

Centre for Business Sustainability, IIM Lucknow
Prabandh Nagar, Off. Sitapur Road, Lucknow- 226013
E-mail: cbs@iiml.ac.in Phone: +91 522 2736987, +91 2736989

Business Sustainability News

International

New Desalination Technologies Spur Growth in Recycling Water

Desalination has long been associated with one process — turning seawater into drinking water. But a host of new technologies are being developed that not only are improving traditional desalination but opening up new frontiers in reusing everything from agricultural water to industrial effluent.

By Cheryl Katz

A ferry plows along San Francisco Bay, trailing a tail of churned up salt, sand, and sludge and further fouling the already murky liquid that John Webley intends to turn into drinking water. But Webley, CEO of a Bay Area start-up working on a new, energy-skipping desalination system, isn't perturbed.



Cheryl Katz

"Look at the color of this intake," he says, pointing to a tube feeding brown fluid into a device the size of a home furnace. There, through a process called forward osmosis, a novel solution the company developed pulls water molecules across a membrane, leaving salt and impurities behind. At Trevi Systems' desalination plant in Tiburon, CA, fouled water is converted to drinking water using forward osmosis. When

low temperature heat is applied, the bioengineered solution separates out like oil, allowing clean water to be siphoned off.

This method uses less than a quarter of the electricity needed for standard desalination, making it easier for the technology to run on renewable power, said Webley. His company, Trevi Systems, recently won an international low-energy desalination competition and is building a pilot solar plant to desalinate seawater in the United Arab Emirates.

With world water demands rising and extreme droughts like the one now gripping California expected to grow more frequent and widespread as the climate warms, drawing fresh water from oceans and other salty sources will be increasingly important.

"Eventually, we'll have to develop new sources of water," said David Sedlak, a University of California-Berkeley professor of civil and environmental engineering and author of *Water 4.0: The Past, Present and Future of the World's Most Vital Resource*. Desalination, along with wastewater recycling and capturing and storing rainwater, will be "three main pillars," he said, to replace "water supplies that are going to become less reliable and less available in the future."

However, desalination is expensive, energy-intensive, and can damage marine ecosystems. Moreover, while seawater accounts for 60 percent of desalinated water today, Sedlak and others say it's much more practical and sustainable to desalinate less-salty brackish water and use the technology to recycle wastewater. So companies around the world are working on new technologies that cut desalination costs, reduce environmental impacts, and broaden its applications.

In addition to removing salt from seawater, technologies like Trevi's also can economically cleanse brackish groundwater, industrial effluent, and other forms of liquid waste. That includes desalinating sewer water to recharge groundwater aquifers, which it will soon begin doing for a large urban water district in Southern California.

"That's what's particularly interesting to us — we can run on really, really dirty water," Webley said. "Where you really should start with this whole thing is, let's squeeze everything we can out of re-use and then start talking about other options."

More than 17,000 desalination plants are now operating in 150 countries worldwide, a capacity that could nearly double by 2020, according to the United Nations World Water Development Report 2014. Desalination produces 21 billion gallons of water a day, according to the International Desalination Association, providing a crucial water source in

arid places such as the Middle East and Australia. Major new desalination facilities are in the works in China, Chile, and elsewhere.

However, the current standard technology, reverse osmosis — in which high-pressure pumps force water through semi-permeable membranes to exclude salt and impurities — uses large amounts of energy and has an outsized impact on the environment. These effects include damage to aquatic ecosystems, such as sucking in fish eggs with its intake water; using harsh chemicals to clean membranes; and releasing large volumes of highly salty liquid brine back into the water. Costs vary, but the lowest price for desalinated seawater from a reverse osmosis plant is around \$750 an acre-foot (325, 851 gallons) — more than double the average cost of groundwater.

Engineers and entrepreneurs across the globe are now trying to devise greener desalination. Some are inventing new alternatives to traditional reverse osmosis. Among them: Israel, whose own dependence on desalinated water has made it a world leader in the process, has come out with several state-of-the-art technologies, including a novel "semi-batch" reverse osmosis process developed by Desalitech that shrinks energy and brine, and a chemical-free "plant in a box," produced by IDE Technologies; and Memsys, of Singapore and Germany, is working on hybrid-thermal membrane technology that is energy-efficient enough to run on solar power.

In the U.S., water-strapped California, leads in both innovations and needs. The largest seawater desalination plant in the Western Hemisphere, a \$1 billion state-of-the-art reverse osmosis facility being built near San Diego, is set to begin producing 54 million gallons a day — supplying water to 300,000 residents — in early 2016. At least 15 other desalination plants on the West Coast are currently in some stage of planning, and some small ones are already operating.

But residents' concerns about the expense and environmental impacts like chemical use and brine disposal problems have slowed down and even halted some recent projects.

"Desalination is a really a hot button issue in California — a lot of people oppose it," said Aaron Mandell, co-founder and chairman of Water FX.

Mandell hopes to quell those concerns with his company's new process utilizing large parabolic mirrors to collect and concentrate the sun's energy. Inside this solar still, pure water evaporates, while solids remain

"We are tackling both sides of the water problem — disposal and reuse," says one entrepreneur behind. The system is currently being tested by a water district in California's agricultural Central Valley, cleaning irrigation runoff tainted with salts leached from the soil. The demonstration is now producing about 14,000 gallons of fresh water a day — a welcome boon to local farmers who received no water from federal allotments this year. The company plans to expand and boost production to 2 million gallons a day early next year.

Mandell points out that his salt byproduct is dry and can be mined for useful chemicals, rather than winding up with hazardous brine that's costly to discard. What's more, water districts and farms otherwise have to fallow land and lose income to dispose of the brackish effluent now being recycled into new water for crops.

"We saw the opportunity to take something that was costing quite a lot of money as a waste product and turn it into something of value," he said. "In essence, we are tackling both sides of the water problem ... disposal and re-use."

"One of our biggest challenges," Mandell said, "is that we are dealing with a lot of agricultural businesses that still sort of pray for rain. A lot of farmers do really rely on these seasonal water cycles. So getting people to think differently about climate change rather than just seasonal drought is definitely a challenge."

Researchers at Lawrence Livermore National Laboratory and Stanford University are working on a new desalinating method using porous carbon aerogel electrodes. The system, which they call flow-through electrode capacitive desalination, or FTE-CD, removes salt electrically. Although still in the early stages, its developers say the technique requires little equipment or energy, and the system could be scaled to fit any need: from portable personal devices to city water treatment.

"In places like California, where there is brackish groundwater in large volumes, FTE-CD can provide potable water at a potentially much lower cost than sea water desalination could achieve," said co-developer Michael Stadermann, a physical chemist at Lawrence Livermore. "For desalinating brackish water, we predict that this method could be up to five times more energy efficient than reverse osmosis."

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NASA to launch CO₂-tracking satellite

By Tim Radford for Climate News Network, for theguardian.com



The US space agency NASA is about to send up a satellite that will provide vital data for predicting future effects of CO₂ by taking the measure of the planetary carbon budget.

OCO-2, more formally known as Orbiting Carbon Observatory-2, is planned for launch on July 1 and will circle the globe, taking an inventory of those places on the planet that absorb carbon from the atmosphere (the sinks) and those places that release it into the atmosphere (the sources).

Artist concept rendering provided by NASA shows their Orbiting Carbon Observatory (OCO)-2. Photograph: AP

Although the satellite's acronymic name pleasingly evokes CO₂, the carbon dioxide greenhouse gas that is now at higher levels in the atmosphere than at any time in the last 800,000 years, this is pure accident. The first attempt to launch an orbiting carbon observatory came to grief when the satellite failed to separate from the launch rocket. OCO-2 is the second attempt.

"Knowing what parts of Earth are helping to remove carbon from our atmosphere will help us understand whether they can keep on doing so in future," said the project scientist Michael Gunson, of Nasa's Jet Propulsion Laboratory. "Quantifying these sinks now will help us predict how fast CO₂ will build up in the future."

Carbon dioxide exists in the atmosphere only in trace amounts: 400 parts per million. But humans are adding 40 billion tons of the gas a year by burning fossil fuel, destroying forests and quarrying lime for cement.

Less than half of this total stays there: the rest is taken up by forests on land and by algae in the oceans. But quite how much, for how long, and how predictably, remains a puzzle.

Climate scientists need to know more about sinks and sources to make more accurate predictions. And governments, planners and foresters need to know more about the ways the forest world absorbs and emits carbon dioxide.

The new satellite will use onboard spectrometers to take hundreds of thousands of measurements every day to answer these complex questions of supply and demand. Researchers are also likely to match the data with other studies of the planet's changing forests.

Scientists at Ludwig Maximilian University in Munich – where records show that average temperatures have risen by 1.5°C in the last century – have been observing at ground level, to measure changes in the growing season.

There are around 16,000 species in the Munich Botanical Garden, and researchers have measured changes in leaf-out times for 500 species to establish why the characteristic forests of the region are likely to change with warming temperatures. The answer is that some species burst into leaf when daylight reaches a certain number of hours, while some respond to temperature.

This will put central European species – such as beech, which buds when there are 13 hours of daylight, whether the spring has arrived early or not – at a disadvantage. Southern species, which respond instead to rising temperatures, will gain a growing advantage.

Meanwhile, in the US, foresters have begun to resign themselves to inexorable change in the iconic forests of Minnesota.

A report by the US Forest Service warns that, in the next 100 years, the evergreen white spruce and balsam fir and cool-climate deciduous trees, such as tamarack and quaking aspen, could give way to black cherry, eastern white pine, sugar maple and white oak.



The upper levels of the launch gantry, surrounding launch gantry, surrounding the United Launch Alliance Delta II rocket with the Orbiting Carbon Observatory-2 (OCO-2) satellite onboard, is shown at the Space Launch Complex 2 at Vandenberg Air Force Base, California. Photograph: Bill Ingalls/NASA/Getty

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European Union Leads World on Efficiency, But Disappoints on New Target

SustainableBusiness.com News

After approving new, higher targets for 2030 for greenhouse gas (GHG) cuts and renewable energy early this year, the European Union voted on an energy efficiency target last week.

Binding targets for 2030 are:

- reduce GHG emissions 40% (below 1990 levels)
- get 27% of energy from renewable energy (nuclear included)
- increase energy efficiency by 30%

The plan costs an estimated \$52 billion a year and updates the EU's 20-20-20 plan, which it is on track to meeting, except for efficiency, which has been the surprising laggard.

Across the 28 countries that comprise the EU, emissions are down 18% from 1990 levels (including outliers like Poland, which use mostly coal) and renewable energy supplies 12.7% of electricity, heat and transportation. In contrast, the figure for the US is about 9.5%.



Still, many are disappointed with the new targets. While they easily exceed other major economies, they don't meet the climate challenge.

The European Environmental Bureau – the region's largest federation of environmental organizations – calls for a minimum 60% target for cutting emissions, 45% for renewable energy and 40% for efficiency.

Greenpeace calls the plan "gutless" that's a "gift to the oligarchs", reminding them that they could drastically reduce reliance on Russian fossil fuels with an ambitious efficiency target. It would also create 3.5 million jobs according to the Commission's research.

It is ambitious, while being affordable and realistic, says EU Energy Commissioner Günther Oettinger. "Our aim is to give the right signal to the market and encourage further investments in energy-saving technologies," he told The Guardian. Business interests don't want an efficiency target, but instead rely on the market and cap-and-trade program.

Read our article, European Union Sets New Targets For Renewable Energy, GHG Emissions.

UK Announces Auctions

The UK government announced it will conduct auctions for guaranteed renewable energy payments worth over \$340 million a year, with a third for solar and onshore wind, and two-thirds for emerging technologies such as offshore wind and marine energy.

The "contracts for difference" auctions subsidize renewable energy companies that offer bids that would provide energy at lower rates than fossil fuel.

Compare the \$340 million cap with that for nuclear energy – \$136 billion – and it's not hard to understand the disappointment expressed by renewable energy industries.

In related news, the UK government may have to compensate solar companies with \$224 million for cutting feed-in tariffs without warning in 2011. A judge recently ruled they were illegal and the government is appealing the decision. Solar companies claim the unanticipated change led to huge losses and cancelled contracts.

EU Leads World on Efficiency

Although there's lots of room for improvement, Germany is the world's most efficient major economy, followed by Italy and the European Union as a whole. The US ranks #13 out of 16 nations measured – where newly proposed power plant regulations would help move it up.

2014 International Energy Efficiency Scorecard, by American Council for an Energy-Efficient Economy (ACEEE) ranking:

1. Germany
2. Italy
3. European Union
4. China and France tied
5. Japan and United Kingdom tied
6. Spain
7. Canada
8. Australia
9. India
10. South Korea
11. United States
12. Russia
13. Brazil
14. Mexico

These 16 economies represent over 81% of global gross domestic product and 71% of global energy consumption, says ACEEE.

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How Bogota creates social equality through sustainable transit

By Laurie Guevara-Stone



In the 1990s private companies ran all of Bogotá's 1,500 public buses. They fought for passengers, often driving on sidewalks and blocking streets so other buses couldn't pass. Traffic congestion was out of control, often taking over two hours to travel 18 miles. Some of the city's urban planners proposed building a network of elevated highways across the city. However, Peñalosa was not convinced that would solve the problem. He felt that urban development done the right way could develop a more egalitarian and sustainable city.

Into the millennium with bus rapid transit

For a fraction of the cost of the proposed elevated highways, the mayor put in what at the time was one of the world's most advanced bus rapid transit systems. The BRT system includes over 1,300 large buses that can hold up to 160 passengers that travel throughout the city, and smaller feeder buses that take care of the outlying areas.

The buses have dedicated lanes with elevated stations in the center of the roads. The floor of the bus is level with the floor of the station, making it easy for wheelchairs, the elderly and people pushing strollers to enter and exit. People pay the bus fare in the station, rather than paying the driver, another timesaving measure.

It wasn't an easy change. The prior bus system was in the hands of the mafia. It was a multibillion-dollar business, and the government was wary of the potential of crippling strikes if they were to take that business out of private hands. So the mayor invited the bus operators to be part of the system. Six private companies now run the bus fleet and ticketing system — although they have to abide by strict rules and regulations — and the city maintains and develops the necessary infrastructure.

Yet one of the most difficult parts was not the engineering of the new public transport, but the marketing. "We had to make our bus system sexy," according to Peñalosa. One thing they considered heavily was the name. Taking the bus always had been considered something for the poor. So they called the bus system TransMilenio — going from one millennium into the next. "Nobody now says, 'I'm going take the bus,'" Peñalosa said. "They say, 'I'm going to take the TransMilenio.'"



Beyond its usefulness, the then six-year-old Transmilenio was exciting enough to attract a flashmob in this 2007 image. (Credit: Carlos Felipe Pardo via Flickr)

in 1982, it has grown every year. "More than a million and half people come out, rich, poor, fat, skinny, old, young," Peñalosa told PBS. "This is a wonderful place for integration, it's the safest place in the city."

Mayor Peñalosa also doubled the parking fee in the city, implemented car restrictions — 40 percent of vehicles can't travel during peak hours Monday to Friday, depending on the last number on the license plate; renovated streets are more pedestrian-friendly; and one day a year the entire city (not just 74.5 miles of main highways) goes car-free. The first car-free day was Feb. 24, 2000, and was the first time in the world that the use of private vehicles was restricted across an entire city. It was so successful that the people of Bogotá voted in a referendum to annually hold a car-free day the first Thursday of every February.

The TransMilenio is also connected to bike lanes. An estimated 70 percent of TransMilenio users cycle or walk to the station. Once there, many stations have bicycle storage areas that function like coat-checks, where people can park their bikes safely and securely for free.

The two mayors following Peñalosa have not been as strong cycling proponents, so a group called La Ciudad Verde (Spanish) (the Green City) has taken up the cycling cause in Bogotá. The group identifies places in the city where more bike lanes are needed, and using social media bring citizens together to paint the lanes themselves. The city's authorities, instead of fining the group for vandalism, usually respond positively and offer to work with La Ciudad Verde. La Ciudad Verde also works on shifting cultural perceptions around cycling, and in March convinced some of the country's most famous soccer players and actors to use electric bikes for a day and share their experiences on social media.



The streets of Colombia's capital have become more pedestrian-friendly. (Credit: Carlos Felipe Pardo via Flickr)

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Tips:

Mahatma Gandhi advocated "simple living", with a great foresight, most of the environmental and sustainability issues that we are facing today are result of our complex lifestyle. Present lifestyle is harming even health of people. You will find more and more people suffering with obesity, diabetes, hyper tension, cardio-vascular diseases, lack of sleep etc. The condition in western and developed countries is even worse because the lifestyle of people there is very complex. Physical activities have reduced to a great extent and consequently many ailments gradually set in our lives. Keeping all this in view here are some tips for promoting sustainability

- Simplify your living as much as possible. Keep the belongings that are regularly used. When you will reduce belongings we will naturally purchase less and so will create less waste in the future.
- Now days attractive and unique packing of commodities is used as a marketing tool where as packing in most of cases is just thrown away, unnecessarily creating wastage. Therefore unless unavoidable do not purchase packaged articles.
- Don't use drinks and beverages that are marketed in single use aluminum cans, if the same is available in glass or pet bottles. It might be news to most of people that Aluminum smelting requires much more energy than other metal processing. In the process it produces PFCs, which are most dangerous Green House Gases, trapping thousands of times more heat than CO₂. Till now many trillions of such cans must have been buried in the landfills.
- Stop using disposable products, go for reusable products wherever possible (i.e. napkins, diapers, shopping bags, shaving razors, rechargeable batteries, refill ink in lieu of ink cartridges etc.). Instead buying glass or metal container packs every time buy refill packs.
- While buying computers, photo copying machines, play stations etc. go for refurbished products.
- Purchase used furniture rather than buying furniture made from fresh cut wood. Also donate the old furniture to charity if it is not being used.
- Wedding attires are used once only, so one may hire instead stitching new one. And in case you have stitched new one then after using donate the same to some poor person.
- Avoid products that are packaged in sachets of small quantity (i.e., shampoo, hair oil, candy, drinks, biscuits, snacks etc.). Instead, buy in bulk and transfer the products to your own reusable containers.
- Share things like books, magazines, movies, games, and newspapers between friends and neighbors. You can make a pool with your friends and buy magazines and books and share among yourselves.
- Often some medicines are left unused after getting rid of ailments. As medicines have expiry after certain time it will be waste. So give such medicines left with you, to community hospitals so that it can be used.
- Make greeting cards out of waste, it will be an innovative card and you will save that waste going to landfill.
- Instead using dryers for drying clothes use sun light to dry them. Bring a clothesline and put them under sunlight to dry them. In most parts of our country we find sufficient sunlight throughout the year.

China and US sign deals on climate change

Sharing of information on clean coal power technology among eight pacts between world's two biggest emitters

Reuters, [theguardian.com](#)

The United States and China on Tuesday signed eight partnership pacts to cut greenhouse gases, bringing the world's two biggest carbon emitters closer together on climate policy.

The deals, which involve companies and research bodies, were signed in Beijing ahead of a two-day visit to China by top Obama administration officials, including Secretary of State John Kerry, Treasury Secretary Jack Lew and Energy Secretary Ernest Moniz.



Kemper County clean coal aerial view in February 2014, Mississippi. Photograph: Courtesy Mississippi power

The signing was attended by Xie Zhenhua, vice chairman of China's influential economic planner, the National Development and Reform Commission (NDRC), Todd Stern, the lead US climate treaty negotiator at the US State Department, Obama adviser John Podesta and Lee Zak, director of the US Trade and Development Agency.

In one of the memoranda of understanding (MOUs), China's Huaneng Clean Energy Research Institute, a subsidiary of state-owned power company China Huaneng and Washington-based Summit Power Group agreed to share information on clean coal power generation technology.

Huaneng is part of a Chinese consortium operating a 400-MW pilot integrated gasification combined cycle plant in Tianjin. Under the pact, Huaneng will share information with Summit Power, which is expected to soon break ground on a similar project in Texas after it secures engineering and procurement support from Petrochina and Chinese engineering firm Huanqiu Contracting and Engineering.

The MOU is expected to be signed on Wednesday in Beijing.

Summit, in turn, will share information and technology for recovering oil from captured carbon.

"This (pact) accelerates sharing of information on carbon capture and storage for power," said Julio Friedmann, deputy assistant Secretary for Clean Coal for the US Department of Energy.

The partnership will be a boon to both countries, said Laura Miller, a former mayor of Dallas who now manages the Texas Clean Energy Project.

"We will be sharing expertise, years of development experience and non-proprietary technology on both projects, all while making giant steps forward for the world's environment," she said in an interview.

Another project partners West Virginia University with Yanchang Petroleum on an industrialized demonstration of ultra-cleaning technology in northern Shaanxi province.

The University of Kentucky, another coal state university, will partner with Shanxi Coal International Energy Group and Air Products and Chemicals Inc on a project feasibility study for a 350MW supercritical coal-fired power plant that can capture 2 million tonnes of CO₂ a year.

At a news briefing in the Chinese capital on Wednesday, the NDRC's Xie welcomed the closer partnership of the world's top two CO₂ emitters, but said more was needed in areas such as technological cooperation.

"Developing countries are most concerned that they get funds and technological support from developed countries," he said. "On this issue, we are still having great difficulties and we have to put forth more effort."

China has led the way in trying to persuade developed countries to set up financing mechanisms to help poorer nations cut emissions and adapt to climate change.

The issue remains a major stumbling-block in talks on a new global accord, with the United States and others reluctant to commit funds.

Xie told Chinese media on Tuesday that wider two-way talks would include a special high-level meeting on climate change, focused on discussing domestic and international policies and possible cooperation.

The US delegation is in China for the sixth round of the US-China Strategic and Economic Dialogue, which are high-level meetings on cooperation in areas from security to agriculture.

[<Source>](#)

Ecuador Doused In Oil, Two Months After Drilling Begins

SustainableBusiness.com News

After Ecuador issued a permit to drill for oil in Yasuni National Park in May, there's already been one of its largest oil spills.

On July 2, state-owned oil company Petroamazonas spilled 660,000 gallons of oil into the Amazon, contaminating the Aguarico and Parahuaico rivers where the indigenous Cofan, Secoya, Kichwa and Shuar communities drink, bathe, and fish, reports Amazon Watch.

These are some of the same communities that still suffer from Chevron's toxic legacy of contamination there - with a 20-year lawsuit remaining unresolved.

The crude has reached Cuyabeno Wildlife Reserve and three weeks later, no action has been taken by the environmental ministry:

So much for careful oversight and operations in one of the most biologically diverse and culturally sensitive places on Earth.

Read our article, [Ecuador Issues Permit to Drill in Yasuni National Park](#).

Please sign this message asking Environmental Minister Tapia to revoke Petroamazonas' license to drill in the Amazon and to make sure it remediates the area and compensates affected communities.

Dear Minister Tapia,



We - as global citizens concerned about the future of the Amazon and indigenous rights - write to you to express our alarm over Petroamazonas' July 2 oil spill. We are concerned that your ministry has not condemned the spill nor forced Petroamazonas to compensate the communities. We are worried that unless you use your executive power to prohibit Petroamazonas from extending its operations into Yasuni and the south central Amazon, disasters like this will become increasingly commonplace.

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Generator produces electricity out of waste heat

EE Times

GMZ Energy has demonstrated a thermoelectric generator (TEG) that recaptures automotive waste heat. The unit generated an output power well in excess of its 200W design goal. The TEG was built as part of an ongoing vehicle efficiency research programme sponsored by the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) and administered by the Department of Energy (DOE).

Half-Heusler compounds comprise the device. These elements have desirable thermoelectric properties when put together. For GMZ's device, the company used hafnium, zirconium, cobalt, nickel, antimony, and tin. Eventually, though, hafnium will be replaced with a cheaper element.

GMZ used the ball milling technique to grind the compound into nanometre-scale bits. Heat and pressure were then applied to form the resulting powder into small disks. These processes enhance a measure of thermoelectric conversion—called ZT—by 30 per cent, enough to allow the device to convert about 7 per cent of waste heat into electricity.

Thermoelectric generator

The goal of the TARDEC TEG programme is to develop a thermoelectric solution that directly converts exhaust waste heat into electrical energy in order to increase fuel efficiency by reducing the load on the alternator. The project also aims to reduce thermal signature and muffle engine noise, all while minimising exhaust pressure drop. There are no moving parts in the solid-state design of GMZ's TEG, which enables the very high reliability, mechanical robustness, and silent operation necessary for military applications.

With total delivered fuel costs on the battlefield in excess of \$40 per gallon, the United States Military is extremely interested in pursuing this economical fuel efficiency solution across a broad range of applications and will first test GMZ's TEG in a Bradley Fighting Vehicle.

