

Recycling is Not Enough, Go for Upcycling



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Sruti Harihara Subramaniam could put reduce, reuse and recycle enthusiasts to shame. Her products, made from waste material, are better than the original. Check them out at her Goli Soda store in Chennai

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Goli Soda is an unlikely name for a retail store dedicated to selling upcycled merchandise. It brings back memories of the fizzy drink of yester-years where the “Goli” (marble) locks in the fizz in a soda bottle. It was our very first symbol of re-use. The goli soda bottles would go back to get re-filled at a factory.

The Goli Soda Store in Besant Nagar, Chennai is all about innovation, creativity and conscious living. True to its name, the store focuses on up-cycling and re-use. The year-old store is a retail space that brings together inventors, designers, evangelists and people who want to make a change for the better. The store features products that are up-cycled, organic, environment-friendly, locally sourced and more importantly, are aimed at making lives better and safer.

Sruti Harihara Subramaniam, the young and sprightly founder of Goli Soda, believes that if people are given options, they do opt for more eco-friendly choices. “There are a lot of stores selling organic food but none selling up-cycled merchandise. I wanted to offer people a choice of high quality, well-designed products that will compete with regular products and also be eco-friendly.

What is Up-cycling?

Up-cycling is the process of converting waste materials or useless products into new materials or products of better quality or for better environmental value. Up-cycling is the opposite of down-cycling, which is the other half of the recycling process. Down-cycling involves converting materials and products into new materials of lesser quality. Most recycling involves converting or extracting useful materials from a product and creating a different product or material.

Up-cycling has shown significant growth across the United States. For example, the number of products on ‘Etsy’ (an e-commerce website focused on hand-made or vintage items tagged with the word “up-cy-

clad” increased from about 7,900 in January 2010 to nearly 30,000 a year later—an increase of 275%. As of April 2013, that number stood at 263,685, an additional increase of 879%!



The Goli Soda Store

Goli Soda stocks unique and innovative merchandise made completely from up-cycled material. You could walk in and find wallets up-cycled from old tyres by ‘Green the Gap’, jewellery made from PET bottle plastic by ‘The Silver Nut Tree’ which could make you do a double take because they look more like glass than plastic! Interesting bags made from discarded vinyl advertisement, billboards by the NGO ‘Baladarshan’ and waste cloth by ‘Stitched to Save 9’. The shelves also boast coasters made from juice tetrapaks and milk covers and Gramophone LP record clocks made by ‘Workshop Q’. Beautiful wooden pin-up boards made from reclaimed wood and wasted fabric by ‘Enthucutlets’ can brighten up any room.

The Goli Soda Store is itself made completely from recycled wood and fruit crates. The shelves and racks sport a rustic look. The store stocks all-natural

home-cleaning products like detergents, floor cleaners, mosquito sprays and dish wash powder. There is also an eclectic range of organic cotton clothes from 'Bhoosathva' and 'Paruthi' that are made with completely natural dyes. **There are also some natural seed jewellery and some elephant poo products like coasters, notebooks and photo frames from 'Haathi Chaap'.**



“We have to think beyond the three Rs (Reduce, Re-use, Recycle). Instead of buying regular gifts, why not buy up-cycled gifts? They are equally beautiful and help save the Planet too,” says Sruti. Goli Soda also stocks Khambas from 'Daily Dump', vermicompost, panchakavyam and cocopeat.

“We have consciously kept the pricing low at Goli Soda to promote re-use. The idea is to make it accessible, available and affordable to more people” says Sruti. The way forward for Goli Soda is to have more physical stores in other cities. “The next leap will be when we get on to an online store” avers Sruti. “In our first year of operation, we were focused on getting the right merchandise into the store, now is the time to think of growth and other possibilities.

Design plays a huge role in making Goli Soda truly a one of a kind store. Every single product sold at the store was created with a purpose beyond its immediate usage. The various featured innovators and designers have thought about everything from the material used and their long- term impact on the environment.

Model Entrepreneur

Sruti, a visual communication student, won the runner-up title at the Miss Chennai Beauty pageant in 2002. She has modeled for brands like Pepsi, Bharat Matrimony, Citibank, Airtel and Chakra Gold Tea. She has acted in some prominent Tamil TV shows, most popular being K. Balachander's serial 'Sahana'.

Sruti's initiation began with the nature club in her school. She was taken aback when one day while talking about it, her sister told her that if she really cared, she should not be eating chicken since chicken have feelings too! As she grew older, Sruti stopped wearing silk and leather. “I was a fanatic and did not wear silk at my wedding! However, I soon realized that I have to be practical and flexible when it comes to making others understand my point.”

“Memories of my grandmother plucking vegetables from the garden to cook in Kerala were very poignant and I always wanted a farm. Then I thought why should I wait till I retire? So I started organic terrace gardening and composting using a Khamba. When I went looking for a composting Khamba, I realized that things we require to make our lives more sustainable are not easily available and so I decided to start a store that stock everything that someone who cared for the environment would look for” summarizes Sruti.

<https://www.facebook.com/golisodastore>

India's first electric bus runs in Bangalore

India's leading technology hub, Bangalore, has become the first city in the country to add an all-electric bus to its public transport fleet. The air-conditioned 31-seat coach is from China's BYD and is similar to those running in a number of cities around the world. The bus has been put on trial basis for three months. When fully charged, the e-bus can make about eight trips along the route where it has been deployed. A battery charging station has been set up at one of the city's bus depots.

While switching entirely to e-buses could be a long term measure, the Karnataka government is looking at cutting pollution caused by public transportation. A report by India's Centre for Science and Environment released in 2013 identified Bangalore as one among 14 cities that have high levels of particulate matter.

In his budget speech last month, Chief Minister Siddaramaiah said the state government will soon introduce buses running on compressed natural gas (CNG). According to a World Bank study, CNG-fueled vehicles emit 83 percent less carbon monoxide, 58 percent less nitrogen oxide and 97 percent less particulate matter than diesel-powered equivalents. The BMTC, the transport company that runs buses in Bangalore, currently operates 6,472 buses with

4.9 million passengers using its services daily.

Manmohan Singh unveils India's first zero-net energy building

India's Prime Minister, Manmohan Singh inaugurated the country's first net zero carbon building, the Indira Paryavaran Bhawan in New Delhi's central government district is the head office of the Ministry of Environment & Forests. It has been designed to accommodate about 1,000 officials.

The new building has a solar-passive design and has been constructed from energy-efficient building material. It is expected to be a trend-setter in the country and inspire people towards adoption of green technology.

The \$33.7 million environment ministry HQ was built to meet the requirements for LEED Platinum rating as well as the 5-Star standard. Interesting features include:

Effective ventilation by orientating the building in an east-west direction, separating different blocks with connecting corridors and having a large central court yard.

Total energy savings of about 40 percent through innovative combination of geothermal cooling which uses air convection flows to exchange cool air within the rooms.

The design enables natural daylight to provide up to 75 percent of lighting requirements. The building's lifts have a system to regenerate energy.



