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Business Sustainability News

A 50th anniversary few remember: LBJ's warning on carbon dioxide

By Marianne Lavelle, The Daily Climate



Fifty years ago this month President Johnson voiced concern over invisible fossil fuel emissions in a special message to Congress. It was the first time a U.S. president warned the nation about our carbon habit.

Fifty years ago this this month President Johnson's science advisors delivered the first warning about rising greenhouse gas emissions to a sitting president. On Feb. 8, he warned Congress about altering the atmosphere with carbon emissions. Above, climate scientist Roger Revelle shakes hands with Johnson in the Oval Office. Photo courtesy Roger Revelle Papers, Special Collections & Archives, University of California, San Diego.

It is a key moment in climate change history that few remember: This week marks the 50th anniversary of the first presidential mention of the environmental risk of carbon dioxide pollution from fossil fuels.

This generation has altered the composition of the atmosphere on a global scale through radioactive materials and a steady increase in carbon dioxide from the burning of fossil fuels.

- President Lyndon B. Johnson, 1965

President Lyndon Baines Johnson, in a February 8, 1965 special message to Congress warned about build-up of the invisible air pollutant that scientists recognize today as the primary contributor to global warming.

"Air pollution is no longer confined to isolated places," said Johnson less than three weeks after his 1965 inauguration. "This generation has altered the composition of the atmosphere on a global scale through radioactive materials and a steady increase in carbon dioxide from the burning of fossil fuels."

The speech mainly focused on all-too-visible pollution of land and waterways, including roadside auto graveyards, strip mine sites, and soot pollution that had marred even the White House.

Within the year, Johnson would sign six new environmental laws during a period better remembered for the strife that led to the Voting Rights Act of 1965 and the escalation of the Vietnam War. Johnson also that year established a dozen new national monuments, historic sites, and recreation areas; and submitted a draft nuclear non-proliferation treaty to the United Nations.

Carbon risk, of course, still stymies policymakers. But it was not ignored entirely in the wake of Johnson's "Special Message to Congress on Conservation and Restoration of Natural Beauty." In fact, the warnings and predictions given to Johnson from his science team proved remarkably prescient.

On-target estimate

Coal, oil, and natural gas burning would lift atmospheric carbon dioxide between 14 percent and 30 percent by the year 2000, the panel estimated.

In fact, CO2 increased 15.5 percent by 2000, and is 25 percent higher today than in 1965.

The science on carbon dioxide as known at the time, including forecasts of warming and sea level rise, was detailed in a chapter of a **report** on environmental pollution issued later that year by the president's Science Advisory Committee. Pioneering climate scientist Roger Revelle chaired the sub-committee that wrote the chapter in the November 1965 report. While citing a need for better calculations with "large computers," Revelle's panel delivered a forecast on growing atmospheric carbon that proved on-target.

Coal, oil, and natural gas burning would lift atmospheric carbon dioxide between 14 percent and 30 percent by the year 2000, the panel estimated. In fact, **CO2 increased** 15.5 percent by 2000, and is 25 percent higher today than in 1965.

"Man is unwittingly conducting a vast geophysical experiment," the report said, echoing language Revelle first had used in a 1957 scientific paper when he was at the University of California, San Diego, Scripps Institution of Oceanography. "Within a few generations, he is burning the fossil fuels that accumulated in the earth over the past 500 million years."

Ken Caldeira, atmospheric scientist at the Carnegie Institution for Science's Department of Global Ecology, said the exchanges between scientists and the White House 50 years ago have significance for climate discussions today.

"To the best of my knowledge, 1965 was the first time that a U.S. President was ever officially warned of environmental risks from the accumulation of fossil-fuel carbon dioxide in the atmosphere," Caldeira said in an email. "This year will mark a half-century of Presidential knowledge of the risks of climate change. I wish I could say that there has been a half-century of concerted efforts to reduce these risks.

"The science of climate and the carbon-cycle that was reported to President Johnson in 1965 largely holds up today, demonstrating that climate science is a mature science," Caldeira added. "Climate scientists are still arguing about the details, but knowledgeable people have agreed about the fundamentals for a long time."

Cue to Johnson's thinking

The only surviving member of the sub-panel, Wallace Broecker, geology professor at Columbia University's Earth Institute, said by telephone he does not recall work on it, though he might have been asked to review the chapter by Revelle, then at Harvard, and the other panel members, who were at Scripps.

As a young Columbia faculty member in 1965, Broecker had already begun what would be his seminal work on ocean chemistry and the carbon cycle; the chapter includes an appendix of detailed calculations on that subject.

A clue to Johnson's own thinking about his environmental message – and his concern about potential push-back he'd face from industry proponents – may be found in a telephone conversation he had three days before sending it to Congress. Johnson sought support for his environmental initiatives from United Auto Workers' union chief Walter Reuther, a recording of the phone call shows.

"Now my natural beauty message is going up Monday, and it is an eloquent thing," Johnson told Reuther. "We think it will be our best message." He added that White House speechwriter Richard Goodwin and his team had crafted the language with two figures who later would be recognized as icons of the conservation movement, Interior Secretary Stewart Udall and financier-philanthropist Laurance Rockefeller.



Congressional master

Udall had two years earlier authored the book, *The Quiet Crisis*, about land and water degradation. Rockefeller co-founded the American Conservation Association, which later merged into the World Wildlife Fund. The two were then working closely with the president's wife, Lady Bird Johnson, on the environmental initiatives she hoped to make her legacy.

The president's message to Congress called for White House "Conference on Natural Beauty" to be co-chaired by the First Lady and Rockefeller, grandson of oilman John D. Rockefeller. Nearly 1,000 delegates attended the conference, which was held in May.

Johnson, well-recognized for his mastery of Congressional politics, knew his plan faced opposition – especially his call for devoting 3 percent of highway trust cash for purposes other than road building, such as the planting of trees and wildflowers on roadsides. Johnson urged influential auto union leader Reuther to meet with one of the most vocal opponents, Democratic Michigan Sen. Pat McNamara, the public works chairman. The president suggested he deliver the message that the state's workers supported cleaning up pollution, because in the end, it would sell more cars.

"Now you must not quote me," Johnson says. "You just must get the positive, affirmative message out... how we're going to have a real campaign to see America, go to Wyoming, go to Colorado, and get the kids out on Sunday afternoon... and we'll make more automobiles, and sell more!

"Now you're intelligent enough to take it from there," Johnson cajoles.

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3 reasons trucking needs to accelerate use of low-carbon fuels

By Nathan Springer



The transport sector contributes about a quarter of all energy-related emissions. Alternatives to diesel — including natural gas if methane leaks can be reduced to 1 percent or less — can go a long way in reducing emissions generated by trucks.

This article originally appeared at BSR.

Earlier this year, scientists reported that 2014 was the hottest year in recorded history, underscoring the urgency of action to reduce emissions that contribute to climate change. To do its part, the transport sector, which contributes about a quarter of global energy-related emissions, would need to expand low-carbon fuels from 3 percent of the share today to more than 30 percent by 2050.

Yet owners of corporate fleets and fuel buyers face two dilemmas: a limited supply of costeffective, low greenhouse-gas fuels, and little information on fuel sustainability impacts across the full production and use value chain.

Last week, BSR's Future of Fuels initiative released an updated version of "The Sustainability Impacts of Fuel," which provides a comprehensive analysis of the economic, social and environmental impacts of diesel, natural gas, biofuels, electrification and hydrogen for trucking. After reviewing more than 500 comments on the first draft of the report, and adding the latest science and stakeholder views, we came to three conclusions:

- The industry must address issues at a systemic level to avoid unintended consequences and solutions that will fail to have the desired large-scale impact.
- Despite some uncertainties and trade-offs from the impacts of alternative fuels, the case for bold action to accelerate low-carbon fuels is clear.
- Practical solutions exist to accelerate low-carbon fuels and avoid or reduce their sustainability impacts.

Our report highlights some examples of these findings:

Demand for natural gas never has been stronger, but key impacts must be reduced to realize its potential as a low-carbon, sustainable fuel. Natural gas can be considered a low-carbon alternative to diesel only to the extent that it lowers emissions, from drilling and refining to distribution and burning. Methane, a gas 20 times more potent than carbon dioxide, escapes at all stages of this process, and new data suggest that keeping methane leakage below 1 percent would ensure lower emissions than diesel. It is critical to understand and manage methane leakage, as well as other sustainability impacts natural gas pumping can have on communities, water and seismicity. This approach — of managing the full spectrum of sustainability impacts across the fuel production and use system — is also important when considering diesel and low-carbon alternatives.

New standards and maturing market approaches provide tools to manage some of the biggest uncertainties and trade-offs of alternative fuels. California's low-carbon fuel standard (PDF)offers fleet planners comparable data on emissions for more than 160 fuelproduction processes. Market schemes such as the Roundtable on Sustainable Biomaterials certification provide scientific and industry verification of biofuels' social and environmental performance. Meanwhile, the U.S. Department of Energy, Environmental Defense Fund, and others are investing in commercialization of new technologies to address sustainability impacts such as methane leakage and water contamination in natural gas.

Low-carbon fuels may not work for all applications, but they do provide practical solutions for many fleet needs. Even though hybrid electric engines are a ways off for commercial long-haul trucks, electrification can be deployed in other ways to reduce fleet emissions — for instance, for air-conditioning and other systems. Renewable natural gas (a byproduct of landfills and other sources) can be used in existing natural gas vehicles and has a potential to replace 2.5 billion gallons of diesel yearly while creating a negative carbon footprint from transport. Hydrogen fuel cells already power materials-handling vehicles and transit buses and can be used to extend the range of medium-duty-battery electric vehicles.

Using these findings, BSR and our Future of Fuels member companies will be developing a "fuel tool" that fleet managers can use to identify and procure the lowest-carbon, most sustainable fuel available. While uncertainties and trade-offs in fuel sustainability remain, the case for bold action is clear. By drawing on and adding to a suite of practical solutions for fleet managers, this tool will accelerate the use of low-carbon fuels while reducing or avoiding other sustainability impacts.

Bold Statement By Business Leaders: Net-Zero Emissions by 2050

SustainableBusiness.com News

In 2013, Sir Richard Branson launched the B Team, saying it's time for business to be a "force for good."

Now, the group of progressive business leaders is calling for world leaders to commit to netzero greenhouse gas emissions by 2050 - and urged corporations to match the goal in their own long-term targets.

B Team leaders include Paul Polman, CEO of Unilever; Ratan Tata, Chair of Tata Group; Mo Ibrahim, founder of Celtel; Guilherme Leal, co-founder of Natura; Francois-Henri Pinault, Chair of Kering; Arianna Huffington, CEO of Huffington Post and Jochen Zeitz, former CEO of Puma.

They are following up on the breakthrough that happened during December's Lima Climate Summit, where over 100 countries adopted the target.

By reaching a global agreement, "governments will demonstrate they are unequivocally setting the world on a clear, low-carbon trajectory. Businesses will respond by embedding bold climate action into their strategies - unleashing innovation, driving investment in clean energy, scaling-up low carbons solutions, creating jobs and supporting economic growth," says B Team.

Reaching this goal by 2100 only gives the world a 66% chance of limiting global warming to 2°C, according to the Intergovernmental Panel on Climate Change (IPCC), but that's worth the shot, and strengthens the business case for achieving net-zero GHG emissions by 2050, they sav.

The B Team calls for:

- Governments to commit to a global goal of net-zero greenhouse gas emissions by 2050, and to embed this in the agreement to be signed at COP21 in Paris.
- For businesses to match this ambition by committing to long-term targets and driving low-carbon solutions to scale - thereby enabling the world to achieve the net-zero 2050 target.
- 3. Businesses and governments to adopt meaningful, effective carbon prices.
- Governments to end all fossil fuel subsidies, and to shift this capital to help scale affordable renewable energy solutions to enable a wider economic transformation.
- Businesses and governments to ensure the benefits of responses to climate change flow to vulnerable and impoverished communities that suffer disproportionately from climate change and are least equipped to cope with its impacts.

They note that businesses are already incurring the costs of climate change, with increasing supply-chain disruptions from extreme weather events, rising sea levels and ocean acidification, falling crop yields and increasing desertification. At the same time, the world's poorest and most vulnerable - who are disproportionately affected and least equipped to cope - are being hit the hardest.

They also say "as business leaders they view the transition to a net-zero GHG emissions economy as an historic opportunity that, if managed responsibly, fairly and collaboratively, can bring economic benefits to countries at all levels of income, including new jobs, cleaner air, better health, lower poverty and greater energy security."

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Almost All of Canada Will Soon Price Carbon

SustainableBusiness.com News

Believe it or not, more than 80% of Canada's economy will soon have a price on carbon.

That's because Ontario announced it will price carbon, joining Quebec and British Columbia. Ontario, where 40% of Canada's population lives, will release a strategy later this year, says its Energy Minister. Even Alberta, land of tar sands, has a small carbon tax of C\$1.80 per ton (BC's is C\$30 a ton).

The decision hasn't been made whether to have a carbon tax or cap-and-trade program, but it will be part of a comprehensive plan to reduce the province's emissions 80% by 2050.

Ontario has closed all its coal plants and has a target of renewable energy supplying 50% of electricity by 2025.



Like the US, there's no interest on the national level. This week, fossil fuel champion Prime Minister Harper said it would be "crazy economic policy" to penalize the oil and gas industry. He has gutted Canada's environmental laws, muzzled and fired top scientists, and threatened environmental organizations terrorists. as forecasters Government weather are prohibited from publicly discussing climate change.

Indeed, Canada is becoming a tale of two countries as progressive areas move on renewable energy and climate change, while the federal government focuses on tar sands profits and exploitation.

Pricing carbon is moving inexorably across the world. Around 40 national and 20 subnational jurisdictions have implemented or are planning emissions trading or taxes representing 22% of global emissions.

International

Air traffic controllers plan route to fuel-saving flights

By Will Nichols



New technology and smoother routes are helping NATS save airlines 1 million tons of CO2 and \$174 million a year

This article first appeared at Business Green.

Aviation emissions are a problem. Currently, they equate to about 2 percent of total global greenhouse gas emissions, but they are expected to make up a much larger share in the coming years as global trade increases and other sectors start to decarbonize. EU aviation emissions, which represent a third of total global emissions from aviation, have doubled since 1990 and are predicted to triple by 2050 if unchecked.

The 2.2 million flights passing through U.K. airspace each year are responsible for putting around 23 million tons of CO2 in the atmosphere each year — roughly equivalent to the annual emissions of six coal power plants.

Reducing U.K. aviation emissions is win-win for the environment and the airlines — if less fuel is burnt, carriers are lowering their costs and pumping fewer emissions into the atmosphere. But how to address the problem?

International talks at the U.N. have yielded only a set of voluntary pledges, and while the industry is investing in alternative greener fuels and more efficient aircraft, research by Boeing last year predicted the number of aircraft in service will double between 2011 and 2031, most likely pushing up emissions regardless of any fuel efficiency improvements.

One organization attempting to stall this growth of aviation industry emissions is NATS, the air traffic services company that controls U.K. airspace. Since 2008, NATS has been working toward smoother, more direct routes that use less fuel, and is saving around a million tons of aviation-related CO2 each year.

The improvements equate to \$174 million in fuel savings for airlines and an average 4.3 percent cut in CO2 emissions per flight against a 2006 baseline, beating NATS' target for a 4 percent improvement by the end of 2014. This is good news for lan Jopson, head of environment and community affairs at NATS, as it means the company has secured a bonus payment from the airlines. NATS is the only air traffic services provider in the world to be financially incentivized to improve environmental performance and could have faced a penalty of \$7.27 million if it failed to hit the 4 percent goal.

Now, Jopson is tasked with helping NATS hit a 10 percent reduction by 2020 with the stakes raised even higher. "We could potentially win or lose 1 percent of our turnover," he admitted, rather more cheerfully than you might expect. "[But] it's good news for me, because when you have bonus and penalties on delivery of a plan, then it gets on to the managing director and chief executive's scorecards pretty quickly, which raises the profile through the organization."

In the past six years, NATS has brought in over 300 airspace and procedural changes to improve flight profiles and to reduce fuel burn, ranging from removing barriers to flights in certain sectors of airspace, which enables more direct routes, to encouraging pilots towards more efficient flying, such as gliding descents into landing. Negotiating with the military to use its previously restricted airspace at certain times has saved 30,000 tons of CO2.



NATS next goal is to hit a 10 percent reduction in CO2 emissions per flight by 2020.

they burn fuel, which enables them to climb to higher altitudes that are closer to the optimal track and can take advantage of high winds.
Collaboration with counterparts in other jurisdictions also has helped bring down burn rates. The winningly named X-Man project
more prosaically, the Cross Border Arrival Management

Initiative — involves asking other air traffic organizations to slow aircraft down so they spend more time cruising, which is far more efficient than circling holding patterns over airports. Just slowing down aircraft has taken more than a minute off holding time for every aircraft that holds around Heathrow.

Technology also has played a role - a new software tool called

GAATS+ was brought in last month to help controllers give more

efficient profiles across the North Atlantic, saving a further 110,000

tons. The technology even takes account of aircraft losing mass as

Working out the savings takes a hefty dose of computing power. "Every aircraft that goes through our airspace has an environmental efficiency score — to compute those scores we have to analyze over a billion radar points," Jopson said. "No one else does it to that level of granularity."

But while NATS undoubtedly has achieved excellent results, the next push to deliver 10 percent savings is likely to get the circuits firing even more furiously.

Jopson is overseeing a \$909 million "root and branch" redesign of the airspace in southeast England and above Manchester that he said will improve safety, capacity and environmental performance, through "enabling continuous climbs, more point to point routes, [and] strategically de-conflicting flows of traffic through that airspace."

The skies above London and the southeast are some of the busiest in the world and Jopson is certain the London Airspace Management Programme is "probably the biggest airspace change we'll ever undertake." New, highly accurate satellitenavigation technology will enable aircraft to get closer to each other and closer to their more optimal profile without compromising safety.

Controllers also will be given better information to help plan more efficient routes. Currently, NATS can give controllers data about their environmental performance when they end their shift, but Jopson would like to get to a situation "where that information is on their control screen so they can make decisions on the best data about how environmentally effective their route selections are."

However, a 10 percent saving remains a testing target. Jopson freely admitted when it was set he did not know if it would be achievable and that reaching it will require him and his team to come up with more ideas.

"Our projections show that even if we deliver all of those things, there will still be a gap to the 10 percent target for 2020," Jopson said. "We're thinking hard about where the extra 1 or 2 percent is going to come from."

Teams of controllers and pilots are convened regularly to discuss how to tackle remaining inefficiencies, while Jopson also holds out hope further savings could come from working closer with other national operators.

It promises to be a considerable challenge — but you would hope if anyone can land something this big, it would be air traffic controllers.

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Tips:

With more and more electronic gadgets becoming part of our lives demand for energy is growing every day. AnotherSimilarly use of vehicle is also growing very rapidly. Most of the energy in India comes from fossil fuels such as coal, natural gas and oil. Higher energy demands and poor efficiency practices have great bearing on fossil fuel usage. There is great concern about use of fossil fuels to produce energy and air pollution. After witnessing fall in prices of petroleum products for several months, now petroleum prices are once again rising. We feel this most opportune time to once again remind some tips to conserve fossil fuel and also save energy. It will also prevent the environment from getting worse.

- Reduce consumption of Petrol and Diesel by using your vehicles more judiciously: Avoid unnecessary use of fossil fuel driven vehicles. Walk down small distances or ride bicycles.
- Maintain your vehicles appropriately i.e. timely servicing of vehicle, change of filters, change of lubricants etc. so that it gives better mileage and also reduces pollution emission.
- Apart from maintenance the driving habits are also to be watched. Sudden acceleration and braking must be avoided and vehicles should be driven at a speed on which maximum fuel efficiency is obtained.
- Use air conditioning only when it is required as it directly affects the fuel efficiency of the car.
- Air pressure in tires should be as per recommendations of the manufacturer.
- While washing clothes in your washing machine use cold water or set the temperature to warm instead on hot.
- On the signals do not keep your car/ bike idling if you have to wait for more than a minute. Switch off engine and start it when signal turns yellow.

Are you going to replace your old car with a new one, do consider buying a more fuel efficient car or hybrid car that runs on electric also.

- Summers are round the corner and load shedding, power interruption are inevitable. As an alternative source, use of generator or inverters by people is very common. If requirement of power is not very high it will be better to use an inverter, as it is noise free, no fossil fuel is used and also no emission is there.
- Whether it washing machine or dish washer always run full load. If it is run on partial load the amount of energy consumed will be same but work done will be less.
- Before starting air conditioner this summer ensure that air filter has been cleaned, so that it does not have to work harder to draw air. It results in saving of energy up to 5%. Also keep in mind not to over cool the room.
- Replace CRT monitors of your computer with LCD monitors as they are much more energy efficient. CRT monitors consume more than double the energy LCD monitors consume. Apart from energy saving LCD monitors emit very small amount of radiation as compared to CRT monitors.
- Install solar water heaters rather than electric or gas operated water heaters, as it is green and inexpensive.

Bangladesh uses floating farms and solar to adapt to climate change

Sustainable Bus...



When we wrote about the surge of small solar in Bangladesh in May, we were astounded that 2.667 solar systems were being added every day. Since then, the numbers have grown to 50,000 to

60,000 a day,

government's

the

bringing

goal into reach - a solar nation by 2021, where every household has solar.

Solar has reached 3.5 million homes — 10 percent of the population — up from 1 million in 2012, according to government's Infrastructure Development Company, which runs the program with funding from the World Bank and other development partners.

In addition to low cost financing for small, home solar systems, the government has plans for 50 mini-solar grids across the country by 2017, part of its plan to replace all diesel-powered irrigation pumps with solar in five years. Five large solar farms are also in the works, adding 143 megawatts of capacity.

And that's not the only way Bangladesh is stepping up to meet its challenges.

Floating schools and farms

Bangladesh — a country of waterways — is one of the most threatened by rising sea levels. About a third of the country is covered by water during monsoon time, but with climate change, water can soak two-thirds of the country.

An amazing nonprofit, Shidhulai Swanirvar Sangstha, has developed solutions that can be used in many parts of the world.

When there's too much rain, students take classes aboard solar-powered boats, often for four months a year. There are now 22 floating schools, five floating health clinics and 10 libraries. A new two-tiered school has classrooms on the lower level and a playground on top.

And in the watery world that's taking over, they are even helping people create floating farms. The nonprofit provides training, seeds, feed and the entire structure for farms that include ducks, fish and even a vegetable garden.

The structure, moored to the shore, is large enough for five to 10 people who can earn about \$1,700 a year selling eggs, fish and vegetables. So far, there are 40 floating farms, with plans for 400 in the next few years.

Made from a simple bamboo platform, floating farms are 56 feet long and 16 feet wide, and float on empty oil drums or plastic containers, moored to the shore.

These adaptations are crucial, because the only alternative to flooded farms is for people to move into overcrowded cities. Bangladesh is one of the most densely populated countries, with 156 million people living in an area the size of Iowa.

This article originally appeared at SustainableBusiness.

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Canadian mounties' secret memo casts doubt on climate change threat

Intelligence report identifies anti-petroleum movement as a threat to Canadian security and suggests those concerned with climate consequences occupy political fringe

By Suzanne Goldenberg



A tar sands mine facility near Fort McMurray, in Alberta. The memo presents continued expansion of oil and gas production as an inevitability. Photograph: Jeff McIntosh/AP

The US security establishment views climate change as real and a dangerous threat to national security. But Canada takes different view, а verv according to secret а intelligence memo prepared by the Royal Canadian Mounted Police (RCMP).

The memo, stamped "Canadian eyes only", repeatedly casts doubt on the causes of climate change the burning of fossil – and its potential threat. The 44-page intelligence assessment of Canada's environmental protest movement was prepared for the government of Stephen Harper, who is expected to roll out new anti-terror legislation.

In the memo, obtained by Greenpeace and seen by the Guardian, the RCMP repeatedly departs from the conclusions of an overwhelming majority of scientists – and the majority of elected leaders in the international arena – that climate change is a growing threat to global security.

Instead, the memo on the "anti-Canada petroleum movement" presents continued expansion of oil and gas production as an inevitability, and repeatedly casts doubt on the causes and consequences of climate change.

It mentions the "perceived environmental threat from the continued use of fossil fuels". It suggests that those concerned with the consequences of climate change occupy the political fringe.

"In their literature, representatives of the movement claim that climate change is now the most serious global environmental threat and that climate change is a direct consequence of elevated anthropogenic greenhouse gas emissions which, reportedly, are directly linked to the continued use of fossil fuels," the memo says.

However, there is an apparent growing international anti-Canadian petroleum movement. In their literature, representatives of the movement claim climate change is now the most serious global environmental threat, and that climate change is a direct consequence of elevated anthropogenic greenhouse gas emissions which, reportedly, are directly linked to the continued use of fossil fuels.

Excerpt from RCMP memo Photograph: Guardian

It does not refer to the findings of the United Nations' climate science panel, the IPCC, and its exhaustive reports on the causes of climate change and its consequence.

The language and tone of the RCMP memo are strikingly at odds with perceptions of climate change within the security establishment of Canada's closest ally, the US, and with the current findings of the world's best scientists.

Scientists have known for decades that the burning of fossil fuels is the main driver of global warming, and parts of Canada are in line for some of its gravest consequences. The Arctic is warming at twice the rate of the rest of the world.

In terms of security perceptions, Barack Obama in a national security assessment earlier this month called climate change "an urgent and growing threat".

The CIA and Pentagon both view climate change as a serious threat to international order, and factor sea-level rise, drought, and extreme weather into their future security planning.

The US military has been tasked with reducing its carbon footprint at all of its military bases and in war zones.

PROTECTED A//CANADIAN EYES ONLY

Criminal actions mounted by environmental activists are often planned and executed with the intention of NOT inflicting casualties. Activists are focused on delivering a message, while not inflicting physical harm to living entities, or the natural environment.

Those aligned with the most extreme factions use the Internet to promote and instruct on the use of violent criminal techniques, including arson, vandalism and sabotage. Demonstrated criminal activity associated to this extremist faction includes: threats to life and property, improvised explosive devices, arson, vandalism, sabotage, thefts, and, break and enters. most notably in New Brunswick, Quebec, Ontario, Alberta, and British Columbia.³⁴

RCMP excerpt Photograph: Guardian

The Globe and Mail, which was the first to report on the memo, said the tone of the RCMP memo reflects the hostility of the Harper government towards environmental activists.

The memo warns: "Violent anti-petroleum extremists will continue to engage in criminal activity to promote their anti-petroleum ideology".

The memo also echoes the accusations of former Harper officials of foreign funding of environmental protesters.

"There is a growing, highly organized and well-financed anti-Canada petroleum movement that consists of peaceful activists, militants and violent extremists who are opposed to society's reliance on fossil fuels," the memo says.

"If violent environmental extremists engage in unlawful activity, it jeopardizes the health and safety of its participants, the general public and the natural environment."

The RCMP did not respond to repeated requests for comment

Regardless of the source, or nature, criminal actions targeting the Canadian petroleum industry, intended to cause harm or not, represent a credible threat to the health and safety of the workers, the general public, the activists, the natural environment and the facility's operations.

If violent environmental extremists engage in unlawful activity, it jeopardizes the health and safety of its participants, the general public and the natural environment.

Law enforcement, and other first responders, face the challenge of additional burden on their resources, and of ensuring the safety of their members, of company employees, of the general public, including those engaged in "*peaceful assembly*".

RCMP excerpt Photograph: Guardian

<Source>

Car makers face 'real world' emissions tests in EU pollution clampdown

Europe to become first place in world to force car makers to undergo more realistic tests in bid to reduce nitroaen oxide emissions

By Arthur Neslen



New regulations will force car-makers to measure pollution emissions in tests that more accurately reflect emissions from real-world driving. Photograph: Andreas Rentz/Getty Images

Europe is to become the first place in the world to force 'real world' emissions tests on car makers, opening up a new front in the fight to tackle air pollution.

