



ENCORE



BCSD India

CELEBRATING BUSINESS SUSTAINABILITY  
VOLUME 4 ISSUE 3 JANUARY 2008



# Business response to climate change



Special edition-  
**Managing Climate  
Change:  
A Panoramic View**

Highlight:  
**TERI-BCSD member  
companies: Climate  
change initiatives**

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TERI-BCSD (TERI-Business Council for Sustainable Development) India – initiated by TERI – is a regional network partner of the WBCSD (World Business Council of Sustainable Development), Geneva. It provides an independent and credible platform for corporate leaders to address issues related to sustainable development and to promote leadership in environmental management, social responsibility, and economic performance. Membership is open to organizations. The following are its current members.

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# Editorial



R K Pachauri  
 Director-General  
 TERI

The year 2007 can truly be described as the year of climate change, because not only did the Intergovernmental Panel on Climate Change complete and bring out its Fourth Assessment Report, but the Panel was also awarded the Nobel Peace Prize for 2007 along with former US Vice-President Mr Al Gore. Finally, in December the 13th COP (Conference of the Parties) at Bali under the United Nations Framework Convention on Climate Change was concluded successfully with a statement that clearly represents a positive step forward, even though some may be disappointed with the lack of quantified emission reduction targets in it. However, the Bali meeting represents a distinct departure from previous such meetings not only in terms of what was agreed on as the final statement, but also on account of the nature and content of the discussions that took place. There is basis for some optimism that by the 15th COP, to be held in Copenhagen in 2009, the world may have an agreement in place for mitigation of emissions of GHGs (greenhouse gases). Of course, it is too early to predict the exact nature and thrust of this agreement but there is a strong basis to assume that whatever is agreed on will ensure a distinct movement towards reduced emissions of carbon dioxide and other GHGs. The world, therefore, will move towards a much lower carbon future in every activity and human action.

These trends and developments have major implications for the

corporate sector. If countries are to assume commitments for reduction of GHG emissions, the task will fall squarely on the shoulders of the leaders of business and industry. India being a developing country may not have binding targets flowing out of any agreement to be reached in Copenhagen, but if the Indian economy is to be based on greater globalization, as is indeed the current pattern, then Indian industry will only be able to compete in global markets if it carries the distinct characteristics of low carbon intensity. The developed countries in any case will have to, as expected, take major steps to reduce emissions of GHGs.

Forward looking corporate policy, therefore, requires companies to address the challenges of a low carbon world as it relates to their own operations with a sense of urgency. Those companies which successfully tackle this challenge will clearly have a major advantage in future world markets, quite apart from exercising corporate social responsibility that the public would demand increasingly as part of actions to combat the threat of climate change.

The corporate sector has to be concerned about this issue for another set of important reasons. The impacts of climate change would be widespread and serious in several parts of the world. These would include an increase in the frequency and intensity of extreme events such as heat waves, floods, droughts, and extreme precipitation events, quite

apart from the threat of sea-level rise and impacts on water resources and agriculture in different parts of the globe. These would affect a large number of business activities that directly concern companies in different locations. The corporate sector would, therefore, have to assess the future impacts of climate change and evaluate how these would affect their own operations and future growth and development. An effective adaptation strategy will have to be put in place for the impacts that are to occur. Those companies that are unable to do so could suffer major losses over a period of time.

All of this indicates that business organizations such as TERI-BCSD (Business Council for Sustainable Development) India would need to come up with collective evaluation of the challenge of climate change and develop a broad strategy for meeting it. But at the same time companies, particularly those that have adequate size and strength, would need to formulate individual response strategies, the urgency of which is growing with time. This issue of *Encore*, which deals with various aspects of climate change and actions that the world of business must take to counter these challenges, would be of great value to a large audience not only in business and industry but among researchers and policy makers as well.



## FEATURE

### Business and climate change

Björn Stigson, President, WBCSD (World Business Council for Sustainable Development)

#### The context

It is obvious that we need to move towards a low carbon economy to address climate change. The climate science, presented by the IPCC (International Panel on Climate Change), clearly emphasizes the requirements of the mitigation of emissions. There is an urgency to act and define a new global policy framework post-2012, to guide long-term investments in technology and infrastructure.