The entire building has an access-friendly design for differently-abled persons.

With an installed capacity of 930-KW peak power, the building has the largest roof-top solar system of any multi-story building in India.

Green materials used include fly-ash bricks, regional building materials, materials with high recycled content, with high-reflectance terrace tiles and rock wool insulation for the outer walls.

Rapidly renewable bamboo jute composite material has been used for door frames and shutters. UPVC windows, with hermetically sealed double glass. Grass paver blocks to build the pavements and driveway.

Reduction of water consumption by the use of low-discharge water fixtures; recycling of waste water through the building's own sewage treatment plant; use of plants with low water demand in landscaping; rain water harvesting and use of curing compounds during construction.

India's environment worst among large developing nation, its air quality worse than China's

India has emerged as Asia's worst environmental performer, ranking just 155th out of 178 countries studied by Yale University

researchers in their 2014 Environmental Performance Index (EPI).

A bottom performer on nearly every policy issue included in the 2014 EPI, with the exception of forests, fisheries, and water resources, India's performance lags most notably in the protection of human health from environmental harm.

The country, in fact, performed worst among other large emerging economies that make up the BRICS bloc, with China ranking 118th, Brazil 77th, Russia, at 73rd, and South Africa at 72nd, the researchers said in a statement.

In particular, India's air quality is among the worst in the world, tying China in terms of the proportion of the population exposed to average air pollution levels exceeding World Health Organization thresholds.

The stresses of urbanization without sufficient investment in environmental protection help explain why India has seen a 100 percent decline in its air quality scores over the past decade. While media attention has focused on neighboring China's air quality over the last year, India and other South Asian countries, including Bangladesh and Nepal, rank the worst in the EPI's air quality category.

With expanded data coverage, the 2014 EPI ranks 46 more countries than the last EPI release. These countries are mostly sub-Saharan African nations and Small Island Developing States, providing

a first look at where these developing countries stand on their environmental efforts.

The sweeping coverage of the 2014 EPI reveals important global trends. For example, the world is doing well on improving drinking water and sanitation. Child mortality has declined as a result.

Progress in these categories tracks the concerted pursuit of the Millennium Development Goals, which have clear targets, strategies, and metrics for assessment on water and sanitation.

Setting clear targets help

Poor environmental performance is difficult to improve when policymakers do not set clear targets, as with fisheries, industrial wastewater treatment, and air quality. Since 2000, the number of people breathing unsafe air has risen by 606 million people, to a total of 1.78 billion. These numbers are heavily concentrated in the developing world.

"The EPI reveals that improved environmental results are possible when measurement and management practices align," said Yale University professor Daniel Esty. "When data and measurement are poor or not in concert with policy priorities, natural and human systems suffer."

The Index also demonstrates what happens when countries are unable to prioritize environmental management.

While the 2014 EPI offers an overview of global performance on some issues, it also reveals distressing data gaps. The sustainability of agricultural practices and toxic chemical exposure, among a range of critical policy challenges, have virtually no reliable metrics by which to identify priority needs, set policy targets, or evaluate national performance.

Delivering better data will not be easy. “It is going to require more than just the work of national governments and NGOs,” said Kim Samuel, the EPI’s co-creator.

India’s top court orders set up of environmental regulator

The Union Government of India has been given until March 31 this year by the Supreme Court to set up a national environment regulator. The court has mandated that offices of a National Environmental Appraisal and Monitoring Authority be established in all states to oversee the implementation projects that impact the country’s environment.

The court said that henceforth the task of processing, appraisals and approval of the projects for environmental clearance would be done by the regulator as it could carry out independent, objective and transparent appraisal environmental impact assessments (EIAs) and also monitor the implementation of the conditions.

This latest ruling from the court is one of a series it has made against the Union Government in environmental affairs, seemingly believing that – in the absence of effective government policy – a more activist judicial approach is needed to set the country’s house in order. This is also reflected in the National Green Tribunal, another Jairam Ramesh initiative, which was launched in October 2011 as special fast-track court to handle the expeditious disposal of cases pertaining to environmental issues.

Indian textile suppliers see 765% ROI through water management

A water management project

among textile suppliers in India – led by the Stockholm International Water Institute (SIWI) and Swedish fashion brands Indiska, KappAhl and Lindex – has demonstrated how efficient resource management in textile production in India can achieve substantial environmental improvements and financial gains.

In an industry with low profit margins and negative environmental impact, the SWAR project showed that by implementing resource efficiency recommendations in production lines, savings in energy, chemicals, and water consumption lead to cost-savings in production and better environmental impact. The project design restructures production costs with water flow becoming a cost-carrier.

In the Delhi region alone, the Indian project partners implemented 85 different “low-hanging fruit” recommendations suggested by SWAR. The results were staggering: a 765 percent return on investment in one year and an average payback time of 11 days per project, according to a press statement from SIWI.

“The private sector is realizing the parallel benefits of business and environmental sustainability. The hope is that the EPI will guide increased cooperation among all sectors of society.”

<http://www.cleanbiz.asia/news/indias-environment-worst-among-large-developing-nations?page=2#.Ux2Aaz-Sxcl>



“SWAR has been much more effective than other resource management projects that we have undertaken in that it has gone beyond giving paper reports and has actually helped implement projects,” said Mukesh Tomar of Maya Exports, one of the suppliers in the project.

In water-scarce Delhi, the project reduced total water consumption by an annual 84.5 million litres or 6.6 percent. It reduced electricity use by 3.4 percent, fuel by 4 percent and chemicals by 14 percent at supplier and sub-supplier levels. This resulted in an annual 1.7 percent saving in production costs for all 35 units.

The recommendations include applying best-practices such as right-first-time chemical dyeing

procedures, household savings, rainwater harvesting, effective waste water treatment and reuse, as well as efficient boiler heating cycles.

<http://www.cleanbiz.asia/news/indian-textile-suppliers-see-765-roi-through-water-management#.Ux2GFj-SxcI>

Rajasthan to have largest solar power plant in the world

India is getting ready to start construction of its ultra mega solar power project in Rajasthan, which is expected to be the largest solar power plant in the world.

The 4000 MW proposed project has participation from six PSUs.

A joint venture (JV) company will be formed with equity from BHEL, Power Grid Corporation of India, SJVN, Sambhar Salt Ltd. (SSL- 16 percent) and Rajasthan Electronics & Instruments Limited to implement the first phase of the project.

The project, initiated by the Department of Heavy Industry (DHI), will be situated in the 23,000 acre area of SSL, a subsidiary of Hindustan Salts Limited, a public sector enterprise.

The project will be completed in two stages in seven to eight years. The first phase of 1,000 MW is planned to be set up in about three years. The other 3,000 MW will be set up in subsequent phases. Estimated investment is Rs. 7,500 crore, an estimated plant life of 25 years. It will supply 6,400 million units of energy per year and help reduce carbon dioxide emissions by over 4 million tons per year.