The 200W TEG is a modular component of a larger 1kW TEG that GMZ Energy is developing for the \$1.5 million TARDEC programme. Combining a module approach with a scalable thermoelectric heat exchanger design, GMZ Energy will integrate multiple 200W blocks into a single 1kW diesel engine waste heat recovery solution. The TARDEC TEG incorporates GMZ's TG8-1.0 thermoelectric modules, which are the first commercially available, off-the-shelf modules capable of operating with continuous hot-side temperatures up to 600°C while at power densities greater than 1W/cm²

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China makes new electric cars tax-free

Buyers of fully electric, hybrid and fuel cell cars will not have to pay purchase tax from September to the end of 2017

AFP, *theguardian.com*

China will exempt electric cars and other types of "new energy" vehicles from purchase tax, the government said, as it seeks to reduce pollution and conserve resources.

The State Council, or cabinet, said that buyers of new energy vehicles – fully electric, hybrid and fuel cell cars – would not have to pay the levy from September to the end of 2017, according to a statement.



A Chinese child looks on next to the Active-E, an electric car made by German car manufacturer BMW, at the Shanghai Auto Show in Shanghai Photograph: PHILIPPE LOPEZ/AFP/Getty Images

China has sought to increase ownership of electric and hybrid vehicles to ease chronic pollution and reduce reliance on oil imports, but high prices, lack of infrastructure and consumer reluctance have been obstacles.

The government has set a target of having five million new energy vehicles on the streets by 2020.

But China has only 70,000 currently in use, the China Daily newspaper reported on Thursday.

The central government also offers outright subsidies for electric passenger car buyers, which were set at \$5,700 to \$9,800 last year, while local incentives can bring the price down further.

Lack of charging stations and the desires of Chinese consumers - many first time owners - for big, flashy vehicles have hurt electric car sales.

Policymakers are seeking to move away from state spending to domestic consumption as a key driver of the economy, which has been slowing.

Several foreign auto makers have announced plans to develop environmentally-friendly vehicles in China, despite the currently small market.

US electric car maker Tesla Motors has also caused a stir with aggressive marketing and by pitching its imported vehicles to luxury buyers in China, although analysts say they might only find a niche market.

[Source](#)

Quarter of UK's food thrown away 'untouched', waste figures show

By Fiona Harvey, *theguardian.com*



Unopened food from a domestic household thrown away in a dustbin. Half of the 'untouched' food wasted is fresh vegetables and salad. Photograph: Nick Ansell/PA

As much as one-quarter of the food that is thrown away by households in the UK is still "untouched" in its wrapping, analysis of waste figures shows.

This habit of regularly throwing away unused food, usually because it has been allowed to go past its eat-by date, is costing £2.4bn a year nationally or £90 per household. Such unopened food amounts to 1m tonnes of the 4m tonnes of wasted food each year, according to a new report from the Waste Resource Action Programme, a government-sponsored initiative.

Adding the value of food and drink that is partly eaten before being thrown away, or cooked and then binned uneaten, the total cost of wasted food rises to about £200 a year for the average person.

Of the unopened foods that end up chucked, about half is salad and vegetables. The waste is happening at a time when poorer and vulnerable people are reporting that they are cutting down on healthy fresh fruit and vegetables because they cost too much.

Wrap recommends simple actions including checking the fridge and cupboard before going shopping to avoid duplicating items, meal-planning and making a shopping list.

The tax is 10% of the net value of the vehicle, according to state media.

"For achieving industrial development and environmental protection, this is a win-win," the state council said in a statement on Wednesday.

The exemption applies to imported vehicles as well as domestically produced ones, the statement said, adding the government would compile a catalogue of eligible models.

China has sought to increase ownership of electric and hybrid vehicles to ease chronic pollution and reduce reliance on oil imports, but high prices, lack of infrastructure and consumer reluctance have been obstacles.

Food waste also adds indirectly to the cost of waste collections and landfill, Wrap notes, and to greenhouse gas emissions. The organisation is suggesting that each of us could choose just one bad habit to change.

Emma Marsh, head of Wrap's Love Food Hate Waste campaign, said: "We all have our own reasons for why food gets thrown away at home, so there isn't a one-size-fits-all solution. We want to get people to look at the huge volume of food and drink ending up in the bin and consider the one thing they might do differently to make sure food gets tasted, not wasted."

Wrap has set up an online site with a portion calculator and a free app, with advice on how to buy and cook just what is needed, including recipes and tips for using up leftovers.

This week, ten cities across the UK will be begin taking part in campaigns to help people understand why they waste so much food, and to find easy ways to avoid it, including Belfast, Birmingham, Cardiff, Glasgow, Leeds, London, Liverpool, Manchester, Newcastle, Nottingham and Sheffield, with a variety of events planned between now and September.

Wrap is also urging retailers to do their bit by looking more closely at their packaging, for instance by considering whether their portion size is realistic or more reclosable packaging could be used to retain freshness. It also proposes changing the "freeze on day of purchase" instruction on packaging to "freeze by the date shown."

[Source](#)

Poll: Small businesses are ready to fight climate change

By Zach Bernstein

Depending on where you go for your news, you might have heard some nasty things about the Environmental Protection Agency's new rules on power plant emissions. Many in Congress accuse the EPA of trying to destroy the coal industry, and are vowing to fight them any way they can. So you might think these rules are totally unpopular with the American public — and the business community.

Actually, the opposite is true.

A Washington Post-ABC News

poll in early June found that 70 percent of Americans felt the government should place limits on greenhouse gases from existing power plants, and 63 percent supported cutting emissions even if it raised their energy bills by \$20 a month. An NBC/Wall Street Journal poll later in June found similar results, with 67 percent supporting the EPA's move to cut emissions from existing plants. Political sniping aside, there's clear support for this kind of action.

Of course, that doesn't include the small business community, right? After all, one of the most common arguments we've heard opposing these rules is that they're job-killers that will drive small business into the ground. Surely they hate this proposal.

As it turns out, that's not true either.

That's the takeaway from the American Sustainable Business Council's latest round of polling (PDF). These results make it clear: The small business community supports efforts to cut our carbon emissions, for the simple reason that they have a great deal to lose if we don't act.

Overwhelming agreement on key points

Eighty-seven percent of small business owners named at least one possible consequence of climate change — such as higher energy costs, power outages or severe storms — that they expect to affect them in the future.

Many small businesses already have felt the effects of climate change firsthand: About one in five said extreme weather associated with climate change already has affected their operations.

Sixty-four percent of small business owners said government regulation is needed to reduce carbon emissions from power plants, compared to 29 percent who think power plants should be allowed to regulate themselves.

When they heard both sides of the argument, 50 percent of small business owners supported tighter limits on pollution from power plants. Only 28 percent opposed it.

The sample was politically diverse, but a plurality of the business owners surveyed — 43 percent — identified themselves as Republicans or Independents who leaned Republican, compared to 28 percent who identified as Democrats or Democrat-leaning and 19 percent who identified as Independents.

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How new tech is spurring growth in recycling water

By Cheryl Katz

This story originally appeared at Yale360 and is reprinted with permission.



A ferry plows along San Francisco Bay, trailing a tail of churned up salt, sand and sludge and further fouling the already murky liquid that John Webley intends to turn into drinking water. But Webley, CEO of a Bay Area start-up working on a new, energy-skipping desalination system, isn't perturbed.

"Look at the color of this intake," he says, pointing to a tube feeding brown fluid into a device the size of a home furnace. There, through a process called forward osmosis, a novel solution the company developed pulls water molecules across a membrane, leaving salt and impurities behind. When low temperature heat is applied, the bioengineered solution separates out like oil, allowing clean water to be siphoned off.

This method uses less than a quarter of the electricity needed for standard desalination, making it easier for the technology to run on renewable power, said Webley. His company, Trevi Systems, recently won an international low-energy desalination competition and is building a pilot solar plant to desalinate seawater in the United Arab Emirates.

With world water demands rising and extreme droughts like the one now gripping California expected to grow more frequent and widespread as the climate warms, drawing fresh water from oceans and other salty sources will be increasingly important.

"Eventually, we'll have to develop new sources of water," said David Sedlak, a University of California-Berkeley professor of civil and environmental engineering and author of "Water 4.0: The Past, Present and Future of the World's Most Vital Resource." Desalination, along with wastewater recycling and capturing and storing rainwater, will be "three main pillars," he said, to replace "water supplies that are going to become less reliable and less available in the future."

However, desalination is expensive, energy-intensive and can damage marine ecosystems. Moreover, while seawater accounts for 60 percent of desalinated water today, Sedlak and others say it's much more practical and sustainable to desalinate less-salty brackish water and use the technology to recycle wastewater. So companies around the world are working on new technologies that cut desalination costs, reduce environmental impacts and broaden its applications.

In addition to removing salt from seawater, technologies such as Trevi's also can economically cleanse brackish groundwater, industrial effluent and other forms of liquid waste. That includes desalinating sewer water to recharge groundwater aquifers, which it will soon begin doing for a large urban water district in Southern California.

"That's what's particularly interesting to us — we can run on really, really dirty water," Webley said. "Where you really should start with this whole thing is, let's squeeze everything we can out of re-use and then start talking about other options."

More than 17,000 desalination plants are operating in 150 countries worldwide, a capacity that could nearly double by 2020, according to the United Nations World Water Development Report 2014. Desalination produces 21 billion gallons of water a day, according to the International Desalination Association, providing a crucial water source in arid places such as the Middle East and Australia. Major new desalination facilities are in the works in China, Chile and elsewhere.

However, the current standard technology, reverse osmosis — in which high-pressure pumps force water through semi-permeable membranes to exclude salt and impurities — uses large amounts of energy and has an outsized impact on the environment. These effects include damage to aquatic ecosystems, such as sucking in fish eggs with its intake water; using harsh chemicals to clean membranes and releasing large volumes of highly

salty liquid brine back into the water. Costs vary, but the lowest price for desalinated seawater from a reverse osmosis plant is around \$750 an acre-foot (325,851 gallons) — more than double the average cost of groundwater.

Engineers and entrepreneurs across the globe are now trying to devise greener desalination. Some are inventing new alternatives to traditional reverse osmosis. Among them: Israel, whose own dependence on desalinated water has made it a world leader in the process, has come out with several state-of-the-art technologies, including a novel "semi-batch" reverse osmosis process developed by Desalitech that shrinks energy and brine, and a chemical-free "plant in a box," produced by IDE Technologies; and Memsys, of Singapore and Germany, is working on hybrid-thermal membrane technology that is energy-efficient enough to run on solar power.

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Plastic Microbeads Hidden In Your Soap or Toothpaste?

SustainableBusiness.com News

Plastic microbeads are fairly new in personal care products, but in the short time they've been on the market, they have caused serious water pollution problems.

These tiny plastic beads - barely visible without a microscope - are 0.5-5 millimeters in diameter, and can be found in products from toothpaste to soap and cosmetics. Too small to be filtered by water treatment plants, they go down the drain and directly into waterways, with billions ending up in rivers, lakes, and the ocean. There, they are swallowed by small fish (they are the size of zooplankton), entering the food chain and ending up in humans.

They also tend to attract motor oils and pesticides, adding more toxins to the food chain.

Commonly found in ocean samples, microbeads are at equally high concentrations in the Great Lakes - 1,500 to 1.7 million plastic particles per square mile - say researchers at University of Wisconsin/ Superior. Lake Erie is the worst, containing over 90% of plastics found, finds 5 Gyres Institute.

In a rare move, manufacturers are responding to the data rather than resisting it. Unilever, Procter & Gamble, Johnson & Johnson, L'Oreal, The Body Shop and Colgate-Palmolive have already stopped using microbeads or say they are phasing them out. One of the reasons is that - as anyone that buys organic products knows - natural substitutes are readily available.

Illinois banned microbeads with almost no industry opposition, and bills are moving forward



in New York and California. Once manufacturers reformulate products for those major markets, microbeads will disappear (if not from our waters). On the federal level, Rep. Frank Pallone (D-NJ) introduced the Microbead-Free Waters Act of 2014, which would ban the sale or distribution of products containing microbeads in 2018.

If you buy conventional personal care products, look for "microbeads," "polyethylene," or "polypropylene" on the label.

We've known for years about the dead zones plastics are causing in the world's ocean, but microbeads were discovered just a couple of years ago when scientists sampled all the Great Lakes with custom designed nets. They found them everywhere.

Incredibly, more than a trillion micro-plastics could be released into the ocean over the next 10 years because of the melting Arctic. Researchers actually found high concentrations trapped in ice cores, reported in "Global Warming Releases Microplastic Legacy Frozen in Arctic Sea Ice." Besides microbeads, they come from semi-synthetic fibers like rayon (from washing machines) and the breakdown of larger plastics.

There's even stone infused with plastic now, found on the beach in Hawaii and officially named Plastiglomerate by the Geological Society of America. "Our results indicate this anthropogenically influenced material has great potential to form a marker of human pollution, signaling the occurrence of the informal Anthropocene epoch."

[<Source>](#)

Giving up beef will reduce carbon footprint more than cars, says expert

By Damian Carrington, for *theguardian.com*



Beef's environmental impact dwarfs that of other meat including chicken and pork, new research reveals, with one expert saying that eating less red meat would be a better way for people to cut carbon emissions than giving up their cars.

The heavy impact on the environment of

meat production was known but the research

shows a new scale and scope of damage, particularly for beef. The popular red meat requires 28 times more land to produce than pork or chicken, 11 times more water and results in five times more climate-warming emissions. When compared to staples like potatoes, wheat, and rice, the impact of beef per calorie is even more extreme, requiring 160 times more land and producing 11 times more greenhouse gases.

Agriculture is a significant driver of global warming and causes 15% of all emissions, half of which are from livestock. Furthermore, the huge amounts of grain and water needed to raise cattle is a concern to experts worried about feeding an extra 2 billion people by 2050. But previous calls for people to eat less meat in order to help the environment, or preserve grain stocks, have been highly controversial.

"The big story is just how dramatically impactful beef is compared to all the others," said Prof Gidon Eshel, at Bard College in New York state and who led the research on beef's impact. He said cutting subsidies for meat production would be the least controversial way to reduce its consumption.

"I would strongly hope that governments stay out of people's diet, but at the same time there are many government policies that favour of the current diet in which animals feature too prominently," he said. "Remove the artificial support given to the livestock industry and rising prices will do the rest. In that way you are having less government intervention in people's diet and not more."

Eshel's team analysed how much land, water and nitrogen fertiliser was needed to raise beef and compared this with poultry, pork, eggs and dairy produce. Beef had a far greater impact than all the others because as ruminants, cattle make far less efficient use of their feed. "Only a minute fraction of the food consumed by cattle goes into the bloodstream, so the bulk of the energy is lost," said Eshel. Feeding cattle on grain rather than grass exacerbates this inefficiency, although Eshel noted that even grass-fed cattle still have greater environmental footprints than other animal produce. The footprint of lamb, relatively rarely eaten in the US, was not considered in the study published in the journal *Proceedings of the National Academy of Sciences*.

Prof Tim Benton, at the University of Leeds, said the new work is based on national US data, rather than farm-level studies, and provides a useful overview. "It captures the big picture," he said, adding that livestock is the key to the sustainability of global agriculture.

"The biggest intervention people could make towards reducing their carbon footprints would not be to abandon cars, but to eat significantly less red meat," Benton said. "Another recent study implies the single biggest intervention to free up calories that could be used to feed people would be not to use grains for beef production in the US." However, he said the subject was always controversial: "This opens a real can of worms."

Prof Mark Sutton, at the UK's Centre for Ecology and Hydrology, said: "Governments should consider these messages carefully if they want to improve overall production efficiency and reduce the environmental impacts. But the message for the consumer is even stronger. Avoiding excessive meat consumption, especially beef, is good for the environment."

He said: "The US and Europe alike are using so much of their land in highly inefficient livestock farming systems, while so much good quality cropland is being used to grow animal feeds rather than human food."

Separately, a second study of tens of thousands of British people's daily eating habits shows that meat lovers' diets cause double the climate-warming emissions of vegetarian diets.

The study of British people's diets was conducted by University of Oxford scientists and found that meat-rich diets – defined as more than 100g per day – resulted in 7.2kg of carbon dioxide emissions. In contrast, both vegetarian and fish-eating diets caused about 3.8kg of CO₂ per day, while vegan diets produced only 2.9kg. The research analysed the food eaten by 30,000 meat eaters, 16,000 vegetarians, 8,000 fish eaters and 2,000 vegans.

[<Source>](#)

The fashion brands empowering women in developing countries

From providing jobs for Palestinian refugees in Lebanon to offering business training for emerging artisans in Rwanda, fashion has the power to create positive change

The textile and clothing industry is the second largest employer after agriculture in the developing world, and a large percentage of this workforce are women. Research shows that empowering and investing in women has a cumulative bonus: women are likely to spend their income on their children and families, on education, health and nutrition, bringing long term positive change and prosperity to communities.

There are numerous fashion brands making a strong social impact but restricted to their local markets. Because I am aware of the role that fashion plays in our lives and the lives of those that create it, I decided to support these brands and bring them to a global mainstream market via the online boutique Fashion ComPassion.

As of April, more than 53,000 Palestine refugees from Syria were seeking safety and shelter from the continuing conflict in Lebanon. One of the first brands Fashion ComPassion partnered was Palestyle, a brand providing jobs and an income to Palestinian refugee women in camps in Lebanon and Jordan.

With a vision of becoming a leading accessory brand in the Middle East, Fashion ComPassion worked as its retailer, agent and distributor, helping to build its market in Pakistan and securing its stock in the British Museum. Palestyle started with a small team of 20 women who used their skills and craftsmanship to add traditional embroidery and designs to fashion pieces, and today works with 100 women, investing in community projects such as the Water Tank Exchange Program, which has provided clean water to over 4,000 refugees.

Rags2Riches is another brand creating positive change through fashion, working with women in Payatas, one of the poorest parts of the Philippine capital. According to the Payatas Poverty Alleviation Foundation, almost 40% of the active population are unemployed and nearly half are earning less than 4,000 Philippine pesos (\$100) a month.

Many women living in Payatas were part of the cottage industry of rug weavers controlled by middle men, leaving them with minimal money for the work they created. Rags2Riches was created to give these skilled women fair access to the market. It has formed a partnership with well known Filipino designers who have transformed the scrap material into high-end fashion accessories. In three years, the brand has supported more than 400 women (pdf), upcycled more than 500 tons of scrap cloth, and increased the earning potential of artisans from less than \$0.02 per day to more than \$10 per day.

In Rwanda, Indego Africa is working with women to support them through economic empowerment and education. This summer it is launching a leadership academy in Kigali that will provide business training for 100 emerging artisan leaders over the next two years. Indego Africa has taken the work of its artisans to a global level by partnering with the likes of J. Crew, Eileen Fisher, TOMS and Nicole Miller.

Another social enterprise, Sougha, was established by the Khalifa Fund in the United Arab Emirates to preserve and promote the traditions of women emirati artisans. Sougha creates economic opportunities for isolated local communities by reviving their skills and connecting them to new markets. Due to religious and cultural restrictions, the women don't have access to the outside world, so the Sougha team visits these artisans, refines their products and sells them to a global market.

As an online retailer the social impact of Fashion ComPassion is not limited to just providing a platform for socially responsible brands. It also creates awareness around sustainability, and supports girls' education through its partnership with the United Nations World Food Program, which provides school meals and take-home rations as an incentive for poor families to send their daughters to school, while giving girls the nutrients they need to focus in class.

Ethical fashion companies do not have to compete with big retailers; they are different and can grow alongside them. Since the Rana Plaza factory collapse, steps have been taken by bigger brands to look into transparency, code of conduct, working conditions and wages. Retailers cannot afford another such disaster to happen, and checks are being introduced to ensure better standards. The bigger players will always dictate the fashion landscape but small retailers can also have a profound impact on the industry.

As consumers, we need to assess our needs, desires and the part we play in the cycle of consumption. Fashion has the power to bring positive change to the most disadvantaged women around the world, but it is only with the support of us all that the sustainable fashion industry can boom and grow.

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How to brew beer better: Less water, less energy, more innovation

By Paula Del Giudice

The U.S. produces beer. A lot of beer. In 2013, over 195 million barrels — each barrel equaling 31 gallons — were produced. When you consider that it typically takes between four to 10 pints of water to produce one pint of beer — you do the math.



And producing good suds takes more than water. Consider the energy needed for compressed air, lighting, refrigeration and other demands. Couple those with the waste products remaining after the brewing process is complete, and it all adds up to a resource-rich and waste-producing libation.

The U.S. beer market has been relatively flat, even slightly down, with overall sales of beer declining 1.9 percent in 2013.

Enter an innovative and sustainability-minded group of craft brewers that has set the beer market on its ear. Sales of craft beer is on a significant rise, with a jump of 17.2 percent in sales in 2013 driven by market demands for local food and beverages.

Both sectors of the brew biz are making significant impacts on their commitments to sustainability. When it comes to the major brewers, Anheuser-Busch, the country's leading brewer by sales, has undertaken some strident measures such as reducing water use by 37 percent in the last four years, brewing nearly one in six of its beers using renewable fuel (biogas, landfill gas and solar), recycling 99 percent of the solid waste in its breweries and reducing the material in its aluminum, fiber and glass packaging.

It makes sense that water usage is one of the most significant resources that goes into brewing beer. Anheuser-Busch took on an interesting marketing campaign recently to encourage men to reduce their use of water. The campaign asked men to stop shaving in the weeks leading up to World Environment Day in June. More than 2,300 of its employees took up the challenge and stopped shaving for two weeks. It's estimated that because the average shave takes five gallons of water, they saved over 160,000 gallons. (Sorry, A-B, but the Boston Red Sox were way ahead of you.)

On a serious note, Anheuser-Busch has reduced its ratio of water used to beer produced to 3.5-to-1 (excluding the amount of water it takes to grow the crops).

Craft brewers get crafty with water use

That's a goal that many smaller craft brewers are shooting for, but they have their challenges. Craft brewed beers use more hops for that great flavor that beer drinkers want (which is also leading to a shortage of hops, but that's another story) and those hops require more water to process.

New Belgium is a sustainably minded brewer that has a goal of reducing water in its production process to a 3.5-to-1 ratio. Producing the "hoppier" beers and the demand for more bottles than kegs are contributing to a decrease in its water efficiency in the past few years, but it recently added sub-meters throughout its facilities to address any wasted water efficiency opportunities.

Full Sail Brewing Company processes have been known for consuming a relatively lower percentage of water used to beer produced, but this year Full Sail has made even further improvements. The company installed a Meura mash filter that improved its water efficiency even more. Full Sail's 2.5-to-1 water used to beer produced ratio is one of the best in the industry.

Beer requires energy



New Belgium explains its approach to energy conservation. (Credit: Betsy Weber via Flickr)

Whether it's in the brewing process, lighting, heating or cooling facilities or product refrigeration, energy usage is another top resource sink. Energy is also costly so efforts to conserve energy significantly will improve the operating bottom line.

The Craft Brew Alliance, with well-known brands such as Widmer Brothers, Redhook, Kona Brewing Company and Omission Beer (brewed by Widmer Brothers), is a brewer with its eyes on energy and other conservation opportunities. "We are continually searching for efficiency opportunities around energy and water,

realizing that this can translate into big money savings," said Julia Person, sustainability manager for the CBA. "We've found that even simple, quick fixes can result in a significant energy savings. In our pursuit in making our beers in a sustainable manner, we have

targeted compressed air leaks as well as fan cycling in our refrigerated spaces and have seen immediate benefits." Fixing compressed air leaks in its breweries can save an estimated \$20,000 a year in energy costs.

Sierra Nevada beer is one of the best-selling craft brews and the company is fully committed to its sustainability mission. Sierra Nevada, based in Chico, Calif., prides itself on owning one of the largest private solar arrays in the country. The company's 10,573 panels on its brewery roof and parking lot, at the on-site daycare and at its private rail spur produce two megawatts of DC power and provide the brewery with nearly 20 percent of its energy needs.

In addition, Sierra Nevada is the only brewery in the country to house its own hydrogen fuel cells. The fuel cells produce one megawatt of power. Together, on a clear and sunny summer day, the two supply about 90 percent of the brewery's energy, according to the dashboard on the company's website.

Refrigeration accounts for about 35 percent of a brewery's electricity bill. Inadequate insulation of cold storage areas and pipes carrying steam or cold fluids, air infiltration, open cooler doors and other energy wasters can have a big influence on energy costs. Using an infrared camera at Fort George Brewery in Astoria, Ore., PPRC Industrial Engineer Michelle Gaither and staff at Fort George discovered inefficiencies from heat loss on uninsulated steam pipes and a small compression tank, and from the surface of the hot tank, especially the uninsulated door. They found cold losses from refrigerant lines and cold storage areas, especially around doors. Insulation was specified for the pipes, and a high-speed insulated roll-up door was recommended for cold storage.

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Better use of world's existing cropland could feed 3 billion more people: study

By Fiona Harvey, environment correspondent, for theguardian.com



The world's existing cropland could feed at least 3 billion extra people if it were used more efficiently, a new study has found, showing that the large increases in population expected in the next three decades need not result in widespread hunger.

