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Business Sustainability News

International

Food foolish: Waste, hunger and climate change

By John Mandyck and Eric B. Schultz



Flickr/Kumar's Edit

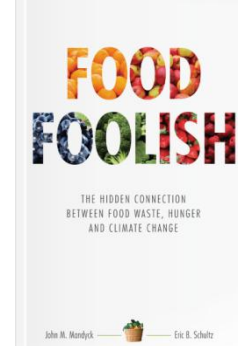
Beyond the human toll of food waste lies a range of damaging environmental impacts.

throw it away. They reject perfectly nutritious food that is cosmetically imperfect.

Too often we are served oversized meals, large portions of which are discarded. Although reasons vary, we waste food everywhere, often in ways that are unintended yet seem foolish given our fundamental need for this precious resource.

In reality, we produce enough food to feed 10 billion people — everyone today and those expected by 2050. Yet people are still hungry. It's hard to imagine so much waste of something so valuable in our modern, connected world.

More than 800 million people — a population equivalent to the United States and European Union combined — are chronically hungry. Two billion people, many of them children under 5, suffer from malnutrition.



demand are the very foods that reduce malnutrition.

They are also the most susceptible to spoilage and waste and require the greatest care as they move through the food supply chain.

Food waste also has a devastating impact on the environment. The water used to grow just the food we discard is greater than the water used by any single nation.

[Learn more about solutions to food waste at VERGE 2015 in San Jose, California, Oct. 26 to 29.]

Greenhouse gas emissions are no less significant. The embodied carbon dioxide (CO₂) emissions in food waste alone represent 3.3 billion metric tons. That's all the energy that goes to produce the food we never eat, including fuel for tractors used for planting and harvest, electricity for water pumps in the field, the power for processing and packaging facilities and more.

In total, those emissions are more than twice the emissions of all cars and trucks in the United States. Viewed another way, if food waste were a country by itself, it would be the third largest emitter of greenhouse gases behind China and the United States.

Yet the connection between food waste and climate change is missing from policy discussions and public discourse.

Food conservation is every bit as important as energy conservation. Public policies have long and successfully encouraged energy efficiency to spread more power throughout our

The following is an excerpt from the book Food Foolish.

One-third or more of the food we produce each year is never eaten.

More than 1 billion metric tons of food is lost or wasted, never making it from the farm to our fork.

Often in developing countries it decays in fields before harvest or spoils while being transported. Some is lost in retail markets before consumers can buy it. Meanwhile, in developed countries people buy too much and then

economy without having to build costly energy production facilities that result in greater environmental emissions.

That same rigor must now be applied to prevent food waste.

The magnitude of food waste is shocking. Imagine purchasing three bags of groceries. While driving home, toss half of one bag of food onto the road. That represents the loss that occurs during harvest, processing and distribution.

Arrive home and immediately toss the other half of the bag into the trash. That's the waste experienced by retailers and consumers. Buy three, get two: Welcome to our food system.

Some estimates show that we will need to increase global food production by 70 percent to meet the needs of our growing population. Yet we already produce enough food to feed everyone, including all those expected to join the planet by the middle of the 21st century.

All we need to do is get that third bag of groceries home safely and onto our plates. When we waste less, we feed more. Even saving a portion of what is wasted can have a dramatic impact on reducing hunger, malnutrition, poverty, political instability, water shortages and carbon emissions.

There is a better way. Without action, the low-hanging fruit for reducing climate change will continue to literally rot before our eyes.

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Antarctic Ocean's carbon dioxide absorption increased

Source: Economic Times

WASHINGTON: The Antarctic Ocean has been absorbing increasing levels of carbon dioxide over the past decade, a new study has found, dispelling fears that the ocean's carbon sink might have begun to "saturate".

The Antarctic Ocean, also known as the Southern Ocean, seasonally absorbs vast amounts of carbon dioxide from the atmosphere and releases it back later in the year.

On an annual average the seas surrounding Antarctica absorb significantly more CO₂ than they release. average the seas surrounding Antarctica absorb significantly more CO₂ than they release. These seas remove a large part of the CO₂ that human activities emit into the atmosphere, thereby slowing down the growth of this greenhouse gas in the atmosphere, lessening the rate of climate change.

The Southern Ocean accounts for 40 per cent of the global oceanic uptake of that man-made carbon dioxide.

From the year 2005, however, scientists pointed out that the Southern Ocean carbon sink might have begun to "saturate." Based on model results, they suggested that it had not increased since the late 1980s.

This was unexpected as it was assumed that a direct relationship existed between the magnitude of the carbon sink and the concentration of atmospheric CO₂: the higher the concentration of CO₂ in the air, the greater the amount of CO₂ absorbed by the sea.

But researchers found that since the beginning of the millennium the Southern Ocean carbon sink has become much stronger, thereby regaining its expected strength.

In a new study by an international research team led by Nicolas Gruber, a professor at ETH Zurich, and his postdoc Peter Landschutzer the scientists analyzed measurements of the concentration of carbon dioxide in the surface waters of the Southern Ocean.

They also compared the resulting fluxes with estimates based on measurements of atmospheric carbon dioxide.

The interpolated surface ocean carbon dioxide data and the estimates based on atmospheric carbon dioxide data show that the Southern Ocean carbon sink began to revive around 2002.

By 2010, its carbon uptake was once again comparable to the level expected on the basis of atmospheric CO₂ increase alone.

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A new study has found that the Antarctic Ocean has been absorbing increasing levels of carbon dioxide over the past decade. (Representative image)

Autonomous electric vehicles begin operation on Dutch roads

Source: GreentechLead



The Netherlands has received its first lot of self-driving electric vehicles for public transport.

The electric shuttle named "WEpod", The Telegraph reports, will take passengers between the Wageningen and Ede, towns in the province of Gelderland, beginning November.

Unlike existing autonomous public transportation elsewhere in the world, WEpods will drive on regular roads amid traffic. Systems such as the ParkShuttle bus in Rotterdam, the Heathrow Pod in London and the LUTZ Pathfinder in Milton Keynes, depend on special single trajectory lanes or automobiles-free areas to operate.

In the early phase of testing, the vehicles won't be run in challenging conditions such as in rush hour traffic, at night or in bad weather.

The vehicle will be continuously monitored from a control room to ensure safety of the passengers. The vehicles are able to carry six persons at maximum speed of 25 kilometers per hour.

Joris Ijsselmuiden, a researcher at Wageningen University which is testing the pods, has told The Telegraph that the vehicles will be equipped with multiple cameras to map landmarks, which can be used as an alternative navigation tool when GPS accuracy is masked by obstacles such as trees.

According to the report, the scientists have enabled booking rides on WEpods by the use of an app. It allows passengers to reserve a seat and specify their starting points and their destinations. Vehicles are expected to select their itineraries independently.

EasyMile, the French vehicle manufacturer and robotic specialist is developing the technology for Citymobil2, an EU-funded project looking at automated road transport systems across urban Europe.

Previously the technology was deployed in Vantaa, Finland, and Lausanne (EPFL university campus), Switzerland, and successfully transported 19,000 passengers.

In its test phase, WEpods will be taking fixed routes. But they are expected to expand to more routes and regions in The Netherlands from next May.

[<Source>](#)

How the hotel industry benefits from energy storage

By Glenn Hasek



Courtesy of / Fairmont Waterfront

Hotels are offering EV charging and other perks, and storing energy in batteries to avoid peak charges.

Hotel, San Diego's Ocean Park Inn and many others have installed energy storage systems.

As battery storage technology has improved — Tesla announced in May its entry into the energy storage market — an increasing number of hotels are investing in energy storage systems to help reduce demand charges that typically account for at least 30 percent of a commercial electricity bill, and often as much as 50 percent.

Demand charges are based on the highest 15 minutes of electricity usage each month.

Last fall, Stem, Inc. announced it had finalized an agreement to deploy advanced energy storage systems and real-time energy intelligence software across 68 of Extended Stay America, Inc.'s California locations.

About two months ago, the Shore Hotel in Santa Monica, California, officially unveiled its Green Charge Networks intelligent energy storage system. The Extended Stay America properties, Shore

According to John Carrington, CEO and director of Stem, who wrote about demand charges for Green Lodging News in 2014, hotels are looking to advanced energy storage and data analytics systems to alleviate demand charges.

These systems combine predictive software and safe, reliable batteries to proactively store and discharge energy for optimal economic impact. The systems can access energy reserves during times of peak electricity demand to avoid short-term usage spikes and the corresponding demand charges — all with no human intervention or impact to operations.

Intelligent storage systems also can provide personalized energy recommendations based on a hotel's specific electricity needs and usage patterns.

Mitigating demand charges is especially critical where demand charges are most expensive — California and New York, for example. Demand charge rates for three of California's largest utilities have risen substantially in the past few years, and are about 75 percent higher when compared to 10 years ago.

Vic Shao, CEO of Green Charge Networks, said a big chunk of the cost of energy storage is battery technology. Green Charge Networks took a step toward alleviating the cost of battery storage systems last month with its announcement that it had partnered with Nissan to deploy second-life vehicle batteries for commercial energy storage markets.

The first system is set to be placed this summer at a Nissan facility to offset demand charges. "[The vehicle batteries] drive down the cost of our system and allow us to go into markets or applications that previously were not possible," Shao said.

A technology with a new purpose

"The idea that energy storage can be used to mitigate demand charges is fairly new," said Gabe Schwartz, marketing manager for Stem. "Batteries have to be effective and the system has to know the building's energy profile. It needs to know when to release stored energy."

At the Ocean Park Inn in San Diego, an 18 kW system was activated in June 2014 and has reduced demand charges by 10 percent.

Stem generates monthly energy savings by learning the hotel's energy usage patterns, charging when energy prices and demand are low and deploying stored power to offset costly peaks. The facilities staff is free to manage other operations while Stem automatically stores and deploys in the background.

Beyond automated storage, the inn's CEO, Elvin Lai, furthered savings by spreading out energy-intensive activities with the help of Stem's PowerScope software platform. Stem's software displays real-time and predicted energy use, providing visibility into how the hotel's energy usage patterns translate to costs.

With this insight, hotel staff can assess the value of operational changes they are considering and predict monthly energy costs before the bill arrives.

"When I see how my peak rates differ throughout the day, I can spread out hotel activities to further help prevent high demand peaks," Lai said. "It makes our operations more efficient and consistently saves us money."

A combination of San Diego Gas & Electric's energy storage incentives and Stem's financing plan allowed Lai to activate the system for no upfront costs. Automated savings from Stem's system are expected to save the Ocean Park Inn an average of \$4,500 per year.

Demand spikes when vehicles charge up

At the Shore Hotel in Santa Monica, electric vehicle (EV) charging is a sporadic, high-usage activity that creates a spike of demand on the grid, triggering a demand charge. Even a couple of EV charges per month can result in a surprisingly high addition to the hotel's energy bill.

To mitigate the effect of those spikes, the Shore Hotel chose to link its EV charging station to an energy storage solution from Green Charge Networks called GreenStation. Green Charge Networks was able to show how its energy storage solution could identify the EV charging draw and immediately discharge enough power to avoid a demand charge-inducing spike.

Based on the hotel's usage history, Green Charge Networks projected that Shore Hotel would reduce its demand costs by as much as 35 percent. There was no charge to install or maintain the energy storage system.

Through a partnership with NRG eVgo, Green Charge Networks had installed a Fast DC charger in a designated space in the hotel's parking garage, adjacent to a 60 kWh-capacity Green Charge Networks lithium ion-based energy storage system.

At the heart of the system is a smart controller with software that monitors facility loads on a second-by-second basis and automatically discharges or charges the storage system as needed to flatten the power load curve.

Green Charge Networks monitors the system over the dedicated network, and reports on the savings in demand charges, which it shares with Shore Hotel.

"Energy storage is a natural complement to the many measures we've taken to reduce our carbon footprint and achieving LEED Gold certifications," said Steve Farzam, CEO at Shore Hotel.

Having an energy storage system does not necessarily require much space or time commitment. Stem's Schwartz said an 18 kW system has a footprint of only 2 square feet and is about the size of a gym locker.

Maintenance is included in any purchase. "There is no need for anyone to do anything on-site," Schwartz said. "Data is sent back to the operations center. We can usually do a fix remotely."

Engineers, however, actively can benefit from using the software that manages the energy storage systems. For example, information that a peak will be set could prompt one to delay laundry for 30 minutes. Stem software allows one to receive alerts — to know if something is turned on when it should not be.

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Obama Administration Launches Smart Cities Initiative

SustainableBusiness.com News

The Obama Administration announced the "Smart Cities" Initiative yesterday to tackle the range of challenges facing cities - climate change, traffic congestion, fighting crime, fostering economic growth and improving delivery of city services.

The focus is on building an infrastructure that continuously improves collection, aggregation, and use of data that can improve the life of citizens.

- The National Science Foundation and National Institute of Standards and Technology will create the research infrastructure for Smart Cities, and the Departments of Homeland Security, Energy, EPA, Transportation, and Commerce will develop solutions for safety, energy, climate preparedness, transportation and health.
- 20 cities will participate in multi-city collaborations between cities, universities and the private sector - the MetroLab Network.
- formation of non-profit Envision America to accelerate innovative technology deployment for energy, water, waste, and air challenges.



"Array of Things in Chicago," for example, will be the first network (500 nodes across the city) to serve as a testbed for rapidly deploying sensors, computing, and communications systems at scale in an urban environment. Sensors will continuously measure the physical environment block by block in the city.

The Department of Homeland Security is developing cutting-edge emergency response technologies for Smart Cities. Big data will be used to ensure first responders get the information they need at the right time, increasing their efficacy and safety.

The Department of Energy is creating a SMART Mobility consortium that conducts research on the energy-mobility nexus for future transportation systems: connected, automated vehicles; multi-modal transport; and integrated vehicle-fueling infrastructure systems. It will also advance smart building technologies that optimize performance and maximize energy efficiency within and between buildings and between buildings and the grid.

AT&T will select 10 cities to deploy technology for smart metering, lighting, traffic management, parking, and public safety.

IBM will help Detroit remove blight and build smarter Detroit neighborhoods: cost-efficient removal, recycling and re-use of debris from abandoned and neglected properties, allowing the city to use its limited resources to strategically invest in neighborhoods.

New York City will create neighborhood innovation labs in all five boroughs that accelerate testing and deployment of smart technologies. This is in addition to the state's Smart Cities hub in Albany.

Part of the climate agreement signed by China and the US last year is encouraging bilateral trade in green technologies and the launch of a Climate-Smart/Low-Carbon Cities Initiative. Japan and India are also moving forward on Smart Cities. And in Austria, Siemens and partners are creating a living lab that tests designs and systems for intelligent cities of the future. San Diego's smart city public-private collaboration aims to increase energy independence and adoption of electric vehicles. There's even a certification for smart cities under development.

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One in four major cities won't be able to provide clean water to residents

From Mumbai to São Paulo, safe water supplies are precarious. Research suggests that conservation could be a cost-effective solution

They are two of the biggest cities in the world and both are set to grow significantly over the next decade, yet Mumbai and São Paulo are still unable to supply the clean and safe water residents need.

Precarious water supplies are nothing new in São Paulo but today Brazil's largest city is suffering the worst drought since records began in 1930. This urban crisis is being replicated across the world, with one in four of the biggest cities experiencing water stress.

Much of the focus on water scarcity has been on agriculture, which accounts for the lion's share of global water consumption – more than 90% of the total on average. Yet the fundamental reason for the precipitous drop in water supplies is the explosive expansion of cities and their growing demand for high quality water.

From grey to green

The conventional response is to invest in grey infrastructure such as treatment plants, reservoirs and distribution systems. These remain an important part of the solution.

But there is also a growing recognition of the role natural infrastructure plays in addressing water stress. Upstream approaches such as restoring river banks and terracing hillsides to reduce nutrient and sediment runoffs are investments in a better functioning environment that can improve water quality and lower treatment costs.

According to research conducted by The Nature Conservancy (TNC), reducing sediment and nutrients in water supplies by 10% could lead to a reduction of about 5% in treatment costs. Furthermore, we calculate that if every conservation method – forest protection, reforestation, agricultural best management practices, riparian restoration and forest fuel reduction – was applied to cities around the world, total savings would amount to \$890m (£579m) per year.

This makes a compelling case for local governments and water utilities to invest in this kind of conservation, enabling utilities to reduce their capital expenditures over time by using cheaper treatment technologies rather than upgrading to more complex, expensive ones.

Take India. More than 40% of the population lives in cities – this is set to double to 814 million by 2050. Prime Minister Narendra Modi recently announced a set of initiatives, among them the Smart Cities Mission, to make Indian cities globally

competitive growth centres. This will involve a modernisation programme in which providing clean water will be high on the agenda.

Our research has identified 17 Indian cities where conservation strategies could help the country meet its development goals. We believe that Mumbai is one of the five cities in the world where water quality could be improved most by restoring river banks and working with farmers upstream to reduce runoff.

Scaling up

In all, a quarter of the more than 500 cities TNC studied could make a positive return on investing in watershed conservation. Among the leading cities that could benefit is São Paulo. Improving farming techniques, protecting forests, reforestation and restoring riverbanks in the watersheds of the Cantareira water system on which the city depends together have the potential to cut sediment and pollutants in the city's water supply by 10% and reduce treatment costs by 5%.

In 2005, a small community in the Cantareira watershed, Extrema, launched an effort to counter the effects of deforestation and the subsequent increase in runoff and sediment. The local government, in collaboration with the São Paulo watershed committee and Brazil's federal government, set up a programme that pays landowners \$120 per hectare to reforest land. So far, 3,500 hectares have been reforested. Analysis completed by colleagues in Brazil suggests that restoring an additional 14,200 hectares of deforested areas and preventing erosion on just over 2,000 hectares within certain river basins could cut the concentration of sediment of the system in half. While results won't be seen overnight, this restoration has the potential to improve water supplies and benefit more than 13 million people who live in the São Paulo metropolitan region and Extrema.

The potential for upstream nature conservation to protect water quality in cities is not limited to developing countries. The US cities of Santa Fe and Albuquerque, both in New Mexico, have suffered from forest fires, increasing the chances that subsequent rains will carry topsoil, debris and ash into rivers and reservoirs. One answer has been to ecologically restore the watershed forests to reduce the amount of combustible material and lower the risk of fires.

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A Brazilian boy watches his mother collect water in a barrel. Photograph: Ricardo Moraes/Reuters



The river Tansa, north of Mumbai, supplies water to the city, which has been identified as one where water quality could be improved most by restoring river banks and working with farmers to reduce runoff. Photograph: David Levene/Guardian

Burning all fossil fuel in world can melt South Pole ice sheet

Source: GreentechLead



Burning the entire deposit of fossil fuels in the world — about 10,000 gigatons — would melt ice covering the South Pole entirely. And melting of this ice sheet can raise global sea levels to nearly 200 feet, which, in turn, would submerge large swathes.

This has been revealed in a recent study which has also found that the process is likely to take up to 10,000 years.

The team of researchers led by Ricarda Winkelmann, a professor of climate system analysis at the Potsdam Institute for Climate Impact Research, used a state-of-the-art ice sheet model to make the projections about what would happen if humans burned various amounts of fossil fuels in the coming centuries.

The researchers have projected that it would take humans about 500 years to burn through all fossil fuels.

The resulting carbon output would stay in the atmosphere and cause global temperatures to remain elevated for thousands of years, the researchers say.

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Paris climate talks are the shortest route to business stability

By Peter Bakker



The COP21 United Nations climate talks taking place this December could set the stage for businesses to truly start the transition to a low-carbon economy.

business must become a strong and unified advocate on the Road to Paris and beyond. Halfway through this critical year, I am inspired to see an increasing number of businesses stepping up to tackle the climate challenge and lead governments in adopting ambitious measures.

Decisions made at COP21 will influence the way we do business, as well as the world we do it in.

To avert the most serious consequences of climate change, we must stay under the 2 degrees Celsius limit for global warming. A massive transformation of our economies, policies and societies is necessary to make this happen.

This is the start of a long journey of public-private collaboration in addressing one of the most pressing challenges we face. But as big as this challenge may be, it is also a great opportunity to create a more prosperous world.

Bringing business into the fold

Business has an important role to play in driving the transition to a low-carbon economy.

There is a strong and clear business case for climate action: low-carbon growth. Supported by the right economic incentives and multilateral collaboration, it is the only way to ensure sustainable profits and employment in the future.

Forward-looking companies know this and they are taking ambitious climate action. Their activities range from the adoption of science-based emissions reductions targets, to the removal of commodity-driven deforestation from supply chains and the procurement of electricity from renewable sources, among others.

The past four months have seen an unprecedented mobilization by business. At the Business & Climate Summit in May, 25 business networks representing 6.5 million companies from 130 countries called for a climate deal to achieve net zero emissions before the end of the century. Robust and stable carbon pricing also was emphasized as a prerequisite for a successful policy package.

Led by the World Bank, more than 1,000 companies and investors and over 70 countries are calling for carbon pricing. Coupled with the elimination of fossil fuel subsidies, effective carbon pricing mechanisms will catalyze extensive investment in cleaner options and drive low-carbon growth.

This momentum continues: in June, the G7 leaders recognized these messages and agreed to deep cuts in greenhouse gas emissions. They underlined the need for leadership in transforming energy systems, mobilizing climate finance and developing long-term national low-carbon strategies.

Across all sectors, business is supporting the global climate agenda by developing low-carbon solutions with a high impact. Many of these solutions require existing technologies to be deployed at scale or new technologies to be developed.

To support this need, the World Business Council for Sustainable Development (WBCSD), in partnership with the International Energy Agency and the Sustainable Development Solutions Network, has developed the Low Carbon Technology Partnerships initiative (LCTPi). Endorsed by the French Presidency of COP21, LCTPi is a collaborative platform to analyze barriers and identify solutions, policy asks and partnership opportunities for the large-scale deployment of low-carbon technologies.

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Dutch Trains Run on 100% Wind, Airports on Solar

SustainableBusiness.com News

While the Dutch government recently lost in court for not moving on climate emissions fast enough (and is appealing), the country is leading in one exciting way: its entire train network will run on 100% wind by 2018.

About half its energy will come from wind this year and by 2018, the 1.2 million daily passengers will travel on a system that consumes 100 gigawatt-hours of wind each year.

The contract involves Eneco, which will supply the power, and joint buying group VIVENS, which consists of Netherlands Railways, rail freight companies, Veolia, Arriva and Connexion.

"What makes this contract and partnership unique is that a whole sector decreases its CO2 footprint enormously and sets an example for other sectors to follow. Mobility is responsible for 20% of CO2 emissions in the Netherlands, and if we want to keep travelling, it is important that we do this without burdening the environment with CO2 and particulate matter. This contract offers all Dutch citizens the option to make a climate neutral trip, regardless of distance," Michel Kerkhof of Eneco, told *Railway-Technology.com*.



Half the energy will come from Dutch wind farms developed by Eneco and the other half from wind farms in Scandinavia and Belgium. The idea is to increase

renewable energy both in the Netherlands and in Europe by encouraging new wind farms.

Ticket prices are not expected to rise because the rail company continuously improves energy efficiency - reducing it 30% over the past decade by using new trains and more efficient driving techniques. And the 10-year wind electricity contract is under "attractive commercial conditions."

Recently, the Netherlands approved a major offshore wind project, the 600 megawatt (MW) Gemini project, expected to come online in 2017. It will add to the 2.7 gigawatts (GW) of wind capacity, mostly onshore. The country's goal is for 4.45 GW of wind by 2023.

India Turns to Solar

In India, SunEdison just finished installing 1.9 MW of solar systems on eight of India's Delhi Metro Rail Corporation's rail lines. They are on the roofs of rail stations, where millions of people travel each day - and another 1.7 MW are under construction.

India is also home to the first airport that runs solely on solar. Cochin International, its fourth largest airport in terms of passenger traffic, will consume most of the 12 MW of solar, with a few MW leftover to send to the grid. More airports are following suit, such as Netaji Subash Chandra Bose International Airport, which is planning a 15 MW system.

Mexico Too

A \$9.2 billion international airport is under construction in Mexico City, one of the biggest in the world and "most sustainable," say the developers. 120 million people are expected to pass through the 6 million-square-foot structure each year. The entire structure will be covered in solar and will collect rain water.

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Looking to forests for urban water solutions

By Jennifer Barnes and Alexandra Ramsden

This story first appeared on Asking Nature, the Biomimicry Institute and Biomimicry Global Network blog.

Have you ever walked through an evergreen forest in the rain? There is a hush all around. The forest floor is spongy and soft beneath your feet, and the layers and textures all around you create a coziness, a feeling of being protected. As you take a deep breath of fresh, clean air, you know it's raining big drops up above, but all you feel is a cool mist floating down through the canopy.



Where does all that urban rain go? A shot of Shanghai.

reconnect and remember that we are nature. But it is also an ecosystem services powerhouse. It stores carbon, cleans the air and water, regulates temperatures and provides shelter and food for critters big and small.

Before urban development, this forest dominated Seattle's landscape. Dotted with bogs and meadows, with wetlands proliferating along the rich edges between forest and water, the vast majority of the region was forest. And the system operated in dynamic balance.

The current gap between forest and urban water flows

Now, the forest mist is an unchecked rain that washes across polluted streets and sidewalks. The urban hardscape of Seattle and surrounding areas interrupts the balanced ecological flow of our predevelopment forests and wetlands. We know imbalance creates stress on a system, but how do we regain ecological equilibrium in areas that are now urban? What can we learn from nature that will help our cities thrive?