Major oil companies to launch renewable energy wings

Major oil companies in India like Oil and Natural Gas Corp (ONGC) and Indian Oil Corp (ICO) are planning to launch new companies dedicated to renewable energy. The collaboration is supported by GAIL, Engineers India Ltd (EIL), Solar Energy Corp of India (SECI) and Indian Renewable Energy Development Agency (IREDA).



The collaboration plans to set up a special purpose vehicle (SPV) to undertake big electricity grid-connected projects.

Another SPV led by IOC will be set up for off-grid projects. It will include participation of companies like Bharat Petroleum Corp (BPCL), Hindustan Petroleum Corp Ltd (HPCL) besides SECI and IREDA.

Commenting on this collaboration oil secretary for the Government of India, Vivek Rae said the collaboration aims at leveraging the financial and managerial strength of the companies to scale up renewable energy projects and manage the complexities of small projects. The government is looking at ultra mega projects of up to 500 MW at a cost of Rs 6-7 crore per MW.

After completing the feasibility studies, the two SPVs are likely to be incorporated by August 15. The move is likely to boost the renewable energy industry in India.

India has been ranked the fifth in wind energy installations with over 20,000 MW of capacity installed at the end of 2013, according to information available at Global Wind Statistics.

Grundfos Pumps and NDTV launch 'Mission Energy'

Grundfos Pumps India Pvt. Ltd and NDTV announced the launch of 'Mission Energy', a campaign to create awareness

about the importance of saving energy and to provide ideas to conserve energy. The campaign aims to draw attention to the power of individuals in creating a cleaner and greener future. Mission Energy is supported by AEEE as Energy Efficiency Partner and CII as Knowledge Partner.

In order to meet India's growing energy demand, it is important to not only increase electricity-generating capacity, preferably through renewable sources but also use energy efficiently. Energy conservation and energy generation go hand in hand. In fact energy conservation is less expensive than energy generation. In the light of this, Mission Energy will actively engage with the country's leading experts, policy makers, conservationists, leading industry voices and NGOs to highlight the growing requirement for energy efficiency in India. The campaign will also reach out to the general public to create awareness on how, at an individual level too, one can contribute towards energy conservation.

Bioplastic gets Big Boost

The global bioplastic industry is expected to witness significant growth and reach an estimated \$7.02 billion by 2018, says a new research from Lucintel, a leading global management consulting and market research firm. The major forces that are driving bioplastic market are high consumer acceptance, danger posed by climate change, increasing price of fossil materials, and dependence on fossil resources,



the research said.

The research finds that a wide variety of bioplastic applications under development is a positive factor for growth of bioplastic which also helps to capture market share from competing materials; huge potential lies within the fields of consumer electronics and automotive.

On account of new technological developments, bioplastics are moving out of the niche and entering the mass market. Although full market penetration is just beginning, bioplastic materials and products are

multiplying continuously.

Multinational brand owners such as PepsiCo and Tetra Pak in the packaging market or Ford, Mercedes, Volkswagen, and Toyota in the automotive market have launched or integrated bioplastic products.

However, the bioplastics industry is facing a number of challenges. Bioplastics are generally two to three times more expensive than the conventional plastics. Currently, bioplastic resins cost at least twice as much as petro plastic resins. Price considerations will be the primary determinant for the success of bioplastic market. **It is expected that rising petroleum costs will allow some bioplastic resins to be able to achieve price parity with conventional plastics.**

As crops are used for bioplastic manufacturing along with arable land some perceive this as an undesirable development that could increase food prices and contribute to food shortages.

Bioplastics are found to reduce CO₂ emissions by 30 percent-70 percent as compared to conventional plastics. This shows a significant reduction in hazardous waste that is caused by oil-derived plastics.

Global business is now turning to bio-plastics as governments demand cleaner alternatives to petroleum-based technologies and their reckless emission of greenhouse gas CO₂. One metric ton of bioplastics generates between 0.8 and 3.2 fewer metric tons of carbon dioxide as compared to one metric ton of petroleum-based plastics.

<http://www.greentechlead.com/2014/01/22/global-bioplastic-industry-reach-7-02-billion-2018-13174>



How to Hook Millennials to Sustainability

Business leaders worldwide recognize that changing consumer attitudes and behavior around sustainability within a rapidly evolving marketplace presents considerable challenges. In 2012, the World Economic Forum and its partner companies began addressing this challenge by researching the key question: “How can companies engage consumers to trigger simple behavioral shifts that enable more sustainable lifestyles, grow demand for more sustainable products and create business value?”

Their key findings were - Sustainability needs a makeover

and millennials are the opportunity. On presentation of the key research findings and recommendations at the World Economic Forum Annual Meeting 2013 in Davos-Klosters, business leaders suggested pilot initiatives that would test strategies to engage millennials (ages 18 to 34) in sustainable lifestyles. Responding to this mandate, the Forum and its Partner companies collaborated to explore the following three initiatives in 2013:

- Incentivize brand marketers to embed sustainability in their marketing campaigns

- Understand what language will motivate millennial consumers to engage in sustainable lifestyles
- Create a non-branded, collaborative social media platform that will raise awareness and engagement of millennial consumers around sustainable consumption.

Build the consumer case

The Forum, its Partners and Effie Worldwide announced a new Effie award focused on campaigns and efforts that promote sustainability.

The idea was - if the marketers are not engaged in the issue, then they will not engage consumers. 72% of brand managers are aware of their companies' sustainability agendas, but the majority feels that they are not incentivized to prioritize sustainability in their work (Source: Millward Brown Corporate, December 2012). This award gives marketers that incentive and is a step toward changing the existing dynamic.

To millennials, creating "less waste" or a more "simplified" world does not necessarily mean consuming fewer products. Rather, they want the products they consume to have minimal impact on the environment. This could mean a product that uses less material, or lasts longer than its predecessor. Longevity and durability of a product is a good motivator to purchase the product at a premium.

Millennials also appreciate "simplicity" in the sense that they want it to be as easy as possible to adopt the sustainable behavior - and appreciate companies that make the first effort to create better products before asking the consumer to change their habits. In essence, millennials expect brands to take the lead on the work, allowing them to "consume smarter" without much effort on their part.

Engage Marketers

Sustainability, as currently framed, is often perceived as irrelevant, confusing and demotivating. To

address this, businesses want to develop and use a lexicon that is contextual, relevant, inspirational and aspirational to engage people in sustainable lifestyles.

Based on this, researchers tested messages with millennials in China and India, as these are the markets which present the greatest opportunity for engagement. Millennials in the United Kingdom formed the control group for testing. Four response measures – message rankings, eye movements, brain activity, and open-ended interview responses – were used to understand underlying attitudes and behavior around sustainability. In addition to these tests, in-store exploratory research was con-

ducted at Marks & Spencer stores in London and Mumbai. For the first time, they have multi-level scientific validation of what kinds of sustainability messages resonate with millennial consumers.