More than half of the fertiliser currently poured on to crops in many countries is wasted, according to the study. About 60% of the nitrogen applied to crops worldwide is not needed, as well as about half of the phosphorus, an element whose readily available sources are dwindling.

Cutting waste even by modest amounts would also feed millions, the authors found: between one-third and a half of the viable crops and food produced from them around the world are wasted, in the developing world usually because of a lack of infrastructure such as refrigerated transport, and in the rich world because of wasteful habits.

The study, published in the peer-review journal *Science* and led by scientists at the University of Minnesota in the US, suggested that a focus on staple crops such as wheat and rice in key countries, including China, India, the US, Brazil, Indonesia, Pakistan and Europe, would pay off in terms of producing more food for the world's growing population. Most forecasts are that the world will number more than 9 billion people by 2050, up from about 7 billion people today.

Looking after water could also yield vast dividends, the report found: if the water used for irrigation was pinpointed more efficiently to where it is needed, then much more could be grown, but currently much of it is sprayed uselessly over crops. Between 8% and 15% of the water currently used could be saved, the study suggested.

But the research also found that at least 4 billion people could be fed with the crops we currently devote to fattening livestock, fuelling the argument that the over-reliance on meat in the west and among the growing middle classes in the developing world is an increasing problem when it comes to feeding the world.

Paul West, of Minnesota's Institute of the Environment, and lead author of the paper, said the research would enable funders and policymakers to focus their efforts better on areas of agriculture where it could do most good. For instance, increasing agricultural productivity in Africa, where the actual crop yields lag severely behind their potential, could produce enough to feed hundreds of millions of people.

By focusing fertiliser use where it is needed, and avoiding overuse, countries could also bring down greenhouse gas emissions markedly. Agriculture currently amounts to between one-fifth and one-third of greenhouse gases, coming from deforestation, methane and fertilisers.

West said that the report gave cause for optimism, showing that the world's growing population could be adequately fed in the future if basic measures are taken to look after food supply. But he said that politics would play a big role in whether the world grasps these opportunities.

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Green Building Spotlight: CLIMATE RIBBON™ Replaces Air Conditioning in Miami

SustainableBusiness.com News

Can a "climate ribbon" replace air conditioning? People visiting an open air shopping center in Miami will soon find out.

Topping the \$1 billion mixed use Brickell City Centre which spans four blocks of waterfront will be a 150,000 square foot climate ribbon - an enormous overhead trellis made of steel, glass and fabric. It covers the walkway of the shopping center, where there are open-air shops, escalators, restaurants, and terraces.

It will protect visitors from oppressive heat and the odd rain shower by creating a micro-climate that stabilizes the temperature.



How does it work? Under the glass is an undulating design that captures cooling ocean trade winds, encouraging air flow, while hanging fabric panels act like huge Venetian blinds - arranged to block the harshest of the sun's rays. "The orientation of a series of louvers is very specifically designed to protect the shop fronts from direct sun," says Hugh Dutton of Paris-based Hugh Dutton Associés, which participated in developing the design.

The sophisticated environmental management system allows daylight to penetrate - giving visitors the feeling that they are outdoors - and also captures rainwater for reuse at the rate of 5 million gallons a year. In the future, it may also produce solar energy.

It's designed to achieve three benefits: ventilation so that air conditioning isn't needed in the shopping center's public places; shelter from inclement weather; and solar shading for the hottest times of the day.

More details:

- The surface is a dynamic series of flat, inclined planes positioned at variable angles and supported by a steel frame. Positioning is the result of careful analysis of sun paths, wind patterns and the need for a flexible structure.
- The slope of each plane allows rainwater to drain easily into multiple storage cisterns for reuse. Water is stored above ground, eliminating the need for electrical pumping when it's distributed.
- An upper glazed 'skin' provides rain protection and acts as a partial filter for solar radiation.
- Inside the retail center, a continuous series of dramatic fabric 'blades' provides shade. Blades vary in height and angle based on the direction of the sun's rays, while maximizing views of the sky. This provides a sheltered, but still open air environment, and the design floods the interior with patterns of light throughout the day.
- Toward the eastern end it gently lifts up to create a 'scoop' that captures trade winds in the summer. Other parts of the structure act as deflectors or additional 'scoops', ensuring that a flow of air, between 6-9 knots in speed, keep the temperature comfortable throughout the public spaces.

At a cost of \$20 million, it's a collaborative effort between the developer, Swire Properties, the group that's building the structure - German design firm Gartner - project architect, Arquitectonica, Cardiff University of Wales and Carnegie Mellon.

"From its initial conception, the CLIMATE RIBBON™ has provided an architectural shade system to protect visitors, so it's gratifying now to see the dynamic evolution of the structure to include so many climate management features," says Stephen Owens, president of Swire Properties, Inc. "We feel this element will become a distinctive design emblem of Miami and will be reason alone for people to visit and experience Brickell City Centre."

Swire has registered it as a LEED for Neighborhood Development - because it's part of a larger project that has residential and commercial elements. The project is an expansion of Brickell, a shorefront development constructed in the 1980s.

For more inspiration, Check Out the World's Largest Living Wall and [two buildings that purify the surrounding air](#).

[<Source>](#)

Are crickets the next foodie trend?

Coming to a grocery shelf near you: US startups' insect-based energy bars, baked goods and barbecue-flavored "Chirps"

By Megan Anderle, [theguardian.com](#)



Lucy Siegle: 'Bugs have a much smaller carbon footprint than livestock. Few produce methane, and they provide dietary protein very efficiently.' Photograph: Alamy

In one way, Big Cricket Farms is just what it sounds like, that is, a farm that raises crickets. But it's also something that it might not sound like: a food supplier.

The Ohio-based startup, open since April, aims to bring Americans around to what two billion people worldwide already believe - that insects can be a delicious, inexpensive and environmentally friendly source of protein.

Founder Kevin Bachhuber is already working with several local businesses, including a burger joint creating an insect topping and a bakery using finely-ground crickets as flour in cookies. The farm is also supplying a Boston-based startup named Six Foods with the main ingredient for "Chirps" - baked snack chips made from cricket flour, beans and rice. Six Foods is using \$70,000, which it raised on crowdfunding website Kickstarter, to produce and package sea salt, aged cheddar and hickory BBQ flavored Chirps, which it plans to deliver to US grocery stores in October.

Big Cricket Farms is one of a growing number of startups betting that insects will be the next big food trend. There's Tiny Farms in California and World Ento (for "entomophagy," the word for insect-eating) in Texas, and a handful of startups bringing insects to mainstream Americans by disguising them as snack foods, such as the Chirps chips from Six Foods, energy bars from Salt Lake City startup Chapul and Brooklyn-based startup Exo, and a line of cricket-flour cookies from San Francisco-based Bitty Foods.

Poised for growth

Right now, Big Cricket Farms's facility - which spans 465 sq km (5,000 sq ft) - produces about 136kg (300lb) of crickets each month. But Bachhuber plans to scale up to 454kg (1,000lb) a month by August and 2,722kg (6,000lb) a month by October. He hopes to be producing around 11 tons (25,000lb) of crickets a month within the next year and a half.

Although it seems like a substantial expansion, Bachhuber says it's well within reach because raising crickets is "very space efficient, and the equipment is not expensive." Given that a single cricket produces 1,000 to 3,000 eggs in its lifetime, and that it takes only nine weeks for crickets to go from birth to harvest, Bachhuber believes he could harvest 19.5 tons (43,000lb) of crickets per month at peak production times.

Big Cricket Farms hasn't nailed down its wholesale pricing yet, but Bachhuber states that generally a bag of dead, frozen whole crickets goes for \$4 to \$10, while a pound of cricket flour runs in the \$30 to \$35 range.

"Our single largest cost is the food for the crickets," says Bachhuber, because Big Cricket Farm crickets feed on certified organic grains that are twice as expensive as conventionally grown feed for most of their brief lives. He hopes that as his cricket crop increases, he'll be able to pay less by weight for this premium feed.

For their last few days, Bachhuber finishes his crickets with apples, carrots and other produce to sweeten and vary their flavors.

Eco-friendly protein

Cricket husbandry has many environmental advantages over raising other animals for food. It creates significantly less greenhouse gas and ammonia than other livestock, according to a 2010 study led by Daniel Ooninx of Wageningen University in the Netherlands.

They are also more efficient at converting feed to protein, according to a 2013 report from the UN Food and Agriculture Organization, because they are cold-blooded, so they don't need to burn calories to keep themselves warm. To produce the same amount of protein, crickets consume 12 times less feed than cattle, four times less than sheep, and half as much as pigs and broiler chickens.

This relative ease of bringing insects to market is one reason they are popular in developing countries. But Western countries have been slow to adopt this trend, with television shows like "Fear Factor" reliably triggering disgust in viewers by feeding squirming creepy crawlers live to contestants.

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2013: Hottest May Ever, Hottest June Ever

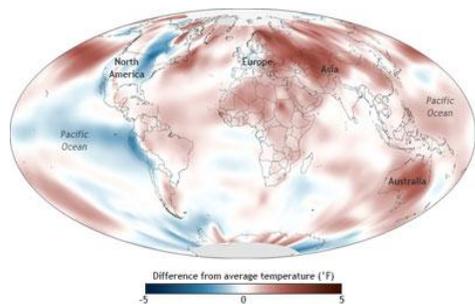
SustainableBusiness.com News

As the US drills for ever-increasing amounts of oil and gas - now the leading producer in the world! - the earth keeps getting hotter.

Since records began in 1880, this May was the hottest May ever and June was the hottest June, reports the National Oceanic and Atmospheric Administration (NOAA). It coincides with carbon levels in the atmosphere - which, since April have exceeded 400 parts per million for the first time in at least 800,000 years. The Japan Meteorological Agency came to the same conclusions.

In June, the Earth's land surface averaged 61.2 degrees Fahrenheit (1.3 degrees higher than the 20th century average) and ocean surface temperatures were even hotter at a record 62.7 degrees (1.71 degrees above the average), according to NOAA.

While the US had its 33rd hottest June, every other continent broke heat records, especially Australia, Greenland, the South Pole, northern South America, central Africa, southern Asia and New Zealand.



Greenhouse gas emissions, sea levels, global temperatures and super storms all are trending upward, says NOAA, showing us what global warming looks like. There isn't record heat everywhere at the same time, but the trends are clear.

425 scientists from 57 countries helped to compile NOAA's "State of the Climate

2013" published annually by the American Meteorological Society. It provides a detailed update on global climate indicators, notable weather events, and other data collected by environmental monitoring stations and instruments on air, land, sea, and ice.

Dozens of climate indicators and thousands of measurements track patterns, changes, and trends of the global climate system: greenhouse gases; temperatures throughout the atmosphere, ocean, and land; cloud cover; sea levels; ocean salinity; sea ice extent; and snow cover.

It comes to similar conclusions as the US National Climate Assessment and IPCC reports. Risky Business calculates the financial impacts of these trends. In 2011, the International Energy Agency released a stern warning: **the world has five years before it locks in irreversible climate change.**

Conclusions include:

- carbon, methane and nitrous oxide are all continued their rise in 2013, once again reaching historic highs: carbon rose by 2.8 parts per million (ppm), reaching a global average of 395.3 ppm for the year (countries agreed to stay below 350 ppm).
- Australia had its warmest year on record, Argentina had its second warmest and New Zealand, it's third. Depending on the dataset used, 2013 ranks between the 2nd to 6th warmest year on record for the Earth.
- Sea levels continue to rise and the Arctic had its 7th warmest year since records began, with the 6th lowest amount of sea ice ever. All seven lowest sea ice extents have occurred in the past seven years.

Climate.gov has highlights of the report broken into categories:

Website: www.climate.gov/news-features/understanding-climate/state-climate-2013-highlights

[<Source>](#)

6 reasons technology alone can't solve water scarcity

By Will Sarni

The drought in California is great test bed for how the private and public sector is addressing, or not addressing, water scarcity (the "drought" is likely the "new normal" for water in the state and not a temporary condition). It also highlights a bias for technology instead of the more challenging solutions in order to rethink both how we value water and change behavior.

The drought in California is starting to bite, with an estimated cost of \$2.2 billion and 17,100 part-time and seasonal farm jobs this year. A report by the University of California-Davis Center for Watershed Sciences ([PDF](#)) finds that agriculture in the state is experiencing the

"greatest water loss ever seen," a result of warming winters, thinning seasonal snow packs, drier rivers and, through it all, heavier reliance on water pumped from underground.

Welcome to the "new normal."

So what is our response to the new normal: Increase supply through conventional and innovative technology solutions?

This is not the complete answer. Remember, "wicked problems" require "wickedly smart solutions," which in my view is a combination of water technology innovation and "soft path water" approaches.

Let me elaborate. We appear to be overwhelmingly focused on technology as a cure-all for water issues. How many times have we heard, "Why can't we just desalinate sea water?"



Essentially, create more supply so we can maintain business as usual from a consumption perspective.

Sustainably addressing water scarcity will require technology solutions both conventional and innovative — both the "hard path for water" and the soft path for water. The conventional "hard path for water" is characterized by centralized infrastructure and decision-making using technology and institutions developed in the 19th and 20th centuries: large

dams and reservoirs, pipelines and treatment plants, public water departments and agencies and private companies.

The soft path for water defines a "new approach to managing water resources," says the Pacific Institute. It seeks to take advantage of the potential for decentralized facilities, efficient technologies, flexible public and private institutions, innovative economics and human capital. It strives to improve the overall productivity of water use rather than seek endless sources of new supply. It works with water users at local and community scales and seeks to protect the critical ecological services such as nutrient cycling, flood protection, aquatic habitat, as well as waste dilution and removal that water also provides.

The Pacific Institute distinguishes the soft and hard paths for water in these six ways:

1. The soft path directs governments, companies and individuals to focus on sustainable ways to satisfy the needs of people and businesses, instead of just supplying water. People want clean clothes or to be able to produce goods and services — they do not care how much water is used and may not care if water is used at all.
2. The soft path leads to water systems that supply water of various qualities for different uses. For instance, storm runoff, greywater and reclaimed wastewater are well-suited to irrigate landscaping or for some industrial purposes.
3. The soft path for water recognizes that investing in decentralized infrastructure can be just as cost-effective as investing in large, centralized facilities. Nothing is inherently better about providing irrigation water from a massive reservoir instead of using decentralized rainwater capture and storage.
4. The soft path requires water agency or company personnel to interact closely with water users and to engage community groups in water management. The hard path, governed by an engineering mentality, is accustomed to meeting generic needs.
5. The soft path recognizes that the health of our natural world and the activities that depend on it (such as swimming and tourism) are important to water users and



people in general. Often times, the hard path — by not returning enough water to the natural world — harms other water users downstream.

6. The soft path recognizes the complexities of water economics, including the power of economies of scope. An economy of scope exists when a combined decision-making process would allow specific services to be delivered at a lower cost than would result from separate decision-making.

At the state level or country level, "hard path" technology solutions and infrastructure coupled with soft path solutions such as public policy, pricing and behavior change are needed together to address water scarcity.

The same is the case for companies trying to maintain their social license to operate and resiliency in the face of increased competition for water and prolonged droughts — focus on water efficiency, reuse, recycling and collective action programs with stakeholders within a watershed (the soft path).

Technology alone can't save us.

Top image of water-saving drip irrigation by Max Lindenthaler via Shutterstock.

[<Source>](#)

George Washington University plans bright future with solar energy

By Meghan Chapple



In the heart of bustling Washington, D.C., land is at a premium. Here in Foggy Bottom, where the George Washington University (GW) sits just blocks from the White House, we would never have the land—or roof space—to build enough solar panels to sustainably power our institution and significantly reduce our carbon footprint. Our neighbors in a three-mile radius—startup OPower, the U.S. Chamber of Commerce and the World Bank—face the same problem, which is

increasingly exacerbated by the fact that more and more people are moving into urban areas around the world.

How can we sustainably support the power urban institutions need in a climate-constrained world?

Each of us can implement various environmental efficiency measures (GW has nine LEED-certified buildings and a campus-wide building energy efficiency program, for example), but they only go so far in reducing or eliminating our carbon footprint. The answer, we've found after engaging in a four-year process and working with two other D.C. institutions, is to receive our "green" power directly from an offsite solar farm. With the hope that we can begin to shift the retail energy market toward greener power, we are showing that large organizations in an urban setting can partner to significantly reduce their carbon footprints.

Capital Partners Solar Project, as we've dubbed it, is a partnership among GW, American University (AU) and the George Washington University Hospital (GWUH). Comprising 52 megawatts (MW) of solar photovoltaic (PV) power—roughly the amount of electricity used by 8,200 homes every year—it is the largest non-utility solar PV power purchase agreement in the United States in total megawatt hours contracted, and the largest PV project east of the Mississippi River. Duke Energy Renewables (DER) supplies the power.

By 2015, GW will receive more than half of its electricity need from the Capital Partners Solar Project, which will accelerate GW reaching its 2025 carbon reduction goal. The project will create a 30 percent reduction in GW's emissions associated with its electricity use. Together, the three partners will eliminate 60,000 metric tons of carbon dioxide each year, which is equivalent to taking roughly 12,500 cars off the road.

The solar power harvested by 243,000 solar panels in North Carolina will move through the state's electrical grid into the D.C. regional grid, increasing the amount of solar energy in the region.



University buildings like the H.B. Burns Memorial Building will benefit from power generated on offsite solar farms. (Credit: NCinDC via Compfight) For the partners, the 20-year agreement will provide fixed pricing for the solar energy at a lower total price than current power solutions and is expected to yield greater economic savings for the partners as traditional power prices are anticipated to increase at a higher rate over the same period.

The project wouldn't have been possible without the support of our leadership and the collaboration of AU and GWUH.

Gary Farha, president and CEO of CustomerFirst Renewables (which structured the deal with DER), said, "Executive involvement and support is key in moving these projects forward. While the cross-functional team can develop a plan and vet the options and issues, without buy-in and progressive leadership at the highest levels, it is very difficult to make a project of this importance and magnitude happen."

GW provided the greatest buy-in as the largest purchaser, with about 70 percent of the project's power. The partners will break ground on the first site this summer, and panels will begin to deliver electricity to GW by the end of the year.

"There are a number of ways to procure renewable power, but what GW and its partners have done with their direct approach is rare and has established a new precedent for sourcing offsite solutions at lower costs and at meaningful volumes, while also protecting themselves from future market price risk," Farha said.

Alex Perera, renewable energy expert at the World Resources Institute, said the project is a "model" for others.

"GW and its partners have developed a model that directly ties the solar source with their use and payments," he said. "Their approach could help move the market to more direct sourcing of renewable energy by large retail buyers. This solution could be widely replicated by buyers in the public and private sectors."

Rhone Resch, president and CEO of the Solar Energy Industries Association, added: "This project is a real game changer for a number of reasons. It shows that renewables can be deployed on a scale that really moves the needle for large customers. And it proves, once again, that the clean tech industry is growing."

We, with our partners, have proven that a university in the middle of an urban center can directly receive a significant amount of our power from renewable energy. We see this as a great step toward a greener energy future and look forward to other large institutions joining us in combating climate change.

Top image of panels on solar farm by portumen via shutterstock.

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Clear differences between organic and non-organic food, study finds

By Damian Carrington and George Arnett, for The Guardian



Organic apples and pears. Photograph: David Sillitoe for the Guardian

Organic food has more of the antioxidant compounds linked to better health than regular food, and lower levels of toxic metals and pesticides, according to the most comprehensive scientific analysis to date.

The international team behind the work suggests that switching to organic fruit and

vegetables could give the same benefits as adding one or two portions of the recommended "five a day".

The team, led by Prof Carlo Leifert at Newcastle University, concludes that there are "statistically significant, meaningful" differences, with a range of antioxidants being "substantially higher" – between 19% and 69% – in organic food. It is the first study to demonstrate clear and wide-ranging differences between organic and conventional fruits, vegetables and cereals.

The researchers say the increased levels of antioxidants are equivalent to "one to two of the five portions of fruits and vegetables recommended to be consumed daily and would therefore be significant and meaningful in terms of human nutrition, if information linking these [compounds] to the health benefits associated with increased fruit, vegetable and whole grain consumption is confirmed".

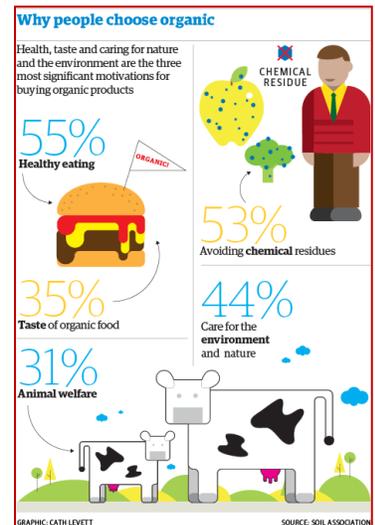
The findings will bring to the boil a long-simmering row over whether those differences mean organic food is better for people, with one expert calling the work sexed up.

Tom Sanders, a professor of nutrition at King's College London, said the research did show some differences. "But the question is are they within natural variation? And are they nutritionally relevant? I am not convinced."

He said Leifert's work had caused controversy in the past. "Leifert has had a lot of aggro with a lot of people. He is oversexing [this report] a bit." Sanders added the research showed organic cereals have less protein than conventional crops.

The research was peer-reviewed and is published in a respected scientific journal, the British Journal of Nutrition. It has appeared on several academic websites.

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Unleashing employee creativity to deliver on sustainability

By Oliver Balch, for *theguardian.com*

Every corporate strategy worth its salt has to have a simple, catchy title and sustainable growth is no exception; Unilever's "Sustainable Living", Marks & Spencer's "Plan A" and IBM's "Smarter Planet" offer a flavour of the current fare. Don't mistake simple for simplistic, though. As with all effective communication, behind the brevity lies a set of complex, engaging ideas.



Engaging with employees to build a sustainability strategy together ensures they champion the cause. Photograph: Alamy

Take HP. The US technology company has a sustainability strategy it calls "Living Progress", the stated aim of which is to "create a better future for everyone through our actions and innovations". But getting employees on board is the key to "making that vision a

reality", says Gabi Zedlmayer, chief progress officer at HP.

Aligning interests

Yet companies face a dilemma. A catchy title might win the ear of their employees, but it won't necessarily encourage them to act. For that to happen, companies need to appeal to employees' hearts as much as their heads, says Zedlmayer: "Being able to meld HP's long-term commitment to sustainability with the passion of our employees represents a winning formula."

Before corporate strategists pick up their pens, they need to discover where it is that their employees' passions lie. That means listening – through workshops, focus groups and other forms of structured dialogue. The next step should, in principle, be easy: provide the framework to let those passions loose.

Strong-arm tactics won't work, warns Jay Coen Gilbert, founder of B Lab, a US-based non-profit organisation that certifies companies as sustainable: "Increasingly, telling people to care about sustainability – or what to do about it – is not as effective as asking them what they care about and what they think you should do about it together."

That logic applies across the spectrum of sustainability issues, from building stronger communities or reducing carbon emissions through to reducing workplace accidents or eliminating corruption.

Alexi Carli, global health and safety manager at UPS, stresses the importance of employee ownership too: "If you want to nurture genuine employee engagement, it has to be less top-down and a lot more bottom up", she says. "Management needs to provide support and an overall framework, as well as set expectations, but real employee creativity comes when you loosen the reins."

UPS has clear procedures and strict targets for reducing injuries and auto accidents at work and its 3,300 health and safety committees all have management and non-management employees as co-chairs. The remaining members, approximately four to 20 people, are all operational employees. Such an approach not only gives a sense of employee ownership, but also provides the company with a ready network of peer-to-peer advocates. "When you give employees the latitude to act and when they see that those actions have value and are making a difference, then that will make them want to do more," adds Carli, who notes that lost-time injury frequency has been reduced by nearly 15% since 2009.

Prompting passion

Volunteering provides another natural way of tapping into employees' passions and exciting their interest in sustainability. Gib Bulloch, executive director of Accenture Development Partnerships (ADP), a social enterprise spin-off from consultancy firm Accenture, is a big fan. Volunteering opportunities – particularly those that are long-term and skills-based – can act as a "living laboratory for social innovation", he says.

To think out of the box, employees have to live out of the box, he reasons: "There are lots of examples of where a volunteering programme can get people thinking out of the box and thinking about their skills, their job, their company's products and services and how these might be able to solve a particular problem."

He gives the example of an industrial engineer at UK pharmaceuticals company GSK. The mid-level employee came up with an idea for providing low-cost health diagnostics during a volunteering stint in Kenya. "It's no surprise that the idea came to him in the slums of Nairobi," says Bulloch.

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Mandatory fuel economy standards for cars could dramatically cut emissions

By Bridie Jabour, for *theguardian.com*

If Australia introduced mandatory emissions or fuel economy standards for cars, emissions could be reduced by millions of tonnes, a new report from the Climate Change Authority says.

The restrictions on all light vehicles could avoid 59m tonnes of emissions by 2030 and double the fuel efficiency of light vehicles in Australia by 2025, CCA estimates show.