How can we design our buildings and infrastructure to function like the natural ecosystems that preceded them? The Urban Greenprint is a project that asks these questions, applying biomimicry at a city scale. The project looks at issues not only of water flows, but also of carbon flows and biodiversity.

Evaporation as a new approach to stormwater mitigation

The initial focus of the project is Seattle. Perhaps not surprisingly, the most eye-opening research to-date is related to rainfall. In the water-rich region of Puget Sound, the forest holds a critical role of helping regulate water flows. When we study these flows, we learn a very important fact: when it rains on our region's forests, 50 percent of that rainfall is evapotranspired — used by the plants and then returned to the atmosphere.

For Seattle, as for many cities across the globe, polluted runoff is an enormous problem, and is considered by many to be our most critical environmental issue. The rainwater that washes across polluted roads and sidewalks flushes toxins into water bodies. What our research tells us is that if we can design our cities to evaporate half of the rainfall, as our local forests do, we will go a long way towards solving our polluted runoff problem.

Regulators and the building industry are putting forth tremendous effort to slow and filter water, but evaporation is rarely, if ever, emphasized. This is a primary component of our regional water cycle, and it needs to be addressed.

"If we can design our cities to evaporate half of the rainfall, as our local forests do, we will go a long way towards solving our polluted runoff problem."

The current focus of the Urban Greenprint is to generate building design techniques and use of materials that take cues from our local natural ecosystems, including methods of construction that encourage evaporation.

Remember the mist you feel on your face when you walk through a coniferous forest in the rain? The layered and textured canopies of red cedars and other conifers break up big raindrops into fine droplets that readily evaporate. Tree trunks, lichen and moss hold onto moisture, as does the detritus on the forest floor and the rich organics in the soil itself. Textures, layers and permeability all contribute to a system that holds water like a sponge until it infiltrates or evaporates.

The Urban Greenprint is working with a diverse group of experts to determine how buildings and infrastructure can mimic these functions, researching materials and digging into questions such as:

- What if rainwater, after being used inside a building, gravity-fed out to a spongy façade where it was held until it evaporated?
- What if building skins had hydrophilic and hydrophobic surfaces, like moss, to hold onto water and slowly trickle it off the building, increasing the opportunity for evaporation?
- What if curbs were built of material mimicking mushrooms to remediate stormwater and store it until it could evaporate?
- What if downspouts coming off our buildings were designed to pool water in staggered trays along their height, allowing for evaporation, like the leaves of a tree?

The Urban Greenprint is exploring these and other ideas through community engagement and workshops with design and material experts in Seattle and the Bay Area, and they have put out a public call for any other innovative solutions. Contact them to share your ideas.

[<Source>](#)

Tips:

By the time this edition of Sustainability Forum will reach you Diwali will be round the corner. We wish you all **Happy Diwali!** We humbly request you all to celebrate Diwali in a very responsible manner. Though there has been reduction in pollution level on Diwali last year as compared to 2013 still the pollution levels are quite high. That means we will have to further reduce use of fire crackers. We request all responsible citizens to celebrate a greener, pollution free, environment friendly and safer Diwali.

As our continuous effort towards promoting sustainability we are providing below some tips that may help us towards achieving our goal of sustainability.

- Let us reduce bursting of fire crackers and save money that may be used for distributing clothes, sweets, foods etc to under privileged people.
- We may also plant some saplings which in long run will provide shelter, greenery and also help in cleaning the air.
- It has been seen that people compete in bursting fireworks with their neighbors. How nice it would be that they compete in planting saplings or cleaning the surroundings.
- On Diwali when we clean our houses we should look for such items that have not been used since long but may be of great use for others we may give those items to needy people.
- While decorating our houses with light we must ensure that most energy efficient lighting is used and thereby reduce power consumption.
- We may also use our creative skills and make items for decoration with waste material. Thus on one hand we will have innovative decoration and on the other hand we will save money, which may be used for charity or help of under privileged.
- Now days we find that people decorate their houses mostly with electric lights, if we decorate our houses with earthen Deepak or Diya it will provide living to poor potters who have their main business during this festivals and promote sustainability too.
- We may celebrate Diwali and display fireworks collectively with people residing in neighborhood. We can fix a time and duration during which it will be done. This will reduce the amount of firecrackers used for celebration and thereby pollution.
- Every year there are incidents of injury during bursting of fire crackers so always be with your children while they crack fireworks.
- While selecting fire crackers please ensure that the sound produced by it is lower than the permissible decibel limit prescribed by Pollution Board. Go for eco friendly crackers in place of traditional chemical cracker. These crackers produce paper fluffers and different color lights instead of sound on bursting.
- The excess consumerism leads to very high consumption of raw materials used to manufacture those products; this automatically results in increased pressure on the natural resources. Therefore slash your shopping list and as far as possible buy recyclable products.
- Do not burn old used papers, posters, calendars etc this causes double impact, on one hand it releases gases polluting environment and on the other which is equally important that by not recycling and destroying paper we lose lot of trees and water.
- Let us greet our friends and relatives through electronic media and save paper. We may also make greeting cards out of waste materials using our creativity.

Let us pledge that we will celebrate Diwali in a greener and environmentally safer way.

The madness of drinking bottled water shipped halfway round the world

By Oliver Balch

We can't get enough of it, but the long-term environmental impacts of bottling and transporting water across countries are doing more damage than we realise



Discarded mineral water bottles after the London Marathon. Photograph: Tracy Gunn/Alamy

Yet the prospect of global sales hitting 233bn litres this year brings another set of fears. "The problems of waste, inequity, high economic costs and impacts on local water resources are intrinsic to the entire industry," says Peter Gleick, president of the US-based Pacific Institute and author of *Bottled and Sold: The Story Behind our Obsession with Bottled Water*.

The zero-sense game

The most obvious sustainability black mark against the bottled water industry relates to imports. The branding for bottled waters is linked to their place of origin: for Evian, owned by French multinational Danone, it's the "pristine peaks of the French Alps"; for Italy's San Pellegrino, its "terroir" is the mountains of Lombardy.

Yet it doesn't need an environmentalist to tell us that carting water from one country to another in plastic bottles makes zero sense. "If you're a business in the UK and you're not selling British water, the first question is 'why?'," says Karen Lynch, chief executive of Belu, a UK-based bottled water producer. "Why incur the food miles when we have got a beautiful, abundant source of mineral water?"

Over one fifth (22%) of water sold in the UK is sourced overseas, according to the Natural Hydration Council, a business membership group. Most comes from northern Europe, although some from as far away as Fiji or the Himalayas.

Logistical changes by some importers are reducing their carbon footprint to a small extent. Evian and Volvic factories on the continent have their own private train stations, for example, meaning over two-thirds (69%) of bottles arrive by rail in the UK, according to a Danone spokesperson.

Importing bottled water could be excused if domestic tap water was not potable or is insufficient for immediate needs, as is the case in some Pacific Islands during drought. Neither holds for the UK, however.

"My understanding is that we could absolutely cater for our current needs," says Jo Jacobius, director of British Bottled Water Producers. In other words, there's more than enough water in the UK to mean that we shouldn't need to import.

Conservation represents an additional environmental argument for buying British, she maintains. Strict health and safety regulations mean UK producers are obliged to keep their water sources "completely unpolluted" or risk lose their operating licence.

"UK-based bottled water producers are having to keep huge acreages of land clean and green, so the water is pristine, as it needs to be by law," says Jacobius.

Take Highland Spring, a Scottish bottled water firm. The company permits no farming, agricultural spraying, building or habitation in its privately owned catchment areas in the Ochil Hills of Perthshire. "It has been kept free from pesticides and pollution for almost three decades [which] has earned the land organic status," says a company spokesperson.

The same strict regulatory oversight should act as a guarantee against the over-extraction of water, leaving water sources scarce or prejudicing water access for other local users. Yet that's not always the case. Earlier this year, Swiss-based Nestlé came under fire from protesters in drought-hit California after reports that it was still extracting water 27 years after its permit had expired.

Packaging problems

Bottled water isn't just about the water. It's about the bottle too. A sizeable proportion of the industry's supply-side impacts derive from packaging.

Plastic dominates. The industry's big players, such as Nestlé, Danone, Coca-Cola and Pepsi, are all pursuing efforts to increase recycled content in polyethylene terephthalate (PET). But progress is slow. Coca-Cola, for instance, averages 34% of recycled PET across all its bottled drinks, which include water brands Abbey Well and Glacéau Smartwater in the UK. The figure for Danone's main water brands is a mere 9%.

Producers say they are hamstrung by supply shortages. That's partly due to physical infrastructure (there aren't enough reprocessing plants) and partly due to public behaviour (consumers don't recycle enough bottles).

Bottled water firms can make a contribution to resolving both issues, either by investing in recycling capacity or running public recycling campaigns. Bar an investment by Coca-Cola Enterprises in Eco Plastics back in 2011, evidence of either is scant.

The industry isn't without packaging innovations, however. In late 2011, Coca-Cola introduced a plastic bottle with up to 30% organic material. The PlantBottle uses a waste by-product created when processing sugarcane. A new generation of the technology could bring the organic content up to 100%.

Moves to reduce packaging weight represent another innovation. Globally, light-weighting initiatives saw plastic bottles reduce by 47.7% in weight between 2000 and 2011, leading to savings of £3.3bn of PET resin, according to the International Bottled Water Association.

[<ReadMore>](#)

Transportation needs to get on the sustainability train

By Ryan Schuchard



The Walmart Advanced Vehicle Experience is a tractor-trailer combination that features leading edge aerodynamics, an advanced turbine-powered range extending series hybrid powertrain, electrified auxiliary components and sophisticated control systems, developed in support of the company's sustainability program.

Over the past few years, companies have made tremendous progress on renewable energy. More than 40 large corporations have committed to sourcing 100 percent of their energy from renewables, and at least eight have organized utility-scale purchase agreements for electric power larger than 100 megawatts.

This exciting progress needs to continue, and companies that have not yet taken advantage of the increasingly attractive renewable-energy options should scale up their commitments. But to date, the focus of the renewable energy movement has

been solely on stationary power (for example, electric power plants that stay put), which leaves half the job of energy undone. It is time to include transportation.

In the United States, transportation accounts for 27 percent of greenhouse gas (GHG) emissions, which is very close to the 31 percent from electricity. And when considering the broader lifecycle impacts of fuels, vehicles and infrastructure, the emissions from transportation is likely more than 40 percent, making it the biggest source of impacts of all.

Transportation also contributes to air pollution, which is linked to major global health problems including asthma, cardiovascular and autoimmune diseases, and cancer. So addressing transportation's emissions also will reduce the impacts of these related issues, which disproportionately affect poor communities and are of increasing interest to regulators internationally.

Many companies are in the transportation business, as providers of fuels, vehicle technologies and transit services. Virtually all require transportation to get critical work done: Companies own fleets, they depend on inbound and outbound logistics, they have employees who commute and travel for business, and they rely on customers to travel to their stores and facilities.

And despite impressive corporate commitments to renewables for stationary power, similar commitments for transportation are rare: Walmart's aspiration goal of 100 percent renewables is unusual in that it includes transportation. There are few case studies on companies making transformative commitments to buy alternative fuels (so called "offtake" agreements) or fully converting fleets to renewable resources.

The lack of investment in renewables for transportation is understandable. Unlike with stationary power, mobile energy must be energy-dense, and no mature technologies can compete with petroleum-based diesel and gasoline on price, range and scale. This makes the way forward less clear.

But if corporate sustainability leaders don't take the lead here, advanced vehicle and fuel markets will develop too slowly. On the flip side, companies committed to effectively addressing climate change can pioneer this market and ensure that transportation is high on the agenda, where it should be.

Here are some actions company leaders can take right now:

- Understand your total transportation footprint, including how freight and passenger mobility affect the company. BSR's Future of Fuels initiative has a suite of research initiatives that explore transportations' impacts, which include well-known emissions such as carbon dioxide as well as the often overlooked short-lived climate pollutants such as black carbon.
- Take advantage of new tools and opportunities to collaborate. BSR is developing a Commercial Fuel Sustainability Tool, CALSTART and the National Association of Fleet Administrators have the LEED for Fleets framework, WBCSD is leading the Low-Carbon Technology Partnerships Initiative for Freight and the Partnership on Sustainable Low-Carbon Transport has the Paris Process on Mobility and Climate.
- Pilot new technologies, including electric vehicles, hydrogen and biofuels, in order to understand how the continuing transition from a "mono-fuel" (diesel) to a "poly-fuel" economy will affect your business, and how these technologies actually work on the ground

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China Gets a B+ On Climate Pledges

SustainableBusiness.com News

During China's presidential visit to the US this week, news organizations splashed the country's intention to start a national cap-and-trade program in 2017.

While we're glad the news media covered it, we've been writing about that for years as China has been preparing for the program through pilots in its largest provinces.

The program is impressive, covering key industry sectors such as power plants, iron, steel and other metals, cement, chemicals, building materials and paper-making.

What didn't get covered is also significant. China remains committed to cutting carbon emissions 60-65% per unit of GDP; cap coal use by 2020, and run on 20% renewable energy (including nuclear) by 2030. The latter is huge - it means installing as much capacity as the US uses to power our country - 800-1000 gigawatts. Another pledge will increase forest "stock" 4.5 billion cubic meters by 2030.

It will also prioritize renewable energy and more efficient fossil fuel power on the grid - a big change from the current practice of putting coal first, which has caused many wind plants to remain idle. Half of all new buildings will be "green" by 2020, and the share of public transport will reach 30% in medium and large cities by then, says China's President.

China's climate pledges earn a B+, according to NRDC.



The US-China Climate Change Working Group addresses the full range of topics: fuel economy standards for heavy-duty and other vehicles, smart grids, carbon capture, energy efficiency in buildings and industry, collecting and managing greenhouse gas emissions data, climate change and forests, industrial boilers efficiency and fuel switching, and climate-smart/low-carbon cities, shipping ports and vessels, zero emission vehicles, and climate forcers such as HFCs.

Read our articles, China Installs As Much Solar As Entire US This Year and China Leads World On Wind Additions Again.

Climate Pledges So Far

So far, 146 countries have submitted climate pledges, which together add up to 2.7°C (4.9°F) of warming by 2100, according to Europe's Climate Action Tracker.

While that's obviously not enough to meet the 2°C goal (3.5°F), this is the first time we're below 3°C. "This is a signal that the process can work," Bill Hare of Climate Analytics told Reuters.

Another group, Climate Interactive, calculates it differently and comes to much more pessimistic figures. Pledges add up to 3.5°C (6.3°F), compared with 4.5°C (8.1°F) under business as usual.

The objective of this year's Climate Summit is to *finally* come to an agreement. Periodic reviews and new pledges will be built in, encouraging ramping up over time.

What's important is getting on the path. Once that happens, countries and stakeholders will find it's easier and cheaper than expected. That's the history of environmental cleanup, notes Gavin Schmidt at NASA. "By the time people get 10, 15 years of actually trying to do something, that's going to lead to greater expertise, better technology, more experience, and then people will then say, 'Oh, you know what? We can commit to do more.'"

[\[Source\]](#)

Hidden problem of 'ghost gear': the abandoned fishing nets clogging up oceans

A new global initiative founded by World Animal Protection hopes to tackle the problem that's killing animals and costing business

By Hannah Gould

Over the weekend, boats, helicopters and airplanes searched up and down the southern California coast, hoping to rescue an 80ft blue whale spotted entangled in a 200ft fishing line.

Exact numbers are unknown, but the National Marine Fisheries Service reported an average of 11 entangled large whales per year from 2000 to 2012 along the US west coast. Around the world, seals, turtles, birds and fish are also injured and killed in the same way. Between 2002 and 2010, 870 nets recovered from Washington State alone contained more than 32,000 marine animals.



Many ports lack the facilities to collect, recycle or trade nets making them easier to simply dump in the ocean. Photograph: Zheng Peibo/Xinhua Press/Corbis

Fishing 'ghost gear'

One cause of this problem is "ghost gear", fishing gear that is lost and abandoned in the ocean. Thought to make up 10% of all marine litter, fishing gear can be lost accidentally during storms, but it can also be abandoned deliberately. Many ports lack the facilities to collect, recycle or trade nets and

it's simply cheaper and easier to throw them overboard.

Ghost gear isn't just a problem for animal lovers, it's a problem for the fishing industry too as it kills marketable produce, poses a threat to fishermen and divers, and clogs up harbours.

The SeaDoc Society, for example, has estimated just one abandoned net could kill almost \$20,000 (£13,000) worth of Dungeness crab over 10 years. The Virginia Institute of Marine Science has estimated abandoned or lost crab pots in the Chesapeake Bay area capture 1.25m blue crabs annually.

The Global Ghost Gear Initiative

The fishing industry's sustainability issues with by-catch and plastic pollution are relatively well reported, but the issue with ghost gear is less well known.

A new initiative that launches today in London, aimed at finding solutions, is hoping to change this. Founded by the NGO World Animal Protection, the Global Ghost Gear Initiative (GGGI) will bring together industry, governments, academics and charities.

Participants from the UK include the Department for Environment, Food and Rural Affairs; the Marine Stewardship Council; Sainsbury's; Young's Seafood (whose in-house marine biologist will be working on the initiative); and the charity Surfers Against Sewage.

The initiative will focus on evidence building, on the ground solutions and reviewing policy. Over the next few days a steering group made up of different sectors will be elected to run it, and it plans to meet annually to review progress and next steps.

Mike Baker, chief executive of World Animal Protection, says it's been easy to get people in the industry to see the problem because of its commercial impact. However, a reluctance to be associated with another negative story has made it hard to get the industry to engage publicly.

Instead of waiting for public outrage and imposed solutions, Baker says the GGGI initiative can help industry players get ahead of the game. "In NGOs, and particularly in animal welfare, people highlight the problem and sort of contrast it as an issue that clashes with the interests of business. What we're saying is that's not the case and the most constructive thing we can do here is be part of forging the solutions. If it doesn't work for industry, it doesn't work."

"It's so easy to highlight the problem, you can show pictures with seals being caught in nets with their heads being gouged, but actually solutions are what's important," says Baker.

It's not waste

Key to finding these solutions will be a shift in perception so that used nets aren't seen as a waste product but a raw material for something else. "Once it becomes a commodity worth having it becomes a business opportunity, and that changes the whole agenda," says Baker.

Some companies are already embracing this approach. Net-Works, a collaboration between Interface, the Zoological Society of London and Aquafil, turns discarded fishing nets into carpet tiles and has long been cited as an example of the circular economy in action. But new examples are emerging.

The US Fishing for Energy partnership has collected 2.8m pounds of fishing gear from bins placed in 42 communities across the US since 2008 and turned this into enough electricity to power 182 homes for one year.

Sustainable skateboard retailer Bureo has set up a net collection programme with support from the Chilean government.

"[Fishermen] are the first to recognise [ghost gear] being a problem, but they have had limited options," says Bureo co-founder, Ben Kneppers. "The additional infrastructure and cost required to discard the nets in a sound manner made this material a burden, especially for artisanal fishermen."

Now, for every kg of net returned, Bureo allocates funds to local NGOs. It then transforms the old nets into skateboards.

No small fry

As the first fishery in Australia to sign up to GGGI, Northern Prawn Fishery's CEO Annie Jarrett says it will work closely with World Animal Protection to report sightings and locations of ghost gear. Its fishermen are already involved in retrieving ghost gear and releasing marine animals from ghost gear as they come across it.

For a small charity like Surfers Against Sewage, with limited resources but an army of volunteers angry about ocean waste, the chance to be part of a global network sharing best practice and contacts was a "no-brainer" says project manager Dom Ferris.

It's very early days for the GGGI but, in an ideal world, Baker would like to see recycling systems at every port; local solutions around each region of the world; major retailers reflecting the issue in its CSR and purchasing policies; and committed governments and industry.

[\[ReadMore\]](#)

ConAgra, Albertsons, Sodexo join fight to halve food waste

By Barbara Grady



Beans considered too short to sell commercially were sent to a food pantry in Tennessee where volunteers package them for donation.

USDAHunger is the biggest obstacle to learning for children in public schools in Oakland, California, according to a survey of district teachers. In Washington, D.C., 31 percent of children live in "food-insecure" households.

That's one in five residents across Louisiana. Ditto in New York City.

Hunger persists in the United States, where 48.1 million regularly face food insecurity or inadequate access to food.

At the same time, one-third of the food produced in America is thrown out and winds up in landfills, said the Department of Agriculture. That 133 billion pounds of food waste in landfills becomes a major emitter of methane.

Somewhere between farm to table, a lot of good food is tossed out. Farmers chuck tomatoes or apples that are not cosmetically attractive. Supermarkets do the same or toss food that is near premature expiration dates. Restaurants finish their evenings with unserved food.

And consumers — the biggest culprits of all — throw out food from their refrigerators and plates.

An estimated 133 billion pounds of food waste go to municipal landfills, where it accounts for 18 percent of total U.S. methane emissions, according to the Environmental Protection Agency.

This week, the EPA and the USDA — along with about 253 companies including ConAgra, General Mills, Albertsons, Wegmans, 7-Eleven, Walmart, Kellogg's, B.J.'s Wholesale and Chipotle, plus charities, schools and faith groups — committed to drastically reduce food waste.

The aim is to cut food waste in half by 2030.

The endeavor comes one week before businesses and diplomats meet in New York City to consider the Sustainable Development Goals — many of which focus on ending poverty and hunger — and confer at Climate Week.

The second of the 17 Sustainable Development Goals is "to end hunger [and] achieve food security," and the third is to "ensure healthy lives." Businesses and national governments have been asked to back them.

Many large corporations will be represented in New York for Climate Week meetings, so this issue is gaining exposure.

The combined corporate-federal intent is to bring new attention to what happens to food all along the production and distribution value chain so that resources aren't wasted and unserved, unsold food gets to people who are hungry. The USDA plans to educate consumers.

Business commitments

ConAgra stated it's a matter of managing resources.

"Solid waste is simply the result of wasted resources, representing an opportunity for further



efficiency in our operations. Our continuous improvement program — based on a 'zero loss' philosophy — drives maximum use of all of our material resources," ConAgra stated, announcing its participation.

By re-setting the tone of how we talk about these materials, we can begin changing attitudes and behaviors in our facilities to better manage them for value.

"Nearly all solid waste generated at our manufacturing facilities consists of food (more than 80 percent) and packaging

materials and much of it could be more aptly characterized as by-products vs. wastes.

"By re-setting the tone of how we talk about these materials, we can begin changing attitudes and behaviors in our facilities to better manage them for value."

ConAgra said through efforts it began five years ago, it diverts about 75 to 90 percent of its solid waste away from its landfills. It did this by increasing its donations to charities that feed hungry people, improving processes to allow waste byproducts to be used as animal feed and increasing use of technologies such as anaerobic digestion to recovery energy and soil amendments from composting.

Now ConAgra aims to increase all of these activities.

The merged Safeway and Albertsons, and their 2,230 supermarkets, said it has had strategies to reduce waste at the store level — also a business imperative to reduce shrinkage — by more precise inventory replacement and just-in-time ordering. A second major activity, it stated, is donating food to hunger relief agencies. Safeway said it donates about 72 million pounds of food to hunger relief agencies, or the equivalent of about 59 million meals.

Surplus oranges considered past their sell date or not orange enough became part of a Second Harvest food donation packaging effort.

Several food companies are seeing the value of diverting food waste to animal feed processors and even biodiesel makers.

In its California and Pacific Northwest stores, Safeway has begun to collect bone and animal fat to send to feed lots. It collects used cooking oils in those regions to be recycled and processed into biodiesel fuel for delivery trucks. Safeway said the Western states trial of this has been successful in that it diverts about 42,800 tons of food waste to animal feed lots and 4,680 tons of used cooking oil a year those regions to biodiesel producers.

General Mills said it has been recycling or reusing most of its food waste in the last three years, processing 84 percent of the approximately 159,000 metric tons of waste it generates at manufacturing plants. It also has a system of food donations from its factories to charities.

With the EPA and USDA initiative, it plans to add efficiencies to the donation system to minimize damage to food in transport and add packaging in its donations. It works through the nonprofit Feeding America.

Secondly, it aims to work towards zero loss in production facilities, both reducing waste generation and then capturing what waste exists for recycle, reuse or donation.

Whole Foods Markets will continue to donate food that has lost its attractiveness or saleability to We Don't Waste in various cities where Whole Foods operates.

Bon Appetit Management, 7-Eleven Stores, Unilever, Walmart and even the Milwaukee Brewers have made commitments to reduce food waste.

Thirty-one colleges and universities, about 100 K-through-12 schools and the state of Connecticut also committed to the effort.

[<Source>](#)

US Offshore Wind Grows Behind the Scenes

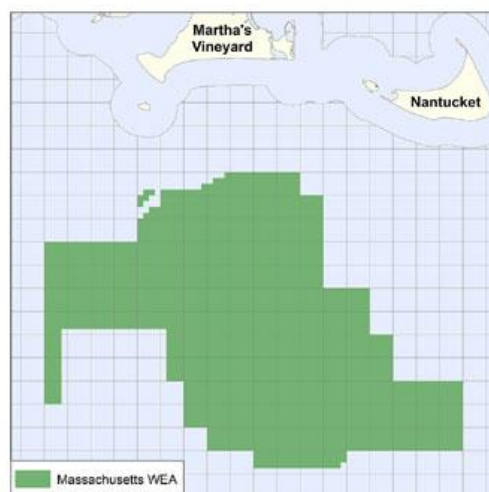
SustainableBusiness.com News

While it seems offshore wind in the US is barely budging, there's a lot happening behind the scenes.