New regulations will introduce the tests to reveal what cars' emissions are like when driving on roads and in traffic rather than in ideal laboratory-like conditions as is currently the case. the Guardian has learned.

Green lit by European Commission vice president Frans Timmermans, the tests are designed to enforce a limit of 80mg of nitrogen oxide per kilometre, a level met by only one car out of 16 according to researchers.

Other countries such as China and Korea, which are also considering real world emissions tests, will be watching what happens next closely.

Pollutants from diesel engines such as nitrogen oxide, carbon monoxide and particulates are thought to be responsible for at least one quarter of the 29,000 annual pollution-related deaths in the UK alone. That figure is likely to rise, when the committee on the medical effects of air pollutants publishes what it calls "strengthening evidence" of damage to public health from nitrogen oxide emissions later this year.

But the current 'New European Drive Cycle' laboratory test for measuring these emissions is a quarter of a century old, and has been outpaced by technological developments in the car industry. Studies have shown that lab techniques to measure car emissions can easily be gamed with techniques such as taping up doors and windows to minimise air resistance, driving on unrealistically smooth roads, and testing at improbably high temperatures.

Campaigners say that car makers also use tricks such as programming vehicles to go into a low emissions mode when their front wheels are spinning and their back wheels are stationary, as happens in such lab experiments.

"The Commission is finalising a proposal to introduce a new emissions testing procedure which will allow proper assessment of the vehicles in real driving," said Lucia Caudet, a Commission spokesperson. The proposal still needs approval from other commissioners and a technical committee, but "we don't expect any major internal hurdles," an EU source added.

"One key reason why air pollution kills 400,000 citizens annually is that carmakers cheat the tests for diesel cars, causing many times more pollution on the road," said Greg Archer, the clean vehicles manager for Transport and Environment. "The development of a new realworld driving emission test is an important step forward to tackling urban air pollution. EU states should now support the Commission's proposals and ignore the whinging from carmakers that the rules are too tough."

According to research by the International Council on Clean Transportation last year, actual nitrogen oxide emissions from cars are seven times higher than the 80mg/km standard, with some models running at 22 times above the recommended limit. Only one car out of 16 met the 80g target.

Around one third of all nitrogen oxide pollution comes from road transport - mostly diesel and in urban areas concentrations can rise as high as 64%. European Environment Agency figures indicate.

Campaigners say that the car industry has tried to delay reforms to car test cycles, but industry groups deny this, arguing that a 5-year lead-time is necessary for technical and economic reasons.

"Real Driving Emissions is a totally new regulation that will force significant emission control hardware changes that may be demanded in the middle of a vehicle's production lifetime, said Cara McLaughlin, a spokesperson for the European Automobile Manufacturers Association (Acea). "However, Acea fully accepts that RDE will apply to new types [of cars] from September 2017."

<ReadMore>

Climate change inaction pushes 'doomsday clock' closest to midnight since 1984

Symbolic clock is now at three minutes to apocalypse, the darkest hour for humanity since the cold war

By Suzanne Goldenberg, US environment correspondent



Professor Richard Somerville of the University of California in San Diego unveils the doomsday clock, which says the world is now 'three minutes' away from apocalypse. Photograph: Nicholas Kamm/AFP/Getty Images

The symbolic doomsday clock moved to three minutes before midnight on Thursday because of the gathering dangers of climate change and nuclear proliferation, signalling the gravest threat to humanity since the throes of the cold war.

It was the closest the clock has come to midnight since 1984, when arms-control negotiations stalled and virtually all channels of communication between the US and the former Soviet Union closed down.

"It is now three minutes to midnight," said Kennette Bennedict, the executive director of the Bulletin of the Atomic Scientists, announcing the two-minute shift toward the midnight hour.

The move came as scientists sounded a warning about climate change for the second time in three years. The last move of the clock hands, from six minutes to five minutes to midnight, in 2012, was also because of climate change.

As the scientists noted last Thursday, 2014 was the hottest year in 130 years of systematic record keeping. Nine of the 10 hottest years on record have occurred since 2000.

But the scientists suggested that

the greater danger lay in the failure

of leaders to recognise and act on

have imperiled civilisations on a

global scale," Benedict said. "World

leaders have failed to act on a

scale or at a speed to protect humanity from catastrophe.

The greenhouse gas emissions

that cause climate change have

risen more since 2000 than in the

three previous decades combined,

Richard Somerville, a research professor at the Scripps Institution

of Oceanography, said. Even so,

Meanwhile, the scientists said,

global efforts to reduce nuclear arsenals have slowed since 2009,

and all of the nuclear powers were

expanding reactors and weapons

Scientists created the symbolic

clock in 1947 to indicate the cold

Bulletin of the

a global climate deal.

programmes.

The

observed, negotiators had steadily lowered their ambitions for

government

failures

climate change.

"Stunnina

he

How the minutes to doomsday have changed

| | 2015 Climate change and nuclear weapons | 2012 Climate change |
|--|---|--|
| 2007 North Korea conducts nuclear test | 2002 Fears of nuclear terrorist attack | I998 India and Pakistan test nuclear weapons |
| 1991 Cold war over | 1990 Soviet Union collapses | Berlin wall falls |
| 1981 Soviets invade Afghanistan | 1974 India tests its first nuclear device | 1972 Arms treaty signed |
| 1969 World's nations sign nuclear treaty | 1963 Partial test ban treaty signed | US tests first hydrogen bomb |
| 1949 Soviet's first nuclear test | 1947 Doomsday clock first appears | I |

GUARDIAN GRAPHIC

war threat. In 1991, when the threat of nuclear annihilation receded with the end of the cold war, the clock stood at 17 minutes to midnight

But it was now moving closer to the apocalypse because of climate change. "We are not saying it is too late to take action, but the window to take action is closing rapidly," Benedict said.

<Source>

Atomic

<Source>

Data On Earth's Vital Signs Grows in Leaps & **Bounds**

SustainableBusiness.com News

Data about Earth's vital signs is growing in leaps and bounds, and soon anyone will be able to monitor greenhouse gases in cities, states, and countries by using their mobile phone.

Last week, NASA launched the SMAP Observatory (Soil Moisture Active Passive), the first satellite to collect data on how much moisture is in the soil everywhere on Earth.

SMAP is the third Earth-observing satellite launched by NASA over the past year. Along with and Orbiting Precipitation Measurement Observatory the Global Carbon Observatory, scientists are receiving unprecedented precise measurements as never before



Amazingly, SMAP will peer into the top 2 inches of soil from space - day and night - tracking water movement in real time. The information will vastly increase the accuracy of weather and climate forecasts, including the ability to predict and monitor droughts and floods.

And since plant growth depends on the amount of water in the soil - and whether it's frozen or thawed - SMAP will allow nations to better forecast crop yields, track changes in the length of growing seasons due to climate change and the amount of carbon plants remove from Earth's atmosphere each year.

Greenhouse Gas Emissions Get Very Accurate

There are also big advances in the ability to measure greenhouse gas (GHG) emissions.

While carbon emissions have been measured from the ground for decades using the Keeling Curve - which tells us we have exceeded 400ppm - scientists can't pinpoint where the emissions are coming from and can't get more detail than how much carbon is in the air over time.

NASA's Carbon Observatory is the first to measure carbon from space, giving us precise, global measurements of the amount of carbon dioxide in the atmosphere. Combined with ground-based sensors, scientists can pinpoint exactly where carbon emissions are coming from down to individual factories, for example. It can also identify carbon sinks - where carbon is best absorbed, with the goal of protecting those places.

Last year, Europe's space agency, Airbus Defence and Space, launched the "Emissions Measurement Service" which complements NASA's efforts It will provide accurate assessments of GHG - going beyond carbon to include methane and carbon monoxide - and with the ability to quantify emissions at city, state and country levels.

Methane leaking from landfills, oil refineries and all small-scale sources of emissions will be catalogued, as well as emissions from the world's oceans for the first time.

By combining measurements on the ground, in the air and from the CarbonSat Earth Explorer-8 satellite, scientists will be able to monitor and verify if GHG levels are declining because of efforts to reach climate targets.



For example, what's the real impact of policies that encourage energy from biomass nuclear, and renewable energy? Can we see results on the local level that GHG are coming down?

Mobile Friendly

To make this data easily and freely available to policy-makers, scientists and everyone else, the World Resources Institute developed a tool anyone can use.

Having a discussion where you need quick statistics on how much emissions England generates each year? Using their Climate Analysis Indicators Tool (CAIT 2.0), stakeholders around the world can visualize and compare GHG emissions and other climate data from 186 countries worldwide - including all 50 US states - using smart phones, iPads and tablets

With this level of accuracy and transparency, we will soon know which corporations, cities and national governments are meeting their climate targets - where and how they can improve - giving us a level of information and accountability we've never had before.

Emissions Curbing Deal by 2015 may help Kyoto Protocol Survive

As Kyoto Protocol turns 10, UN says 'first critical step' must trigger new 2015 emissionscurbing deal.

By ThinktoSustain.com

momentum builds As negotiations towards in Paris next year on а universal climate agreement, the United Nations announced that early analysis shows that countries with targets under the landmark Kyoto Protocol - the world's first emission reduction treaty have collectively exceeded their original ambition.



Source UNEP

According to the UN Framework Convention on Climate Change (UNFCCC), those countries who took on targets under the treaty have reduced their emissions by over 20 per cent - well in excess of the 5 per cent target they aimed to meet.

The achievement, which comes as the world today marks the 10th anniversary of the entry into force of the Kyoto Protocol, underlines what can be achieved via international cooperative action.

The news also comes as countries meeting in Geneva last week produced negotiating text for a successor climate change agreement that is excepted to be approved later this year in Paris - the next key chapter in humanity's quest to chart a defining path to keep the world and its people under a 2 degree C temperature rise.

Christiana Figueres, Executive Secretary of the UNFCCC said: "The Kyoto Protocol was a remarkable achievement in many ways. It not only underscored the scientific reality that greenhouse gas emissions need to fall. But it also put in place pioneering concepts, flexible options, practical solutions and procedures for accountability that we often take for granted today".

Continuing, Ms. Figueres said she is convinced that without the treaty and its various mechanisms "we would not be as far forward as we are today in respect to, for example, the growing penetration of renewable energies." The Kyoto Protocol's vision also helped spawn new and innovative initiatives like supporting developing countries to reduce emissions from deforestation and forest degradation, she added.

"The Kyoto Protocol was the first critical step - today we must take further and more far reaching action towards a truly sustainable future for seven billion, rising to over nine billion, people. Despite our best efforts, greenhouse gases continue to rise, threatening sustainable development and putting millions if not billions of people at risk over the coming decades, "said Ms. Figueres.

As such, the Paris agreement of December 2015 would bring all nations into common cause in support of men, women and children everywhere.

"It needs to be a long term, paradigm shift that reflects today's scientific reality - one that speaks to the urgency of swiftly peaking global greenhouse gas emissions, triggering a deep de-carbonization of the global economy and achieving climate neutrality in the second half of the century," she added.

The Protocol, an international agreement under the UNFCCC, was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005.

During its first commitment period, from 2008 to 2012, 37 industrialized countries and the European Community committed to take a leading role in climate action by reducing their emissions to an average of just over five percent against 1990 levels.

The UNFCCC secretariat is expected to complete final accounting for the first phase later this year or early next year.

"Paris will not solve climate change at a pen stroke. But similarly it must trigger a world-wide over-achievement and a clear sense of direction that can restore the natural balance of emissions on planet Earth," said Ms. Figueres.

Source: United Nations

<Source>

California Ranchers Enticed Into **Carbon Farming**

SustainableBusiness.com News

Recently we wrote that carbon emissions can be significantly reduced through the widespread application of compost, and now California is providing incentives for ranchers to do it.

They can get tradable greenhouse gas emission reduction credits, bringing them another revenue stream for sustainable land management practices that also improves the soil and its ability to hold water.

Ranchers can sell them on California's Greenhouse Gas Reduction Exchange (GHG Rx), where polluters buy credits to be used in projects that benefit the state. So, ranchers can now benefit from the state's cap-and-trade program.

Research at University of California/ Berkeley shows that compost applied to 5% of the state's grazing land would store a year's worth of emissions from conventional farms and forestry operations there. If that's increased to 25% of grazing land, the soil would absorb 75% of California's total annual emissions.

Prairie Pot Hole Region, North Dakota:



A similar program is launching on the level under the USDA. national "Carbon farming" ranchers can generate revenue by simply leaving grasslands undisturbed. The more carbon in their soil, the more carbon credits generate, thev which buy to offset their corporations emissions.

Australia's Parliament In 2011. passed legislation creating the world's first nationwide system for carbon credits from farming and forestry industries. There's also a program for small farmers in Kenya.

<Source>

Coastal communities dumping 8m tonnes of plastic in oceans every year

China ranked top polluter as figures suggest total plastic litter ending up in the seas could rise tenfold bv 2025

By lan Sample, science editor



Coastal pollution, viewed from underwater, in Philippines. Photograph: Jurgen Freund/Corbis

Coastal populations put about 8m tonnes of plastic rubbish into the oceans in 2010 an annual figure that could double over the next decade without major improvements in waste management efforts, scientists warn.

The mountain of plastic litter, including bags, food packaging and toys, was equivalent to five full shopping bags of debris for every foot of coastline bordering nearly 200 countries the team studied

Though researchers have known about plastic waste in the oceans for 40 years, the latest report, published in the journal Science, is the first to attempt a detailed estimate of how much plastic made on the planet finds its way into the oceans.

The figures suggest that about 10 to 30 times more plastic debris ends up in the oceans than surveys have found floating about on the surface. In one recent survey, an international team reported more than 5 trillion pieces of plastic are floating in the world's oceans, collectively weighing nearly 269,000 tonnes.

In the latest study, researchers at the University of Georgia and the Sea Education Association in Massachusetts calculated the amount of waste plastic generated in 192 countries with coastlines on the Atlantic, Pacific and Indian Oceans, and the Mediterranean

Ocean plastic polluters The worst offenders

Twenty worst countries for dumping plastic in the oceans

Kev | Total plastic marine debris (million metric tonnes per year) 263 Total coastal population, millions



International

and Black seas. From data or regional manufacturing and waste management practices, they worked out that 4.8m to 12.7m tonnes of plastic rubbish wound up as ocean debris in 2010.

"This input of plastic waste to the oceans is several orders of magnitude more than we can see, which means there's a lot of plastic out there that we are finding," not said Jenna Jambeck, the first author of the study at the University of Georgia.

Some countries still dump plastic litter into watercourses that carry the material out to sea. But much of the plastic made on land becomes marine debris because it is not properly disposed of in landfills or at recycling plants. Left in piles in coastal areas, the waste can easily blow into waterways or be carried out to sea by flood water.

plastic reaches the Once oceans it forms floating waste washes up on coastlines, and accumulates on sea floors bags, items like Larger wrapping and fishing gear can entangle dolphins, turtles and even whales. Small pieces are eaten by fish, turtles and seabirds. Over time, the

material weathers down into tiny particles that can be ingested even by small marine animals. The pollution is extremely difficult to remove from the environment or trace back to its source.

In the study, Jambeck and her colleagues ranked the 20 countries responsible for the most waste plastic ending up in the oceans. The greatest sources were not only the major plastic producers, but generally those nations with the worst waste management practices

China topped the table with 1.32 to 3.53m tonnes of plastic reaching the oceans in 2010. Indonesia followed, where 83% of waste was mismanaged, added 0.48 to 1.29m tonnes of marine plastic to the seas that year. The US ranked 20th, where only 2% of waste was badly handled, and 0.04 to 0.11m tonnes of plastic found its way to the ocean. Sixteen of the top 20 polluters are middle income countries where fast economic growth is not accompanied by major improvements in waste handling.



Kuta beach, Indonesia, strewn with plastic litter. Up to 83% of waste is mismanaged in the country. Photograph: Agung Parameswara/Getty Images

marine plastic to 2.4 to 6.4m tonnes annually by 2025.

According to the report, the cumulative amount of plastic in the seas will soar tenfold by 2025 if nothing is done to slash waste generation or manage it more effectively. The current annual rate of 8m tonnes put into the oceans could also double by 2025 without action.

If changes are made, they could have a impact, the scientists claim. huae Reducing mismanaged plastic waste by 50% in the top 20 ranked countries would cut the pile of plastic likely to end up in the oceans by 41% in 2025. More stringent caps on plastic in waste streams, and better disposal in the top ten-ranked countries could reduce the amount of new

Though the greatest gains would come from better waste processing in regions where waste management is the poorest, Jambeck stressed that substantial improvements were possible even in countries with effective waste disposal. "It's not just about improving the infrastructure in other countries." she said. "There are things we can do in our daily lives to reduce the amount of waste plastic we all produce.

In December, a team led by Lucy Woodall at the Natural History Museum in London, found "microplastic" debris had accumulated in deep sea sediments, with some as deep as 3000m.

"Marine litter appears to be a much more serious phenomenon than previously thought with studies from the last six months suggesting this pollutant is all pervasive in our oceans and is present in much larger quantities than previously thought," Woodall said.

"The world's oceans cover such a large surface area and by nature are remote from much of human habitation, therefore it is unsurprising that every new study adds to our understanding how serious this issue is. This environmental challenge is one entirely of human making, but we can all help by starting to value, reduce, recycle and reuse plastic products.

<Source>

International

Four of nine planetary boundaries now crossed

By ThinktoSustain.com

Four of nine planetary boundaries have now been crossed as a result of human activity, says an international team of 18 researchers in the journal Science. The four are: *climate change, loss of biosphere integrity, land-system change, altered bio-geochemical cycles.* The scientists say that two of these, climate change and biosphere integrity, are "core boundaries" – significantly altering either of these would "drive the Earth System into a new state". The team will present their findings in seven seminars at the World Economic Forum in Davos (21-25 January).

The concept of planetary boundaries, developed by a global community of scholars with participation of the **Potsdam Institute for Climate Impact Research (PIK)** and first published in 2009, identifies nine global priorities relating to human-induced changes to the environment. The science shows that these nine processes and systems regulate the stability and resilience of the Earth System – the interactions of land, ocean, atmosphere and life that together provide conditions upon which our societies depend.

The new research confirms original the set of boundaries and provides updated analvsis and quantification for several of them (see table at end). To achieve some of these PIK quantifications, а computer model (LPJmL) simulating human impacts on Earth's water resources and ecosystems was key.

"Transgressing a boundary increases the risk that activities human could inadvertently drive the Earth System into a much less hospitable state, damaging efforts to reduce poverty leading and to а deterioration of human well being in many parts of the world including wealthy countries," said lead author Will Steffen from the Resilience Stockholm Centre. Professor at the

Stockholm University and the Australian National University Canberra "In this r



Source: PIK

University, Canberra. "In this new analysis we have improved our quantification of where these risks lie."

On the regional scale, even more boundaries are crossed

Even some boundaries that have not yet been crossed at the planetary scale were found to exceed regional tolerance limits, such as freshwater use in the western US and in parts of southern Europe, Asia and the Middle East. "The challenges for society to stay within several planetary boundaries require balanced policies," said co-author **Dieter Gerten** of PIK. The boundaries are closely interlinked, and preventive measures relating to one of them can have negative repercussions on another one. "For example, if irrigation was reduced to stay below the boundary for freshwater use, cropland may have to be expanded as a compensation measure, leading to further transgression of the boundary for land-system change," Gerten explained. "Implementing methods to use water more efficiently in agriculture can help sort out this dilemma and at the same time increase global food production."

Regarding climate change, the team argue that carbon dioxide levels should not cross 350 parts per million (ppm) in the atmosphere. The current level is about 399 ppm (December 2014), growing by about 3 ppm per year. "This boundary is consistent with a stabilisation of global temperatures at about 1.5 degrees above pre-industrial levels," said co-author

| Planetary Boundary | Current Status |
|----------------------------------|-----------------------|
| Climate change | Boundary transgressed |
| Change in biosphere integrity | Boundary transgressed |
| Stratospheric ozone depletion | |
| Ocean acidification | |
| Biogeochemical flows | Boundary transgressed |
| (phosphorus and nitrogen cycles) | |
| Land-system change | Boundary transgressed |
| Freshwater use | |
| Atmospheric aerosol loading | |
| Introduction of novel entities | |
| | |

Professor Johan Rockström, director of the Stockholm Resilience Centre, who will present the new findings at the World Economic Forum. In December, nations will meet in Paris to negotiate an international emissions agreement to attempt to stabilise temperatures at 2 degrees above pre-industrial levels. "Our analysis suggests that, even if successful, reaching this target contains significant risks for societies everywhere," said Rockström.

"Two degrees must therefore be seen not only as a necessary but also a minimum global climate target."

Investigating the implications of global risks for national policy-making

PIK maintains an extensive collaboration with the Stockholm Resilience Centre on the topic of planetary boundaries. Under the leadership of Wolfgang Lucht, Co-Chair of PIK's department of Earth System Analysis, PIK is a founding member of the Planetary Boundaries Research Network (PB.net) to coordinate this science. PIK researchers led by Wolfgang Lucht have also recently launched a project funded by the German Environmental Agency (Umweltbundesamt) to specifically investigate the implications of planetary boundaries for national policy making.

<Source>

Tesla and the electric vehicle battery tipping point: Are we there yet?

By Jaclyn Brandt



Tesla, the luxury electric carmaker, plans to expand production of batteries beyond vehicles to residences.

Tesla plans to enhance its stamp on the smart grid industry — but this time it will be from the home.

The company already has a significant market in the electric vehicle (EV) industry, but is working on a battery that can power residences. The company, and CEO Elon Musk, made the announcement on a recent investor call.

Musk said that designs for the battery will be available to the public in the next few months and could be in production within six months.

"It's really great. I'm really excited about it," he said.

Tesla hopes the battery can work similarly to that of a solar panel — storing energy and allowing customers to sell excess back to their energy company.

In May, Musk spoke about the possibility of a home battery, telling Forbes, "We are trying to figure out what would be a cool stationary (battery) pack. Some will be like the Model S pack: something flat, 5 inches off the wall, wall mounted, with a beautiful cover, an integrated bi-directional inverter and plug and play."

The company is working fast on its plan, building its own large factory — which they call a "gigafactory" — that is expected to cost around \$4 billion to \$5 billion. It has broken ground in Nevada, and will be partnering with Panasonic.

Tesla also works with SolarCity, a company that has taken Tesla's batteries and integrated them into its solar panels. Musk is the cousin of one of SolarCity's founders, as well as being the company's chairman.

Tesla's home battery announcement follows its May announcement, where Musk had said it would solidify its home battery release by the end of 2014 or beginning of 2015.

"A lot of utilities are working in this space, and we're talking to almost all of them," Tesla Chief Technical Officer J.B. Straubel said. "It's early stage stuff and a lot of these projects are very far out since the procurement cycle for utilities is so long. But this is a business that certainly is gaining an increasing amount of our attention."

Although many companies are working on the technology, Tesla's announcement has shown it is at the forefront of the technology. According to the Washington Post, Morgan Stanley wrote last March: "There may be a 'tipping point' that causes customers to seek an off-grid approach. The more customers move to solar, the remaining utility customer bill will rise, creating even further 'headroom' for Tesla's off-grid approach."

In its announcement, it sounds as if Tesla will move quickly on releasing its stationary battery. The company did not mention possible pricing when the battery is released.

This article originally appeared at Smart Grid News.

Greenland's hidden meltwater lakes store up trouble

Scientists find evidence of vast 'storage tanks' of water deep below the melting Greenland ice sheet that could have a major effect on sea level rise, reports Climate News Network

By Tim Radford for Climate News Network, part of the Guardian Environment Network



Summer meltwater in Greenland has been recorded making its way down fissures and filling a lake basin at the base of the icecap. Photograph: Joe Raedle/Getty Images

One small mystery that surrounds Greenland's melting ice is a little closer to being solved as scientists in the US confirm that surface meltwater can drain all the way down to fill concealed lakes under the ice.

This means that atmospheric warming can reach thousands of metres below the ice sheet – warming the glacial base and potentially increasing its rate of flow.

One group, led by geologist Michael Willis, of Cornell University, and another team led by glaciologist Ian Howat, of Ohio State University, report in two different journals on separate but related studies of Greenland's plumbing system: what happens to meltwater.

The ice sheet of Greenland adds up to about four-fifths of the mass of the vast frozen island, and there is evidence that, as a consequence of global warming, the rate of melting has begun to accelerate.

This has already begun to make a measurable difference to global sea levels, and were the entire island to shed its burden of ice – a process that would take a considerable time – then sea levels would rise by seven metres or more.

So what exactly happens to the water that forms on the surface and collects in lakes each summer, and how much of it gets into the sea, has become an important but perplexing problem. Surface lakes are now appearing much further inland, and at higher altitudes, than recorded in the past.

Dr Howat and his colleagues report in The Cryosphere that they measured a two kilometrewide depression 70 metres deep in the icecap of southwest Greenland, which they then identified as "the first direct evidence for concentrated long-term storage and sudden release of meltwater at the bed".

The slumped crater suggested a holding capacity of more than 30 million cubic metres of water, which had suddenly drained away.

"The fact that our lake appears to have been stable for at least several decades, and then drained in a matter of weeks – or less – after a few very hot summers, may signal a fundamental change happening to the ice sheet," Dr Howat said.

The Cornell team worked in northeast Greenland, and in 2011 found a collapsed basin 70 metres deep. Dr Willis and colleagues report in Nature journal that between 2011 and 2014 they watched as summer meltwater made its way down fissures in the depression and refilled a lake basin at the base of the icecap.

"We're seeing surface meltwater make its way to the base of the ice where it can get trapped and stored at the boundary between the bedrock beneath the ice sheet and the ice itself," they say.

"As the lake beneath the ice fills with surface meltwater, the heat released by this trapped meltwater can soften surrounding ice, which may eventually cause an increase in ice flow."

The researchers do not yet know whether the draining water is increasing glacial flow, and nor can they be sure how many such depressions in the Greenland ice mask buried meltwater storage tanks.

But melting of glacial ice is likely to accelerate anyway, according to new research in the journal Climate Dynamics.

Earth scientist Patrick Applegate, of Penn State University, reports that computer models confirm that the more temperatures increase, the faster the ice will melt.

Were all Greenland's ice to melt, sea levels would rise catastrophically. At least one billion people live on coasts and estuaries vulnerable to a mere one metre rise.

The Arctic is already the fastest warming place in the northern hemisphere, and the Penn State scientists wanted to see how present warming could play back into future warming. Engineers call this positive feedback.

Great Idea! Bringing Solar to Familes That Can't Afford Electricity & Heat

SustaínableBusíness.com News

What a great idea!

Just as the USDA now allows people to spend food stamps at farmers markets, a group in Minnesota wants to spend state energy assistance funds to bring solar energy to low income families.

Funds make sure people with low incomes get electricity and heat during the winter.

"We are hemorrhaging public resources to foot the bill for low-income energy assistance. On an annual basis we spend about \$100 million in Minnesota alone," says Jason Edens, Founder of Rural Renewable Energy Alliance (RREAL). "If we can deploy these community solar gardens in lieu of energy assistance, that's a solution for three to four to five decades. It's a much wiser use of public resources on behalf of our low-income families and neighbors," he told *Pine and Lakes Echo Journal*.

RREAL built Minnesota's first Community Solar Garden in 2013. Now, instead of giving families money to pay expensive electric and heating bills, suitable families will get electricity from solar gardens. They can even get a solar heating system installed if they qualify for the federal LIHEAP program.

Under "Community Solar for Community Action," not only would people benefit from clean energy, they will be political insulated from decisions on how much funding goes to the program each year.



"This model that could be deployed from Florida to Alaska, Hawaii to Maine because energy assistance is used even in warm climates. In those areas it is actually used for low-income families grappling with the high cost of air conditioning," says Edens. "This is a model that RREAL will be able to bring to the national stage, because we have cultivated good relationships with our friends in the energy assistance community, it's quite possible we will be able to do that over the coming years."

