture in renewable energy may be no big deal, except if you happen to live in villages in and around the Sitapur district in UP. Thanks to Mera Gaon Power (MGP), started by Nikhil & Brian, they now get seven hours of electricity per night at just Rs 25 per week. The two US citizens while working in Nigeria on captured flare gas had noticed that equipments and facilities reached the farmers but utilising it was out of their capacity. When Nikhil moved to India in 2009, he witnessed the same problem existed for solar generated power energy in India. MGP’s village-level lighting facility generates electricity through centrally located solar panels and stores the generated electricity in batteries. Power is distributed over a short distance from the battery bank to households within the village for seven hours per night. Every household gets light through light emitting diodes (LEDs), which reduce power consumption by 90% per household. Each household can get its set-up of two or four LED and a mobile charging point at a one-time price of Rs 40.



## Transform Rooftop into A Wind Farm

**Bhupesh Sharma, 22**

**BRESON, Mumbai**

“IT’S my passion to build ideas that are useful and have real scope to reduce either cost or efforts,” says 22 year old Sharma. One may tend to shrug him off as an amateur dreamer if not for his list of innovations, which include rooftop installed wind-turbine, solar powered car and zero electricity refrigerator. Out of these, rooftop wind turbine is a commercial success helping his company Breson clock revenues worth Rs 15 lakh in just 6 months. An

Contd.

engineer by education and innovator by nature, Sharma has developed wind turbines of 800W, 1,000W and 5,000W capacity, in accordance with the wind speeds. He did all this while pursuing his Masters in Business Design from Welingkar Institute of Management and Research, Mumbai. He went on to develop an economical turbine, which can be even used by individuals in their households. "Diverse wind speeds across the country was a major challenge so I developed a business design of customised wind turbines that helps suffice the demand of power," adds the young scientist cum entrepreneur. Breshon has already completed pilots across several states including Maharashtra, Madhya Pradesh, Rajasthan and Gujrat.



evident when he sells solar generated electricity at price as cheap as Rs 120/month for 5 hours of electricity "I had worked in MNCs but that kind of work didn't create a social impact or changed lives, completely opposite to what I wanted to do – reach to the havenots," said Patra. Naturetech follows a model developed by Patra to make sure that not a watt of energy goes waste. There are rooftop installations of solar cells of 60-watt capacity for 10 households. The grid is DC and has current circuit breakers to reduce electricity theft and is kept on only during the distribution hours -- 6 pm to 10pm "Seeing our success, UPNEDA (Uttar Pradesh New and Renewable Energy Development Agency) gave us a contract for a pilot project of 7 mini grids of 1.8 kw each for 200 households in Gonda, which we accomplished in just 15 days," says Patra. He feels that banks are wary of backing renewable energy projects and that the government should be on the forefront.

**Taking the Road Less Travelled**

**Shyam Patra, 35**

**Nature Infratech, Lucknow**

PETITE, bespectacled Shyam Patra doesn't come across as someone who has lighted up lives in 400 villages in the Bhagalpur district of Bihar, and Gonda and Unnao district of UP. But his company Nature Infratech, started in 2009, has already installed solar energy-based micro grids in these villages, which don't even have proper road connectivity. Having worked in the power sector with companies like GMR and Lanco, his experience is well

1. The villagers in front of the house on whose rooftop our panels are installed
2. Electric bicycle that runs on solar power
3. Just 2 panels (120 Watt) source of power
4. Raghuram Kondubatla & Bhagwan Reddy

*The Times of India Lucknow dated August 5, 2012*

# Solar flares in desert sky

*As half of India huddled in darkness earlier this week, large swathes of Gujarat powered by plants that tap the sun glimmered unaffected. But how viable is this source of energy? And is it easy on the pocket?*

Rajiv Shah & Ankur Jain | TNN

Just off the road heading towards the salt pans of the Great Rann, a desolate swathe of desert shines brightly. Across a big expanse — till the eye can see — it seems the whole patch has turned into a silver plate. On closer look, though, one realizes that it is the solar panels — hundreds of them spread over an area of 3,000 acres — that are reflecting the sunlight and, in the process,

Gujarat already has solar power plants with 604 MW capacity, and there are plans to convert Gandhinagar into a solar-powered city. That will be a first in the country

turning it into energy. This project, in Patan district of Gujarat, has a capacity of 214 MW; it's bigger than China's 200 MW Golmud Solar Park and will soon generate two-thirds of India's total 900 MW of solar needs.

In the age of global warming, days of fossil fuels may or may not be numbered but people have begun to look beyond energy sources that pollute. In India, Gujarat, which gets a good sun for 10 months of the year, is leading the revolution. The state's record in this field is impressive; it already has solar power plants with 604 MW capacity, and there are plans to convert the state capital, Gandhinagar, into a solar-powered city. That will be a first in the country.

But there is a catch. Since good intentions can often translate into bad economics, such green efforts may put a huge dent in the government's finances. In fact, the state is already paying an extremely high price — Rs 15 per unit — compared to conventional sources. Currently, the Gujarat Urja Vikas Nigam Ltd (GUVNL) buys more than 3 million units of solar power at this rate. "This will put an additional burden of Rs 1,600 crore on us," says a senior official who has worked in the energy department. "The utility has no other option but to

pass it on to the consumer."

So, what's the way out? Subsidy? But even if the reluctant finance department agrees to write off Rs 1,600 crore, there are fears that finally it's the consumer who will get singed by additional taxes. With the state set to add 300 MW of solar power by the year-end, the burden — on the government and consumers — could become heavier.

Gujarat is leading the country with its green energy plans but the solar power

international, agreed to install power units at such high costs as they knew they would be able to recover the capital in less than eight years. "For four years, they would get Rs 15 per unit, all of it nothing but profit. Then, for the next 13 years, GUVNL would pay them Rs 5 per unit — at a time when the actual cost of producing solar power comes to just about 15 paise per unit after recovering the capital cost," says an official.

No wonder there is a mad rush right



**BLOOMING PLANT** A worker at India's first 1MW canal-top solar power installation at Chandrasan village near Mehsana, 45 km from Ahmedabad

price has also sparked a debate, with some saying that the state "rushed" to attract solar units by offering a high Rs 15 per unit without looking into the scenario of the future. "Solar plants were established for around Rs 12 crore per MW at a time when in just one year — 2011 — the cost of putting a solar power plant came down by 30%," says an official. The government established its own solar power plants at an even higher Rs 16 crore to produce just one MW at the state-run Pandit Deendayal Petroleum University, and at Rs 17.5 crore atop the Narmada canal, again to produce just one MW.

The developers, both national and in-

now to set up solar power plants in the state. And why not? The new units have been offered Rs 9.98 per unit for 12 years, and Rs 7 per unit for another 13 years. The offer is equally lucrative as the cost of installing a plant is already down. "We have offers pending for 18,000 MW. And those who have made offers include groundnut oil millers. All of them hope to reap a windfall," says a Gujarat Energy Development Agency official.