Besides the tiny project under construction in the Northeast, offshore wind projects in the pipeline total 15.7 gigawatts (GW)! 13 that are in advanced planning stages total 6 GW - enough power for 1.8 million homes - and 12 projects (over 3 GW) plan to be operating by 2020.

Offshore projects are moving ahead off the coasts of nine states. With 80% of US electricity demand coming from coastal states, offshore wind can play a crucial role in meeting our energy needs.

Deepwater's 30 MW project is the first to be under construction in the US:



Globally, there's now 9 GW of operating offshore wind farms, with another 4 GW coming online next year. In fact, offshore wind is expected to drive much of the industry's growth going forward.

Turbines are getting bigger and bigger, with the largest ones at 6 MW and 8 MW (typical turbines on land are 1.9 MW). To give you an idea of how large they are, the average offshore turbine at 3.4 MW is 279-feet tall and the blades are 377-feet in diameter.

Siemens, which leads on manufacturing offshore turbines, recently received a \$1.2 billion order for 91 of its 6 MW

turbines for Race Bank farm in the UK, and another order for 67 turbines for the Vea Mate Offshore Project in the German North Sea. The company is the favored supplier for a \$2.9 billion order (171, 7 MW turbines) if the Hornsea Project One - the largest in the world - goes forward. Dong Energy is the developer for all these projects.

Offshore wind is expected to reach 30 GW in Europe by 2020 - 45% compound annual growth, according to Bloomberg New Energy Finance. The EU has 8 GW installed right now.

[<Source>](#)

Food and drink companies found to be ignoring biggest impact on climate

CDP analysis finds fewer than a quarter of big food, beverage and tobacco brands report agricultural emissions

By Frances Way



Farm fields in the Central Valley near Fresno, California. The state's drought is estimated to have cost the agricultural sector more than \$2bn. Photograph: Lucy Nicholson/Reuters

threats to the coffee industry, consumers are increasingly aware of the effects of rising global average temperatures.

For companies in the food, beverage and tobacco sectors, climate change presents a two-fold challenge: the industry is highly exposed to climate-related impacts, but is at the same time a major contributor to increasing global greenhouse gas (GHG) emissions levels – particularly from agricultural production, which according to the IPCC causes 10-14% of global GHG emissions.

These challenges are significant. KPMG has warned that inaction on climate change could threaten the financial viability of the food industry. The increase in unpredictable extreme weather events is already affecting agricultural productivity and food companies' supply chains are being hit: the ongoing drought in California is estimated to have cost the agricultural sector more than \$2bn to date.

A growing number of companies are realising the risks. This year 92% of brands reporting to CDP – the global non-profit organisation that gathers data on environmental risk – noted risks from the physical impacts of climate change, up from 84% in 2012. Some companies are relating this to future financial outputs: Diageo projects that changes in temperature could have negative financial implications on its agricultural supply chain. This could force the company to spend up to \$77m more in increased commodity costs and production disruption.

But, despite these clear business risks, many companies are not yet investigating where their largest climate impacts may lie. The biggest source of food-related GHG emissions occurs before produce leaves the farm gate, in the agricultural production portion of producer's supply chains. Yet only 22 of the 97 major food, beverage and tobacco brands that disclosed to CDP this year reported their indirect GHG emissions from agricultural production.

In addition, the majority of emissions-reduction activities companies report carrying out are focused on their direct operations, rather than their supply chain, where the bigger opportunities and risks lie, confirming that companies should be moving their attention from their own operations to their agricultural supply chain.

These risks are increasingly being realised by investors. Following a shareholder proposal set out by Green Century Capital Management and Oxfam America, one of the world's largest food and beverage companies, General Mills, recently became the first in its sector to adopt long-term, ambitious targets to cut GHG emissions.

General Mills' strategy includes carbon emissions from its own operations but also from its supply chain, including those from agricultural production. The company is ahead of its peers in recognising agricultural production as producing the largest amount of GHG's of all its operations, bringing competitive advantage.

Data disclosed to CDP shows that major food producers that do take steps to address climate change through activities such as nutrient or manure management see multiple benefits, including financial savings. Over a third of food, beverage and tobacco companies report lower costs as a result of carrying out agricultural management practices with climate change benefit, either in their own farms or with suppliers.

Companies are also realising that they cannot do it alone. General Mills states that there is much to be achieved in pre-competitive collaboration across the industry when tackling emissions in agriculture. Supply chain collaboration is also providing positive feedback, with firms like SABMiller and Dairy Crest group undertaking knowledge sharing to improve fertiliser use.

To truly ensure future resilience, food, beverage and tobacco companies must shift their focus from in-house emissions to those from agricultural production. While there are clear barriers to action, including the complexity of working with huge, global agricultural supply chains, signs of change are becoming more frequent.

[<Source>](#)

Scant climate benefits to natural gas-fueled buses and fleets

By Jonathan Camuzeaux



At a time when companies and governments are looking more closely at alternative fuel sources to reduce their environmental impact, many players in the transportation sector are considering shifting their bus or commercial truck fleets from diesel to natural gas fuel.

They're looking for an advantage in carbon dioxide (CO2) emissions as well as fuel costs savings to justify the higher

vehicle costs and reduced fuel efficiency of natural gas vehicles.

They may be surprised to know, however, that natural gas-powered vehicles are not necessarily more climate-friendly than their diesel fumes-spewing counterparts.

Climate benefits uncertain at best

To make sure a fuel switch brings immediate climate benefits, we must make engine-efficiency improvements and major cuts in potent heat-trapping methane emissions along the natural gas value chain. If these steps are not taken, moving truck fleets from diesel to natural gas actually could increase warming for decades to come.

This is a growing concern today as the market share for such vehicles seems poised to grow.

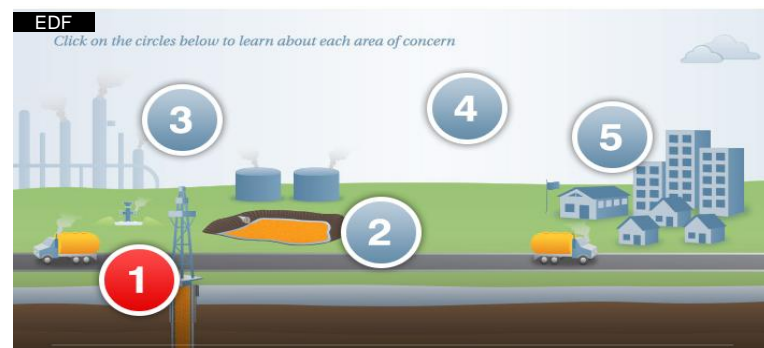
While only about 3 percent of new freight trucks run on natural gas today, some analysts suggest their market share could reach as high as 20 percent over the next decade if high oil and diesel prices return. Meanwhile, investments in natural gas-powered utility vehicles and transit buses are growing, with 11 percent of such vehicles already running on gas.

It means we must address the problem of methane emissions today, before market penetration becomes significant and the technology is locked in and harder to change.

Natural gas value chain full of leaks

Methane — the main ingredient in natural gas and a greenhouse gas many times more potent than CO2 — is leaked to the atmosphere from the point where it's first extracted from the ground to when it's burned by a vehicle barreling down the expressway.

There are 5 areas of concern about natural gas:



Five areas of potential pollution concern with natural gas extraction.

1. At a (natural gas extraction) well site, groundwater can be contaminated through faulty well construction or chemical spills at the surface. In both cases, strong rules and oversight are the keys to public safety.
2. Groundwater also can be contaminated by mishandling waste water. Water used in the process of hydraulic fracturing, as well as water released from the shale along with the gas, must be treated and disposed of properly to avoid contaminating groundwater.
3. As natural gas is extracted and processed, air pollutants can leak into the atmosphere.
4. Natural gas — comprising mostly methane — burns cleaner than coal, but when it is vented or leaks from wells and pipelines uncombusted, it is a powerful greenhouse gas. The good news is, we have the technology to avoid venting and fix leaks.
5. People have a right to know what chemicals are being used in their community, what is being emitted into the air and what is in the wastewater being produced on site. They also have the right to exercise their traditional authorities over this intensive industrial activity.

Fewer emissions at combustion, but leaks during production

While natural gas releases less CO2 than diesel to the atmosphere when it is combusted, methane leaks from the production and transportation of natural gas has the potential to remove some or all of the climate benefits companies are looking for as they upgrade their fleets.

Adding to the challenge, today's natural gas truck engines can be as much as 15 percent less efficient than diesel engines. Consuming more fuel for each mile traveled also reduces their net pollution reductions.

[<ReadMore>](#)

Will the GenZe scooter disrupt your commute?

By Barbara Grady



encouraging the use of public transportation, bikes and shared vehicles while increasing parking fees.

Many have "smart city" blueprints on the drafting board where four-wheeled, gasoline powered cars are out of the picture, replaced by a system of light rail complemented by shared electric vehicles (EVs) available on-demand for commuters.

It's that last mile between train and office that cities want to solve, along with millennials' inclination to ditch cars in favor of bikes or shared rides, as well as a general desire to reduce carbon footprints that is creating a new market.

Within this changing urban transportation marketplace GenZe, a U.S. subsidiary of Indian transportation conglomerate Mahindra Group, developed what it sees as the urban commuter vehicle for U.S. cities of the future — the near future, that is.

GenZe — named for "next generation" and "zero emissions" — has created an electric scooter that has certain amenities for urban commuters. It's a one-person lightweight motorcycle with storage for a briefcase or groceries, and equipped with smart-vehicle logistics apps for drivers to find out how to get places, which routes have traffic, how their battery is doing and so on.

The GenZe 2.0 is in production, and GenZe plans to ship its first scooters in October.

GenZe, based in Fremont, California, on the edges of Silicon Valley, touts its scooter as a Valley-engineered and Michigan-made EV that answers commute headaches and the need — and desire — for zero emissions vehicles. It already sells an electric powered bicycle — the GenZe e-bike — but that, it says, was just a precursor.

"We went out and traveled the country to various cities, urban centers. We talked to people asking how do you get from point A to B, how do you get to work or school? And we asked what are your pain points in those commutes," said Yesim Erez, GenZe's head of marketing, describing the road trip led by Terry Duncan, the product's designer, three years ago.

"We learned so much from that exercise. We learned that people don't want to be stuck in traffic, that sometimes it is easier for people to bicycle or train than take car.

"We also learned that people sometimes are inconvenienced by those choices. The bus or train doesn't go everywhere. Your office might be a mile away from the train stop. And not everybody is in shape to take a bicycle or they don't want to arrive at a meeting sweaty."

Moreover, she said, "They may want to take a briefcase or gym bag to work or stop on the way home for groceries," which are not easily done on a traditional bicycle or even by train.

Thus they came up with the GenZe 2.0, a two-wheeled EV that looks like a cross between a scooter and a motorcycle.



Daniyel Turner of GenZe's marketing team showing the GenZe 2.0 at a party in Oakland, California.

the battery snaps out and can be carried into an office or coffee shop for charging. Thus there's no need to park the GenZe 2.0 at a charging station. The Lithium-Ion battery, contained in a battery pack, can be plugged into standard electrical outlets.

And it doesn't take gasoline, of course.

What's all this mean?

Like the Nissan Leaf, the Tesla sedan and the Proterra EV bus, the GenZe 2.0 motorcycle is a product filling a newly emerging space of EV transportation that begins to tackle the pollution problems of the urban core and the greenhouse gas problems of the globe. Like the Gogoro EV scooter in Taiwan, it may have to nudge this market along.

American cities are rethinking transportation, as urbanites rethink cities and how to get around in them.

Cars are not so appealing anymore; they are isolating, expensive, a bother to park, and they pollute. Meanwhile, cities have to be redesigned to make room for more people while reducing smog and CO2.

Cities from Portland to Boston, Oakland to New Orleans are

Consultant and mobility designer Dan Sturges told GreenBiz this summer that the four-wheeled, gasoline powered car for solo driving commuters driven by a solo commuter is a scenario of the past that soon will disappear.

"Nearly 50 percent of our trips in urban areas are less than three miles, and 28 percent are one mile or less. Our cars are over-engineered for nearly every trip we take in them. It's overkill. It's like killing a roach with a shotgun. We could not do anything about this before the auto tech revolution, but now we can," he said in an interview with GreenBiz.

In smart cities discussions spawned by the 100 Resilient Cities movement and others, cities are talking about multi-modality transportation, about building infrastructures and kiosks and systems so that city workers or residents can take trains for parts of their commutes and then hop on a shared vehicle motor scooter or bike or the rest of their trip, the last half mile to the office or meeting or home. They envision zero emissions trains and vehicles, bicycles and walkways.

GenZe aims to tap into that desire and is in discussion with several cities, including Oakland, and state agencies about pairing up to create city kiosks where potential drivers could rent a GenZe to get to a meeting, say, or find one at the end of a train commute.

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Majority of oil and gas companies want a climate deal, says CDP

By Madeleine Cuff



Royal Dutch Shell is one of 13 publicly-traded fossil fuel companies whose boards support international climate negotiations.

Some of the world's largest fossil fuel producers would support a global deal to tackle climate change, sustainable investment campaign body CDP has revealed as negotiations continue this week at the United Nations headquarters in Bonn, Germany.

CDP — formerly the Carbon Disclosure Project — has received climate change information from more than 2,000

listed companies, including 28 of the world's largest energy firms. It asked each company whether its organization's board of directors support an international agreement to limit climate change to below 2 degrees Celsius.

None of the energy firms responded "no" despite widespread agreement that such a deal would require large swathes of the world's fossil fuel reserves to be left unburned.

Nearly half of the energy firms explicitly backed a global agreement, including Russian natural gas firm Gazprom and U.S. oil and gas firm Conoco Phillips, said CDP. Eight said they had no opinion on the matter, and seven did not respond to the question.

Among the wider group of respondents, 806 companies said they would support a global agreement, compared to 111 in opposition. The majority, numbering 1,075 organizations, said they had no opinion on the topic, and 330 did not respond to the question.

CDP's executive chairman, Paul Dickinson, said governments should listen to the strong business voice in support of climate action, rather than be influenced by firms who would prefer to see environmental priorities downgraded.

"Companies are telling us — and their investors — that they welcome climate action, which brings prosperity and growth," he said in a statement.

According to CDP, firms in industrial and consumer-facing sectors often cite market leadership through technological innovation as a main reason for support of a global climate deal, while in the financial sector economic stability is a key driver of support.

The findings echo remarks made last week by former Treasury adviser Lord Stern, who said tackling climate change did not have to mean sacrificing economic growth.

The results of the latest CDP survey also should add to the growing pressure for the international community to deliver a strong climate agreement in Paris later this year.

Less than nine negotiating days are left before the Paris summit, and at the current round of talks in Bonn officials are working to streamline the 83-page draft text into something more manageable.

U.N. officials were upbeat as the talks kicked off earlier this week, after it revealed that over 50 countries have submitted their official national climate action plans — a higher number than expected by this point in the process. However, progress remains painstakingly slow and it is widely expected any deal will fail to deliver on the 2 C target without an additional mechanism to ensure countries ratchet up ambition over the coming years.

This article is part of BusinessGreen's Road to Paris hub, hosted in association with PwC.

This story first appeared on: BusinessGreen

[<Source>](#)

Five companies using waste products in surprising ways

From ketchup byproducts being turned into bio-plastic to waste bread being used to brew beer, here are five innovative ways companies are re-thinking waste



The sky's the limit when it comes to what we can do with waste. Photograph: Shutterstock

prices for crude oil swinging wildly, market leaders decided that the only way to tackle this escalating crisis was to get innovative.

Auto-giants Ford have been leading research into 100% bio-based plastics, teaming up with Heinz in a mutually beneficial union.

While producing their world famous ketchup, Heinz generates up to 2 million tonnes of stems, seeds and skins every single year. In a collaboration with plastics research specialists from Ford, the companies are striving to create a plastic material from plant byproducts which can be used in many aspects of automotive design and finishing. The Coca-Cola Company, Nike Inc. and Procter & Gamble are also involved in the project, which will incorporate bio-plastic material into everything from packaging to clothing, making a huge dent in the impact of petrochemical-based products on the environment.

De-icing roads with cheese brine

Traditionally, when the roads in the Wisconsin city of Milwaukee freeze over (as they are known to do in the harsh winters that scourge the American midwest), they would be treated with regular rock salt, an effective but expensive and environmentally damaging solution.

Elsewhere in the state, dairy manufacturers struggle to cope with the costs of dealing with thousands upon thousands of gallons of cheese brine: the salty liquid which is left over after the production of Wisconsin's famous soft cheeses.

It took one leap of innovation to solve both problems: dairies donate brine to their municipality, eliminating the haulage charges associated with disposing of it themselves. The city then uses the byproduct to help keep the roads and highways safely de-iced, saving



The city of Milwaukee in winter. Photograph: ERWIN GEBHARD/AP

tens of thousands of dollars every year. The cheese brine even has a lower freezing temperature than the salt brine that had previously been used has - an added bonus.

Making beer with unsold bread

The goal of eliminating food wastehas produced some of the brightest innovators of our time.



"Babylone" is a beer made using leftover bread which would otherwise have been thrown out. Photograph: Marks and Spencer/PA

Sustainability has become one of the most important factors for businesses both big and small, worldwide. And while many companies are implementing recycling and waste management systems that have worked for years, some people are thinking outside the box and coming up with sustainability schemes you might never have thought possible.

Turning tomatoes into plastics

The demand for plastics isn't slowing. In fact, it's growing at a rate that has troubled many companies for years. With market



While producing ketchup, Heinz generates up to 2 million tonnes of stems, seeds and skins every single year. Photograph: Alamy

The idea of using food byproducts as a means to increase road safety has spread across the globe, with Irish seafood company and Origin Green member Errigal Seafood donating large quantities of shellfish shells to their local council to be used as road grit in the winter months. The initiative is helping the company lower their waste outputs, as well as lowering

The "Brussels Beer Project" is led by one such group of pioneers. The Belgium micro-brewers have teamed up with a local sustainability group to produce "Babylone" - a beer made using leftover bread which would otherwise have been thrown out.

Talented brewing specialists were able to reduce the amount of barley used in the brewing process and replace it with bread sourced from local supermarkets, a move which sees an average of 500kg worth of unused loaves find their way into 4000l of amber ale.

The simplicity and the benefits of this new method has attracted attention from breweries across the world, with many Origin Green members taking note of the Brussels Beer Project's ingenuity and success.

Coffee waste into furniture

With so much coffee being consumed worldwide, many novel solutions have sprung up to tackle the amount of waste produced by coffee farms and suppliers.

Coffee shops offer used grounds as fertiliser to their customers, and coffee pulp from farms can be ground down to produce coffee flour, a new product which is high in anti-oxidants.

In addition to this, a British design company has developed a way to create stunning furniture comprising 60% recycled coffee grounds, sold in many cases to the same offices and shops that they were sourced from.

Re-worked, the design firm run by Adam Fairweather, implements innovative techniques to produce a range of furniture, sculptures and jewelry from used grounds which, if left to less inventive folk, would have ended up as landfill.

Using sugar beets to cool refrigerators

Anaerobic digestion, the process by which biodegradable waste materials are converted into energy or heat - has become a staple in the quest for greener industry.

The success of anaerobic digestion led supermarket giant Sainsbury's to investigate new ways in which food byproducts could be utilised, leading to the implementation of eCO₂: an alternative refrigerant which is derived from waste sugar beet.



Coffee grounds are being put to all sorts of interesting uses, including towards producing furniture. Photograph: JASON REED/REUTERS

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Tesla Gigafactory & Battery Improvements Could Cut Battery Costs 50%

By James Ayre

Update: Title updated to 50% rather than 70%.

Originally published on *EV Obsession*.

Tesla will drive down battery-pack-level costs by 70% (down to around \$38/kilowatt-hour) once the Gigafactory hits peak production via economies of scale, improved chemistry, supply chain optimization, and other factors, according to Jefferies analyst Dan Dolev.

As part of his recent appraisal of the company, the analyst increased his price target for Tesla's stock up to \$365 a share — largely owing to his analysis of the company's battery business. As company executives have previously forecast a cost reduction of around 30%, the new analysis seems to suggest that that was a very "conservative" estimate (perhaps meant to be greatly exceeded for PR purposes, or simply because so many factors were/are still in the air).



Tesla Gigafactory under construction, by Bob Tregilus (CC BY-NC-SA 4.0)

The analyst in question is basing this prediction around an estimation that current Model S battery-pack costs hover somewhere around \$250/kWh (kilowatt-hour) — and that the

company "can bring the cost of the battery cells down to ~\$88/kWh and the pack-level cost to ~\$38/kWh."

Here's a clip from that:

"We believe that Tesla's use of an efficient nickel cobalt aluminum (NCA) cathode (ie the positive electrode), use of a silicon synthetic graphene anode (ie the negative electrode) that has 2-6x the lithium-ion storage capacity of today's standard graphite anode, and a possible use of water-based anode solvent, are key advantages. [...] Our analysis details a potential path to a 30% cell-level cost reduction to ~\$88/kWh by using a more efficient lithium-rich nickel cobalt manganese cathode (vs. NCA), doubling the percentage of silicon in the synthetic graphene anode, replacing the liquid electrolyte with an ionic gel electrolyte which eliminates the need for a separator, and using a water-based electrode solvent for the cathode. The Gigafactory, which is expected to begin production in early '16, should drive down pack-level costs by 70% to ~\$38/kWh via economies of scale, supply chain optimization, increased automation, and production domestication."

As noted by *Electrek*, that puts things in the sorts of ranges that would probably allow for a very affordable electric vehicle (EV) with a 200–300 mile plus range.

With regard to the estimation that Tesla Model S battery packs cost around \$250/kWh at the moment, it should probably be noted here that the company's Powerpacks are currently selling for around that price — so, presumably it's a bit lower, but that's just a guess. Other estimates put Tesla's battery packs at a cost of ~\$200/kWh right now.

[<Source>](#)

Transforming Our World: The UN's New Sustainable Development Agenda

SustainableBusiness.com News

It's been a busy week in the US, between visits by Pope Francis and China's president, and now the United Nations meeting.

At the UN, after two years of negotiations, 193 countries formally adopted the 2030 Sustainable Development Agenda: Transforming Our World, which includes 17 goals (with 169 targets) that build on the last set of 15-year goals - Millennium Development Goals that expire at the end of this year.

SUSTAINABLE DEVELOPMENT GOALS



The 17 Goals Are:

1. No Poverty: End poverty in all its forms everywhere
2. Zero Hunger: End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Good Health & Wellbeing: Ensure healthy lives and promote well-being for all at all ages.
4. Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Gender Equality: Achieve gender equality and empower all women and girls.
6. Clean Water & Sanitation: Ensure available and sustainable management of water and sanitation for all.
7. Affordable & Clean Energy: Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Decent Work & Economic Growth: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Industry, Innovation & Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
10. Reduce Inequalities: Reduce inequality in and among countries.
11. Sustainable Cities & Communities: Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Responsible Consumption & Production: Ensure sustainable consumption and production patterns.
13. Climate Action: Take urgent action to combat climate change and its impacts.
14. Life Below Water: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Life On Land: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Peace, Justice & Strong Institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels."
17. Partnerships For the Goals: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

The goals "are the result of the most open and transparent consultation process in the history of the United Nations, in which individuals, community organizations, businesses, scientists, academics and other partners worked with Governments. Millions of people shared their vision for a better world and what is needed to attain it. The result is truly the people's agenda," says Ban Ki-moon, Secretary-General of the United Nations.

"The Goals are universal; they apply to all countries, since we know that even the wealthiest have yet to conquer poverty or achieve full gender equality. No one goal is more important than any other; they are integrated and mutually reinforcing. For instance, access to energy will allow a child to study at night. This energy might come from a solar source and therefore be tackling climate change. In turn, the solar-panel industry might be helping a developing country grow its economy. Greater opportunity to study, in turn, can lead to better job opportunities, innovation, and stronger national institutions," he adds.

According to the White House, over the years, the UN's sustainable development goals have cut the number of people that live on less than \$1.25 per day by more than two-thirds;

more than halved the child mortality rate; and helped to reach gender parity in primary school enrollment.

"The first opportunity to prove that we are serious about these goals comes this December in Paris, where leaders will gather to find a way forward on climate change. An ambitious and universal climate agreement is an absolute must," says Mogens Lykketoft, president of the UN General Assembly.

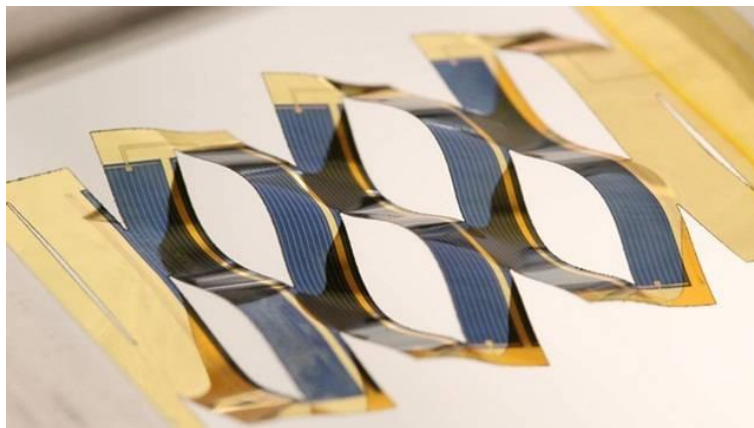
Learn more about the Sustainable Development Goals:

Website: <https://sustainabledevelopment.un.org>

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Kirigami-inspired solar cells track Sun the entire day

Gizmodo India Bureau



Solar energy is the cleanest and most abundant renewable energy source available on our planet. And with the use of modern technology, we can not only harness solar energy for power generation and several other purposes.