Messages which frame millennials as "trendsetters" do not resonate at all. Talking about "trend-setting" takes the focus away from the product itself. Without some connection to the product and how it will benefit them and others, millennials lost interest in making a purchase.

Making corporate claims - If a company advocates itself as a pioneer and forward thinker in the area of sustainability, it produces a

What the millennials Want

- Millennials like messages which make them feel socially inclusive and positive about the future
- Corporate claims produces a negative connotation for millennials
- Messages which frame millennials as "trendsetters" do not resonate at all

negative connotation for millennials.

Recommendations

- Sustainability messaging requires sustainable products

The challenge of engaging millennial consumers is not just a matter of communication. Millennials want brands to deliver products which use less material, have innovative designs, and are durable. When brands use messaging that highlight these benefits, millennial consumers are more likely to purchase these products.

- Simplify messaging

Many millennial consumers still do not understand the meaning of “sustainability”. Instead, they understand simple messages that break down the concept of “sustainability” into elements they make sense of, such as saving energy and water, and reducing waste – which makes it easier to connect to their daily lives and take action.

- Appeal to the social conscience

Millennials like messages which make them feel socially inclusive and positive about the future. Millennials will choose more sustainable options if brands contextualize their consumption habits in terms of leaving more for the future generations.

Digital Platform for Consumer Collaboration

Millennials also want to digitally connect with brands to make a difference.

The platform will drive greater engagement through a variety of content areas like frequently updated feed on the latest news and stories of interest; a look at the future of the living environment – cities, farms, interiors, and the materials we use to make them. A showcase of the work of artists and designers who are using creativity to influence the future of the earth

The Forum wants to make 2014 a year of impactful action with tangible results.

http://www3.weforum.org/docs/WEF_RC_EngagingTomorrowsConsumer_ProjectReport_2014.pdf

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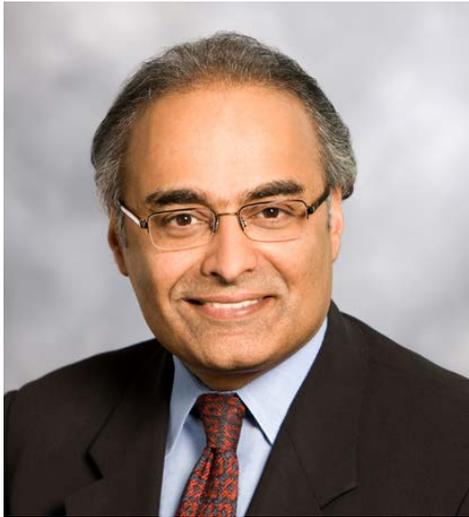
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**Anil Menon, President,
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The macro trend that is staring at us is the mammoth **\$ 4.6 trillion urban services market**. Three trends will drive the globe – one is the social demographics – India is becoming a younger country, 64% of Indians under the age of 27; Turkey, Brazil, Indonesia too share the same story. One part of the world is getting younger and larger and then you have places like Japan that has 20% shrinkage and that means in 2020, 40% will be over the age of 65. Germany is 36% over the age of 65 and 13% smaller in population size.

So the dynamics are shifting and most important part is that dynamic is people are moving from rural areas and coming to urban areas and creating a lot of challenges of urbanization.

Cities will Soon be Managed Globally

Take that as one of the biggest market trends in the world. And up to now cities were ignored by politicians globally. Politicians have an unhealthy fixation with rural areas and farming to the detriment of cities and ignore cities where 60% of the GDP is produced. That is also changing worldwide.

The second trend is about the economic drivers. This year, with all the devaluation, more than 50% of the world's GDP is generated in the emerging markets. In 1820, India and China were top two economies. By 2009 India was not in the top 10, China was only about 1.2%. By 2020 India would still not be on the list, but by 2050 India, US and China will be the top three – China being the largest followed by US and then India.

Look at the top 10, only UK and Germany will be in the top 10. Brazil, Russia and China and Mexico will be in top ten. Indonesia is going to be larger than

Japan. If you look at the numbers and you are going where the money is, you better understand emerging markets.

So you take all you need to create products that are cloud based and affordable. I want to talk about this new thing that is emerging that I call Urban Services Industry.

In 1998, Paul Krugman wrote that here is no such thing as a global service industry, only manufacturing is a global industry but services have to be localized. We know that's not true in information technology, the ICT industry became a global industry that somebody could not have conceived back in the early 80s. After that the engineering services industry became a global industry with lot more engineering services, operations being run out of India and other places.

However, there is a new industry that is emerging that is going to be about worldwide management



of cities because cities historically have focused on their political boundaries, geographical boundaries and locational boundaries, so police, water, security, traffic, education all come within city.

Local Companies Managing Global Cities

Already you see TaKaDu, an Israeli start-up manages water network of Singapore, Egypt and Australia using cloud technology. So from a knowledge management point of view if you have unlimited computing at a reasonable price, if you have unlimited storage at a reasonable price, unlimited bandwidth at a reasonable price, and everything was connected to everything else, would you run education, healthcare or a city the same way as we do today?

If you look at 1992 to 2010 one meth of computing has come down from 269 dollars to 13 cents, if you look at storage one gigabyte has come down from 556 dollars to down to 6 cents, bandwidth has come down from 1100 dollars to less than 100 dollars. In 2020, 50 billion things will be connected to smart objects.

The point is, we already have affordable infrastructure, now the question that we have to ask is – what we can do in Indian cities. Can we create capabilities in traffic management or in water management or security management or in medical practice that can be delivered globally in a different model? This is a 4.6 trillion dollar market, video surveillance is a 62 billion dollar, water management is 10 billion dollar market, and parking is a 62

billion dollar market worldwide.

So, in knowledge management, the answer is not as interesting as the question. What we have to do using technology is we reframe the question.

Today, doctors sitting in Miami can do surgeries anywhere in the world. Traffic and parking can be managed from anywhere. Data from digital sensors in a certain area can be used by several agencies. This can lower costs significantly and provides several revenue options. So the next big business is in urban services. So how are we going to get there?

5-point Formula

- Visionary leadership: can we redesign, rethink what this is going to be?
- Adopt global standards – we have to think globally
- Smart regulation
- Public private partnerships
- Eco-system

We need to work for a new knowledge management system on regulations, global standards then these internet technologies will become global and transformable.

Edited excerpts of Anil Menon's talk at the CII – Knowledge Management Summit Bangalore recently.



The Sustainability Mindset of Executives: Four Views

After working with scores of corporations and executive leaders over the past twenty years on matters relating to business and sustainability, I have come to the conclusion that there are fundamentally four distinctive mindsets of executives when it comes to this challenge: **Deniers, Avoiders, Camouflagers, and Transformers.** Not surprisingly, the sustainability strategy (or lack of one) in any given company is driven by the prevailing mindsets. Allow me to describe them for each type:

Deniers are executives who either refuse to face facts or willfully deny the existence of a problem despite the existence of overwhelming evidence to the contrary. Whether the issue is climate change, poverty, inequity, or loss of biodiversity, deniers consistently discount scientific evidence as “biased” or align themselves with a fringe minority of “experts” who expound the opposing view. For deniers, climate change is a hoax and poverty is due to laziness or lack of aptitude. Context and circumstance matter little to deniers. Belief is absolute, not unlike religious dogma. For those working in companies led by Deniers, it is virtually impossible to be an effective sustainability change agent since these concerns are literally dismissed out of hand by senior leadership.