Solar could be the energy of the future and Gujarat may just be leading by example. The question is: at what cost and who pays?

The Economic Times, New Delhi dated August 8, 2012

FIRST TO OFFER INSURANCE TO ALL UNORGANISED WORKERS

# Health Cover For All in Chhattisgarh From Oct

AMITI SEN  
NEW DELHI

Chhattisgarh is set to become the first state to extend health insurance cover to all its unorganised sector workers, a step that will not only make healthcare accessible to all but also set a model for other states to follow.

The state has offered to pay the insurance premium from October 1 for all those not covered under the Centre's flagship health insurance scheme—the Rashtriya Swasthya Bima Yojna (RSBY). The labour ministry, which implements the scheme across the country, has accepted the proposal.

Launched in April 2008, RSBY aims to provide annual health insurance cover of ₹30,000 each to below poverty line (BPL) families and some categories of unorganised sector workers.

Chhattisgarh government's decision will ensure that the poor and needy, who do not have BPL cards or are not covered under the Employees State Insurance Act, are not ignored by RSBY. The state is also pioneering the use of RSBY smart cards to deliver ration through the public distribution system.

"This is the first time that a state has taken such a decision," said Anil Swarup, director general of Labour Welfare and the architect of the scheme. "A few other states, like Kerala, have used the RSBY platform to extend it to a larger section of the population, but they have not universalised the scheme."

Swarup said RSBY will be available for all in Chhattisgarh.

"All clearances are in place and an insurance company also has been selected," he said. "We have also doubled the capacity of the new cards so that all information related

## Healthcare Accessible to All

**THE SCHEME**

₹30,000

Health insurance family floater basis for maximum of 5 members

**CHARGES**

**PREMIUM**

₹500

a year, shared between centre and states in 75:25 ratio

**REGISTRATION FEE**

₹30

borne by the beneficiary

**SMART CARD**

₹60

each, borne by the centre

**BENEFITS**

- Cashless health insurance** to cover hospitalization expenses, including maternity benefit
- Transport expenses** of ₹100 per visit subject to maximum of ₹1,000
- Pre-existing diseases** also covered
- Nearly 8,000** empanelled hospitals across India

**INNOVATIONS**

- The scheme** has been appreciated by the World Bank and UN
- The govt** is increasing its coverage to include more categories
- States** are using the smart cards to deliver other benefits as well

to PDS can also be stored."

In a country where expenditure on health is one of the main causes of indebtedness, the Centre is banking on the success of RSBY. It wants to more than double the scheme's coverage to 70 million families by the end of the 12th Five-Year Plan. At present, there are 32.2 million families holding the RSBY smart card and there have been more than 4 million claims. The finance ministry has stepped up allocation for the scheme to ₹1,500 for 2012-13, from ₹360 crore in the previous year.

The premium for households covered under the scheme ranges between ₹500 and ₹700, a third of which is borne by the Centre, while the states bear one-fourth of the cost.

Chhattisgarh government, however, will have to pay for all the additional beneficiaries. "The labour ministry is of the view that the RSBY platform can be allowed to be used for all such unorganised workers who are not eligible for cover under the ESI Act," Labour Minister Mallikarjun Kharge said in a letter to Chhattisgarh CM Raman Singh.

KAMAL

*The Times of India Delhi dated August 9,*

*Deccan Chronicle, Hyderabad dated August 13, 2012*

# Dams, reservoirs are new global warming culprits

Washington: American researchers have found that fluctuating water levels in dams and reservoirs emit large amount of greenhouse gases, the main culprits of global warming.

Researchers at Washington State University-Vancouver have documented the emission of greenhouse gases like methane, as water levels go up and down in dams and reservoirs.

Methane is 25 times more effective than carbon dioxide at trapping heat in the atmosphere. And while dams and the water behind them cover only a small portion of the earth's surface, they harbour biological activity that can produce large amounts of greenhouse gases.

"Reservoirs have typically been looked at as a green energy source. But their role in greenhouse gas emissions has been overlooked," researcher at Washington State University Bridget Deemer said.

Researchers measured dissolved gases in the water column of Lacamas lake in Clark County and found methane emissions jumped 20-fold when the water level was drawn down. They also sampled bubbles rising from the lake mud and measured a 36-fold increase in methane during a drawdown.

There are nearly 80,000 dams in the United States alone, according to the US



**NOAH'S ARK OF CHINA?** A 6-tonne ball container built by a Chinese inventor undergoes a burning test in Yiwu. It can house a family of three and hold food to sustain them for 10 months. It was designed to protect people inside from external heat, water and external impact. It took two years and \$235,585 to be built

Army Corps of Engineers National Inventory of Dams.

A previous study estimated that the ability of terrestrial ecosystems to act as carbon sinks, storing greenhouse gases, could be one-fourth less than estimated once emissions from reservoirs are considered.

This is the first study to demonstrate and quantify the relationship between water-level drawdowns and greenhouse gas releases. ■



## INDIAN COMES UP WITH AFFORDABLE, GREEN HOUSES

**DC CORRESPONDENT**  
CHENNAI, AUG. 12

They are going to be eco-friendly houses by slapping together recycled material, plastics, broken concrete pieces, requiring minimum bricks and mortar. They are also going to be pocket-friendly houses, to help the poorest of the poor gaze satisfactorily at an affordable roof over their heads.

Vijay Govindarajan, International Business professor of Dartmouth College, US, and his group of friends mooted the idea of '\$300' (₹17,500) eco-friendly houses which could be constructed anywhere in the world.

In a video post explaining the idea, Prof Govindarajan mentioned that he had seen the poor living conditions of slum-dwellers in Chennai and he had thought of improving their housing facility

The prototype of the house would be displayed in the city at the 10-day 'Indo-German Urban Mela' which starts at August 24.

*Deccan Chronicle, Hyderabad  
dated August 13, 2012*

# Plastic bottles escape pollution laws

**JATINDER KAUR TUR | DC  
HYDERABAD, AUG. 12**

While bottles of mineral water are increasingly becoming a major cause of pollution, not much is being done about it. A reason for this is that the entire focus of Plastic Waste (Management and Handling) Rules, 2011, is on polythene bags and their thickness and that the rules to ensure the responsibility of disposal is on the manufacturer.

Nobody cares to know where tons of plastic bottles containing water or other beverages, thrown carelessly after consumption, are being dumped. Even the authorities are

conveniently passing the buck saying it is not covered under the amended rules.

Surender Raj, joint chief environmental engineer, AP Pollution Control Board said, "Neither the plastic bottles nor plastic containers have been covered under the Plastic Waste (Management and Handling) Rules, 2011. It is important to ensure proper recycling and disposal of plastic, since it cannot be decomposed and should not be burnt as well."

Mr Raj said: "When we consume water from plastic bottles, we just crumple it and throw it in the dustbin. It may lie there for hundreds of years before it

## GLASS HOUSE

As per reports, per capita consumption of bottled water in India has increased by more than 20 per cent. South India, due to its inherent drinking water-related problems, consumes more than half of the bottled water in the country.

starts decomposing."