But generating power is not such an easy task; as one of the major difficulties faced by the designers of traditional flat solar panels is that the sun keeps moving through out the day. Seeking inspiration from kirigami, the ancient Japanese art of paper cutting, researchers at the University of Michigan have now developed solar cells panel that can work both the ways.

The team of engineers and an artist has developed an array of small solar cells that can tilt within a larger panel, keeping their surfaces more perpendicular to the sun's rays as it increases the effective area that is soaking up sunlight.

To explore patterns, the team of engineers worked with paper artist Matthew Shlian, a lecturer in the school of art and design. Shlian showed the researchers how to create them in paper using a plotter cutter. It was then that the team made more precise patterns in Kapton, a space-grade plastic, using a carbon-dioxide laser.

Cuts in a flexible backing for solar cells allow a flat solar panel to separate into many small cells that can track the sun across the sky. Tracking provides a 20 to 40 per cent improvement in the amount of energy captured by the cells.

Although the team tried more complex designs, the simplest pattern worked best. With cuts like rows of dashes, the plastic pulled apart into a basic mesh. The interconnected strips of Kapton tilt in proportion to how much the mesh is stretched, to an accuracy of about one degree. The optimized design is effective because it stretches easily, allowing a lot of tilt without losing much width.

"The beauty of our design is, from the standpoint of the person who's putting this panel up, nothing would really change. But inside, it would be doing something remarkable on a tiny scale: the solar cell would split into tiny segments that would follow the position of the sun in unison," said Max Shtein, an associate professor of materials science and engineering.

The paper on this study is titled Dynamic kirigami structures for integrated solar tracking. The University of Michigan has applied for a patent and is seeking partners to bring the technology to market.

(Image: The University of Michigan)

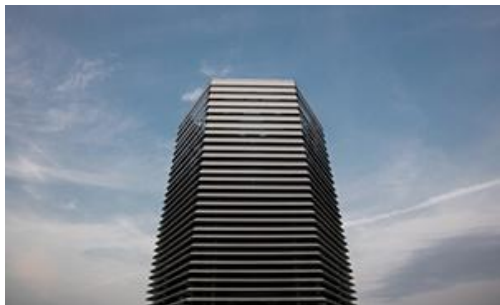
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World's first smog filtering tower goes on tour

A seven metre tall tower designed by Daan Roosegaarde filters dirty air, releasing bubbles of smog free air. Does it detract from tackling causes of air pollution?

By Elisabeth Braw



The smog-free tower in Rotterdam sucks in dirty air, filters it and returns bubbles of clean air through its vents. Photograph: PimHendriksen.com/Studio Roosegaarde

million people die prematurely due to air pollution each year. This is projected to double by 2050 if the problem isn't tackled.

"The smog-free tower contributes to a debate that shouldn't be confined to politics," says Rotterdam's mayor, Ahmed Aboutaleb. "Air pollution is a matter that affects us all, and it requires a serious discussion. But we do need innovators like Daan Roosegaarde to start the conversation at another level."

Roosegaarde has far-reaching ambitions for the tower, which is part of his Smog-Free Project. "It's not only intended to be a local solution that creates clean parks or playgrounds," he explains. "It's also a sensory experience of a clean future, a place where people can experience clean air."

He hopes to bring together governments, NGOs, the clean tech industry and ordinary citizens. "We can work together to make whole cities smog-free," he says. "We can wait – or we can participate."

The man behind the tower's Hoover-like cleaning filter is Bob Ursem, a nanoparticles expert at the Delft University of Technology. In outdoor tests, the filter has cleaned the air by 60%, measured by the share of nanoparticles removed, and in indoor environments the reduction is even more significant, he claims. "We've installed it in a parking garage here in the Netherlands and it sucks and cleans both the inside and outside air," Ursem says. "Inside the parking garage, the air became 70% cleaner."



An aerial view of the smog free tower. Photograph: Studio Roosegaarde

is much poorer in China and Malaysia, for example, where most cities feature air deemed unhealthy for sensitive groups. The air in several cities, including Delhi, has been classified as very unhealthy, indicating emergency conditions.

The tower's creators recognise this and, after its run in Rotterdam, the tower moves to Beijing, a city suffering from very poor air quality.

Earlier this month, Chinese authorities shut hundreds of factories in Beijing and banned half of the country's 5m cars from the roads in preparation for a gigantic military parade. In the days leading up to the parade, the air quality improved, resulting in pristine blue skies for the parade, only to return to smog when the ban was lifted.

According to Ursem, Rotterdam's filter can easily be scaled to help alleviate Beijing's smog. Yet while smog filters may offer some hope to suffering residents of booming cities, as the military parade ban suggests, no one technology or tactic can be as effective as working on the root causes of air pollution. In the tower's case, the filters would be costly too. While neither Roosegaarde nor Ursem would disclose the cost of the tower, the filters they have developed range in price from €1,600 to more than €118,000.

The Dutch city of Rotterdam has opened the world's first smog-free tower.

Co-designed by Dutch artist Daan Roosegaarde, the seven-metre high tower sucks in dirty air like a giant vacuum cleaner. Ion technology then filters it, before returning bubbles of smog-free air through the tower's vents. It is able to clean 30,000 cubic metres of air an hour, according to Roosegaarde.

Clean air is a precious commodity. A new study has found that more than three

But it's not Rotterdam where the need for air filters is greatest. According to the World Air Quality Index, most of western Europe enjoys clean air, with exceptions including London, where air quality is classified as moderate. It's a different story in the booming cities of the developing world and the Brics countries. Air quality

Sustainable aquaculture surfaces as a target for food investors

By Monica Jain



With global demand for fish growing at a rapid clip, sustainable aquaculture is emerging as a target for investment.

which connects sustainable seafood entrepreneurs with investors — I'm struck by the potential for aquaculture businesses to make a real difference in seafood sustainability.

Factors such as global population growth and increasing per-capita demand for seafood from an emerging global middle class already strain the world's oceans. More than 57 percent of worldwide wild fish stocks are fully exploited, while 30 percent is overharvested — and analysts expect worldwide seafood demand to double by 2050.

Aquaculture is playing a major role in meeting demand: In 2014, the industry overtook wild-caught fish as the world's leading source of seafood for consumption.

The industry has had its own sustainability issues, largely environmental problems associated with some open-water systems, but this is a highly entrepreneurial area with a lot of activity focused on responsible production.

About 20 percent of the entrants in Fish 2.0 are building on opportunities in aquaculture.

Many are focused on using land-based systems in markets that do not traditionally have access to freshly produced local seafood, such as Switzerland; the states of New Mexico, Indiana and Missouri; and several small Pacific islands.

Others are creating new technologies to reduce risk and improve the profitability of aquaculture ventures. These include hatcheries using novel technologies and business models to create both environmental and social change, as well as systems that reduce pollutants and coproduce biofuels alongside seafood.

Fishing on dry land?

Land-based aquaculture is among the most promising solutions.

Projected to grow nine-fold over the next 15 years, this segment includes the emerging and rapidly improving technology of self-contained, land-based Recirculating Aquaculture Systems (RAS).

Unlike open-water systems, RAS tanks can operate almost anywhere in the world, including urban and even desert environments.

This extreme flexibility, which enables strategic co-location of RAS production with major markets, distribution centers and transportation hubs, gives RAS a huge potential for expanding sustainable seafood production and delivery worldwide.

RAS technology is already seeing significant adoption in markets including the United States, where virtually all tilapia fish come from RAS operations, and Norway, where one-third of all Atlantic salmon smolts (juvenile fish reared in hatcheries) are RAS-produced.

Yet RAS has certain limiting factors. Costlier to build than open-water farms, land-based systems require more energy to operate, are harder to scale up, and require careful attention to water quality and disease control.

Entrepreneurs are developing solutions in all of these areas, however, and with strategic investment RAS could be an important source of high-quality protein for populations worldwide.

An appetite for innovation

We also see opportunities in the area of fish feed. A term generally describing protein-based pellets formed with a binding agent, fish feed is an integral component of aquaculture, with 46 percent of farmed fish requiring some form of feed to grow.

Fish feed production must increase 8 to 10 percent annually to keep pace with aquaculture, even as sources of marine-based proteins, a vital component of fish feed, are diminishing due to overfishing and climate change.

Here again, Fish 2.0 competitors are on the cutting edge. They are developing solutions that include software that allows farmers to optimize feed usage; an integrated aquaculture and feed approach in the South Pacific that uses only raw local ingredients; and alternative feed technologies based on krill, algae and insects.

By 2020, the value of the global aquaculture industry is expected to exceed \$200 billion, an increase of 38 percent over today's value. The global fish feed industry, meanwhile, is projected to grow from its current value of approximately \$75 billion to \$123 billion by 2019.

Both sectors could have a lasting positive impact on seafood sustainability, and both offer a multitude of investment opportunities — including helping businesses resolve key challenges on the road to success.

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Stanford engineers invent transparent coating that cools solar cells to boost efficiency

The hotter solar cells become, the less efficient they are at converting sunlight to electricity, a problem that has long vexed the solar industry. Now, Stanford engineers have developed a transparent overlay that increases efficiency by cooling the cells even in full sunlight.

BY GLEN MARTIN

When laid over a solar cell, the transparent material shown here can radiate heat away from solar cells, allowing them to produce electricity more efficiently.

Every time you stroll outside you emit energy into the universe: Heat from the top of your head radiates into space as infrared light.



Now three Stanford engineers have developed a technology that improves on solar panel performance by exploiting this basic phenomenon. Their invention shunts away the heat generated by a solar cell under sunlight and cools it in a way that allows it to convert more photons into electricity.

The work by Shanhui Fan, a professor of electrical engineering at Stanford, research associate Aaswath P. Raman and doctoral candidate Linxiao Zhu is described in the current

issue of *Proceedings of the National Academy of Sciences*.

The group's discovery, tested on a Stanford rooftop, addresses a problem that has long bedeviled the solar industry: The hotter solar cells get, the less efficient they become at converting the photons in light into useful electricity.

The Stanford solution is based on a thin, patterned silica material laid on top of a traditional solar cell. The material is transparent to the visible sunlight that powers solar cells, but captures and emits thermal radiation, or heat, as infrared rays.

"Solar arrays must face the sun to function, even though that heat is detrimental to efficiency," Fan said. "Our thermal overlay allows sunlight to pass through, preserving or even enhancing sunlight absorption, but it also cools the cell by radiating the heat out and improving the cell efficiency."

A cool way to improve solar efficiency

In 2014, the same trio of inventors developed an ultrathin material that radiated infrared heat directly back toward space without warming the atmosphere. They presented that work in *Nature*, describing it as "radiative cooling" because it shunted thermal energy directly into the deep, cold void of space.

In their new paper, the researchers applied that work to improve solar array performance when the sun is beating down.

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

For a typical crystalline silicon solar cell with an efficiency of 20 percent, 23 F of cooling would improve absolute cell efficiency by over 1 percent, a figure that represents a significant gain in energy production.

The researchers said the new transparent thermal overlays work best in dry, clear environments, which are also preferred sites for large solar arrays. They believe they can scale things up so commercial and industrial applications are feasible, perhaps using nanoprint lithography, which is a common technique for producing nanometer-scale patterns.

"That's not necessarily the only way," said Raman, a co-first-author of the paper. "New techniques and machines for manufacturing these kinds of patterns will continue to advance. I'm optimistic."

Cooler cars

Zhu said the technology has significant potential for any outdoor device or system that demands cooling but requires the preservation of the visible spectrum of sunlight for either practical or aesthetic reasons.

Welcome to the next generation of sustainable development

By Terry F. Yosie



The year 2015 is shaping up as one of the most consequential years for environmental/ sustainability policy in our lifetimes. In May, the Vatican published the Papal encyclical *Laudato Si*, a moral reference point for examining climate change, poverty and inequality and a critique of capitalism as currently practiced.

In August, the Obama Administration announced its final greenhouse gas controls for existing electricity generating power plants as part of a broader Clean Power Plan.

On September 25, the United Nations is scheduled to launch a comprehensive set of Sustainable Development Goals that significantly expands the number of global environment, development and social commitments beyond the Millennium Development Goals.

And, beginning on November 30 in Paris, the United Nations Conference of the Parties (COP 21) will hold its 21st session with the expectation of achieving a new agreement to limit future greenhouse gas emissions in both developed and developing nations.

Taken together, these initiatives are restructuring the expectations, policy frameworks and commitments for businesses and governments to implement sustainable development — not in some distant future, but beginning now.

Both business and government, and their partners in non-governmental organizations (NGOs) and multi-lateral institutions, are already engaged in many elements of the new sustainability agenda. This has occurred through investments in disease eradication, local collaborations to extend mobile telephony and build other infrastructure, job creation, and other philanthropic endeavors.

Businesses are also in the process of extending many of the tools and methods they created in developed countries (e.g., stakeholder assessment methodologies, supply chain management, energy and water efficiency measures) to emerging and lesser-developed markets.

Expected outcomes

Expected outcomes from the new generation of sustainable development differ from current efforts in at least several important ways:

- 1) Companies will be challenged to go beyond efforts to achieve efficiencies in energy and water consumption to develop more fundamental changes in business processes and product innovations to embody "net zero" and circular economy parameters,
- 2) This new generation includes a social responsibility agenda — centering on women's empowerment, workforce diversity, access to capital and natural resources, income inequality and poverty reduction — which aims to achieve parity with the economic and environmental pillars of sustainability, and
- 3) New institutional innovations will be expanded to focus on system-level governance and take sustainability initiatives to market scale in ways that will increasingly eclipse more bureaucratic, time-consuming multi-lateral negotiations as a preferred approach to problem-solving.

At this stage, very few institutions — public, private or non-profit — have thought systematically about these interrelated aspects of the new sustainability agenda. The past decade of experimentation involving a variety of cross-institutional collaborations, however, has yielded increased information and confidence among leading companies and NGOs that they can shift the contours of capitalism towards sustainability.

From reducing footprints to innovating

Businesses across a variety of sectors — motivated by employee expectations, the search for operational efficiencies, awareness of sustainability-related risks, and external stakeholder pressures — have increasingly engaged in the sustainability conversation and published their commitments and performance results.

However, while companies invested years of effort and money to integrate sustainability parameters into "normal" business operations, the goal posts have moved.

This development has occurred for several reasons. For one, competitive pressures in key market segments (e.g., retail, consumer products) have begun to disrupt the business processes and products of important upstream value chain participants (think of the dilemma of chemical producers that face chemical de-selection pressures from customers and stakeholders in making ingredients for food products, cleaning agents and personal care products).

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15-year-old gensets to be phased out in Delhi

IANIS | New Delhi

Fifteen-year-old generators being used in the national capital for residential and commercial purposes are to be phased out to bring down the city's air and noise pollution, the National Green Tribunal (NGT) has been told.

The Central Pollution Control Board (CPCB) informed the NGT that generators would be deactivated after completing 15 years from the date of manufacture or 50,000 hours of operation.

"Any generator set having engines not engraved with the date and name of the manufacturer should not be allowed to operate after June 1, 2015. Any diesel generator set without a certified acoustic enclosure will not be allowed to operate," the CPCB said.

The CPCB said generators used for agricultural purposes will have to be "discarded" after 16 years from the date of manufacture or 60,000 hours of operation.

The CPCB said that it had issued guidelines on 'in-use generator sets (noise and emissions)' under which generators used for agricultural purpose will have to be "discarded after its useful life, which is 16 years from the date of manufacturing or 60,000 hours of operation, whichever is earlier".

"Any generators used for agriculture purpose, having engines not engraved with manufacturer's name and date of manufacturing would not be allowed to operate after June 1, 2016," the CPCB said in its affidavit.

The CPCB response came on a plea filed by activist Ved Pal, stating that unchecked and uncontrolled lighting used at weddings required deployment of large generators that led to generation of smoke, heat and sound and contributed further to environmental degradation.

"Excessive number of musical bands are played during the night (that) also need excessive lighting in these processions requiring generators which cause air pollution and the atmosphere becomes polluted further, aggravating environmental pollution in terms of smoke and sound due to the use of such generators," the plea said, seeking to ensure decrease of carbon impact due to uncontrolled/unregulated celebrations.

[<Source>](#)

A modern passage to India's Water Markets

A crackdown on water pollution, new regulations and tougher action on offenders are driving significant investment in the Indian water and wastewater market. According to the new report from GWI, the NDA government is encouraging foreign players to establish partnerships with local companies as well as private sector participation, creating new routes into the industry.

NORTH AMERICA (PRWEB) SEPTEMBER 09, 2015

Out of millions of litres of untreated water that flows into India's rivers daily, only 30% is being treated to acceptable levels. Due to pollution becoming critical, the new NDA government is determined to take action.

India's capital expenditure on water and wastewater infrastructure is set to increase by 83% over the next years, hitting an annual run rate of \$16 billion by 2020. The wastewater treatment sector is expected to grow faster than water treatment, this alone reaching \$6.78 billion in the next five years.

The clean-up of river Ganga, home of over 400 million Indians, has been made a top priority, with \$3 billion guaranteed investment.

The CEO of Oval Observer Foundation, Sanmit Ahuja, told GWI Magazine that the river Ganga clean-up initiative "is a very good step in the right direction, but it is just not enough. You need the private sector to come in ... and a market for treated water needs to be created." (June, 2015).

India Water Markets, GWI's new primary research report, reveals the government's initiatives to transform India's cities and large towns to rival those in developed nations. Projects such as AMRUT (Atal Mission for Rejuvenation and Urban Transformation) and the Smart Cities Mission have already been put in place, aiming to raise the quality of India's water supply and sanitation level. Water and wastewater infrastructure is anticipated to constitute up to 40% of total investment, with \$7.7 billion allocated in 500 towns and \$7.4 billion put aside for upgrading 100 cities.

Rapid industrialization has added to an increase in water demand as the country tries to sustain its economic growth. Many new projects are expected to be implemented over the next coming years creating a strong market for water and wastewater.

Stricter regulations are being enforced by the government on wastewater discharge and freshwater consumption, causing many industrial units to face closure unless they meet the criteria.

Innovative treatment technologies will be required, creating demand for companies that can enable industrial users to treat their wastewater to a higher standard, using biological treatment systems, reverse osmosis, nanofiltration and membrane bioreactor systems.

Foreign players such as MyCelx and BioPetroClean have already started to infiltrate the market, providing solutions where Indian companies cannot offer the technologies needed.

The biggest areas of growth in the field of wastewater treatment will be in industries such as power, refining & petrochemicals, pharmaceuticals and steel.

Low oil prices are driving the refining & petrochemical industry with many refineries in India operating at over 100% of their design capacity, while demand for ultrapure water treatment in the pharmaceutical sector is expected to grow by 15.2% by 2020.

Investment regions and greenfield industrial parks are being built in corridors across the country, such as the Delhi - Mumbai Industrial Corridor. Management of integrated water and wastewater systems will be required, as well as the outsourcing of operations in the form of EPC + O&M contracts.

By implementing stricter rules and regulations, the new Indian government is creating opportunities for local and international companies in the water industry. Ramping up action on pollution will require private sector participation and foreign expertise.

View the report page complete and the full table of contents at:

<http://www.globalwaterintel.com/india-water-markets/>

[<Source>](#)

Battery-run tricycles to collect waste

Source: The Hindu, Chennai

Battery-operated vehicles, engaged in garbage collection in suburban Pallavaram, will ply on the narrow city lanes soon.

The Council on Monday has decided to buy 400 battery-operated tricycles to collect garbage directly from houses on congested lanes in areas like George Town, Purasawalkam and Royapuram. The Corporation collects garbage from 18 lakh households. But most of them do not segregate the waste due to lack of awareness. The city generates around 5,000 tonnes of municipal solid waste but the segregation at source continues to be poor, councillors complained.

The initiative to privatise waste collection, segregation and disposal has also not been implemented in the newly-added zones. Ramky Enviro Engineers will manage waste in Teynampet, Kodambakkam and Adyar. The initiative to procure battery-operated tricycles is due of delay in privatisation of waste collection in added zones. The civic body has decided to procure 3,300 bins in north Chennai and 2,200 bins in Perungudi, Sholinganallur and Alandur. Central zone will get an additional 2,100 bins.

[<Source>](#)

Biomass fuel More Harmful: Study

By Ram M Sundaram

CHENNAI: Women using biomass fuel to cook contribute more to the disease burden of India compared to cigarette smokers and high blood pressure patients, said Kalpana Balakrishnan, member of Steering committee on air pollution, Ministry of Health and Family Welfare.

Household air pollution due to use of unprocessed biomass fuel like wood, dung and other agricultural residues ranked second among all risk factors contributing to disease burden in India, according to a recent Global Disease Burden (GBD) study led by Institute for Health Metrics and Evaluation.

Kalpana Balakrishnan who was a member of this study said people in India using biomass fuel to cook in poorly ventilated rooms were exposed to more smoke compared to cigarette smokers. Even though the per unit risk per person was comparatively low, this value multiplied with a large population using it (700 million) added heavily to the country's disease burden, she added.

The study revealed that value of fine Particulate Matter (PM 2.5, an air toxic) suspended in air in rural houses in India (500 microgram per metrecube) was ten times higher compared to Chennai's annual outdoor average (50-60 microgram per metrecube). The rural Indian values are also fifty fold high compared to the WHO guideline exposure value for PM and other air toxic materials. Kalpana from Sri Ramachandra University said that through recent assessments it was found out that household air pollution resulted in Ischemic heart diseases, cardiovascular diseases, lung cancer, stroke in addition to chronic respiratory disease in women and acute respiratory infection in young children in India.

Before this study which recognises cooking smoke exposure as a leading cause of Chronic Obstructive Pulmonary Disease (COPD), doctors were puzzled by the fact that women, who were not smokers, developed COPD, she added on the sidelines of SRU University day celebrations.

In India, about a million deaths were attributed to household pollution and 6,27,000 deaths were due to ambient air pollution in 2010, and the 2013 figures are similar with no significant differences.

Indeed the assessment concluded that household and ambient air pollution together account for a disease burden which is greater than the burden contributed by all the 65 other risk factors put together.

But evidence for some outcomes associated with this pollution like asthma, lower birth rate, neuro-developmental defects and cataracts are in the process of being synthesised and published. Kalpana told Express.

Kalpana said India was surely in a position to act on this risk factor and the steering committee had already submitted recommendations to endorse health associations to take history of patients with such exposure and counsel them and go for a cleaner fuel "which is the best possible way out".

[<Source>](#)

Business opportunities stay buried in e-waste mgmt.

Source Name: Moneycontrolcom



Electronic waste (e-waste) management is a lucrative segment in the overall waste management services market in India owing to the vast amounts of untreated e-waste piling up.

As rapid economic growth stimulates consumer spending, the rise in the use of electronic devices is heightening e-waste

generation and unlocking tremendous scope for recycling. However, a large base of informal recyclers monopolise the market. Deploying a multi-pronged approach that includes creating public awareness and collaborating with scrap dealers will help companies emerge from the shadow of the unorganised sector.

New analysis from Frost & Sullivan, Electronic Waste Management Services in India, finds that the country generated 1.2 million metric tonnes (MT) of e-waste in 2014 and estimates this to reach 3.1 million MT in 2019, underlining the critical need for e-waste management.

"With India evolving into a global IT services hub and the usage of electronic products surging, the urgent requirement for effective e-waste management cannot be stressed enough," said Frost & Sullivan Environment and Building Technologies Industry Analyst Nidesha Naidu. "The proper enforcement of guidelines will be crucial to fuel added interest in e-waste recycling."

To bridge the huge gap between supply and demand of services, the existing setup and practices of the entire value chain will need significant improvement. For instance, customer preference for the unauthorised waste collection network continues to grow due to the convenience and the lack of efficient formal collection systems. Large businesses hesitate to dip their toes into this complex sector, while small-to-medium enterprises have limited cash resources and cannot fully exploit market potential.

The privatisation of e-waste contracts by municipalities, although at a very nascent stage, promises to unearth opportunities for private organisations across the value chain, from collection and segregation to dismantling and recycling. Capitalising on the strengths of the unorganised segment will speed up the integration of the formal and informal sectors and strengthen the infrastructure for e-waste recycling.

"A little innovation in marketing, such as sharing a percentage of the profit with e-waste suppliers, can lure them towards formal recycling," urged Naidu. "Initiating an aggressive public awareness program will also reinforce the importance of e-waste recycling."

Concentrated planning and investing in these strategies will allow new and existing firms to make the most of the tremendous business prospects in the e-waste management services market in India.

[\[Source\]](#)

Indian Railways Introduces Biodegradable, Environment Friendly Trash Bags

By Shreya Pareek

In an environment friendly move, Central Railways has introduced biodegradable garbage bags in AC coaches of two trains. This is how the bags will work.

Indian Railways has found yet another way of becoming eco-friendly. In a first of its kind move, Central Railways is going "green" by introducing environment-friendly biodegradable



garbage bags on long distance trains.

And how will this be done? CR will be using the bags in which linens are provided to the train passengers.

Linens will come packaged in these light green bags and once the passengers unpack their linen, they can use the bag for garbage.