Making energy assistance more affordable will also lower costs to taxpayers, while making assistance possible for more people.

Xcel Energy plans to double the amount of solar on its Minnesota grid by giving customers the option of participating in community solar projects.

<Source>

The system was first installed in San

Antonio, TX and Riverside, CA's water

system, and this is the first power

Turbines come in a range of sizes and

each can generate as much as 100

of

can

purchase agreement.

kilowatts

single pipeline

Green Technology Spotlight: Energy From Water Pipelines

SustainableBusiness.com News

Who would think of generating energy from inside a water pipeline?

Portland, Oregon is trying it out, having just switched on the LucidPipe[™] Power System in one of its major water pipelines.

Developed by Lucid Energy, turbines spaced inside the pipe use gravity-fed water flows to create electricity. It's hydro without the negative environmental impacts.

Four, 42" turbines are now producing electricity and selling it to utility Portland General Electric under a 20-year power purchase agreement. This initial project will serve about 150 homes and revenues will be shared with Portland Water Bureau. After 20 years, the water agency will have the right to own the system and the energy it produces.



1 megawatt for \$0.05-\$0.09 cents per kilowatt-hour.

"Water agencies are looking for ways to be more energy efficient, energy utilities are seeking more renewable sources of energy and investors are seeking opportunities in smart water and energy infrastructure," says Gregg Semler, CEO of Lucid. "The industry is looking to Portland as an example of how all of these entities can partner to take advantage of in-pipe hydropower to generate investment returns and reduce the cost of delivering clean, safe drinking water."

Seems like a great idea, producing clean energy - instead of paying for it - reduces the costs of supplying water. It opens the door for municipal, industrial, and agricultural facilities to generate clean, reliable, low-cost electricity from their gravity-fed water pipelines and effluent streams.

The company is pursuing commercialization worldwide, supported by investors that include Northwest Pipe Company (which co-developed the technology), Star Energy and the Harbourton Fund, and individuals through OurCrowd - a crowdsourcing platform. The US Department of Energy also chipped in \$1 million.

electricity, A

produce over

High-speed chargers drive EVs closer to the mainstream

By RP Siegel



ChargePoint's EV charging station network is growing across the U.S. and Canada. *This article first appeared at Justmeans.*

In 1906, Ray Stannard Baker wrote the following passage about automobiles in "The Boy's Book of Inventions: Stories of the Wonders of Modern Science."

"The electric vehicle which has had its most successful development in this country has its well-defined advantages and disadvantages. It is simpler in construction and more easily managed than any other vehicle: one manufacturer calls it 'fool proof.' It is wholly without odor or vibrations and practically noiseless. It will make any permissible rate of speed and climb any ordinary hill. On the other hand, it is immensely heavy, owing to the use of storage batteries; it can run only a limited distance without recharging...

"Indeed, all the manufacturers of electric vehicles speak with the confidence of the day when the whole of the United States will be as thoroughly sprinkled with electric charging stations as it is today with bicycle road-houses."

A hundred years ago we were at a crossroads similar to the one we find ourselves at today, with electric vehicles vying against gasoline-powered cars. Back then, the choice was made, influenced by a good deal of lobbying and maneuvering by the oil industry. The facts that gasoline-powered cars were cheaper and didn't have the range issues of electrics also helped to tip the scales.

A century of inertia

So, the question is, how much have things changed? Electric cars are still more expensive and still confront the range limitation challenge that seems to be inherent in trying to store adequate energy in electrical rather than chemical form.



Dropping prices on EVs such as the Chevy Volt tempt consumers, but range anxiety is still an issue.

What has changed is the realization that widespread usage of fossil fuels has put our planet and everything living on it at risk of a destabilized climate that threatens every aspect

of our life-support system.

With so much of our day-to-day life built around a gas-powered car that can be quickly and (of late) inexpensively filled up at any of thousands of gas stations that cover the landscape, the challenge of switching over to a completely different energy is huge.

Yes, EV prices are coming down (see Chevy Volt) and charging stations are popping up everywhere. According to DOE, 8,983 charging stations and 22,387 charging outlets are in the U.S. Whether that's as many as there were bicycle roadhouses in 1906 is not clear, but unless people are convinced that it's enough to assuage their "range anxiety," they will hesitate to buy an EV. Roughly 120,000 electric vehicles were sold in the U.S. last year, bringing the total up to around 280,000.

There are a couple of other dimensions to this question. One is that, unlike gasoline, people do have access to electricity at home, which is where much of the vehicle charging — at least for local trips — will take place. That's why there needn't necessarily be as many charging stations as there are gas stations.

The other dimension is that not all charging stations are created equal. What varies is the amount of time required for a charge, although what is true in all cases is that it will take longer to charge your car with electrons than it did to fill it with gasoline.

Most people will come to recognize that it will be worth the wait in order to maintain a livable climate, but that doesn't mean it will be an easy adjustment.

Battery services and other business innovations

Some areas, such as Denmark, are experimenting with the idea of a charged battery as a service. Instead of owning the battery as part of your car, the battery is a shared resource. When your charge is getting low, you pull into a station, where they lift out your battery and replace it with a fully charged one. This doesn't take any longer than filling up a gas tank, but it's a different ownership model more in line with the sharing economy.

Not all EVs are configured for this, but several Nissan models are designed to work with a robotic battery switching station designed by Shai Agassi of Better Place. That same approach, by the way, was used by New York taxi companies in the early 20th century when electric cabs made a brief appearance. The other option would be to go to hydrogen fuel cell, which Toyota is vigorously pursuing.

That concept might be a little slow to catch on in the U.S., which is why companies such as Tesla, and now BMW and VW, are investing in the installation of a vast network of high-speed charging stations. One hundred new stations will be installed along the busy coastal corridors such as Interstate 95, which runs between Washington and Boston.

The need for (charging) speed

The charging networks are not necessary for those using their EVs for local commuting. They can charge up at home, perhaps with a second car in the garage for longer trips. But for those people who will own only one car and want it to do everything they are used to doing, they'll want those charging stations when they take to the road.



BMW and Volkswagen are working with ChargePoint to build "charging corridors" for EVs.

The question of charging speed adds an additional wrinkle. Tesla, for example, has proprietary electronics both in their Superchargers and their cars, which allow for a charging speed that can provide as much as 340 miles of range per hour of charge. So if you're in a hurry and you're not far from home, 15 minutes will get you 85 miles.

By contrast, plugging a Tesla Model S into a typical household outlet will get you only 3 to 4 miles of range per hour of charge. That means that an overnight charge, while enough for commuting around town, won't be enough to extend that road trip by very much. Perhaps it will be enough to get you to the nearest Supercharger. An optional 240V wall connector can raise that to 58 miles of charge per hour, enough to get you a full charge overnight. Only Tesla cars can use Tesla chargers.

All EVs have a standard connector, a J1772, which can connect to any and all models of public chargers. But the charging time depends on the level of the charger. A Level 1 charger essentially will get you the same charging efficiency as a regular outlet at home, up to 5 miles per hour. A Level 2 charger will provide about 19 miles per charging hour, provided that the car has the appropriate electronics to accept this amount of current. Likewise, a Level 3 charger, which requires a 480 Volt connection, will provide about 120 miles per charge in an hour.

While Level 2 chargers have become fairly standardized and you can get one for your home, the Level 3 standard is still in dispute. Contenders include the CHAdeMO plug, used by most Japanese EVs including the Nissan Leaf; and the newer J1772 Combo, which, as the name implies, adds additional functionality to the existing J1772 plug. This type of connector is used by the Chevy Spark EV and the BMW i3. To further complicate things, there is also Express DC fast charging offered by Chargepoint (PDF), which uses the standard J1772 connector.

The new network announced by the two Ws is being developed in conjunction with ChargePoint, the largest provider of EV chargers in the U.S., with over 20,300 stations already in place. According to information provided by Chargepoint, "many vehicles can charge up to 80 percent in as little as 20 minutes."

"This is the last piece of the puzzle to let people make an electric car be their primary vehicle," said Pasquale Romano, chief executive of ChargePoint. "Otherwise, you're telling drivers they can't travel, and that just doesn't work."

<Source>

International

How to keep climate emissions from grounding aviation

By Robert Litterman



If aviation doesn't reduce its carbon emissions, there's no blue sky for the industry. *This article first appeared at Ensia.*

In his recent State of the Union speech, President Barack Obama spoke movingly about addressing climate change. But frankly, the United States government has not yet moved the needle. In fact, the world today is fiddling while future humans are being made subject to worst-case scenarios we have not even thought about.

Although we may not admit it publicly, or even to ourselves, every sane person understands that as a society we are performing an uncontrolled experiment on our planet. How big of a shock we subject it to matters tremendously to those who will be alive in the future and who will suffer the unknown consequences of our collective actions.

What society is doing to the planet with respect to greenhouse gases is very much like the actions that led to the devastating and deadly Johnstown flood of 1889: dangerously filling up a reservoir with unknown capacity and unknown consequences, with concern for society's well-being overshadowed by human greed and irresponsible behavior.

The lesson is this: It doesn't matter if you don't foresee the consequences of your behavior. It doesn't matter that you didn't anticipate exactly when or where or how your actions would lead to catastrophic consequences. Certain actions, such as filling up a reservoir, are inherently dangerous, and anyone who engages in such behavior is strictly liable for the consequences of their actions.

Aviation needs to make GHG reductions fly

As a risk manager, I was taught to worry about worst-case scenarios — even while recognizing that I was not likely to see them coming. As an investor and a former partner heading risk management at Goldman Sachs, I clearly understand that the purpose of risk management is not to eliminate risk, but rather to make sure that risks are priced appropriately. As an economist, I understand that incentives are the most powerful force that society can provide to influence behavior.

And yet little is being done today to price climate risk and create appropriate incentives to reduce emissions.

It is our duty to manage the risks to future generations of carbon emissions now. And the way I propose we can best do this is to price the risk in a way that creates appropriate incentives to reduce them — first in aviation and then throughout the global economy.



The aviation industry acknowledge its risks, and must manage them.

Why start in aviation? The aviation industry very well understands that Earth's atmosphere is a reservoir that has a limited capacity to safely absorb emissions. Aviation also knows that no alternative technologies on the horizon will allow people to fly without creating emissions.

So for many decades into the future, the aviation industry will need a growing share of the remaining capacity to emit carbon dioxide, giving it a stronger interest than most sectors in quickly reducing emissions and reserving as much capacity as possible for the future.

Aviation, with its hard-won expertise in risk management, understands that there is uncertainty about how much capacity Earth's atmosphere has left to safely absorb emissions — tremendous uncertainty that creates tremendous risk.

The good news is aviation has a head start: The International Civil Aviation Organization is already designing the world's first internationally harmonized market-based-measure to reduce emissions (PDF). This creates an important opportunity for aviation to lead the global

effort to reduce the risk of climate change by immediately creating an appropriate benchmark for the incentives needed to reduce emissions throughout the global economy. For a number of years (2012, 2013, 2014) World Wildlife Fund, on where heard hait here

For a number of years (2012, 2013, 2014) World Wildlife Fund, on whose board I sit, has partnered with top economists, including several Nobel Prize winners, in calling for carbon pricing that reflects the externality of the risk created by international aviation emissions.

<ReadMore>

Is gluten-free good for the planet?

'Free-from' produce is muscling in on bread and pasta, but the environmental and social consequences of increased demand for grains like quinoa are being overlooked

By Eleanor Ross



Flizabeth Hall spends more than £40 of her weekly budget on gluten-free bread, cakes and pasta. She self-diagnosed as gluten intolerant two years ago, citing bloating and cramps whenever she ate wheat. Now she declines

rolls in

bread

Sales of wheat-based bread and pasta are plummeting, but is gluten free good for the environment? Photograph: Alamy restaurants and gives the nod to rice flour, which

she eats as a carbohydrate substitute.

Hall is not alone. Sales of wheat-based bread and pasta are plummeting, while the UK "freefrom" market is worth an estimated £238m, according to retail analyst Kantar Worldpanel. Sainsbury's, one of the largest stockists of free-from produce in the UK, estimates that one in five consumers now buys gluten-free produce. In the US, the gluten-free food and beverage industry experienced a growth of 44% between 2011-13, with neither market showing signs of slowing down.

A quick look at the back of a packet of gluten-free bread shows a variety of ingredients: rice flour, tapicca starch, sorghum, millet, potato starch, maize starch and maize flour. So what happens when 25% of UK consumers start swapping out their daily loaf of bread for gluten-free, and how can we ensure that the grains we're getting The growth in demand for are sustainable?

Doves Farm is one of the largest producers of gluten-free flour in the UK, and tries to ensure its employees are treated fairly. "We currently source our gluten-free buckwheat grain from Poland and are committed to fair The growth in demand for gluten-free grains puts pressure on the environment and on the livelihoods of workers

working conditions for workers; we visit our suppliers around the world," said spokesperson Wendy Akers.

In 2013 the negative impact on producers of the rise in demand for quinoa hit headlines with news that Bolivian quinoa producers could no longer afford to eat the gluten-free superfood. The media used this story to blast quinoa consumers, but Stephen Jones, founder of the British Quinoa Company, says that "while we hear a lot about the negative effects of quinoa production in South America, attention should be paid to the benefits that the crop has also given the people in the region, something which is often overlooked in the media".

Studies have shown that farmer's livelihoods in countries such as Bolivia and Peru have actually improved. Dr Adam Drucker, senior economist at Bioversity International, said: "I had a group of students from Cornell who carried out a review of press reports regarding quinoa which highlighted that many quinoa farmers were now better off as a result of higher quinoa prices and that increased exports were not at the expense of reduced domestic consumption, which has been rising slightly and had always been at a low level following colonial-era restrictions."

Matthias Jager, a market and value chain expert at CIAT, also found that increased income had allowed quinoa producers to diversify their diets with meats, fruits and vegetables while maintaining quinoa as a source of valuable protein. However, Jones, who began producing quinoa in Shropshire, says: "Producing locally grown and traceable produce is a key solution to ensure sustainability. The problem with buying goods from across the globe is that the buyer is often far removed from the producer, with the buyer unable to fairly assess the positive or negative impacts on the local community."

The rise in popularity of gluten-free grains may have helped producers improve their daily lives, but there have been environmental consequences. Research by Jager found that the rise of quinoa production in Bolivia means farmers rarely give the soil time to recover and that producers plant the crop continuously on slopes and valley areas.

Drucker explains: "Over time, the soil becomes eroded, pest and diseases spread and yields decrease. Research organisations in Bolivia are currently working on solutions for sustainable intensification in these areas." He adds that as quinoa becomes more lucrative, some farmers who had left for the city are returning to cultivate quinoa part-time. This means they can't manage the llama herds year-round, and as llama manure is used to fertilise the soil, the soil isn't being replenished.

he environment? Photograph: Alamy drate substitute. s of wheat-based bread and pasta are plummeting, an estimated £238m, according to retail analyst K

storage The Unspeakable Connection: Soaring 'Largest ever' U.S. energy system takes shape

By James Murray



Alevo will produce 480 energy storage GridBanks at a new facility.

Energy storage specialist Alevo Group has announced plans to deliver the largest U.S. energy storage deployment to date, after signing a deal to provide 200MW of capacity.

The company, which emerged from stealth mode last autumn with news that it had raised around \$1 billion to support the development of its advanced battery technology, revealed that it has signed a deal with energy services firm Customized Energy Solutions (CES).

The joint operational agreement will see the two companies work together to provide 200MW of grid frequency regulation services to the wholesale power market through Alevo's GridBank energy storage systems. These are 2MW capacity batteries stored in shipping containers

Alevo said that the deal will allow CES to provide energy storage-based frequency regulation services to its customer base in the U.S. and Canada, and "represents the largest ever energy storage deployment in the U.S."

Growing to fit the grid

"This is a critical juncture in the integration of battery storage into the market, transitioning from pilot projects to grid-scale commercially viable installations," explained Judith Judson, director of emerging technologies at CES, in a statement.

"Storage can provide huge value across the electric grid in terms of increased efficiency and reduced costs, but the challenge has been monetizing the benefits. Alevo is a forwardthinking company with an exciting new battery chemistry and aggressive growth goals.

Alevo predicts that a combination of falling battery costs, new U.S. regulations governing grid management, utilities' desire to reduce peak energy demands and the need to capture power from renewables for use at optimum times, means that demand for energy storage technologies will expand rapidly

The company is planning to produce 480 GridBank units at a new factory in Concord, N.C., as it seeks to exploit an innovative battery design featuring lithium-iron-phosphate, graphite and an inorganic electrolyte that creates much less friction when electrons move through it, leading to longer lasting batteries.

Jostein Eikeland, chief executive of Alevo, said that the latest deal underlined the huge potential for energy storage technologies. "The major expansion of projects deployed in Independent Systems Operator [ISO] markets continues to prove the benefits and commercial applications for readiness of energy storage," he said.

"Our operational agreement with CES is a milestone for Alevo and testament to the proven performance attributes of our battery technology, which offers a superior value proposition for grid applications.

"The longevity and performance characteristics of the technology allow us to deploy projects in multiple ISO markets that earlier technologies have not been able to profitably address."

North Carolina is renewing itself

The announcement came as the North Carolina Sustainable Energy Association (NCSEA) published a report (PDF) highlighting the state's emergence as one of the leading clean tech hubs in the U.S.

The report details how North Carolina has experienced about 15 percent annual increases in revenue generated by clean energy activities since 2012, reaching \$4.8 billion in 2014. It also reveals how the state's 1,200 clean tech firms now employ nearly 23,000 people.

"This year's census not only reveals good news for the clean energy industry; it demonstrates powerful news for all of North Carolina," said NCSEA executive director Ivan Urlaub. "Consider the rise of clean energy business sectors like building efficiency and energy storage, which are creating immediate jobs and lowering business expenses, while preparing our state to affordably meet future energy demand.

"Our state is not only better off with clean energy, it's thriving and becoming a national model for how clean energy development can strengthen economic competitiveness.

This article first appeared at BusinessGreen.

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Human Population & Climate Change

SustaínableBusíness.com News

These days, we rarely hear about the need to stop soaring human population growth, but clearly this is at the root of many of our problems, such as climate change and biodiversity loss

In September, the United Nations will update Sustainable Development goals and an international coalition wants universal access to family planning recognized as integral to "climate-compatible development."

Right now, world population stands at 7.3 billion and while experts used to believe it would level off at an unsustainable 8-9 billion, there now seems to be no end in sight. Projections are for 11-12 billion humans by 2100.

Many experts believe the Earth's carrying capacity can't handle more than 1-2 billion humans.

Obviously, the more crowded the Earth is, the more pressure there is on every resource from land for farming to water to drink. As human populations expand, there's less and less space (and resources) for every other species. It means more economic activity, which brings more greenhouse gas emissions and more intense climate change.

A recent study shows that global temperature rise is in lockstep with population growth - an additional percentage point of human population coincides with an additional 2 degrees Fahrenheit in average global temperatures, according to economist David Rosnick at the Center for Economic and Policy Research.

"There are many warnings of 'demographic time bombs' due to population declines in countries like Japan. But lower population growth has many economic benefits; one of the most important is that it reduces the rate of global climate change," he says in The Consequences of Increased Population Growth for Climate Change.

Smaller populations in developed countries would have the most beneficial impact on climate change because of super-sized consumption and emissions. It would have the most beneficial impact on biodiversity in the developing world, where population is growing the most

Another recent study estimates that slowing population growth could provide 16-29% of the emissions reductions necessary by 2050.

Estimates of population growth:

"There are many positive economic and social policies that can promote a transition to lower birth rates. including more security in old age; education of girls and women and increased economic opportunities for them. as well as affordable contraception and reproductive choice: lower infant and child mortality: and increased literacy

education levels, and

these

productivity generally."

Indeed.



measures have been priorities for sustainable development groups for decades, and there's been improvement, but there's a long way to go.

In Pakistan, for example, just a third of married women use contraception and half of all pregnancies are unintended, according to the Population Reference Bureau, reports Reuters. Ethiopia already includes family planning in its climate action plan. Providing the 222 million women in developing countries with contraception would prevent 54 million unintended pregnancies at a relatively modest cost of \$4 billion a year, reports the NY Times.

If women in sub-Saharan Africa had 2.1 children in 2050, down from 5.4 today, providing food for the region would be much easier. It would spare remaining forests, substantially reducing carbon entering the atmosphere, while protecting crucial habitat for species like great apes.

"In the past 40 years, we've added more than 3 billion people to our population, while wildlife populations have plummeted by half. We can no longer ignore that rampant human population growth and overconsumption are driving species extinct. We can't continue on this same path and still hope to have a planet that's ultimately livable for people and wildlife,' says Stephanie Feldstein, director of the Population and Sustainability program at the Center for Biological Diversity.

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Turning our mountains of food waste Why cheap energy is the biggest threat to climate action

Scientists are trialling out new techniques for converting food waste into graphene and hydrogen

By Rich McEachran

Scientists at the City University of Hong Kong can turn coffee grounds and stale bakery goods into a sugary solution that can be applied to manufacture plastic. Photograph: Alamy

Blended cocoa beans, rice, fruit skins, leeks and asparagus sounds like it should be a recipe for a disastrous smoothie. But these are just some of the wasted foodstuffs that are being treated and converted into materials, with environmental benefits.



Scientists at the City University of Hong Kong have found that they can turn coffee grounds and stale bakery goods collected from local а into a sugary Starbucks solution that can be used to manufacture plastic. The food waste was mixed with bacteria and fermented to produce succinic acid, a substance usually made from petrochemicals, that can be found in a range of fibres,

fabrics and plastics.

Meanwhile, engineers at the Colorado School of Mines have discovered a way to turn banana peels, eggshells and rice husks into glass. By blending, drying and pounding it into a fine powder, and with a little help from the magic of science, they found the mixture could provide some of the metal oxides required in the composition of glass. Ivan Cornejo, a professor at the university, told the Denver Post at the time that such an innovation could reduce the need to mine for silica, one of glass's primary components.

Food into graphene

Now, a new EU project, PlasCarb, is researching a way to fashion food waste into graphene. It's perfectly timed, given the recent buzz surrounding the material and its potential to revolutionise the green industry. The material, discovered in 2004, is so super, Bill Gates is even investing in it to develop an ultra safe condom.

The project uses a process known as anaerobic digestion (AD), where waste is converted into biogas. Finding a new lease of life for food waste using AD isn't anything out of the ordinary. Businesses have been using the process to make energy for some time. Most notably, early last year, Harvest Power, a Brooklyn-based waste treatment plant, built a digester to deal with waste coming from Disney World. More recently, Sainsbury's partnered with recycling specialists Biffa to launch their first shop powered by food waste collected from the chain's stores. But PlasCarb takes the process one ambitious step further.

"Together with an innovative low-energy plasma reactor we convert the biogas from AD, which is mainly methane and carbon dioxide, to graphitic carbon [from which comes graphene] and renewable hydrogen," explains project manager Neville Slack, from the Centre for Process Innovation.

Beyond the science and technicalities of the process, PlasCarb offers a possible dual advantage over how traditional materials and gases are produced: a happier environment and a commercial use for food waste from a range of industries including retail and hospitality.

"The obvious benefit is taking waste destined for landfills and transforming it into raw materials in a sustainable way," adds Slack. "Graphene is the latest wonder material. Hydrogen has also been identified as a future transport fuel for a low carbon economy."

Food mountains

According to the PlasCarb, 95% of hydrogen currently comes from fossil fuels. And some bioplastics produced from crops such as corn are beginning to be deemed unsustainable. The belief is that there won't be an endless supply of crops, but whether we like it or not, there will probably always be a high volume of discarded food. Growing materials from waste streams could also reduce concerns over how corn-based biopolymers may impact on crop prices, land availability and food shortages.

Graphene and hydrogen from surplus food are desirable alternatives, but despite the exciting prospects they offer, Slack and his team aren't getting ahead of themselves. There is still a question of scalability and how both small and large businesses could access the technology to deal with their waste. He says the project is still in its infancy – it's in its second year of its three-year duration – and that the economics of it all need to be ascertained. A pilot trial lasting at least a month will see 150 tonnes of food transformed into 25,000 cubic metres of biogas and then on into the graphitic carbon and renewable hydrogen. The results of this will give the team some indication about future market interest and uptake.

There's no doubt that, if scaled up successfully, PlasCarb could play a key role in helping prolong food's life cycle. But Slack suggests that it doesn't take away from the fact that, in an ideal world, there wouldn't be any waste at all. Even though the EU has steps in place to improve the situation (including a target to reduce waste by about 30%), estimates indicate that more than 100m tonnes of food is thrown away annually across the union, and this could rise to 126m by 2020 if not enough action is taken.

<Source>



Falling oil prices and stagnant energy costs have disincentivized tangible action on climate change.

This article originally appeared at the Shelton Group blog.

In last week's State of the Union address, President Barack Obama generated plenty of headlines for his statement that "no challenge poses a greater threat to future generations than climate change."

The nation's chief executive also threw down the gauntlet to Capitol Hill, saying, "That's why I will not allow this Congress to endanger the health of our children by turning back the clock on our efforts."

The efforts Obama references are most likely the Corporate Average Fuel Economy standards for auto manufacturers (set to gradually increase to 54.5 miles per gallon by 2025) and the Clean Power Plan that the EPA proposed in June to cut carbon pollution from power plants.

While the 56 percent Republican majority in the newly seated 114th Congress certainly could pose a threat to these initiatives, the data shows that an even greater threat is posed by declining energy prices and the (real) priorities of most Americans.

So, what are those priorities?

First and foremost, low energy bills. We found in our Energy Pulse 2014 study that Americans' biggest energy concern is their "ability to pay for energy" (34 percent), not the "environmental impact of our energy use" (18 percent) or that "we're using up our energy resources at the expense of future generations" (15 percent).

The fact is residential electricity prices have remained relatively affordable and stable in recent years.

Americans may claim that their home utility costs concern them, but based on self-reported bills (which average only about 5 percent of median monthly earnings), those costs aren't high enough to force behavior change or make energy-efficient improvements a priority. So as the supply of affordable domestic natural gas has increased and the economy has improved, the economic driver for action has declined.

Likewise, the growth in U.S. shale oil production has driven gasoline prices down, creating the same dynamic for transportation.

When the price at the pump was nearing \$4 a gallon, many Americans changed their driving habits, and purchasing shifted to more fuel-efficient vehicles. But now, with global oil prices down by more than 50 percent since June, the automotive industry is experiencing the best sales they've seen in as many as 13 years, with Americans primarily flocking back to larger trucks, SUVs and luxury sedans.

This brings us to the second American consumer priority: comfort. This applies to both the preference for big, comfortable cars and the desire to live in temperature-controlled comfort in their homes.

When asked to choose between competing home expenditure priorities in Energy Pulse 2014, Americans prioritized "making my home more comfortable" ahead of "making my home more energy efficient," "healthier/safer" or "more beautiful." When energy prices are low, Americans prioritize making themselves comfortable, not conserving energy.

Finally, the third American consumer priority that most threatens climate change initiatives is convenience.

Americans simply expect the lights to come on when they flip the switch. Several coaldependent, investor-owned utilities have leveraged this priority in their public response to the proposed Clean Power Plan. Southern Company CEO Thomas Fanning was recently quoted in Businessweek as saying, "I don't think we have the ability to maintain a reliable system" (if forced to follow the proposed rules).

So what does this mean for energy conservation messaging? Without the "stick" of high prices, or truly compromised reliability, it's hard to get the attention of most Americans.

Encouraging conservation with "carrots" such as purchase rebates or tax incentives is very difficult in the current environment. The best we can do is keep the "real" priorities in mind as we develop energy conservation messaging (prioritize the comfort benefits of energy efficiency rather than the savings benefits while prices are low), and we must increase the size of the carrots. A \$20 per ton rebate for a high-efficiency air conditioning system is just not going to cut it.

International

World Can Achieve Climate Goals, With All 10 Billion People Prospering

SustainableBusiness.com News

It can feel overwhelming and even futile when we hear targets like zero emissions by 2050, while population reaches 10 billion and the world's economy triples in size - how can we possibly stay below 2°C temperature rise?