Avoiders are executives who may actually

understand the social and environmental challenges we face, but either postpone serious consideration or seek to avoid engagement of the issues in the company altogether. The classic Avoider is in his or her early 60s or only 2-3 years away from retirement or being packaged out with a large financial windfall. Their primary motivation is selfish--to “kick the can down the road” so that they don’t have to invest the time and emotional energy in the few years they have remaining. For the Avoider, the serious challenges of global sustainability can wait, so they become someone else’s problem. Patience is required if one seeks to be a change agent or sustainability champion in a company led largely by Avoiders.

Camouflagers are executives who wrap themselves and their companies in the jargon of sustainability but fail to take decisive action or launch initiatives that would fundamentally alter their strategic path. They take on the “protective coloration” of sustainability by investing in incremental initiatives that continuously improve existing operations and strategies. Camouflagers want their cake and eat it to: external validation for their progressive stance but little in the way of strategic risk or change. Companies led by Camouflagers typically publish elaborate Sustainability Reports with lots of charts and

graphs showing how eco-efficiency and corporate responsibility have reduced emissions, lowered costs, or built brand image. Those seeking to become engaged in sustainability in companies led by Camouflagers had best get their Six Sigma Black Belt or demonstrate a passion for corporate volunteerism.

Finally, Transformers are executives who are willing and able to stake out a new direction for their companies--one which will disrupt current industry structure and “leapfrog” toward a more sustainable world.

Transformers are not afraid to take unpopular positions within the current industry; they often withdraw from industry associations, defund lobbying designed to preserve the status quo, and make preemptive investments that threaten to unseat industry incumbents. Not satisfied with incremental improvement, Transformers seek creative destruction. For those really interested in using the power of business to drive us toward a more environmentally sustainable and socially inclusive world, companies led by Transformers are the place to be.

How does your company stack up? **Try the following exercise:** Assign each one of the senior executives on the leadership team to one of the above four categories. Where is the center of gravity of the mindsets of your senior executive team when it comes to sustainability leadership? How does this relate to your own personal profile (be honest with yourself)?

Make career decisions accordingly. Alas, our planet has no choice.

Prof. Hart is one of the founders of Emergent Institute, Bangalore (www.emergentinstitute.net) and Enterprise for a Sustainable World (www.stuarthart.com)

Water to India's Slums

Matt Damon Style



Many Bollywood movies have made tons of money by ‘fighting’ problems of the poor in the slums. Heroes typically fight the mafia and the goons single handedly, to ensure justice. In contrast, a Hollywood action hero of the Bourne trilogy fame goes to the same slums in India, and without a fight, has so far enabled access to clean water to more than a quarter million poor families. The contrast can’t get any starker.

Matt Damon’s www.water.org is supporting his friend Gary White’s innovative project of providing micro-finance to the poor so that they are able to have access to clean municipal water network just like everyone else. How does this work?

The poor in India have to wait in long queues for hours to collect a couple of pots of water every day. Gary found this to be a highly unproductive way of ensuring a basic necessity. Instead, the loss of productive time is used to earn

and pay a part of it to buy the more reliable municipal water. Gary and Matt Damon were inspired by Bangladesh’s Mohammad Yunus about the power of microfinance to change the life of the poor. Matt Damon said in a recent interview to BBC how his NGO has so far (January 2014) given small loans to quarter million households – 94 percent of them to women. The repayment percent is 99 percent. “Access to affordable capital is the biggest choke point for the poor,” he said. Contrast this to Indian banking system which doesn’t trust that the poor to pay back.

Covers 11 districts

Water.org’s program in India provides safe drinking water and sanitation facilities to the families living in rural and urban Indian communities in 11 states and one Union Territory (UT) - Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Bihar, Chhattisgarh, Orissa, West Bengal, Assam, Tamil Nadu and Pondicherry

(UT). Water.org offers both grant and WaterCredit programs in India.

The project’s website lists rural projects in districts of Tiruchirappali, Kanchipuram, Villupuram, and Thiruvallur in the southeastern state of Tamil Nadu; Bangalore Rural District, Belgaum, Tumkur and Mysore in Karnataka; parts of Nagpur District in Maharashtra; Jodhpur District in Rajasthan; Kathihar District in Bihar; Kurda, Ganjam and Puri Districts in Odisha, Darjeeling and Murshidabad Districts in the state of West Bengal; Sivasagar, Jorghat, Golaghat, Kamrup Distracts of Assam; and some regions of Pondicherry (UT), Madhya Pradesh and Chhattisgarh. Urban projects are located in the slums of Tiruchirappali, Bangalore, Hyderabad and Kolkata.

The rural communities have large populations of a 2,000 or more with houses built in tight clusters. The proximity of the dwellings in these villages makes the villages ideal candidates for tube wells capped with shared hand pumps.

India’s water and sanitation crisis

Although access to drinking water has improved, the World Bank estimates that 21% of communicable diseases in India are related to unsafe water. In India, diarrhea alone causes more than 1,600 deaths daily—the same as if eight 200-person jumbo-jets crashed to the ground each day.

Hygiene practices also continue to be a problem in India. Latrine usage is extremely poor in rural areas of the country; only 14% of the rural population has access to a latrine.

Can Indian banks and micro-finance companies wake up to make a difference in a big way? In any case, it’s not all charity; there is money to be made by serving the poor.

Apopo – Making Rats Man’s Best Friend

By Tania Ellis, The Social
Business Company

When dealing with the societal and environmental challenges we face today, the most common approach is often the same. For example, putting our faith in some new technology that has been developed in a lab in Geneva or from a secret military base in the Nevada desert.

However, the best way to face challenges is often to use existing resources and technologies in new ways. An excellent example of this is the social enterprise Apopo. Back in 1995, its founder, Baart Weetjens, analysed the landmine problem in Africa, and was surprised by the complexity and high technological levels of expensive mine-clearing solutions that were largely proposed by research institutions outside the continent.

By relying on locally available resources his solution has turned out to be cheaper, quicker and more scalable, yet efficient: Apopo trains the widely present African Giant Pouched Rat to detect landmines,



which, at the same time as it saves lives, provides local jobs for the economically disadvantaged.

The Apopo model has since been expanded and now operates in Mozambique, Thailand, Angola, and Cambodia as well, where the HeroRats so far have neutralized 3,244 mines. **In addition, the rats have now also been trained to detect tuberculosis and have to date screened 198,610 samples in Mozambique and Tanzania.**

Baart’s innovation not only creates jobs and saves lives as well as costs – it also represents a significant shift in the field from landmine-affected countries depending on foreign expertise to having the power to control the demining

process, and the same goes for tuberculosis detection.