Passengers can use these bags for storage or disposal of dry or wet waste. They can either throw these bags in the dustbin themselves or can request the on board housekeeping staff to do so during their rounds.

The bags also have printed details of on board housekeeping service and fire safety instructions.

As of now, this new step has been introduced in AC coaches of two central trains – Mangalore Express and the Pune-Jammu Tawi Jhelum Express

[\[Source\]](#)

Delhi Metro's Faridabad Line wins 'highest green building' rating

By Team lamin.in

The recently inaugurated Delhi Metro's Faridabad extension has received the 'highest green building' ratings for being equipped with a host of eco-friendly features.

Indian Green Building Council (IGBC), part of the Confederation of Indian Industry (CII), gave the highest possible rating- Platinum – to Delhi Metro Rail Corporation (DMRC) chief Mangu Singh for adhering to green building norms. The IGBC rates metro stations and buildings on a scale of platinum, gold, silver for following green building specifications.

Some of the eco-friendly features on the 14-km long section include facilities of rainwater harvesting, energy efficient air-conditioning and lighting arrangements, solar power generation facilities.

The DMRC has providing clean energy in the form of solar power. There are carbon dioxide sensors at the control room to monitor air quality. Moreover, water from the sewage treatment plant will be used for horticulture and sanitary purposes.

LEDs have been used for all indoor and outdoor lighting to ensure minimal power consumption.

[\[Source\]](#)

Ganesh festival leaves 50-tonne waste trail in Chennai

By Divya Chandrababu, TNN

Source: Economic Times

CHENNAI: The city was a mess on Monday morning, a day after thousands of people took out processions to immerse Ganesha idols in the sea, and left more than 50 tonnes of garbage in their wake on three beaches and roads leading to them.

Officials of Corporation of Chennai and sanitation firm Ramky Enviro Engineers Ltd said workers collected 30.5 tonnes of garbage on Foreshore Estate and Pattinapakkam beaches and roads leading to them. They collected 20 tonnes of waste from Palkalai Nagar Beach in Palavakkam.



20 tonnes of waste from Palkalai Nagar Beach in Palavakkam was collected recently, after Ganesha idols were immersed. (Representative photo)

"The garbage left behind by Ganesha processions this year has doubled from the previous year" a representative of Ramky said. The private operator is in charge of sanitation in three of the city's 15 zones. Adyar Kodambakkam and Teynampet which includes the Marina Beach stretch.

"On a routine day we collect 24 tonnes of garbage from Teynampet zone but on Monday morning there was an additional 6.5 tonnes," he said. "Last year there was only 2.5 tonnes of additional waste. Even roads that are usually clean during Ganesh Chaturthi such as Santhome High Road and Radhakrishnan Salai were littered with garlands and water packets."

Officials said the Hindutva push with the BJP government at the Centre could have led to people celebrating the festival on a grander scale. Hindu Munnani, the largest organiser of Ganesha processions in the city, displayed more than 5,000 Ganesha idols this year and its stamp was evident in the trail of orange headbands left on roads and beaches. "We increased the number of idols by around 700 this year," Hindu Munnani general secretary and founder of Vinayaka Chaturthi Vizha Committee Kutty Ganesh said. "Political parties such as AIADMK, DMK and PMK approached us and we got permission from local deputy commissioners and set up Ganesha pandals for them."

The city police had identified five points for immersion — Foreshore Estate, Palavakkam, Kasimedu, Ennore and Thiruvottiyur — and asked organisers to adhere to the routes agreed upon to head to the beaches. The processions began around 10am on Sunday morning and continued for more than eight hours.

"Most years there is little garbage on the Palkalai Nagar beach after Ganesha Chaturthi but there was 20 tonnes of waste after the festival this year," said a senior corporation official. People immersed more than 800 idols in the sea from the Palkalai Nagar beach. Most people ignored advice to use dustbins and left the beach littered with paper plates and water packets.

[\[Source\]](#)

Groundwater turning toxic with sewage

HYDERABAD: The recent spate of moderate to heavy rains in the city may have boosted the groundwater levels by at least half a metre, but a new report reveals that the water thus recharged is highly contaminated with fluorides, nitrates and large quantities of iron.

A report on the state's groundwater profile by the Central Groundwater Board (CGWB) says harmful chemicals are present in the water beyond the permissible limits. "It is bad news for the people as the report mentions a rise in the nitrate levels in the water. The basic source of nitrates in water sources is from sewerage, which seeps from improperly built septic tanks," Dr Shakeel Ahmed, chief scientist, National Geophysical Research Institute (NGRI), told TOI.



Since most of the times sewage tanks aren't properly constructed, toxic waste mixes with ground water in cities. (Representative photo)

aquifers.

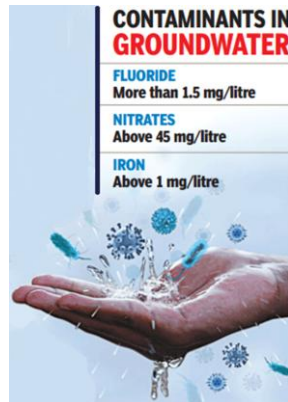
Medical experts say there are myriad harmful effects caused by nitrates in water. The symptoms include shortness of breath, and prolonged exposure may even be fatal. However, short term exposure to drinking water with nitrate levels above the prescribed standard is a potential health hazard primarily for infants.

Meanwhile, the ground water directorate said that with the recent rains, the groundwater level has risen from 9.89 metres to 9.77 metres. "We are expecting that the levels would further increase as September comes to a close," K Dhanunjay, deputy director, groundwater directorate, told TOI.

[Source](#)

He said that in an urban agglomeration like Hyderabad, most households have septic tanks, where the sewerage is collected. "But in many cases, we have noticed that the tanks are not built properly. The contractors play it cheap and construct flimsy tanks, which aids in the leakage of sewerage into the aquifers," he said.

He advised that the people of the city must have septic tanks made out of concrete, whose base is no lesser than four inches thick so as to prevent harmful chemicals from leaking into



India losing green cover more rapidly than before: study

Agricultural land development, by large and small scale producers, is believed to be the main driver behind the decreases

Melbourne: The world's forests have shrunk by 3% since 1990 — an area equivalent to the size of South Africa — with India among the countries losing green cover more rapidly, a new study has warned.

The globe's forests have shrunk despite significant improvements in conservation over the past decade, researchers said.

The UN's Global Forest Resources Assessment (GFRA) 2015 that released last week showed that while the pace of forest loss has slowed, the damage over the past 25 years has been considerable. Total forest area has declined by 3% between 1990 and 2015 from over 10,200 million acres to 9,881 million acres — a loss of 319 million acres.

Significantly, loss of natural forested area was double the global total at 6%, while tropical forests took the hardest hit with a loss rate of 10%, the report said.

Professor Rod Keenan, forestry expert at the University of Melbourne, headed a team of academics analysing the GFRA data for the UN's Food and Agriculture Organisation. "These are not good stats. We really need to be increasing forest area across all domains to provide for the forest benefits and services of a growing population. So there is more work to do," said Keenan.

Agricultural land development, by large and small scale producers, is believed to be the main driver behind the decreases, with Brazil, Indonesia and Nigeria recording the biggest losses over the past five years. While the annual rate of net forest loss in the 1990s stood at 18 million acres, it has since halved to over 8 million acres between 2010 and 2015.

"Halving the loss is a good thing, but we need continued policy focus to ensure the trend can be sustained," Keenan said. Keenan said the study showed forest is being more rapidly lost in some of the low-income countries, including India, Vietnam and Ghana.

"In low-income countries with high forest cover, forests are being cleared for direct subsistence by individuals and families and large scale agriculture for broader economic development," he said. "Some have policies and regulations to protect forests, but they do



The world's forests have shrunk by 3% since 1990 — an area equivalent to the size of South Africa. Photo: Mint

not have the capacity and resources to implement them," said Keenan.

[Source](#)

Indian entrepreneur develops biogas-fuelled fuel cell

Source: Greentechlead



PHOTO ILLUSTRATIVE ([HTTP://WWW.FUELCELLS.ORG](http://www.fuelcells.org))

An Indian entrepreneur based in Pune, Maharashtra, has developed a biogas-fuelled solid oxide fuel cell (SOFC) generator.

According to The Times of India, Siddharth Mayur, the founder president of h2e Power Systems, has developed the system which uses biogas produced from the breakdown of organic materials such as agricultural waste in the absence of oxygen.

Siddharth has told TOI that his fuel cell uses biogas, ammonia, other gaseous hydrocarbons or liquid fuels such as methanol and ethanol. "The input is renewable," he says.

The emissions from this process include a small quantity of carbon dioxide, distilled water, and usable heat at 800 degrees Celsius. Siddharth commissioned the first SOFC generator on August 15. The project was executed in collaboration with Germany's Fraunhofer IKTS.

Currently, the fuel cells Siddharth's company is producing are of 10–500 kw capacity. He believes he can produce systems with per kilowatt cost at just under Rs1 lakh (\$0.0015 million) compared with Rs2.5 lakh (\$0.00376 million) that conventional systems cost.

SOFC technology uses natural gas as the source for hydrogen in a fuel cell which combines it with oxygen to generate electricity.

"Subsidy linked products do not have long life and once the subsidy period ends, the product too finishes in the market," he says. The commercial product will be launched next February and it will be used at telecom towers and commercial establishments.

[Source](#)

Indian Railways to introduce 500 Solar Panel fitted Trains

Source: irctc.co.in

New Delhi: Indian Railways may introduce 500 trains with solar panel fitted coaches. Reports that the ministry of new and renewable energy could subsidize the project cost. The national transporter had run a pilot project with a specially outfitted coach earlier this year to study the feasibility of such an initiative.

The energy generated by the solar panels is likely to be used solely to meet illumination and air flow requirements in the bogies.

The report does not detail whether the project would also have storage mechanisms coupled with the panels to power devices in the absence of sunlight.

The railways already have a plan to install solar power capacity of 500 megawatts on rooftops of railway stations.

It is part of the organization's target to meet 10 percent of its energy requirements from renewable sources by 2020.

And it has signed four agreements with the ministries of power and renewable energy toward this purpose last month.

On average, Indian Railways is seeing 5 percent increase in energy consumption annually. In the year ended March 31, the railways had a power bill of Rs12,500 crore.

Recently the railway network of The Netherlands, Nederlandse Spoorwegen, announced that it will be operating its entire rolling stock on wind power by 2018.

[\[Source\]](#)

Material Recovery Facility to streamline waste collection

By G. Krishnakumar, for *The Hindu*

The government has okayed a proposal directing corporations and municipalities to set up Material Recovery Facility (MRF) for maximising recyclable waste generated in the State.

A specialised plant, MRF, separates and prepares recyclable materials for remanufacturing and reprocessing.

The move to set up the facilities came after government agencies, including the Suchitwa Mission and Clean Kerala Company, reported that efforts to implement a zero-waste system in the State hit rough weather after the local bodies failed to properly sort out recyclable material from waste.

Funds utilization: "Corporations and municipalities could utilise its own funds and identify land to establish MRFs. The local bodies could scale up the returns from sale of recyclable waste by introducing such a facility, where sorted discards could be stored before sending it to the recycling facilities," said Manjalamkuzhi Ali, Minister for Urban Affairs.

A proposal by the Suchitwa Mission had recommended that each corporation could set up medium-size MRFs in 10 locations while a municipality could have five similar facilities in the initial phase.

"MRFs could act as a temporary storage and segregation area before transporting the materials for recycling. It could be a shed of about 1,000 sq ft for a population of nearly 10,000," said K. Vasuki, Executive Director of the Mission.

Kabeer B. Haroon, Managing Director, Clean Kerala Company, pointed out that they are planning to rope in the services of Kudumbasree workers in the collection, segregation, and sorting of the recyclable waste brought to the MRFs.

Clean Kerala Company now pays Rs.2 a kg to local bodies providing plastic waste and Rs.5 a kg for e-waste.

It is then sold to private companies at Rs.5 and Rs.12 a kg respectively.

The specialised plant will separate and prepare recyclable materials for remanufacturing and reprocessing

[\[Source\]](#)

Rs 5000 fine on those throwing waste, puja offerings in Yamuna

PTI

New Delhi, Sep 20 (PTI) Ahead of the festive season, Delhi government has decided to strictly impose a fine of Rs 5,000 on those spotted polluting the Yamuna by throwing waste or puja offerings in it. National Green Tribunal (NGT) had in January passed a slew of directions in this regard, cracking the whip on those polluting the river. Among its directions was a fine of Rs 5,000 on individuals "spotted throwing waste or religious items in the river". The decision was taken at a recently-held high-level meeting, chaired by Delhi Environment Minister Asim Ahmed Khan, with officials from DPCC, municipal corporations, Environment Department and Irrigation and Flood Control Department. "MCD, police and DPCC officials will have power to penalise people, who are found throwing religious items in the river, with Rs 5,000. It was also decided to erect barricades and mesh near nine temporary ghats along Yamuna. "People will be asked to deposit their religious items at the designated places near ghats and if they do not comply with, we will strictly deal with them," a senior official told PTI. The government has also decided to approach as many as 100 Durga and chhath puja committees across the capital and request them to collectively deposit waste or puja offerings at the ghats created by the Flood and Irrigation Department. Sources said that this is the first time that the government has decided to "strictly" execute the green courts direction by imposing the fine of Rs 5,000. "The deposited items, including idols, at

designated places, will be taken out by the staff of municipal corporations so that people are able to immerse religious items. Delhi Police has also been asked to deploy its personnel in good numbers near ghats so that nobody can throw such items," a source said. Earlier this week, the NGT had banned immersion of idols made from non-biodegradable material like quick-setting gypsum plaster, also known as Plaster of Paris, or plastic in the Yamuna.

[\[Source\]](#)

Save on your electricity bills for up to 25 long years with Tata Power Solar

Source: **ENEGETICA**

Tata Power Solar has announced the nationwide launch of 'Tata Solar Dynamo' series of rooftop grid tie systems exclusively for the residential and SME rooftop market. This latest offering will enable rooftop consumers to, both, generate clean and green power as well as save on electricity bills for up to 25 long years.

Tata Power Solar, having installed 65 MW of rooftop and distributed generation projects across India, is looking to create awareness and influence the uptake of solar power in urban India. This two-way Tata Solar Dynamo system serves as a complementary source of energy, supported by a net meter, allowing users to both generate power to meet their needs and route excess power back to the grid. Users can either fully or partially off-set their captive consumption, allowing for up to 100% savings on electricity bills based on installation capacity and power usage. Additionally those feeding excess power back to the grid will receive monetary compensation, subject to state policies.

Speaking on the launch, Ashish Khanna, ED & CEO, Tata Power Solar said "India's residential rooftop market holds tremendous potential, and state specific net metering policies provide the needed impetus for consumers to take up rooftop solar. We are excited to enter the urban residential and SME market with a specialised offering, bringing the promise of brand Tata to an evolving sector in India. Through awareness campaigns, we want to get consumers to recognize solar energy as a viable and cost effective electricity option thereby influencing solar and clean energy adoption."

This easily installable modular structure, ranging from 1KW to 100KW, is compatible with various types of rooftop constructions and materials. Users get to enjoy a 25 year and 5 year warranty on the modules and inverter respectively, and the system's no-battery feature offers a maintenance-free experience. Additionally, for customer convenience, the coordination with distribution companies is handled by Tata Power Solar appointed dealers. Through a data logger customers can remotely monitor the system output and overall performance. The Tata Solar Dynamo system comes with long lasting module mounting structures and high efficiency inverters, ensuring the solar generation is maximised at any given point in time.

As part of this launch, Tata Power Solar has initiated a solar awareness van project in Bangalore and Hyderabad to encourage people to 'Go Green'. These solar awareness vans come fitted with a customized system to showcase and engage with consumers at city pulse points, educating them on the benefits of rooftop solar.

[\[Source\]](#)

Solar rickshaws to beat Howrah traffic blues

By **Rupak Banerjee, TNN**

HOWRAH: The Howrah Municipal Corporation is planning to launch a solar powered e-rickshaw designed by IEST, Shibpur. It will have twin benefits: the rickshaws will ensure a safe ride for passengers and secondly, the new mode of transport is expected to generate employment.

"The e-rickshaw we have designed will be covered on all sides with a solar panel atop. It will be akin to a three-wheeler car and one can even choose to fit an air-conditioner inside. Moreover, existing e-rickshaws have a very short battery life and it costs an operator approximately Rs 300 a day to charge the battery for a 12-hour drive. The new rickshaw will have long-lasting battery life," said IEST director Ajoy Ray.

IEST's Centre for Green Energy and Sensor System, which conceived the 'improved green three-wheeler', has submitted a patent application for the design. "Once approved, the patent will be sold to a manufacturer," said Ray, adding, "When it hits the road, the solar e-rickshaw will have a capacity to carry four passengers besides the driver."

Besides outpacing existing e-rickshaws on safety and operational aspects, the IEST-designed three-wheeler will be more competitive on the price front as well. While existing e-rickshaws cost over Rs 1 lakh, the green version will command a five figure price tag.

HMC chief advisor for slum development Masud Alam Khan said, "We have entered into an agreement with IEST to ensure that this green e-rickshaw is first launched in Howrah town. HMC will promote the e-rickshaw among unemployed youth in Howrah's slums."

"Initially, we will buy the first lot of green e-rickshaws made by the manufacturer IEST chooses to transfer its patent to. These vehicles will be distributed among unemployed youth in Howrah, including women. Later, we will talk to banks to extend loans on easy terms to such youth for buying and operating these green e-rickshaw."

[\[Source\]](#)



Traffic chaos near Howrah station.

A Vision of Sustainability with focus on Water

3 - 5, December 2015

Mumbai, India

The event Cumulus Mumbai 2015: 'In a planet of our own' is being held at Mumbai, India in December 2015, hosted by the Industrial Design Centre (IDC), at the Indian Institute of Technology (IIT) Bombay, Mumbai.

This international event is aimed at creating design awareness on sustainability bringing focus on water and simultaneously offers a platform for interaction for the art, design and media community. The events are centered around the interests of students, educationalists and practicing professional designers.

The event has been designed to be lively, interactive and thought provoking and shall provide great opportunity to converse with grandmasters of design, interact with thought leaders and listen to visions by outstanding speakers.

The event is expected to throw light on the role of art, design and media in an interconnected global world within the context of sustainability.

Apart from national speakers delegates from Italy, Slovenia, Denmark, China, France, Sweden, Norway, Finland, UK, Austria, US, Colombia, Portugal, Canada, Poland, Russia, Iceland, New Zealand, Switzerland, Singapore, Germany, Hong Kong and Australia are expected to give deliberations at the event.

The main themes of the conference are: i) Vision, Thinking and Philosophy in context to Sustainability. ii) Culture, Identity, Artefacts, Storytelling and Sustainability iii) Design Process, Planning and Strategy for Sustainable best practices iii) Production, Supply, Energy, Conservation, Preservation and Waste and iv) Awareness, Education, Curriculum and Policy.

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2015 3rd International Conference

on

Environment Pollution and Prevention (ICEPP 2015)

5th to 6th December 2015

Dubai, UAE

2015 3rd International Conference on Environment Pollution and Prevention (ICEPP 2015), is sponsored by the Asia-Pacific Chemical, Biological & Environmental Engineering Society (APCBEES). The conference is being organized in at Flora Grand Hotel, Dubai (UAE). It is one of the leading international conferences for presenting novel and fundamental advances in the fields of Environment Pollution and Prevention. It also serves to foster communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in improving Environment Pollution and Prevention related techniques. The Conference on Environment Pollution and Prevention (ICEPP 2015) is the premier forum for the presentation of technological advances and research results in the fields of Environment Pollution and Prevention. ICEPP 2015 will bring together leading engineers and scientists in Environment Pollution and Prevention from around the world.

The topics of interest include important and most relevant aspects. The topics also include Air pollution and treatment, Biofuels, Desalination, Energy Management, Environmental Protection, Environmental Risk Assessments, Environmental Safety Regulations, Environmental Sustainability and Development, Green Manufacturing and Technologies, Pollution Prevention, Greenhouse Effect, Global Warming, and Climate Change, Groundwater Issues, Impact of Industrialization on the Environment, Nanotechnology Impacts on Environment, Oil Spills, Pollution and Health Issues, Renewable and Non-Renewable Energies, Soil Pollution and Treatment, Wastewater Management & Treatment Water Pollution and Treatment.

Keynote speakers at the conference are Prof. Saif Al Qaydi, UAE, Prof. Dr. Hami Alpas, Turkey and Asc. Prof. Ernesto Hernandez, UK. Other than UAE delegates from many countries are expected to participate in the conference.

[<ReadMore>](#)

**2nd Annual**
International Conference on Poverty and Sustainable Development - 2015
"Economic growth, environmental mitigation and poverty in the post 2015 agenda"
Date - 15th - 16th December 2015
Venue : Colombo, Sri Lanka.



The 2nd Annual International Conference on Poverty and Sustainable Development (ICPSD 2015), will be held during 15 – 16 December 2015 in Colombo, Sri Lanka under the theme of “Economic growth, environmental mitigation and poverty in the post 2015 agenda”. The conference is being organized by The International Institute of Knowledge Management, Sri Lanka and with support of Ministry of Social Empowerment and Welfare, Sri Lanka.

Chief Guest at conference is Hon. S.B. Dissanayake Minister of Social Empowerment & Welfare, Sri Lanka. Keynote speakers and plenary speakers will include some of the world’s leading thinkers in the poverty & sustainability, as well as numerous papers and workshop presentations. These include speakers from New Zealand, USA and Pakistan.

The main tracks of the conference are VIZ. Economic growth and environmental degradation mitigation, Economic growth and poverty, Transforming economies for sustainable growth and Global partnerships and sustainable development. In each track there are very interesting topics, details of which can be seen on the website.

[<ReadMore>](#)

2015 IIER 25th International Conference on Natural Science and Environment (ICNSE) December 27, 2015 Zurich, Switzerland

2015 IIER 25th International Conference on Natural Science and Environment (ICNSE) will be held in Zurich, Switzerland, during December 27, 2015, as the Conference of ICNSE-2015. ICNSE 2015 is sponsored by International Institute of Engineers and Researchers (IIER). The conference will be held at Hotel Allegra Zurich, Switzerland.

It aims to be one of the leading international conferences for presenting novel and fundamental advances in the fields of Natural Science and Environment. It also serves to foster communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in improving Natural Science and Environment related techniques.

The conference will be an international forum for the presentation of technological advances and research results in the fields of Natural Science and Environment. The conference will bring together leading researchers, engineers and scientists in the domain of Natural Science and Environment interest from around the world.

The major themes are natural science and environment. Under environment theme there are numerous topics of interest like Environmental Science and Technology, Environmental dynamics, The Global environmental change and ecosystems management, Climate and climatic changes, Global warming, Ozone layer depletion, and Carbon capture & storage.

[<ReadMore>](#)

The Times of India, Delhi dated August 27, 2015

No subsidy, but draft solar plan promises competitive returns

Jayashree.Nandi
@timesgroup.com

New Delhi: If you are interested in setting up a solar rooftop system, don't expect a subsidy that can bring down capital costs. The Centre recently withdrew the 30% subsidy for commercial and industrial consumers; the Delhi government's new draft policy also doesn't have any provisions for a subsidy, which pretty much means consumers in Delhi will install solar panels or rooftop solar systems at market costs. Experts, however, believe that solar power is anyway competitive because of significant returns on investment within a short time.

The draft policy that was presented on Tuesday focused on achieving 1,000 MW by 2020 and 2 GW by 2025. The policy stresses on first covering all the government buildings on a renewable energy service company (RESCO) mode wherein a consumer need not pay installation cost upfront but pays for the power produced. The space is provided by the consumer.

HIGHLIGHTS OF THE POLICY

- 1,000 MW of solar power to be generated by 2020
- Government buildings will be given priority
- Within 3 years, government will try to install solar panels on all government buildings
- 75% of renewable purchase obligation target for solar power to be met with solar energy generated in Delhi
- Solar rooftop projects will not be made mandatory for domestic and commercial establishments
- Space for solar panels may be incorporated in MCD bylaws
- No subsidy to be given for installing solar rooftop projects
- Projects on government buildings will be on RESCO model, where a consumer need not pay the installation cost upfront but pays for the power produced. The space is provided by the consumer
- There may be generation-based incentives



Some discoms that attended the meeting said they were unsure a RESCO mode will work. "I don't know how many companies will come forward to do it.

The Delhi government should check the feasibility of RESCO first," said a participant. The Delhi government is planning to incorporate solar rooftop sys-

tems in corporation bylaws so panels can be installed even if they are not meeting the floor area ratio norms. There are also features like a generation-based incentive of about Rs 2 per unit. Another incentive is "accelerated depreciation", a method to reduce tax burden on the projects. There may be provisions for a "tax-free green bond".

"It's good the government doesn't have any subsidy provisions. The cost of solar rooftop is about Rs 80,000 per KW with return on investment within five years for commercial projects. For instance, if your bill is Rs 1,500 per month, power will be free after five years for the next 15 to 20 years. Solar is very competitive now," said a power company representative.

"The generation based incentive will encourage early adopters. Given current tariff structures, this sector can see significant savings," said Puja-rini Sen of Greenpeace. She cited the example of Holy Family Hospital in Okhla that has a 300 KW system and is saving over Rs 15 lakh per year.