The context for our actions is complex, involving the difficulty of balancing competing societal goals. Five key elements of this context are—

- 1 Climate change and development must be addressed together. This involves trade, financial flows, technology cooperation, and preservation of forests.
- 2 Energy demand will grow, driven by the needs of the developing countries to alleviate poverty.
- 3 There is a lot of inertia in the global energy infrastructure and change will take a long time because of the enormous amount of existing capital stock.
- 4 Fossil fuels will be the primary energy source for coming decades.
- 5 Carbon emissions will grow as a consequence.

#### The role of business

The role of business in society is to provide efficient goods and services that people want and can afford. We are fulfilling this in a way that minimizes resource use and pollution because it makes perfect business sense and reduces costs and risks.

The private sector is the major source of innovation, technology, and investments that can transform the global energy system. The investment decisions being made by the business will impact climate change for the next 20, 30, 50, or even more years to come. To do 'the right thing' we need clarity on the policy framework within which we do our business.

#### The role of governments

The role of governments is to balance competing societal interests and decide on the difficult trade-offs between these interests. Nationally and globally, we need to find a balance between economic development needed to improve the living conditions of poor masses in the developing countries; the growing energy demand to fuel this economic development; affordable access to energy, energy security, climate-change challenges; and competition concerns between countries and companies.

Clarity is needed on a short-term basis to define the policy framework post-2012 when the Kyoto Protocol expires. But we also need clarity at a long-term ambition level of GHG (greenhouse gas) emission reductions to 2050 by governments to guide the investment decisions by business.

At this point in time, it is fair to say that governments have some way to go to fulfil their societal role to provide clarity. We hope that governments will successfully complete negotiations on the new climate change regime before the end of 2009. We cannot continue with the 'you first' mentality. We need leadership and actions by governments.

#### Technology

Technologies and policies go hand in hand. We need what the British would call 'horses for courses'—policies that are adapted to various kinds of technologies we want to see developed and deployed. Existing technologies have significant potential for reducing emissions that is not realized because of the lack of enabling policies.

Policies can be of different types.

- Simplifying red tape for planning and permitting like for big hydro and nuclear

- Energy efficiency standards for appliances and cars
- Building codes for energy efficiency
- Subsidies for fast market penetration of renewable energy and how to get these to scale, and thereby reduce costs for the technologies
- Sharing of R&D (research and development) costs between governments and business for new technologies like carbon capture and storage or next generation of nuclear energy
- Risk guarantees for these new major technologies

### Technology transfer

In the efforts to find a way to engage the developing countries in a global climate agreement there have been proposals for industrialized countries to buy IPRs (intellectual property rights) and transfer technology, as was done for HIV/AIDS and the Montreal Protocol.

These examples are not applicable to climate change. The private sector wants investment opportunities, not divesting its technologies. Even if we were willing to sell technology then, the scale of technology for climate change would be prohibitive in monetary terms. Besides it would send strong negative signals to business, especially

with respect to investments in future R&D.

What governments can do instead is to facilitate and create the policy frameworks, which encourage the private sector to engage in technology cooperation—to work with our partners in developing countries to invest in clean energy and low carbon technologies. If we have an unambiguous signal from governments within a clear, simple, and fair framework, then that is the direction in which the business investments will move. The carbon markets including CDM (Clean Development Mechanism) are important tools to achieve this.

Business realizes that access to funding and technology will be key for the developing countries' ability to respond to climate change. Finding solutions to this will require innovative thinking around the perspective roles of governments and business.

### Recommendations from business

A number of recommendations have been given to the governments by various national, sectoral, and global business organizations. We believe that the following points could be seen as a common denominator for most of these business recommendations.

An urgent need for a new global policy framework post-2012 to be finalized before the end of 2009 based on—

- A long-term target for GHG emissions
- A price of carbon
- Use of market mechanisms
- Push for energy efficiency and demand-side management
- Strengthened R&D and accelerated deployment of energy technologies
- Clean coal solutions, including carbon capture and storage
- Revival of nuclear and big hydro
- A reformed and broadened CDM
- New policy tools like industrial sectoral approaches

### To conclude

'Business cannot succeed in a society that fails', was stated in one of our reports six years ago. We want thriving societies that are good places for doing business.