Officials revealed that a significant chunk of plastic bottles are not recycled and most of these end up in municipal dumps or landfills along with other municipal waste, which

indeed, is not the place for plastic refuse.

Experts are raising a hue and cry about the oil required to manufacture these plastic water bottles wherein the major cost is towards the plastic and not the water, being a burden on energy resources starting from the manufacture to transportation, and finally being the leading cause of pollution in our fresh water bodies and oceans.

"Just like polythene bags bearing the specifics of the manufacturer and its features, even plastic bottles should ensure the onus of responsibility for safe disposal and recycling should also be fixed," said Mr Raj.

*The Times of India Delhi dated August 14, 2012*

# Arctic sea ice may vanish in 10 years

Due To Global Warming, Meltdown Is 50% Faster Than Estimates: Experts

London: Arctic sea ice could vanish within 10 years as it is melting much faster than previously believed, thanks to global warming, warn scientists, claiming that the process is 50% faster than the current estimates. Preliminary results from the European Space Agency's CryoSat-2 probe indicate that 900 cubic kilometres of summer sea ice has disappeared from the Arctic ocean over the past year.

Sea ice in the Arctic is disappearing at a far greater rate than previously expected, according to data from the first purpose-built satellite launched to study the thick-



**GOING, GOING, GONE?**

ness of the Earth's polar caps, the 'Guardian' reported.

This rate of loss is 50% higher than most scenarios

outlined by polar scientists and suggests that global warming is beginning to have a major impact on the region.

In a few years the Arctic ocean could be free of ice in summer, triggering a 'gold rush' to exploit its fishstocks, oil, minerals and sea routes. The new measurements indicate that this ice has been thinning dramatically at the same time.

For instance, in regions north of Canada and Greenland, where ice thickness regularly stayed at around five to six metres in summer a decade ago, levels have dropped to one to three metres.

"Preliminary analysis of our data indicates that the rate of loss of sea ice volume in summer in the Arctic may be far larger than we had pre-

viously suspected," said Dr Seymour Laxon, of the Centre for Polar Observation and Modelling at University College London (UCL).

"Very soon we may experience the iconic moment when, one day in the summer, we look at satellite images and see no sea ice coverage in the Arctic, just open water," Laxon said.

The consequences of losing Arctic's ice coverage, even for only part of the year, could be profound. Ocean temperatures will rise and methane deposits on ocean floor could melt, evaporate and bubble into atmosphere. AGENCIES



The Economic Times, New Delhi dated August 16, 2012



Cos are realising it's not enough for CEOs to talk sustainability but they will have to live it out & drive it too

## Companies Going All Out to Get More Employee Buy-in

LABONITA GHOSH

Six months back, Infosys freed up two executives from their daily grind, gave them their own labs, financial grants and a licence to chase ideas in alternate energy. Vishwas Vidyaranya is now trying to produce electricity from bacteria and Deepan is looking at seawater as a source for power, in Mysore and Chennai, respectively. Executive co-chairman S Gopalakrishnan handpicked the two after an inhouse competition on alternative energy sources, organised by Infy's 'sustainability' team. If the two find a new source of energy for their employer, it could first power Infy's Mysore and Bangalore campuses, and later its centres around the country, says Rohan Parikh, head of the company's Green Team. If they don't, Infy would still have what it wanted from the competition: get the boardroom agenda of 'sustainability' to reverberate across its rank and file.

Companies like Infosys, Wipro, Hindustan Unilever (HUL) and Mahindra & Mahindra are discovering that it is not just enough for CEOs to talk about sustainability; executives have to live it out, and, over time drive it too. That's why many companies are going all out to get employee buy-in on their sustainability programmes: from recognising and rewarding efforts among staff and funding events they organise, to turning them into sustainability evangelists within and outside the company.

"Sustainability is at the heart of our business," says Nitin Paranjpe, CEO and MD HUL. "The Unilever Sustainable Living Plan (USLP) takes a valuechain approach to sustainability, right from sourcing to consumer use and disposal of our products. Employees have a key role in enabling this."

To survive, every company will eventually need to become sustainable, says Amita Joseph, director of Business and Community Foundation (BCF). "It's important to get buy-in from all your stakeholders...including employees..." she says. Conversely, not being sustainable presents a business risk, says Beroz Guzdar, senior vicepresident, Group Sustainability at Mahindra & Mahindra (M&M). "The idea is to make our employees sensitive to both the environment and the communities around them while also drive home the point that not doing so amounts to a business risk," says Guzdar. "For instance, we have to tell our plants to conserve water because without it, there can be no work." Taking it a step further, Guzdar's team also asks its plants to try and improve the water tables of the catchment communities, in the long-term interest of the company.

Back in the office, M&M's sustainability team acts as an advisory body for the company's 11 verticals to map strategies, actions and processes that take into consideration climate change, natural resource constraints and local people. Suggestions for sustainable practices come from everywhere — including the shadow boards at M&M, who have been asked to ideate around the theme of sustainability. But it is programmes like the Employee Social Option (Esops) and initiatives undertaken by the individual verticals that clinch employee buy-in. Employees doing well in sustainability receive a congratulatory letter from CEO Anand Mahindra, himself a huge advocate of it. Companies are also discovering that a commitment to sustainability can help attract and retain talent. "This helps to increase the motivation levels among our employees, given that they find their jobs more fulfilling, being driven by a larger purpose," says Paranjpe. Adds PS Narayan, head of sustainability at Wipro: "A younger workforce is much more clued in to sustainability and may actively choose to join only organisations that have a strong sustainability commitment."

### Seeding Sustainability

#### M&M

**EMPLOYEE** Social Options, the company's programme on staff volunteerism, has seen a 45% increase in volunteers & 49% increase in man hours



**SUSTAINABILITY** team acts as advisory for company's various verticals to map strategies, processes and actions

**SHADOW** boards ideate on sustainable practices

#### HUL

**TIED** up with Cambridge University for employees to undergo course on sustainability

**PLANS** to mobilise every employee to play a role in Unilever

**SUSTAINABLE** Living Plan, the global strategy on sustainability

**BY 2020**, HUL intends to halve its carbon/water/waste footprint, or become a zero-footprint co

#### Infosys and Wipro

Employees of both cos run green chapters and clubs

Wipro sets aside ₹2 lakh per chapter for programmes

Infosys organises annual in-house contest 'Eco Innovation' on alternative sources

#### LET EVERYONE INVENT

"We welcome ideas from anywhere, whether it's from employees or even our supply chain," says Infy's Parikh. "And we do whatever we can, in terms of funding and infrastructure, to support it. It's not about the money, but about becoming more sustainable as a company."

"Sustainability means different things to different people," says Wipro's Narayan. "So trying to communicate to employees about what it is, in a top-down manner, will not work. At Wipro, we feel employees view sustainability in their own way." Some might be passionate about it from the environment perspective, others may be more concerned with the community. But the best way to get employees engaged with the idea is to let them do their own thing, Narayan says. While his team tries not to impose the agenda, the initiatives come with a caveat. The sustainability team is available as a mentor and a possible funder, but employees must take the projects forward on their own.