Disabled women bat for greens

Nitisha.Kashyap@timesgroup.com

New Delhi: For 33-year-old Veena, planting a sapling was more of an experience than a campaign. The feel of supple leaves, invigorating smell of wet soil and watering plants left this visually-challenged from the National Association for the Blind Women (NAB) at Hauz Khas Enclave enthralled.

Accompanied by 20 others from the organization, Veena was part of the Green Drive campaign at the centre on Wednesday. And for each of these visually-impaired women, it was an experience in itself.

Green Drive, a TOI initiative along with Hero MotoCorp and Delhi Development Authority (DDA), aims at planting 1 lakh saplings in Tilpath Valley, Maidan Garhi, on August 30 after covering several areas across the city.

"It was for the first time I planted a sa-

pling. The experience made me happy. I will take care of the sapling I planted," said Veena, who works as a receptionist at the centre.

The joy of being part of the drive was evident on the participants' faces. Extra cautious for those carrying the lemon sapling, the director of the centre, Shalini Khanna, explained them the steps involved in the plantation.

Archana, who aspires to become a chef, tried identifying the saplings by touch. She lost her vision ten years ago, and with that her confidence. But today, she takes care of the guesthouse of the centre, interacts with foreign clients, and also teaches the new candidates at the centre.

Another member, Ritika, famous at the institute for making delicious muffins, took breaks in between her cooking session to plant saplings. Upset over being a little late, Amrita Gupta, pledged to be part of the plantation drive during weekends.



FIGHTING POLLUTION

Urban forests can clean up city air

Delhi's Green Cover Is Below Int'l Standards, But Experts Say It Can Do Better By Planting Right Species

TIMES NEWS NETWORK

New Delhi: Delhi has a per capita green cover of about 22 sqm (square metres) when the global standard ought to be 25 sqm to 100 sqm. Every year Delhi may be recording a marginal rise in green cover, but experts say there is room for much more. This is where urban forests like Tilpath Valley, where one lakh saplings will be planted on Sunday, play a role in offering multiple ecological services to polluted cities like Delhi.

There are 42 city forests as of now covering an area of 1,656 hectares. Forest department officials say there is no better proof of the importance of the Ridge and urban forests than the Asola Bhatti sanctuary. "Asola is in a rain shadow area. Since 2000, when we handed over the area for plantation to the eco task force (ETF), the micro climate has improved. Now we have 70 to 75 rainy days in Asola. Isn't that proof enough that urban forests are very important?" said a senior forest official.

"Chandigarh's per capita green cover is 55 sqm. Delhi can do much more but what is important is the species that Delhi will plant. Unfortunately, in many states city forests are filled with exotic and flowering species. I hope the capital doesn't go the wrong way," said professor N H Ravindranath of the Centre for Ecological Studies (CES), Indian Institute of Science in Bangalore.

Ravindranath added that the carbon sequestration potential of trees is obvious with each grown tree having a potential to sequester about 100 kg of carbon, but new research now points at association between green cover and better cognitive development among children.

"There are so many studies that have



Urban forests serve multiple ecological purposes for polluted cities like Delhi. And a thicker green cover ensures better cognitive abilities in children



Delhi Development Authority

proved that green cover has an impact on behaviour and psychology that these should also be taken into account. Urban forests can also be a source of food for the poor. Jamun today is one of the most expensive fruits when it should be so easily available in cities like Delhi. So should be tamarind and mangoes," added Ravindranath.

Forest department officials said they need to focus on developing woodlots.

"People want good-looking flowering trees but the best services are provided by dense woodlots," he added.

According to C R Babu, professor emeritus, Delhi University and the brain behind biodiversity parks in Delhi. "The plantation in Tilpath Valley of native Aravali species will be a first step in recharging groundwater aquifers in the entire Chhatarpur Valley. It will also improve the micro-climate in the area and might bring back wildlife like leopards and hyenas."

Plant 1 lakh trees at Tilpath Valley, Block M, Devli, Sainik Farms, right next to Igrou

On August 30, 7am onwards

For more details log on to: tel.in/greendrive



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The Times of India, Delhi
dated August 29, 2015

Air pollution may affect child's grades

Washington: High levels of emissions from cars, trucks and buses near your home could hamper a child's grades, according to a new study.

The study has found that fourth and fifth graders in US who are exposed to toxic air pollutants at home are more likely to have lower grade point average. Researchers analysed academic performance and sociodemographic data for 1,895 fourth and fifth grade children living in Texas. They used the US Environmental Protection Agency's National Air Toxics Assessment to estimate child's exposure to toxic air pollutants, such as diesel exhaust.

"Some evidence suggests that this association might exist because of illnesses, such as respiratory infections or asthma," study's co-author Sara E Grineski said. "The other hypothesis is that chronic exposure to air toxics can negatively affect children's neurological and brain development," Grineski said. 77



The Times of India, Delhi dated
August 29, 2015

Elderly sow seeds of a green future for all

TIMES NEWS NETWORK

New Delhi: A little green patch in the middle of a concrete jungle at Tughlaqabad Extension has more trees added to it as residents of Panchavati Home for the Senior Citizens came together to plant saplings at the TOI Green Drive on Friday morning.

The participants aged between 70 and 90 years talked about the ways in which individuals can act consciously to save the environment by planting more trees. Neem, hybrid guavas and peaches were planted on the ground beside the home. "These trees grow quickly and require less maintenance," said an official from DDA horticulture department.

Green Drive, a TOI initiative along with Hero MotoCorp and Delhi Development Authority (DDA), aims at planting 1 lakh saplings in Tilpath Valley, Maidan Garhi, on August 30 after covering several areas across the city.

The enthusiastic resident of the home stepped out with their gardening tools and gathered to plant the saplings with utmost care. "I have planted most of the trees on this patch during my stay here. I have nothing much to do for the rest of the day and love seeing them grow. These new plants would be an addition to them," said 80-year-old Shanti Devi, a housewife fondly called "auntie" by other residents of the home.

Neelam Mohan, chairperson of the trust that runs the home, said the residents were inspired to be part of the drive after reading about it in TOI. "We wanted to show that if we can do our bit for the environment, the rest of the city, too, can. The residents here have



Photo: Rajesh Mehta

spent most of their lives caring for their children and loved ones. The bond they share with the trees is something you would love to see," she said.

Applauding TOI for the venture, Shakuntala Biswas, 70, said she would like to participate next time too. "I want to see the peach trees grow and probably will share a fruit or two with my friends saying that this tree was planted by me," she said. Biswas was joined by Satya Prakash Sharma, a former CPWD engineer and Sundari Vishwanathan, wife of a former Indian Air Force officer.

"This home and the garden is a family to me and every new member, whether a human or a tree, is always welcome. I promise to give them the equal importance as the rest," said Vishwanathan, who has been staying in the home for the past few years since her husband had passed away.

The Times of India, Delhi dated
August 30, 2015

'Such parks are key to making the capital a smart and sustainable city'

Developing biodiversity parks or mini nature reserves within cities is the only way to conserve its natural heritage, believes C. R. BABU, professor emeritus, Delhi University, and head of Centre for Environmental Management of Degraded Ecosystems. In charge of developing the Tilpath Valley Biodiversity Park project, he tells JAYASHREE NANDI how he created the Yamuna and Aravali biodiversity parks

How did you come up with the idea of developing biodiversity parks in Delhi?

Delhi's native flora and fauna are on the verge of extinction. But it's our natural heritage that supports human civilization. Their ecological service is irreplaceable. At a conference attended by former lieutenant governor Vijai Kapoor 12 years ago, I had shared my concerns. He offered me 150 acres upstream of Wazirpur and I jumped onto the idea. I'm also thankful to DDA for land and infrastructure to create the biodiversity parks.

How did you create the Yamuna Biodiversity Park?

I studied what species were found here and how they co-existed. My task was to collect all those 25-30 forest tree communities found along the river. It's been over 10 years since and the trees now have a canopy height of 35 feet. Many animals that disappeared from Delhi—like wild boars—have returned. Vijai Kapoor, who has a lot of knowledge on Delhi, told me how wild boars used to roam near the Red Fort almost a century ago. The civet and jungle cat have also returned.

Ecological services are also being provided by colony parks. Why did you choose to develop nature reserves?

There's no other way to learn about Delhi's natural heritage. Students and researchers should have access to flora and fauna in the wild. That way even biodiversity parks have become a part of urban infrastructure and are key to making Delhi a smart city. A smart city is nothing but a place where there is sustainable use of resources. Nature reserves help us achieve that.

Why did you choose Tilpath Valley to build a biodiversity park?

Tilpath Valley is one of the deepest valleys of Delhi. In fact, they are a series of interconnected valleys that act as a catchment for the entire area. It can recharge massive amounts of water. This place can also attract wildlife like leopards and hyenas. TOI Green Drive is a first step towards developing the park.

How degraded are the Aravalis in Delhi?

There is nothing but Prosopis juliflora, an invasive species, all over the Ridge. The native species have all but vanished. Even Prosopis cineraria or khejri that once used to be abundant is lost.

Why do you choose degraded lands to work on?

Any place which has no life can be nursed back to health. Asola was a desertified ecosystem, nothing would grow there. Shatti was covered with mining pits, over a hundred years old. We have managed to develop a forest there. A similar example is the limestone mines near Mussoorie. The locals in Dehradun had moved Supreme Court complaining there was oxygen stress in the area. SC banned mining there. We took it up as a challenge and today it's in much better health.

The Times of India, Delhi dated
August 30, 2015

Thousands to plant 1L saplings at Tilpath Valley today

South Delhi To Inherit A Biodiversity Park That Will Clean Up The City's Air And Recover Its Lost Flora And Fauna

TIMES NEWS NETWORK

New Delhi: As Sunday dawns, TOI Green Drive will reach its ultimate objective: the planting of one lakh saplings at Tilpath Valley near Sainik Farms, south Delhi. All these saplings of native Aravali species will be planted by thousands. These will grow up in the years to come to create not just a pollution sink for Delhi but also a conservation space for Delhi's lost biodiversity. All are welcome to join the drive that will be carried out between 7am and 4pm.

Delhi is the most polluted city among 1,600 cities globally, according to the World Health Organisation's (WHO) urban air quality index released in 2014. Almost every winter, the PM 2.5 (fine, respirable pollution particles that are so dangerous that they can get lodged in your lungs and enter your bloodstream) count has been several times the safe standard. Even in summer, our lungs choke on Ozone, a highly hazardous gas that can trigger severe asthma attacks.

The TOI Green Drive with Hero MotoCorp and DDA is an effort to create a pollution sink because research has increasingly pointed out that trees not just sequester carbon (each tree can sequester about 100 kg of carbon) but also abate pollutants like PM 2.5. The other benefits include recharging of groundwater aquifers in south Delhi, which have depleted alarmingly, some as low as 80 metres below ground level, improvement of the micro-climate and bringing back species that were on the brink of extinction. More than 100 species of 10 biological communities will be planted here replicating a real forest.

CURBING POLLUTION & DEFORESTATION



TREE COMMUNITIES TO BE PLANTED IN TILPATH VALLEY INCLUDE:

- Adina
- Mitrgyna
- Anogeissus
- Butea
- Prosopis Cineraria or Khejri
- Tecomella Undulata
- Sterculia and
- Boswellia Serrata, deciduous broad leaved species and scrub forests



WHY TOI GREEN DRIVE?

- Once these saplings grow, they will act as a large CO2 sink; they will also guard against dust and improve air quality
- The grown-up trees can cool the area around Tilpath Valley. Plantations can reduce temperature by blocking sunlight
- Further cooling can occur when water evaporates from the leaves

- They can reduce the urban heat island (UHI) effect around Tilpath Valley and other areas where plantation will take place. Surfaces that were permeable and green have been concretized as a result of urbanization. These changes cause the urbanized areas to be much warmer than surrounding green areas
- Once the trees grow, the thick foliage will act as a buffer against noise pollution
- They can also provide a habitat for birds and other wildlife
- One large tree can provide a day's supply of oxygen for up to four people. Trees can also check soil erosion
- Some plants improve soil quality by fixing nitrogen; humus formed here will store carbon
- The plantation can check desertification and loss of biodiversity
- Besides acting as catchments for water bodies, Tilpath Valley can be an excellent rainwater harvesting and groundwater recharge site

Volunteers from 40 NGOs under the Teach India programme, 16 spiritual organizations of all religions and various corporations will be participating in the drive. Teach India and Sant Nirankari Charitable Foundation volunteers will take care of logistics.

All other participants are advised to bring their own sunscreen lotions, hats or caps, comfortable shoes etc. There are several approach routes to

Tilpath Valley. TOI has put up directions to the plantation site from Saket Metro station, from Sainik Farms gate number 1 and from Ignou main gate.

"These native species were abundant at one point of time in the Delhi Ridge but disappeared due to the spread of invasive species like Prosopis juliflora and urbanization along the ridge. The plantation drive will be a first step in bringing back the lost

vegetation of the area and pristine glory of the Ridge in Tilpath Valley," said C R Babu, professor emeritus, Delhi University.



Delhi Development Authority

Plant 1 lakh trees at Tilpath Valley, Block M, Devli, Sainik Farms, right next to Ignou

On August 30, 7am onwards

For more details log on to: toi.in/greendrive



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Celebrate

GREEN DIWALI

AVOID CRACKERS . CELEBRATE NATURE



Overall decline in green cover since 1986: Study

TIMES NEWS NETWORK

New Delhi: A recent study on the city's green cover shows a disturbing trend. Delhi's vegetation has seen an overall decline since 1986. The green cover is also increasingly becoming fragmented, the study reveals. The highest fragmentation is being seen on the periphery where afforestation work is being conducted to compensate for the loss of trees to urban development projects. However, it is also only on the periphery that the green cover is increasing while the same is on the wane in the core and transitional areas.

The study by Ashoka Trust for Research in Ecology and Environment (ATREE), Manipal Academy of Higher Education and Azim Premji University, highlights that though vegetation is increasing on the periphery, rapid urbanization and expanding real estate business could put this in danger. "Farm lands, wetlands, open spaces and trees on the periphery have been rapidly converted into urban built-up areas. With this, the vegetated landscape of Delhi is becoming increasingly fragmented like Shenzhen, Daqing and Mumbai" the study states.

For instance, the green cover in Delhi's core area in 1986 was about 64.68%, but it reduced to about 43.98% in 2010. Vegetation in the transitional area was 25.32% which marginally reduced to 22.43% but the peripheral green cover increased from 13.22% in 1986 to 16.52% in 2010.

"My study shows that there is an overall decline in the green cover in the past 25 years and the vegetated landscape is increasingly becoming fragmented. But when we look at different zones, we find that the core has maximum vegetation but it is also declining since 1986. The

“TOI-Hero Green Drive has been a great experience—there is a huge amount of excitement among people, especially schoolchildren. I compliment and thank hundreds of schoolchildren and citizens of Delhi who have taken out time and put in efforts to be part of the Hero-TOI Green Drive. I am sure we will have thousands of them at Tilpath Valley on Aug 30

—VIJAY SETHI | VICE-PRESIDENT, HERO MOTOCORP



“For the past four months, all government departments have worked very hard to ensure plantations are a success. This time we have also introduced third-party audit of each plantation because we need to be assured that saplings are in good health. We planted saplings that are more than five-six feet in height so that they survive. Our focus is also on fruit varieties like jamun, ber, imli, bel and others

—ASIM AHMED KHAN | DELHI'S ENVIRONMENT MINISTER



transitional zone has lesser proportion of vegetation than the core area. Though there has been a slight increase in the green cover in this zone from 1986 to 1999, the period between 2000 and 2010 saw a steady decline," said Somajit Paul, co-author of the study, which was conducted using satellite images for all these years.

The Times of India, Delhi dated August 30, 2015

The Times of India, Delhi dated August 31, 2015

Solar panels at DTC shelters

New Delhi: To meet Delhi's ever-increasing power demand, the AAP government plans to install solar panel on roofs of bus shelters of Delhi Transport Corporation (DTC) to generate more electricity.

According to the government, solar power is the only way to meet the growing power demand in future as the cost of conventional power is drastically increasing every year.

"We are planning to install solar panel on the roofs of the city's bus shelters so that more electricity could be generated," said Delhi power minister Satyendar Jain. **PTI**

The Economic Times, Delhi dated August 31, 2015

Climate Conference: Before Paris, There's Bonn

URMI A GOSWAMI

No real investments in energy are possible in India with its high interest rate, says France's special representative for climate change Laurence Tubiana prior to this week's Bonn meet

As host of the crucial round of the UN-sponsored climate talks in December, France has one eye on the clock and another on the table as negotiators from 190-odd countries assemble this week in Bonn to finalise the agreement to be inked in Paris.

France's special representative for climate change, Laurence Tubiana, says that the essence of the new global agreement, which will come into effect from 2020, is a cooperative approach, "what every country can do, and how we can do better together".

Progress towards this goal has been slow. Over this week in Bonn, negotiators will discuss a text prepared by the two climate negotiators, Dan Reffsnyder and Ahmed Djoghlaif, who are leading the talks on the post-2020 agreement to be inked in Paris. The length of the text has been cut down from 86 pages to 76 pages, but Tubiana acknowledges that "it is still very long and complex," despite seeing "big progress".



France's special rep for climate change Laurence Tubiana

According to Tubiana, it makes an effort of clarifying the three baskets of elements: the first about what should be in the legal instrument; the second about what should comprise the package of decisions taken by the conference of parties; and the third about undecided issues to be discussed in September.

With barely three months to Paris, the concern is whether there is enough time to bridge differences on key issues that present a hurdle to an agreement. Divergences persist on key issues of differentiating between developing and developed countries, ensuring transparency and accounta-

bility, and providing finance.

To address these issues, France has been holding informal consultations in ministerial meets and under the aegis of the Major Economies Forum and the Petersburg Dialogue. The idea is to find political solutions to address contentious issues.

The French academic-diplomat explains that there can be no negotiations in these informal meetings between parties representing various country groupings and regions. It doesn't represent the formality and the legitimacy of the formal UNFCCC negotiating process.

Experience from the Cancun round in 2010 shows that evolving a consensus on contentious issues and translating it into the formal negotiations process is time-consuming. And time is running out. Tubiana says that unlike in Copenhagen and Cancun, "We are not building from scratch". France has stressed that Paris is not the culmination but the beginning of a global effort where all countries work together to tackle climate change.

Developing countries are concerned about how industrialised countries are failing to take aggressive steps to reduce emissions, or to provide finance and technological support to tackle climate change. Between 2015

and 2020, when the new agreement will come into effect, the onus of taking action to address climate change rests with industrialised countries.

Tubiana acknowledges this concern, but says, "When I hear this discussion, I am not able to separate the political rhetoric and whether there is something we can do pragmatically."

It is to address this gap that France has put forward the 'solutions agenda'. "It is to identify the key sectors where, and the key actors who, can make progress. We have to work more. Probably we will do the mapping before Paris, to identify the sectors where we can make a difference," she says referring to the non-state actor zone for climate action (Nazca) initiative that showcases commitments by companies, cities, subnational regions and investors to tackle climate change.

"The major problem for middle-income countries is lowering the cost of technology, making technologies available and cheap, and lowering the cost of capital. Particularly in the case of India it is quite surprising, because you end up paying quite a high interest rate in the market for investments. You can't engage in this level of investment in energy by paying 10% interest," says Tubiana, adding, "Trust will probably be produced on the package."

The Times of India, Delhi dated
September 01, 2015

40,000 paint Tilpath green in 6 hrs

Month-Long TOI Campaign Culminates In Planting Of Over 1 Lakh Saplings On Sunday

TIMES NEWS NETWORK

New Delhi: Sunday's dry heat did little to deter the crowd of 40,000 and more that had turned up at Tilpath Valley on Delhi's southern fringe to contribute their bit to greening the city. The month-long TOI Green Drive culminated with the planting of over one lakh saplings in the south Delhi biodiversity park in less than six hours.

The Green Drive, a TOI initiative along with Hero MotoCorp and Delhi Development Authority (DDA), brought together people from across the National Capital Region, and even from Ladakh. The event saw leaders and followers of different faiths from 17 spiritual organizations congregating to raise awareness about greening and cleaning Delhi. Over 30,000 people represented Sant Nirankari Charitable Foundation alone. They included doctors, lawyers, auto drivers, students and businessmen.

Thirty NGOs under the umbrella of Teach India, with more than 3,000 volunteers, also supported the initiative in a big way. Companies that joined in the mega event included Oracle, Accenture, Sony, Ericsson and WWF.

Professor C R Babu, professor emeritus, Delhi University who, along with DDA, is developing Tilpath Valley as a biodiversity park, said that around 100 native species from 12 plant communities had been planted on Sunday. Sapling had been chosen carefully to suit the soil and topography. "This was a historic event. After inspecting the site in the evening, I found that the plantation has been done extremely well," he said.

A team of around 200 gardeners

from DU and DDA helped people in planting the saplings. The day started with the blowing of the shofar, a horn used by the Jewish community to formally inaugurate important events. Rabbi Ezekiel Isaac Malekar explained that the ritual was meant to communicate to nature that people had collected to save trees.

An hour after the event began at 7am, Delhi's deputy chief minister Manish Sisodia arrived and spent close to 30 minutes at the venue. After that saplings were planted by the heads of religious groups, including the leader of the Nirankaris, Baba Hardev Singh Ji Maharaj.

The major plantation work was over by noon, but Professor Babu needed his team to bring in more saplings to meet the demand. "We were not prepared for so many people. Just before noon, there were



Photos: Ranjit Kumar, Ryal Bhattacharjee, Vipin



more than 25,000 people," he said. A woman, he said, had walked 3.5 km with her baby to come and plant a tree.

Volunteers like Mohid worked through the day. "I reached the venue at 4 am and stayed till 5 pm to handle the traffic. About 600 of us were tasked with looking after the traffic arrangement," said the 34-year-old businessman and member of the Nirankari sect.

He was helped by Nirankari teams from places like Sonapat and Sohna in Haryana.

The saplings need care till they are 10-15 feet high, after which their developed roots can sustain growth. The Green Drive covered 35 acres of the park, but another 40-45 acres have to be forested. "Had it not been for this drive, the work would have taken us five years," said Babu.

AVOID TOO MUCH OF



Celebrate An
Environment Friendly
Diwali

The Times of India, Delhi dated
September 02, 2015

Houses take a shine to solar power

HARNESSING THE SUN

The Energy Efficiency & Renewable Energy Management Centre will be nodal agency

HIGHLIGHTS OF DRAFT POLICY

- > Mandatory installation on all government rooftops, to be completed within 3 years
- > All government buildings with a minimum shadow-free rooftop area of 50 sq m must generate 5 kW or 15% of sanctioned load
- > Solar adoption will be encouraged with generation-based incentive for 3 years
- > Solar panels can also be floated on perennial water bodies

Installation must with net metering on 50% of shadow-free rooftop area in buildings completed after Sep 1, 2015

COMMERCIAL
500 sq m

RESIDENTIAL
300 sq m

Amendment to building bylaws

Height of structure carrying solar panels shall not be counted towards total height of building

INCENTIVES

- > A generation-based incentive (GBI) of ₹ 2 per solar unit for 3 years
- > It will be paid on a first-come first-serve basis
- > GBI shall come from a Green Fund established by government
- > If consumer's bill falls to lower tariff slab through use of net metering, they aren't eligible
- > Electricity tax shall be exempted for solar energy units generated
- > No transmission and wheeling charge for five years
- > Solar panels, inverters, energy meters and other devices exempted from VAT and entry tax for five years
- > Generator can avail proceeds of carbon credits if any

Growth plan for solar power in Delhi

Fiscal year	Solar energy generation target (MW)	Cumulative generation target (MW)
FY 16	60	65
FY 17	108	173
FY 18	184	357
FY 19	281	638
FY 20	354	991
FY 21	276	1,268
FY 22	221	1,488
FY 23	186	1,674
FY 24	165	1,839
FY 25	150	1,989

A basic household will need a 5 kW system which can run 1 geyser, 1 AC, 3 fans, 3 lights and 2 room heaters



How costly it is for domestic generators
Cost of 1 kW solar rooftop system ₹ 90,000

Cost Down, Investment Recovered In 5-6 Yrs

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New Delhi: As solar panels get cheaper, they are being bought for use in houses also. Until last year, industries and institutions like schools and hospitals bought most of the rooftop solar systems to save on power bills and taxes.

Free power from solar panels offset the high rate of electricity for commercial use and businesses were also able to claim accelerated depreciation (a method to increase deductions) on the equipment to lower their taxable income.

Households, however, were reluctant to pay the steep initial cost of rooftop systems. But now, prices have come down to a level where users can recover the initial cost in 5-6 years, so interest in these systems is increasing.

"Our company is receiving decent demand from the residential sector because people have realized that they can reduce their electricity bill considerably. The highest slab of grid tariff that a household pays is Rs 9.6 per unit but with the installation of rooftop solar systems they only have to pay around Rs 6.5 per unit. Installing a system of 3kW-5kW can reduce

the electricity bill by 30%," says Tanya Batra, senior marketing manager, Sunkalp Energy.

The demand from households is growing slowly and there are limitations attached to the installation of solar power panels. The wind speed in an area determines the thickness of a solar panel. The efficiency of a system also depends on its orientation.

Households were reluctant to pay the steep initial cost of rooftop systems. But now prices have come down, so interest in these systems is increasing

It has to face outwards and be at an angle of 28 degrees from the ground for optimum efficiency.