A new tool shows it is possible to meet this goal while ensuring everyone has a good standard of living. People can have the food they need, live in comfortable homes, and even travel. [Not that we condone an ever-expanding population and economy].

"The Global Calculator unequivocally demonstrates that it is physically possible to achieve both our economic development and climate change goals by 2050. The world has enough energy, land and food resources for us all to live well," says UK's Department of Energy and Climate Change.

The Department led a team of 10 international organizations to build a model of the world's energy, land, food and climate systems that takes us to 2050.

The Global Calculator models the kinds of lifestyles physically possible for the world's population - from miles travelled per person to calorie consumption and diet - and the energy, materials and land necessary to satisfy all that.

Experts from more than 150 organizations have tested the model and it's available for everyone to use. You can experiment with various pathways to see what it takes for the world to stay under 2°C.



The tool is being offered to governments around the world to use in the run-up the Paris Climate to

Summit. Government officials can weigh various policy choices and see if it them to the 2°C gets goal. China, India and other countries are already using national versions of the tool

"For the first time, this

calculator shows that everyone in the world can prosper while limiting global temperature rises to 2°C, preventing the most serious impacts of climate change. Yet the calculator is also very clear that we must act now to change how we use and generate energy and how we use our land if we are going to achieve this green growth," says Ed Davey, Secretary of State for Energy & Climate Change

While experimenting with the energy mix, energy efficiency in buildings, modes of transport and land use, the tool warns you about blackout risks, unsustainable resource consumption, or unrealistic levels of ambition.

One thing you'll find is that to feed a population of 10 billion, much more land will be consumed by agriculture (unless we move to indoor food systems like vertical farms), with negative ramifications for biodiversity. To balance that, deforestation must be stopped and forested land must rise about 15% by 2050.

About a third of cars will have to run on electricity or hydrogen by 2050, and 25-50% of households will be heated with clean electricity or other zero-carbon sources.

Sounds possible!

You can also play with pre-set options: "Business as Usual," "Friends of the Earth" and "Vegan Society"

Under "Business as Usual," programmed in by the International Energy Agency, carbon emissions continue rising at the current rate, bringing temperature rise of 6.6°C by 2100.

Under the 'Friends of the Earth' option, we reach zero net emissions by 2050 by renewables supplying 72% of electricity, quadrupling building efficiency and tripling transport efficiency. The Vegan Society shows what happens with a less meat-intensive diet.

<Source>

Scientists reveal revolutionary palm oil alternative: yeast

A little-known yeast historically used in South Africa's wine industry could revolutionise the food and cosmetics industries, and help halt deforestation

By Oliver Balch

The ubiquity of palm oil, which appears in everything from margarine to lipstick, is now widely recognised. So too are the detrimental effects of palm oil plantations on the world's remaining rainforests. So why do we keep using it?

The simple answer is it's just too good at what it does. Its versatility comes down to two main stellar properties: an exceptionally high melting point and very high saturation levels. Some vegetable oils get close to one of the two, but none to both.

Now researchers at the University of Bath believe they may have hit on an alternative: yeast. A three-year research programme between the university's biochemistry and chemical engineering faculties has successfully cultivated an oily yeast that matches palm oil's key properties almost identically



Researchers at the University of Bath have been experimenting with the yeast Metschnikowia pulcherrima, which has a similar oil yield to palm oil. Photograph: laboratory/Alamy

on the University of Bath's own campus.

Another singularity of М pulcherrima is its ability to grow on pretty much any organic feedstock. It's hoped that waste from the process can feasibly be recycled as a feedstock as well, helping close the loop in the supply chain.

"Irrespective of what you are putting in at the start, whether it's rapeseed, straw or waste food, M pulcherrima can use the sugars in it and grow on it", says Dr Chris Chuck, research fellow at Bath's Centre for Sustainable



A significant benefit of M pulcherrima is that it does not need sterile conditions, so can be grown outside the lab in open tanks. Photograph: University of Bath

Chemical Technologies and co-lead on the project. Chuck estimates that the land use requirement for commercial yeast production could be 10 or even 100 times less than palm oil.

That will please those concerned about food security as well as the environment, because palm oil plantations are not only credited with widespread deforestation - their ubiquity in tropical regions is also blamed for occupying agricultural land and pushing up food prices as a result.

"Technologies which can produce useable oil from waste and so don't compete for dedicated farmland look much more promising, and this work appears to bring one of those technologies closer to reality", says Dr Doug Parr, chief scientist at Greenpeace UK.

From lab to plate

Such optimism doesn't come without several notes of caution, however. For starters, yeast would not be the first palm oil alternative to have been tried and found wanting. Examples include oils based on algae or plants grown on marginal land, such as Jatropha curcas. Despite some niche applications, bringing these options to scale and matching palm oil's lipid-capacity have proved steps too far to date.

"It's still early days", notes Parr, with respect to a yeast-based solution. "Commercialisation can reveal environmental and practical problems which were missed at the small scale.

M pulcherrima's researchers admit that the road is a long one from lab tests to industrial production. Unanswered questions include what the most sustainable and financially viable

culture to produce the yeast on is, how to protect the yeast against bugs and other so-called inhibitors, and how to maintain high saturate levels.

The good news is that early tests in a one litre bioreactor provide a degree of confidence. Unlike other yeasts, M pulcherrima is found to be very tolerant to inhibitors. Initial research also shows it can grow at pH levels ranging from 1.9 to as high as nine. From an environmental perspective, experiments show that the yeast is able to grow at temperatures of between 12-30C. meaning energy inputs for heating and cooling can be kept low.



Early tests show M pulcherrima to be tolerant to a wide range of pH levels and temperatures. Photograph: University of Bath

M pulcherrima can also use solubilised carbohydrate feedstock to ferment, meaning that the feed does not need to be broken down into sugars by additional enzymes. "Growing the enzymes is extremely expensive, so if we can replace that with a chemical process then that would be a big step", says Chuck.

This raises the knotty question of whether yeast can ever compete with palm oil on cost. To be viable, the yeast process would ideally range between \$800-\$900 (£521-586) per tonne, says Chuck, citing recent palm oil trading values. To date, the closest comparable estimate is for yeasts cultured on dry plant matter, which researchers in China believe could produce oil at \$1,200 per tonne (PDF). "There is a way to go yet", conceded Chuck.

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Early laboratory tests in a shake flask show that the yeast Metschnikowia pulcherrima historically known for its use in South Africa's wine industry can produce up to 20 grams per litre of oil, giving it a similar lipid profile to palm oil. Among its other selling points, M. pulcherrima can be found pretty much anvwhere. including on a huge variety of tree leaves, fruits and flowers.

Initial bio-prospecting efforts turned up strains in have Vietnam, South Africa, Italy,

'Green' fuel to 'achche din' dream

Source Name: Times of India

The ministry of petroleum and natural gas has taken a giant step towards realizing 'Achche Din' dreams with the announcement of the new biofuel policy. To begin with, the ministry has empowered biofuel producers to sell directly to consumers — in bulk and in retail.

The benefits of the new policy are far-reaching than they apparently look, claimed ministry sources. First, it will bring down India's oil import bill considerably. Consumers will also have to pay less for fuel. Increased use of biofuel will reduce pollution as well. But more importantly, it will make life easier for farmers.

"We have simplified the policy so that the agriculture sector gets maximum benefit out of it. At present, thousands are opting out of farming because of low income. But as demand rises, farming of oilseeds seems to be a bright prospect for them. The policy will facilitate producers to explore alternative sources of biofuel as well," said Union oil and natural gas minister Dharmendra Pradhan.

Way back in 2009-10, Calcutta Tramways Company (CTC) made a quiet revolution by using biofuel for its fleet. Emami Biotech, the biggest producer of biofuel in eastern India, used to supply biofuel. But CTC stopped using biofuel on the face of objections raised by oilmarketing companies. With the new policy in place, Emami is now thinking of focusing back on domestic market and CTC is also likely to turn to biofuel again.

"It is an interesting development. During the lull period, we used to export biofuel. But now our domestic biofuel industry will be encouraging. Our focus is now on the domestic market and we will set up biofuel dispensing stations shortly," said Emami Group director Aditya V Agarwal.

According to Biodiesel Association of India president Sandeep Chaturvedi, the policy has the potential to make India energy-sovereign. "The current market for biodiesel is worth Rs 20,000 crore. In two years, it will be Rs 1 lakh crore. The policy envisages a huge investment as far as dispensing stations, tankage and productions are concerned," he said.

But Chaturvedi admitted there's a yawning demand-supply gap. Oilseeds production is no way near the demand. The current production of oilseeds is 1 lakh tonne but it should jump 100 times to match the demand. "The policy now allows B5 — or 5% biofuel blended with fossil fuel. In two years, it would be B20 — or 20% biofuel with 80% fossil fuel. Gradually, we will be moving towards B100," added Chaturvedi.

"Blending of biofuel with fossil fuel ensures substantial reduction in pollution and better engine performance," said auto emission consultant Somendra Mohan Ghosh. Bengal's principal secretary (transport) Alapan Bandyopadhyay echoed: "Use of any green fuel like biofuel will reduce pollution and might cut down our fuel bill."

The biofuel policy has also proposed financial incentives — including subsidies and grants — for second-generation biofuel like cellulosic ethanol and algal biodiesel. "If it becomes necessary, a National Biofuel Fund could be considered. The government had already made 10% ethanol blending with petrol effective from October last year," Pradhan said.

The Centre has also cleared a proposal to set up a National Biofuel Coordination Committee and a Biofuel Steering Committee.

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Biogas plants show way in waste management

Source Name: Times of India

Here is a lesson the Corporation of Chennai can learn from its own experiments with garbage management-small is efficient. The civic body had proposed several projects in the past for scientific closure of dumping yards in Kodungaiyur and Perungudi, but nothing has materialised so far. Meanwhile, small biogas generators set up in places like Koyambedu and Pulianthope are showing the way for efficient waste management. Neighbourhoods like Otteri, Velangadu, Vanagaram, MRC Nagar, Anna Nagar and Harrington Road are also likely to get biogas plants in the next few months.

Experts say source segregation and biogas initiatives at the ward level can make streets garbage free, and reduce the amount of garbage going to the dumping yards. Every year, the civic body spends more than 400 crore on garbage collection and transportation, but overflowing garbage bins are a common sight in several localities.

Corporation officials said they have identified about 700 rag pickers to promote source segregation of waste. "We will provide them training and also give identity cards so that they can collect waste from households," an official said, adding that the civic body will set up biogas plants in burial grounds and parks.

Activists say the civic body should implement source segregation in a systematic way. "Every ward should have at least three biogas plants to reduce the volume of garbage going to dumping yards. The civic body should first rope in bulk garbage generators like hotels, restaurants and other commercial establishments and collect food waste separately. The concept of segregation should also reach residents and the civic body should encourage them through some incentives" said an expert working on the project.

He said the civic body is paying more than 1,500 per tonne for garbage collection and transportation to a private firm. "The corporation should make it mandatory for private firms to segregate the garbage collected from and convert into biogas," he said.

Meenakshi Sriram of NGO Samriddhi Foundation, which promotes source segregation in T Nagar, MRC Nagar and Harrington Road, said: "The biogas concept will be successful only with the participation of residents. The plants require biodegradable waste and it can be achieved through source segregation."

Mini Pick Up Trucks in India – The Slow but Steady Electric Vehicle Revolution

Source Name: Indian Cars Bikes

A few weeks back, Mahindra inducted a few Maxximo Electric passenger vans to ferry tourists at one of the world's seven wonders, the Taj Mahal in Agra. The Maxximo Electric was developed in association with Reva Electric, the Indian EV making company now owned by Mahindra. This induction is a pilot project, which if successful will lead to Mahindra introducing the Maxximo Electric in markets all over India. Among other things, the van seats 8 and is powered by lithium ion batteries that give it a range of 100 kilometers per full charge. Top speed is limited to 65 Kmph in the interest of battery conservation.

Tata Motors, India's leading commercial vehicle will join the EV revolution in 2016, with the Ace Electric mini pick up truck. Ashok Leyland, another large CV maker in India has shown two new EVs, electric variants of the Dost mini pick up truck and the Boss mid sized truck. The Dost Electric concept has a 50 Km range and a 650 Kg payload. With three major CV makers in India showing big interest in the EV segment, the Indian government's National Electric Mobility Mission Plan of 2020 is a measure that can quickly lead to these vehicles actually becoming adopted on Indian roads in a big way. Low pollution and running costs are two big advantages these vehicles are known for.

Mini pick up trucks and their passenger van iterations are used for short haul trips. Typically, these vehicles cover less than 300 kilometers in a day, mainly on intracity trips. This is the reason you see a big line of commercial vehicles queuing up at CNG/LPG refueling outlets on a daily basis in cities where such infrastructure is available. Since electric vehicles also need to be charged after say 80 kilometers presently, quick charging infrastructure and battery swapping systems will make electric power viable for vehicles that are mainly used in urban areas. This is where the Indian government's policies will have to be far sighted.

<Source>

The Biodegradable Credit Card That Fights Climate Change

Source Name: Take Part

Would you feel less guilty about whipping out your credit card if you knew buying stuff could help save the planet from climate change? Especially if that piece of plastic was biodegradable?

Now's your chance to find out.

A company called Sustain:Green will purchase two pounds of carbon dioxide offsets for every dollar spent using its new biodegradable MasterCard. (The first purchase made with the card earns 5,000 pounds of offsets.) The carbon credits help finance reforestation of the Amazon in Brazil to absorb greenhouse gases that are warming the planet.

The credit card, that symbol of rampant consumerism, is being repurposed. Instead of giving you frequent flier points as a reward for buying an airline ticket, it will offset some of the carbon emissions from your flight by helping grow a new rainforest.

Arthur Newman, chief executive of Sustain:Green, said no matter how dedicated people may be to reducing their personal carbon footprint—recycling, composting, driving an electric car—they almost certainly use a credit card to buy new products. In other words, if we're all going to buy carbon-intensive goods and services, why not do what we can to ameliorate the damage?

"Credit cards are a real issue," said Newman, a former Wall Street banker who cofounded Sustain:Green in 2013. "It's something that you use every day, but it doesn't seem to be at the forefront of the discussion" about climate change.

Carbon offsets, of course, have been around for years. When companies or nonprofits undertake projects that slash greenhouse gas emissions, they can receive credits for avoiding that spew. Those credits can be sold on carbon markets to finance other efforts to reduce greenhouse gas emissions.

Consumers have been able to buy carbon offsets for a number of years. For instance, some airlines let you choose to voluntarily offset your flights by buying carbon credits. Commerce Bank, which issues the Sustain:Green MasterCard, has let some customers cash in their credit card points for carbon offsets.

The problem, according to Chad Doza, Commerce's senior vice president of consumer credit cards, is the voluntary part. "We saw some struggles in that area with the recession as people were not willing to redeem their points for carbon credits," he said.

Users of the Sustain:Green MasterCard, on the other hand, need do nothing but hand over their plastic to a cashier to rack up offsets, as each purchase automatically results in the purchase of carbon credits.

"Once you're a cardholder, you get a personal carbon home page where you can track your offsetting through the use of the card and compare that to your footprint," said Newman. "You really get to see what you're doing and can compare yourself against your peers."

Sustain:Green buys carbon offsets generated by Nike. In 2006, the athletic apparel giant voluntarily stopped using sulfur hexafluoride in the manufacture of its shoes, preventing millions of pounds of the potent greenhouse gas from entering the atmosphere. Nike earned carbon offset credits, which were verified and listed by the nonprofit American Carbon Registry. Sales of the Nike offsets finance the Mata no Peito project, which aims to reforest swaths of Brazil.

Over time, the forests will generate their own offsets that can be sold to pay for other projects to reduce carbon pollution.

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Urban waste management poised to be a USD 1.5 billion market in India by 2017

Source Name: Sustainability Outlook

The urban municipal solid waste management market in India is expected to be worth USD 1.5 billion by 2017 per a report released on Tuesday by Shri Vankaiah Naidu, Minister for Urban Development, at the 3rd National Conference on Waste to Wealth organized by ASSOCHAM.

The report 'Value out of Waste: the USD 1.5 Billion opportunity for India' authored by sustainability advisory firm, cKinetics and Industry body ASSOCHAM, provides insights into the value that can be generated from urban municipal solid waste as also the potential opportunity this represents for the Indian industry.

As per the report, composting and waste to energy present significant opportunity for generating value out of waste in the country. The report estimates the potential for processing waste for conversion into energy at around 956 MW by 2017 and likely to touch levels of 2200 MW by 2030 and 5400 MW by 2052 due to technological improvements, improved waste segregation and waste management systems. Given the high organic content in Indian urban municipal waste, less upfront capital expenditure, as well as ease of adoption in decentralized setting, composting is also expected to grow from about 26,000 TPD in 2017 to 66,500 TPD in 2052. The



report also highlights the key policy, financial and business aspects that would need to be addressed to realize this potential.

Releasing the report, **Cabinet Minister Venkaiah Naidu** spoke about the efforts being undertaken by the Central Government to address the ever increasing urban waste levels particularly in light of the continued urbanization in the country. The minister specifically shared about the efforts being undertaken under the '100 Smart Cities Initiative' and the 'Swachh Bharat Abhiyaan'. He further stated "The current state of municipal solid waste (MSW) reflects huge potential for additional waste collection and treatment. The Union Ministry of Urban Development (MoUD) is empanelling list of companies that can provide solid waste processing solutions to the urban local bodies and this process is expected to be completed over next three months."

Delivering the theme address in the technical plenary, Shri Upendra Bhatt, Managing Director of cKinetics said, "With the impending resource shortage, it is imperative that waste management be viewed not just as a necessity but also as an opportunity to create closed loop systems thus presenting a pathway for growth in a resource constrained world. Urban waste management has the potential to emerge as a key market for the Indian industry in the years to come and the private sector needs to embrace this opportunity."

As an action agenda, the report also put forth the Urban Waste Management Maturity Framework (UWMMF) for the creation of a highly comprehensive and integrated urban solid waste management system in India. The framework presents a guide on various levels of action based on which key performance indicators can be developed for tracking the success of waste management system for Indian cities.

The complete report can be accessed at www.ckinetics.com/publications/Value Out of Waste_2015.pdf.

<Source>

Wind industry's pitch to India Inc: 18% IRR

Source Name: Business Line- The Hindu

Wind turbine manufacturers in India want to create a new market by enticing large companies to start wind power businesses. Their pitch to them: 18 per cent IRR.

A recent White Paper produced by the rating agency, CRISIL, supports the wind industry's claim that wind farms can give up to 18 per cent internal rate of return (which is a measure of the profitability of an investment, arrived at by bringing all the future cash flows from the project to their today's value and comparing the total value with the investment.)

CRISIL's report speaks of an "attractive IRR in the range of 16.5-18.5 per cent", thanks to the favourable tariffs that State-owned electricity distribution companies pay for the wind power as well as the 50-paise-per-unit 'generation-based incentive' paid by the Centre.

The Chairman of the Indian Wind Turbine Manufacturers' Association, Madhusudan Khemka, says the Association is making the "high returns" pitch to large Indian companies. Now that the mood in the industry is buoyant and companies are looking at investment opportunities, the time is ripe for the wind industry to make its pitch, he said.

The Indian wind industry has grown by adding market segments organically. It started with textile companies in Tamil Nadu (the windiest state in the country) putting up wind mills for availing themselves of the tax-saving 'accelerated depreciation' benefit. The AD market alone sustained the wind industry until a few years ago, when Independent Power Producers came into the play. These IPPs had power generation and sales as their core business, as opposed to the 'AD customers', who had other businesses but put up wind projects only for tax benefits.

More recently, a third segment has come into being — the public sector undertakings. All the major PSUs —NTPC, ONGC, IOC, SAIL, NLC — have large plans for putting up wind projects, more to demonstrate their good corporate citizenship than to make money. They became the 'tender market' because they selected their vendors through tendering process.

But now, the Centre is keen that the total installed wind power capacity in India be raised to 60,000 MW by 2021-22, from 22,000 MW today. Meeting this target calls for jacking up the annual installed capacity, which will be about 2,200 MW this year, to a steady-state rate of 10,000 MW from 2018-19.

The three market segments, viz., AD, IPP and PSUs, may not be enough to guarantee demand of this size. Hence, the new market — the corporates.

According to Khemka, many Indian companies are showing interest. The Indian corporate sector already has some experience with wind, having put up some turbines for AD benefits. ITC has confirmed that it is keen on increasing its renewables portfolio, but it is understood that the other large industrial houses, such as Bajaj and Reliance, are also interested.

"The 18 per cent IRR is a powerful argument," says Khemka, who is also the Chairman and Managing Director of wind turbine manufacturer, ReGen Powertech.

<Source>

Ajmer railway station to run on solar energy

Source Name: Times of India

Ajmer, which is gearing-up to become a smart city, courtesy a joint Indo-US initiative, is also set to get Rajasthan its first railway station to run on solar energy. Ajmer division of North Western Railway has decided to meet the power demand from solar energy. A feasibility report of this project said that fixing solar cells will cost 1.16 crores to produce estimated 40 kilowatt power every year.

This project will yearly save Rs 52 lakh on electricity bill for Ajmer railway station. "The solar panel will be fixed under the corporate social responsibility. The life of solar panel is expected to be 25 years," said senior railway officer. Under this scheme, the Ajmer station will save 75,000 units electricity annually. In the second phase, the solar panels will be fixed at Bhilwara and Abu Road stations.

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Climate change: India to focus on green energy and efficiency instead of emission reductions

Source Name: IB Times

The first meeting of India's reconstituted Prime Minister's Council on Climate Change called for a shift in global attitudes from emission cuts to adopting green energy and improving energy efficiency.

The meeting that comes a few days before US President Barack Obama is to visit India reiterated the country's stand declared at the Lima climate talks where it insisted on focussing on climate adaptation as opposed to emission reductions.

While noting that key infrastructure activities should be 'climate sensitive' to limit impact on environment, Prime Minister Narendra Modi called for a shift from "carbon credit" to "green credit" when chairing the first meeting.

Pitching for a "consortium of all nations who have the greatest solar energy potential", Modi urged them to "join hands with India for innovation and cutting-edge research that would reduce the cost of solar energy, making it more accessible to people". Together the group can put pressure on rich nations to share their technological know-how, he said.

It plans to focus on renewable energy, particularly solar energy, in which India has announced the ambitious plan of adding 100GW of capacity by 2022.

It is expected that solar energy will feature in the talks between India and the US during Obama's visit.

The council gave the green signal for the launch of four new initiatives — on wind energy, coastal zone management, health and waste-to-energy — to strengthen India's response to climate change.

The council also discussed issues such as preparation of intended nationally determined contributions (INDC) for the Paris climate summit later this year.

A global pact in Paris will also depend on India, the fourth largest emitter country, and its stand on climate change.

India has been insisting on a common but differentiated responsibility based on equity that calls upon developed nations to scale up mitigation and allow developing nations to grow.

At Lima and even before, it has been calling upon rich nations to part with more green funds and technology transfer to help developing nations shift to a clean energy track.

India has refused to announce a peaking of emissions, insisting that it would have to wait till poverty has been addressed. It has noted that present trends indicate big polluters like the US and China would have appropriated most of the available carbon space by 2030, leaving nothing for most developing countries.

<Source>

National

My Eco Energy opens bio-fuel diesel pump on Pune-Mumbai highway

Source Name: Green Tech Lead

Pune-based bio-fuel manufacturer My Eco Energy (MEE) opened its second bio-fuel diesel pump at Khalapur on the Pune-Mumbai highway in Maharashtra. Union minister for road transport, highways and shipping, Nitin Gadkari inaugurated the "Indizel' bio-fuel retailing outlet.

MEE opened its first bio-diesel station at Lonikand near Pune on August 2014. Over the next two odd years, the company aims to establish around 500 bio-diesel outlets along green corridors of four national highways in Maharashtra at an investment of \Box 250 crore.

In addition to the full-fledged stations, company will also focus on smaller kiosks with 25,000 liter tanks. Besides, 2,000-3,000 smaller 100 liter tank outlets will also be launched.

At present, Bio-diesel is cheaper and costs only Rs.52 a liter. The company has a current capacity of 25 lakh liters per day. MEE bio-diesel uses locally produced edible oil, which is biodegradable and non-toxic that helps in reducing carbon emissions.

Minister also urged automobile companies and research organizations to develop technologies that will enhance biofuel production and manufacture vehicles that would run efficiently on such fuels.

The government wants to make production and distribution of biofuels more liberal. The country wants time-bound programs to develop alternative fuels and mobility solutions, he added.

In his speech, Gadkari also mentioned that government is keen to launch the amphibious 'Stockholm Ocean Bus' which can run on both land and water in India for the Jawaharlal Nehru Port Trust (JNPT).

To encourage the prime minister's 'Make in India' plan, government is promoting use of ecofriendly bio-fuels in the country.

<Source>

NABARD plumps for solar pump systems

Source Name: The Hindu

The National Bank for Agriculture and Rural Development (NABARD), an implementing agency of the Ministry of New and Renewable Energy's (MNRE) solar photovoltaic water pumping systems scheme, is involving all the stakeholders to encourage farmers to prefer solar systems for irrigation needs.

The NABARD has invited the MNRE empanelled manufacturers of the solar photovoltaic water pump systems, all the banks and the New & Renewable Energy Development Corporation of Andhra Pradesh for its one-day workshop on implementation of the scheme in Krishna district. The workshop will be conducted in Vijayawada on Thursday. "Solar pump systems are economically viable for all kinds of farmers. The subsidy offered by the NABARD is a minimum of Rs. 50,000 and a maximum of up to Rs. 1.94 lakh for each system based on its capacity," NABARD Assistant General Manager N. Madhumurthy said.

The solar photo voltaic water pump systems manufacturers – Tata Solar, BPL Solar, Cyber and Motion companies – will present their technology before the bankers in order to convince them to extend their credit support to the farmers.

The NABARD is acting as an implementing agency of the scheme as a part of the Jawaharlal Nehru National Solar Mission of the government of India. "Installation of solar systems will help farmers avoid dependency on grid-power, apart from minimising input cost," said Mr. Madhumurthy. Farmers who have installed the solar systems since December 2014 would be brought into the scheme.

Manufacturers invited to share their technology with banks and farmers

<Source>

On offer: Cost-effective measures to rid India of air pollution

Source Name: Hindustan Times

Delhi has the dubious distinction of being the world's most polluted city. In fact, the entire country, including the rural areas, is heavily polluted as anyone who has taken a flight in India knows. The fog that engulfs north India in winter is largely a consequence of the smoke particles in the air on which water condenses easily. Why have matters been allowed to reach this state? One reason is that people do not realise how cheap it is to get rid of much of the air pollution that plagues us.

In November, the fields of north-western India are set on fire to burn the loose stalks of the harvested rice crop that are left behind by combine harvesting machines. The pollution from these fires is so great that the chief ministers of Haryana and Punjab have appealed to farmers not to burn the residue, and some district magistrates have tried to ban burning. These measures have had little effect because most farmers don't have an alternative method to remove the residue.

A machine called 'Happy Seeder' was introduced a few years ago and it solves this problem. It can plant wheat seeds through the loose residue without getting clogged. Retaining the residue rather than burning it helps to preserve soil moisture and nutrients. We now need a major extension effort and subsidy to speed up the adoption of the machines. Once an alternative to burning is available, the bans on burning can be enforced.

Emissions from trucks and cars are another huge source of particulate emissions that can be largely eliminated economically. The main expense required to do this is to reduce the sulphur content of diesel and petrol from the current levels of 50-350 parts per million down to less than 10 parts per million. This needs investment in improvements in oil refineries. The International Council for Clean Transportation (ICCT) has studied the cost of these investments to produce ultra-low-sulphur-fuel and concluded that they can be covered by raising fuel prices by just 50 paise/litre.