The WBCSD, that represent a market value at stock exchanges of \$7 trillion and an economic activity that reaches half of the world's population every day with a product or a service, is looking forward to a constructive public-private partnership to create a sustainable world for future generations.



## POINT OF VIEW

### Climate change and water resources

Dr Prodipto Ghosh, Distinguished Fellow, TERI and Former Secretary, Ministry of Environment and Forests

**L**arge-scale changes in the climate system are a matter of grave concern for vulnerable developing countries like India. Climate change will probably alter the distribution and quality of natural resources such as freshwater. With an economy closely tied to its living natural resource base and climate-sensitive sectors such as agriculture and forestry playing major roles in the livelihoods of hundreds of millions of people, India faces a significant threat due to projected changes in the climate.

The IPCC (Intergovernmental Panel on Climate Change) *AR4 Report* projects the following global impacts on freshwater availability.

- By mid-21st Century, an average run-off increase by 10%–40% at high latitudes and some wet tropical areas, and decrease by 10%–30% in some regions at mid-latitudes and tropics, some of which are already facing water stress. (confidence level: high)<sup>1</sup>
- Increase in drought and flood-affected areas due to extreme changes in precipitation (Confidence level: High)
- By 2100, decline in water supplies stored in glaciers

and the snow cover, reducing water availability for downstream population (confidence level: high)

Changes in key climate variables, that is, temperature, precipitation, and humidity, may have significant long-term implications for the quality and quantity of water. These impacts might be direct or indirect and/or coupled with other human-induced factors such as changes in water supply and demand, land-use patterns, water storage and recharge methods, and land and soil-utilization practices.

While the observed monsoon rainfall at the all-India level does not show any significant trend, regional monsoon variations have been recorded. Increasing trends in the monsoon seasonal rainfall have been found along the west coast, north Andhra Pradesh, and north-west India (+10 to +12 % of normal over the 100 years); while a decreasing trend has been observed over east Madhya Pradesh, north-east India, and some parts of Gujarat and Kerala (-6% to -8 % of normal/100 years). At this point, it is unclear whether or not these changes are attributable to anthropogenic climate change.

A much-debated issue is the impact of climate change on glacier systems. The Himalayan glaciers are a source of freshwater for perennial rivers, in particular the Indus, Ganga, and Brahmaputra river systems. Glacier and the melting snow may impact their long-term lean seasonal flows, with possible adverse impacts on the economy in terms of water availability and hydropower generation. There is evidence that some Himalayan glaciers, besides glaciers and ice and snow cover from other regions, have retreated significantly. Possible causes of the retreat, in case of the Himalayan glaciers, apart from climate change, include natural long-term geological cycles, and local warming and/or change in albedo (reflectivity) of the ice and snow cover due to particulate emissions, which are otherwise not related with climate change. While much further research will be required to establish the precise causation, it is also necessary to evaluate the likely impact on river flows of the glacier retreat, irrespective of causation, and identify measures to augment the river flows during the lean season.

<sup>1</sup> Very high confidence: At least 9 out of 10 chances of being correct; High confidence: At least 8 out of 10 chances of being correct; Medium confidence: At least 5 out of 10 chances in being correct; Low confidence: At least 2 out of 10 chances in being correct; Very low confidence: Less than 1 out of 10 chances in being correct

India is, of course, highly vulnerable to natural climate variability, and anthropogenic climate change is properly viewed as intensification of natural variability. For many decades, India has had large publicly-funded programmes to address the impacts of climate variability, particularly with respect to that of water resources. Water resource conservation is the backbone of the government's programme on agriculture and rural development. Several initiatives have been targeted towards watershed development and management. Promotion of water-harvesting measures, including rejuvenation and revival of traditional water storage systems, are high on the water conservation agenda. The National Water Policy (2002) stresses that non-conventional methods for utilization of water, including inter-basin transfers, artificial recharge of groundwater, and desalination of brackish or sea water, as well as traditional water conservation practices like rainwater harvesting, including roof-top rainwater harvesting, should be practised to increase the utilizable water resources. The Government of India has also circulated a 'Model Bill' to the state governments for regulation of the extraction of ground water. The government

has also urged state governments to pass appropriate legislation to enable regulatory measures to protect the sources of drinking water in rural areas, thereby restricting overexploitation of ground water sources.