Sunil Tikku, associate vice president of Luminous Power Technology Limited, says his customer base from the residential sector is limited to people who have independent houses. "It is difficult to install solar panels in multi-storey housing societies. Residents of apartments that do not have (independent) roofs cannot install solar panels

and not all the residents of a housing society would want to invest so much in solar energy-driven systems."

The solar energy sector is carrying out various innovations in an attempt to attract the attention of individual consumers towards the benefits of solar power.

Rooftop systems come with a net metering system that displays the power produced in real time on a monitor.

Many companies are also developing economical solar products. "We have come up with solar batteries that can charge inverters. They are very economical and useful in areas that face frequent power cuts," says K K Roy, director of Kalisons Telvent Private Limited that supplies solar energy equipment.

Atul Khanna, a resident of Green Park, installed a 4kW solar panel in his house a year ago. His experience has been good so far as he is able to save Rs 4,000 on his electricity bill.

"With the net metering system I am able to monitor the energy produced which I give to BSES in return for a reduction in my electricity bill. Even though the installation cost was high it has turned out to be beneficial in the long run."



The Economic Times, Delhi dated September 04, 2015

Green Scooters on Offer to Rev up Ecommerce Delivery

Go Green BOV offers electric vehicles on a lease model to delivery cos

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Bengaluru: City-based Go Green BOV is offering its electric scooters on a lease model to logistics, ecommerce and hyperlocal delivery companies, helping them save capital expenditure.

"The need of hour is B2B because they need to reduce logistics costs," said Dhivik Reddy, co-founder of Go Green BOV, whose scooters run 120 kms per charge. Until now the company has been selling through a dealership network as a B2C product.

The electric vehicle company has already leased 15 vehicles each to hyperlocal delivery companies Roadrunnr and Swiggy as a pilot. It is in early talks with Opinio and a major international ecommerce player too. "We are also in first level talks with Snapdeal, Holisol Logistics and GoJaavas," Reddy said.

Go Green's lease model includes an annual fee for charging the vehicle's battery, servicing and maintenance. Also, its scooters come with a hardware component (that doubles up as a key) — a dashboard that tracks the delivery person remotely, provides real-time data on performance of the vehicle, quality of the ride, amount of charge in bike and a route map for navigation.

"In terms of operational cost, Go Green scooters work out 65%



Green Ride

120 km Distance that Go Green scooters can travel on a single charge

15 Number of vehicles leased to Roadrunnr and Swiggy each

Scooters also have a dashboard that tracks the delivery person remotely, provides real-time data on performance of the vehicle, quality of the ride, amount of charge in bike and a route map for navigation

cheaper than a petrol vehicle," said Rowel Coelho, operation manager for sourcing and onboarding at Swiggy, which has been testing the service for a month. Swiggy has 2,000-2,500 delivery boys who own vehicles, and this model, Coelho said, allows the company to employ a larger chunk of people who don't own two-wheelers, are above 18 years and without a driving licence. "It reduces maintenance and other overheads — this model will help delivery boys." Swiggy is planning to add 10,000 delivery boys by next June.

Amar Sapra, professor of production and operations management at IIM-Bangalore said the leasing model is good in the ini-

tial phase when volumes and number of rides is low for a startup since it saves capital expenditure. "Once the volumes or number of rides become large, leasing will be more expensive than owning the vehicles. Moreover, the cost per km is likely to be lower with leasing in the initial phase."

Mayank Kumar, cofounder and CEO of last-mile delivery company Opinio, too is unsure on how this model will integrate with the company's operations. "There's a substantial risk because delivery boys can run away with the vehicle. Also, there are operational challenges of picking and dropping these bikes, since we have allocated our boys at delivery hubs near their homes."

The Times of India, Delhi dated
September 06, 2015

Nothing goes waste here, Vasant Vihar takes care

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In what could be seen as a unique community initiative, residents of Vasant Vihar have taken it upon themselves to manage the waste generated by the colony. Instead of banking on the civic body to clear the garbage, the RWA has created a composting facility in its three-acre Shaheed Rajguru Park to turn the wet waste into manure.

South Corporation standing committee chairman and area councillor Radhey Shyam Sharma recently inaugurated the "Community Composting Station". He was so impressed by it that he has decided to replicate the model in 6,400 parks under the corporation's jurisdiction.

A South Corporation spokesperson said, "We do have composting pits at various locations but now we are going to take this up on a pilot basis—around 10 parks in each zone." The park in Vasant Vihar is a zero-waste park that even composts dry leaves and twigs into leaf mould. The manure produced from the composting station is used for nurturing the plants in the park.

There are three rainwater harvesting units in the park and a fourth one is going to be set up soon. Plants like wood apple, aloe vera, shyam tulsi, giloy amrita,

papaya and lemon grass are available in a small nursery within the park. RWA members are allowed to take five saplings free of cost. Most of these have medicinal value with antibacterial qualities.

Promila Vohra (85), who has been residing in Vasant Vihar since 1993, recalls how the space was being used as a dump yard till a few years ago. She claims to have pursued the cause and made the residents take stock of the mess they were living in. "People would defecate in the open. The place used to stink. It took so many years to get the residents together," Vohra said.

Rajinder Maggu, vice-president of the RWA, said Vohra would sit in the park and catch hold of people. "She got us to contribute for the welfare of this park," he said.

The park has five sheds demarcated for composting and each shed has five rows of wet waste. "At a given point, we can process around a tonne of segregated wet waste. We cover it with grass and leaves after segregation, turn it around for aeration every 15 days and the manure is ready in 45 days," Maggu explained. The leaf mould takes six



GREEN CAUSE: Promila Vohra (above) convinced her neighbours to create a composting facility in the colony park; (right) saplings available in the nursery



Photos: Vipin

months and produces very fine manure, he added.

There are around 300 members in the RWA who contribute Rs 200 per month. Six workers are involved in the collection and segregation of garbage from each household. "The landfill sites in Delhi are overburdened and have been dumped with waste beyond capacity. If every RWA comes up with such facilities, we can reduce the burden on landfill sites greatly," said Sharma.



*Deccan Chronicle, Hyderabad
dated September 08, 2015*

Water table shrinks in concrete jungle

DC CORRESPONDENT
HYDERABAD, SEPT. 7

Rainwater from rooftops, residential complexes and office spaces, which is usually let off on roads or drains, is wreaking havoc and is one of the primary causes of water stagnation.

"The drains aren't built to handle the stormwater and when silt mixed with leaves, garbage and other waste enters them, they get clogged and water overflows on the roads," said a senior official from Greater Hyderabad Municipal Corporation (GHMC).

"It is not that people don't know this, but awareness about alternatives is low and so is the budget allocation for (rainwater) harvesting," the official added.

While harvesting pits help in replenishing the city's groundwater, storing water in sumps is also a good idea as it can be used almost immediately.

If one is not sure about rainwater harvesting pits, one can build reuse tanks of 15,000-20,000 litres capacity with a filter.

"The filter costs not more than ₹1,000. Hyderabad has around 600-800 mm of rains and with a rooftop of 300 sq.



A rainwater harvesting pit in the city.



■ If one is not sure about rainwater harvesting pits, one can build reuse tanks of 15,000-20,000 litres capacity with a filter.

■ A filter for rainwater harvesting pit costs a mere ₹1,000.

director at Center for Sustainable Agriculture who has a 50,000 litre capacity reuse tank in his house.

Mr Ramanjaneyulu had started harvesting rainwater around eight years ago and hasn't had to call for a water tanker since then.

mt, the entire tank can be filled. In my house, we don't use municipal water for around two-three months every year

and the HMWS&SB people had even noticed it as the meter had not recorded usage," said Ramanjaneyulu G.V.,

The Times of India, Delhi dated September 08, 2015

Climate deal: India seeks debate on 'lifestyles'

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New Delhi: India on Monday appealed to countries across the globe to include a debate on "lifestyles" while arriving at a climate deal when they assemble in Paris later this year. This followed Prime Minister Narendra Modi's speech last week when he sought to change the discourse on the issue from "climate change to climate justice".

India also hit out at rich nations for their extravagant consumption and asked them to seriously look at the needs of developing and poor countries which have a right to emerge out of poverty.

New Delhi's statement is a clear indication that India is more keen to keep the focus on 'adaptation' (sustainable practices) to deal with the climate change as

against the developed countries' formulation of 'mitigation' (emission cuts) to save the world from disastrous consequences of global warming.

India's stand was articulated by the country's environment minister Prakash Javadekar while making his intervention during a meeting on climate change negotiations in Paris on Monday. "Lifestyle adopted in developed countries is unsustainable and it will require five earths to fulfill their lifestyle demands. On the other hand, Indian lifestyle is sustainable where one earth is sufficient," he said. "This is not because of poverty, but because of Indian value systems. We believe in need-based consumption and our lifestyle is against extravagant consumption. We have ingrained sense of responsibility where wasteful consumption is ab-



horred," he added.

Javadekar quoted the latest 'Earth Overshoot Report' to substantiate his points. The report is brought every year by the Global Footprint Network — an international sustainability think tank — which presents objective analysis on 'ecological footprint', mapping consumption and requirement of natural resources to sustain it.

"The latest 'Earth Overshoot Report' is an eye-opener", said the minister while

“Lifestyle adopted in developed countries is unsustainable and it will require five earths to fulfill their lifestyle demands. On the other hand, Indian lifestyle is sustainable where one earth is sufficient

PRAKASH JAVADEKAR
Environment minister

emphasizing that the "world must debate seriously the sustainable lifestyle issue, as only sustainable lifestyle can mitigate the challenge of climate change". Hitting out at rich nations, he said, "Greed and unsustainable lifestyle should have no place in a new world regime to fight climate change and its ill-effects".

His remarks came just four days after Modi emphasized that poor and down-trodden are "most adversely" affected by climate change.

"The issue is not merely about climate change. It is about climate justice. Again I repeat (it) is not the issue of climate change, it is about climate justice," Modi had said last Thursday.

Making his intervention during the meeting in Paris, Javadekar also noted that India and other developing countries have priority of eradicating poverty. "They (developing countries) cannot be asked to compromise on that goal in the name of Climate Change. Every poor of the world has the right to emerge out of poverty, and poor and developing countries need sufficient carbon space to ensure sustainable development. As climate change impacts the poorer and vulnerable sections severely, we must ensure climate justice", he said.

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

The Times of India, Delhi dated
September 09, 2015

Landfill in Fbd hills will make NCR aquifers toxic

Leachate From Defunct Waste Plant Creates Polluted Lake

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New Delhi: The Haryana government may end up destroying the water recharge zone for Delhi, Gurgaon and Faridabad if it goes ahead with its plan of landfilling quarry pits near Pali village in Faridabad Aravalis. Scientists and geologists **TOI** spoke to said the Aravalis and the Yamuna floodplains are absolutely sacrosanct for drinking water availability in a large part of NCR.

Meanwhile, damage of groundwater aquifers in the region has already begun with leachate from the defunct Bandhwari waste treatment plant nearby forming a huge toxic lake in the midst of the forest.

The government, however, has not even bothered to send leachate samples for tests. The Bandhwari plant stopped treating waste two years ago, reportedly after a fire on the premises. But villagers claim that the plant never processed the entire waste that would land there, leading to leachate seepage that gradually flowed into the hills. They also say that waste from Gurgaon is also dumped in the precincts

POISON IN WATER

SOUTH DELHI'S GROUNDWATER IS SUFFERING FROM LEACHATE POLLUTION

WHAT IS LEACHATE?

It's a solution resulting from leaching, as of soluble constituents from soil, landfill, etc., by downward percolating ground water. Leaching is loss or extraction of certain materials from a carrier into a liquid

Municipal solid waste (management) rules 1999 state that the landfill site shall be away from habitation clusters, forest, water bodies, national parks, wetlands and places of cultural, historical or religious interest

Why is it dangerous?

- A JNU team studied raw leachate samples collected from Bhalswa, Ghazipur and Okhla landfills
- Samples were found to have relatively low concentrations of heavy metals
- The organic component was 158 times the upper permissible limit
- Xenobiotics, aromatic compounds, polycyclic aromatic hydrocarbons, phthalate esters and other contaminants were present
- There was a significant load of cytotoxic compounds which cause DNA damage

of the plant.

The Haryana government seems to have violated several provisions of the 1999 municipal solid waste rules. It did not construct a non-permeable lining system at the base and walls of the waste disposal area; nor did it make provisions for leachate collection or treatment, stipulated in schedule 4 of the rules. The new draft sol-

id waste management rules, too, warn against locating landfills on hills.

Pointing at the leachate lake, villager and activist Sunil Harsana said, "This used to be a village *johad* (water body) years ago. The leachate has already contaminated the groundwater. Some houses across the border in Delhi are receiving foul-smelling water.

Sanjeev Rastogi



MUCK POOL: Slurry leaching out of the shut Bandhwari waste treatment plant at Mangar in Faridabad

They are depending on tankers now." One can expect several dangerous—even carcinogenic—pollutants in the leachate, Piyush Mohapatra of Toxics Link said.

Municipal Corporation of Gurgaon commissioner Vikas Gupta said he has initiated action only now. "We contacted NEERI; it asked us to get sampling done. We have built a boundary wall to contain leakage." He declined to comment on the Pali landfill plan.

When **TOI** visited the plant and leachate lake on Tuesday, the trees had withered completely and the pungent smell of chemicals hung in the hills. No boundary wall was seen.

Shashank Shekhar, a hydrogeologist and assistant professor of geology at DU, said, "The Ridge and floodplains are our lifelines. As a geologist, I will never recommend locating a landfill in the Aravalis simply because the leachate will travel downhill."

Sources said MCG has plans of reopening the Bandhwari plant and doubling its capacity. On the Pali landfill plan, a senior official from Central Ground Water Authority, who declined to be named, said, "It's important to check if the landfill is located in a fracture zone. If groundwater is coming up to the surface there are probably fractures close by which will lead to contamination if the lining of the landfill is not well-designed."

Meanwhile, local activists are trying to push politicians to abandon the landfill plan. "We have decided to boycott the MP, Krishen Pal. We met the Faridabad DC who said there is no other space available for the project except the Aravalis. Some of these quarry pits are 100m deep and the groundwater has started appearing on the surface. Contamination is inevitable," Jitendra Bhadana, a Save Aravalis campaigner, said. Villagers will move NGT against the landfill proposal soon.

*The Times of India, Delhi dated
September 09, 2015*

Now, a car powered by whisky residue

In A First, Scottish Scientists Produce Biofuel From Liquor Waste

PIO's start-up tests driverless vehicle

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London: Scientists in Scotland have become the first in the world to produce biofuel capable of powering cars from residues of the whisky industry. Edinburgh-based Celtic Renewables plans to build a production facility in central Scotland after manufacturing the first samples of bio-butanol from by-products of whisky fermentation.

The company has been awarded £11 million to fund a new plant to make the biofuels. Transport minister Andrew Jones says advanced biofuels have the potential to save at least 60% of the greenhouse gas emissions from equivalent fossil fuel. He said, "The techni-



GREEN DRIVE

que could transform the Scottish whisky industry and generate up to £100 million of transport fuel a year." The latest biofuels use low value waste products to produce high value fuel and will help power modes of transport that cannot be electrified in the future such as heavy trucks or even aircraft.

A bacterial fermentation process known as Acetone-butanol-ethanol (ABE) produces acetone, n-Butanol, and ethanol from starch. ABE fermentation was first developed in the UK a century ago, but died out in competition with the petrochemical industry.

Martin Tangney, founder of Celtic Renewables, said, "The construction of our demonstration facility will herald the reintroduction of ABE fermentation to UK for the first time since the 1960s, but this time for advanced biofuel production using entirely sustainable raw materials."

Julie Hesketh-Laird from the Scotch Whisky Association said, "The production of bio-butanol from draff and pot ale is another example of the

industry putting its by-products to a good use to promote sustainability and jobs." Celtic in partnership with Ghent-based BioBase Europe Pilot Plant produced the first samples of bio-butanol earlier this month. Bio-butanol is now recognized as an advanced biofuel—a direct replacement for petrol.

The biofuel is produced from draff — the sugar rich kernels of barley soaked in water to facilitate the fermentation process necessary for whisky production—and pot ale, the copper-containing yeasty liquid that is left over following distillation.

Scotland's distilleries currently produce around 750,000 tons of draff and 2 billion litres of pot ale annually.

Move over, Google! A US-based startup co-founded and helmed by an Indian-American entrepreneur is testing a new driverless vehicle at the Santa Clara University campus. The autonomous shuttle system is being developed by Silicon Valley start-up Auro Robotics, whose co-founder and CEO Nalin Gupta praised the university's "technology-forward mindset". The electric vehicle uses an array of sensors such as laser scanners, radar, cameras and GPS to create a 360-degree view. It is conditioned to avoid pedestrians by adjusting its route, or to stop completely if necessary. The sensors can evaluate as far as 200 metres away. PTI

To save the Great Barrier Reef from starfish, a bot designed to kill them

Melbourne: Australian researchers have developed the world's first robot designed to seek out and eliminate crown-of-thorns starfish (COTS) that are wreaking havoc on the Great Barrier Reef's coral.

COTS are responsible for 40% of the reefs total decline in coral cover. The COTSbot is equipped with stereoscopic cameras to give it depth perception, five thrusters to maintain stability, GPS and



TERMINATOR REDUX

pitch-and-roll sensors and a pneumatic injection arm to deliver a fatal dose of bile

salts. "There just aren't enough human divers to cover all COTS hotspots across the reef," its creator Dr Mathew Dunbabin said.

The COTSbot is designed to search the reef for up to eight hours at a time, delivering more than 200 lethal shots. "COTSbot can think for itself in the water," said Dr Feras Dayoub, who designed the robot's software system. PTI

*The Times of India, Delhi dated
September 10, 2015*

*The Times of India, Delhi dated
September 11, 2015*

NGT raps DDA over report on trees

TIMES NEWS NETWORK

New Delhi: The National Green Tribunal (NGT) on Thursday slammed the Delhi Development Authority (DDA) for not submitting a report on the de-concretization of trees in the capital, even while five panels were formed to monitor the issue over a year ago.

The NGT bench directed

DDA, CPWD and others have to submit a report on the de-concretization of trees in the capital before October 13

DDA to hold a meeting within two weeks adding that a considerable time had passed but the DDA had not convened any meeting to car-

ry out scientific de-concretization of the trees and ensure that these were not uprooted and got proper air.

"Why are you not filing reports? Why don't you take a meeting? You want us to run after you all the time. We direct the vice-chairman of DDA to call a meeting within two weeks from today. All the municipal corporations, Central Public Works De-

partment and other concerned should submit the final report before the next date of hearing," the bench said, listing the matter for October 13.

While observing that "trees are lungs of a city", the NGT had on August 26, 2014, set up five committees to monitor de-concretization of trees and submit quarterly reports.

The Times of India, Delhi dated
September 13, 2015

Red Carpet For Our Green Heroes

Earth Care Awards Bring Recognition To Community Groups & Corporate Houses That Show Eco Initiative

TIMES NEWS NETWORK

When Shanti Tekam, a woman from a remote MP village, walked on to the stage on Friday night to receive an award on behalf of her community for saving forests, she realized how the world was looking at her with respect. Tekam is from a household that's part of 12,500 such, across 175 villages in her state. Union environment and forests minister Prakash Javadekar gave her the award.

Tekam, with another villager, Bansuri Ram, received the 6th JSW - The Times of India Earth Care Award in the 'community' category given to the Royal Bank Scotland (RBS) Foundation, India, for leading a consortium that's been not only working to save green cover through community participation but also helping thousands to adopt sustainable practices for their livelihood.

Another award in this category went to Chennai's M S Swaminathan Research Foundation for developing an integrated mangrove, fishing and farming system to con-



The award winners with environment minister Prakash Javadekar

serve the ecosystem and improve the coastal community's access to livelihood opportunities.

Presenting the awards, Javadekar praised the joint efforts of the JSW Group and The Times of India. It was a wonderful move to recognize communities for their efforts and unique solutions they had adopted, he said.

"I've got better solutions from a

common man and a farmer than experts," he said, promising full support to community initiatives to make lives of fellow citizens better and fulfil the government's "clean India, green India" motto.

These were part of the eight awards given in different categories including innovation, industry and small & medium enterprise. The awards honoured entities that

have demonstrated excellence in climate change mitigation and adaptation. Besides Javadekar, Union power and renewable energy minister Piyush Goyal honoured the winners and shared the stage with the green heroes at an impressive ceremony at Kamal Mahal, Hotel ITC Maurya.

Enlisting measures being taken by PM Modi's government to fight

climate change and promote sustainable development practices, Javadekar and Goyal urged people, communities and industries to partner the government in its effort to save "Mother Earth".

Launched in 2007-08, the Earth Care Awards is a joint initiative of the JSW Foundation (social arm of the JSW Group) and TOI. It seeks to identify and foster actions with special reference to mitigation and adaptation imperatives related to climate change across sectors.

The Center for Environment

The 2015 awardees were selected by a six-member jury headed by eminent scientist and former DG of the Council of Scientific and Industrial Research R A Mashelkar.

The awards in the 'innovation' category went to Larsen & Toubro Limited, Datamatrix Infotech Pvt Ltd and the Gujarat Energy Research and Management Institute. Raymond UCO Denim Pvt Ltd won in the 'industry' category. The award in the 'small and medium enterprise' category went to JB Chemicals. Surat Municipal Corpo-

6th JSW - THE TIMES OF INDIA
EARTH CARE AWARDS-2015
Edition Awards for Excellence in Climate Change Mitigation & Adaptation

Education (CEE) is the Knowledge partner for these awards. It has been instrumental in conceptualizing a technical and methodological framework for assessment of the mitigation and adaptation parameters to define the evaluation process. In 2011, this initiative extended its reach to all SAARC countries and was joined by TERRE Policy Centre as outreach partner.

ration won in the 'urban' category. Highlighting joint commitment to save the earth through concerted action on the ground, JSW Foundation Chairperson Sangita Jindal said: "We've borrowed this earth from our children. JSW, Times of India, CEE and TERRE are committed to return a thriving and prosperous planet to them. We will continue evolving."

'Developed world must cut emissions rapidly'

Union environment, forests and climate change minister **Prakash Javadekar** is confident of a global climate deal in Paris this December. This will help nations jointly fight climate change challenges. Before giving away awards to the green heroes of the 6th JSW-Times of India Earth Care Awards, he told Vishwa Mohan about the roadblocks in the run up to the Paris summit, specifying what India has been doing to ensure climate justice while striving to save the planet without compromising on its goal to eradicate poverty by 2030. Excerpts:

Is the world moving in the right direction to save the earth from the impact of climate change?

■ It's a fifty-fifty. The world realizes the dangers of climate change and the vulnerability of certain sections of people and countries, but developed countries haven't done enough to deal with the challenge. The developed world must cut emissions rapidly. But, they're fix-



Environment minister Prakash Javadekar speaks at the Earth Care awards

ated on their own formula. They haven't come out aggressively with their pre-2020 action against climate change. While developing countries like India have stepped up efforts voluntarily, rich nations aren't even taking ambitious targets (to cut carbon emission).

What are the roadblocks?

■ Sharing cutting-edge technology and finance are key issues. Technology can bring solutions but it has a high Intellectual Property Right cost. Companies that conduct research and come out with critical technology can be compensated from the Green Climate Fund (created through contributions from rich nations to help developing countries

TOI INTERVIEW

combat climate change). It can make a difference if technology is provided to the developing world at affordable costs. Climate change is a common problem. The world did this in case of HIV/AIDS. Why can't they do it for climate change?

Has India raised this issue at a global forum?

■ India has constantly been raising it. I flagged it in Paris last week during an informal meeting ahead of the December conference. I told the gathering if technology is made available, we can make progress.

Will nations be able to sign a deal in December?

■ Paris will be a success. I am hopeful. We'll sort out differences during negotiations in October and November. Commitment on finance is a major roadblock. But differences on climate finance are narrowing. We are firm the agreement must come in Paris within the UNFCCC mandate, reflecting all its basic principles and key elements.

How would India contribute to this?

■ We've already engaged with one of the world's largest renewable energy programmes comprising solar and wind. We will also tap offshore wind energy. We are increasing carbon sink through a massive forestation drive. Rs 38,000 crore that had been locked for 10 years will now be unlocked through a new legislation for increasing green cover. We have taken up energy efficiency measures. We will substantially reduce carbon intensity (emission per unit of GDP).

Inspiration from the hinterland



N Sunil Kumar, senior vice president RBS foundation and Shanti Tekam receive their award on sustainable living

TIMES NEWS NETWORK

New Delhi: Shanti Tekam's journey from the forests of Balaghat, Madhya Pradesh, to the capital reflects her effort to keep the rural economy running when thousands of loss-stricken farmers are forced to leave their lands and migrate to cities.

Standing among awardees in business suits was Shanti, a 40-year-old woman and a mother of four from Amoli village. She had received the award on behalf of her community; instrumental in building the resilience of rural areas in tackling challenges arising out of climate change.

Shanti is one of the initiators of a women's organization that started as a self-help group and is now key to harnessing the village economy.

She and members of the Nari Shakti Sangathan started this group in 2009 roping in women from their village to pool their savings. "We began by saving Rs10 a week. Gradually, we realized the potency of such a model, so we invited four to five similar groups from other villages and established a larger body where savings was not our sole objective. We discussed issues and worked towards getting women to take part in economic activities and decision making," she says.

They got 70 women from different villages to participate in these groups that, like a gram sabha, shared thoughts and raised concerns about the progress of the village. They raised their voice against domestic violence.