The mandatory standards, which the authority says could also lower fuel bills, would include restrictions on how much carbon dioxide could be emitted from vehicles from 192g/km to 105g/km.

The report, Light Vehicle Emissions Standards for Australia, proposes starting to introduce the standard from 2018 when car manufacturing finishes in Australia.

"Australia has an opportunity to reduce greenhouse gas emissions and lower fuel bills for Australian motorists by making light vehicles more efficient. A light vehicle emissions standard is the best way to achieve this," the report says.

"Reducing emissions from all light vehicles (including both passenger and light commercial vehicles) would support Australia's contribution to global efforts to limit the harmful impacts of climate change."

Transport accounts for 16% of Australia's greenhouse gas emissions and light vehicles alone account for 10%.

"Despite a long history of policy discussion and moderate improvements in vehicle fuel efficiency and emissions, Australia lags behind many other countries. This is unlikely to change in the absence of government action, despite the closure of domestic manufacturing and the importation of all vehicles by 2018," the report says.

"Without regulatory intervention to address market failures and other behavioural barriers, Australia risks continuing to lag behind and to miss opportunities to improve its energy productivity, reduce emissions and permit motorists to save on their fuel bills."

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Delta Electronics intros innovative battery energy storage solution

CIOL (press release)

Delta Electronics, a global leader in power and thermal management solutions headquartered in Taiwan, announced today the launch of a new Battery Energy Storage Solution (BESS), at a press conference in Paris.

This innovative energy-saving solution is complementary with renewable energy production systems in smart grids, and helps managing energy demand to ultimately reduce or defer the overall costs of grid investment and power dispatch.

Delta developed this innovative energy storage system designed for smart grid applications to optimize home energy balance. The system serves as an 'energy reservoir' for electricity generated from the photovoltaic (PV) module. The electricity which is stored in the batteries in the system can either be used by the household when there is no sunlight, or be fed into the grid when there is surplus energy.

Jackie Chang, president and general manager of Delta EMEA, said "thanks to Delta's Battery Energy Storage Solution, the system showed a significant reduction of grid power purchase. This new flexible and modular system helps managing energy in a grid including intermittent energy sources, such as solar energy. With this new solution, Delta contributes to smarter and greener energy management".

The Delta energy storage and management system is designed to be modular and flexible in configuration. It can optimize energy consumption and power dispatch according to customer profiles.

Significant benefits resulted from the Delta energy storage system include 1. Reducing grid peak power demand; 2. Increasing the utilization of renewable energy, such as the existing rooftop PV installation; and 3. Reducing electricity bills by load shift and avoiding high electricity tariffs.

The BESS system is a home energy system consisting of a complete Delta composition, including rectifier, charger, micro-inverter, Li-ion battery, controller, sensor module and an energy management system, which can be remotely-controlled via mobile device. The Delta BESS system will be available on market in 2015.

[<Source>](#)

DuPont and GM's lessons for closing in on zero waste

By Matthias Krause



Every time something in your company's production cycle gets thrown into a trash can and ends up in a landfill, you throw out some money.

A landfill-free strategy is too costly, too challenging, and too hard to implement, you say? Check out how the experts featured in Greenbiz's recent webcast "Innovative Approaches to Recycling and Waste Reduction" did it.

GM turns rubbish into resources

"We like to say: Waste is a resource out of place," said John Bradburn, General Motors' global manager of waste reduction. 111 of GM's facilities worldwide are landfill-free. Via recycling and reuse, GM diverted 2.2 million tons of waste from landfills, the equivalent of 38 million garbage bags. Since 2000, the company reduced its non-recycled waste by 73 percent. The total waste was diminished by 43 percent from 2000 to 2010 and by 10 percent more from 2010 to 2013. "It has been a long road for us," Bradburn said.

If you think of waste as a resource out of place, you might come up with innovative ideas that not only solve your own problems but those of others as well, just as GM did. After the Deepwater Horizon disaster in the Gulf of Mexico, GM approached BP to help recycle booms used to prevent the spilled oil reaching the beaches. GM found a way to extract the raw materials — including the oil — from the booms and incorporated it into producing air deflectors for the Chevy Volt. 227 miles of booms were recycled that way, diverting 212,500 pounds of waste from landfill and eliminating 140 tons of CO₂-equivalent emissions.



John Bradburn Chevy Volt Duck Nests

Brad Marley 301+ views
2 0

[In this video, GM's John Bradburn shows off Chevy Volt parts made into homes for wood ducks.](#) (Credit: Brad Marley via YouTube)

Sometimes, materials can be incorporated into new products that help the community instead of polluting its environment. 4,000 yards of sound-absorbing material for GM vehicles have been made into waterproof coats that transform into sleeping bags for the homeless in Detroit. Old battery cases from Chevy Volts have been made into nesting boxes for ducks. And steel baskets used for shipping parts from Europe to Detroit serve as raised vegetable beds for community gardens. The option was to melt the metal and get a few cents per pound for it, or do a community service, Bradburn said: "We chose the community service."

It's even possible to upcycle, to transform seemingly inferior materials into something more valuable. GM uses cardboard from shipping material to produce sound-dampening material for the headliners of the Buick Lacrosse and Verano. Old tires from GM's test facilities are mixed with plastic caps that used to be protective packing aids and together with other materials they become air and water baffles for a variety of GM vehicles. "We like to combine streams. We like to solve two or three problems at the same time," said Bradburn.

But what about the costs?

The materials that leave GM's facilities to be recycled are creating \$1 billion in revenue each year, Bradburn said. "But in future we want to make it zero [materials leaving GM], because we want to consume all of our materials within our processes."

DuPont's recipe for zero waste

For chemical giant DuPont, recycling typically generates revenue as well, said David Walter, the company's global business development manager. But what is even more impressive is how little manpower and time he required to make DuPont Building Innovations department landfill-free.

14 people, none of them full-time, worked on DuPont's "Drive to Zero." No capital was required for the program. Instead the company ended up saving money, Walter said. The results were no less impressive. In 2008, DuPont Building Innovations still sent 81 million pounds of waste to landfills. The company achieved the goal of taking that number down to zero on Dec. 22, 2011.

"The last couple of pounds were very stubborn, but we knew that that was going to be the case," Walter said. And he took an important lesson away from the experiment, besides all the environmental and economic benefits: "Never underestimate the power of a dedicated group of people committed to a vision. That was a key learning for us, for sure."



Corian begets Corian when scrap is worked into the Terra collection. (Credit: DuPont via YouTube)

The most important step in the beginning of the project was to thoroughly access the waste streams. That data was not readily available. "We did some deep mapping," Walter said. Why were the materials there? Where were they produced? When were they produced? After the first step, the process was guided by the EPA waste management hierarchy, with reduce and reuse as the more desirable options and recycle and energy recovery as the less desirable ones, resulting in a whole laundry list of things to do.

1. Scrap sheet and trim ground back into first-grade material or ground into drain rock
2. Carrier film recycled into glue
3. Metal melted down and recast
4. Banding melted and recast into same
5. Pallets repaired and re-purposed
6. Scrap wood ground into animal bedding
7. Paper and cardboard recycled back into same

Tips from a waste management pro

GM and DuPont were optimizing their existing production processes, but even if a product is designed from scratch, the idea of a circular economy is often poorly implemented. "We are still acting very linear. We tend to pass on the problem," said Tom Carpenter, director of Waste Management Sustainability Services.

Instead, it needs to be more of a matrix approach that takes into account that all parts for the production process are interrelated. For the best results, the important questions need to be asked in the design phase of a new product already, Carpenter said: "We should be asking: What is the end of use of this material? What is the next use of this material?"

In Carpenter's opinion, it also is important to test the products in a real-life environment. Only if the material did indeed run successfully through a recycling facility can one be sure that it is suitable. Sometimes, Carpenter said, even subtle changes, such as the use of a different coloring of a product, can make the difference between more waste going to landfills or materials finding a new life.

Top image of empty wastebasket by JOAT via Shutterstock.

[<Source>](#)

Oil-rich United Arab Emirates aims to be a sustainable energy pioneer

One of the world's richest oil-based economies is embracing sustainable technologies, and making a surprise bid to become a clean energy leader

By Andrew Winston, *Guardian Professional*



Masdar City aims to show how clean technologies can work in practice. Photograph: Ali Haide/epa/Corbis

Imagine if you and your extended family were digging in the backyard and found something valuable like, say, 10% of the world's oil reserves. That's the story of the United Arab Emirates (UAE), a small country with big assets and bigger ambitions.

UAE should be a powerful defender of the status quo on energy use. Denying climate change would also make tremendous sense. But this country is attempting a pivot of historic proportions, trying to build a oil-free future in the desert. UAE has become a major player in clean technologies, funding large-scale renewable energy projects around the world, and investing millions in fundamental research (in partnership with MIT) in energy, water, microelectronics, advanced materials, and transportation systems.

Earlier this year, I spent a few days in Abu Dhabi (on a press trip with travel paid for by the PR firm that represents Masdar and the UAE), attending the city's annual World Future of Energy summit and spoke with key executives from the country's clean energy business arm. In recent weeks, I was struck by the difference between the UAE's approach and that of a similar sized entity, ExxonMobil. The oil company released a long statement on the risk of its oil and gas assets being "stranded" (that is, made worthless) by the world's potential pivot away from fossil fuels.

Not surprisingly, Exxon said there was no real risk to its investors – it would burn all the fuel it has in reserve, climate change be damned, because a) the world's poor and growing middle classes need energy and b) the world's governments would not take strong enough policy action to seriously reduce carbon emissions. On the latter point, sadly, the company may be right. On the first, though, it was top-notch propaganda to conflate the need for energy to a need for their form of carbon-based energy. We can provide carbon-free energy to the world, with or without Exxon.

In comparison to Exxon's backward-looking position, the UAE seems positively progressive on clean energy. At the Future of Energy Summit, UAE leaders announced a partnership with Denmark, and with Vestas Wind in particular, to tackle energy poverty in the developing world. The Wind for Prosperity project will offer carbon-free electricity to those who mostly use very expensive diesel generators for power. This partnership is only one example of the UAE's strategy to help bring about a clean economy future, which, according to Bader Al Lamki, the director of Masdar Clean Energy, has two major elements.

First, the country is helping build the global supply of clean energy, recognising that, as Al Lamki told me, "conventional forms of energy are going to decline" (a statement in direct opposition to Exxon's projections). Al Lamki runs a couple of funds investing hundreds of millions of dollars in some of the largest utility scale solar and wind projects in the world, as well as water desalination, energy storage, and energy efficiency.

Second, UAE built Masdar City, a demonstration project and research facility, to show how clean technologies could work in practice. Assessing the progress of Masdar City (which I visited), is a longer conversation. But the research going on there is real. UAE partnered with Massachusetts Institute of Technology (MIT) to build a graduate degree programme and research facility to patent and leverage new technologies.

Cynics would say the UAE is doing this all for show, but it doesn't feel that way. And it's not new. Decades ago, the father of the UAE, Sheikh Zayed bin Sultan Al Nahyan (who died in 2004), laid out a surprising vision of critical issues that would shape the future of his country. The four main ideas, according to Fred Moavenzadeh, the MIT professor running the Masdar Institute of Technology, were the diversification from oil and gas, concern about

climate change, the importance of good education for his people, and equal rights for women.

UAE is certainly not alone in trying to make a fundamental pivot away from fossil fuels. There's a surprisingly long list of countries that get over half their electricity from renewables already, although most are using hydropower to get there. A smaller group is going for the true renewables like solar, wind, and geothermal.

Germany, while struggling at times, is pursuing green energy aggressively. Kenya is planning to get half its electricity from solar by 2016. Morocco is shooting for 42% renewables by 2020. Even Saudi Arabia has some aggressive solar goals and is investing over \$100bn in a solar future.

The business case for oil countries to go clean first is strong – every barrel they don't use they can sell at a vast profit to all of us. And it was actually a Saudi leader who once said memorably that the Stone Age did not end for lack of stones. But UAE seems to be taking that concept to heart. I heard the phrase, "If you can do it here ..." repeatedly. They were talking about both the literal challenge of creating a net-zero building in a country with no water and 120F temperatures, and also about building a clean oasis in the middle of so much oil.

The scale of UAE's clean activity may not be enough to replace their oil-based economy any time soon. But it's clear that the country is trying to avoid a round trip from a nomadic existence to untold riches and back again. Companies and countries of all sizes should heed the heretical questions that this small, unusual country is posing, or risk a similar fate.

Andrew Winston, founder of Winston Eco-Strategies, is a globally recognised expert on green business strategy.

[<Source>](#)

Sainsbury's store to be powered solely by food waste

By Rebecca Smithers, *for theguardian.com*



Food waste from Sainsbury's supermarkets around the UK is delivered by lorry to Biffa's plant in Cannock, and turned into bio-methane gas which is then used to generate electricity. Photograph: Diensen Pamben/Getty Images

A Sainsbury's store in the West Midlands will be the first retail outlet in the UK to come off the National Grid and be powered by food waste alone in a ground-breaking project being unveiled on Monday.

Sainsbury's and waste recycling company Biffa have been working on new technology to allow the Cannock store to run on electricity solely generated from anaerobic digestion.

Sainsbury's is already the UK's largest retail user of anaerobic digestion, generating enough electricity to power 2,500 homes each year. Food waste from the chain's supermarkets around the UK is delivered by lorry to Biffa's plant in Cannock, and turned into bio-methane gas which is then used to generate electricity that is directly supplied to the supermarket via a newly constructed 1.5km-long electricity cable.

Sainsbury's says all general waste from stores is recycled or turned into fuel. Surplus food that cannot be used by its charity partners to feed vulnerable people via food banks and other initiatives is processed into animal feed for farmers or used to generate energy through anaerobic digestion. Waste bananas from its Prescott Road store in Liverpool go to Knowsley safari park to feed the monkeys.

Paul Crewe, head of sustainability at Sainsbury's, said: "We send absolutely no waste to landfill and are always looking for new ways to reuse and recycle. So we're delighted to be the first business ever to make use of this linkup technology, allowing our Cannock store to be powered entirely by our food waste."

[<Source>](#)

General Mills Takes On Climate Change

SustainableBusiness.com News

Pushed hard by Oxfam America's "Behind the Brands" campaign, food giant General Mills announced industry-leading initiatives on climate change.

Oxfam has been pressuring the food industry to make much more serious commitments on climate change, gathering over 230,000 signatures on petitions for General Mills alone. Along with Kellogg, the two companies are at the bottom of the big 10 food corporations on addressing the problem.

As a result, Cheerios, Betty Crocker, Haagen-Dazs, Green Giant and other well-known General Mills brands will publicly advocate for action and clean up their operations and supply chains.

The company says it will sustainably source 100% of its 10 priority ingredients by 2020 - half its raw material purchases. And it's committing to long-term science-based targets - those that keep global temperature rise below 2°C. Importantly these targets include a clear commitment to address its supply chain, which generates 92% of its emissions from agricultural ingredients and packaging.

Palm oil and pulp and paper industries are the leading cause of deforestation, accounting for almost 85% of Indonesia's carbon emissions - the third highest in the world. 2.5 million acres a year are clear cut, releasing more carbon than all the cars, trucks, planes and ships in the US combined.



Supply chain targets will also include direct emissions (such as dairy farms), water use, waste, packaging and transportation.

To advocate for strong policy, General Mills signed the Climate Declaration and joined Business for Innovative Climate and Energy Policy (BICEP) which is working to pass meaningful climate and energy legislation.

"This would not have happened without the remarkable outpouring of public action from individuals who are fed up with the lack of effort to address climate change from too many food companies and governments," says Monique van Zijl, who manages Oxfam's Behind the Brands campaign.

General Mills says it lost 62 days of production in the first quarter alone from extreme weather. "Too many of today's food and beverage giants are crossing their fingers and hoping that climate change won't disrupt the food system imagining somebody else will fix it. The "Big 10" companies generate over \$1 billion a day and have great power to influence global food chains, says Winnie Byanyima, Executive Director of Oxfam.

General Mills says it will:

1. Set and disclose emission-reduction targets for its total supply chain by August 2015, with a focus on agriculture.
2. Aim for net-zero deforestation in high-risk supply chains - palm oil, packaging fiber, beef, soy, sugarcane - by 2020.
3. Disclose top three suppliers of palm oil and sugar cane.
4. Participate in the Carbon Disclosure Project, including annual reports on supply chain emissions data and forest health.
5. Publicly advocate for effective public and industry policy, such as encouraging peers to join the Consumer Goods Forum's net-zero deforestation commitment.
6. Join BICEP and sign the Climate Declaration.
7. Regularly review company statements and policies to ensure alignment with mitigation targets and initiatives.

Kellogg is next on Oxfam's list, so far refusing to take serious action. "We applaud General Mills for taking this vital first step," says van Zijl. "We look forward to tracking the actions the company takes to follow through on their promises. The ball is now in Kellogg's court to respond to the hundreds of thousands of people calling for climate action."

Although GMO agriculture isn't included in Oxfam's campaign, almost all the top 10 food companies are behind the misinformation campaign to stop food labels.

Read our article, Big 10 Food Companies Must Do More on Climate Change, Says Oxfam.

Here is General Mill's Climate Policy:

Website: www.generalmills.com/ChannelG/Issues/climate_policy.aspx/

[<Source>](#)

Efficiency and performance meet in BMW's electric i3

By Greg Rucks



The EPA recently rated BMW's new all-electric i3 at 124 MPGe, making it the most efficient car in the U.S. market. While this is only nine MPGe better than the comparably sized Nissan LEAF, the i3 upholds BMW's reputation for manufacturing luxury cars that offer a superior driving experience. How BMW created a car with greater efficiency without sacrificing performance or functionality is mostly due

to its holistic design approach and use of advanced lightweight materials.

Designing from the ground up

Unlike many car manufacturers, BMW didn't take an existing platform and adapt it to electric drive, but designed the i3 from the ground up. Its design in many ways reflects a shift away from traditional car design due to the fundamentally different way an electric vehicle operates. There is no longer an engine or radiator, usually housed under the hood, so there is no need for extra length at the front of the vehicle. Similarly, there is no longer an exhaust system or traditional transmission and thus no need to accommodate these systems under the passenger, sometimes done today through the mound on the floor that runs the length of the interior and separates driver from passenger. But there are a large and relatively hefty battery back, new power electronics and an electric motor to put somewhere.

To accommodate and best take advantage of these many differences, designers started from scratch. That's why the battery pack essentially forms the foundation of the i3, creating a battery platform on which the rest of the vehicle sits and giving it a low center of gravity, contributing to good handling and stability. Simplified EV componentry perhaps made the i3's flat floor, with no center console, easier to execute, giving the i3 more interior space. It also provided a surprising safety benefit — the driver can more easily exit or enter from the passenger door while parked on high-traffic city streets. The occupants are also shifted forward relative to a standard design and the footprint is very small considering the amount of interior volume it provides. To put things in perspective, BMW's i3 offers as much interior space as the automaker's 3-series sedan, but the i3 is a full 2 feet shorter.

As for performance, the i3 is legitimately quick, accelerating from 0 to 60 in 7.4 seconds.

Advantages of lightweighting

The i3 weighs 20 percent lighter than a Nissan LEAF. Our analysis indicates this level of weight reduction normally would provide an efficiency increase equivalent to 18 MPGe over the LEAF's 115 MPGe, but the performance benefits partially reduced the efficiency benefit. Nonetheless, use of materials that enable low weight with equal or better structural performance allowed BMW to produce a high-performing vehicle while still hitting the impressive mark of 124 MPGe. In addition to the efficiency and performance benefits of lightness, use of lightweight carbon fiber composite in the i3 gave the car some benefits not seen in other vehicles.

Because carbon fiber composite is much stiffer and stronger than steel, it was easier for the i3 to eliminate the B-pillar, the vertical support between the front door and rear door. The front doors open normally while the rear doors are hinged at the back. These "coach doors" make it easier to load child car seats, groceries and more, and contribute to a sense of spaciousness and accessibility.

Another interesting fact about the i3 is its low embodied emissions — the sum of all the emissions during production of the car. Carbon fiber poses a challenge from this standpoint because it is produced from a relatively energy-intensive process. Composite materials are also inherently difficult to recycle and part manufacturing currently produces a lot of excess scrap material that is difficult to reuse. However, BMW has at least partially mitigated these challenges by powering its carbon fiber production plant in Moses Lake, Wash., with clean hydro-derived electricity, allowing it to completely avoid combustion of natural gas during the production process.

Of course, the embodied emissions go up when the i3 is equipped with its optional "REX," or "Range Extender," as most are. We'll discuss the implications of this in a future blog post.

It is unclear whether BMW's i3 is actually a moneymaker given the much higher cost associated with its carbon fiber composite construction. Its selling price in the low \$40,000s is already outside the price range of most car buyers. Whether BMW will be able to bring that price within range of the mainstream (assuming it wants to do so in the first place) remains an open and important question for the industry.

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Aviation innovation: Solar powered aeroplanes and silicone wings

Wing flaps modelled on birds and a 100% solar-powered plane, technology to tackle the industry's high emissions

By Elisabeth Braw, *theguardian.com*



German test pilot Markus Scherdel steers the solar-powered Solar Impulse 2 aircraft for its maiden flight in Switzerland. Photograph: Denis Balibouse/AP

When birds land, their wings adjust to the airstreams, allowing them to spend as little energy as possible. By contrast, aeroplanes use clunky landing flaps that help channel the air but also waste large amounts of energy.

A research team, financed by the EU, has developed a new material that allows aeroplane wings to function more like birds' wings. "Our prototype shows that it reduces the aeroplane's fuel consumption by 6% thanks to the reduced air resistance", explains Andreas Lühring, a research scientist at the Fraunhofer Institute for Manufacturing Technology and Advanced Materials (IFAM) in Bremen, which was responsible for developing the new aeroplane wing's "skin" - the surface that allows the flaps to move seamlessly. "And because the material makes the plane lighter, it will consume even less energy."

What seems so easy for birds is, in fact, an extremely tricky task. "You have to develop a very particular kind of material that can cope with temperatures of -55C at the plane's cruising altitude, and at such temperatures most materials get stiff," explains Lühring. "But when the plane lands it needs to be flexible." Lühring and his colleagues, part of a team of around 50 scientists from 15 European companies, universities and research institutes, found a formula that does the trick: solid materials such as aluminium mixed with soft ones such as silicone and even silicone foam, a very elastic substance that functions much the same as a bath sponge when it's squeezed.

The project, called Saritsu (Smart Intelligent Aircraft Structures) and coordinated by Airbus, was presented at the Berlin Air Show last month. The team's prototype aeroplane wing will now be tested outside the lab, in real-life aviation settings. If it proves safe, any aircraft manufacturer will be able to use it. The potential impact on the aviation sectors' CO2 emissions is significant. If every aeroplane were to use the bird-like wings, it would cut 42m tonnes from the world's annual aeroplane emissions of 705m tonnes.

Another aviation innovation could eventually eliminate the sector's CO2 emissions altogether. Solar-powered plane, Solar Impulse, is fuelled not by petroleum but by solar energy. "It has unlimited endurance", explains André Borschberg, Solar Impulse's co-founder. "It can fly for weeks and months without stopping to fuel because it collects its energy from the sun. The energy it collects during the daylight hours is enough to power it during hours of darkness as well." Borschberg, a Swiss businessman, is also a former fighter pilot. Four years ago, he set the record for the world's longest solar-powered flight, when he flew the Solar Impulse 1 plane for 26 hours straight.

The company has now built Solar Impulse 2, which Borschberg and his co-founder Bertrand Piccard plan to pilot around the world in the first-ever circumnavigation by solar aircraft next year. The aeroplane, a single-seater, made its maiden voyage earlier this June. Though it weighs only as much as an average car, it has a 72 metre wingspan, making it wider than a Boeing 747. Most importantly, it features no fuel tank but instead 17,000 solar cells that are built into the wings and supply four electric motors with renewable energy.

Zero fossil fuel consumption is, of course, a gigantic aviation leap. But a single-seater plane will hardly make a dent on the aviation business. That, Borschberg explains, is not even the company's intention right now. "It takes a long time to change things in the aviation business, and of course making a solar jumbojet will take a long time", he explains. "Every aspect has to go through many rounds of testing. For now, we want to use the plane as an ambassador for fuel efficiency. If we used energy in this way in different sectors, we could reduce our consumption by 50%."

[<Source>](#)

Green Technology Spotlight: Biodynamic Cement Purifies the Air

SustainableBusiness.com News

Last year we wrote about a hospital in Mexico City that has a façade that literally purifies surrounding air - now there's another one in Milan, Italy.

The 6-story Palazzo Italia has a similar appearance to its predecessor. Crowned by a glass canopy of solar panels, the façade is designed to look like a petrified forest with 2200 tons of photocatalytic concrete. The architects say it mimics the role of trees by cleaning the air.