Community involvement in management of water resources is also increasingly being realized and encouraged. To be able to effectively address response measures to floods, the government has outlined several initiatives that promote the implementation of flood-proofing measures, including repair and protection of embankments, and prevention of settlements in the flood zones.

Programmes such as the Drought Prone Areas Development Programme and its precursors have addressed issues of agricultural productivity in rain-fed areas. Watershed-based programmes for agriculture, forests, and rural development, with an aim of conserving soil and water, improving productivity, and enhancing ecosystem resilience, have now been implemented for several years.

Overall, India's current fiscal expenditures on various programmes linked to climate variability exceed 2.6% of the GDP (gross domestic product). Nevertheless, it is

clear that these efforts would have to be further strengthened very substantially to enable adaptation to increased variability due to climate change. A particular challenge in the design of the future global climate change regime is the provision of financial resources and technology to developing countries on a scale sufficient to enable sustainable development to proceed, while addressing the imperatives of adaptation. One proposal under discussion is the extension of the present 2% levy on the proceeds of the carbon credits from the CDM (Clean Development Mechanism) to the Adaptation Fund, which is being operationalized, to the other flexibility mechanisms of the Kyoto Protocol. While this option, coupled with the emergence of a stronger, long-term carbon market, driven by deeper emissions cuts in developed countries would certainly help raise financial resources for adaptation, this may be far short of the requirements, likely to be at least several scores of billions of US dollars a year. Further measures would be unavoidable, and apart from raising finances, these too should aim at promoting sustainable development globally.

## Special Edition

# MANAGING CLIMATE CHANGE: A PANORAMIC VIEW

## The evolution of environmental markets: from the Chicago Accord to the Bali Roadmap

Richard L. Sandor, PhD., Chairman and Chief Executive of Chicago Climate Exchange

In 1992 during the Earth Summit, we presented a paper on the framework for a global emission trading system at a 'side show' in a tent, overlooking the beautiful beaches of Rio. The idea was received with great skepticism. At that time, concern over climate change was limited to a few scientists and environmentalists, and the concept of emissions trading was but a theoretical chapter in economics textbooks. Five years later, we hosted the first GHG (greenhouse gas) Emissions Trading Policy Forum in Chicago, and signs that a market could play a decisive role had begun to emerge slowly.

Today climate change is at the top of the agenda for corporate leaders, academics, policy-makers, politicians, and citizens alike. Market-based mechanisms such as emissions trading have become widely accepted as a cost-effective method for addressing climate change. Equity and debt analysts are paying closer attention to climate liability. Even small rural entrepreneurs are exploring the possibility of linking to the

global GHG marketplace. In short, we are witnessing a major transition involving the convergence of financial and environmental markets.

In the four decades that we have been involved as students of new markets, this is the first time that a market has captured the interest of not only academicians and traders, but also social and environmental entrepreneurs.

### *The road so far*

The massive progress in building the institutions to support carbon markets reflects the long history of intellectual developments and practical implementation steps that created the current positive circumstances. As we gear up for the first phase of Kyoto, we have crossed many important milestones but face important challenges ahead. Some of the initiatives for GHG reduction include the EU ETS (European Union Emissions Trading Scheme)-Phase I and the CCX (Chicago Climate Exchange) in the US. Furthermore, other region-specific initiatives in this regard are— the Regional Greenhouse Gas Initiative in

the north-eastern United States; the California Climate Action proposals; emerging programs in Canada, Japan, Australia, New Zealand; and the Asia-Pacific Partnership.