But at HUL, head of sustainability, Meeta Singh has found that a top-down approach can be effective too. During the company's recent drive on health and keeping fit, says Singh "somebody at the top starts off a movement — it could be Doug Bailey, Nitin Paranjpe or Dhaval Buch — and the next thing you know thousands of employees are following that, and doing things like running in the Mumbai marathon". The company takes such movements forward with appropriate initiatives, says Singh, and looks to functional heads to cascade ideas about sustainability down to their juniors. To give some structure to this process, HUL has tied up with Cambridge University in the UK for select employees to do a course on how to embed sustainability with communities. Five functional heads have already undergone the programme. But it's not just the leaders; employee engagement on sustainability is a must for future targets at HUL. Before HUL's Mumbai staff moved to their new campus in Andheri, Singh received a host of suggestions on how to make the premises more ecofriendly, from planting more trees to having low-flow taps in the washrooms.

Then there is the idea of employees as sustainability champions. "There is always a small, core group of employees in every location who take the extra initiative to make that big difference," says Wipro's Narayan.

"We call them the 'sustainability evangelists', and the most effective way to get employee buy-in, is to have these evangelists talk to their colleagues. That creates more ready receptivity than imposing ideas from the top."

[labonita.ghosh@timesgroup.com](mailto:labonita.ghosh@timesgroup.com)

*The Economic Times, New Delhi dated August 16, 2012*



# Measure It, Report It, Reduce It

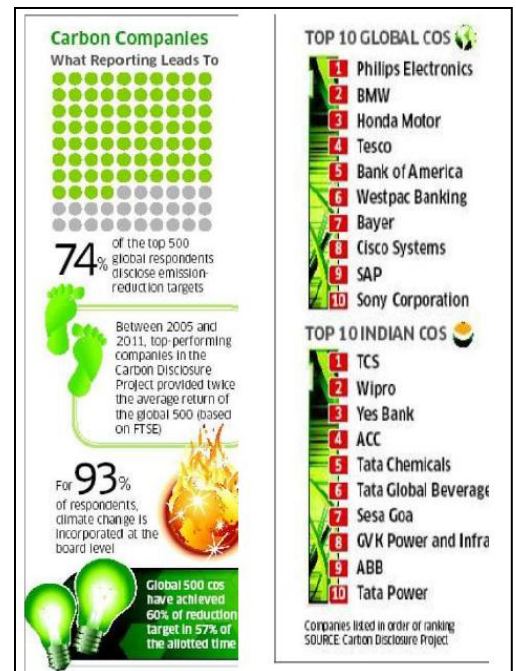
It makes business sense for companies to measure their carbon emissions, report it, & then reduce it. A few Indian ones are doing this to good effect, reports **Hari Pulakkat**

Like most global companies, Logica always knew that air travel accounted for a large portion of its carbon dioxide emissions. It also increased the company expenses significantly, but Logica had to continue the practice because of its importance to business. Like all IT services companies, its executives have to travel to its customer sites to negotiate deals and later for knowledge transfer. But when the company started reporting its carbon emissions, and then made a decision to reduce it by 50% by 2020 against the baseline of 2008, air travel had to be reduced. Logica looked at new ways of talking to its customers. For knowledge transfer, the company started using webcams and recording conversations. It also used a search engine that allowed its engineers to find specific words and listen to parts of the conversation later. This had an immediate business benefit. "Earlier all knowledge was in people's heads," says GBS Bindra, global innovation head of Logica. "The person who acquired the knowledge was not the person who was solving the problem. But now you could access this knowledge when it is needed most." The use of remote-meeting technology not only reduced emissions, it also improved work. Logica's discovery would not surprise sustainability experts. "Measuring your carbon emissions lets you know several things about your business," says Damandeep Singh, director of Carbon Disclosure Project (CDP) India. CDP is a UK-headquartered global organisation that works with corporations around the world to report and then reduce carbon dioxide emissions. Last year, Harvard Business Review rated it as the most powerful green NGO you have never heard of. It works with 655 institutional investors with \$78 trillion in assets. It had been operating in India for a few years through the World Wildlife Fund,

but set up formal office last month. Its aim: to increase carbon disclosure by Indian companies. In the last few years, it has persuaded several Indian companies to report their carbon emissions. This exercise is still in its early days. Only 29% of the top 200 companies listed on the Bombay Stock Exchange contacted responded in 2011, in contrast to 81% of the top 500 on the FTSE in the UK. But carbon emission reporting is already leading to some aggressive reduction targets. As expected, it is also leading to a better understanding of business operations. "Measuring our emissions helped us to go deep into granularities of energy efficiency," says PS Narayanan, head of sustainability, Wipro. "We would not have done that without carbon reporting."

### Cutting Emissions...

This year, Wipro came second best in India among the two indices of CDP, after TCS. Among the top ten were five Tata Group companies. Also featured are ACC, ABB, GVK Power and Infrastructure, Yes Bank and Sesa Goa. CDP has two indices, one on disclosure and the second on performance. Some of the leaders in the reporting scores have already set aggressive emission reduction targets, although their nature varies with the company. Some have absolute targets, while others have targets to reduce the intensity of their emissions. According to the data provided to CDP, ACC has a carbon dioxide reduction target of 27 kg per tonne of cement by 2013, compared to 2009. Tata Chemicals is targeting a 20% reduction in carbon dioxide per tonne of product by 2020, with 2008 as the baseline. Titan Industries has a target of 50% reduction in emissions by 2015, over a base year of 2010. Infosys Technologies has already set a target of 65% reduction in emission per revenue unit by 2015, with the base year being 2008. Wipro has set a target of 50% reduction in carbon emission per capita from 2008 to 2015. Most companies do not have the luxury of reducing total emissions. "We have been expanding our operations rapidly," says Namita Vikas, president of responsible



banking, Yes Bank. "So, we are targeting carbon intensity reduction."  
...To Improve Business

Since Indian companies are new in this game, they have fewer stories to tell on the business impact of emission reporting. But foreign multinationals in India have been part of their global reporting exercise and have more specific examples of efficiency improvements. Schneider Electric, the energy management company, has been setting aggressive emission reduction measures in the last few years. It is first going after the low-hanging fruits like electricity bills. This constitutes part of what is known as Scope 1 emissions, or emissions from the company's own offices. Reducing the Scope 2 and 3 emissions, which happen outside the company offices, required more serious analysis. It requires, among other things, better management of vendors. Like all manufacturing companies, Schneider sources some components locally and imports others. To send a component through surface transport, it needed to know the lead times for sourcing components precisely. "We developed better sales forecasting capabilities ultimately as a result of carbon emission reporting," says Satish Kumar, energy ambassador of Schneider Electric in India.