Like the building in Mexico City, the materials react with sunlight to break down nitrogen oxide within 2.5 meters of its surface. About 80% of the materials are recycled and a company called Italcementi makes the concrete. Because of its air purifying ability, Chicago is experimenting with it to pave roads.

"The entire outdoor surface and part of the interiors will consist of i.active Biodynamic cement panels," says Italcementi.

"In direct sunlight, the active principle contained in the material 'captures' certain pollutants present in the air and converts them into inert salts, helping to purify the atmosphere from smog."

Palazzo Italia will be the centerpiece of the Universal Exposition of 2015: Feeding the Planet, Energy for Life, expected to draw 20 million visitors with a focus on how to feed the planet in the face of shrinking resources. At almost 100,000 square feet, it has a central square, offices and meeting rooms, and temporary restaurants during the Expo. Afterwards, the structure will remain as an icon of sustainable design. Architects Nemesi & Partners won an international competition to design the pavilion.

Other innovative building designs we've written about include an algae-covered apartment building in Hamburg, Germany, a skyscraper in Indonesia that's shooting for net-zero energy, and a tower in Taiwan.

[<Source>](#)



Self-cooling solar cells to last longer

Zee News

What if a solar cell could keep itself cool even in the blistering heat of the sun?

By adding a specially patterned layer of silica glass to the surface of ordinary solar cells, a team of researchers has found a way to let solar cells cool themselves by shedding unwanted thermal radiation.

This paves the way for developing high-efficiency, long-lasting solar cells.

For every one-degree Celsius increase in temperature, the efficiency of a solar cell declines by about half a percent.

"That decline is very significant. The solar cell industry invests significant amounts of capital to generate improvements in efficiency," informed Aaswath Raman, a postdoctoral scholar at Stanford University.

Under normal operating conditions, solar cells can easily reach temperatures of 55 degrees Celsius or more.

Actively cooling solar cells by ventilation or coolants would be prohibitively expensive and at odds with the need to optimize exposure to the sun.

The newly-proposed design embeds tiny pyramid- and cone-shaped structures on an incredibly thin layer of silica glass.

With this, researchers found a way of redirecting unwanted heat - in the form of infrared radiation - from the surface of solar cells through the atmosphere and back into space.

"Our new approach can lower the operating temperature of solar cells passively, improving energy conversion efficiency significantly and increasing the life expectancy of solar cells," explained Linxiao Zhu, a physicist at Stanford University.

"These two benefits should enable the continued success and adoption of solar cell technology," added Shanhui Fan, an electrical engineering professor at Stanford.

Silica is transparent to visible light, but it is also possible to fine-tune how it bends and refracts light of specific wavelengths.

"A carefully designed layer of silica glass would not degrade the performance of the solar cell, but it would enhance radiation at the predetermined thermal wavelengths to send the solar cell's heat away more effectively," Fan concluded.

The research was published in the journal *Optica*.

[<Source>](#)

India supports Dearman Engine

Gas World

Support for the Dearman Engine liquid air technology as a solution to the challenges of postharvest food losses and air pollution gained prominence recently, following events in both the UK and India.

This began with a call for urgent attention to cold chain development, discussed at the two-day Clean and Cool Summit on June 30 and July 1 in London, organised by the Liquid Air Energy Network (LAEN) and hosted by the Institution of Mechanical Engineers (IMechE). Alongside the Summit, the IMechE's Head of Energy and Environment, Dr. Tim Fox, launched the Institution's latest report, A Tank of Cold: Cleantech Leapfrog to a More Food Secure World.

The report explains how, in developing countries like India, up to 50% of perishable food is lost before ever reaching a plate because cold chains are rudimentary or non-existent. Dr. Fox, the lead author, stated, "One in eight people on the planet goes to bed hungry every night. That shocking fact is made worse when you consider that a third to a half of the food produced globally is never eaten."

Where cold chains are developing – in megacities such as Beijing and Delhi – the delivery component is powered by highly polluting diesel transport refrigeration units (TRUs), which contribute to chronic and toxic smog. Outdoor pollution has caused 600,000 premature deaths in India in a single year.

At the Summit, delegates including government officials from India, Malaysia and Tanzania, multinationals and academics discussed the next steps towards the creation of a joined-up 'cold economy.'

In particular, the Tanzania Horticultural Association commended the work done by the Dearman Engine Company and stated their desire to partner with Dearman on an eco-friendly solution for transport refrigeration.

According to Eric Trachtenberg, Director of Food & Agriculture at McLarty Associates, studies of Tanzania have shown that using liquid air in the transport of passion fruit in the country could halve the cost of the refrigeration system. Trachtenberg commented, "Liquid air technologies will make it cheaper to make the necessary expansions in the cold chain" and Jacqueline Mkindi of the Tanzania Horticultural Association added "the majority of farmers are small farmers and liquid air can help them. The Dearman engine could transform prospects in Africa."

The 'need for clean' was a strong theme across the event. One of the key statistics quoted in the report was that diesel-powered TRUs emit 29 times the amount of particulate matter (PM) as the primary engine of a modern diesel truck. Eric Trachtenberg highlighted how liquid air uses fewer resources, could reduce PM and NOx emissions, offer more reliable energy access in countries where grid-based power can be unreliable, and offer better price stability too.

Toby Peters, Senior Group Managing Director of the Dearman Engine Company, has been invited to present the technology to industrial leaders and government officials in a special seminar at the British High Commission in Pune in December. He said, "On the evidence of the presentations given at the Summit and our meetings in India, demand for liquid air technologies from developing countries would far exceed the demand from within the UK. As well as supporting cold chain development in countries like India this has a real benefit for UK PLC, with the potential of even more British jobs."

"We know that the Dearman engine and liquid air are exciting and important options for developing cold chains around the world, but this recent support is exactly the validation we need. As the Dearman engine undergoes on-vehicle testing this summer, we will be working hard over the coming months to ensure the technology is ready to go into manufacturing and into market."

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CSMCRI develops green plastic from bio-fuel residue

Business Standard

Bhavnagar-based research institute Central Salt and Marine Chemicals Research Institute (CSMCRI) has developed a 'green plastic' using the residues of bio-fuel that is made from a tropical weed jatropha. What's more, the institute has been granted an European patent for its bio-degradable plastic in January this year.

"We had initiated a research on using the residue of bio-diesel to be converted to plastic. The idea of green plastic came as a result of our concern to effectively utilize the crude glycerol which is the byproduct of the Jatropha biodiesel," said S Mishra, principal scientist, CSMCRI.

Council of Scientific & Industrial Research (CSIR) and CSMCRI have started research related to the development of 'green plastic' in 2005 during the second phase of the project entitled 'Biofuels from eroded soils of India' sponsored by Daimler Chrysler, Germany.

More than 500 gms. of green plastic has already been produced in the laboratory at gram scale which was distributed to some firms for research analysis and studies on its further applications in bio-medical area. "Now, our target is to scale up the process from gram to kilogram scale per batch production. Besides, we are also trying to improve functional/physical properties of the product," she added.

Recently, European patent has been granted in January 2014 for the process of bioplastics made by CSIR-CSMCRI (Grant no. EP 2475754 B1). Tests conducted on the polymers have shown that they completely degrade in moist soil within three months.

A senior ex-scientist associated with the institute claimed that such plastics can find suitable use in the automotive industry, and by replacing conventional plastics with biodegradable plastics could enhance the 'green' content of a car. However, institute sources confirmed that so far no car manufacturer has shown any interest to test it on their vehicles.

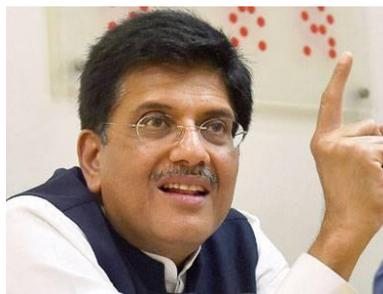
Meanwhile, the institute along with certain other premier institutes has also been working on exploring the feasibility of developing microalgal bio-fuels from marine strains of micro-algae found abundantly along the coastline of India. Micro-algae are a group of microscopic life forms in moist environments, and the lipids stored in these can be extracted through suitable methods and then can be converted into biodiesel by chemical means.

"Microalgal biodiesel have some distinct advantages over using plants for making biodiesel. The most significant advantage of microalgal among these is their faster growth rate and the ability to utilize seawater or even polluted waste-water streams for their growth instead of agricultural land & water," Mishra explained adding that they also do not feed the 'food vs. fuel' debate as they do not utilize the resources needed for growth of food crops.

The first phase of the project on "Biofuel from marine microalgae" was aimed at developing a scalable process for producing biofuel from marine microalgae.

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World Bank to invest \$775 million in clean energy projects across India



Minister for Power, Coal and Renewable Energy
Piyush Goyal

Shuchi Srivastava, ET Bureau

MUMBAI: The World Bank plans to invest \$775 million in clean-energy projects across India, even as it expects that the new government's plan to give fiscal and policy support to the sector will galvanise further investment in renewable energy.

"The support shown by the new government towards clean energy is quite encouraging and is expected to give the much-needed push to the sector and unlock pending investments," said Ashish Khanna, lead energy specialist at the multilateral funding institution.

"The World Bank is ready to partner with the government in scaling up sustainable clean energy investments."

Minister for Power, Coal and Renewable Energy Piyush Goyal recently said that the potential and scope of renewable sources were a part of the government's vision for ensuring energy security.

Narendra Taneja, national convener of the BJP's energy cell, told ET earlier that the ruling party "strongly believes that renewable energy will play a pivotal role in bringing power to every household in the country".

India's clean-energy sector has attracted interest of international investors. Recently, companies such as Welspun Energy and Renew Power saw investment from General Electric, Asian Development Bank and Goldman Sachs.

Gevorg Sargsyan, programme manager for climate investment fund at the bank, said it had approved two projects for investment - a \$100 million Himachal Pradesh development policy loan and the \$200 million Rajasthan renewable energy transmission investment programme implemented by the Asian Development Bank.

According to the World Bank, the climate investment fund provides middle-income countries with highly concessional resources to explore options to scale up the demonstration, deployment and transfer of low-carbon technologies in renewable energy, energy efficiency as well as sustainable transport.

India has substantially increased its share of clean-energy projects, said Khanna. But, in order to achieve the targets of its own national solar mission, the government must provide long-term clarity in policy, regulations and financial support mechanisms and encourage sustained commercial lending from financial institutions, he added.



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National Solar Mission back with a bang

Business Standard

After facing delays, trade disputes and industry tiffs, the Jawaharlal Nehru National Solar Mission (JNNSM) appears to be back on track.

The ministry of new and renewable energy (MNRE) has issued guidelines for setting up 1,500 Mw of solar power plants, the largest tender issued till now. It has also roped in NTPC Vidyut Vyapar Nigam (NVVN) to expedite the phase and meet the mission's targets.

NVVN would also bundle the solar power generated with cheaper conventional power and sell at an average rate.

"The selection of grid-connected solar photovoltaic (PV) projects of 1,500 Mw total capacity shall be carried out by NVVN through a transparent, tariff (rate)-based reverse bidding process. NVVN will purchase the power from the successful developers at their bid tariff and sell bundled power to distribution companies/utilities/other bulk consumers," say the guidelines issued by MNRE.

NVVN is the trading arm of the nation's largest thermal power producer, NTPC. It was responsible for carrying out the very first bidding of the JNNSM, in 2010.

That helped the solar power rates go down from Rs 17 a unit to Rs 10-12 a unit. Subsequently, the cost of solar power has come down to Rs 6.5-7 a unit, a 60 per cent decline in three years. The previous batch of bids under JNNSM had a fixed rate of Rs 5.45 a unit, supported with viability gap funding.

"We are hopeful that during this bidding, the rate would come down to at least Rs 5 a unit. There are now serious players in the sector, expected to bid aggressively," said Tarun Kapoor, joint secretary, MNRE. He said the tender process would take off as soon as consultations with the stakeholders concluded, most likely by the end of August.

The government is also hopeful of achieving grid parity that is solar power at the same cost as conventional power, by 2017, scaling down from the earlier target of 2022.

The mission guideline has divided the phase target in two portions. "In order to avoid the difficulty that may arise in achieving financial closure of projects, selection of PV projects shall be done in a phased manner. The total capacity of solar PV projects to be selected in the first tranche, in FY2014-15, will be 750 Mw. The projects for the remaining capacity of 50 Mw for solar PV projects will be selected in the second tranche, that is, in FY2015-16," say the guidelines.

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Polaris Bags 'Best Implementation of Green IT' Award at National IT Leadership and Excellence Award Ceremony

Business Wire India

Polaris Financial Technology Limited, a leader in financial technology products, solutions and services that enable unprecedented operational productivity for the global Financial Services, was awarded the 'Best implementation of Green IT' award at the National IT Leadership and Excellence Award ceremony by the Asia Outsourcing Congress. The grand ceremony was held at Malabar, Taj Lands End, Bandstand, Bandra (W), Mumbai.

The National IT Leadership & Excellence Awards is a benchmark to recognize excellence throughout IT industry. The award focuses on the contribution of Individuals, Projects, and Organizations that have excelled in the use and development of IT. Through this award, Asia Outsourcing Congress recognizes Polaris for taking the impactful effort in reducing harmful effects on the environment and in creating a green and sustainable IT ecosystem.

Polaris was given this award for its consistent efforts on direct power reduction and for reducing carbon emission amounting to over 3517 tons. For easier comprehension, this equates to the effort of planting 17585 trees per annum.

Polaris is focused on Go Green in all aspects of IT, from procurement to operations to all the way to disposal, and all the stages in between. Out of many ways we enable Go Green, below are some of the unique and/or most effective ways

Polaris shuts down its two unused servers over the weekend to improve data center energy efficiency and to drive its green initiatives forward. Less power consumption results in reduction of carbon emission, and heat output. This reduces carbon emission on a regular basis and helps in protecting the environment.

Polaris promotes Video Conferencing (VC) within the organization and with clients across the globe. This initiative saves the energy spent on travelling and associated costs.

The economic gain that Polaris accrues due to its Green IT initiatives enable approximate savings of INR 6 crores per year on power and travel costs.

Receiving the award, Shashi Mohan, CIO and CTO, Polaris Financial Technology Limited said, "We are delighted to receive the 'Best Implementation Green IT award' as a part of our effective green initiatives implemented. Most organizations replace old RISC based servers and initiate server visualization as part of their 'Go Green' initiatives in their data centers. These basics are now into Polaris' DNA. We, in Polaris, started a very unique way of Go Green by 'Weekend Shutdown of the unused Servers: switch off the lights, the ones not needed and when not needed'. We strongly believe in the advantages of Video

Conferencing and propagate the same, within the organization, and, with our customers. This has enabled us to reduce unnecessary travel across locations."

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Rubber dam for sustainable production

The Hindu

Checkdams are mainly used for soil and water conservation in watersheds. In India, several types of these are being used for regulating water supply in watersheds which in turn help in assured water supply to vegetation.

Generally check dams are made up of cement base and are inelastic in nature. To give more flexibility in release and control of water flow across the streams, research efforts were made at the Directorate of Water Management, Bhubaneswar to fabricate rubber sheets instead of cement material.

As a result, five rubber dams were installed at different locations of Khurda district, Odisha. These are the first indigenous rubber dams in the country.

As an innovative hydraulic structure, the rubber dam consists of four parts : i) a rubberised fabric dam body; ii) a concrete foundation; iii) a control room housing mechanical and electrical equipment, such as air blower/ water pump, automatic inflation and deflation mechanism; and iv) an inlet/outlet piping system.

The dam height can be raised up to 1.5 m by filling water through inlet pipe (inflation mechanism) and it can be lowered to base level by releasing the water through outlet pipe (deflation mechanism).

Main advantages are better erosion and flood control during excess water flow. It also provides cushion as a reservoir for storing water during scanty rainfall and can be used during drought.

The assured irrigation created by rubber dams helped in enhancing crop productivity at Baghamari and Chandesar in Odisha.

The average productivity of rice in kharif season at Baghamari was enhanced from 2.87 tonnes/ha to 4.67 tonnes/ha.

The average productivity of green gram in rabi season at Baghamari was enhanced from 0.63 tonnes/ha to 0.92 tonnes/ha and the productivity of sunflower and cucumber in rabi season are 0.84 tonnes/ha and 4.3 tonnes/ha respectively.

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Eureka Forbes Makes Water from Air

AFAQs

Eureka Forbes, a water purifying brand, is running an experiential campaign in Mumbai with Aquaguard Canters, where it forms water with air.

Water conservation is an important subject, although it is not top-of-the-mind for the common man. With India is facing problems such as water shortage or contamination, the need of the hour is to look for more non-conventional ways of sourcing and utilising water to do away with the scarcity and contamination.

A government report projects that by 2015, 334 million Indians will lack access to safe drinking water. Also the Indian Meteorological Department (MET) has forecasted this year's monsoon to be the lowest in four years.

In a bid to spread awareness on the need to combat water scarcity, Eureka Forbes has undertaken an on-ground campaign demonstrating innovative and alternative ways to produce pure drinking water from air.

The unique, experiential campaign introduces a breakthrough technology that converts thin air to pure, healthy drinking water. The air water generator is designed and developed by Aquaguard, a water purifier brand in collaboration with Mumbai-based WaterMaker.

On an average, Aquaguard Canters (each Canter will tour 16 strategic locations in Mumbai) convert 120 litres or 500 glasses of pure, healthy water from air. The WaterMaker machine uses refrigeration techniques, capturing water vapour before it touches the earth and provides a localized source of pure water without any connection to pipes or catch basins. It works on electricity or alternate sources of energy to condense, collect, filter and dispense pure, healthy drinking water. The machine works most effectively in warm areas with high humidity.

The air water generator is designed to produce water as per the rated capacity when average temperature is 25°C-32°C and relative humidity is between 70 and 75 per cent Rh. The output goes up with an increase in humidity and vice versa. The large atmospheric water generators in the machine have inbuilt chiller systems to maintain the temperature of the water at 8°C-13°C.

Speaking about the initiative, Marzin R. Shroff, CEO, direct sales and senior VP, marketing, Eureka Forbes, says, "Our Aquaguard air-to-water initiative is in line with our mission to provide a safe, healthy and happy environment to our consumers. This campaign is an endeavour to showcase futuristic and market-changing concepts which will safeguard both consumer and environment interests." The activation is carried out by the Orchard Advertising, an activation arm of Leo Burnett. Eureka Forbes is a part of Shapoorji Pallonji Group and its product portfolio encompasses water purification, vacuum cleaning, air purification and home security solutions. It has a reach of over 450 cities and towns in India and a global footprint across 35 countries.

[<Source>](#)

Startup ties up with ragpickers to use waste for running green 3D printer

Economic Times

Narendra Modi may have never heard of Sidhant Pai, but if the young MIT graduate's plans remain on track then the 21-year-old may unwittingly become an ally in the Indian prime minister's push to clean up Indian cities. In the run up to the general election, Modi had made making Indian cities world-class one of his key poll promises. Along with impressive skyscrapers and airports, cleanliness is a common factor of all great cities.

Which is where a startup like Pai's Protoprint with its innovative solution to transform plastic waste into raw material for 3D printers makes a difference. The Pune-based startup, the first of its kind in India, has tied up with ragpickers who bring in waste they collect from various parts of the city to a site run by Protoprint.

At the site, the plastic materials are segregated and fed into the FlakerBot, a machine built from scratch by Pai to shred the plastic. From there, the shredded plastic moves to the RefilBot, also built by Pai, which converts it into filaments that is used as raw material to print objects in a 3D printer.

"We designed them (the machines) specifically to be low cost," said Pai, who started up through grants and the fellowship money that he received, apart from his work on projects like building an affordable solar cell phone charger in Nicaragua and pedal powered butter churn in Tanzania during his first two years at Massachusetts Institute of Technology in the United States. "As an environmental engineer I wanted to bring technology to the masses."

Of the total investment of \$110,000 in the startup, non-profit global investment firm Echoing Green put in about \$80,000, said Pai. So far, different commercial 3D printers used filaments of various sizes as raw material. Pai is now trying to change this by standardising the sizes and quality of the filaments. Deepak Raj of Bangalore-based 3D printing design factory Df3d said there is a certain chemical composition that has to be met for a filament to work in a particular 3D printer, stressing on the difficulty in developing a standardised filament. "It's very interesting how this (standardisation of filament) is being done. It is quite difficult," said Raj.

Protoprint is working as the first officially certified producer with UK-based charity organisation Techfortrade's The Ethical Filament Foundation, an initiative that partners with organisations worldwide to aid the manufacturing of ethical 3D printer material from recycled plastic waste.

Globally, there are a few precedents. While Italy-based Ewe Industries has developed a machine that turns any recycled plastic into filament, UK's Omnidynamics recently raised £64,369 on crowdfunding platform Kickstarter to develop its filament maker.

[<ReadMore>](#)

Coca-Cola, TERI University fund water management schooling in India

The Daily Star

Beverage giant Coca-Cola has established a department on water studies at India's TERI University in a bid to tackle the challenges regarding water sustainability.

The Coca-Cola Department of Regional Water Studies also aims to help scientifically manage water resources in India with the help of research and development as well as build capability for various stakeholders who can influence policy and implement research effectively.

It will examine water issues in an interdisciplinary framework, bringing in cultural, educational and scientific factors as well as religious, ethical, social, political, legal, institutional and economic dimensions towards a better, holistic approach to water management.

The department is supported by funds from the Coca-Cola Foundation and TERI University, said Asim Parekh, vice-president of Coca-Cola's India and Southwest Asia Business Unit.

Freshwater is a subject of immediate attention and concern across the world. "All of us need to come together to address these issues."

Parekh said Coca-Cola by establishing the department is trying to create a centre of excellence that will provide people that have the right skill set to address all the issues regarding freshwater.

The department will provide MTech, MSc, post-graduate diploma, PhD and a certificate course. The courses are open to students and professionals who are graduates or equivalent from any branch of engineering.

Postgraduates from environmental science, physics, mathematics, statistics, chemistry, geology, atmospheric science, economics and geography can also apply.

Parekh said the partnership brings together the golden triangle of government, business and civil society with academia. "We hope that this department will lead in the field of water governance."

"Coca-Cola believes that through this partnership with TERI University, we can contribute to the creation of human resource capital in the area of water management as well as help in research and development on water management."

In the first phase, the Atlanta-based company will be supporting the department with an endowment of \$750,000.

Parekh thinks 21st century business entities must create shared value for shareholders, stakeholders and local communities, as the problems that the world now faces are too large for any single entity to solve.

"As a leading business organisation, we consider it our responsibility to play a role in issues of water management, sustainable packaging and sustainable agriculture."

[<ReadMore>](#)

Indo-US group to work very closely on climate change: Javadekar

Zee News

Terming the Indo-US Joint Working Group as an "important platform" for addressing environment and sustainable development concerns, Environment minister Prakash Javadekar Wednesday said the group needs to work "very closely" and develop common understanding and balanced package for post 2020 period.

Javadekar today met the US Special Envoy Climate Change Todd Stern and discussed a sequence of events in the run up to the Conference of the Parties (CoP) in Paris next year which was followed by the first meeting of the India US Joint Working Group on combating Climate Change.

Stressing that both the countries have "experience and technologies", Javadekar said that the best practices can be shared by both the nations and hoped the joint partnership to go ahead and become "very active" cooperation partners in days to come.

"In view of the 2015 agreement on climate change, the group needed to work very closely and develop common understanding for ambitious and balanced package for post 2020 period. The Joint Working Group would also establish coordination on Mitigation and Adaptation aspects," he told reporters after the meeting.

"We can collaborate because essentially both countries have experience and different kinds of technologies. We can share many best practices," he said, adding he was confident that there would be some kind of agreed outcome which would limit the global temperature rise under two degrees Celsius.

Javadekar said the group may consider other issues related to phasing out of Hydro-fluoro carbon and may consider discussing both scientific and technical aspects of the issue to prepare a common strategy.

"The Group may consider other issues related to phase out of Hydro-fluoro carbon which is a green house gas but substitutes ozone depleting substance and has much higher GWP. The Working Group may consider discussing both scientific and technical aspects of the issue to prepare a common strategy," he said.

Asserting that Prime Minister Narendra Modi has a "strong record of engagement" on clean energy and climate change in Gujarat, Stern said both countries were looking forward to "still more" important relationship going forward.

"There is obviously a new Prime Minister Narendra Modi who has a strong record of engagement on clean energy and climate change in Gujarat and who has already indicated in a number of ways the priorities that he intends to assign to these issues.

"US and India who have had a very constructive partnership on these issues in the past years have every basis for looking forward to still more important relationship going forward," he said.

Stern said both nations were discussing multi-lateral issues relating to international climate negotiations that would culminate at the end 2015 in Paris as well various kinds of bilateral cooperations.

"I think we meet at a propitious moment. President Barak Obama is leading an intensive engagement focussed both on whole set of policies related to mitigation.

"The most important of which was the recent announcement of new EPA rules regarding the reduction of emissions in our entire power sector but a whole host of policies in many different sectors which are part of the President's climate action plan," Stern said.