### *The road ahead*

So where do we go from here? The recently concluded Bali Summit provides a glimpse of the general direction we are heading. It seems increasingly clear that we will see a well-integrated plurilateral system of worldwide climate action.<sup>2</sup> The major components are likely to be regional trading systems, supplemented by efforts in the CDM (Clean Development Mechanism) that involves voluntary and retail carbon markets. The challenge is to design a system that facilitates the varying needs of diverse market participants. Issues involving standardization, transparency, monitoring and verification, and the degree of sustainable social and environmental positive externalities appear challenging, considering the scope and sectors involved.

As the market matures, there is a hope that carbon can be the catalyst for

<sup>2</sup> David L. Boren and Edward J. Perkins, *Preparing America's Foreign Policy for the 21st Century*, University of Oklahoma Press, September 1997

motivating numerous environmentally sustainable and social development goals for the rural poor around the world. Just as corporations transform the way they do business in response to the climate challenge, it is critical for us to inform, invent, and provide incentives to the cities and villages around the world to enhance their local

environments in a carbon-friendly mode.

Second, it is of critical importance that the environmental markets further refine and expand channels for integration of carbon absorbing land-use practices, especially reforestation and conservation management of agricultural soils.

Concurrently, there is also a

need to establish risk-sharing mechanisms, such as insurance, in the mainstream domain of carbon markets. The future holds the promise of greater diversity and integration in the marketplace. But I believe we know our destination and this will lead to continued growth in the environmental marketplace.



## Why carbon markets offer the best hope for climate change mitigation

Bishal Thapa and Kunal Sharma, ICF International

Climate change mitigation has been extremely profitable for many Indian companies that have taken advantage of carbon markets. The CDM (Clean Development Mechanism) under the Kyoto Protocol offers companies an opportunity to receive carbon credits for activities that help reduce the GHGs (greenhouse gases). These credits can then be sold in international carbon markets. An equally vibrant voluntary carbon market has also emerged outside the regulated regime. Several Indian companies have been financially benefited by offering offsets for VER (voluntary emissions reductions).

Indian companies have been quick to respond to the opportunities in carbon markets. India leads the world in the number of projects registered under CDM. To date, Indian project developers have been issued over 25 million credits, accounting for over 40% of

the global issue of CDM credits. The market value of India's CDM-based emissions reductions through 2012 could be well over \$5 billion. The pace of projects entering the pipeline suggests that the value could easily double over the next few years.

A few years ago, an official with the Ministry of Environment and Forests suggested that the value of Indian emissions reductions could exceed India's foreign direct investment. Most took it as a bit of promise and a lot of hyperbole. That outlook now appears strikingly prophetic. Furthermore, the impact of opportunities under carbon markets, particularly from CDM and VER, has been beyond the simple value of credits.

Carbon markets have helped open new pathways that can connect development needs to clean technology and financing. Many project developers have used carbon markets to raise financing,

reduce their project risks, and acquire new technology. At the same time, market intermediaries have begun to use these pathways to create new markets for their products and services.

Carbon reduction incentives create pathways by helping to reduce the transaction cost of creating and reaching new customers in the climate change market. Often these are the customers who would never have had the access to technology, financing, or international markets. Banks, for example, have begun to use the investments – made possible by carbon incentives – as the new customer base for their services. Similarly, new markets have opened up for technology providers. Innovative commercial arrangement that aligns with the incentives of carbon markets has helped to connect financial services companies and project developers.

India's engagements with carbon markets have also had an impact on corporate governance and transparency. The creation of new pathways, the certification process, and the monitoring requirements for validating reductions has meant that many companies have had to become more transparent. The engagements with financiers and buyers require a higher level of due-diligence. The certification process for acquiring credits requires transparency with the stakeholders. Monitoring protocols for validating reduction achievement requires detailed record keeping and transparency for

independent verification.

Many carbon deals have failed because of the inability of project developers to satisfy the requirements for transparency in the certification or the commercial negotiation process. But many successful carbon reductions projects have institutionalized greater transparency, better record keeping, and enhanced accountability to stakeholders. Improvements in corporate governance, accountability, and transparency will be one of the lasting impacts as the new pathways for carbon markets deepen and mature.