The second investment that is needed to reduce transport emissions by over 90% is to tighten standards for new vehicles from the current Euro-IV (for metro cities) or Euro-III for the rest of India to Euro-VI and VII. These would require all new vehicles to be fitted with the latest emission control technologies. For example, trucks and buses need to be fitted with diesel particle traps to capture particles in the exhaust. These do not work properly if the sulphur content of fuel is high. The ICCT study finds that these improvements would raise the price of new vehicles by 3-5%. This is not negligible but it would be paid by the richest and is a modest price to pay for bringing emissions down to developed country levels.

A third major source of particle emissions is from households that use firewood, dung and waste for cooking and heating. For most households, gas is too expensive. Improved biomass 'chulhas' remain unpopular and in any case, would reduce emissions only slightly. However, electric induction stoves now cost as little as Rs 1,500 and are being adopted in cities as a cheaper alternative to gas. Promotion of these stoves in rural areas can reduce the problem of pollution from cooking fires. Initially, we may expect rural households to use them only for small tasks like making tea, for which it is too inconvenient to start up a wood fire. Over time, we may expect usage to increase. Of course, even with public health messages explaining the health effects of pollution, extension efforts, and subsidies, electric appliances will spread only in the northwestern and southern states that have reasonably reliable rural power supply.

<Source>

Punjab govt plans to set up Asia's first bio-ethanol refinery

Source Name: Business Standard

Punjab is set to ink a memorandum of understanding (MoU) for setting up of bio-ethanol refinery with a consortium of Beta Renewables, Novozymes and CVC India Infrastructure Pvt Ltd, for an estimated project worth Rs 950 crore. This will go a long way in tackling the major problem of paddy straw burning, resulting in irreparable loss to land's fertility and environment.

Bikram Singh Majithia, new and renewable energy minister, Punjab, on Thursday, was presented a conceptual plan to set up Asia's first ever Rs 950-crore second generation bioethanol, producing refinery leading to setting up of five more such refineries with \$1-billion investment.

Making a detailed presentation to Majithia here at Chandigarh, CVC India Chairman K Krishan proposed initially one bio-refinery project with design capacity of 60,000 tonnes of cellulosic ethanol per year (75 million litres per year) would be set up in the state, with three lakh tonnes of paddy straw as feedstock. He said the proposed plant would also generate co-products of biogas, pellets and compost through processing bio-refinery effluents and pellets through processing surplus lignin, residue of bio-refinery and lignin further could be used for a captive co-generation plant. This would be followed by five more projects, with an investment of \$1 billion.

He further said the state produces 15 million tonnes of paddy straw and its maximum usage for such bio-ethanol refineries could result in avoiding major environmental problem of burning of paddy straw. Naveen Sharma, project director, bio fuels, World Agro Forestry Centre, added the proposed plant can also use Napier grass as feedstock.

And other crops grown in high saline and waterlogged areas. This would help in a big way to achieve diversification targets of the state government. The farmers with option of these crops would be able to get revenue year around with less use of water.

Novozymes Regional President G S Krishnan pointed out the other benefits of such projects to state farmer include additional income for supply of paddy straw, availability of biocompost generated from the plant as bio-fertiliser, high level of direct/indirect investment i.e. \$150 million per 60,000 tonnes/annum plant, large number of direct/indirect jobs, energy security through replacement of petrol/diesel produced from imported crude oil besides bio-CNG replacing liquefied petroleum gas (LPG) and vehicular fuels. This would provide opportunity to rural entrepreneurs to set up feedstock (paddy straw) management and supply units.

Majithia informed the representatives that these second generation bio-ethanol projects would play a significant role in dealing with the challenge of paddy straw burning as three lakh tonnes of paddy straw could be used in a single plant. He was hopeful that once investors see a successfully-running project, there would be lot of investment in such projects. Keeping in view the availability of 15 million tonnes of feedstock and the hardworking nature of Punjabis, the state is poised to become a major hub in Asia for producing bio-ethanol and related products.

<Source>

Punjab offers rewards to stop stubble burning

Source Name: Zee News

The Punjab government on Wednesday announced rewards to districts and villages across the state which curb the unhealthy practice of burning stubble (residue of harvested crops). "The Punjab government has announced an incentive for each district and village with a financial grant of Rs.1 crore and Rs.1 lakh respectively, which were free from the burning of stubble," a state government spokesman said here.

"This decision has been taken to curb the practice of straw burning, which was not only a health hazard but equally detrimental to the fertility of soil," the spokesman said.

He said it was considered that resorting to punitive measures to end this menace would not yield results and hence it was decided to reward the districts and villages which curbed the practice of straw burning.

The burning of crops straw leads to massive air pollution during harvesting season. This leads to health issues for many people.

The Punjab government has urged agriculture scientists, environment experts and farmers to join hands for curbing the unhealthy practice and suggest ways for farmers to dispose off the crop residue after harvesting.

Punjab contributes over 50 percent of food grains, wheat and paddy, to the national kitty despite having just 1.54 percent of geographical area of the country.

In the recent years, the state has seen bumper crops of wheat and paddy.

<Source>

SBI commits Rs 75,000 crore for financing clean energy generation

Source Name: Economic Times

Country's largest lender State Bank of India today committed Rs 75,000 crore for generation of 15,000 MW of renewable energy in the next 5 years.

"SBI has committed to provide Rs 75,000 crore over a period of five years for the renewal energy sector," SBI Chairperson Arundhati Bhattacharya said at the first Renewable Energy Global Investors Meet (RE-Invest) here.

"The funding would be for 15,000 MW of renewal power. Of course, the proposals will have to be viable and they also have to be viable as per the norms of the banks," she said.

SBI has a loan exposure of Rs 1.78 lakh crore in the power sector including conventional energy and discoms.

Of this, she said, the bank's outstanding loans towards clean energy is to the tune of Rs 7,500 crore.

Asked if there could be concessional rate for clean energy, she said, as per the existing norms it cannot be.

"Interest rate will depend on the borrower. We have to do internal rating of the customer plus external rating. So, rate will not be the same for all customers. It also depends on the size of the project, viability and the risks involved. So it will not be the same for all," she said.

Bhattacharya said, interest rate can come down for the sector, provided RBI classifies the renewal energy in priority sector lending category. It would provide incentives to banks for lending to this segment.

Echoing similar views, HSBC country head Naina Lal Kidwai, Indian Bank Chairman and Managing Director T M Bhasin and Exim Bank Chairman and Managing Director Yaduvendra Mathur said that inclusion of renewable energy in the priority sector category would help in easy financing.

As per RBI norms, banks have to necessarily lend 40 per cent of the total loans towards priority sector category.

The SBI chairperson further said the RBI may look at raising the sectoral exposure limit or a separate class could be introduced for the renewable energy.

However, it would be difficult for the regulator to raise sectoral cap, she added.

On cut in the base rate, Bhattacharya said, "The easing cycle will happen. It may not happen now. You have heard the RBI Governor also saying it takes three quarters for things to sort of trickle down."

She further said the cost of fund still is the same. Till it comes down, there is a little chance of cutting down lending rate.

"So it will take a little time but definitely the easing cycle is on," she said without giving any specific timeline.

Earlier this month, the RBI kept the interest rate unchanged at 7.75 per cent, but cut the statutory liquidity ratio (SLR) - the amount of funds that lenders must set aside - by 50 basis points to 21.5 per cent of deposits from February 7, a move that will help banks to increase lending.

Speaking at the event Kidwai, former FICCI president, said there is a need to create a green bond market.

"Globally, we have seen USD 34 billion (green bond issuance) last year. It's a nascent market and India needs to participate in it," Kidwai said.

Meanwhile, Mathur said, "We need to take benefit of huge capability in India. We have to implement and execute project with the technology globally."

India could also access a lot of foreign lines of credit, he said, adding Exim Bank along with other banks are going to come out with green bonds.

<Source>

World Bank agrees \$8 million aid to India for climate change mitigation

Source Name: Economic Times

India on Friday signed an agreement with World Bank for an assistance of \$8 million to take up various adaptation measures in rural areas to deal with the threat of climate change.

The money will be used to implement special projects to improve adaptive capacity of the rural poor, engaged in farm-based livelihoods, to climate change in Bihar and Madhya Pradesh.

The assistance fund, under Sustainable Livelihoods and Adaptation to Climate Change (SLACC), will be for projects that will help community institutions of the rural poor, particularly women farmers, to foster improved resilience in the production system in collaboration with government programs such as MGNREGS.

The National Rural Livelihoods Mission (NRLM) is the implementing agency of these projects. This fund is in addition to what the government had set up last year as `National Adaptation Fund' and set aside Rs 100 crore for taking up adagriculture adaptation measures.

The environment ministry has, meanwhile, initiated the process to select agencies for implementing climate change mitigation and adaptation projects using the Green Climate Fund (GCF) -a global fund meant to assist developing countries in promoting low-emission and climate-resilient development.

Rich countries are supposed to contribute to the GCF that has a little over \$10 billion. The fund targets to be \$100 billion by 2020. Developing countries are supposed to identify projects that can be implemented using the fund, set up under the United Nations Framework Convention on Climate Change (UNFCCC) in 2010.

The environment ministry, which had sought applications from eligible institutions for selection as National Implementing Entity (NIE) for the fund, received many requests till Thursday, the last day of sending applications. Once India identifies its NIE, it will be accredited by the GCF Board. India is one of the 24 GCF Board members.

<Source>

PMC to use garbage to fuel burners in industries

Source Name: Times of India

The Pune Municipal Corporation (PMC) has abundance of one raw material which could be of great utility to the industry — garbage.

Unable to offload its over-flowing bins, the PMC's solid waste management department has thought of providing mix and dry waste to industries for running burners. The administration is convincing local industries to replace wood/coal fired fuel with garbage.

Over 7,000 tonne waste is lying unattended in different processing plans across the city since January 1. The processing plants in Uruli-Phursungi have either shut down or are not functioning to capacity. Some processing units in the city are operational, but their capacity is too less to deal with the enormous volume of waste generated every day.

The situation is likely to worsen as Ajinkya, one of the key processing plants, stopped on Monday after a fire on late Sunday night. This plant processes around 200 tonne garbage per day.

"There are no takers for dry and mix garbage. As a result, waste is piling all over the city. We want to rope in the industry sector to resolve this problem," said Suresh Jagtap, head of PMC's solid waste management department.

The PMC has approached industries in MIDC Kurkumbh, Chakan, Ranjangaon and Pirangut. They have been given an option to replace traditional fuels used to fire burners with domestic waste which is available aplenty for no cost. Nearly 20 tonne garbage has been passed on to small industries so far, said Jagtap.

"Factories, like those in steel manufacturing, can benefit from the scheme. Garbage can be used for industrial processes which require heat to be generated in large quantity. But the operators should take care of possible chemical reactions from the burning of waste," said Salil Korde, a chemical expert and trader.

Korde said that 'safe garbage' (which will not adversely affect machines or the processes) can be a good option to coal or wood.

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<Source>
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State govt to give 89 pc subsidy on solar pump sets

Source Name: The Hans India

The State government has decided to give top priority to installation of solar pump sets for agriculture by offering as much as 89 per cent subsidy. The government is giving a thrust to it to save power being generated by thermal power stations in the State.

The officials have claimed that the agriculture sector is one of the largest consumers. The solar powered pump set would help the State government utilise the power saved for other purposes, the officials explained. The cost of 3 Hp pump is priced at Rs 3.20 lakh and the 5 Hp set Rs 4.90 lakh. The MNRE (Ministry of New and Renewable Energy), according to officials, will extend 33 per cent subsidy.

The Discom will provide another 56 per cent subsidy and the beneficiary will have to bear remaining 11 percent. Officials have said that farmers may submit their applications for buying solar pump set either to Discoms or Irrigation Department, besides Horticulture wing. The cultivators may also approach the ITDA in case of tribal areas.

The Third Southern African Solar Energy Conference (SASEC 2015)

11 to 13 May 2015

Kruger National Park, South Africa

SASEC 2015 is being organized at Kruger National Park, South Africa by the University of Pretoria. The conference concentrates on all aspects of solar energy research and development. It not only includes all technical, scientific, and engineering aspects, but also engineering sciences which are indirectly related such as fluid mechanics, heat transfer, thermodynamics, heat exchangers, fluids, nanofluids, materials, weather, resources, solar irradiance and illuminance, and solar storage systems, solar physics, solar applications, and policy. The conference provides a forum for solar scholars from all corners of the globe to present the latest progress and developments in the field. The broad scope brings together a wide range of research areas from narrow fundamental work to import applications from generating power to the saving of energy. This will not only allow the dissemination of the state of the art, but it will serve as a catalyst for discussions about future directions and priorities in these areas. The additional purpose of this conference is to initiate collaboration in research.

<ReadMore>



The aim objective of 2015 International Conference on Waste Management, Ecology and Biological Sciences (WMEBS-2015) is to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in Waste Management, Ecology and Biological Sciences. The conference will be held in Kuala Lumpur, Malaysia during May 13-14, 2015.

This conference provides opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration. The conference is sponsored by Emirates Research Publishing (ERPUB) and Emirates Association of Chemical, Biological & Environment Engineers.

In this International Conference the topics of interest include, but are not limited to: Environmental Engineering, Ecology, Waste Management, and Water.

<ReadMore>

ICERE 2015

International Conference on Environment and Renewable Energy

20-21 May 2015,

Vienna, Austria

The ICERE 2015 (International Conference on Environment and Renewable Energy shall be held on 20th and 21st May, 2015 at **Grand Hotel Wien in Vienna, Austria.** The aim of this conference is to promote environmentally safe and economically sustainable renewable energy, to create theoretical base of the utilization and implementation of renewable energy sources.

Another goal is to promote research in the field of Environmental science and development of renewable energy and to facilitate exchange of new ideas in these fields and to create a dialogue between scientists and practitioners. The topics of interest include most pertinent subjects like Climate change, Global warming, New perspectives of renewable energy, Wind energy technologies, Solar energy technologies, Biomass industries, Waste to energy, Heating and cooling applications etc. It is expected that participants from all the corners will give their deliberations.

<ReadMore>

ICOCEE - Cappadocia 2015

The International Conference on Civil and Environmental Engineering

May 20 - 23, 2015

Nevsehir, Turkey

The International Conference on Civil and Environmental Engineering (ICOCEE -Cappadocia 2015), will be held in Cappadocia, Nevsehir, Turkey during May 20 -23, 2015. The conference will be organized by Nevsehir Haci Bektas Veli University (Department of Environmental Engineering and NeU Science -Technology Application & Research Center) and Bursa Technical University incorporated with The Ministry of Environment and Urbanization, The Ministry of Foresty and Water Affairs, The Ministry of Culture and Tourism, Nevsehir Governorship, the Scientific and Technological Research Council of Turkey (TUBITAK) and Su Vakfi. This aims at presenting current researches being carried out in the areas of Civil and Environmental Engineering for scientists, scholars, engineers and students from the universities, technologists, entrepreneurs and policy makers all around the World. Thus, the ICOCEE -Cappadocia 2015 shall provide opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find global partners for future collaboration.

Speakers from France, Turkey, Germany, United States and other developing and developed countries are expected to participate in the conference. The topics of the conference include Air Pollution and Control, Noise Pollution and Control, Solid Waste Management, Water Treatment Technologies, Wastewater Treatment Technologies, Water Pollution, Environmental Impact Analysis, Ecology, Climate Change, Education on Environment, Renewable Energy Sources etc.

<ReadMore>

Forthcoming Events



2015 2nd Journal Conference on Environmental Science and Development (JCESD 2015 2nd) will be held in Singapore During May 23-24, 2015. JCESD 2015 2nd aims to provide a forum for researchers, practitioners, and professionals from the industry, academia and government to discourse on research and development, professional practice in environmental science and development. It is one of the leading international conferences for presenting novel and fundamental advances in the fields of environmental science and development. It also serves to foster communication among researchers and practitioners working in a wide variety of scientific areas with a common interest in improving environmental science and development related techniques.

The major themes of the conference are Environmental dynamics, Global environmental change and ecosystems management, Health and the Environment, Wastewater and sludge treatment, Environmental restoration and ecological engineering, Environmental sustainability, Air pollution and control, Solid waste management and Water treatment and reclamation.

<ReadMore>

ISHUD2015

International Conference on Sustainable Human Development

May 26th and 27th 2015

Brunel University London

The International Conference on Sustainable Human Development will be held in London, UK May 26th and 27th 2015 at Brunel University campus, Uxbridge. This conference aims at providing the leading forum for debate, on issues of importance to society at large. Through a structured programme of research presentations, seminars, posters, demonstrations and exhibition, it is intended that participants will gain new insights, knowledge and competencies of relevance to the betterment of life in a sustainable way. Scholars and policy makers will have the opportunity to engage in discussion on the pressing problems facing long-term viability and sustainability of societies, including considerations for diversity and well-being of local communities in reaction to the challenges posed by growing globalization and development.

The chair invites contributions in broad thematic areas viz. Diversity, Knowledge Management and Economy, Sustainability, Well-being and Society and Technology.

<ReadMore>



5th International Youth Conference on Energy 2015 ^{27th} May – 30th May 2015 Pisa, Italy

5th International Youth Conference on Energy 2015 (IYCE'15) is being organized in, Pisa, Italy during May 27 and May 30, 2015. This conference is aimed at contributors working in any field of energy and power engineering, and encouraging the participation of young researchers (undergraduate, MSc and PhD students and other young professionals), to provide them with an opportunity to present their work in an international forum and make contacts for their future.

The broad themes of the conference are Sources & Production, Transmission & Consumers, Environmental issues & sustainability and Economics & policies. The topics of interest also include Renewable energy, Energy storage, Sustainable energy management, Smart grids & Smart cities, Transport & fuels, Environmental impact and pollution, Tools of decarbonization, Emission control and Nuclear safety.

<ReadMore>

The Economic Times, Delhi dated January 26, 2015

Climate Change no More Under the Weather as India and US Agree to Strike Alliance

Fuelling Green Energy

USAID to install field investment officer in India backed by a transactions team to help mobilise private capital

US to host Clean Energy Finance Forum and govt-to-govt Clean Energy Finance Task Force in February



Focus Areas: Air pollution in India & renewable energy

Our Bureau

New Delhi: US President Barack Obama and Prime Minister Narendra Modi have agreed to team up and combat climate change by cooperating to reduce air pollution in Indian cities and ramping up finance and technology for India's ambitious ₹6 lakh crore renewable energy push.

Obama stressed the importance of India's voice in climate talks and efforts to reach a global agreement on the issue. Modi said India was acting with a sense of responsibility towards future generations, not under international pressure.

The two leaders also agreed to work together to adjust to the adverse effects of climate change such as variations in rainfall pattern, rising sea levels and falling water tables.

"President and I expressed hope for a successful Paris Conference on climate change this year," Modi said.

Modi and Obama focused on a low-carbon development path.

All Eyes on India Now >> 18

All Eyes on India Now

► From Page 1

This will ensure that the Indian economy grows and creates jobs without polluting the environment. "The prime minister has informed me about his missions of economic prosperity to improve the lives of rural Indians with bank accounts, clean water and clean air. We are working on providing assistance to all these," Obama said, addressing a joint press briefing. The US president said that the two countries took "important steps today to support clean energy and climate change," focusing on increasing investment in clean energy.

Analysts said the world will watch how India delivers. "Now we have to build at home on the PM's strong press conference statement that climate change is an important issue for Indians and come up with creative and robust domestic actions," said Navroz Dubash, senior fellow at the Delhi-based Centre for Policy Research.

Addressing air pollution in urban centres is an important plank of the dialogue between the two leaders. The US has agreed to help with providing relevant data and this will enhance India's ability to track current levels of contamination, identify sources and track progress in reducing air pollution.

There had been speculation about whether the US' climate deal with China last November would mean increased pressure on India to make a similar commitment. India's important role in the international climate negotiations, particularly as the world works towards a new global compact to be inked in Paris in December, was stressed by President Obama. It was also clear that India's own circumstances and priorities would be respected.

Modi made it clear that while India is not under any pressure on account of the US-China deal, climate change itself was a pressure for all countries to act.

"India is a sovereign country. No pressure from any country or any person has any effect on it. But there is pressure. Pressure about what kind of earth we shall leave for our future generations. Climate change itself is a very big pressure. Global warming itself is a very big pressure. And whoever worries about the future generations has a responsibility to be conscious about climate change; adopt practices and policies which will ensure a good life and good environment for future generations," Modi said in response to a question on increased pressure on India to take on a specific target.

Ahead of Sunday's meeting, UNFCCC executive secretary Christiana Figueres told **ET** there was no need to compare the US-China deal with any agreement that is worked out with India.

"Every country is unique. And what President Obama is going to agree to or how he is going to support Prime Minister Modi in fulfilling his priorities which we know is to bring light to every single Indian remains to be seen. But I am fully confident that President Obama will respect Prime Minister Modi's priorities. And those will be reflected in whatever they decide to do together on climate change."

Modi said both leaders agreed on the importance of renewable energy. "For President Obama and me, clean and renewable energy is a personal and national priority. We discussed our ambitious national efforts and goals to increase the use of clean and renewable energy. We also agreed to further enhance our excellent and innovative partnership in this area. I asked him to lead international efforts in making renewable energy more accessible and affordable to the world," Modi said.

Modi emphasised the importance of expanding clean energy research, development, manufacturing and deployment to increase energy access and cut emissions. The two sides agreed to cooperate in solar energy research, improve energy efficiency, join hands in biofuels and undertake joint research on smart grid and grid storage.

Modi stressed on India's efforts to create an environment to promote trade and investment in the sector. The US president, according to the joint statement, "encouraged India to continue its efforts to increase trade and private investment in this sector. President Obama conveyed the potential availability of the US government's official financing in this area, consistent with its policies, to support private sector involvement for those entities in contributing to India's clean energy requirements."

In Print Media

The Economic Times, Delhi dated February 01, 2015



which are incapacitating.

coincides with the foggy weather. She is scared she

may be hospitalised soon.

insurance and feels that the expense could wipe

She has noticed this

She has no health

out all her savings. Names have been changed to protect the privacy of individual

to often stop and catch for breath. In the summer months he feels better.

out for his morning walks because that

worsens his breathing.

He lives on the second

to climb stairs and has

floor. He finds it hard



Sustainability Forum@IIML

Deccan Chronicle, Hyderabad dated February 03<u>, 2015</u>

Great global warming scare



2014's claim to being the warmest on record is at best moot. As Goddard Institute director Gavin Schmidt has conceded, it is impossible to be sure which of the recent years has been warmest because the temperature differences are smaller than the margin of error. ON

id you know that 2014 was the hottest year ever recorded in the entire history of the world? Probably you did because it's been all over the papers. Not only that but US President Barack Obama slipped it into his State of the Union address and the president of the World Bank quoted it at Davos and the singer and rap producer Pharrell Williams is so concerned that he plans to stage a series of Live Earth concerts with Al Gore to emphasise the seriousness of the problem.

to emphasise the seriousness of the problem. And these luminaries must know what they're talking about, right? After all, it's not just one distinguished scientific institution which has endorsed the "2014: hottest year on record" claim, but a whole clutch of them. First out of the gates was the Japanese meteorological office, then British's Met Office, then most recently Nasa's Goddard Institute of Space Studies. These, then British's Met Office, then most recently Nasa's Goddard Institute of Space Studies. These, in turn, were doing no more than agree with the US National Oceanic and Atmospheric Administration and the University of East Anglia's Climatic Research Unit. So many international experts, all in agreement: what kind of "scientifically illiterate" denialist nutcase would you have to be to dispute a consensus as overwhelming as that?

to be to inspite a consensus as overwhelming as that? A very thick-skinned one, that's for sure, as I was saying just the other day to my old friend and fellow scientifically illiterate denialist nutcase Christopher Booker.

Given the choice. I'm sure we'd both be more than happy never to write again on a subject for which we take so much flak. Except we don't have a choice. Not really, When you're a journalist and a story comes your way which is screaming to be told and which almost everyone else is ignoring, what option do you have but to fulfil your professional obligations to the truth? So it is with this "hottest year on record" story. There are several reasons why it doesn't stand up. The first is that it's wilfully misleading. You read that headline and you think: "Wow! Hottest ever? That is serious." But it's not when you consider the context. "On record" means, in this case, since widespread global thermometer records began — which is as recently as 1880. There have been many, many occasions in history when the earth's average temperature is reckoned to have been warmer than it is now: in the medieval and Roman warming periods, for example.

periods, for example. Indeed, as the Canadian scientist Dr Tim Ball has calculated by studying the evidence of ice-core data, earth's recent temperatures rank in the lowest three per cent of those recorded since the end of the last ice age 10,000 years ago.

of those recorded since the end of the last ice age 10,000 years ago. Next is the problem of scientific accuracy. When the Goddard Institute held its press conference to announce the "hottest year on record" claim, the compliant media went to town. For example, Associated Press' Seth Borenstein — long an assiduous promulgator of the alarmist message — reported that nine of the 10 hottest years have occurred since 2000 and that the odds of this happening are about 650 million to one.

Well 'm no statistical genius but even I can work out the flaw with that one: it only works if you assume that every year in history has an equal chance of being hotter or colder. Clearly, though, this is not the case. In the past 150 years we have been emerging from something called the Little loe Age, so it's inevitable that the cluster of years at the end of that trend will have a higher likelihood of being warmer than those at the beginning. And in any case, 2014's claim to being the warmest on record is at best moot. As Goddard Institute director Gavin Schmidt has since grudgingly conceded, it is impossible to be sure which of the recent years has been warmest because the temperature differences — we're talking 2/100ths of a degree — are smaller than the margin of error.

But the biggest problem is this, and few journalists are willing to touch it because it opens such a huge can of worms: The surface temperature readings used by and quoted by all the experts mentioned above no longer accurate or trustworthy. When you write this, it invites the obvious question: "You're not seriously arguing, are you, that all the world's top meteorological institutions are cooking the books because they've got the same hidden agenda'' And instantly you look like a crackpot conspiracy theorist. "Theyee budyuter to the surface to

crackpot conspiracy theorist. There's plenty of evidence to support it, mind. Exhibit no. 1: the satellite

Exhibit no. 1: the satellite records which, unlike the landbased records, show no rise in temperature in the past 18 years. Exhibit no. 2: the actual raw data from weather stations all over the world. This, it invariably turns

from weather stations all over the world. This, it invariably turns out, tells a very different story from the narrative which has been imposed on it by the Keepers of the Flame of the Great Global Warming Scare.

of the Flame of the Flame of the Flame of the Countries which according to the Goddard Institute has shown the most marked warming. So why the discrepancy? Simple. The keepers of these temperature datasets have, for some unknown reason, been tinkering with the evidence. Invariably, this has involved adjusting early 20th century temperature records to make them look cooler than they were, and more recent ones hotter.

This has happened not just to Paraguay data sets, but also those from countries including the US, China, Russia, Greenland, Australia and New Zealand.

Never has anyone offered any satisfactory explanation for these adjustments. Perhaps it's about time someone did.

> By arrangement with the **Spectator**

NGT Directs Delhi Authorities to Shut Factories Polluting Yamuna

Our Bureau

New Delhi: The National Green Tribunal has directed anti-pollution authorities in Delhi to immediately shut down factories in the capital that continue to pollute the Yamuna river with toxic effluents.

It has ordered the Delhi Pollution Control Committee to ensure that stainless steel pickling units at Delhi's Wazirpur do not operate if they do not have the requisite approvals or are polluting the environment.

"Despite several warnings, some units are still not following the norms laid down by the DPCC. This order has come as a respite to River Yamuna, which is being polluted by harmful chemicals used by these pickling units," Girish Kumar Pandey, president, All India Lokadhikar Sangathan, which had filed the plea, said in a statement. The Wazirpur Industrial Area has about 2,000 units. Most of them are steel pickling units.

The statement said the Delhi Pollution Control Committee had earlier issued closure notices to 112 industrial units for discharging untreated toxic waste water in drains causing major health hazards to the health of the people living in nearby areas. The tribunal's latest order gave the pollution control authorities a list of 17 units that were violating norms. The 22-km stretch of the Yamuna, which lies in Delhi, is barely 2% of the length of the river, but contributes over 80% of the pollution in the entire stretch of the river, it said.