*The Times of India, New Delhi dated  
August 16, 2012*

## Loo and behold: Next-generation toilets go green

Kounteya Sinha | TNN

New Delhi: Imagine a toilet that removes water from human waste and vaporizes it using a hand-operated vacuum pump, turning the remaining solids into fuel that can be used as fertilizer. Or, how about a self-contained toilet that disinfects liquid waste and turns solid waste into fuel or electricity. Even better is a solar toilet that uses concentrated sunlight to disinfect liquid-solid waste and produce biological charcoal (biochar) that can be used as replacement for wood charcoal or chemical fertilizers. These "next-generation" toilets won the prestigious "Reinvent the Toilet" challenge, which was floated by IT czar-turned-philanthropist Bill Gates last year.

During his recent visit to India, Gates had told TOI that reinventing a toilet that has an operational cost of \$0.05 per user, per day, and a contraption that does not rely on water to flush waste and does not discharge pollutants was his latest mission. According to him, no innovation in 200 years has saved more lives than a toilet. The Gates Foundation said 2.6 billion people still don't have a safe "affordable way to poop". California Institute of Technology received \$100,000 as the first prize for designing a solar-powered toilet that generates hydrogen and electricity.

Loughborough University of the UK won \$60,000 as the second place prize for a toilet that produces biological charcoal, minerals and clean water. University of Toronto won the third prize of \$40,000 for a toilet that sanitizes feces and urine and recovers resources and clean water. Unsafe methods to capture and treat human waste result in serious health problems and death. According to Gates, food and water tainted with fecal matter result in 1.5 million child deaths every year. Most of these deaths could be prevented with the introduction of proper sanitation. Gates felt that all other modes save flush toilet are vastly inferior. "One of my ultimate dreams is to reinvent the toilet — find a cheaper alternative to the flush toilet that does not require running water, has smell characteristics better than flush toilet and cheaper to build," he had said.

*The Economic Times, New Delhi dated August 20,*

## Odisha Board Shuts Hindalco Power Unit

**NAGESHWAR PATNAIK  
BHUBANESWAR**

Odisha's pollution control board has ordered Hindalco Industries to shut its captive power plant near Hirakud after chemicals from its breached ash pond damaged crops in the adjoining areas.

The closure order was issued on Saturday. The board has also directed Hindalco to repair the dyke breach and clean up effluents from the affected areas.

Hindalco, the country's largest aluminum producer, operates a 367.5-mw captive power plant in western Sambalpur district. The ash water in the attached settling pond, which collects effluents from the power plant, had breached the embankment on Thursday—the second time this month—flooding farms and a nearby canal. "Since the company does not have a clear plan for ash disposal, we have asked them to shut down the CPP in phases," Odisha State Pollution Control Board

member-secretary Sidhanta Das told ET, adding that ash was present in the canal up to 10 km.

"However, we have asked them to draw power from the grid to keep its smelter in operational condition," Dassaid.

A Hindalco spokesman said the breach was due to torrential rains over the past few days and that the company has already shut down one of four units in the plant.

"We should be able to come up with a contingency plan by Wednesday and convince the Board to allow the CPP to operate, failing which the only industry operational in western Sambalpur district will come to a halt," the spokesman, who did not want to be named, said.

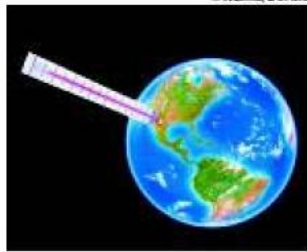
The company's smelter near Hirakud has a capacity of 1.46 lakh tonne per annum. The plant generates about 3,000 tonne of ash every day from its CPPs, of which 1,000 tonne is supplied to cement plants and another 2,000 tonne is deposited at a site about 12 km away.

*The Times of India, New Delhi dated  
August 20, 2012*

## Pee plan: Urine cocktail can help fight global warming

London: Human urine can be used to reduce pollution by absorbing greenhouse gases, especially carbon dioxide, a Spanish researcher has said.

Researcher Manuel Jimenez-Aguilar of the Institute of Agricultural and Fisheries Research and Training of the regional government of Andalusia observed that absorbing large quantities of carbon dioxide and other greenhouse gases present in cities would require millions of tonnes of some naturally occurring substance.



**HEAT IS ON**

The ocean, the ground, rocks and trees act as carbon drains but are far from places where greenhouse gases are concentrated, so urine can be used as a reactive.

“For every molecule of urea in urine, one mole (a chemical unit used to measure the quantity of a substance) of ammonium bicarbonate is produced along with one mole of ammonia, which could be used to absorb one mole of atmospheric carbon dioxide,” he said.

To avoid the urine from decomposing, the researcher suggested the possibility of including a small proportion of olive waste water (a black, foul-smelling liquid obtained from spinning the ground olive paste). ¶¶

The Economic Times, New Delhi dated August 22, 2012



THE ECONOMIC TIMES, WEDNESDAY, AUGUST 22, 2012

ADVERTORIAL AND PROMOTIONAL FEATURE

Expert Speak

**DIPANKAR GHOSH**  
Partner for Climate Change & Sustainability Services, Ernst & Young



Solar power is undoubtedly the most viable form of energy among all the alternatives available though it has cost issues. The solar power generation cost becomes high when it is done on small scale. However, it is possible to bring down the generation cost if the generation takes place at megawatt level.

**M.R. BHARATH**  
President Operations, GTL Infrastructure Ltd



Today the ecosystem is not ready for such kind of a challenge but the telecom industry has taken a very positive step, they have started the solar installations where by the carbon footprint has been reduced, they have also gone one step ahead in reducing the power consumption, like sizing of the batteries, free cooling and the other technological advancements that have taken place, these are some positive steps that the telecom industry has been taking.

**P SAIRAM PRASAD**  
Chief Technology Officer and Head of Operations, Bharti Infratel Limited



We are encouraging the renewable energy service companies to set up renewable energy generating plant of any kind to cater to all the tower companies located in the vicinity on 24x7 bases. Along with this, they are also free to serve other consumers. We would like to guarantee to the demand they require for making their revenues sustainable for longer period of time.



From the left

Paromita Chatterjee, Senior Editor, ET NOW; Dipankar Ghosh, Partner for Climate Change & Sustainability Services, Ernst & Young; P Sairam Prasad, Chief Technology Officer and Head of Operations, Bharti Infratel Limited and M.R. Bharath, President Operations, GTL Infrastructure Ltd

# Powering India's Telecom Revolution

With TRAI mandating a shift to hybrid power, India's telecom behemoths are grappling to find the right answers. Yet, there is still some way to go, and many brave initiatives to take to successfully drive the adoption of renewable energy in India

Last month, India was witness to one of the worst blackouts in 11 years. The failure of the northern power grid has only brought the issue of India's unreliable and erratic power supply to the fore. Given such power paucity, it is clear that a unified approach is required to shoulder responsible use of power and reduce carbon footprint. Traditionally, the telecom industry, especially in the hinterlands, has been reliant on diesel generators (DGs). Statistics reveal that 60% of approximately 4 lakh telecom towers in India draw power from DGs, utilising about 2 billion litres of fuel a year, and making towers among the largest consumers of diesel in India. Extensive use of diesel invariably leads to carbon emissions, making the telecom sector account for over 2% of India's total greenhouse gas emissions.