Action on climate change mitigation and adaptation

cannot be achieved by governments alone. They require markets where incentives can drive the development, adoption, and diffusion of new clean technologies. Translating incentives into actions would require markets that are free, and are able to connect different regions, different people, and different cultures. And as the Indian engagement has demonstrated thus far, markets have the ability to sustain a low carbon growth without risking development. Markets must continue to be our primary instrument in the fight against climate change.



## CDM—industry has an important role in low carbon growth

Charles Cormier, Sr Carbon Finance Specialist, South Asia Region, World Bank

There is a growing alarm that global temperatures are rising due to the accumulation of GHGs (greenhouse gases) in the atmosphere. To arrest this trend, the world must find ways to achieve economic growth that is also sustainable—commonly called low carbon growth.

In 1997, the industrialized countries agreed under the Kyoto Protocol, to reduce their GHGs by 5%. Although the effort required under the Kyoto Protocol is modest, and the protocol expires in 2012, it has set the stage for unprecedented international cooperation to fight climate change. The Kyoto Protocol has established instruments

that use market forces to find the most economic means for reducing GHGs and steer the global economy towards low carbon growth. One such instrument, the CDM (Clean Development Mechanism), allows entities in industrialized countries to purchase GHG reductions from projects in developing countries such as India which can achieve reductions in GHGs at a much lower cost than the developed nations. By investing in climate-friendly technologies, developing countries can sell their emission reductions, provided they reduce emissions when compared to a business-as-usual scenario. Already, the

CDM has achieved some success by growing to an annual market of \$5 billion.

One of the greatest challenges facing the international community today is to come up with an equitable agreement that would significantly reduce GHGs to avoid the worst consequences of climate change. These would occur if global temperatures were to rise by more than 2 to 3 degrees celsius. To prevent this, many analysts feel that global emissions would have to be reduced by as much as 50% or more by the mid of this century. Under such a scenario, the CDM market could grow to \$100 billion

annually. This would provide significant transfers from the countries of the north to the south for the deployment of climate-friendly technologies. The international community agreed at Bali in December 2007 to begin negotiations for a successor to the Kyoto Protocol, which would come into force in 2013.

India has traditionally had a low carbon economy. It generates among the lowest GHGs per capita, emitting one ton per capita per year. China emits close to four times that amount. Canada and the US emits eighteen and twenty times the amount emitted by India, respectively. India's carbon intensity (a measure of how much GHGs are generated per unit of gross domestic product has been lower than that of the comparable economies, and more importantly, it has been declining since 1995, despite the country's strong economic performance. However, it is expected that a large portion of the growing energy demand over the next few decades will be met by fossil fuel generation, which means that India's GHG generation is expected to increase.

Although its economy is already efficient, Indian entrepreneurs have found numerous opportunities to further reduce the GHG emissions through CDM. So far, India has been the second largest supplier of GHG reductions among the

developing countries. India holds 12% of the market share compared to China's 61%. India also has the second largest portfolio of approved projects by the national designated authority, with more than 750 projects approved by the Ministry of Environment and Forests. Till now, CDM projects in India have been concentrated on renewable energy such as small hydro and small scale cogeneration using bagasse, rice husk, and mustard crop residues as a source of biomass. India's CDM projects covers energy efficiency measures in many industrial sectors including SMEs (small and medium enterprises) and industrial sectors such as cement production, as also the elimination of industrial gases.

Industry has a significant role to play, if the CDM is to fulfil its promise and assist developing countries such as India in achieving low carbon growth. Business leaders should, for instance, replicate successful CDM projects from India and elsewhere, and screen every investment project to determine whether it is eligible for CDM or not. In the energy sector, many opportunities already exist to catalyse investments in renewable energy to meet the growing energy needs, as well as to improve efficiencies in coal generation, hydropower generation, and transmission and distribution. In the urban

sector, the CDM can bring additional revenues from the sale of emission reductions, and lower investment risks for waste management, wastewater treatment, and water supply. For the SMEs and households, the private sector would have to build its capacity to bundle a number of small energy conservation projects together, so that it can sell the minimum quantity of emission reductions required by many buyers. There are also numerous uncovered opportunities available to the entrepreneurs, who understand the eligibility requirements of the CDM.