Pollution in the Yamuna river, the largest tributary of the Ganga, is high on the government's priority list. The Centre is implementing Yamuna Action Plan with aid from Japan International Cooperation Agency since 1993. So far it has spent 71,273 crore on various steps under the scheme.

To ensure that only treated effluent is discharged into the river Yamuna in its Delhi stretch, the Delhi Jal Board has prepared schemes for laying of interceptor sewers along three major drains in the city, government officials say. So far, a total of 286 schemes including 38 sewage treatment plants have been completed in 21 towns. The Economic Times, Delhi dated February 03, 2015

The Times of India, Delhi dated February 04, 2015



With air pollution dominating public discourse this winter, **TOI** approached the major political parties contesting Delhi assembly elections to ask them about their action plan for cleaning up Delhi's air and taking positive steps for the environment. *Ajay Maken* of Congress gives us his party's plan in this regard in the first of a series.

Aving reined in air pollution during most of the past decade, primarily by introducing CNG and then strengthening public transport in the shape of Metro, we are back to the days of achieving the dubious distinction of being the most polluted city in the world. With PM 2.5 levels at 441 mcg/m3, we are back to the pre-CNG days of diesel fumes-emitting Blueline and Redline buses.

The primary reason for this decline

in ambient air quality is gaseous pollution caused by vehicles, especially the diesel ones. As a first step towards making the air of the city breathable by our children, we need to mandate Bharat/Euro VI norms in NCR and at least Bharat/Euro IV across the country, up from the current Bharat IV and III, respectively.

NOx, sulphur, carbon and lead emissions from diesel vehicles need to be curbed also by way of mandating diesel producers to produce compliant fuel for use by such vehicles. The costs for the same may be higher but it is a small price to pay for the future of our children and our own health besides sustainability of the city.

With crude at a record low, it is an opportunity for the govern-

ment to deregulate diesel prices in the city in true spirit. This will deter the use of diesel vehicles as the preferred choice.

Similarly, the opportunity could also be utilized for decreasing excise on public transport and passenger vehicles that use clean fuel so that they can in turn lower tariff.

We will have to make the much-delayed shift to multi-modal public transport that uses less of road space and automated transport like buses, autorickshaws and taxis. We also need to shift considerably to trains and other rail-based transport. This will have to be supplemented by ensuring last-mile connectivity with the help of electric vehicles which could also become the encouraged mode of short-distance public transport.

Delhi, because of its extremely precarious environmental situation, has to immediately stop the transit of heavy transport vehicles and public transport



You know, that stuff is bad for you.

that do not have the city as destination. For this purpose, the East-West and North-South bypass corridors will have to be made operational immediately.

A concrete and tough plan to curb the burning of solid waste, especially leaves, will have to be put into place by the government by providing alternate technologies.

Of course, the core bulwark of a 33% green cover in the city will not only have to be strengthened but ways will have to be found to enhance it.



he greatest threat to us in Delhi today is the air that we are breathing. The city has been ranked as the most polluted city in the world by WHO. The dangerous particulate matter, PM 2.5, in Delhi's air averages up to 15 times the annual permissible limit! The air is very hazardous and has serious consequences for those living in the city. It is high time that our authorities take note of this and share an immediate action plan to combat the situation.

In order to escalate this up to the government and administration, **TOI** has now launched 'Let Delhi Breathe', a campaign to clean up Delhi's air . We invite our readers to show their support for #LetDelhiBreathe by taking a pledge on toi. in/LetDelhiBreathe. Once we receive 1 lakh pledges, we will take this up with the authorities for speedy action.

Join us and save Delhi from choking on its own air.

In Print Media

Clean power, alternative energy & low emissions



In the second part of our series featuring the action plan of political parties contesting the Delhi assembly elections for dealing with the air pollution in the city, Aam Aadmi Party spokesperson Atishi Marlena unveils its roadmap. AAP is calling for a holistic solution

am Aadmi Party believes an environmental policy should seek to bolster growth and development by promoting public good. This can be done by applying principles of ecological sustainability, social justice and inter-generational eq-

uity. It shouldn't be piecemeal legislation or an afterthought but part of the main framework for growth and development. Our 70-point manifesto reflects this thought as we seek to treat Delhi's

problem. For example, consider our electricity policy. AAP will provide cheap ower to Delhi by fixing billing and meter defects, improve transmission and conduct a discom audit. However, we want to provide Delhi with clean electricity too. The AAP government will bid for clean power from Bhakra Nangal hydropower plant, overhaul or revamp the polluting and

intractable air pollution

non-functional Rajghat power plant, and bring the Bawana power plant to full utilization. Transformation in Delhi's power generation composition will reduce air pollution.

Further, AAP will facilitate a phased shift

to renewable and alternative sources of energy. Incentives will be given to households, housing societies, enterprise and industry to gradually switch over to renewable energy. We are committed to ensuring that 20% of Delhi's energy needs are met through solar power by 2025. A recent Yale University study termed



taller than the pyramids

tantly, public transport and last-mile connectivity will be radically improved to reduce the number of cars on the road. A good city is not one where the poor have cars but where the rich use public transport.

sibility to improve lives of fu-

ture generations. We have al-

ready taken the clean energy

path and enhanced our renew-

summit made a strong pitch

for environmental protection

by adopting renewable ener-

All the participants at the

able energy commitments'

Delhi the most polluted city, especially on PM and SPM metrics. To correct this, the Delhi Ridge, the lung of the city, will be protected from encroachment and deforestation. Environmentally-appropriate afforestation would be carried out. We will acquire mechanized vacuum cleaning vehicles to clean the city's dirt.

The government will encourage car-pooling, ensure adherence to the highest fuel emissions standards, promote lowemission fuels like CNG and increase research on electricity as a fuel to improve our transport infrastructure. Most impor-

The Times of India, Delhi dated February

06. 2015

Make clean air a birthright of every Indian: Javadekar

Follow Modi's Actions, Arnie Tells States TIMES NEWS NETWORK

New Delhi: A day after the Delhi high court expressed its anguish over the Capital's dirty air, Union environment minister Prakash Javadekar on Thursday admitted that the government needs to work to make air cleaner and aid, "Clean air must be a birthright for all and that's the way India wants to walk".

The minister's remark came in the context of global carbon emissions that has triggered climate change and at a time when many countries look to India to take the lead in moving to a low-carbon economic growth model.



TERMINATING POLLUTION: Environment minister Prakash Javadekar with former California governor Arnold Schwarzenegger at the Delhi Sustainable Development Summit on Thursday

Inaugurating the Delhi Sustainable Development Summit with French foreign minister Laurent Fabius, railway minister Suresh Prabhu and Hollywood actor and exgovernor of California Arnold Schwarzenegger, Javadekar said, "We have the respon-

gy and sustainable develop ment goals. France, chair of this year's UN climate conference, is represented by its official delegation-led by its foreign affairs minister Fabius — to the summit. Fabius later called on PM Narendra Modi who will visit France in April.

Arguing for an economy that generates more jobs and less carbon, Prabhu said, 'We need to find a unified solution to tackle climate change innovatively. We need to create a new economy which tackles climate change and creates jobs'

Arnold Schwarzenegger said he would be a "termina-tor" for climate change and asked states to follow Modi's "actions" to achieve sustainable development goals. He said "Gujarat is California of India" and Modi had certainly created "good action".

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

The Times of India, Delhi dated February 05, 2015

> The Times of India, Delhi dated February 07, 2015

600 officials to give views on green laws

TIMES NEWS NETWORK

New Delhi: Government will take the view of forest officials from across the country before proposing amendments to key environment laws. Their views will also be taken on how people's participation can be ensured in areas of forest development, pollution control, river cleaning and other activities

The 600-odd officials, drawn from Indian Forest Service (IFoS), will express their views at three 'chintan shivirs' (brain-storming sessions) at Bengaluru, Bhopal and Guwahati to be organized by the environment ministry next month.

'We will take their suggestions on what are the changes needed in governing environmental policies and all the five acts," environment minister Prakash Javadekar said while referring to work of the panel that

CHINTAN SHIVIRS

Chintan Shivirs For Suggesting Amendments To Existing Laws

- Forest officers to express themselves freely at closeddoor sessions at Bengaluru, Bhopal and Guwahati
- Their views will be
- considered before proposing amendments in
- five existing green laws

THEY ARE:

- The Environment
- (Protection) Act, 1986
- The Forest (Conservation) Act, 1980
- The Wildlife (Protection)
- Act. 1972
- The Water (Prevention and Control of Pollution) Act, 1974
- > The Air (Prevention and Control of Pollution) Act, 1981

recently reviewed existing green laws and suggested amendments.

Deccan Chronicle, Hyderabad dated February 07, 2015

Groundwater hits rock bottom

Telangana, Rayalaseema affected due to hard rock formations, Andhra luckier

SUDHEER GOUTHAM | DC HYDERABAD, FEB. 6

The Telangana government needs to initiate enforcement to control the depletion of groundwater, especially since the state has over 80 per cent hard rock formations.

The Andhra Pradesh government, meanwhile, needs to worry about the groundwater situation in all four districts of Rayalaseema and a few upland areas of West Godavari.

According to studies conducted by the Central Ground Water Board (CGWB) and State Ground Water department, certain hard rock areas have been identified in Telangana and Rayalaseema. "Compared to Telan-

"Compared to Telangana and Rayalaseema, the situation in Andhra is significantly better due to the existence of several filter points," said K.B. Biswas, chairman, Central Ground Water Board, New Delhi.

Over 105 areas or mandals in Telangana, where the study was taken up, were found to be critical. Of these, 42 were identified to be over-exploited (OE), while eight are critical (C) and 55 were semi critical (SC). All the 16 mandals in

All the 16 mandals in Greater Hyderabad Including Hyderabad and Ranga Reddy districts) were found to be overexploited.

Groundwater resources marked as over-exploited (OE) are at areas where the withdrawal of water is more than 100 per cent and at 30-meter depth. Up to 100 per cent withdraw

al is classified as critical while 90 to 100 per cent withdrawal is classified as semi-critical.

The over-exploited areas include 14 blocks in Medak, 11 blocks in Karimnagar. 10 in Warangal, one in Khammam and one each in Adilabad and Nalgonda.

Meanwhile in Andhra Pradesh, 41 blocks have been identified as over exploited, seven as critical and 42 as semi critical.

Majority of the overexploited areas in AP are in Kadapa, Anantapur, Chittoor, Prakasam and Krishna

Krishna. "It is high time that both state governments consider the situation as high priority and start implementing the 'Model Ground Water Regulation Act' so that the situation does not worsen in the future, as is being considered in Uttar Pradesh, Haryana and Punjab. In comparison to Telangana and Rayalaseema, the situation in Andhra is significantly better due to the existence of several filter points," said Mr Biswas.

Wherever experiments have been taken up, we have got good results. Watersheds can be developed through proper soil water management from the upper reaches to the lower reaches. Improvement in soil and moisture will also enhance the water levels.

- DAMODHAR RAO,, Regional director, Central Ground Water Board

DEPLETED RESOURCE

CURRENTLY BOTH AP AND TS GOVERNMENT DO NOT HAVE ANY EXCLUSIVE BODY TO LOOK INTO IMPLEMENTATION OF THE GROUND WATER REGULATION ACT.

Section 3 (2) of the AP WALTA Act, 2002, enables the government to nominate non-officials to its authorities at different levels for conservation of scarce natural resources. But this is pending since a long time.

Revenue officials at the district level are empowered to implement the AP Walta Act, but they are occupied with many other issues.



THE MODEL GROUND WATER REGULATION ACT, DESIGNED BY CENTRAL MINISTRY OF WATER RESOURCES, INCLUDES IMPLEMENTA-TION AND ENFORCEMENT OF VARIOUS STEPS TO PREVENT ABNORMAL DRAW-ING OF WATER AND RECHARGING.

City among 65 critical areas in the country

DC CORRESPONDENT HYDERABAD, FEB. 6

Hyderabad has attained the dubious distinction of being among 65 critical areas in terms of groundwater exploitation in the country of water

Ministry of water resources has identified these areas where stringent Ground Water Regulatory Act needs to be implemented. All the 16 mandals or blocks in Greater Hyderabad (including areas in Hyderabad and Ranga Reddy district) were identified as overexploited areas.

Other areas notified by the Central Ground Water Authority include areas in Haryana, Punjab, Madhya Pradesh, Tamil Nadu,

EXPERT ADVICE

Experts favour, recycling fresh water two-three time, as practiced in Singapore, Canada and other countries. And every household should have dual pipeline system, one for fresh water and the other for grey or recycled water. Besides, rooftop water harvesting systems are the need of the hour in Hyderabad.

Puducherry, Maharashtra, Kerala, Karnataka, Gujarat, NCT Delhi and Uttar Pradesh, warranting urgent action for registration of existing ground water extraction structures.

"Based on the data thus generated, action for notifying these areas for regulation has been initiated." said K.B. Biswas, chairman, Central Ground Water Board, New Delhi.

The groundwater levels in the city have been steadily falling over the last 10 years. Besides deficit rainfall, over withdrawal and concretisation of the city, scientists at Central Ground Water Department observed that the number of rainy days during the monsoons have reduced, while erratic heavy rainfall days are more.

As per the assessment of experts at Central Ground Water Board, of the total water supplied by the city Water Board, over 80-85 per cent goes into the drains or sewer lines, while only 15-20 per cent is consumed by the population.

Ideal water resource areas listed

DC CORRESPONDENT HYDERABAD, FEB. 6

The Central Ground Water Board, the national-level apex body under the ministry of water resources, identified deep fracture areas in Andhra Pradesh and Telangana state for creating ideal groundwater resource areas.

"Deep fracture areas are those which are generally found to have good groundwater table," said Damodhar Rao, regional director, Central Ground Water Board.

Water Board. He added, "We identified five such deep fracture areas, one in Hyderabad at Jubilee Hills, and others in Kadapa, Kurnool and Guntur." The CGWB recently imported highend rig machinery (borewill digging machine) that is capable of drilling borewells up to 500 metre (more than 1.500 feet).

"The rig machine we will be deploying to drill borewell in these areas for deep exploration of the area and also to develop them into ideal water resources for replication," said K.B. Biswas. chairman, Central Ground Water Board, New Delhi.

Borewells were dug with the depth range of 150-200 feet initially. The depth of borewells increased to 300-1000 feet in some areas.

In Print Media

Deccan Chronicle, Hyderabad dated February 07, 2015

CLEAN ENERGY

India gets global aid for solar plants

Gets commitments from US, German cos

New Delhi: India could start installing 20,000 megawatts of solar power capacity as early as April after companies pledged to support the govern-ment's drive for clean energy, an official said Details of the plan,

which has drawn com mitments from the US, German and Chinese companies, will be announced soon, said Upendra Tripathy secretary of the ministry of new and renewable

energy. "We have got com-mitments from very both foreign and domestic for the next year," he said in an interview at his office. Foreign companies will be allowed to decide where they manufacture the required equipment, he said.

The rapidly falling cost of solar power, which is expected to reach parity with conventional energy by 2017, has ignited interest in its potential in India.

Minister Prime Nare-ndra Modi has looked to industry for help in funding what could be a \$100 billion expansion in clean

For its part, the gov-ernment will have to find the land required to build the solar panels on.

Mr Modi aims to make India one of the world's largest renew-



INDIA CAN START **INSTALLING 20,000 MEGAWATTS OF SOLAR POWER CAPACITY BY APRIL** OF THIS YEAR.

A NEW LIGHT Companies from the US. Germany

and China have committed for setting up solar units in India. As per plan, for-

eign firms will be allowed to choose their preferred location of manufacturing as well as the product to manufacture

CENTRE TO DEVELOP HIGH-END TECHNOLOGY FOR HYDRATES

S

Kochi, Feb. 6: To meet the country's growing demand for energy, the ministry of earth sciences (MoES) is developing a high-end equipment to harness and exploit the deposits of gas hydrates in Indian Ocean, a top official on Friday said.

Addressing dele-gates at the four-day World Ocean Science Congr-ess, ministry of earth sciences secretary Shailesh Naik said, "The gas hydrate deposits said, "The gas hydrate deposits would be a sustained source of energy for

able energy markets, targeting 100,000 MW of output by 2022 from just 3,000 MW current-ly. Despite more than 300 days of sunshine a



Mr Nayak said a global collaboration was needed for discussing and evolving a comprehensive policy framework for research and man-agement of international waters.

He also stressed on the need for a co-ordinated action plan for developing and improving capability to forecast weather etc. PTI

year, India relies on coal for three-fifths of its energy needs while solar supplies less than one per cent. Reuters

Deccan Chronicle, Hyderabad dated February 08, 2015

Thermal plants pollute air, water

SUDHEER GOUTHAM | DC HYDERABAD, FEB. 7

Most government thermal power plants in Telangana state and Andhra Pradesh have been continuously violating basic environmental standards and polluting natural resources includ-ing air, ground and sur-face water. Repeated notices from the State Pollution Control Board, for time-bound action to arrest the pollution, have gone unheeded.

Major pollutants from thermal plants are fly-ash and the waste water that is used for cooling the thermal machinery. Flyash causes air, water pollution while discharge of waste water into rivers, sea or ponds, kill aquatic beings.

One example is the high-ly polluting Kothagudem Thermal Power Station. At present, the station At present, the station has 11 units operating with a total installed capacity of 1,720 MW. Eight of the units are 36 to 48 years old, and are highly instances and add highly inefficient and add to pollution.

The KTPS plant has not been maintaining the stack standards (it needs to install or maintain electrostatic-predicated bag filters to control fly-ash) and the Kinnerasani river is being polluted by fly-ash. After issuing several notices and direc-tions for time-bound action, we have forfeited the ₹5 lakh bank guaran-tee and have asked for another bank guarantee of ₹25 lakh," said P. Viswanath, joint chief environmental engineer.

The level of suspended particulate matter emission should not exceed 150 milligram per normal cubic metre (mg/Nm3). However, our random inspections of KTPS units have revealed that suspended particulate suspended particulate matter level at times has gone up to 1,000 mg/Nm3," said, an envi 1.000 ronmental engineer of TS PCB. PCB issued over 10 show-cause notices to KTPS between 2007 and 2014 for violating provi-sions of the Water (Prevention and Control of Pollution) Act 1974 and

Major pollutants from thermal plants are fly-ash and the waste water that is used for cooling the thermal machinery. Fly-ash causes air pollution while discharge of waste water into rivers, sea or ponds, kill aquatic beings. One example is the highly polluting Kothagudem Thermal Power Station.



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tee of ₹25 lakh, - P. VISWANATH, Joint chief environmen-

tal engineer

the Air (Prevention and Control of Pollution) Act 1981. It has also issued specific directions to the company to take time-bound actions to comply with the regulations.

Similar is the case of Narla Tatarao Thermal Power Station in Ibrahimpatnam in Krishna district and Rayalaseema Thermal Power Plant in Kadapa

district. "During our regular monitoring of these plants, we found the regular fly-ash standards have been exceeding the stan-dard limits of 150 milligram per normal cubic metre. The authorities of these plants have been insensitive to the notices served. Now we are look-ing to file court cases and also forfeit bank guaran tee," said, a task force offi-cial of AP pollution cial of AP pollution Control Board (AP PCB) The real time monitor

ing systems made manda-tory by the Central Pollution Control Board to all polluting industries are still in violation by TS and AP Gencos.

The Times of India, Delhi dated February 08, 2015

Yamuna pollution can't be reversed: Water commission



The Central Water Commission has said the water at Agra is unsafe for irrigation and domestic use

Arvind.Chauhan @timesgroup.com

Agra: The Yamuna, by the time it flows through Agra, has nearly 50 times more biochemical oxygen demand (BOD) than the permissible limit.

The Central Water Commission(CWC) has declared that the river water at Agra is safe neither for irrigation nor for domestic use. Water in the river, now polluted beyond repair, an official said, is also contaminating ground water.

BOD is the amount of dissolved oxygen needed by aerobic biological organisms to break down orga-

nic material, in a given time and at a certain temperature. Once BOD in-creases beyond a certain limit, it becomes a pollutant, leading to the growth of harmful bacteria.

BOD forms when the equilibrium of chemical compounds and solid waste is disturbed in a water body.

A CWC official said, This contamination level is irreversible. Water is unusable, both for irrigation and drinking. In fact, polluted water from the Yamuna is also partially respon-sible for the contamination of ground water in Agra.

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

In Print Media

Soaring pollution pushes up sales of air purifiers

Shobita.Dhar@timesgroup.com

eteriorating air quality in India became a talk ing point during US President Barack Obama's recent visit to the Capital.

The statistics are certain ly grim. For example, Bangalore's air on any given day is as toxic as the smoke from six cigarettes daily while inhaling Delhi air is equivalent to puffing 26 a day, according to study by the United Nations Environment Program.

Little wonder that sales of air purifiers have shot up. It is a portable machine that removes bacteria, virus and particulate matter that can be inhaled. For the same amount of power a ceiling fan uses, it strips the air of major pollutants, including dust, pollen, mould, dander and tobacco smoke using various filtration techniques.

Though there's no official scientific study to confirm that air purifiers can provide relief from breathing disorders, that hasn't affected HOME, CLEAN HOME An air purifier is a small nortable machine that

removes bacteria, virus, particulate matter, dust, pollen & tobacco smoke etc Can cost anything

between ₹15,000 and ₹1 lakh > Not scientifically

proven that purifiers reduce risk of breathing disorders but some companies say sales have gone up by as much as 70% a year

sales. Shashank Sinha, senior general manager of marketing at Eureka Forbes. says its sales have been growing by 60% to 70% year on year over the past twothree years.

Whether scientifically proven or not, consumers are looking for clean air options. Jayati Singh, business head (air purifiers) at Philips says that enquiries shot up by 20% over the past six months

► Delhi, B'luru top sales, P 11.

Delhi, B'luru top sales of air purifiers

► Continued from P 1

hilips launched its range, priced between Rs 15,000 and Rs 49,000, last year. "At present, 50% of our buyers are expats, but Indians, too, are exploring this technology," says Singh. Delhi and Bangalore dominate the sales of Philips air purifiers.

Sharp air purifiers are priced between Rs 15,000 and Rs 30,000. "We sell 1,100 to 1,200 units a month," says Shuvendu Mazumder, national product manager at Sharp. "We are selling the most in Delhi NCR, followed by Andhra Pradesh and Telangana, Bangalore and Mumbai. Forty per cent of our sales are to individual customers and of them 70% usually have a sick person at home.

These devices also come in a highend variant. Vijay Kannan, head of Blueair India, a Swedish brand, says that their product costs between Rs 50,000 and Rs 1 lakh. Recently, the US embassy in Delhi purchased 1,800 Blueair purifiers for its staff. Now hotels, too, are offering allergy-free rooms that come equipped with heavy duty air filters. The ITC Maurya in Delhi, for instance, introduced 80 'allergy-free' rooms in 2013.

While some individual user accounts may be positive, Dr Ashish Jain, senior consultant pulmonologist. says he doesn't recommend air purifiers because there's no study yet conclusively establishing a link between air purifiers and improved respiration

As Mazumder points out, individual sales are mostly driven by an illness in the family. Vikas Singhal, a Delhi-based executive, purchased an air purifier for Rs 30,000 last October for his asthmatic mother and reported relief in her symp toms. For Barun Aggarwal, a director at the Paharpur Business Centre in Delhi, the reason for buying this machine was his five-year-old son's wheezing and congestion. "Now symptoms are down. My vife who was prone to winter coughs has also not had an attack since we pur-chased a purifier two years ago," says Aggarwal

In the early 1990s, most Indians living in urban areas switched from tap water to purified water. And today the water purifier market in India is worth Rs 3,500 crore, according to Technopak Advisors, a market consultancy firm. Could the air purifier become the next RO? It could depend on how effective these gadgets actually prove to be.

While some individual user accounts may be positive, Dr Ashish Jain, senior consultant pulmonologist with Max hospitals in Delhi, says he doesn't recommend air purifiers because there's no study yet conclusively establishing a link between air purifiers and improved respiration. However, he adds: "Considering that the outdoor air is highly polluted - and that affects the indoors as well --- one can 'assume' that an air purifier could offer a patient with respiratory issues some relief," says Jain.

The problem, say technology experts, is that the filters inside an air purifier cannot trap all allergens that can cause asthma. A more worrying issue, though, is the use of the ionization filtration technique in certain air purifier brands. This process emits ozone which, in fact, harms the lungs in the long run. When it comes to breathing clean air we are clearly running short of options.

The Times of India, Delhi dated February 08, 2015

Deccan Chronicle, Hyderabad dated February 09, 2015

Vehicular pollution highest in city

AMAR TEJASWI | DC HYDERABAD, FEB. 8

Stemming the unabated increase of vehicles in Hyderabad could vastly downsize its carbon foot-print as new research estimates that nearly 57 per cent of Hyderabad's carbon footprint is contributed by vehicular emissions.

Though Hyderabad doesn't rank very high in the list of Indian metrop olises with large carbon footprints, the propor-tion contributed by vehi-cles in the city is the

highest in the country. The study on carbon footprints of individual metros in the country

According to a study carried out by Indian Institute of Science

was

Indian

the city According to the study (IISc), though Hyderabad

doesn't rank very high in the list of Indian metropolises with large carbon footprints, the propor-tion contributed by vehicles in the city is the highest in the country. only ahead Ahmedabad.

carried out by Researchers estimated that the transport sector in Hyderabad con-tributes a whopping 57 per cent to its entire car-bon footprint. In Delhi, vehicular emissions only contribute 22 par cent of Institute Science (IISc) in Bengaluru. The carbon footprint of a city is the total amount of green-house gas emissions, methane, carbon dioxide and nitrous oxide, caused by all greenhouse contribute 32 per cent of the city's total emissions while in Mumbai, vehigas emitting bodies in cles contribute about 17

er cent of the greenhouse gas emissions. The proportion in Bengaluru is 43.5 per

scientists led by Dr Ramachandra from cent. Researchers said that vehicles are adding the Indian Institute of Science (IISc), Delhi had the highest carbon foot-print followed by Mumbai while a huge burden of air pol-lution to cities and that the quantum of emis-sions due to vehicles in Mumbai while Hyderabad had the sixth largest carbon footprint, of Researchers estimated

Hyderabad is only behind New Delhi and Bengaluru. Researchers say that the use of public transport is markedly higher in cities like Chennai and Mumbai where non-polluting where non-polluting local trains is a major mode of city public transport. But in almost every city, vehicular emissions far exceeded industrial emissions.

The Times of India, Delhi dated February 09, 2015

Okhla missionary hospital to generate solar power

Jayashree.Nandi @timesgroup.com

New Delhi: The energy needs of the occupants of 100 beds-including air conditioners—will be met by the sun at Holy Family Hospital, a missionary nursing home in Okhla. The hospital is likely to be the first private or non-government building in Delhi to have a large solar rooftop system, generating 300kW

Interestingly, the hospital is not entitled to any govern-ment subsidy on solar power and is yet set to make big sav-ings on its total energy cost. Instead of using China-made panels that have flooded the market, the hospital staff chose German panels which, they say, have a longer life and require little maintenance

The Holy Family Hospital has 350 beds, nine operation theatres and five intensive care units-it has 200 air conditioners apart from over a thousand electrical lights and other appliances. Its total energy needs are close to 900kW. To avoid the steep initial cost of installing such a huge rooftop solar panel system, the hospital signed a 20year agreement with the Ger-

man company. Under the power purchase agreement, the compa ny installs, operates and maintains solar panels on **GOING GREEN** Solar rooftop capacity 300 kW Total energy needs

900 kW Savings per month ₹ 3L-4L Likely to meet energy

To avoid the initial steep cost of installing such a huge rooftop solar panel system, Holy Family hospital has signed a 20-year agreement with a German company

their rooftop and the hospital pays for the power generated and provides space for the panels. The power purchase agreement model is usually feasible only for large estab lishments.