The Apopo case is illustrative of how social entrepreneurs create value: they develop social innovations that meet needs that are either overserved because the existing solutions are more complex than required – or not served at all because of market or government failure.

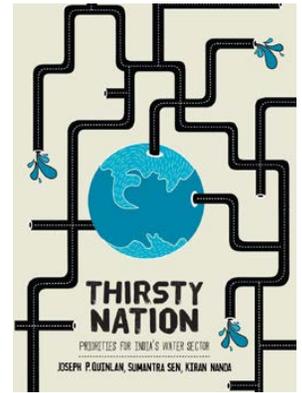
To read the full blog post, please go here

*Tania Ellis is a Danish-British prize-winning author, speaker and business advisor, specialized in social business trends and strategies. Her internationally acclaimed book *The New Pioneers* has been listed on Cambridge’s Top 40 Sustainability Books.*

[More at www.taniaellis.com](http://www.taniaellis.com)

THIRSTY NATION

Priorities for India's Water Sector



The Mounting Water Crisis in India

In India, another developing nation expected to emerge as a global economic growth leader in the next decade, there are worrying problems too. Thought by many to be one of the most dynamic economies among the developing nations, India's economic potential could very well get derailed or aborted by the nation's looming water crisis.

The economy, one of the largest in the world, is overly dependent on water, or to be more precise, monsoons. A disappointing monsoon season can wreck havoc on the pace of growth in one of Asia's largest economies. Given a severe shortage of proper irrigation facilities, the lack of rain is notably difficult for India's agricultural sector, accounting for nearly one-fifth of its gross domestic product. More importantly, roughly two-thirds of India's population relies on farming and related industries. Hence, poor monsoon rains have a huge negative multiplier effect on the rest of the economy.

In particular, the lack of rain can easily and often trigger a hike in food prices, a dynamic that erodes the purchasing power of both urban and rural households. In

Mumbai, meanwhile, water rationing is now in place, a step that could slow economic growth in one of India's most important cities. While the ADB recently forecast that India will confront a serious water crisis by 2020, many believe the crisis will arrive a great deal earlier. Indeed, India is a country under intense water stress. Consider the following:

- India currently has the world's second largest population, and is expected to overtake China's by 2050, when it is likely to reach a staggering 1.6 billion, putting unheard of stress on the available water resources. Presently, the nation has 17percent of the world's population, but only 4 percent of its usable fresh water
- The per capita availability of water in India has dropped from 5,300 cubic meters per annum in 1951 to 1,544 cubic meters in 2011. Thus, the country is already in a 'water stress' situation
- Water is under growing pressure both on the supply side (insufficient freshwater, uneven distribution, poor quality, non-revenue water, climate change), and the demand side (agriculture, industry, residential). Moreover, even the reduced availability of fresh water is highly uneven over time and space

• Besides, the declining per capita availability of water, there are also issues of deteriorating water quality

• According to the World Watch Institute, India suffers from misgovernance on the water pricing front—giving either water free or at heavily subsidized rates. This naturally has led to over-exploitation of ground water and widespread environmental damage

• Water sector is crucial for the Indian economy on account of its growing population and production of goods and services. Water shortages imply a future of food shortages, as well as other essential goods and services shortages

• For years, experts have been issuing warnings about the likely onset of water wars. However, the policymakers have failed to realize the gravity of the situation

• Indian economy has started witnessing the first glimpses of conflicts over water, like many countries in the Middle East, Africa and Central and South Asia. Competition for water is leading to social unrest, conflict, and migration

• India's 12th Five Year Plan's (2012-17) thrust is on providing a



facilitative environment for the amelioration of water related problems. Time is of essence, however. The country can no longer postpone concert actions to address its water crisis.

All of the above outlines the stark challenge in front of India. The problem is complex—how to provide clean water to a population of over one billion people who are eating better, driving more, and living in urban areas.

The solutions are just as complex and expensive—it will take billions of dollars in investment to head off this crisis. The outcome, however, assuming nothing is done in the immediate future, is rather simple: India will not only fail to grow and prosper but will see its economic development and prosperity retard and diminish.

Economic uncertainty—if not

economic and social chaos—will ensue if India does not meet its water challenge.

Solutions

Against a backdrop of global water scarcity, capital expenditures on building and improving water filtration, waste water treatment, desalination, rural water services, water utilities, water utility performance, irrigation systems, and a host of related projects are poised to increase sharply during the next decade. Trillions of dollars are likely to be spent by governments and corporations over the next few decades, a necessary and imperative capital expenditure lest many economies falter and stagnate. The choice is that simple and stark.

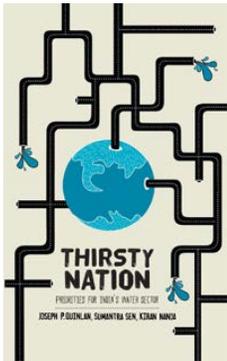
The capital has to be spent or countries like India and China

will simply not grow. Indeed, their economic development will be reversed; their societies and populations sent reeling backwards instead of forward. In fact, it is these threats and potential solutions for India that form the topic of the following chapters.

In brief, we expect infrastructure expenditures to materialize via public/private partnerships. The Global Water Partnership estimated in 2000 that global water infrastructure requirements would amount to \$180 billion per year through 2005—actual annual private investment over the period totalled \$3.3 billion, or just 1.8 percent of the forecast. Lack of investment has sent fixed water infrastructure into disrepair in many of the world's fastest growing cities.

Moreover, according to the World Bank, private financing has accounted for less than 10 percent of total water supply and sanitation investment in the developing world to date. With existing water infrastructure strained to the point of capacity, and many emerging market governments flush with capital reserves, thanks to booming trade surpluses, we suspect that future infrastructure build outs will rely on the expediency of private sector expertise and the depth of public sector capital.

Thirsty Nation: Priorities for India's Water Sector by Joseph P Quinlan, Sumatra Sen and Kiran Nanda (Random House India, Rs. 399)



Thirsty Nation: Priorities for India's Water Sector

By **Joseph P. Quinlan, Sumantra Sen, Kiran Nanda**

Random House, 2014

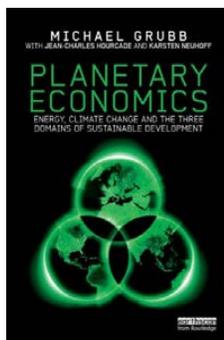
Water is the most precious natural resource in the world far ahead of oil and minerals. Blue Gold not only analyses the impending water crisis to hit the world and more importantly India but also explores the investment opportunities possible in the water sector. Presented in the book are innovative, cutting edge ways to combat the water crisis and ways of investing in the right projects. The roles of technology, finance and a general view of domestic and foreign investment in water are explored by the authors and practical and lucrative financial advice is offered making it an important book in the present ecological and financial environment.