Javadekar, while replying to a question on India's earlier stance of refusing to carbon limits and would there be a different stance in Paris, said essentially the Kyoto arrangement was not India's demand.

"It was a globally accepted regime. We are taking our own actions. We are positive on that agenda. We are making our economy a green economy. We are moving on the path of cleaner energy and besides that we are achieving energy efficiency in practically every sector of the economy.

"We want to march ahead very confidently on that. We want the technologies to flow freely and the development funds which the developed world has promised also to flow freely so that things can be achieved. That is what we expect. But we are always positive on the climate debate," he said.

The Minister said that deliberations on important activities in the areas of clean Energy, smart grid and energy efficiency, development of technology, sharing of information on best practices on adaptation measures were done during the meeting.

Highlighting the IPCC 5th Assessment Report, Javadekar said that non-availability of water was an important concern for mankind and called on the joint group to work together on various technologies for enhancing water use efficiency, conservation of water resources and ground water recharging.

The Minister further said that REDD+ issues had gained momentum through adoption of various decisions by COPs in its previous sessions.

"In view of this the management practice responsible for enhancing eco system services, carbon sequestration and protection of bio-diversity required significant research and development activities. This would form part of deliberations of the Joint Working Group," he said.

Javadekar said Prime Minister Narendra Modi was much committed to climate change debate and initiatives.

"Therefore for the first time in India, the Environment and Forest ministry is now Environment, Forest and Climate change ministry. The added nomenclature gives the importance that we place in all these climate change mitigation and adaptation efforts.

[<ReadMore>](#)

2014 4th International Conference on Energy and Environmental Science (ICEES 2014)

4th to 5th September 2014

Kuala Lumpur, Malaysia

2014 4th International Conference on Energy and Environmental Science (ICEES 2014) will be held in Kuala Lumpur, Malaysia during September 4-5, 2014, it is co-sponsored by University Putra Malaysia, Polytechnic University Puerto Rico, Chengdu Young Education & Consultancy, and IACSIT. The aim objective of ICEES 2014 is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Energy and Environmental Science. This conference provides opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration.

ICEES 2014 is the premier forum for the presentation of new advances and research results in the fields of theoretical, experimental, and applied Energy and Environmental Science. The conference will bring together leading researchers, engineers and scientists in the domain of interest from around the world. The major topics of conference are: Sustainable/ renewable energy, Behavior of and impacts of pollutants in atmosphere, soil and water, Management of ecosystems, environment and water resources, Alternative Energy and the Environment, Assessments of the condition of ecosystems and environmental quality, Modeling and regional environmental assessments and Treatment/restoration of ecosystems, environment and water resources

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2014 7th International Conference on Environmental and Computer Science (ICECS 2014)

September 15-16, 2014,

Paris, France

2014 7th International Conference on Environmental and Computer Science (ICECS 2014) will be held during September 15-16, 2014, Paris, France. ICECS 2014 is to bring together innovative academics and industrial experts in the field of Environmental and Computer Science to a common forum.

The primary goal of the conference is to promote research and developmental activities in Environmental and Computer Science. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working in Taipei and abroad. The conference will be held every year to make it an ideal platform for people to share views and experiences in Environmental and Computer Science and related areas. ICECS 2014 will be premier forum for the presentation of new advances and research results in the fields of Environmental and Computer Science. The conference will bring together leading researchers, engineers and scientists in the domain of interest from around the world. Topics of interest for conference include various topics directly associated with environment.

[<ReadMore>](#)

Global Business Sustainability Conference 2014

24th to 26th September 2014

Saginaw, Michigan, USA

Saginaw Valley State University is hosting an international business sustainability conference titled "Global Business Sustainability Conference 2014" with Lady Shri Ram College, University of Delhi. The Global Business Sustainability conference is scheduled to be held from Tuesday, Sept. 23 to Friday, Sept. 25 at its campus, 7400 Bay in Kochville Township, MI, USA. Speakers include Linda Kennan, Dow Corning Corp. vice president for corporate stewardship at Dow Corning, Debashis Kanungo, Tata Consultancy Services global head of talent transformation and management and Bo Miller, Dow Chemical Co. global director of corporate citizenship.

The event will include two multi-session tracks, one for academic scholars and another for business professionals. Scholars will present original research on a broad range of business sustainability issues in the academic track. Business leaders will share case studies and experiences with implementing sustainable business practices in a variety of industries in the professional track. Sessions will focus on sustainability in agribusiness, the automotive industry, construction, entrepreneurship, energy, family business, information technology and business in India.

[<ReadMore>](#)

2014 2nd International Conference on Renewable Energy and Environment (ICREE 2014)

September 27-28, 2014,

Bali, Indonesia

2nd International Conference on Renewable Energy and Environment (ICREE 2014) will be held during September 27-28, 2014, Bali, Indonesia. ICREE 2014, is to bring together innovative academics and industrial experts in the field of Renewable Energy and Environment to a common forum.

The primary goal of the conference is to promote research and developmental activities in Renewable Energy and Environment. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners. The conference will be held every year to make it an ideal platform for people to share views and experiences in Renewable Energy and Environment and related areas.

ICREE 2014 is the premier forum for the presentation of new advances and research results in the fields of theoretical, experimental, and applied Renewable Energy and Environment. The conference will bring together leading researchers, engineers and scientists in the domain of interest from around the world. Major tracks of the conference are Wind Energy Applications, Hydropower Applications, Photovoltaic Technology and Solar Thermal Applications.

[<ReadMore>](#)

The Times of India, Delhi dated June 27, 2014

Tofu can help make cheaper solar cells

Kounteya Sinha | TNN

London: The chemical used to make tofu and bath salts could also replace a highly toxic and expensive substance used to make solar cells. Cadmium chloride is currently a key ingredient in solar cell technology used in millions of solar panels around the world. This soluble compound is highly toxic and expensive to produce requiring elaborate safety measures to protect workers dur-

ing manufacture and then specialist disposal when panels are no longer needed.

Physicist Jon Major from the University of Liverpool has found that it can be replaced with magnesium chloride, which is extracted from seawater and is already used in products such as tofu, bath salts and for de-icing roads.

Safe and at a fraction of the cost — \$0.001 per gram compared to \$0.3 — it has also been shown in the study to be as effective as the expensive and toxic al-

ternative. The cheapest solar cells being manufactured today are based on a thin film of insoluble cadmium telluride. These cells convert less than 2% of sunlight into energy. By applying cadmium chloride to them, this efficiency increases to over 15%. Major said, "If renewable energy is going to compete with fossil fuels, then the cost has to come down. Great strides have already been made but the findings in this paper have the potential to reduce costs further"

The Times of India, Delhi dated June 28, 2014

Air quality hit as CO levels shoot up

TIMES NEWS NETWORK

New Delhi: The air quality in the city has worsened in the past few days owing to a dramatic rise in carbon monoxide (CO) levels in some areas. Increased CO levels can lead to shortness of breath, weakness and impact oxygen delivery to organs. Many parts of Delhi, including Dheerpur and Mathura Road, have almost double the limit of 1,700ppb. This is mainly because the winds blowing in Delhi are emerging from Bay of Bengal and sweeping through the Indo-Gangetic plains, where CO levels are already very high.

"Winds blowing from the Indo-Gangetic plains have a concentration of CO because of the burning of firewood and emissions from the transport sector. The levels are usually not this high in

BEYOND SAFE LIMIT

Average level (ppb) of carbon monoxide (CO) from June 20 to 25



Delhi. CO takes much longer to dissipate and can stay in the atmosphere for almost a month. It can also travel great distances. have almost twice the limit of 1,700 parts per billion," said Gufran Beig, chief project scientist, System of Air Quality Weather Forecasting and Re-

search (SAFAR) under the ministry of earth sciences. Parts of southwest Delhi like IGI airport, Aya Nagar as well as Noida are less likely to be affected, added Beig.

Ozone levels, which had gone up earlier this month, are again within the safe range—below 50ppb—in

most areas. Particulate pollution, levels of both PM2.5 (fine, respirable particles) and PM10 (coarse particles) has also come down with the increase in humidity. "But the CO level is building up with the advancing monsoon winds. It may continue to rise till next week," Beig added.

According to the US Environment Protection Agency, heart patients already have reduced capacity for pumping oxygenated blood to the heart, which can lead to myocardial ischemia, a condition often accompanied by chest pain (angina), when exercising or under stress. Short term CO exposure further affects their body's already compromised ability to provide extra oxygen for exercise or exertion. An eight hour standard is generally considered for CO levels.

toi.reporter@timesgroup.co

The Times of India, Delhi dated July 01, 2014



Dwarka to get first 'zero waste' project

South Corpn Procures Land To Set Up Infrastructure, Crematorium For Small Animals

Risha Chitlangia | TNN

New Delhi: For Dwarka residents, sanitation has been a pending concern. Efforts and false starts notwithstanding, South Delhi Municipal Corporation has been unable to streamline the waste management system in the sub-city. But now the civic agency will implement its first 'zero waste' project here.

The waste generated in Dwarka will be managed in a way that none is dumped at the landfill. Two waste management sites, measuring four acres each, have been procured by the corporation in sectors 24 and 29 from Delhi Development Authority. At Sector 24, the civic agency will set up a green waste processing unit and a crematorium for small animals. A dry waste segregation facility will be built at Sector 29.

As part of the project, the civic agency will start door-to-door collection of garbage by ragpickers. An awareness programme will also be held with help of resident welfare associations to encourage people to segregate dry and wet waste at home ahead of handover. "The idea is to effectively dispose of the waste generated in

TO HANDLE TRASH BETTER

SOUTH CORPORATION'S ZERO-WASTE PROJECT AIMS TO MANAGE WASTE EFFECTIVELY

WHAT THE PROJECT WILL DO

- ▶ Wet and dry waste to be segregated at source
- ▶ Dry waste to be segregated at waste management centre and sent for recycling
- ▶ Ragpickers to be employed for door-to-door collection of waste
- ▶ Corporation to run programmes to educate people about benefits of segregating dry and wet waste

WASTE MANAGEMENT SITES

Four sites—two each in Dwarka and near Igrou. Dwarka sites (4-acre each) at Sectors 24 and 29 already with the corporation; yet to get possession of the sites near Igrou

DWARKA PLAN

- ▶ Corporation to set up a green waste processing unit—animal crematorium and segregation facilities
- ▶ Green (biodegradable) waste processing unit at Sector 24
- ▶ Green waste to be converted into compost and refuse-derived fuel (RDF)
- ▶ Crematorium for small animals; RDF to be used for their cremation

Segregation facility at Sec 29

- ▶ Sorting shed where dry waste like paper, plastic, glass etc to be segregated
- ▶ Bailing unit where dry waste to be bundled into compact units
- ▶ Parking space for cycle-rickshaws which to be used for waste collection
- ▶ A training centre



Sites in south Delhi to have a construction and demolition waste management plant, and a waste-to-energy plant

Number of garbage dumps under South Corporation	1,063	No. of safai karamcharis	24,000	Waste generation per week	14,000 METRIC TONNES
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order to bring down the load on landfills," Manish Gupta, commissioner, South Corporation, said.

At Sector 24's green waste

processing unit, the civic agency will set up a composting plant. "All wet waste will be processed into compost and the remaining converted into

RDF or refuse-derived fuel—to be used for cremating small animals in the nearby crematorium," Gupta said.

At Sector 29's dry waste

segregation facility, paper, glass and plastic will be separated and compressed into small shapes to be sent for recycling. "We will also open a

centre for training of ragpickers. They will be given uniforms. There will be a parking lot for cycle-rickshaws which will be provided by the civic agency for waste collection. We will also have a bio-methanization unit," Gupta said. "The corporation will float tenders for the two projects.

There are over 300 housing societies in Dwarka. At present, these have their own door-to-door waste collection. The waste is dumped in bins located outside each society. "These bins aren't regularly cleaned. There is a need to streamline the waste collection system. But the civic agency is just looking for a new project," Rajmon C K, vice-president of Dwarka Forum, said.

Officials admit that, despite outsourcing sanitation, waste is not being managed well right now. The corporation is, meanwhile, planning similar waste management projects in south Delhi, too. It will soon get two sites near IGNOU where it plans to set up a waste-to-energy plant and a construction-and-demolition waste unit. "With Okhla landfill crossing saturation point, we must look for ways to manage the waste," Gupta said.

The Economic Times, Delhi dated July 03, 2014

‘Environment Protection and Growth Can Go Hand in Hand’

Prakash Javadekar assures of bringing down clearance timeline

OUR BUREAU
NEW DELHI

Prakash Javadekar, who is the first environment minister to function out of offices in the new ecologically friendly Indira Pariyavaran Bhavan, is focusing his energies on improving the ministry's image. Javadekar, who doesn't want to get into blame game mode, says he will exorcise the environment ministry of its reputation, acquired in the UPA regime, as a "roadblock".

"I got a legacy in which the environment ministry was perceived as a roadblock ministry...a speed breaker to the growth. Therefore, after assuming charge I assured the people that we believe and our firm conviction is that both environment protection and growth can go hand in hand. My slogan is development without destruction. We care for mother earth. We care for nature. But we want development also. They are not foes they are friends. Decisions are in, delays are out", said Javadekar in an interaction with news agency PTI.

To this end, the government is working to reducing the time taken for environment and forest clearances as well as making processes more transparent. "We will bring down the timeline. For environment clearance, we have already kept two months. For forest clearance, there are two stages — terms of reference and final clearance. But we are setting timelines and there was a huge process of 200 days which also we can bring down. For every industry it is different but we will shorten the process without compromising quality. But by simplifying processes we

Speedy Clearance for 3,000-MW Arunachal Pradesh Hydro Project

OUR BUREAU
NEW DELHI

Environment minister Prakash Javadekar has assured the Arunachal Pradesh government that forest clearance for the 3,000 mw Dibang Hydropower Project in the state will be expedited.

Javadekar gave the assurance when Arunachal Pradesh CM Nabam Tuki met him in Delhi on Monday according to a communication from the CM's office.

The Forest Advisory Committee has rejected the project proposal on two occasions, most recently at its meeting in April. The statutory panel had rejected the project on the grounds that it would affect 4,577.84 hectares of biodiversity rich forest land and entail felling of 3.24 lakh trees. The panel's recommendation came despite the Cabinet Committee on Investment directing the environment ministry "to grant the requisite clearance for diversion of forest land expeditiously" for the project. Earlier, the forest panel had rejected the project when it came up for consideration in July last year.

can do in a shorter span of time," said Javadekar. The environment minister

said he is not interested in computing the exact extent of financial loss or the worth of the projects that were kept pending for clearance during the UPA government. Javadekar suggested the approach of his predecessors in the ministry had caused a "loss of face" to the nation as it was seen as "speed breaker" to development and foreign investors had started leaving the country. The minister said that has inherited thousands of pending files as legacy from the previous UPA government and the monetary damage it caused is "innumerable".

The environment minister's words will come as a welcome change to industry, which have often treated environmental rules and procedures as unnecessary and cumbersome. While many of the processes currently in place could be streamlined and made more effective, the minister's focus on clearance processes without commensurate attention to monitoring and effective implementation of laws does present a cause of concern.

Describing the monetary value of the cost to the country as a result of delays in clearances, Javadekar said, "It is innumerable. It can't be counted in rupees. It is the loss of face. The international investors started withdrawing from India only because of this. We don't want that to happen."

On alleged irregularities under his predecessors, Javadekar said he will do "due diligence" after some time but his first priority was to "deliver". He said priority was being given to clearing defence and public welfare projects like national highways, railways, ports, roads, airports and power transmission lines.

The Times of India, Delhi dated July 03, 2014

Nasa gets new eye in sky to track carbon pollution

Srinivas Laxman | TNN

In the first-ever mission of its kind which will make 24 measurements each second, Nasa on Tuesday launched a flight dedicated to studying atmospheric carbon dioxide, the leading human-produced gas driving changes in the earth's climate.

It will allow scientists to make daily detailed measurements of carbon dioxide at a global level amounting to nearly 100,000 measurements of the gas every day. To carry out the scientific study, the spacecraft will be positioned 704km above earth and the first science observations are expected to begin in 45 days after launch.

As the Delta 11 rocket carrying the spacecraft designated as OCO-2 (Orbiting Carbon Observatory) lifted off at 3.30pm (IST) at the Vandenberg Air Base in California, the launch commentator at the mission control centre declared: "OCO-2 will track a greenhouse gas driving changes in the earth's climate."

There was just a 30-second launch opportunity on Tuesday afternoon. Nasa explained that the timing had to be precise because OCO-2 will join a constellation of five other in-



A Nasa image shows Delta 11 rocket with the Orbiting Carbon Observatory-2 satellite being launched from Vandenberg Air Force Base, California, Wednesday

ternational earth observing satellites functioning close to each other and make simultaneous observations of the earth. Had OCO's launch been too early or late it would have missed the right track.

According to Nasa, the mission will produce the most detailed picture to date of natural sources of carbon dioxide as well as what is known as their "sinks" — places on earth's surface where CO2 is removed from the atmosphere. The observatory will study how these sources and "sinks" are distributed around the globe.

The Times of India, Delhi dated July 04, 2014



Three more solar plants at Metro stations

TIMES NEWS NETWORK

New Delhi: Delhi Metro will install three new solar power plants in its premises.

"This is a continuation of our policy to encourage eco friendly work practices and technologies," said DMRCspokesman, Anuj Dayal.

The three rooftop solar power plants, with a total capacity of 250kWp, will be installed at Anand Vihar and Pragati Maidan Metro stations and DMRC's residential complex at Pushp Vihar.

"The plants are expected to start production within the next six months. The power generated by these plants will be used for DMRC's operational requirements, which include station lighting and other loads," added Dayal.

The Times of India, Delhi dated July 04, 2014

Deccan Chronicle, Hyderabad dated July 05, 2014

Pollution control board told to find source of tar balls

TIMES NEWS NETWORK

New Delhi: The Goa government has asked its pollution control board to find out the source of the tar balls phenomenon on the state beaches. The board is also expected to recommend how to end this polluting menace.

"I have asked the State Pollution Control Board to study the real source of tar balls. We are studying how to dispense them off, how to ecologically get rid of them," Goa chief minister Manohar Parrikar said after his meeting with environment minister Prakash Javadekar.

The tar ball is an "annual phenomenon" which happens as many boats and big ships wash their tanks some 5-10 km off the Goa coast.

"Because of changing currents, they (discharged material) come to the shore," said Parrikar.

Asked whether he would take the Centre's help to deal with such aquatic pollutants, he said the state pollution control board was capable of handling the situation.

The TOI had highlighted the problem of tar balls, flagging how it was polluting Goa's beaches and affecting tourism in the state.

Senior Congress leader and Rajya Sabha member Shantaram Naik had recently asked the environment ministry to take steps to save Goa's beaches from tar balls. In a letter to Javadekar, he had said the government



The Goa gov't has asked the pollution control board to study the tar ball phenomenon and find ways to end the menace

'Will work on action plan for projects in eco sensitive areas'

Environment minister Prakash Javadekar on Thursday assured Goa chief minister Manohar Parrikar of getting an action plan to execute public purpose projects in the state's ecologically sensitive areas without violating rules, regulations and court orders. The assurance came when Parrikar raised issues arising from the ban of mining within a km of national parks and sanctuaries. TNN

should take steps to ensure that crude oil ships refrain from de-ballasting at sea.

Naik had said he raised the issue in Rajya Sabha some time back and his doubts came true that ships carrying crude oil cleaned their tanks off the Goa coast disregarding international norms.

Drug units pollute water bodies

SUDHEER GOUTHAM | DC HYDERABAD, JULY 4

Pollution of water bodies and other natural resources continues on the outskirts of the city with the State Pollution Control Board choosing to ignore rampant violation of environmental laws.

Sri Krishna Pharmaceutical in Uppal, and Neuland Pharmaceuticals, Jinnaram in Medak, were found to produce drugs four-six times more than the permitted limit. "Several million litres of effluents are produced. The drug companies have been found releasing the effluents in the storm-water drains in the wee hours," said K. Veera Reddy, an activist of the Maa Telangana Party, who had filed cases against the bulk drug industries.

Incidentally, both the com-



● Sri Krishna Pharmaceutical was found discharging the effluents clandestinely during the wee hours through a storm-water drain that is connected to the adjacent Musi river.

● The inspection report of Neuland Laboratories revealed that 13 of its products were 'un-consented'

panies were granted the 'consent for operation' (CFO) recently. According to the environmental activists, these companies were repeated violators of environmental laws.

Prior to granting the CFO, APPCB environmental engineer, Ranga Reddy district, in a report (the copy of which is with this newspaper) after inspecting Sri Krishna Pharmaceutical, had said that the industry

was operating without the consent of the Board and its earlier proposals were rejected several times. The report also said that it is permitted to produce Paracetamol and Domperidone Maleate. Though the company had consented to produce 1.88 lakh kg of Paracetamol, it was found producing 6.2 lakh kg. The unit was discharging the effluents clandestinely during the wee hours through a

storm-water drain that is connected to the adjacent Musi river.

Similarly, the inspection report of Neuland Laboratories said that the industry was found manufacturing 28 products, of which 13 products were "un-consented". Moreover, the company was generating effluents more than the permitted limit.

State Pollution Control Board member-secretary Sanjay Kumar said, "When the companies violate the norms, they are issued notices and a large amount of their bank guarantee, which in case of Neuland is ₹25 lakh, is forfeited."

However, environmentalists say otherwise. Jasveen Jairath of Save Our Urban Lakes says, "Drug industries are found releasing the effluents openly. Some are found releasing them in already dug borewells."

Deccan Chronicle, Hyderabad dated July 05, 2014

NATURAL GRASS CAN TREAT SEWAGE WATER, SAY SCIENTISTS

DC CORRESPONDENT HYDERABAD, JULY 4

Forget the complicated sewage treatment plants (STP); simple grass can actually purify sewage water: Scientists have found that wetlands grown with para grass and elephant grass can remove nitrates and sulphates, the two major pollutants of sewage water, when water is

retained in them for a certain period.

With this finding, Dr Shakeel Ahmed, team leader of researchers from the Indo French Centre for Groundwater Research (IFCGR) at the National Geophysical Research Institute (NGRI) suggested that small wetlands with para grass and elephant grass can be used as mini STPs.

The Economic Times, Delhi dated July 07, 2014

W Bank to Invest \$775 M in Clean Energy

HIGH-POWER BOOST Fund helps middle-income countries explore options for scaling up projects in renewable sector

SHUCHI SRIVASTAVA MUMBAI

The World Bank plans to invest \$775 million in clean-energy projects across India, even as it expects that the new government's plan to give fiscal and policy support to the sector will galvanise further investment in renewable energy.

"The support shown by the new government towards clean energy is quite encouraging and is expected to give the much-needed push to the sector and unlock pending investments," said Ashish Khanna, lead energy specialist at the multilateral funding institution.

"The World Bank is ready to partner with the government in scaling

up sustainable clean energy investments."

Minister for Power, Coal and Renewable Energy Piyush Goyal recently said that the potential and scope of renewable sources were a part of the government's vision for ensuring energy security.

Narendra Taneja, national convener of the BJP's energy cell, told ET earlier that the ruling party "strongly believe that renewable energy will play a pivotal role in bringing power to every household in the country".

India's clean-energy sector has attracted interest of international investors.

Recently, companies such as Welspun Energy and Renew Power saw investment from General Elec-

Attracting International Interest

World Bank to invest in:

\$100 million in Himachal Pradesh development policy loan



\$200 million in RAJ renewable energy transmission investment programme by ADB

ADB invested \$50 million in Welspun Renewables Energy (WREL)



Goldman Sachs pumped in \$70 million into ReNew Power

tric, Asian Development Bank and Goldman Sachs.

Gevorg Sargsyan, programme manager for climate investment fund at the bank, said it had approved two projects for investment

– a \$100 million Himachal Pradesh development policy loan and the \$200 million Rajasthan renewable energy transmission investment programme implemented by the Asian Development Bank.

According to the World Bank, the climate investment fund provides middle-income countries with highly concessional resources to explore options to scale up the demonstration, deployment and transfer of low-carbon technologies in renewable energy, energy efficiency as well as sustainable transport.

India has substantially increased its share of clean-energy projects, said Khanna.

But, in order to achieve the targets of its own national solar mission, the government must provide long-term clarity in policy, regulations and financial support mechanisms and encourage sustained commercial lending from financial institutions, he added.

The Times of India, Delhi dated July 07, 2014

Centre readies ₹14k cr subsidy for green cars

Sidhartha | TNN

New Delhi: Buying a hybrid or an electric car may soon fetch you a subsidy from the government, which is readying a Rs 14,000-crore scheme to push green vehicles.

The subsidy will be a proportion of the difference between the price of a car running on fossil fuel and that of a green vehicle, said sources involved with the discussions.