With frequent monthly meetings and more savings, the group started inviting representatives from government departments like women and child welfare. They organized meetings with the panchayat to discuss and understand government policies. "These interaction made us realize that there was a need to boost the economy of our village. So we shifted focus to land, forest and water and became a part of the Mahila Kisan Sashaktikaran Pariyojana." Under this programme, they got step dams built. They learned the use of manure and vermicomposting.

"Soon, we were able to produce good quality grain and vegetables. We avoided chemical pesticides because they damaged land quality," says Shanti.

The group encouraged others of neighbouring villages to take part in these activities rather than doing odd jobs in other places.

The Times of India, Delhi dated September 13, 2015

Antarctica's ice to melt if all fossil fuel is burned

A subsequent sea level rise of 200 feet will see London, Paris, New York, Hong Kong and Tokyo being submerged

Justin Gillis

Burning all the world's deposits of coal, oil and natural gas would raise the temperature enough to melt the entire ice sheet covering Antarctica, driving the level of the sea up by more than 160 feet, scientists reported. In a major surprise to the scientists, they found that half the melting could occur in as little as a thousand years, causing the ocean to rise by something on the order of a foot per decade, roughly 10 times the rate at which it is rising now. Such a pace would almost certainly throw human society into chaos, forcing a rapid retreat from the world's coastal cities.

The rest of the earth's land ice would melt along with Antarctica, and warming ocean waters would expand, so that the total rise of the sea would likely exceed 200 feet, the scientists said. "To be blunt: If we burn it all, we melt it all," said Ricarda Winkelmann, a researcher at the Potsdam Institute for Climate Impact Research in Germany and the lead author of a paper published in the journal *Science Advances*.

A sea level rise of 200 feet



LOSING GROUND: Earth's land ice is set to melt rapidly over the next 1000 years if the average temperature of the planet keeps rising

would put almost all of Florida, much of Louisiana and Texas, the entire East Coast of the United States, large parts of Britain, much of the European Plain, and huge parts of coastal Asia under water. The cities lost would include Miami, New Orleans, Houston, Washington, New York, Amsterdam, Stockholm, London, Paris, Berlin, Venice, Buenos Aires, Beijing, Shanghai, Sydney, Rome and Tokyo.

Nobody alive today, nor even their grandchildren, would live to see such a calamity unfold, given the time the melting would take. Yet the new study gives a sense of the risks that future generations

face if emissions of greenhouse gases are not brought under control.

"This is humanity as a geologic force," said Ken Caldeira, a researcher at the Carnegie Institution for Science in Stanford, Calif., and another author of the paper. "We're not a subtle influence on the climate system — we are really hitting it with a hammer."

The paper found, about half the Antarctic ice sheet would melt in the first thousand years. "I didn't expect it would go so fast," Dr. Caldeira said. "To melt all of Antarctica, I thought it would take something like 10,000 years."

NYT NEWS SERVICE

The Times of India, Delhi dated September 13, 2015

Jury focused on scale, sustainability



Jury members interact with the minister

TIMES NEWS NETWORK

A seven-member jury headed by eminent scientist R A Mashelkar picked awardees for the 6th edition of the **JSW Times of India Earth Care Awards** after a painstaking process of due diligence spread over months. The panel focused not just on novelty but on scale and sustainability.

Other than Mashelkar, those on the panel of judges were Kartikeya V Sarabhai, founder director, Center for Environment Education, Rajendra Shende, former head of OzonAction Programme, UNEP, Aneeta Benninger, executive director, CDSA, Rajat Gupta, deputy DG, Centre for Science and Environment and Nitin Pandit, MD, WRI India, Chandra Bhushan, Deputy DG, Centre for Science & Environment.

The Centre for Environment Education drew up the first shortlist of applicants. The jury members were then made their mentors. "We have a rigorous process where our emphasis is not just output but outcome, in terms of the difference they make in terms of sustainabil-

ity and scale. I chair a lot of awards committees. This is one of the best in terms of practices followed," said jury head Mashelkar, former DG of Council of Scientific and Industrial Research. Each category had a different set of criteria. For instance, judging the community segment, the jury looked at how an initiative had empowered a group of people or households and how useful it was to them. The dialogue between them, networking in terms of how they had learnt from one another and how their projects could be scaled up were assessed. For some other categories, innovation was at the core.

"A lot of it had to deal with how these innovations could be scaled up to reach a wider audience so they have the intended impact," Nitin Pandit said. The jury scrutinized each application and organized field visits. "The jury had to use their expertise and judgment to ensure that the right winner was picked. There was enthusiasm among communities, industries and individuals on battling climate change. But it was difficult to figure out who was doing better," Rajendra Shende said.

LED bulbs to save up to ₹40,000cr, says Goyal

TIMES NEWS NETWORK

New Delhi: Making a powerful pitch for energy conservation, Union minister for power, coal and new and renewable energy Piyush Goyal said the government's ambitious programme to replace all electric bulbs in Indian households with energy-saving LED bulbs over the next three years is attracting reputed companies from India

tonnes every year.

Speaking at the **TOI Earth Care Awards** ceremony, the minister said energy conservation was a prime focus of the government. "When I became a minister, I realized that the Bureau of Energy and Efficiency was languishing. You can judge its status from the fact that last year they procured only about 3 lakh LED bulbs for distribution, while there is a demand for 77 crore

Even at a base cost of Rs 4, we are looking at massive savings which all go to the consumer," he said.

Solar generation was another priority area for the government for which many states have reacted with enthusiasm, Goyal said. "We are bidding out nearly 15000 MW of solar power. We will soon come out with a policy to encourage industries and commercial establishments for rooftop solar generation. We're also looking at expanding wind-generating capacity. Our current renewable energy capacity is 34,000 MW and we plan to increase the target to 1,75,000 MW by 2022. Fortunately, we are doing very well on this and my own internal target is to achieve this by 2020," he told the audience.

Outlining several other plans for environmental protection, the minister said: "Where coal mining is concerned, the investment that should have gone into environment protection was left out so far. According to our target every kilo of coal that comes out of mines and travels a distance has to be washed. My plan is to set up coal washeries for 500 million tonnes of coal every year for next five years. It requires massive investment and probably increases cost of coal, but this is great for environment protection."



R A Mashelkar, head of jury, presents a TOI coffee-table book to Union minister Piyush Goyal

and abroad as transparent contracts and prompt payments to suppliers has made the initiative more than just a pipe dream.

Goyal said replacing bulbs would lead to savings of upto Rs 40,000 crore which would be money in the hands of consumers. For environmental benefits, this would lead to a reduction in carbon dioxide emissions of about 60 million

LED bulbs. The price for each LED was Rs 310 and I realized it would never make economical sense."

He said the ministry changed the rules of the game and pledged to replace every bulb in the country with LEDs in three years. This brought down the cost per bulb to Rs 74 in just one year. "The saving will be 22,000 MW in evening peak hours between 6-10pm.

The Times of India, Delhi dated September 15, 2015

2016 will be among hottest years on record

Over A Decade-Long 'Pause' In Global Warming To End; El Nino To Cause Dry Conditions In Asia, Australia

London: Man-made global warming is set to produce exceptionally high average temperatures this year and next, boosted by natural weather phenomena such as El Nino, Britain's top climate and weather body said in a report on Monday.

"It looks likely that globally 2014, 2015 and 2016 will all be amongst the very warmest years ever recorded," Rowan Sutton of the National Centre for Atmospheric Science, which contributed to the report, told journalists. "This is not a fluke," he said. "We are seeing the effects of energy steadily accumulating in Earth's oceans



HOTTER DAYS AHEAD? A report by Britain's top climate and weather body said El Nino in the tropical Pacific Ocean is underway and will be one of the most intense on record

and atmosphere, caused by greenhouse gas emissions."

The rate at which global temperatures are increasing is also on track to pick up in

the coming years, ending a period of more than a decade in which the pace of warming worldwide had appeared to slow down, the report

said. This "pause" has been seized upon by sceptics as evidence that climate change was driven more by natural cycles than human activity.

Some scientists, however, argue that there was no significant slowdown, pointing instead to flawed calculations.

The 20-page report from Britain's Met Office, entitled "Big changes underway in the climate system?", highlights current transitions in major weather patterns that affect rainfall and temperatures at a regional level.

An El Nino weather pattern centered in the tropical Pacific Ocean is "well underway", the report says, and

shaping up to be one of the most intense on record. Set to grow stronger in the coming months, the current El Nino — a result of shifting winds and ocean circulation — is likely to result in dry conditions in parts of Asia and Australia, as well as southern and sub-Saharan North Africa, the Met Office said. By contrast, the southwestern US — including parched California, suffering from an historic drought — has a strong chance of seeing higher-than-average rainfall.

El Ninos also affect tropical storms, making them less likely in the North Atlantic and more intense in the West

Pacific, where they are known as typhoons. Overall, an El Nino is also likely to add a little heat to the general impact of global warming.

Meanwhile, warming sea surface temperatures along the North American west coast point to a reversal of another natural pattern called the Pacific Decadal Oscillation. This, too, could temporarily nudge regional temperatures higher, but has yet to be confirmed, the report said.

"The current warm phase is now 20 years long and historical precedent suggests a return to relatively cool conditions could occur within a few years," the report says. **AFP**

Corpn fined for burning waste

NGT Orders Meet On Landfills

TIMES NEWS NETWORK

New Delhi: The National Green Tribunal has imposed a fine of Rs 50,000 on East Delhi Municipal Corporation for indiscriminate dumping and burning of municipal solid waste in east Delhi.

In another case, the NGT has directed the Delhi government and the Centre to hold a



HEALTH HAZARD: Ghazipur landfill

meeting of the high court appointed high-level committee to look into the menace of landfill sites in the city. The court was hearing a petition on the three major landfill sites of Okhla, Ghazipur and Bhalaswa which, the petitioner has claimed, are posing a huge health and environmental risk to the city.

A bench headed by NGT chairperson Justice Swatanter Kumar directed EDMC to deposit the environmental compensation with Delhi Pollution Control Committee for

violating the orders of the tribunal. It also directed the EDMC commissioner to conduct an inquiry into the matter and take action against officials involved in the case.

The tribunal was hearing the case of east Delhi resident Mansi Chahal who had complained that the New Seemapuri Road No. 70 is lined with garbage. "The applicant has also found that plastic is burnt in this garbage which leads to emission of various dangerous gases which gives rise to air-borne diseases."

Meanwhile, in the application filed by the Centre for Wildlife and Environmental Litigation on the dangers being posed by the three landfill sites in Delhi, the NGT has asked the high-level committee to meet at the earliest and inform the tribunal about any work done on the sites and finding alternate sites.

The application by the NGO referred to the "pathetic condition of three landfills of the capital, Ghazipur, Bhalaswa and Okhla landfill sites" because of which "a huge environmental hazard looms over the capital as the said three landfill sites are continuously accumulating garbage beyond their shelf life". The leachate being generated was contaminating soil and groundwater.

The Times of India, Delhi dated September 21, 2015

Now, pay ₹5,000 for polluting Yamuna

New Delhi: Ahead of the festive season, Delhi government has decided to strictly impose a fine of Rs 5,000 on those spotted polluting the Yamuna by throwing waste or puja offerings in it.

National Green Tribunal had in January passed a slew of directions in this regard, cracking the whip on those polluting the river.

The decision was taken at a recently-held high-level meeting, chaired by Delhi environment minister Asim Ahmed Khan, with officials from DPCC, municipal corporations, environment department and

irrigation and flood control department.

"It was also decided to erect barricades and mesh near nine temporary ghats along the Yamuna. People will be asked to deposit their religious items at the designated places near the ghats and if they do not comply with, we will strictly deal with them," a senior official said.

The government has also decided to approach 100 Durga and chhath puja committees to request them to collectively deposit puja offerings at the ghats created by the flood and irrigation department.

The Times of India, Delhi dated September 16, 2015

The Economic Times, Delhi dated September 21, 2015

Flip-flops Over Air Pollution

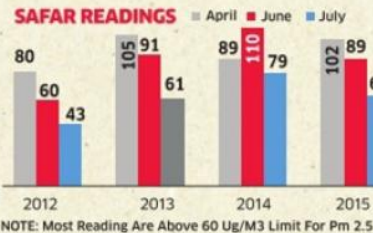
ET analysed Environment Minister Prakash Javadekar's statements on the issue since April, and found him shifting positions and emphases according to the situation. Sometimes, he even resorted to taking U-turns. Gathered through an RTI application, perusal of his written answers in parliament and comments at a press conference to mark BJP government's one year in power, these reflect the minister's changing mind on the most important environment issue today.

JAVADEKAR'S FLIP-FLOPS OVER AIR POLLUTION

THERE IS AN urgent need for comprehensive action plan with short term, medium term and long term targets. Govt alone can't solve the problem of pollution, unless it is taken up at individual level in mission mode. (minutes of the April 4, NCR minister's meet)

(JAVADEKAR) EXPRESSED concern over the present status of air pollution in Delhi, NCR Region. The air quality in Delhi is polluted but it's not as polluted as projected. (At the meeting of NCR States July 24)

IT'S NOT THAT the pollution has risen suddenly as Delhi's air quality has been worsening since 2007. The previous govt did little to improve things. But this was not discussed at that time. (June 29 press conference)

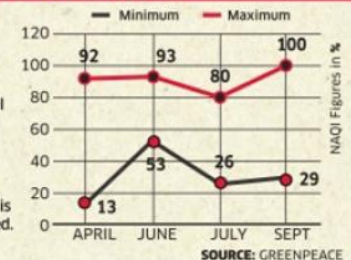


SINCE DATA from all stations is not available on NAQI, other official air pollution index named SAFAR (System of Air Quality and Weather Forecasting and Research) maintained by Ministry of Earth Sciences was checked and it showed even more alarming results, as mentioned in the graphs

AN INTERNATIONAL STUDY recently has claimed that 'Foul air is killing up to 80 Delhites a day. Air pollution, particularly the respirable particulate matter, is one of the several factors responsible for morbidity and premature deaths. (In a reply in Rajya Sabha)

THERE IS NO CONCLUSIVE evidence that air pollution has led to loss of lives of patients suffering from respiratory diseases and has also adversely affected food grain production in the country. Air pollution may aggravate the situation but it not the only cause of respiratory diseases. (Reply in Lok Sabha)

WHO REPORT DESCRIBES 10 INDIAN cities including Delhi among top 20 most polluted cities in world, which is improper. (Reply in Lok Sabha)



GOVT POLLUTION READINGS FOR APRIL, JUNE, JULY, SEPT

National Air Quality Index (NAQI) is the govt's official measure of air pollution. The ideal standard for most toxic pollutant PM 2.5 is 60 ug/m3, but a monthly analysis for all working stations of NAQI in Delhi/NCR shows on most days, readings exceeded this limit. Above graphic shows extent of breaching ideal limits.



Cities	2010	2025	2050
Pearl River Area	49.2	65.2	67.4
Delhi	19.7	31.1	52
Shanghai	14.9	18.9	19.4
Mumbai	10.2	17.4	33.1
Beijing	13.7	17.3	17.7
Kolkata	13.5	26.6	54.8

Death figures in thousands, as per 'Nature' Study

The Times of India, Delhi dated
September 21, 2015

Public transport drive planned to make air clean

TIMES NEWS NETWORK

New Delhi: In a move to get citizens involved in improving the capital's public transport network, the government is planning to start a campaign from Tuesday.

Delhi transport minister Gopal Rai on Sunday said, "I would like to invite citizens to be an integral part of the campaign to beef up the city's public transport system by suggesting a name and logo for the campaign. We believe the people of Delhi are entitled to a brighter, cleaner future—one that isn't covered in a cloud of smoke and dust."

The government's campaign comes close at the heels of The Times of India's "Delhi Let's Get Moving" initiative which has been going on for some weeks now.

Rai said the government campaign will not only focus on getting citizens involved but will also discuss initiatives being taken by the state to improve the public transport situation in the capital. The minister cited the new scheme, the City Taxi Scheme, which is aimed at reducing the number of private vehicles on the capital's streets by providing more intermediate public transport at "reasonable" rates.

Meanwhile, the autorickshaw unions are planning a dharna on Monday against the city taxi scheme. Rajender Soni of Bharatiya Mazdoor Sangh, which had

Your search to find someone to blame for pollution stops at YOU



POLLUTION HORROR

AIR QUALITY INDEX PM2.5

Delhi	154	Moderate
Tomorrow	129	Moderate
Pune	54	Good
Tomorrow	62	Good
Mumbai	60	Good
Tomorrow	66	Good
Source: SAFAR@MoES-IITM-IMD (10 stations)		
Chennai	39	Good

US Embassy data calculated as per Indian standards by SAFAR@MoES-IITM-IMD
Based on 1 Station Data Per City at 4pm

also called a one-day strike earlier this month against the scheme, said the "stir" would continue till the government does not scrap the scheme.

"The dharna will turn into an agitation soon if the government fails to respond. The City Taxi Scheme is against the interests of autorickshaw drivers as well as taxi drivers who ply their vehicles in the capital. The government is taking away our livelihood," added Soni.

Metro steps up solar power push for reducing carbon footprint

Rumu.Banerjee
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New Delhi: It's not just ease of commuting that Delhi Metro is offering. According to the Delhi Metro chief, Metro is also contributing to the environment by reducing carbon dioxide emissions.

At the launch of the first solar plant in a parking lot in the HUDA City Centre station, Delhi Metro Rail Corporation (DMRC) head Mangu Singh said it would help in reducing 12.45 million tonnes of CO2 emission by 2021. A chunk of that will be from the modal shift of passengers to the Metro, accounting for 11.8 million tonnes. "In 2014, Delhi Metro reduced 6.7 million tonnes of carbon emission," he added.

That's not all. By 2031, this figure will go up to 26.6 million tonnes of reduced carbon emissions. Ninety-four per cent of that figure will come from the modal shift. Delhi Metro's revolutionary regenerative braking technology as well as use of solar power and "green", that is, energy effi-

ENERGY-EFFICIENT RIDE



Metro	Bus	Two-wheelers	AC bus	Petrol car	Diesel car
1*	3	5	6	21	22

* Units of energy consumed

cient buildings will also contribute to the emission reduction.

Singh, who also cited Metro's various environmental initiatives, added, "Though Delhi Metro doesn't need environmental clearance, we have tried to adhere to a progressive environmental policy." This includes recycling of water; setting up of sewage treatment plants as well as construction waste along with use of solar power and rainwater harvesting. The average carbon dioxide (CO2) saved per passenger per trip in the Delhi Metro is 144 gm.

According to Delhi Metro, the total cost of all benefits of DMRC's environmental policy is Rs 10,364 crore. D S Mishra, additional secretary in the ministry of urban development who inaugurated the solar plant, added that the benefits from the Delhi Metro system would be documented and presented at the world environment summit in Paris later this year. "This will go a

long way towards showing India's commitment to reducing carbon emissions to the rest of the world," added Mishra. The Delhi Metro also launched the first ever solar plant at a parking lot in the HUDA City Centre Metro station. The plant will have a capacity of 100 KWp and will power escalators and elevators at the station. DMRC has so far commissioned solar power facilities with a capacity of 2.8 MWp with plants at Dwarka Sector 21, Anand Vihar, Pragati Maidan, Metro Enclave, Yamuna Bank station and depot, ITO as well as the stations on the Badarpur-Escorts Mujesar stretch on the Faridabad line.

DMRC is aiming to achieve solar power facilities with generation capacity up to 20 MWp by the end of 2017. Apart from the solar plant at the HUDA city centre's parking lot, DMRC is also installing solar power facilities on the foot over bridges of all stations on the Badarpur-Escorts Mujesar corridor," said spokesman Anuj Dayal.

To celebrate safe Deepawali please do take necessary precautions

1. Always burst crackers in an open place and maintain safe distance
2. Do not keep lighted Diya/ oil lamps at vulnerable places.
3. Never keep your stock of crackers in open space nor keep them near fire.
4. Keep sand filled bucket and water filled buckets nearby. In case you have fire extinguisher at home ensure it's in working condition.
5. Never put too much load of electricity on one point using multiway plugs.
6. Please keep approach road to residential areas clear so that in case of emergency ambulance and fire brigade can reach at the point where it is required.
7. In case of burn injury never apply any ointment, powder/ cream or any other home remedy. Get medical aid immediately from a professionally trained person.
8. Always ensure that only one firework should be lighted at a time.
9. Wear cotton thick clothes while lighting fireworks. Never put synthetic clothes while lighting fireworks.
10. One should never forget to cover feet with shoes, to avoid any injury.
11. Follow all safety precautions issued by the manufacturer mentioned on cover boxes of crackers.

The Times of India, Delhi dated September 24, 2015

NGT seeks data to check car-free effect

Initial Reports Say 21% Cut In PM2.5 In Ggn; Experts Feel It's A Good Way To Involve Public

TIMES NEWS NETWORK

New Delhi: National Green Tribunal (NGT) on Wednesday asked the Haryana government to submit air pollution data to prove the actual impact of the car-free Tuesday in Gurgaon. NGT is likely to soon give its final order on a petition against severe air pollution levels in Delhi.

A bench headed by NGT chairperson Justice Swatanter Kumar took note of TOI's report on Wednesday that said there were 10,000 fewer cars on Gurgaon's roads and that levels of PM2.5—fine, respirable pollution particles—came down by 21% on the car-free Tuesday.

"The media report mentions that pollution levels have gone down due to the drive. Is it a fact or a gimmick? We want you to indicate

whether it's factually correct. We just want to know the fact. Either way you are trapped. Indicate the actual time period and standard adopted for the test. We want to know whether regulation on cars can help or not. Tell us on affidavit. Come on Tuesday," the bench said.

Anumita Roy Chowdhury, executive director and head of Centre for Science and Environment's clean air programme, said, "Car-free days are a great way of involving the community to garner public support so that they make a change in lifestyles. It is important but we need hard measures too of restricting private vehicle usage."

CSE has found that air pollution levels came down in Gurgaon on Tuesday and there was a 30% reduction in traffic volume as per data pro-



Gurgaon commuters waited patiently for public transport on Tuesday

vided by the traffic police.

"The city managed to pull off 10,000 cars from its roads, an achievement that will help improve its air quality," said Chetan Agarwal, a green activist.

"If Car-Free Day is observed every week, we will be able to understand the gaps in (the) public transport system

and resolve them quickly. Such initiatives encourage people to use public and non-motorized transport. It is certainly an achievement," he added.

NGT had ordered a ban on more than 10-year-old diesel vehicles in NCR on April 7 but later stayed it. The Centre had filed an application appealing

SMOG CUTTER

2015	PM 2.5 LEVELS*
17 Sept	124
18 Sept	NA
19 Sept	96
20 Sept	100
21 Sept	84
22 Sept	(Car-Free Day) 76

* Daily average in micrograms per cubic metres. (CSE data)

for a stay on the ban claiming that a phase-out based on age was not an effective solution. The Centre even submitted a number of IIT Delhi studies to back their argument that vehicles are not major polluters.

They had among others submitted a study called 'Understanding role of transport in PM 2.5 emissions in Delhi',

which claimed that the actual number of cars on the city roads is only half the official number registered with the transport department and that only 6% of cars in Delhi are in the age-group of 10-15 years.

They also presented a note that documented the PM 2.5 levels at RK Puram for two years—2013 and 2014—to compare the pollution levels on Sundays with weekdays. The same exercise was repeated comparing pollution levels on days when there was a transport strike with that of regular days. But the team found that reduction in traffic did not make any significant difference to PM 2.5 levels on Sundays.

The NGT bench has been asking respondents to what is causing air pollution if not vehicles.

The Times of India, Delhi dated September 25, 2015

Delhi's air worst among 381 cities: World Bank

Dipak.Dash@timesgroup.com

New Delhi: The latest World Bank report on leveraging urbanisation in South Asia has identified "air pollution" as a big challenge for major cities in the region, including Delhi. While Delhi is the worst among 381 cities from developing countries, 19 of the 20 most polluted cities are from South Asia, the report said quoting the recent findings of World Health Organisation report on ambient air pollution.

The report also mentions how for the "very poorest in Bangladesh, India, Nepal and Pakistan, under-five mortality is higher in urban areas than in rural settings".

Referring to the WHO report with regard to the level of Particulate Matter (PM) 2.5 in the ambient air in cities, the World Bank said that of all the sources of congestion associated with the growth of cities, one of the most serious for health and human welfare is ambient air pollution from vehicle emissions and the burning of fossil fuels by industry.

TOP OFFENDERS

City/ station	Country	Annual mean ug/m3 (PM2.5)
Delhi 1	India	153
Patna 2		149
Gwalior 3		144
Raipur 4		134
Karachi 5	Pakistan	117
Peshawar 6		111
Rawalpindi 7		107
Khoramabad 8	Iran	102
Ahmedabad 9	India	100
Lucknow 10		96

* Source: WHO Report 2014

High concentrations of fine particulate matter, especially that of 2.5 microns or less in diameter (PM 2.5), which can penetrate deep into the lungs, increases the likelihood of asthma, lung cancer, severe respiratory illness, and heart disease.

"Delhi is far from unique in South Asia in having dangerously high concentrations of PM2.5. Among a global sample of 381 developing-country cities, 19 of the 20 with the highest annual mean concen-

trations are in South Asia. And the issue is not just in India — Karachi, Dhaka, and Kabul all feature in the top 20," the World Bank report said.

It said given the lack of availability of and access to clean public transport in India, one can speculate that, for any given increase in demand for mobility associated with a given increase in population density, more air pollution will occur there than elsewhere.

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

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