"My estimation is that we will save Rs 3-5 lakh on our monthly energy bills. We will pay about Rs 7 per unit for so lar energy as against Rs 9 per unit for conventional power that we have been paying." Fr P A George, director of Holy Family Hospital, said.

The hospital had roof space available only for a 300kW system. Electricity generated by the panels is directly fed into the main electrical panel in synchronization with the grid power.

As part of a government pilot project about 15 years ago, a small rooftop solar power system was installed at the same hospital. "But it lasted only five years be-cause of the poor quality of the panels. This time we were cautious. Being a missionary hospital, we cannot afford to lose money with a less efficient system," Fr George explained.

"Our report on Delhi's solar potential found that private facilities have a poten-tial to generate 104MW of electricity and Delhi's over-all potential to be a 2GW solar city can be achieved only by 2020. Holy Family Hospital is a trailblazer in tapping into this potential," a statement issued by Greenpeace India reacting to the hospital's initiative said.

Residents around Sukhdev Vihar are also excited. "The panels will keep the hospital's roof cool bring down AC usage," and said Ranjit Devraj, a resident. Meanwhile, Delhi Transport Infrastructure Development Corporation has recently inaugurated a 130KWp solar rooftop plant at Kashmere Gate ISBT.

In Print Media

The Economic Times, Delhi dated February 10, 2015

Adani, Rajasthan Govt Ink Pact to Set Up Solar Park



Our Bureau

Mumbai: The Adani group has signed a memorandum of understanding with the Rajasthan government to jointly set up India's largest solar park with a capacity of 10,000 Mw, the company said on Monday.

The facility will come up as a joint venture with Rajasthan Renewable Energy Corp and will include generation projects and a manufacturing unit for solar module, parts and equipment.

The Adani group is the country's largest private coal trader and also operates thermal power plants. The new project underscores its interest in solar power. It had recently established a joint venture with US-based Sun Edison to build a solar photovoltaic manufacturing facility in Gujarat with an investment of up to \$4 billion (₹24,800 ccrore).

"India has embarked upon an ambitious programme of becoming a world leader in renewable power generation, with a special focus on solar. The development of the solar park facility is our contribution towards realisation of our Prime Minister's campaign and commitment towards clean and green energy in India," Chairman Gautam Adani said.

The solar park will produce about 16,644 million units, the company said in a statement.

The Indian government had announced plans to set up 100,000 Mw of solar capacity by 2022. It had also issued guidelines for setting up at least 25 solar parks, each with a capacity of at least 500 Mw.

Fuel norms may be flashpoint between new govt & Centre

The Times of India, Delhi dated

February 10, 2015

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New Delhi: Air pollution is one of the vital issues that the new government will have to address as soon as it is formed. However, it may not be an easy task for the state government, as dealing with air pollution will involve tough negotiations with the Centre on various aspects, especially the implementation of superior fuel norms. The issue assumes signifi-

The issue assumes significance in the wake of an affidavitfiled by the Society of Indian Automobile Manufacturers (SIAM) in the Supreme Court recently SIAM has claimed it cannot manufacture Euro Vcompliant vehicles till 2020-2021 and has not committed to any timeline to manufacture Euro VI-compliant ones. The apex court was hearing a petition by M C Meha, lawyer and environment activist, against air pollution in cities. Only 13 cities, including Delhi, have adopted Euro IV level, while the rest of the country is still following Euro III norms.

The Environment Pollution Control Authority (EPCA) as well as experts have recommended immediate implementation of Euro V norms and upgrading to Euro VI norms by 2020 in Delhi and other cities to cut air pollution levels.

"The new government will have to push for implementation of superior fuel standards. For rest of the measures, it may not require Centre's help like scaling up public transport, hiking parking fee and last-



mile connectivity," said Anumita Roychowdhury, head of CSE's clean air programme. Experts say if AAP forms

Experts say if AAP forms government, it will face more difficulty in dealing with the BJP-led Centre on this issue. The party has, however, promised a number of public transport interventions such as shared autos, Metro feeder services and e-rickshaws for efficient last-mile connectivity. Europe has switched to Euro VI norms for light commercial vehicles and will bring heavy vehicles under its purview this year. "This means new Indian vehicles are not fitted with the most advanced emission reduction technologies despite their availability in the market," a 2014 Planning Commission report said.

China implemented China IV emission standards nationwide in 2011 with Beijing already adopting China V norms.

ready adopting China V norms. Euro IV norms mandate a sulphur content of about 50 parts per million (PPM) as against the Euro V's sulphur content of 10 PPM. High sulphur content produces a significant amount of sulphur dioxide (SO2) and high emissions of particulate matter (PM).

The Times of India, Delhi dated February 12, 2015

Poor air quality: HC seeks city pollution map

TIMES NEWS NETWORK

New Delhi: Stating that the levels of air pollution in the national capital are "alarming", the Delhi high court on Wednesday directed the state government's geospatial unit to provide a detailed pollution map of the city since 2010.

A bench of justices Badar Durrez Ahmed and Sanjeev Sachdeva said air pollution in certain areas of Delhi, such as Anand Vihar, is at "hazardous levels". It directed the Delhi Pollution Control Committee (DPCC) to give "standards of air quality as prescribed by statute and notification".

The court issued the directions while hearing a PIL on the problem of poor ambient air quality in Delhi, an issue taken up suo motu and in which it has also appointed an amicus curiae. It directed the Delhi Geospatial Authority to provide the pollution map on the suggestion of the amicus.

The bench also directed

DPCC to furnish data with regard to air quality being monitored by the authority at six different locations in Delhi. It said the data has to be provided from each monitoring station on the levels of pollution recorded during various times of the day over a period of one week, and said "we want to see results."

TO ASSESS WORK

"We will judge your (authorities) performance as per the air quality index of the capital," the bench observed. HC took up the issue on its own after it came across news reports that Delhi is one of the most polluted cities in the world. The bench had also come across information that over 50% of children in Delhi suffered from respiratory trouble caused by poor ambient air quality.

DPCC had on February 6 informed the high court that several comprehensive orders have been issued by NGT in this regard. The Times of India, Delhi dated February 12, 2015

Panchayats to have stake in projects

Sanjay.Dutta@timesgroup.com

New Delhi: Amid the political debate over dilution of the law on acquiring land for industrial units or other projects, the renewable energy ministry has "cracked the code" for overcoming any opposition from the local population in setting up of bigsolar power projects.

The ministry is working on a policy to make village panchayats stakeholders in

DISSENT PLAN

its plan to ramp up solar power capacity to 1,00,000 mw by 2021-22 as land acquisition has emerged as the bane of industrial growth.

"We are looking at land that is outside the purview of farming or urban usage. We are looking at barren land which is not generating any revenue. Almost every panchayat has such land... perhaps commonly called lal dora (an extension of rural areas). These parcels of land would be rented for solar projects," power, coal and renewable energy minister Piyush Goyal said on Wednesday.

The minister said that land would be leased through proper agreement between the solar project promoter and the panchayats. This way, panchayats would get a source of steady income from parcels of land that have been of no use otherwise.

Government sources said the final policy may also have provisions for panchayats and municipal corporations to take stake in the big solar projects. As first reported by **TOI**, the ministry has proposed a gross budgetary support of Rs 4,050 crore for setting up 25 solar parks of 500 mw each and ultra-mega solar power projects to add 20,000 mw green generation capacity in five years.

The money is expected to be spent in phases, starting with Rs 500 crore in 2014-15 and rising to Rs 1,400 crore in 2018-19. Solar Energy Corporation of India under the ministry would be the nodal agency and manage the funding for a fee, equivalent to 1% of the grant disbursed.

In Print Media

The Times of India, Delhi dated February 12, 2015

'Solar plan won't skid on oil prices' Sector May See \$200Bn Investment: Goyal

Sanjay.Dutta@timesgroup.com

New Delhi: Lower crude prices usually spell trouble for renewable energy projects as both institutional investors and Big Oil lose economic incentive to go green. But not so for India, says power, coal and renewable energy minister Piyush Goyal as the Narendra Modi government moves to ramp up solar power capacity to 100,000 mw by 2021-22.

'For us, renewable or solar is not only about economics. It's a deep passion and our PM's and nation's commitment - in that sense, all our commitment - to leave behind a cleaner world for the next generation. As the PM said when someone asked him during the US President's recent visit, 'For us there is no pressure of Lima, or Peru or Paris (global climate talks). The pressure is internal to us. It is an acquired pressure. For the future generation'," Goyal told TOI on Wednesday.

Explaining the economics, Goyal said oil or gas was not the main source for generating power in India. Nearly two-thirds of the 2.5 lakh mw installed generation caPower and renewable energy minister Piyush Goyal explained that oil or gas wasn't the main source for generating power in the country. Nearly two-thirds of the 2.5L MW installed generation capacity used coal as fuel



pacity used coal as fuel. Availability of gas was also limited. "Oil prices may go up or down(but it doesn't affect our solar plan)... Rather, if other countries are pulling back on renewable projects, it is good for us to drive a hard bargain for getting equipment at a cheaper rate." he said.

Several global oil majors have exited or put off plans to set up renewable energy projects in recent times after oil prices plummeted by half since June 2014. But Goyal's optimism doesn't seem out of place, going by the response to a three-day global renewable energy investor summit his ministry is holding with industry chambers CII and Ficci in the capital from Sunday.

"The response has been so overwhelming that we have had to close registrations earlier than the deadline," he said.

He reckons some \$200 billion worth of investments in renewable energy projects over the next several years and is putting in place policies to wean the sector away from subsidy. The policies are focusing on addressing issues of both grid-connected as well as off-grid projects. Simultaneously, funding plans are also being put in place.

The pricing issue is being addressed through mandatory renewable energy procurement norms for state utilities for bundling with power from traditional sources. Power from traditional sources costs an average of Rs 3 a unit, while solar power costs Rs 12-15.

Will our literate illiterates clean up their acts?

The Times of India, Delhi dated

February 13, 2015

Bikram Vohra

hese commandments are written in stone if only you had the good sense to follow them Thou shalt not fling soda cans, crumpled packets of half-eaten food and other garbage from your car window. Not only does it scare the hecl out of the guy behind you and cause accidents, it's disgusting and thoughtless. Whatever makes you believe the wide world is your garbage bin?

Thou shalt read the signage on aircraft toilet: and follow their spirit: Keep the toilet clean for the next passenger. Can't you read, you cretin' The same applies for all public toilets. Don't spi chewing gum into urinals, Another human being has to pick it up. Try and be civilised...at least try brow shall risk being boiled in hot oil if you spit, spew, spray any coloured saliva into a public and the spit spew.

area nor cast out buckets of slop water onto the roads. That includes paan, tobacco juice, other slurpy stuff. Sick.

Thou shalt clean thy house but not at the expense of the neighbours dumping your muck into their space. See, see my



their space. See, see my **LITTERBUG** house is clean so what if **LITTERBUG** yours is dirty, nor see cor-

ridors and stairwells as convenient mobile waste baskets for all your squishy stuff. Yechhhh.

Thou shalt respect picnic spots, be they beach es or parks or landmarks and clean up after the fun not leave half-eaten packets of food and drinilying around. Kilroy wasn't here, there's no need to leave evidence of your presence. Go away, Take your crap with you.

Thou shalt accept without argument that li cigarette butts are dangerous when thrown fron moving vehicles, balconies and staircases...arv you so stupid? Yes, you are. We see it all the time flick, flick, not my problem.

Thou shalt see municipal garbage bins as receptacles of garbage not as centrepoints around which garbage is strewn. Throw the bag into the bin: Need a PhD to make the connect?

Thou shalt use thy brain to figure out that plas tic bags, thermacol cups, fast food boxes and tis sues aren't always degradable and shouldn't by thrown on the streets. So why do it? Disposable straws are to be disposed, not dropped on the road

Thou shalt not throw refuse out of your win dows, over the fence, into the sink, from your pock ets into public places nor rinse your washing into the neighbour's verandah or let the dirty wate from cleaning floors drip onto the flat downstairs
Thou shalt love one's pets but not their pool and if they do it in public it is your bounden duty to scoop it up.

Now, clean up your act.

The Times of India, Delhi dated February 13, 2015

India is dirty because Indians are clean

The Litter Truth: The Indian Litterbug is proud of being filthy; He'll dirty New Delhi but never New York

Indrajit Hazra

ike Nature, India abhors a vacuam. Which is a pretifer way of saying that India and Nature have had a longstanding joint venture that celebrates filling and trimming spaces with muck and filth that folks in other less rank cultures and countries seem to have such a problem with. It explains why there is no mention of Vedic-era flush toilet technology it also explains why when three members of the Rolling Stones urinated in public in 1965 making headlines after beingfined by the police, Indians wondered what the hullabaloo was all about.

Along with the proliferation of beggars, invasions of privacy and lack of silence, we are inoculated against public dirtiness by being literally inside the garbage dump. Having our streets and roads being extensions of garbage tips and urinals strike us as being as noxious to us as it's scandalous for a lady to be toplessat Las Salinas beach in Ibiza.

There's been an explanation passed down generations to explain why we're so filthy: India is so dirty because Indians are so clean. For outsiders, that sounds zen-Upanishadic. But what it's supposed to mean is that our homes are moderately neat—If we don't live in a chawl or a home that resembles a chawl with tubelights, that is — and the world outside can go to the dogs. This explanation is usually accompanied by a description of how other cultures are totally apathetic towards personal



hygiene — 'How do you think the Arabs and the French invented the perfume?' 'Have you seen British teeth?' 'The Swiss actually smell of cheese.' T was once trapped in an elevator in America..' Essentially, there's some theory about the worse your personal hygiene the better your public cleanilness. Which makes no sense at all for us who take a dip in the very public cum-personal Ganga or local tubewell to cleanse our squeaky bis including our souls.

Sona Oanga of vola interest to Ceanse our squeaky bits including our souls. This theory, of course, is wet gunkoozing rubbish. We are a filthy nation because we're quite proud of being filthy. It's a way of declaring we're not namby-pamby and stricken with a fet-



ish for the antiseptic. We're capable of walking past a hill-sized heap piled with cabbage corpses mixed with detritus with smatterings of used sanitary napkins and dark fluids that look like leftover sewer, without gagging. We aren't coy about throwing out kitchen waste straight out of the windows out there', (A lot of us don't even do the chucking; our cooks and maids' with little sense of public decorum doing the needful.) Charalizer, to ze heare an elitit

Cleanliness, to us, bears an elitist tag-despite the nice try by yet another Gujarati to tell the country otherwise. Roads and streets in Indian metropolitan cities—you really don't want to talk about the small towns, trust me—are



Garbage

zones that simply connect people from one point to another. These are no flyzipped zones, where if the pavements have rivulets of piss running down the gutter or bear all demonitions of litter, this is, well, India. Why do you think we like travelling abroad? We can walk about in public spaces that aren't as 'colourtul, full of aromas and life' (read: visually filthy, smelly and chaotle) without having to be marked out as being un-Indian. It's simply more pleasant to step out in Toronto or Sydney than in Delhi or Mumbai—unless you're a very, very rich ragpicker.

There's only one way we litterati, garbage-chuckers, public peebodies and

The move is part of the govt's

commitment to green energy

before international investors

plant to present a strong

and institutions



TRASH ART: Visitors to Delhi's Central Park, Connaught Place were greeted by an installation made of waste materials by art director Ved Pohoja

spit-mongerers can stop what comes so naturally to us in our happy, filthy surroundings: By having our roads and streets become super clean. Even the dirtiest scumbag will find it tough to mess up pavements made of genuine slabs (rather than of glued-on tar and cement chowder), filthify walls with paan and worsen stains that don't grow lab fungi, and trash public loos that don't give us a sneak peak of narak right here in our Maha Bharat.

Because no one wants to throw a wrapper, to spit, to pee or chuck rubbish in an already-sparkling dean place. Not even proudly filthy people like us who gladly litter Kolkata but never Zurich.

The Times of India, Delhi dated February 14, 2015

Govt to banks: Commit loans for clean energy

Sidhartha@timesgroup.com

New Delhi: In a rare initiative of its kind, the government is asking banks to set specific lending targets for renewable energy projects over the next five years as it seeks to present a strong commitment to green energy before international investors and institutions.

Sources said banks have been asked to hand over a 'Green Energy Commitment' certificate to Prime Minister Narendra Modi at the Renewable Energy Global Investment Promotion Meet on Sunday where they will provide long-term financial assistance to these projects during 2015-19. While calculating the total commitment, the government is assuming financial assistance at Rs 5 crore per mega watt and wants the lenders to specify the amount of generation that they intend to fund.

ATT

The move, however, comes with the rider that the projects have to be "bankable and meet the eligibility norms", which bankers said is more like a statement of intent and does not bind them to a specific commitment. "It sounds good just like the announcements that are made at investor meets organized by state governments in recent years," said a banker, who did not

wish to be identified. Executives at banks said the move is in line with Modi's governance style, where he wants government departments and projects to clearly specify targets and timelines so that accountability can be fixed. But the rider gives banks an escape route.

While at least four top executives from State Bank of India, ICICI Bank, IDBI Bank and Union Bank of India are listed to speak at the event, it is not clear how many banks will hand over the certificate to the Prime Minister.

The BJP government is giving a major thrust to renewable energy, partly driven by Modi's experience in Gujarat and has set ambitious targets for capacity addition and is looking at ways to make the projects more viable. The Times of India, Delhi dated February 14, 2015

BOLSTERING ACCESS TO SUSTAINABLE SOURCES OF ENERGY

INVESTMENT OUTLOOK

Renewable energy in India has been growing steadily due to proactive government policies and incentives for the sector. With increasing issues of conventional energy including price volatility, supply issues, the case for increased renewable energy is getting stronger.

Conventional power is getting more expensive and unsustainable in the long term and renewable energy technologies such as solar are projected to attain grid parity three years from now by 2017-18. With solar power projected to attain grid parity before 2020. and increasing cost of conventional electricity sources, renewable energy will grow and MNRE's ambitious plan, which included 100.000 MW of solar power, would be realised. Since then, costs of renewable energy, especially solar energy has declined further leading to reassessment of targets to include more renewable energy into the generation mix.

Even the proposed capacity addition represents a huge

for manufacturing. This will also help create direct and indirect employment opportunities.

MANUFACTURING OUTLOOK

Increased focus on renewable energy and GOI's ambitious long term plans to increase the renewable energy mix in India's generation make the renewable energy sector a very attractive investment in India. Apart from

support manufacturing of renewable energy equipment in India in the long run.

Solar Power: With JNNSM targets of 20 GW by FY 22 and proposals to increase this target provides a huge investment potential for solar manufacturing in India. For solar PV, currently the cumulative installed capacity of Indian solar PV manufacturers is about 1.200 MW of cells and



ing environment if it is to compete with international players in this rapidly evolving sector.

Wind Power: The global wind generation capacity is expected to increase to 1,149 GW by 2020 and 2,500 GW by 2030 , India's proposed National Wind Mission also targets 60 GW generation capacity in India by 2022. India's wind manufacturing capacity has an annual capacity of 10 GW, cater to the global market owing to lower manufacturing costs. Considering this immense potential in both domestic and global demand, the manufacturing sector is set to achieve new heights. Further government initiatives in promoting offshore wind energy and improving technology in the wind generation avenue have

strengthened India's manufacturing sector and will continue to do so. As a result, leading manufacturers like Suzlon, Vestas, Enercon, GE and Siemens have

Bio-energy, small hydro and

RE INSTALLED CAPACITY IN INDIA

rrently, India meets close to 80% of its electricity needs from fossil fuels including coal, oil S gas. At this juncture, Renewable Energy (RE) is being seen as one of the important means to meet the growing power needs of the economy while enhancing energy security through diversification of fuel sources and providing opportunities to primitigating greenhouse gas



Deccan Chronicle, Hyderabad dated February 16, 2015

FUELLING | FIND **Kochi institute has filed for a US patent of biofuel** Coconut oil fuel closer to reality

K.J. JACOB | DC KOCHI, FEB. 15

The SCMS Institute of Bioscience & Biotech-nology Research & nology Development, Kochi, has successfully developed the process for standardising the production of coconut methyl ester (CME) from coconut oil, which can power diesel

automobile engines. The functional property of CME was proved in a diesel vehicle by test-running it directly as biofuel without making modifications in the engine and

in the fuel lines.

The research comprised optimisation of the production of CME from coconut oil, study of its physicochemical properties and testing its efficacy as a fuel in a diesel engine.

Headed by Dr C. Mohan Kumar, the study lasted about 20 months and the centre has filed for a US patent. The Department of Scientific and Industrial Research of the Central government has offered to fund further research into it. "The physicochemical

The low carbon residue, minimal acidity and the absence of sulphur indicated that CME is an eco-friendly fuel

properties of the coconut oil and its increased level of saturation with high percentage of lauric acid are the unique features that support the fuel quality of coconut oil compared to the biofuels developed from other vegetable oils," Dr Mohan Kumar told DC.

"Coconut oil has one of the least shares of free fatty acids, which qualifies it as a possible fuel. For a fuel, its value should ideally be below .5 per cent, but for coconut oil, it is 0.2 per cent.'

The comparative study of CME with diesel was conducted at the quality control lab of the BPCL Cochin refinery, which certified that the CME more than met the standards of diesel, and performed better on emission norms.

"The low carbon residue, sulphur content

and the total contaminant obviously make the coconut biofuel eco-friendly," Dr Mohan Mohan Kumar said.

The centre collaborated with the automobile engineering department of the SCMS Engineering College, Kochi, for the test run in a Matador diesel engine.

The test run showed the technical specifications such as torque and power similar to the efficiency of diesel fuel. It offered a higher mileage of 22.5 km/L than 16 km/L of diesel.

already set up operations in India, and are further increasingly announcing new investments.

Deccan Chronicle, Hyderabad dated February 16, 2015

RENEWABLE POWER Firms seal 5yr green deal 293 firms commit to generate 266 GW of clean energy New Delhi, Feb 15: THE FIRMS HAVE COMMITTED TO A NOBLE PLEDGE As many as 293 companies have com-ACHIEVE THE TARGET IN 5 YEARS Suzion mitted to generate 293 companies These firms 266 giga watt (GW) 11.000 NTPC of renewable energy have so far have shown ReNew Reliance 10.000 MW in the next five Power expressed their interest to set Power years under the gov-MW desire to join up renewable 11.500 6.000 ernment's ambithe governpower plants in tious RE-Invest pro-MW MW gramme unveiled

Narendra Modi. These companies have shown interest to set up renewable power plants in the country and some have assured to manufacture equip-

by Prime minister

ments as well. At the first Renewable Energy Global Investors Meet (RE-Invest), Mr Modi said there should be thrust on equipment manufacturing under the 'Make in India' plan as it will go a long way in job creation.

While unveiling the three-day conference, the prime minister said. "Solar, wind and biomass sources of energy are the way forward and the government is working towards making solar power more viable."

Mr Modi also added that there is a need to develop hybrid plants as well for optimum utilisation of available land.

It was announced at the RE-Invest meet that 293 firms expressed their desire to join this ambitious programme of

ment's ambitious RE-Invest programme

the country and manufacture equipments too.

The Centre is also considering solar, wind and biomass sources of energy and plans to make solar power viable

the government and help in meeting renewable energy generation target.

Renewable energy companies including Suzlon and Gamesa have committed to manufacture equipment to help generate 11,000 MW and 7,500 MW of power respectively to be used in the non-conventional energy side.

The country's largest power producer NTPC has also said it would generate 10,000 MW of power through green sources in the next five years.

Among others are ReNew Power 11,500 MW capacity. Reliance Power MW. 6.000Hindustan Power projects 10,000 MW.

Mr Modi has also given thrust to develop hybrid plants for optimum use of land.

SBI PLEDGES ₹75K-CR FOR ENERGY

New Delhi, Feb. 15: The State Bank of India on Sunday committed ₹75,000 crore for genera-tion of 15,000 MW of renewable energy in the next five years.

SBI chairperson Arundhati Bhattacharya announced this at the first Renewable Energy Global Investors Meet

US FIRMS GIVE COMMITMENT

New Delhi, Feb. 15: US firms Sun Edison and First Solar have committed to set up over 20,000 MW of renewable power capacity in India in the next five years. Sun Edison has pledged to build 15,200 MW renewable capacity and First Solar has committed 5,000 MW at RE-Invest programme. Both the companies are part of the 293 firms that have committed to generate 266 GW power. - PTI (RE-Invest) here.

The State Bank has a loan exposure of ₹1.78 lakh crore in the power sector including conventional energy and discoms

Of this, the chairman said, the bank's outstanding loans towards clean energy is to the tune of ₹7,500 crore. -PTI

WELSPUN EYES SOLAR PLANT

New Delhi, Feb 15: Welspun Renewables has pledged to set up 11 GW of solar and wind power projects across the country. "The 11,001 MW capacity will be developed as 8,660 MW of solar and 2,341 MW of wind power projects," the company said in a statement here. Welspun Renewables has signed renewable energy agreements of 1,100 MW with Gujarat. - PTI The Economic Times, Delhi dated February 16, 2015

In Print Media

The Economic Times, Delhi dated February 17, 2015

INDIA CAN BE LEADER IN RENEWABLE ENERGY: MODI **Drop in Solar Power**

PM stresses on need for equipment makers for clean energy projects

Our Bureau

New Delhi: Prime Minister Narendra Modi has said that India has the potential to lead the world in the domain of renewable energy, describing the narrowing difference between the cost of solar and conventional energy as a 'game changer" for the sector.

At the inauguration of a threeday global conference, RE-Invest 2015, Modi on Sunday described the thrust on renewable energy production as an effort to ensure universal energy access for India's poor. He said the price of solar energy has tumbled from ₹20 a unit to ₹7, bringing it close to conventional power. He recalled that as Gujarat chief minister he persisted with the solar power programme even as people found it scandalous that it was generated at ₹20 a unit. but added that prices started falling as the industry scaled up. "Now prices are in the direction of conventional electricity. This is a game changer," he said. We have always spoken of energy in terms of megawatt. It is the first time we're talking of gigawatt. "We have no option but to make a quantum leap in energy production and connectivity," Modi said, addressing a gathering of 2.000 delegates

Cost a Game Changer

from India and 40 other countries. In November last year, the government set an ambitious target of setting up 170 gigawatt of wind, solar and biomass power projects by 2022. Modi talked

about India working to evolve an alliance of about 50 countries with abundant sunshine to pool research and technological advancements in the field of solar energy with an aim to make power accessible to the poorest of the poor and in remotest locations. He also said that India's stress on renewable energy is not aimed at impressing the world but to meet its own energy requirements.

The prime minister stressed on the need for local equipment manufacturing for clean energy projects to generate jobs and technological innovation. Modi's stress on equipment manufacture in India is linked to his 'Make in India' campaign, through which he wants to boost local manufacture to create jobs for people.

The conference is aimed at engaging different stakeholders in developing renewable energy in the country and attracting invest-ments of more than \$100 billion (over ₹6 lakh crore) in the sector.

India has just 33 gigawatt of clean energy capacity at present, with 22 gigawatt from wind, about 3,000 megawatt from solar energy and the remaining from small hydro and biomass projects.

India's total power generation capacity is more than 250,000 mw. Most of the electricity is generated from coal-fired power plants.

Govt Plans ₹14K-Cr **Corpus for Alternate Green Fuel Vehicles**

Geete says ₹795 cr has already been approved to promote electric & hybrid fuel automobiles

Our Bureau

New Delhi: The NDA government is looking at a ₹14,000-crore corpus to develop and support alternate green fuel vehicles, of which₹795 crore has already been approved to promote electric and hybrid fuel automobiles, heavy industries minister Anant Geete said on Monday.

The minister, who was speaking at the first ET ZigWheels Com-mercial Vehicles Conclave in Mumbai, also promised to support the commercial vehicles segment, which he said had been neglected in the past and urged industry players to suggest strategies to boost its output.