Given the significance of controlling diesel consumption for limiting pollution in the telecom sector, Telecom Regulatory Authority of India (TRAI) has mandated 50% rural towers and 20% urban towers to shift to hybrid power by 2015. Moreover, 75% of rural towers and 33% of urban towers are to turn to hybrid power by 2020. These developments are estimated to reduce carbon emissions by as much as 5 million tonnes and save around \$1.5 billion in OPEX for tower companies. In pursuance of this mission, the TRAI has advised tower companies to create their own emission reduction targets. While telcos have started working with alternate energy sources, effective adoption has remained a challenge. Given this backdrop, coordinated efforts from all stakeholders have become the need of the day in order to achieve the targets set by Department of Telecommunications (DoT).

In a bid to dispel more clarity on these issues, ET Intelligence Group (ETIG), the research arm of The Economic Times, along with Global Group conducted a Knowledge

Forum, 'Green Telephony for Healthier Future'. Moderated by Damini Kumari, Senior Editor, ET Now, the forum aimed at providing a prolific platform for knowledge dissemination by focusing on issues such as challenges of switching from diesel to hybrid or alternate energy sources; operation and maintenance concerns, means for driving green initiatives procuring alternate en-



ergy sources and the action plan for the future. The forum also provided insights on the role played by the government in supporting the efforts of telecom companies in saving the environment.

### POWER SCENARIO IN THE TELECOM INDUSTRY

To begin the session, P Sairam Prasad, Chief Technology Officer and Head of Operations, Bharti Infratel Ltd, summed up the scenario, "While some parts of India like South and West have a fairly good power supply, the Northern and Eastern regions have an unreliable grid. That makes the situation difficult when you require 24 hours power supply. So when you don't have grid power at a telecom site, you depend on batteries and DGs. The problem with that is it increases the cost of operations because grid power is much cheaper and does not require operations and maintenance."

Providing direction to the discussion, M.R. Bharath, President Operations, GTL Infrastructure Ltd, pointed out that the alternatives in renewable energy are solar, wind energy or bio mass but they pose challenges. The scale of production in their power generation has not reached the required peak. The CapEx involved in putting

up this infrastructure is still not affordable. "Telecom sites have not been prepared in line with the need to install solar panels, and the like, so space is a constraint. For wind, there are very few locations with adequate wind quality to meet requirements. The farm resources required in case of biomass energy requires 365 days availability. So an undeveloped ecosystem is a challenge," he said. Despite this, the telecom industry has made substantial efforts by way of setting up solar installations; reducing power consumption at towers; leveraging free cooling units in shelters to reduce air conditioning and by shifting to outdoor BTS.

### THE COST INHIBITIONS AROUND SOLAR POWER

Opining on the prohibitive cost of solar power, Mr. Bharath said, "In addition to the high CapEx of installing a solar plant, the operation and maintenance of panels is a challenge in itself. Because of the spread of tele-



com sites, you need to have a team dedicated for panel upkeep. Panels must be kept dust free and needs cleaning more or less on a weekly basis. In addition, security is another concern with respect to vandalism and theft. Vested interests need to be taken into confidence and made partners in such activities for successful implementation."

Mr. Prasad added that solar power, to the extent of its application in towers, depends on energy storage. "While other sources like biomass are fuel cells and do not actually depend on a battery bank because they can run 24x7 and are sized primarily for application. The problem with storage is that it is an additional cost over and above the cost of the solar panel. Additionally, some loss

takes place when discharging a battery, so this adds to the cost of a unit of power produced and becomes difficult to justify," he stated. However there is some hope. When Jawaharlal Nehru National Solar Mission was announced initially, procurement cost was around Rs 12. Mr. Ghosh stated, "The issue is not solar generation cost, but economies of scale. Solar power can become very feasible provided we have grid connectivity in remote locations."

### THE FINAL WORD

There is a consensus that solar power emerges as the most effective power source for tower electrification. The expectation is that over the next few years, solar generation cost is expected to reduce substantially; but as Mr. Ghosh mulls, it is like a chicken and egg situation. "If the demand and manufacturing of solar panel increases, costs come down; and at the same time, adoption will happen only when costs decrease. With incentives for solar generation, propagation of solar technology may increase and eventually, we should have some cost parity between clean power and fossil fuel power." Articulating the pivotal role of the government in bringing about this transformation in the telecom sector, Mr. Bharath pointed out that despite having surplus power, Gujarat has taken a significant stride in solar power by installing a 1 megawatt solar power plant on a canal. Such initiatives, subsidies and support from the Centre and state governments will finally benefit the end user.



Catch the coverage of the ETIG Knowledge Forum on ET NOW on August 25, 2012 at 5:30 pm and repeat telecast on August 26, 2012 at 5:00 pm.

*The Economic Times, New Delhi dated August 22, 2012*

Continued from previous page

## A Mission to Transform

On discussing the way forward for the telecom industry in making its shift from diesel generators to hybrid power, the panel threw up some profound revelations, praise-worthy achievements and tangible models of transformation

**T**he mandate is absolutely clear and the telecom industry is already oriented towards green energy. Tower operators are doing their bit towards bagging their Green Passport and trying to make their operations efficient and healthier by reducing carbon emission and electricity consumption. Several industry stakeholders have set out on their missions; yet, policy support could go a long way to help them succeed.

There are several options; yet, each has its own drawbacks. Dipankar

Ghosh, Partner for Climate Change & Sustainability Services, Ernst & Young clarified, "In hilly regions, a micro hydro again would do well, but this would of course not be feasible unless it works under a group generation model—the kind of scheme where you know a part of the power goes to nearby villages and some to the tower—that would possibly be feasible. In coastal regions, wind could possibly be a good option; while in areas where a cattle population and bio mass is available, small bio-gas generating units could possibly be feasible."

In urban areas, which are already connected with grid power, gas-based generation can be considered in a bid to reduce carbon footprint, because most cities have a plentiful supply of compressed natural gas.

### INDUSTRY INITIATIVES

Various initiatives to go green are being taken by the telecom industry in the area of leveraging energy efficient and renewable energy solutions. According to M.R. Bharath, President Operations, GTL Infrastructure Ltd, "There are very

## The Requisites for a 'Green' Revolution in Telecom

**R**educing carbon footprint is a multidisciplinary domain where telecom companies must consider reducing power consumption of equipments as a matter of efficient equipment deployment. For instance, there is already a scheme to get the Bureau of Energy Efficiency to label equipment with a 'star rating', while TRAI is mulling the creation of a 'green passport' for telecom equipment. With respect to renewable energy, the Ministry of New and Renewable Energy (MNRE) should be

working out the options for incentivising RESCOs such that they can set up generation centres in remote rural areas and effectively supply power to tower companies. Another area worth exploring is the renewable energy scheme called Renewable Energy Certificate (REC) scheme in India. Today, renewable energy generators can have these renewable energy certificates which are upgradable, and effectively reduce the cost of power generation. Presently, this is applicable only to generators deal-

ing with more than 250 kilowatt and Central Electricity Regulatory Commission decides how to apply the scheme. So if the Commission considers extending Renewable Energy Certificates (RECs) to smaller generators, it can provide a huge incentive for small renewable energy generating units. Therefore, there is a need to look at several such options with respect to crafting policy incentives that can actually help the propagation of renewable energy in the field of mobile communication.