Energy Production and Management in the 21st Century: The Quest for Sustainable Energy

By **C. A. Brebbia, E. R. Magaril, M. Y. Khodorovsky**

WIT Press (23 March 2014)

Discussing the future of energy production and management in a changing world, this book contains the proceedings of the first international conference on Energy Production and Management in the 21st Century - The Quest for Sustainable Energy. Developed societies require an ever increasing amount of energy resources, which creates complex technological challenges. The idea is to compare conventional energy sources, particularly hydrocarbons, with a number of other ways of producing energy, emphasizing new technological developments. The challenge in many cases is the conversion of new sources of energy into useful forms, while finding efficient ways of storing and distributing energy. Energy policies and management are of primary importance to achieving sustainability, and need to be consistent with recent advances made in energy production and distribution.



Planetary Economics: Energy, climate change and the three domains of sustainable development

By **Michael Grubb**

Routledge, 2014

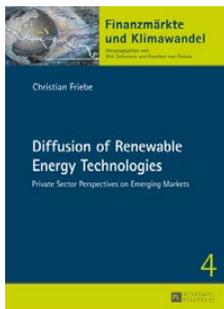
How well do our assumptions about the global challenges of energy, environment and economic development fit the facts?

Energy prices have varied hugely between countries and over time, yet the share of national income spent on energy has remained surprisingly constant. The foundational theories of economic growth account for only about half the growth observed

in practice. Despite escalating warnings for more than two decades about the planetary risks of rising greenhouse gas emissions, most governments have seemed powerless to change course.

Planetary Economics shows the surprising links between these seemingly unconnected facts. It argues that tackling the energy and environmental problems of the 21st Century requires three different domains of decision-making to be recognized and connected. Each domain involves different theoretical foundations, draws on different areas of evidence, and implies different policies.

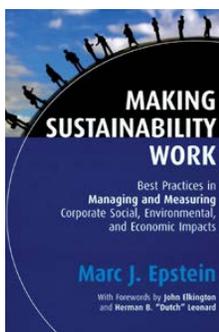
Only by understanding all three, and fitting them together, do we have any hope of changing course. And if we do, the oft-assumed conflict between economy and the environment dissolves – with potential for benefits to both. Planetary Economics charts how.



Diffusion of Renewable Energy Technologies: Private Sector Perspectives on Emerging Markets

By Christian Friebe
Peter Lang GmbH, 2014

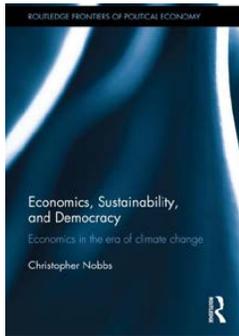
By analyzing the context of emerging and developing countries, the author explores the private sector perspective on renewable energy diffusion. The evaluation of two technology case studies, namely wind farms (grid-connected renewable energy) and solar home systems (off-grid renewable energy), reveals the perspectives of highly experienced early adopters. Thereby, qualitative and quantitative data sources - including innovative methods such as conjoint analysis - are combined. A key finding is that private sector perspectives, especially of early adopters, are highly relevant for policy makers in their Endeavour of designing effective and efficient framework conditions for renewable energy technologies.



Making Sustainability Work: Best Practices in Managing and Measuring Corporate Social, Environmental, and Economic Impacts

By Marc J. Epstein, Adriana Rejc Buhovac
Berrett-Koehler Publishers, 2014

Most companies today have some commitment to corporate social responsibility, but implementing these initiatives can be particularly challenging. While a lot has been written on ethical and strategic factors, there is still a dearth of information on the practical nuts and bolts. And whereas with most other organizational initiatives the sole objective is improved financial performance, sustainability broadens the focus to include social and environmental performance, which is much more difficult to measure.



Economics, Sustainability, and Democracy: Economics in the Era of Climate Change

By **Christopher Nobbs**

Routledge, 2014

How should we conduct economics in an era of climate change, natural resource depletion and population increase? These issues are systemic, and involve great uncertainties and long time horizons. This book contends that the free-market economics that has dominated capitalist democracies in recent decades is not up to the task; that the welfarist economics that preceded it, while preferable, also has inadequacies; and that what is required is an economics founded on ecological principles, greater respect for the laws of natural science, and a moral commitment to a sustainable future.

Sustainable Luxury: Managing Social and Environmental Performance in Iconic Brands

By **Miguel Angel Gardetti, Ana Laura Torres**

Greenleaf Publishing, 2014

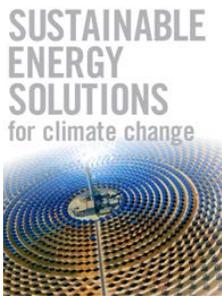
Explores issues relevant to sustainability and business management in luxury goods companies* Comprehensive collection of current thinking on sustainable luxury products Most consumers of luxury products and services use them as status symbols symbols of success. However, the definition of success and the way it is perceived by others is changing. Many of these successful consumers now want the brands they use to reflect their concerns and aspirations for a better world. There are shifts in the luxury paradigm, emerging from major changes in social dynamics. In future, the highest-quality product or service will be the one that generates the most benefit to all involved in its production and trade.

Is the Planet Full?

OUP Oxford, 2014

What are the impacts of population growth? Can our planet support the demands of the ten billion people anticipated to be the world's population by the middle of this century?

While it is common to hear about the problems of overpopulation, might there be unexplored benefits of increasing numbers of people in the world? How can we both consider and harness the potential benefits brought by a healthier, wealthier and larger population? May more people mean more scientists to discover how our world works, more inventors and thinkers to help solve the world's problems, more skilled people to put these ideas into practice?



Sustainable Energy Solutions for Climate Change

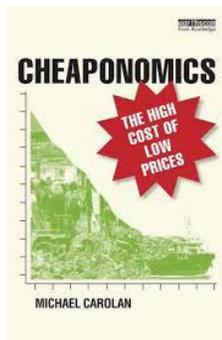
By Mark Diesendorf

UNSW Press, 2014

Renewable energy expert Mark Diesendorf issues a powerful challenge in this clear and comprehensive guide to the technology and policies we need to adopt to ensure an ecologically sustainable energy future for the planet.

Sustainable Energy Solutions for Climate Change brings together the science, technology, economics and policy issues to provide a unique and truly interdisciplinary approach. It details the enormous recent changes in the energy sector and profiles the renewable energy technologies that can transform our fossil-fuelled energy systems into ecologically sustainable ones.

Taking stock of the latest advances in energy efficiency and energy storage, the book is of interest to students at undergraduate and postgraduate level studying energy policy and economics, environmental policy and environmental politics as well as professionals and policy makers.



Cheaponomics: The High Cost of Low Prices

By Michael Carolan

Routledge, 2014

Do you really think you are getting a good deal when given that free mobile phone for switching service providers, if a multinational retailer undercuts its competitors or by the fact that food is relatively cheaper today in many countries than ever before?