The heavy industry ministry, which has moved a proposal for clearance by the finance ministry, has suggested the maximum subsidy of 35% should be given to pure electric vehicles, and a 25% benefit to plug-in cars that can drive

FUEL SAVER

- ▶ Maximum subsidy of 35% to pure electric vehicles
- ▶ Pure hybrids to get 25% subsidy, mild versions 15%
- ▶ Fossil fuel saving estimated at ₹60,000cr in 6 yrs
- ▶ Issue features in PM ModI's 100-day work agenda

for at least 15km at one go. The purchase of mild hybrids will fetch you a 15% subsidy; a stronger version will get a 25% benefit. Currently, only a handful of hybrid models are available in India.

▶ ₹60 cr fuel savings, P 15

Govt's green car push may save ₹60k cr

▶ Continued from P1

The models include the Scorpio from the M&M stable, Toyota Prius, Toyota Camry in addition to electric vehicles such as Mahindra e2o.

If the ministry's proposal goes through, the government will, for instance, provide a subsidy of around Rs 1 lakh on the purchase of a hybrid Toyota Camry, which costs around

Rs 33 lakh in Delhi, while the one running on petrol is priced at Rs 28 lakh.

The government is hoping that the subsidy, which will be routed through auto companies and will result in a reduction in prices, will encourage more Indians to shift to green energy. Although the scheme is expected to cost the exchequer Rs 14,000 crore till 2020, savings in fossil fuel usage has been estimated at Rs 60,000 crore over

a six year period, said an official.

Several countries such as the UK, China, Germany and some states in the US and Canada had introduced sops, including subsidies and tax benefits, to promote electric vehicles.

Although the government discussed the plan in the past, it has failed to move on the proposal. It is only now that the heavy industry ministry has sent the proposal to the expenditure

finance committee headed by the expenditure secretary. Sources said the ministry has also included the issue in its 100-day work programme submitted to prime minister Narendra Modi.

"The entire process, which will include cabinet approval, should take around two to three months," said an official. But he refused to put any timeline on when the subsidy scheme will be in place.

Air quality takes a hit on capital's borders

Polluting Industries, Population Rise & Construction Hurting Satellite Towns: US Study

Jayashree Nandi | TNN

New Delhi: Delhi's air pollution measures like introducing compressed natural gas, building the Metro and moving polluting industries outside city limits have been praised universally. But evidence has now emerged that, since these interventions, areas bordering the city have been experiencing very poor air quality.

As polluting industries, built-up area and population over there rises, satellite towns of Delhi may be silently bearing the brunt of the resulting increase in air pollution.

A study of satellite-based aerosol optical depth data by scientists at division of environmental health in department of public health sciences at University of Miami and NASA has found that Gurgaon, Noida and Faridabad borders saw a significant deterioration in air quality

after 2002.

AOD—the degree to which aerosols (airborne solid and liquid particles) prevent transmission of light in an area—is also considered an indirect proxy for air quality. Naresh Kumar, associate professor at University of Miami, who has authored the study, has correlated land use change in Delhi and surrounding areas between 2000 and 2004 with rate of increase in AOD.

Overall, AOD in the study area was 6.7 times higher than many less polluted areas of United States. Areas outside Delhi experienced 1.7% higher increase in AOD between 2000 and 2004 as compared to parts of central Delhi. "After the interventions, rate of increase of AOD increased rapidly with increase in distance from the city centre," the study found. Rise in AOD was about 2.5% within 10km from the city centre while areas more than 50km away from the city recorded a 6.5% increase in

ALARMING TREND

- ▶ A study has found significant deterioration in air quality after 2002 in bordering areas of Delhi
- ▶ It was done by division of environmental health, department of public health sciences, University of Miami, and NASA
- ▶ The study used satellite-based aerosol optical depth mapping
- ▶ Gurgaon, Faridabad, Ghaziabad, Noida and Bahadurgarh were found to have high AOD
- ▶ After 2002 a lot of polluting industries were relocated here and built-up area increased
- ▶ Unlike Delhi where CNG was introduced and industries moved out, there



were no interventions here to deal with air pollution

- ▶ Lack of uniform policy interventions is likely to result in disproportionate distribution of air pollutants, the study concludes
- ▶ The authors call policy makers' attention to checking unabated rise in air pollution in areas outside Delhi

AOD, suggesting a jump in aerosol loading from anthropogenic sources.

Unlike Delhi, there has been no intervention in the bordering areas to deal with

air pollution. Most of these places don't even have air quality monitoring stations.

The air pollution interventions in Delhi led to registration of 1,00,000 CNG vehicles. More than 25,000 industries that were previously in Delhi—in three industrial areas—have relocated to peripheral areas.

There was also a massive increase in population here. Districts bordering Delhi experienced 1.5-3 times higher population growth than Delhi between 2001 and 2011. Population growth in Gurgaon was 73% as compared to 20% in Delhi. This had a trickle-down effect in peripheral areas. Add to this the effects of increase in built-up area and deforestation.

"Our study suggests an intensifying burden of air pollution with increase in distance from the city centre—especially in eastern, southern and southwest parts of Delhi," says the study

"This calls for policy makers' attention to checking the unabated increase in air pollution in areas outside Delhi. An important lesson we learn from this research is that the lack of uniform policy interventions is likely to result in disproportionate distribution of emission sources and hence air pollution."

Experts have raised these concerns earlier. Environmentalists in Delhi have been demanding all NCR be treated as a single airshed so that there is uniform impact of the government's air pollution interventions.

Kumar feels "there is an urgent need to quantify the burden of morbidity and mortality associated with air pollution, and develop effective air quality management strategies to combat air pollution in the world's most polluted city. PM2.5 concentration in and around Delhi is 6 to 12 times higher than WHO standards, depending on location."

The Economic Times, Delhi dated July 09, 2014

FOREST COVER CONTINUES TO HOLD STEADY

Govt Mulls Harvesting Degraded Forests

The total area under forest cover now stands at 697,888 sq km of geographical area, an increase of almost 1% over 2011

OUR BUREAU NEW DELHI

India's forest cover continues to hold steady at 21% of the country's geographical area despite pressure from increasing population, urbanisation and industrial use, and increased demand for cattle grazing, according to government survey.

While total forest cover remains stable, there has been an increase of nearly 3% in open forest area, which has the lowest tree canopy density. The government plans to "harvest forests" in these areas and in degraded forests which are classified as scrub.

"The total forest cover has increased by a little less than 1% between 2011 and 2013, according to the India State of the Forest Report 2013, a biennial report prepared by the Forest Survey of India.

The total area under forest cover now stands at 697,888 sq km, or 21.23% of the geographical area, compared to 692,027 sq km in 2011. Environment Minister Prakash Javedkar, who released the report on Tuesday, said the 8% degraded forests in India present many possibilities in a country that imports wood. "So in areas with degraded forests, we can harvest forests—in the total area we could earmark a portion, say 20%, for livelihood use of the local

Green Findings

- AREA COVERED BY VERY DENSE forests with tree canopy density of 70% or more rose by just 31 sq km
- SIZABLE DECLINE of moderately dense forests by 1,221 sq km or 0.62%
- TOTAL FOREST COVER has increased by less than 1% between 2011 and 2013
- SUBSTANTIAL INCREASE in open forests, which have tree canopy density of more than 10%

people and the remaining 80% area could be for harvesting forests," he said. "This would have the benefit of creating jobs as well as increasing the forest cover."

The minister declined to give any details of the plan, citing the ongoing session of Parliament. Forest officials said they were not displeased with the findings, especially since the pressure on forest areas has been on the rise.

The area covered by very dense forests—with tree canopy density of 70% or more—rose by just 31 sq km. However, there has been a sizeable decline of moderately dense forests—by 1,221 sq km, or 0.62%—and a substantial increase in open forests, which have tree canopy density of more than 10% and less than 40%. These developments could be seen as possible causes of concern.

Tree canopy density refers to a measurement that compares the amount of sunlight above the trees with the amount near the surface. The Status of Forest Report, which is in the nature of a survey, doesn't draw any conclusions. But an analysis of the loss of 1,257 sq km of forests across 13 states makes it clear that agricultural cultivation practices,

mining, and other developmental activities have contributed to the loss of forests. The loss is most marked in the North Eastern region, with Nagaland (274 sq km) leading the pack, followed by Tripura (111 sq km), Manipur (100 sq km), Arunachal Pradesh (89 sq km) and Mizoram (63 sq km).

The loss, according to the report, is largely on account of shifting cultivation practices and shortening of cultivation cycle.

A sizeable loss in forest cover has been registered in Andhra Pradesh (273 sq km), Madhya Pradesh (178 sq km), Karnataka (62 sq km) and Chhattisgarh (53 sq km). In these states, the decline has been attributed to mining activities, encroachments, developmental activities and rotational felling of trees.

The survey reports an increase of 7,128 sq km of forest cover, the bulk of this on account of plantation activities outside the recorded forest areas—areas described as forests in government records. West Bengal leads the list with an increase of 3,610 sq km of forest cover. Other states with sizeable increase include Odisha, Kerala, Jharkhand, Bihar and Tamil Nadu.

The Economic Times, Delhi dated July 09, 2014

Multilateral Collaboration on Climate Change Must



TK Arun

Jeffrey Sachs is in India to launch the India chapter of the UN's Sustainable Development Solution Network. The year 2015 will see three big conferences, in July in Addis Ababa on financing development, in September at the UN in New York to decide the new sustainable development goals that would not so much substitute as subsume the Millennium Development Goals; and in December, in Paris, on climate change. Sachs is deeply involved in all three and passionately. He argued, when ET caught up with him on Saturday, that the three are interdependent and seek achievable goals.

Jeffrey Sachs, director of the Earth Institute at Columbia University, is, for some, Jekyll and Hyde combined. In the early '90, when he advised Poland, Slovenia, Estonia and Russia on transition from the command and control economies of the newly-shed Soviet past, he was all for big bang market-oriented reforms. But he is all for state action when it comes to

development, poverty removal and climate change mitigation. Does this amount to a split personality?

Sachs dismissed any notion of schizophrenia. The state and the market play complementary roles, he said: private investment in an enterprise in a locality would not be possible if public investment has not created roads to connect that locality to the rest of the world. Apart from infrastructure, he counts health and education as other areas where the state has to play a big role.

In healthcare, is the government's role to buy insurance for everyone? Sachs laughs this out of court. Insurance is the path to ruin that the US took, where healthcare expenditure accounts for 17% of GDP. He would like to see the state provide health assurance, play the role of care provider, on the lines of Britain's National Health Service. Health minister Harsh Vardhan would do well to pay heed to Sachs' caution before he commits himself to dedicating the Union health budget to insurance cover for the masses and sex education, of course, without vulgarity.

Sachs is used to being caricatured as a one-handed economist. The three primary factors that explain development or the lack of it? Location, location and location! The way to end poverty? Aid, aid and yet more aid. Sachs smiles disarmingly. Yes, geography certainly plays a role

in how countries fare. Of the ex-Soviet satellites, those that are closer to Western Europe tend to fare better. And Africa, the fastest growing large region in the world today, gained that state because of aid, state investment in education, healthcare and education, and he puts this at number three - engagement with China for resource export and import of capital.

Diagnosis is the key thing in economics, says Sachs. There is no one cure for all problems, depending on the problem at hand, you have to identify the right solution.

Sachs is a big votary of coordinated action by countries to arrest climate change, that is, restrict global warming below an incremental 2°C (two degrees Celsius). But instead of waxing eloquent on the need to act, he has something more concrete to offer. A large, multi-government science and technology project to develop various options that could slash carbon emissions: carbon capture and sequestration, clean coal technologies, solar energy, nuclear power.

"When I hear experts on a particular subject like carbon capture espouse an entire range of opinions spanning the

spectrum from derisive dismissal to passionate advocacy, I conclude that they just don't know. And they don't know because a serious effort to find out its viability and veracity has not been undertaken. Making that effort should be at the core of climate change efforts."

And he does not believe that this should be the responsibility of any single country or single group of countries. We need multilateral collaboration.

One area where such collaboration is needed is in identifying ways to channel the world's huge savings to those areas where they will produce maximum economic benefit. He does not believe that the Chinese should reduce their savings. The point is to create mechanisms to deploy these savings in sound, sensible activities, complete with credible reporting systems and mechanisms that ensure fiduciary responsibility. The UN and other multilateral organisations should apply themselves to this task.

Sachs retains enough sense of humour to deprecate the organisation's penchant for lengthy lists of goals and self-referential declarations that make little sense to those outside the system. For example, he rues that the sustainable development goals currently number 17. That's more than I can remember, he says. Bring it down to 10 and there's a chance that I'll be able to remember them.

Simplifying things so that they lend themselves to constructive action comes naturally to Jeffrey Sachs

The Times of India, Delhi dated July 09, 2014

India's green cover grows 5,871 sq km in 2 yrs

Vishwa.Mohan@timesgroup.com

New Delhi: India recorded an increase of 5,871 sq km in its forest cover in the past two years with West Bengal contributing over 60% of the total rise in green area.

Odisha, Kerala, Jharkhand and Bihar were some of the other states which contributed to this marginal increase. Hilly and tribal districts of the country registered an increase in forest cover of 40 sq km and 2,396 sq km, respectively.

The northeastern states, which account for one-fourth of the country's forest cover, recorded a net decline of 627 sq km in 2013 compared to the assessment of green cover in 2011. Among bigger states, Andhra Pradesh lost the maximum 273 sq

21% OF COUNTRY IS FOREST AREA

Country's forest cover 697,898 sq km (21.23% of country's geographical area)	Tree cover (outside forest area that includes urban green patches) 91,266 sq km (2.78% of geographical area)	Total forest & tree cover 789,164 sq km (24.01% of geographical area)
<ul style="list-style-type: none"> ► There is a net increase of 5,871 sq km in forest cover in 2013 compared to 2011 Total increase - 7,128 sq km Total loss - 1,257 sq km 	<ul style="list-style-type: none"> ► Maximum increase in forest cover 1. West Bengal (3,810 sq km) 2. Odisha (1,444 sq km) 3. Kerala (622 sq km) 	

► Northeastern states, which account for one-fourth of India's forest cover, report net decline of 627 sq km

km of forest cover whereas Madhya Pradesh lost 178 sq km of green patch in two years.

These facts emerged out of the latest 'India State of Forest Report'

(ISFR), which was released on Tuesday by environment and forests minister Prakash Javadekar.

Though India continues to be far behind its target of having 33%

of its geographical area under forest, the marginal increase is a positive sign.

Javadekar said, "Decline of forest cover in our northeastern states is, however, a matter of concern. We should not allow this to happen."

Assuring that his government would work hard to further increase the forest cover, he said, "We will make it a mass movement where people would come forward to not only protect the existing green cover but also plant more and more trees across the country."

While there is an increase in total forest cover in the country, there is a decrease in the 'growing stock' both inside and outside forest area. This along with decline in forest cover in northeastern states is also

a matter of concern.

The report said even in the 'moderately dense' forest section, the net change in forest cover between 2011 and 2013 assessments shows a decline of 0.62%.

Forest Survey of India (kFSI) has been assessing the forest and tree resources of the country on a biennial basis since 1987.

The results of the assessment are published in its ISFR. Although survey is primarily based on satellite data and its authenticity is widely debated, the FSI director general Anmol Kumar on Tuesday claimed, "The satellite interpretation is followed by extensive and rigorous ground truthing."

For the full report, log on to www.timesofindia.com

The Times of India, Delhi dated July 10, 2014

Sand may power mobiles in future

Washington: Imagine if you only had to charge your cellphone or tablet every three days? A new sand-based battery may make it possible. Scientists have used sand to create a lithium ion battery that outperforms the current industry standard by three times.

"This is the holy grail — a low cost, non-toxic, environmentally friendly way to produce high performance lithium ion battery anodes," said Zachary Favors, a graduate student working with Cengiz Ozkan and Mihri Ozkan, both engineering professors at University of California, Riverside's Bourns College of Engineering.

Graphite is the current standard material for the anode, but as

electronics have become more powerful graphite's ability to be improved has been virtually tapped out. Researchers are now focused on using silicon at the nanoscale, or billionths of a metre, level as a replacement for graphite. The problem with nanoscale silicon is that it

GREEN BATTERY

degrades quickly and is hard to produce in large quantities.

Favors researched sand to find a spot in the US where it is found with a high percentage of quartz. That took him to the Cedar Creek Reservoir, east of Dallas. He came back to the lab at UC Riverside and milled the sand down to the nanometre

scale, followed by a series of purification steps changing its colour from brown to bright white, similar in colour and texture to powdered sugar. After that, he ground salt and magnesium, both common elements found dissolved in sea water into the purified quartz. The resulting powder was then heated. With the salt acting as a heat absorber, the magnesium worked to remove the oxygen from the quartz, resulting in pure silicon.

The pure nano-silicon formed in a very porous 3-D silicon sponge like consistency. That porosity has proved to be the key to improving the performance of the batteries built with the nano-silicon, researchers said. □

The Times of India, Delhi dated July 10, 2014

Trains for Metro lines 7 & 8 will be driverless, more energy-efficient, colourful and comfortable

Faster, greener trains for new lines

Rumu Banerjee@timesgroup.com

New Delhi: Travelling in Delhi Metro's Phase III will be a faster, brighter and more comfortable experience with new trains that will be more energy-efficient and eco-friendly.

"These trains will be 10% more efficient than the existing trains, as well as faster," said HS Anand, director, rolling stock, Delhi Metro Rail Corporation (DMRC). He said the trains will be more energy-efficient due to features like better regeneration of energy during braking. "Sub-systems like LED lighting and more energy-efficient air-conditioning will add

to the green aspect," said Anand. With better acceleration and deceleration systems in place, the trains will also run faster. "At present, Phase II trains run at an average speed of 32kmph. Lines 7 and 8 will run at average speeds of 35kmph," said Anand.

The new trains will be driverless and the space created by removing the driver cabin will be available for passengers. "Commuters will be looking straight out on to the track," said Anand. However, in the first year of operations, the trains will have a temporary partition for drivers.

The trains will be painted in the line colours—for instance, the Brown Line (Mukundpur-Shiv Vihar) will have trains



The trains will run with a driver for the first year. Front of the first coach will be glass-covered

with brown stripes. For passenger comfort, there will be back support along the glass panels at the ends of a row of seats, more grab rails and modified grab poles.

The trains made by Hyundai ROTEM are being sourced from South Korea. Anand said, "The first train will be inducted in May 2015 in Mukundpur. Twenty trains will come from South Korea while the rest of the 61 trains will be manufactured in Bangalore." Delhi Metro will induct four trains (of six coaches each) in each corridor. The cost of each coach is Rs 8.5 crore. Delhi Metro had paid Rs 7.28 crore per coach when it purchased them in 2007 from Bombardier.

Metro will introduce new trains on corridors 7 (Mukundpur-Shiv Vihar) and 8 (Janakpuri West-Botanical Garden) in Phase III

Two lines are **58.46km & 36.58km** long, respectively, and have standard gauge tracks

Line 7 or Brown Line will have **36 stations**

Line 8 or Magenta Line will have **25 stations**

► Will have CCTV at the front

► Train will have stripes of the line colour



EACH COACH TO COST **₹ 8.5 crore**

WHAT'S NEW

- Made by Hyundai ROTEM
- 10% more efficient than existing trains
- Improved energy efficiency in terms of regeneration during braking as well as more efficient sub-systems like LED lighting, airconditioning
- Because of better acceleration and deceleration features, will run faster than the current average of 32kmph
- Will run at an average of 35kmph; will save 12 minutes on the 56km journey
- Will have a different evacuation system
- First train will be inducted in May 2015 in Mukundpur
- 20 trains will come from South Korea; 61 to be manufactured in Bangalore
- Metro will induct four six-coach trains in each corridor

EXTERNAL FEATURES



2 There will be back support along the glass panel near seats, more grab rails and grab poles



3 There will be support for those standing in front of seats and cable cubicles under seats to create more space



4 Seats to be coloured, support for cycles, wheelchairs and 37-inch LCD display inside coaches



5 Ladies coach will have direct view of the tracks. There will also be more space as driver cubicle gone

The Times of India, Delhi dated July 10, 2014

Experts fret about forest survey report

Slight Rise In 'Open' Category, But Dense Forest Not Increasing

rajastree.nandhi@timesgroup.com

New Delhi: There is little to cheer about Forest Survey of India's report that has revealed a marginal increase of 3.61 square kilometres in the forest cover of the city.

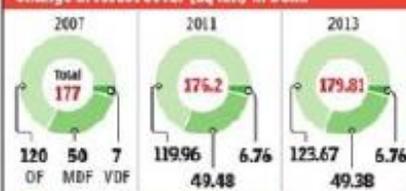
A finer reading of the data shows Delhi's forest cover has only increased slightly in the 'open forest' category. These are forests of less than 40% canopy density which are most likely to be urban parks, very young plantations or even invasive species having little ecological value. The carbon sequestration and pollution countering capacity of these 'forests' is half or a third of that of dense, good quality forests.

What is worrying is that the moderately dense forests—with a canopy density over 40% or, in simpler terms, broad canopy cover—have been decreasing consistently since 2003 when it was 52 sqkm. It measures 49.38 sqkm now. Experts have raised doubts about Delhi's afforestation programmes over the past decades that should have added to the dense or moderately dense categories.

"These open forests could be *Prosopis juliflora* or Vilayati keekar, an invasive species

HOW GREEN IS YOUR CITY

Change in forest cover (sq km) in Delhi



VDF | Very dense forest—Land with tree canopy density of 70% and above
MDF | Moderately dense forest—Land with tree canopy density of 40% and more but less than 70%
OF | Open forest—Land with tree canopy density of 10% and more but less than 40%
Scrub | Degraded forest land with canopy density less than 10%. In Delhi, it's just 0.7 sq km

Geographical area of national capital territory of Delhi: 1,483 sq km



District-wise cover (sq km) in 2013

Districts	VDF	MDF	OF
Central	0	2.2	2.3
East	0	1.1	1.9
Northeast	0	1.1	2.9
Northwest	0.1	7.4	9.0
New Delhi	1.7	5.5	9.1
North	0	3.0	1.3
Southwest	2.4	12.6	29.7
South	2.6	13.6	62.8
West	0	2.8	3.5

with no ecological value. So there is clearly nothing to cheer about," said Pradip Krishen who has authored books on the trees of Delhi.

Very dense forest is also reducing slowly since 2007. Before 2005, there was none in Delhi, according to FSI reports. A study by the Bangalore-based Indian Institute of Science published in Current Science journal recently high-

lighted that FSI has been 'over-reporting' forest cover data because of the ambiguous definition of forest that it follows. FSI defines forest cover to be "all lands more than one hectare, with tree canopy density over 10%, irrespective of ownership and legal status".

This definition could well mean that man-made forests, monocultures and spots like Lodi Garden are forests.

"The data could mean area under parks is going up in certain parts or that there are young plantations," said Prof. N H Ravindranath of IISc, Delhi, with its poor air quality has 76 sqkm of reserved forests and 7 sqkm of protected forests.

A forest department official denied that dense forests are decreasing. "Most of Delhi's forests are scrub forests. So they look open," he said.

Ggn loses acres of green cover

Dipak.Dash@timesgroup.com

New Delhi: Between 2008 and 2012, there was marginal increase in forest cover in NCR districts except Delhi despite all talk by different agencies undertaking plantation drives. While only two districts—Ghaziabad and Gautam Budh Nagar—added 2 sq km (480 acres) of forest area, an equal area of forest vanished in Gurgaon, according to the latest India State of Forest Report 2013 published by Forest Survey of India.

There was no such change in the case of Faridabad. Among all NCR districts, Gurgaon has a maximum of 8.28% of its total geographical area under forest cover. While 4.32% of Faridabad's total geographical area falls under forest, in Ghaziabad it's less than 2%.

The comparison of the forest reports of 2011 and 2013 shows that the change in forest area in case of the three NCR districts—Gurgaon, Ghaziabad and Gautam Budh Nagar—was only in the 'open forest' category.

"It's worrying. We have lost

480 acres of forest cover in Gurgaon despite significant efforts by all stakeholders. Therefore, all existing forest cover should be accorded permanent protection as deemed forest, reserved forest, conservation reserve, etc.," said environment analyst Chetan Agrawal.

He added that there is no clear picture of how much forest exists within Gurgaon city

Gurgaon has a maximum of 8.28% of its total geographical area under forest cover. While 4.32% of Faridabad's total area is forest, in Ghaziabad it's less than 2%

limits. On reduction of forest cover in Haryana, the forest report says, "The decrease in forest cover is largely confined to areas outside recorded forests. The main reasons are tree felling in agro-forestry areas and also for development activities like construction and widening of roads and building residential complexes in non-forest areas."

Deccan Chronicle, Hyderabad dated July 10, 2014

BRIGHT | FUTURE ■ Parks take up 5-point programme, sign letters of intent with state IT parks, SEZs to get a green retrofit

AMRITA DIDYALA | DC HYDERABAD, JULY 9

IT Parks and Special Economic Zones in the city will be upgraded (retrofitted) to world class standards by introducing concepts of green buildings, cycling to work, increasing green cover, waste and water management apart from making the IT parks barrier free for usage of

physically disabled people. Retrofitting of all IT parks will be taken up by the state government in partnership with multiple agencies.