## The Potential of RESCOs

**T**oday, Renewable Energy Supply Company (RESCO) models are being tried out in several parts of the country. According to Ghosh, it has two-fold advantages; first, the RESCO can scale up power generation slightly. After supplying power to the towers, the rest can be used in nearby villages. "Solar or any renewable energy is not feasible on a standalone basis, if you want to power an individual tower." However, Prasad pointed out an important oversight in the RESCO model. "The

only problem in the community model is that towers need 24x7 power supply. Community power plants generate power only in the hours the community requires it. So part of the industry initiative is to encourage RESCOs to cater to all the tower companies in the vicinity on a 24x7 basis, while guaranteeing demand required to make their revenues sustainable over a period of time," he said. The industry has taken this initiative through Tower and Infrastructure Providers Association

(TAIPA) and has received a good response. Ghosh informed, "The TRAI directive has also talked about a kind of carbon credit scheme. We should devise the scheme within the telecom industry, a kind of crediting scheme which could incentivise those who would be taking initiatives to reducing greenhouse gas emission or energy consumption, similar to the 'Perform Achieve and Trade scheme,' operating in the energy intensive industries such as fertilizer, iron, steel and so on."

few locations where quality wind power can be generated to meet the requirements of telecom. Installing of solar panels require much space. And as telecom sites have not been developed in line with this requirement space becomes a major constraint. Using renewable energy resources as an alternative is a challenge by itself but the industry is taking steps from its own standards to ensure that the consumption is reduced."

Speaking from his experience of wind power implementations in Jammu and Kashmir and Orissa, P. Sairam Prasad, Chief Technology Officer and Head of Operations, Bharti Infratel Limited elucidated, that the problem has more to do with the availability of wind speed in a particular location throughout the year and the ability to predict that because insufficient wind data is available today to the extent it is

required. The panel believed that the industry needs that data to predict how many units it can generate from windmills, if they are installed in a particular location. In the southern and western parts of the country, wind strength is higher than in the North and East. Such nuances can affect companies' plans in setting up infrastructure for renewable energy.

### SUMMING UP

Despite all these developments, immense support is sought from the government as well; this includes encouragement to stakeholders in the power industry like RESCOs so that they can serve the telecom industry better and also develop into organisations whose core competencies can be in making micro-grids successful. In turn, with increased efficiency, RESCOs will be able to get higher scales of generation, re-

duce prices, reach a larger population of the country, multiply and serve the demand situation. The telecom industry is requesting the Government to provide assistance to RESCOs rather than to the industry directly. It is important to note that whether it is RESCOs or telecom companies setting up energy infrastructure, there is a general need for financial assistance. At this point in time, telecom companies are finding it extremely difficult to justify a business case for renewable energy utilisation.

The aim to cut down carbon emissions to 7 kilos per subscriber as opposed to the present 21 kilos and the deadline to make the change to hybrid is inching close. Although one cannot be certain if the industry would make it there by 2015 or 2020, the discussions have uncovered that the industry is certainly on the right path.

*The Economic Times, New Delhi dated  
August 25, 2012*

## More Green Features for Your Home...

To cut energy use, some designs such as orientation, sun shades and double-glazed windows can be built at the construction stage itself. A look at two more features:

### EARTH AIR TUNNEL



At a depth of 4 metres below the ground, the earth's temperature remains more or less constant throughout the year. This temperature is nearly equal to average temperature of the place. For example, in Delhi, the summer temperature may go up to 45°C and fall to 4°C during winter, but 4m below the ground the temperature remains at nearly 26°C, which is the local average. An earth air tunnel takes advantage of this phenomenon. Concrete tube pipes are laid at that depth and are connected to the dwelling. When the hot summer air (sucked in by some mechanism, such as fans) passes through the pipes, the surrounding soil acts as a heat exchanger and cools the air which is then routed into the building. The reverse happens during winters. Cold air is sucked in and passes through the pipes, absorbing earth's heat and releasing it into the housing complex or the dwelling unit.

### SOLAR CHIMNEYS



Solar chimneys are tall, hollow structures that are preferably located on the south/south-west portion of a building. These chimneys can help ventilate rooms and are ideal for hot climatic zones. They should, preferably, be dark in colour with lightweight construction (for instance, ferrocement). Spaces within a building have vents opening into this chimney. The chimney heats up during summers and the air inside them rises creating low pressure. The air from the rooms then replaces the escaping chimney air, creating a low-pressure zone inside your home. This makes way for outside air to enter the home naturally and cool it.

*The Economic Times, New Delhi dated August 25, 2012*

## ENVIRONMENTALLY SOUND

# Three Green Technologies to Save Energy

If a 2,000-unit apartment complex adopts these technologies, it can cut power consumption by 17 m kWh units a year



In today's world, a 'green' investment on residential dwellings is no longer considered a luxury. Apart from yielding environmental benefits, homes that invest in green technologies save hard cash for homeowners and open up huge commercial opportunities for businesses. A green home is defined as one that uses less energy by making efficient use of resources and materials without compromising on occupant comfort. This has been made possible by employing new non-conventional technologies, some of which are already in vogue in commercial establishments. Homes use up a major portion of their energy supply in airconditioning, heating and lighting. For example, a typical upper middle class family shells out an electricity bill of Rs 7,000-8000 a month. But with the help of new non-conventional tech—namely, geothermal based airconditioning, hot water co-generation and

energy-efficient lamps — the household can slash its energy bills by up to 80%.

### Geothermal-based AC Systems

A traditional air-conditioner functions by absorbing heat from the room and expelling it into the environment. It uses more power when the outdoor temperature is high (say, 45-49 degrees centigrade) and less when the outdoor temperature is lower (for instance, in September or October). This effect is put to use by new geothermal based air-conditioning systems to enhance efficiencies of traditional AC systems by more than 60%. The geothermalbased system makes use of the ground (or the soil) to generate cooling for the air-conditioning equipment throughout the year, thus saving energy required for operating ACs. In fact, a geothermal system can help cut your power bill by as much as 80%.

### Hot water Systems

Geysers or boilers consume a large amount of electricity. Hot water co-generators that replace the energy-guzzling geysers have made it possible to slash energy consumption by over 80%. The cogen system works on the principle of 100% heat recovery. While geysers offer only 0.7-0.9 Kcal output for every 1 Kcal input, co-gen systems offer over 6-7 Kcal output for every 1 Kcal input. Operating costs with co-gen systems can drop by over 80%.