Think again! As Michael Carolan clearly shows in this compelling book, cheapness is an illusion. The real cost of low prices is alarmingly high. It is shown for example that citizens are frequently subsidizing low prices through welfare support to poorly-paid workers in their own country, or relying on the exploitation of workers in poor countries for cheap goods. Environmental pollution may not be costed into goods and services, but is paid for indirectly by people living away from its source or by future generations. Even with private cars, when the total costs of this form of mobility are tallied it proves to be an astronomically expensive model of transportation. All of these costs need to be accounted for.

The author captures these issues by the concept of “cheaponomics”. The key point is that costs and risks are socialized: we all pay for cheapness, but not at the point of purchase. Drawing on a wide range of examples and issues from over-consumption and waste to over-work, unemployment, inequality, and the depersonalizing of communities, it is convincingly shown that cheapness can no longer be seen as such a bargain. Instead we need to refocus for a better sense of well-being, social justice and a balanced approach to prosperity.

EVENTS

21st to 22nd
March 2014

International Conference on Sustainability and Management Strategy-2014
Nagpur, Maharashtra, India
<http://www.imtnagpur.ac.in/ICMS2014.pdf>

25th
March 2014

Business Forum on Climate Change
India Habitat Centre, New Delhi
www.cii.in

27th to 28th
March, 2014

Training Programme on Energy Management & Conservation in Cement Industry
Chennai
<http://www.eai.in/360/events/pages/452#sthash.TdQm8pmh.dpuf>

31st March
to 18th
April, 2014

TERI-ITEC Course – Integrated approach towards sustainable development
Gurgaon
<http://www.eai.in/360/events/pages/393#sthash.krc6QYmX.dpuf>

3rd to 4th
April 2014

Managing Contemporary issues in Supply Chain 3 - 4 March 2014
CII Naoroji Godrej Centre of Excellence, India
www.cii.in

05th
April 2014

Powering Your Supply Chain with Advanced Technologies
CII Naoroji Godrej Centre of Excellence, India
www.cii.in

8th to 10th
April 2014

Solar Energy India
Gandhinagar, Gujarat
<http://www.solarsummitindia.com/maintenance>

8th to 10th
April 2014

Indian Solar Investment & Technology Summit 2014
Gandhinagar
<http://www.eai.in/360/events/pages/424#sthash.Po34eL53.dpuf>

9th to 11th
April, 2014

WatechAsia
Mumbai
<http://www.eai.in/360/events/pages/427#sthash.kFEgupc9.dpuf>

EVENTS

10th to 11th
April, 2014

[Lean Supply Chain](#)
CII Naoroji Godrej Centre of Excellence, India
www.cii.in

11th to 13th
April 2014

[Third International Conference on Recycling and Reuse of Materials \(ICRM 2014\) –](#)
Kottayam
<http://www.eai.in/360/events/pages/431#sthash.lJO5Xa29.dpuf>

16th
April, 2014

[NASSCOM GIC Conclave 2014](#)
Hyatt Regency, Pune
<http://www.nasscom.in/gic>

24th to 25th
April, 2014

[2nd India Smart Grid Summit 2014](#)
New Delhi
<http://www.eai.in/360/events/pages/414#sthash.8jKOWMUr.dpuf>

25th to 26th
April, 2014

[Green Landscape Summit 2014](#)
Suzlon One Earth, Pune
www.cii.in

15th to 16th
May, 2014

[10th Green Cementech](#)
HICC Novotel Complex, India
www.cii.in

17th to 18th
July 2014

[Green Power 2014](#)
ITC Grand Chola, Chennai
<http://www.eai.in/360/events/pages/453#sthash.mMfHokHp.dpuf>

18th to 20th
July, 2014

[Solar South 2014](#)
Chennai
<http://www.eai.in/360/events/pages/359#sthash.qtUNOaEK.dpuf>

Courses

TERI-ITEC Courses 2013-14

Course VIII - Integrated approach towards sustainable development - 31 March - 18 April 2014

RETREAT, Gual Pahari, Gurgaon

http://www.teriin.org/index.php?option=com_events&task=details&sid=589

Post Graduate Diploma Course in Sustainable Development (PGDM-SD) - <http://bimtech.ac.in/>

M.Sc. in Sustainable Development - Distance learning Course + information

The Global Open University - <http://nagaland.net.in/>

Post-Graduate Certificate in Sustainable Enterprise Indian Institute for Sustainable Enterprise

<http://theiise.net/pgcertinse.html>

Postgraduate in Sustainability Management Silver Bright Institute of Management

<http://www.htcampus.com/college/silver-bright-institute-management-sbim>

Post Graduate Diploma in Sustainability (Distance learning)

Chhattisgarh University - <http://www.cguniversity.com/>

Post Graduate Diploma

IGNOU- Indira Gandhi National Open University
<http://www.ignou.ac.in/>

Master of Architecture (Sustainable Architecture)

Bharati Vidyapeeth Deemed University

<http://www.bharatvidyapeeth.edu/Campuses/Pune/default.aspx>

MBA and MA in Sustainability Management

TERI University - <http://www.teriuniversity.ac.in/>

M Tech, MSc Environmental Science

Thapar University - <http://www.thapar.edu/>

PG Diploma

Entrepreneurship Development Institute of India

<http://www.ediindia.org/>

M Tech in Environmental Engineering

The National Institute Of Technology, Tiruchirappalli

<http://www.nitt.edu/home/>

Advanced Diploma in Bio Degradable & Solid Waste Vellalar College for Women

<http://www.vellalar.com/Arts/carrer-oriented-programmes.php>

PhD in Environmental Science

Gauhati University - <http://www.gauhati.ac.in/>

MSc in Environmental Science

Dr Babasaheb Ambedkar Marathawada University

<http://www.bamu.net/dept/environment/>

Advanced Diploma in Energy

Vidya Prasarak Mandals Polytechnic

<http://www.vpmthane.org/polywebnew/courses.html>

BSc in Environmental Science

University of Calicut

<http://www.universityofcalicut.info/>

PhD in Environmental Science

Punjab University - <http://puichd.ac.in/>

MSc in Environmental Science

Bharathiar University - <http://www.b-u.ac.in/>

MBA in Environmental Science

School of Management & Infrastructure & Development Studies - <http://www.minds-india.org/>

MA in Environmental Economics (Distance Learning Course) - Annamalai University

<http://www.annamalaiuniversity.ac.in/>

PhD in Environmental Bio-Technology & Solid Waste Management School of Environmental Sciences

Jawaharlal Nehru University

<http://www.jnu.ac.in/main.asp?sendval=-SchoolOfEnvironmentalSciences>

MBA in Energy & Environmental Science

Symbiosis Institute of International Business

<http://www.siib.ac.in/programmes.aspx>

CSAP - Certified Sustainability Assurance \practitioner Course - 26th to 30th March

5 Day Accountability UK Certified Sustainability Assurance Practitioner Course

Based on Global Sustainability Standards

Hotel Park Sheraton, Chennai

conference.sr@cii.in vedha.murali@cii.in