Road transport, highways and shipping minister Nitin Gadkari highlighted the shortage of truck drivers in the country and said the government is working to bring in a law that will extend provident fund

sics in place for truck-drivers and we are planning to open nearly 10,000 truck driving schools across the country," Gadkari said in his address to the conclave, adding truck-drivers must have fixed working hours.

A top executive from Tata Motors' commercial vehicles business said highway-building would be critical for the commercial vehicles segment. "National highways, which comprise only about 2% of the road network but carry 40% of the traffic, will be particularly important. By connecting more rural



Heavy Industries Minister Anant Geete



My focus is on getting the basics in place for truck-drivers and we are planning to open nearly 10,000 truck driving schools across the country

NITIN GADKARI

Road Transport, Highways & Shipping Minister

areas to the road network, the need for commercial vehicles outside large metropolitan areas will also rise," said R Ramakrishnan, senior vice president at Tata Motors.

close to conventional nower

The price of

solar energy

has tumbled

from 720 a

bringing it

unit to ₹7.

and insurance benefits to them. "My focus is on getting the baThe Economic Times, Delhi dated February 17, 2015

'Clean Energy Goal Possible Only if **Govt Helps Overcome Constraints'**

Anindya.Upadhyay @timesgroup.com

New Delhi: India's ambitious target of installing 170 gigawatt of clean energy by 2022 may not be possible unless central and state governments take immediate measures to help the industry overcome financial and regulatory constraints, top companies in the industry say.

Clean energy firms such as Suzlon, Mytrah, Vikram Solar and Mahindra & Mahindra's Susten listed a number of preconditions that need to be fulfilled to enable generate enough clean energy in the country.

The Centre and states should have a harmonised policy so that investors can easily put up projects," said Tulsi Tanti, chairman and managing director at wind turbine maker Suzlon. "Then availability of finance in a way that debt equity ratio is 80:20 and tenure of debt is 20 years long, so that cost of financing and energy comes down, is required."

Tanti added that the government should mandate captive clean energy use for small and tention," Kailas said. medium enterprises, giving them lower interest cost on setting up such projects.

Suzlon has committed 11,000 megawatt of clean power to the government, of which it plans 5,000 from solar energy.

"We plan a hybrid model of wind and solar energy, whereby solar plants will be set up on the same land as wind turbines. This saves us from land issues and overcomes power evacuation hurdles as grid is available near our wind farms," Tanti said.

Ravi Kailas, chairman and CEO at Mytrah Energy, told ET that financing is the key constraint in installing so many gigawatts of clean energy, especially the unavailability of long-term debt.

"World over infrastructure has been financed by pension funds and India is far from that, so unlocking pension funds' ability to invest will completely change the game for reaching this goal," he said.

"Banks treating renewable energy as priority sector will take out another impediment from financing this sector. It's the debt market that needs at-

Ivan Saha, president and chief technology officer at Indian module maker Vikram Solar, said having a fixed timeline of setting up clean energy projects is the most critical component in reaching the solar and wind targets.

"There is a cycle of frenetic activity for some months when bids for solar projects are announced and then a long lull," Saha said. "Therefore, a continuous process of planning, bidding and land identification have to take place according to a timetable to implement the said target," he said.

According to Mahindra & Mahindra's green energy vertical Susten, the government should take care of both land and grid infrastructure to make this target a possibility.

"The question is, how effectively can the government address issues to do with power evacuation? I can buy land but I cannot do anything when it comes to grid as it is in the hands of central and state government. The government needs to actively start building the green corridor they're talking about," said Basant K Jain, CEO of Susten.

At present, India has only 33 gigawatt of clean energy capacity, with 22 gigawatt from wind, approximately 3 gigawatt from solar energy and the remaining from small hydro and biomass projects.

In November last year, the government set an ambitious target of setting up 170 gigawatt of clean energy projects by 2022 with 100 gigawatt from solar, about 50 gigawatt from wind and the rest from small hydro and biomass.

The Times of India, Delhi dated February 17, 2015

A HEALTH ADVISORY HAS BEEN DEVELOPED **KNOW YOUR AIR QUALITY** TO TACKLE AIR POLLUTION IN THE CAPITAL Find out air pollution level lowest pollution Children with asthma and other lung diseases specially in your area regularly by Limit children's outdoor vulnerable to air pollution visiting Delhi Pollution Control activity when levels of PM10, Committee website's 'real > A physician to treat PM2.5, ozone, sulphur dioxide time data' such cases should always or nitrogen dioxide are on the > During summer months, be at hand higher side ozone levels are five times > Asthma can be self-Schools should have plans assessed by a simple device higher in some areas in the for high air pollution episodes afternoon than in morning called peak flow meter including alerting teachers > Asthmatics should carry In winter mid- or late and curtailing sports or inhalers regularly afternoon may be the time of exercise (The advisory was prepared by Dr T K Joshi, director, Centre for Occupational and Environmental Health, and Dr Vikram Jaggi, director, Asthma Chest Allergy Centre) Air quality was monitored for 15 minutes at each of these spots between 9am and 4pm

| Area & Schools | Date | Maximum (PM2.5) | Average (PM2.5) | and a surgery of the |
|---|--------|--------------------|--------------------|---|
| Vivek Vihar Greenfield School | Jan 23 | 253 | 215 | |
| Aurobindo Marg Mirambika | Jan 27 | 251 | 231 | |
| Safdarjung Enclave DPS | Feb 5 | 246 | 236 | |
| Rajendra Nagar Salwan Public | Feb 6 | 243 | 192 | A |
| Chanakyapuri American Embassy School | Feb 12 | 209 | 155 | |

Air pollution level in city schools 'alarmingly high'

TIMES NEWS NETWORK

New Delhi: On the new government's first day at work, Greenpeace India, an environmental NGO, released findings of its air quality monitoring survey that highlighted how poor the air is inside five prominent schools in the capital. In its statement, Greenpeace campaigners said dealing with poor air quality should be an immediate priority for the new government.

Greenpeace India used a portable device —PDR1500 to monitor air quality for about 15 minutes on the school premises. Real-time monitoring data from all five schools revealed PM2.5 (fine, respirable particles) to be very high.

According to World Health Organization, air pollution impacts the most vulnerable sections of the population and children are among the worsthit. "Studies by US Environmental Protection Agency

GOVT ALERTED

have concluded that exposure to PM2.5 in children will mean reduced lung functioning, and increase in asthma and respiratory illnesses. The International Agency for Research on Cancer classified particulate matter pollution as carcinogenic to humans in 2013 and designated it as a 'leading environmental cause of cancer deaths'," a statement by Greenpeace India said.

"Air pollution levels inside Delhi's schools are alarmingly high and children are consistently breathing bad air. The new government needs to acknowledge the severity of air pollution in the city," Aishwarya Madineni, campaigner with Greenpeace, said.

Dr Vikram Jaggi, director of Asthma and Allergy Centre, said in the Greenpeace statement that the winter of 2014 has been a particularly bad one for asthmatics. The Times of India, Delhi dated February 18, 2015

App to check air quality in Delhi, Pune launched

AN APP CHOICE

WHAT IS PM10?

Pollution particles of less than 10 microns in size.

These are large, so are often

filtered out during breathing No severe health impact

WHAT IS PM 2.5?

Pollution particles of less than 2.5 microns. Considered

dangerous as these can

penetrate deep into lungs and enter the bloodstream

HEALTH IMPACT

Particulate pollution can arm the heart and the brain.

People with existing cardiac or lung diseases such as asthma, chronic obstructive

pulmonary disease, gestive heart disease, or

ischemic heart disease are at

an increased risk

cities. For Delhi, the app will

be sourcing instant air quality data from three to four

monitoring stations, like

TIMES NEWS NETWORK

New Delhi: Now one can check real-time air quality in certain parts of Delhi and Pune. The ministry of earth sciences (MoES) has launched a smartphone app called 'SAFAR-Air' to provide the data to people. It also provides a forecast for the next two days and a health advisory along with a colourcoded grading of air quality in different city zones. The app can be downloaded for free from Google Play store, the MoES and the System of Air Quality Weather Fore casting and Research (SA-FAR) websites.

In Delhi, the app will provide air quality for east, north, south, west and central Delhi. And in Pune, the app will cover urban, suburban and two other zones. A similar monitoring for Mumbai is going to be launched in April. App users can also compare the levels in these Lodhi road, Airport, Mathura road, Delhi University, managed by SAFAR.

The app automatically identifies ones location and provides air quality data and description. If one wants to access more information like health impacts and the precautions one can take, then details in the app can be browsed. "I think the app has been launched to give people a handy tool. It can help people, especially those who are in the vulnerable category such as children, people with respiratory or cardiac problems and the elderly," SA-FAR's chief project scientist, Gufran Beig, said.

The app was launched by MoES secretary Sailesh Nayak. He also launched a toll-free interactive voice response system (1800-180-1717) for air quality and weather related information which is user-friendly and available in Hindi, English and regional languages.

In Print Media

The Economic Times, Delhi dated February 19, 2015

Growing Demand for Renewable Projects to Benefit NBFCs

Lending requirement for clean energy projects is poised to increase six-fold

Anindya.Upadhyay @timesgroup.com

New Delhi: The paucity of bank credit for renewable energy projects has made the sector the next growth area for non-banking financial companies such as Tata Capital, L&T Infrastructure Finance and PTC Financial Services. The lending requirement for solar, wind and other clean energy projects is poised to increase sixfold from 20,000 crore a year currently, if the government's target of adding 20 gigawatts of green power annually is to be met.

Over the past few years, wind and solar energy companies have found it hard to get banks to finance their projects as most of them have supposedly exhausted their lending cap to the power sector. Also, bank loans have turned bad because some power projects were affected by cancellation of coal blocks, scarcity of gas, absence of power purchase agreements and land acquisition hurdles. These limited the availability of bank credit for clean power projects, a gap that NBFCs now seek to fill.

India's clean energy capacity, including solar, wind, hydro and biomass, stands at 33 gigawatts. The government aims to install 170 gigawatts by 2022, entailing a funding requirement of \$200 billion.

Tata Cleantech, the clean-energy lending arm of Tata Capital, is looking to become an infrastructure finance company so that it can source foreign funds for lending to renewable power projects.

"Our exposure at present is 71,000 crore to the renewable sector. In future, we want to play a significant role and want to get involved in setting up of 2 gigawatts of clean energy in 3-5 years. This could mean 30% of Tata Capital's total infrastructure lending," Tata Cleantech CEO Arijit Bhattacharya told ET.

L&T Infrastructure Finance is considering issuing bonds and is awaiting the government's green signal to allow infrastructure debt finance to fund clean energy

Green Credit The govt aims to install 170 gigawatts of clean energy by 2022 ++ This Wind & solar ambitious energy cos have found it target will hard to get entail a funding Banks find it require difficult to lend ment of to energy cos \$200 as they have billion exhausted their lending cap to the powe sector

projects.

"This has been the most attractive area in last 2-3 years, with 50% of our energy exposure to clean energy. In the next one year, 40% of our total lending will be to this sector. Ours is a ₹20,000crore-plus balance sheet and this is going to be a big opportunity for us," said L&T Infrastructure Finance CEO G Krishnamurthy.

Although NBFCs charge a higher interest rate on loans than banks, clean energy project developers may still find them an attractive option because they offer faster financial closure.

"Banks take a few months to close a project. But we take only 15 days to communicate to a project developer whether we are going ahead or not and we're able to close it within 30-45 days," said PTC Financial Services MD & CEO RM Malla.

PTC Financial will have almost 50% exposure to renewables at 72,000 crore by the end of this financial year, which the company plans to increase.

"We can arrange funds for, say, a 50-200 megawatt project. But that's not possible for a 1 gigawatt project. Only reason we go to NBFCs is that they are quicker. However, we need more sources of funding in addition to these, "said Vikram Kailas, MD of Mytrah Energy, a wind-energy company. Experts say NBFCs should adapt by structuring loans for longer periods and lowering interest rates. The Economic Times, Delhi dated February 20, 2015



THINK POST-MILLENNIUM



Indoor Air Pollution is More than Deadly



Bjorn Lomborg

Air quality has improved dramatically in rich countries over the past century. Yet air pollution is still a huge problem, especially in the developing world. It kills about 7 million people each year, ac-counting for one out of every eight deaths globally. In India, it now kills 1.6 million people each year or one of six deaths. But the most deadly air pollution comes from inside people's houses, because 2.8 billion people still use firewood, dung and coal for cooking and to keep warm, breathing polluted air inside their homes every day. To people who don't live under these conditions, it is hard to imagine how polluted the indoor air is. The World Health Organization says outdoor air, for instance, in Beijing, New Delhi and Karachi is several times more polluted that the outdoor air in Berlin, London and Paris. But the typical indoor air in a developing country house with an open fire is many times more polluted than Beijing, New Delhi or Karachi. That is why indoor air pollution kills 4.3 million people each year; making it one of the world's leading causes of death

Vet indoor air pollution is rarely among the big issues the world dis cusses. In 2000, the world made a number of smart, short promises for 2015 called the UN Millennium Development Goals, focusing on poverty, hunger, education and child mortality. They were mostly good promises, but indoor air pollution was missing.

Now, the world's 193 governments are discussing what targets to set for 2003, and there is a bewildering array of 169 proposed targets. While indoor and outdoor air pollution are now part of the targets, so is everything else. And with so many promises we have no priorities. According to a new study for the Copenhagen Consensus, the simplest solution is to replace inefficient, smoky stoves by more efficient, less smoky ones. Providing 1.4 billion people with such improved stoves would save almost 450,000 lives a year and avoid almost 2.5 billion days of illnessannually.

Moreover, more efficient stoves would on average save about 30% fuel, which translates into a saving of up to \$57 per household per year, and at the same time make cooking more efficient and less time consuming. In total, the health and non-health benefits are estimated at \$52 billion per year. What would it cost to make such a

What would it cost to make such a big improvement? In many parts of the world, an effective, improved stove costing just \$301is all that is needed to reduce indoor air pollution dramatically. The price is higher in some parts because of particular needs; in China, heating is needed as well as cooking, so the cost of an effective, improved stove increases to somewhat over \$100. Nevertheless, providing improved stores for: 50% of those cooking on unhealthy, smoky, traditional ones would cost about \$5 billion a year. So for every dollar spent, better stoves would do \$10 worth of good.

However, helping 1.4 billion people with better stoves doesn't solve the problem. Another 1.4 billion are still cooking with traditional, polluting stoves, and even improved stoves cause more pollution than found in most cities. Besides, some of the smoke from these improved stoves reaches outside so there is pollution within the community as well.

A much cleaner solution is to get everyone to use gas. This would save 2.3 million deaths a year and avoid 13 billion days of illness leading to more than twice the benefits, But unfortunately, gas stoves are more expensive and gas can cost about \$200 per household per year, so the costs are more than 10 times higher. Even so, for every dollar spent, we would get \$2 worth of benefits, a respectable, but not nearly as good a target. As the developing world gets richer, howev er a move to gas and eventually electricity will be both affordable and have obvious health benefits. Reducing outdoor air pollution turns out to be much more costly. Better cook stoves and a transition to gas and electricity is an ef-fective use of money that will also help reduce outdoor air pollution. But trying to reduce outdoor pollution with low-sulphur diesel or with filters on cars generally turns out to be too expensive While benefits could reach \$130 billion annually, the costs could exceed \$300 billion per year. Air pollution is one of the world's biggest and often overlooked challenges. And now we know that one of the best targets for the next 15 years is to get better stoves to 1.4 billion people, saving almost half a million lives each year.

The author is Director of the Copenhagen Consensus Center NEXT WEEK: Water & Sanitation The Times of India, Delhi dated February 21, 2015

Road users breathe dirtier air Study Shows Exposure To PM2.5 Much Worse Than That Recorded By DPCC

TIMES NEWS NETWORK

New Delhi: A Centre for Science and Environment study released on Thursday has found that pedestrians and people riding public transport and auto-rickshaws are exposed to dangerously high air pollution levels-which are much higher than those recorded by the Delhi Pollution Control Committee's stationary monitoring stations at the same locations. The aim of the study is to drive home the point that air pollution in Delhi is alarming and should not be overlooked by the new government, said CSE researchers.

Presenting a 15-point air pollution control strategy, CSE head Sunita Narain said that action to curb it is already late, so no more time should be wasted on forming new bureaucratic committees and steps should be taken immediately. "The previous (Congress) government had an air pollution agenda that was lost after change of guard. The LG came out with his committee and a similar agenda. Not long ago, National Green Tribunal came out with its own agenda of banning over-15-year-old vehicles which we think can't be implemented. Please excuse my sense of angst. We need to take action," Narain said.

CSE researchers monitored air quality with their portable monitoring device, TSI DustTrak DRX Aerosol Monitor 8533, and compared it to levels recorded by DPCC's stationary air quality monitors. The study found average levels recorded on road are two to four times higher than background levels reported by DPCC. This is because there is a 24-hour standard but no official standard for brief exposure on road, experts said.

Auto-rickshaws, walkers and cyclists recorded the highest exposure. During non-peak hours, all modes seem to show lower levels. Levels inside Metro stations were much lower at 209 micrograms per cubic metre. The overhead Metro, however, recorded levels of 330 micrograms per cubic metre. In a traffic jam close to Pa-



very close to truck traffic recorded figures in the range of 651 to even 2,000 micrograms per cubic metre. CSE's study found that traf-

fic police may be one of the worst-affected. Monitoring carried out at ITO crossing for a traffic personnel showed peak exposure to be eight times higher than the DPCC figure.

There is no time to waste The new government should night contribute to a huge



amount of pollution as they are all only Euro-III compliant. She also insisted on completion of the western peripheral expressway.

'Delhi government should increase cess on diesel cars.

Brazil and Beijing do not allow diesel cars. Sri Lanka has imposed very high taxes on import of diesel cars. France has decided to phase out diesel cars completely. Why can't Delhi discourage diesel cars?" Narain said. CSE researchers stressed that linking PUC compliance to issuance of car insurance can help enforce pollution under control norms.

Narain also clarified her stand on certain contentious issues. Parking space for buses is a must, she said. "DDA has space for malls and amusement parks but not buses. I think the Millennium Bus Depot should stay. It is the least of the problems for the river,

Proximity to diesel trucks resulted in extremely high values -a cycle-rickshaw ride on NH-24 very close to truck traffic recorded levels as high as 2,000 micrograms per cubic metre as per the study

said Narain, adding that she even thought of recommending space in Rashtrapati Bhavan and Jawaharlal Nehru Stadium for bus depots.

A key solution CSE recommended is to treat NCR like a single 'air-shed' and formulate policies for the entire region as pollution from neighbouring towns is affecting Delhi. She opposed the new government's announcement of bidding for a coal block and setting up a thermal power station, saying gas power stations in Delhi should be supplied fuel first. "They should negotiate for reasonable gas rates and get the power stations running," she said.

In Print Media

Air pollution on his mind, CM asks babus for offbeat ideas

Tells Them He's Not Satisfied With Slow Response To Crisis

TIMES NEWS NETWORK

New Delhi: In his first review meeting with the environment and forests department, chief minister Arvind Kejriwal dismissed all other issues, choosing to discuss only the rising levels of air pollution in the city. Even before bureaucrats

could run him through presentations on various issues. the CM asked if the department could offer any immediate solutions to tackle the problem of air pollution.

Keiriwal asked bureau crats to skip presentations on other issues and move directly to air pollution. He asked for "offbeat" solutions that could be implemented.

Environment department officials answered that they are awaiting a report by IIT Kanpur due in September, on the sources of air pollution in Delhi. Kejriwal was unsatisfied with their response. Some

'TOXIC CITY': Greenpeace activists campaign for clean air in Delhi outside the Met office on Lodhi Road officials were taken aback. 'We don't know if there can be any offbeat solutions to air pollution", one of them said.

In 2014, World Health Orga-nization's urban air quality index showed Delhi with the highest PM 2.5 (fine, respirable particles). High PM2.5 pollution is linked to cardiac and respiratory conditions. On Saturday, a joint study universities of Chicago, Yale and Harvard found that

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half of India's population may be losing up to three years' life-span because of bad air. Meanwhile, Centre has al-

so asked for a meeting with the department on tackling air pollution next week.

The Times of India, Delhi dated February 22, 2015

Air quality in India curtails lifespan by 3 years: US study

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New Delhi: A new study has concluded that as many as 660 million people, or half of India's population, could add 3.2 years to their lifespan if air quality met the national safe standard. In other words, compliance with standards can save up to 2.1 billion life years in India.

Authored by Michael Greenstone, director of Energy Policy Institute at Chicago, with prominent economists and public policy experts from Yale and Harvard University, the study looks at air quality data in different parts of the country from pollution control boards and satellite data.

The study using the 2011 census data estimates that 660 million people (54.5% of the population) live in regions that do not meet the annual PM 2.5 (particulate matter) standard of 40 microgramme per cubic metre, and 262 million people (21.7% of the population) live in regions with air pollution levels more than twice this standard.

Nearly every Indian (1,204 million people, or 99.5% of the population) lives in an area with PM 2.5 pollution level, much above the WHO's 10 microgramme per cubic metre guideline.

The study arrived at the life expectancy figures using a study by Greenstone conducted in China which had inferred that with every additional 100 micrograms of total suspended particulate (TSP) matterpercubic meter, life expectancy at birth was lowered by 3 years.

The same metric was applied to



Indian data of PM2.5 levels for this study. Michael Greenstone said, "The study shows that air pollution retards growth by causing people to die prematurely. Other studies have shown that air pollution reduces productivity at work, increases incidence of sick days, and raises health care expenses.

The authors recommend three policy measures for the Indian government. The first is to increase real-time air quality monitoring stations. It cites Beijing, which has 35 monitoring stations. Kolkata, the Indian city with the maximum stations, has only 20.

The second intervention they recommend is to rely on civil instead of criminal penalties to "instill a polluter pays" system.

Thirdly, they recommend market-based mechanisms for environmental regulation like the emissions trading system (ETS). For the full report, log on

to www.timesofindia.com

The Times of India, Delhi dated February 23, 2015

Desi thermal plants worst polluters

POWER PLANTS' GREEN RATING First-ever green rating of coal-bas

ter use

 Monitoring by regulators should be strengthened – they should be given more powers (including

(Karnataka) Tata Power | Trombay (Maharashtra) Worst three in terms of erall envir PTPS, Patratu of Jharkhand State Electricity Board UP Raiya Vidyut Utpadan Nigam Ltd's plant, Obra Damodar Valley Corporation,

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(West Bengal)

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> Old inefficient plants should be closed at

TIMES NEWS NETWORK

New Delhi: A first-ever environmental rating of coal based power plants has found that India's thermal power generating units figure among the world's "most inefficient" in terms of compliance to pollution norms, use of resources and overall operation efficiency.

Though private sector ther-mal plants in the country perform better than governmentowned ones, there is "immense scope for improvement" in almost all units so that they can pollute less and generate more electricity with efficient use of available resources.

The study behind the ratings, done by experts at the Centre for Science and Envi-ronment (CSE), also noted that Delhi is home to one of the most polluting power plants in the country- NTPC's Badar-pur Thermal Power Plantwhich has contributed in turning the capital into the most polluted city in the world.

CSE's Study Rates 47 Coal-Based Plants

The study, done under CSE's Green Rating Project (GRP), analysed and rated 47 coal-based thermal power plants from across the country on a variety of environmental and energy parame-ters. About half of all plants operating in 2011-12 were se lected for the rating

"The objective of the study was to give a clear picture of the environmental performance of the sector. Our finding is that in India, where demand for power is increasing, power plants are performing way be low the global benchmarks" said Sunita Narain ahead of the study's release on Saturday. She said, "Given the rapid

increase in coal-based power projected by the government, stress on precious resources like water and land will increase and air and water pollution will worsen unless correc tive measures are taken by the

industry and policy-makers" The study was released jointly by M S Swaminathan, environment secretary Ash ok Lavasa and chief economic advisor Arvind Subrama-

greenest power plants. Three top power plants (CSES-Budge Budge, JSWEL Toranagallu and Tata-Trombay) were awarded for their overall environmental performance, while two others received awards for their efficient use of resources such as energy and water.

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The study found that the country's thermal power plants are estimated to draw around 22 billion cubic meter of water, which is over half of India's domestic water need. It also noted that 55% of the units were violating air pol-lution standards which are already extremely lax.

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

The Economic Times, Delhi dated February 23, 2015

Air Pollution Cutting 660 M Lives Short By 3 Yrs: Report

99.5% of Indians breathe air with pollutants way above safety levels

Urmi.Goswami@timesgroup.com

New Delhi: Mounting evidence that India's poor air quality is cutting short lives is increasing pressure on the government to speed up corrective measures.

The latest pointer to the magnitude of the problem is a study by en-vironmental economists from University of Chicago, Harvard, and Yale. Their report, published on Saturday, says that 99.5% of the Indian population breathes air that has pollutants way above the levels considered to be safe by the World Health Organisation.

In many parts of the country, including 77% of urban areas, the pollution levels exceed national standards. This is cutting short the lives of 660 million Indians by a little more than three years, the report adds.

The study uses data to show that non-compliance to national and international standards is both an urban and a rural phenomenon, more marked in north India, blowing the myth that the problem is restricted to urban areas

The study focuses on particulate matter (referred to in air pollution parlance as PM and these are of varying sizes), which affect cardiovascular and respiratory systems and have been consistently found to be dangerous to human health.

The 660 million people, or 54.5% of the population, the study refers to live in areas where the level of pollution exceeds the limits set out in National Ambient Air Quality Standard. India's national air pollution sets the permissible PM 2.5 levels at 40 micrograms per cubic metre, which is four times WHO's

safe level.

Poor air

quality in

India has

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"Air pollution is an urgent public health problem that deserves policy attention. In approaching the issue of air pollution as one of public health, it would be possible to break the perception and understanding that addressing environmental is sues like air pollution and economic growth/development are somehow opposed to each other," Michael Greenstone of the University Chicago, who led this study, told ET. The Global Burden of Disease Re port 2010 estimated that outdoor air pollution account-

ed for about 6% of deaths worldwide. In 2012, the WHO attributed 7 million deaths globally to air pollution.

since May last India has the highest rate of death caused by chronic respiratory diseas-A 2013 analysis of government data and the Global Burden of Disease report on India by the Delhi-based Centre for Science and Environment revealed

that air pollution was the seventh leading cause of loss of about 18 million healthy years of life.

The levels of pollution and with it the impact on health and mortality have increased dramatically. "Reduc-ing pollution in these areas (where poll ution exceeds the national norms) to achieve the standard would, we estimate, increase life expectancy for these (660 million) Indians by 3.2 years on average for a total of 2.1 billion life years," Greenstone and other re-

searchers state in their study "Lower Pollution, Longer Lives: Life Expectancy Gains if India Reduced Particulate Matter to Air-Quality Standards' The loss of more than two billion life ears is a substantial price to pay for air pollution. And yet this may still be an underestimate of the costs of air pollution, because we do not account for the impact of other air pollutants, the impacts of particulates on morbidity or labour productivity, as well as preventive health or avoidance costs borne by Indian households," the study states

Poor air quality in India has been on the international radar since May last year when the WHO found that 13 of the 20 cities with very high levels of fine particulate matter (PM2.5) were in India. The study, which analyses data from the Cen-tral Pollution Control Board, reports that in 77% of the country's urban centres, the levels of respirable suspended particulate matter (PM10) exceed the national norms

The air pollution discourse in the country has been centred on urban areas. This study broadens the data used. For urban areas it relies on monitoring data from the Central Pollution Control Board, while for areas not covered by CPCB's moni-toring network, it uses satellite measurements of air pollution.

The paucity of accurate and widespread data is a challenge for India. There is room for improvement, wider network of monitors, more vigorous calibration will yield more curate data," Greenstone said.

While the magnitude of the problem may not have been evident, the Indian government recognises the serious challenge that air pollution presents

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

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In Print Media

Bokaro 'B' improvement in capacity utilization an aggressive pace Clearances for enhanced canacities should be based on best achievable water consumption practices

imposing stiff penalties) to enforce compliance > Ash policy should support higher usage of ash Incentives to ensure