### Efficient Lighting

The third category that consumes a sizable amount of power is lighting. Energy-guzzling lamps and even compact fluorescent lamps not only consume high power but also have shorter lifespan. Newer technologies such as LED, induction and cold cathode fluorescent lamps can replace halogen and incandescent lamps and CFLs, and save 50-90% energy. These new lamps have a lifespan of more than eight years and are free of hazardous elements such as lead or mercury vapor. So if a 2,000-unit housing apartment complex adopts these three technologies, it can reduce power consumption by 17 million kWh units a year—enough to power three small villages. In money terms, this comes to around 10 crore a year. For the environment, this means a reduction of 26,000 tonnes of carbon dioxide emission, which is equivalent to planting 1.1 million trees. Imagine the impact if every single apartment complex in the city implements a similar initiative. So it does make perfect sense for every homeowner to go green!



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## The green way to control climate

Bringing in green technologies to HVAC systems is the buzz-word in the present scenario, says **Shilpa Pandya**

**T**he rapid expansion of commercial, modern buildings, spaces and urban lifestyles have increased the participation of HVAC in our lives. "From the coldest extremes to the warmest temperatures on earth, buildings around the world are built with the outdoor climate in mind," says Rahul Aeron, National Manager-Energy Recovery, Desiccant Rotors International (DRI). "Some sustainable and climate responsive buildings deliver not only low energy outcomes but also register an overall occupant satisfaction well above international benchmarks," he adds.

Modern HVAC technologies place control of temperature, humidity and air quality at your fingertips, providing the ideal level of comfort to make your living space always feel like home - regardless of season or climate. Green HVAC facilities are the future says Tanveer Merchant, MD, Star Group, the ideal opportunity to reinforce the positives of Green Buildings, especially the aspect of environment friendly ventilation. Despite the higher cost of setting up and maintaining, Merchant is all for Green HVAC solutions, his pet commercial spaces project, Star Hub, has an HVAC system that represents what's perfect for a Green Building: Green HVAC, which sets the new, upcoming office spaces apart," he says.

Designers, worldwide, are increasingly adopting the Divide & Conquer (D&Q) approach. "In the D&Q approach," says Aeron, "The fresh air load and the room internal latent load is handled by the Fresh Air Unit (DOAS) where in it is decoupled from the internal sensible load," he says.

Another element of refrigeration that needs to be considered is the refrigeration of perishable goods. This often means management of walk in chillers and freezers, with regular calibration and maintenance being essential, says Jeff Brades - VP Marketing & Communications - Sodexo On-Site service solutions. "One area of innovation that Sodexo is bringing to India is in the development of the e-Cube. This small device is based on the theory that most refrigeration systems consider air temperature as the correct gauge on which to set the level of cooling, however the e-Cube considers the actual food temperature and through this can offer considerable saving to costs by monitoring temperature through an in built gel capsule that warms and cools at the same rate as the food itself," he points out.

Elaborating on the long-term benefits of Green HVAC initiatives, Merchant concludes, "To match up the speed of the urban expansion and need for climate control, sustainable HVAC is not an alternative but the only solution for a greener tomorrow."

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room is chilled to the required temperature, and high-end homes in Mumbai offer such cooling options," he adds.

In retail spaces like malls, the concept of central air conditioning tends to be compared with individual shop-based air conditioning; both have plus points and face some challenges, adds Puri.

In the industrial sector there are five main areas where efficiencies in ventilation and air conditioning can be managed, says Brades. "Firstly, all users should be considering move from systems filled with R22 gases to those filled with CFC free agents. Roughly 65 per cent of all HVAC systems in India still use refrigeration systems that are potentially damaging to the

systems need to be deployed to limit the potential damage on expensive systems housed within. However, such intricate units are only required in such areas and organizations must be careful to ensure the system they deploy is appropriate in specification for the environment in which it will operate."

Fourthly, all companies should look at innovative solutions such as thermal storage tanks to help amortise energy costs to take advantage of non-peak hour rates. "Underground wells that are able to store brine and/or ice can then be brought into action for cooling at the peak hours, when direct electricity costs are at a maximum," adds Jeff.

In many ways, the fifth consideration is the most important



ozone layer and these do need to be phased out in the coming years," he says.

Secondly, says Jeff, variable refrigerant flow systems should be considered where possible. "Most systems operate off a central cooling system, which means that the whole unit needs to be fired up when just one or two units in one or two offices are needed. This can cause immense inefficiencies and VRF systems can help limit the impact by only operating at the level needed for the individual units being utilized."

Thirdly, adds Jeff, the system must be commensurate with the usage it is designed for. "An example of this is in data centres where both temperature and humidity must be monitored. In these areas more sophisticated

and that is the usage and maintenance of the units. "Employees need to be trained effectively that units are better operated constantly rather than the blast chill effect of cooling rapidly and then turning off the unit when the room becomes too cold," explains Jeff. "Such variance in usage impacts the systems, which are likely to become damaged from such extremes of operation. Alongside this, regular maintenance of HVAC systems is a cost that is actually a true saving. Not only are real safety considerations dealt with on a regular basis, such as the screening of systems for appropriate levels of carbon dioxide and air borne bacteria, but setting and priming of the whole system ensures it can operate as effectively as possible in the future," he adds.

# Keep it cool!

Keeping the workplace and residential spaces cool is essentially what Climate Control seeks to achieve. The challenge is to do it in a manner that is not just efficient, as also eco-friendly, says **Kamlesh Pandya**

At home and in the workplace, 'climate control' is directly proportional to work efficiency and comfortable living, and has taken prominent place in India's residential and work spaces. Initially, it was about cooling, so air conditioning was the focus. What got added on were issues like humidity and the need to infuse fresh air within the space while removing stale air, which brought about an understanding of not just cooling a space, but controlling the climate within a restricted area. This is the concept of HVAC, which is an acronym for Heating, Air Conditioning and Ventilation.

The overall HVAC market in India has been growing at a fast pace, primarily due to the rise in commercial construction activity

in the real estate and commercial building sector, infrastructure projects etc, says Caurang Pandya, MD, Carrier India. "This market is driven by products like chillers, variable refrigerant flow (VRF) and air handling units (AHU)," he adds.

In an environment like India, HVAC and refrigeration is not a luxury - it is an outright necessity, says Jeff Brades - VP Marketing & Communications - Sodexo On-Site service solutions. "This not only applies to the cooling of the workplace and the home but also to the refrigeration of perishable and semi-perishable food items. The challenge with this is that energy costs money and, sometimes, also has additional negative impacts on the environment," he adds.

In the residential scenario,

HVAC is largely about smart devices that save electric consumption while ensuring use of Green technologies and components, says real estate consultant Prashant Puri. "The 'futuristic' aspect is technology that allows

## Green Solutions

**HVAC is largely about smart devices that save electric consumption while ensuring use of green technologies**

you to start up the air conditioning unit in your home via a text message sent from your hand-phone a few minutes before you actually reach home so that the

*Edited by: Prof. Sushil Kumar  
Centre for Business Sustainability, IIM Lucknow*