IT minister of Telangana K.T. Rama Rao launched the five-point programme for retrofitting the IT parks on Wednesday.

The Cyberabad Police Commissionerate will be the first government building to take up the five-point

Green bytes

● Telangana will see 200 crore saplings planted over the next three years to increase green cover to 33 per cent

● Cycling zone to come up between the ORR and the adjoining service road

retrofiting measures in a bid to bag the green tag and

go for a green certification from GIZ, Germany.

Five IT Parks — Phoenix India, TSI Waverock, Divyashree, Ilabs and Tech Mahindra — will take up the five-point retrofitting programme and have signed letters of intent with the state government. The IT minister has announced ₹5 lakh support to each for appointing consultants to advise on the retrofitting.

"The idea is simple. We want to go so green that we want other metros to go green with envy. The five-point programme includes green building, safe disposal of electronic waste, accessibility for physically challenged people and the concept of cycling to work," said Mr Rama Rao.

■ Page 5: T to get help in retrofitting of IT parks

The Times of India, Delhi dated July 12, 2014

ENVIRONMENT

A WHO study has shown that Delhi has the highest particulate matter, 2.5 microns in diameter, among 1600



8 cities. These can invade lungs and cause serious health complications. Their main source — transport emissions. Travel trips are likely to double by 2020 and air pollution is likely to peak. A CSE study shows that PM10 (coarse particles) increased by about 75% between 2007 and 2011, on the back of a 37% increase in vehicular population, from 54 lakh to about 74 lakh. Between 2011 and 2014, vehicular emissions increased by another 15-20%. Rainwater harvesting in areas with declining groundwater levels is yet to pick up.

The Economic Times, Delhi dated July 14, 2014

Green Ministers to Talk Climate in Berlin, Chalk out Global Pact

Discussion will focus on long-term goals, national contributions to mitigate harmful effects of climate change

URMIA GOSWAMI
NEW DELHI

Environment ministers and their representatives from 29 countries representing the entire spectrum of interests in climate negotiations will meet in Berlin for two days starting July 14 even as increasing instances of unprecedented heat waves and cold winters illuminate the urgent need for a global plan to counter climate change.

The meeting in Berlin, Petersberg Climate Dialogue, is an informal ministerial gathering that is hoped to build on the discussions on climate finance, national contributions and long-term goals at a meeting of the Major Economies Forum in Paris on July 11 and 12. This is the fifth edition of the Berlin gathering, which has become a regular on the climate change annual calendar.

It will focus on the features of the 2015 global agreement to be finalised in Paris in December next year as well as the key deliverables from the Lima round of the climate negotiations under the aegis of United Nations Framework Convention on Climate Change to be held later this year.

All eyes will be on host German Chancellor Angela Merkel, who played an impor-

tant role in clinching the Kyoto Protocol, the only legally binding climate agreement, in 1997. It is expected that the indications Merkel gives in terms of Germany's engagement with the climate change negotiations could help breaking the logjam over climate talks.

In the past four rounds, Petersberg Dialogue has sought to address and create a modicum of consensus on politically contentious issues that have impeded progress in the formal negotiations.

Two major issues that are on the agenda is a discussion on "intended nationally determined contributions" and efforts to reduce carbon emissions in the period before 2020 when the new agreement is scheduled to come into force. The dialogue is expected to attempt a political consensus on the contours of the "intended nationally determined contributions", a compromise term coined during the Warsaw round of negotiations. There is no clarity what these contributions refer to, and neither is there any resolution on how the differentiation between developed and developing countries will be reflected in these "contributions".

The rich industrialised countries have focused on emission reduction, known in cli-

Finding a Middle Path for Green Issues

ENVIRONMENT MINISTERS and their representatives from 29 countries will meet in Berlin for two days, starting July 14 to discuss climate issues

GERMAN CHANCELLOR Angela Merkel to play key role in bringing consensus on politically contentious issues

MAJOR ISSUES on agenda will be discussion on intended nationally determined contributions & efforts to reduce carbon emission

INDIA ARGUES emission reduction isn't possible without the support of developed countries in terms of technology transfer and funds

mate parlance as mitigation, while developing countries argue that a focus on mitigation would cover efforts to adapt to climate change (referred to as adaptation), funds to deal with climate change, support in terms of capacity building and technology transfer.

India has already made it clear that meaningful emission reduction efforts by developing countries would require industrialised countries to make substantial contributions to the Green Climate Fund by 2015.

At the meeting of the Major Economies Forum held in Paris, environment minister Prakash Javadekar had said, "The probability of many developing countries submitting their INDCs will be very low if the developed countries do not commit substantial amount of climate finance upfront before September 2014 to fund the requirements likely to be depicted in the intended nationally determined contributions and bring it to the notice of the heads of state of the developing countries."

The Berlin meeting will also attempt to identify issues that can be dealt with conclusively at Lima, which will host the year-end UN-sponsored negotiations, which is seen as the stepping stone to the Paris agreement.

The Times of India, Delhi dated July 14, 2014

NCR greens eroding at alarming rate

Board Maps Eco Zones From 1999 To 2012, Sends Notices For Violating Plan

Dipak.Dash@timesgroup.com

New Delhi: Between 1999 and 2012, there has been an alarming depletion of Natural Conservation Zones—forest, water bodies and wasteland—in the NCR. In Delhi, waterbodies shrunk by 22.6%, forests by 15% and wasteland by 11%, while in NCR, the maximum reduction in such areas was 55% in Gautam Budh Nagar.

After compiling the wide variations in NCZs, the NCR Planning Board (NCRPB) has asked Delhi, Haryana, Uttar Pradesh and Rajasthan governments to respond why they failed despite these areas being marked in the 2005 Regional Plan.

The notices were issued after superimposing the latest satellite images on the regional map that was notified in 2005, sources said. "This is the first time NCRPB has sent notices to hold authorities accountable for failing to enforce the plan. What is the point of having a plan if states don't abide by it?" asked a government official.

DEPLETING COVER

Decrease in Natural Conservation Zones (in hectares)			
DELHI	2005	2012	% change
Forest	7008.7	5910.3	-15.7
Wasteland	5474.4	4849.1	-11.4
Water bodies	2909.7	2250.9	-22.6



While the overall reduction in NCZs in Delhi is only -15.43%, the loss has been maximum with regard to water bodies which are crucial for a water deficient city. According to NCRPB, the NCZs have depleted in areas including Bawana, Asola, Mandi, Puth Khurd, Alipur, Burari, Mehrauli and Aya Nagar. NCRPB has mentioned specific areas with evidences.

In NCR, the maximum fall

in NCZs was detected in Uttar Pradesh at 44%. Out of the five districts, Gautam Budh Nagar has the worst record, Bulandshahr and Ghaziabad-Hapur have also fared badly to protect NCZs. Construction activities across the region seem to have dented green zones, a central government official said.

In Haryana, the decrease in areas falling under NCZ is maximum in Rohtak at 51%

while in Sonapat it is 45.6% and 43% in Jhajjar.

However, in Gurgaon 99% the NCZs have not been touched yet, though the state government has been pushing for more real estate activities in Aravalis. "The SC order against mining and vigilant green activists in Gurgaon have contributed to this," said a forest department official.

But in the neighbouring

UTTAR PRADESH			
Districts	2005	2012	% change
Baghpat	6248.5	3772.3	-39.6
Bulandshahr	29385.6	16318	-44.5
G B Nagar	17755.4	7887.6	-55.6
Ghaziabad-Hapur	10665.7	5938	-44.3
Meerut	21684.1	14202.2	-34.5
HARYANA			
Faridabad	15401.5	11400.9	-26
Jhajjar	12661.9	7214.1	-43.03
Palwal	8181	5177.7	-36.7
Rohtak	10294.9	5064.6	-50.8
Sonipat	15837.7	8575.7	-45.9

Faridabad district almost one-fourth of such critical green zones has depleted. Sources said NCRPB secretariat has pointed out how in 20 cases out of 45 NCZs in Haryana built up areas have been noticed.

The situation is no better in Alwar district in Rajasthan, which also falls under NCR. While the overall percentage change in the NCZ between 1999 and 2005 is about -11%, there is an alarming decrease of water bodies. It's about 59% in this arid district.

"We need to protect all Natural Conservation Zones, which are crucial for the sustainability of the entire region which has become the second largest urban area in the world. Urban development minister Venkaiah Naidu has already emphasized the need to implement the provisions in the regional plan by all state governments. The regional plan will have little significance if states fail to comply with provisions," an urban development ministry official said.

The Times of India, Delhi dated July 16, 2014

Tatas spent ₹1k cr on CSR activities in FY14

Reeba Zachariah & Namrata Singh | TNN

Mumbai: In what could be the highest CSR spend by an Indian conglomerate, the Tata Group spent Rs 1,000 crore on corporate social responsibility (CSR) in 2013-14. If one were to exclude the salt-to-software enterprise's philanthropic trusts, the Tata Group companies spent Rs 660 crore on CSR in the just ended fiscal. The diversified Indian multinational's CSR spend was well above 2% of its net profit, a minimum requirement for an Indian company under the Companies Act.

A significant amount of the total CSR spend by the Tata Group has gone into skill development, health and education, with Tata Steel emerging as the biggest spender within the group. Among other Indian conglomerates, the \$40-billion Aditya Birla Group spent

Rs 200 crore on CSR in fiscal 2014, which is a little over 2% of the net profit from India.

Under the new law, all companies with at least Rs 5-crore net profit or Rs 1,000-crore turnover will have to spend 2% of their annual net profit on CSR activities — which include slum redevelopment, road safety awareness and consumer protection services — with effect from April 1, 2015.

While some Tata companies spend more than 2% of their profits on CSR, others like Tata Consultancy Services (TCS) are yet to meet the requirement. In fiscal 2014, the outsourcing giant's CSR expenditure was Rs 93 crore, which was 0.48% of its profits. At TCS' annual general meeting last month, chairman Cyrus Mistry informed shareholders on TCS' intent to do more on CSR.

"Over the last decade, our spend on CSR activities, between the Tata trusts and the

GIVING BACK TO SOCIETY

> The new Companies Act requires all cos with Rs 5cr net or Rs 1,000cr turnover to spend 2% of annual profit on CSR

> In the \$100bn Tatas' case, excluding the group trusts, the various Tata cos spent Rs 660cr on skill upgradation, health & edu

> At Rs 200cr, the \$40bn Aditya Birla Group's CSR spend for FY14 was a little over 2% of its net profit from India

> The Godrej Group's cos, also excluding its trusts' contributions, spent around Rs 18cr which is more than 2% of profits



Qpicimages/iStock/Getty Images

Tata companies, has been in excess of Rs 8,000 crore. In the last three years, we have been trending at an average of Rs 1,000 crore per annum between the trusts and our companies, typically in a 60:40 ratio between the companies and the trusts," said Mukund Govind Rajan, member-group executive council and brand custodian, Tata Sons, the holding

company of the \$100-billion group.

The Tata trusts hold 66% of Tata Sons, which in turn has holdings across group companies.

The Aditya Birla Group, which has a presence in cement, telecom, carbon black and financial services, spent Rs 150 crore on CSR in 2012-13. The CSR spend has risen in

2013-14 with growth in profits. The group's CSR initiatives are led by Aditya Birla Centre for Community Initiatives and Rural Development.

The Godrej Group is also among conglomerates that run their philanthropic activities through trusts. About 25% of the shares of the Godrej Group's holding company Godrej & Boyce are held in a trust that supports initiatives in education, healthcare and environmental sustainability. Apart from the trust, Godrej Group companies spent around Rs 18 crore on CSR under the 'Good and Green' initiative, which is more than 2% of the profits.

Around 8,000 companies are expected to come under the ambit of the new CSR regulations. The annual CSR funding by companies is expected to be in the range of Rs 15,000-20,000 crore, according to industry estimates.

The Economic Times, Delhi dated July 17, 2014

MISSING THE WOODS

'Real' Forests Half of What Green Min Claims

India has just 3.3 lakh sq km of land under forests as per 2013 survey, divergence comes to light due to new method adopted by FSI

MRAJSHEKHAR NEW DELHI

India has no more than 3.3 lakh sq km of land under real forests, less than half the number claimed by the environment ministry in the 2013 forest survey released last week. Among other impacts, low forest cover might be a contributing factor for poor rains as is the case so far this year.

The divergence has come to light due to a new methodology adopted by the Dehradun-based Forest Survey of India (FSI) this year.

Till now, the Forest Survey of India (FSI) was following a very expansive international definition for calculating forest cover — all lands, over a hectare in size, with tree canopies over at least 10% of that area, irrespective of tree species and land ownership are counted as forest cover. It is a definition which incorporates coffee plantations, orchards and even urban parks — like Delhi's Lodhi Gardens — into a country's land under forests.

Another definition, recorded forest area, gets closer to the popular understanding of a forest. Pertaining to all

areas recorded as forests in government records, these largely consist of reserved forests and protected forests. These fall under the jurisdiction of the forest department and provide ecological security to India — rivers originate from them, for one.

It is important to not mix up these two definitions. As a paper titled "Forest area estimation and reporting: implications for conservation, management and REDD+", published in Current Science's 10 May, 2014, issue noted, if a forest is cut down and a plantation goes up elsewhere, "it will be recorded as a net gain in forest cover." Even though a plantation cannot perform all the functions of a forest.

And yet, for years now, mix them up is what the FSI did. Its reports presented forest cover data, but were silent on how recorded forest areas were doing. That was because while the FSI was getting satellite images chronicling the distribution of trees and forests across the country, it did not have digitised forest boundaries it could use to isolate recorded forests for closer study.

It is this problem that has now been fixed. The FSI, says Rajesh Kumar, se-

Not on the Same Page

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nior deputy director at the institution, turned to the Survey Of India's (SOI) topographic maps. While being prepared, these maps highlighted forest boundaries. Even today, says the FSI report, these boundaries "by and large" correspond to recorded forest area of the country.

"This is not the perfect answer," says a former director-general of forests.

Even so, the 2013 FSI report is a step towards understanding how India's forests are doing. While the forest department (FD) has 7,71,821 sq km under its jurisdiction, we now know forests cover just 5,30,779 sq km of that land. Seed forests, originating from seeds that naturally germinated in that area, account for just 63% (or 3,34,390.77 sq km) of the land under

the FD's command. In other words, natural forests account for just 43% of the land under the forest department.

Similarly states have been claiming that forests are present in almost all of their recorded forest areas. However, forest cover numbers in the so-called "greenwash" areas — lands marked as forestlands in the SOI reports — shows large declines.

Take Chhattisgarh. With 49,522 sq km of forests in greenwash areas, the state shows a net increase of 1 sq km. This includes 85 sq km of forestland which turned into non-forestland due to mining, encroachment, etc. But between 2008 and 2010 alone, the centre and the state governments cleared about 290 sq km of forests — all from the FD's land — for non-forest use. Even if work has not started on clearing those forests yet, it will. And the state will lose more forest. Another trend which is very visible is erosion in the quality of forests. Very dense forests are turning into ones with medium density. And those, in turn, are becoming open forests.

m.rajshekar@timesgroup.com

The Economic Times, Delhi dated July 18, 2014

Using Ragpickers to Make Green 3D Printer

21-year-old MIT graduate Sidhant Pai's Protoprint turns waste into filaments for 3D printing

MALAVIKA MURALI
BANGALORE

Narendra Modi may have never heard of Sidhant Pai, but if the young MIT graduate's plans remain on track then the 21-year-old may unwittingly become an ally in the Indian prime minister's push to clean up Indian cities.

In the run up to the general election, Modi had made making Indian cities world-class one of his key poll promises. Along with impressive skyscrapers and airports, cleanliness is a common factor of all great cities.

Which is where a startup like Pai's Protoprint with its innovative solution to transform plastic waste into raw material for 3D printers makes a difference. The Pune-based startup, the first of its kind in India, has tied up with ragpickers who bring in waste they collect from various parts of the city to a site run by Protoprint.

At the site, the plastic materials are segregated and fed into the FlakerBot, a machine built from



Protoprint's RefilBot converts plastic as raw material for 3D printer

scratch by Pai to shred the plastic. From there, the shredded plastic moves to the RefilBot, also built by Pai, which converts it into filaments that is used as raw material to print objects in a 3D printer.

"We designed them (the machines) specifically to be low cost," said Pai, who started up through grants and the fellowship money that he received, apart from his work on projects like building an affordable solar cell phone charger in Nicaragua

and pedal powered butter churn in Tanzania during his first two years at Massachusetts Institute of Technology in the United States. "As an environmental engineer I wanted to bring technology to the masses."

Of the total investment of \$110,000 in the startup, non-profit global investment firm Echoing Green put in about \$80,000, said Pai. So far, different commercial 3D printers used filaments of various sizes as raw material. Pai is now trying to

change this by standardising the sizes and quality of the filaments.

Deepak Raj of Bangalore-based 3D printing design factory Df3d said there is a certain chemical composition that has to be met for a filament to work in a particular 3D printer, stressing on the difficulty in developing a standardised filament. "It's very interesting how this (standardisation of filament) is being done. It is quite difficult," said Raj.

Protoprint is working as the first officially certified producer with UK-based charity organisation Techfortrade's The Ethical Filament Foundation, an initiative that partners with organisations worldwide to aid the manufacturing of ethical 3D printer material from recycled plastic waste.

Globally, there are a few precedents. While Italy-based Ewe Industries has developed a machine that turns any recycled plastic into filament, UK's Omnidynamics recently raised \$64,369 on crowdfunding platform Kickstarter to develop its filament maker.

Deccan Chronicle, Hyderabad dated July 20, 2014



The 262-ft crater in the Yamal Peninsula, Russia

Siberia's giant hole is result of warming

London, July 19: A mystifying giant crater that had appeared in far northern Siberia was caused by rising temperatures, and not by a meteorite.

A report quoted Andrei Plekhanov, senior researcher at the Scientific Research Centre of the Arctic, as saying the 262-ft crater which appeared in the

gas-rich area earlier this week was most likely the result of a "build-up of excessive pressure" underground, due to changing temperatures.

Daily Mail reported Mr Plekhanov as saying that 80 per cent of the crater appeared to be made up of ice. There was water at the bottom, and no trace of an explosion.

va — Agencies

The Times of India, Delhi dated July 21, 2014

Subsidy likely on electric cars

TIMES NEWS NETWORK

New Delhi: The Delhi government is mulling a subsidy to car owners choosing to go electric. The move comes after the Centre offered a subsidy in this year's budget under the National Mission on Electric Mobility. These, however, are not aimed at e-rickshaws.

"As part of the pilot pro-

'Delhi government will offer a substantial subsidy to those who switch to electric mode using a specialized conversion kit,' said Kuldeep Gangar of transport department

ject, the government will offer a substantial subsidy to those who switch to electric mode using a specialized conversion kit. A part of the kit expenses will be paid by the government while the rest can be met by the owner of the vehicle," said Kuldeep Gangar, special commissioner, transport department. The subsidy amount is still being worked out.

These retrofitted hybrid-

electric kits can be used on vehicles not more than two or three years old.

As per the Centre's proposal, "half of the retro-fitted vehicles" for such hybridized vehicles can be borne by the government on a pilot basis. Presently, only one company manufactures this kit, which costs less than a lakh.

Gangar said the government hopes to have more manufacturers participate before the project is taken up on a large scale.

The government will also identify deployment points for public charging installations in places like parking lots, malls, cinemas, stated the minutes of the meeting.

"This has to be geographically spread out, so that, on an average, a public charging facility should be available within 2-3kms," add the minutes of the meeting.

"We are encouraging manufacturers to come up with fast-charging vehicles in the near future," also said the minutes of the meeting.

The subsidy will be a proportion of the difference between the price of a car running on fossil fuel and that of a green vehicle, said sources.

The Times of India, Delhi dated July 22, 2014

Green waste collection at MPs' door

TIMES NEWS NETWORK

New Delhi: Flats belonging to MPs on South Avenue will soon have a door-to-door waste collection service run by ragpickers. A team of 65 volunteers from Chintan, an NGO, conducted a campaign, visiting 140 houses and urging residents to give their waste to them.

The ragpickers will charge Rs 75 to dispose the waste ecologically. The waste will then be segregated—the wet composted and the dry recycled.

Chintan works in partnership with Safai Sena, an army of 12,000 ragpickers who service 30,000 households in NCR. It organizes waste collection from 26 colonies in New Delhi Municipal Council's jurisdiction and 25,000 homes in East Delhi Municipal Corporation area.

"Only 33% of MPs in South Avenue avail of doorstep waste collection. The rest prefer to dispose of their trash in *dhalao*s or open garbage stations. That's why we targeted them first. If they start involving



SAVING THE CAPITAL

ragpickers in waste collection and segregation, the corporations, too, will ensure it's done," Chitra Mukherjee, manager, outreach and advocacy, at Chintan said.

Most residents volunteers met agreed to accept the Safai Sena service. "I am excited about this service. Although living in possibly the cleanest and most well-maintained parts of the city, I have seen people dump waste on the footpaths. The best part is this initiative is that it will ensure liveli-

hood for ragpickers who otherwise risk their very lives at the landfills," said T Adeeb, former businesswoman and wife of an MP.

Volunteers also managed to involve the caretakers of MP flats in the campaign. "I will be discussing this with our MP. I personally feel it's a great idea. There won't be any waste dumps near the house. Waste collectors can also do the work safely by wearing necessary gear like gloves so that they don't contract infection," said R Hari-krishna who manages the house of MP R Duruwa Narayan.

In 2009, the erstwhile Municipal Corporation of Delhi had started door-to-door waste collection in two zones—Rohini and Civil Lines. It outsourced the project for effective implementation. The scheme was to be subsequently implemented in other zones but that never happened. At present, private concessionaires are responsible for lifting waste from *dhalao*s and dumping these in landfills maintained by the civic agencies.

The Times of India, Delhi dated July 23, 2014

Skip beef, cut carbon footprint

Kounteya.Sinha@timesgroup.com

London: Eating less beef would be a better way for people to cut carbon emissions than giving up their cars, latest research has shown.

The Weizmann Institute of Science research looked at the five main sources of protein in the American diet: dairy, beef, poultry, pork and eggs. Their idea was to calculate the environmental inputs—the costs—per nutritional unit: a calorie or gram of protein.

When the numbers were in, including those for the environmental costs of different kinds of feed (pasture, roughage such as hay, and concentrates such as corn), the team developed equations that



THAT COULD WELL BE A COSTLY BITE

yielded values for the environmental cost—per calorie and then per unit of protein, for each food.

The calculations showed that the biggest culprit, by far, is beef. That was no surprise say scientists. The surprise was in the size of the gap: In total, eating beef is more costly to the environment by an order of magnitude—about 10 times on average—than other animal-derived foods, including pork and poultry.

Carbon dioxide is the most-prevalent gas when it comes to climate change. It is released by vehicles, industry, and forest removal and comprises the greatest portion of greenhouse gas total. But methane and nitrous oxide are also greenhouse gasses and account for approximately 28% of global-warming activity.

*The Times of India, Delhi dated
July 25, 2014*

With spinach, turn sunlight into fuel

Protein From The Vegetable Can Utilize Solar Power With 60% Efficiency

Kounteya.Sinha@timesgroup.com

London: The vegetable that gave 'Popeye' super strength could one day help power engines. Scientists say they have discovered the humble spinach has the ability to convert sunlight into a clean, efficient alternative fuel.

Purdue University physicists are part of an international group using spinach to study the proteins involved in photosynthesis, the process by which plants convert the sun's energy into carbohydrates used to power cellular processes. A protein complex called Photosystem II is extracted from spinach bought from the supermarket in a complicated process performed over two days in a specially built room that keeps the spinach



A POPEYE IDEA

samples cold and shielded from light. The team then excites them with a laser and records changes in the electron configuration of their molecules.

These proteins require light to work, so the laser acts as the sun in this experiment. Yulia Pushkar, a Purdue assistant professor of physics, says once the proteins start working, scientists use advanced techniques such as electron paramagnetic resonance and X-ray spectroscopy to observe how the electronic structure of the molecules change over time as they perform their functions.

"The proteins we study are part of the most efficient system ever built, capable of converting the energy from the sun into chemical energy with an unrivalled 60% efficiency," says Push-

kar. "Understanding this system is indispensable for alternative energy research aiming to create artificial photosynthesis."

During photosynthesis plants use solar energy to convert carbon dioxide and water into hydrogen-storing carbohydrates and oxygen. Artificial photosynthesis could allow for the conversion of solar energy into renewable, environmentally friendly hydrogen-based fuels.

Photosystem II is involved in the photosynthetic mechanism that splits water molecules into oxygen, protons and electrons. During this process a portion of the protein complex, called the oxygen-evolving complex, cycles through five states in which four electrons are extracted from it, she says.

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