The financial sector has a significant role to play as well. It should learn how the CDM reduces project risks, by providing an additional revenue stream. For instance, a wind power project that is eligible for the CDM, sells energy to the grid as well as emission reductions to a foreign buyer, thus bringing two revenue streams to the same project. Once this is fully realized, the financial sector should find ways to provide incentives for investments in climate-friendly technologies, on preferential terms.

Finally, the private sector must advise those involved in the negotiations for a successor to the Kyoto Protocol on how to improve the CDM, so that it can be scaled up and further contribute to the global effort to combat climate change.



## Energy efficiency and public policy: no rocket science, but no magic bullet either

Dr Ajay Mathur, Director General, Bureau of Energy Efficiency, Government of India

Ever since the industrial revolution began, energy efficiency has been a prime driver of technological change in industry. In the short run, energy efficiency measures have enhanced the bottom-line, and helped in maintaining and expanding market shares. In the longer run, they have contributed to the development of innovative and disruptive products, which have helped companies to redefine competition, and often create new markets. Increases in energy efficiency are therefore generally internalized in competitive industrial markets, not surprisingly then, industrial energy efficiency has continued to plod ahead even when energy prices have been stagnant. For example, in the 25 years between the end of the Second World War and the first oil shock, the energy intensity of the industry in OECD (Organization for Economic Cooperation and Development) countries decreased by 40%, even though energy prices remained more or less flat during this period. As a result, there was, till 1972, relatively limited public policy attention to industrial energy efficiency.

The oil shocks changed that calmness forever. For a few years following the first and the second oil shocks, energy efficiency received a huge amount of public policy attention, and again in the last

ten years, energy efficiency is being seen as a major solution to the climate-change challenge. The energy security, macroeconomic stability, and environmental impact dimensions of energy use have brought centre-stage, the opportunities for public policy to accelerate industrial energy efficiency.

At first glance, this effort seems trivial and mundane. Public policy measures, which would limit GHG emissions, increase energy prices, or establish minimum energy performance measures will spur energy efficiency. Why is it then still proving difficult to craft public policy to accelerate industrial energy efficiency?

The foremost reason is the need to ensure that a number of businesses which are adversely affected by the change in public policy are kept to the very minimum. This is because all industries are not equally equipped to handle technological change, with some industries unable to decide between technological choices, and others unable to manage the uncertainties in operating costs and performance that always accompany a shift to a new energy technology. Such industries are very vocal about potential losses and, as in any case of unfavourable policy change, lobby hard and bitterly about the unfairness of proposed policy changes.

Supporting policy measures are therefore needed to address diversity. In India, for example, we are seeing the installation of some of the world's most energy efficient industrial units in almost every sector; for example seven Indian cement plants today operate at the global frontier of energy efficiency. But when it comes to older and smaller units in same sectors, energy efficiencies are often much lower, and technological options suitable for these units are also often not available. Consequently, enabling technological change in such industries may require a host of accompanying policy measures such as vendor development, pilot projects, facilitation of financing, and credit risk guarantee mechanisms, in addition to increases in energy prices or setting of performance standards.

The second problem is to calibrate policy so that the required energy efficiency and climate mitigation goals are met. Across the world, the macro-economic modelling of energy efficiency policy interventions has tended to overstate gains, where as bottom-up technology-based micro-economic cost-benefit analysis has tended to underestimate total benefits. This necessarily calls for a 'probe-and-learn' approach in which iterative policy intervention is used to fine-

tune policy measures. However, this approach has high transaction costs, both for industry and government. At the same time, they also necessitate a robust institutional structure for data reporting and validation so that the 'probing' is meaningful. In India, we have notified nine industrial sectors within which large industrial units with energy consumption exceeding specified benchmarks would need to report energy-use

data, and periodically validate the data through energy audits carried out by an accredited energy auditor.

Does all this mean that it is too complex to use public policy to accelerate industrial energy efficiency? Global experience suggests that government-industry discussions and joint benchmarking of energy-use, prior to any policy intervention, makes all the difference. During this process, intentions and

expectations get a 'reality check' and a trust is created, along with an understanding of the supporting policy measures needed. This moves energy efficiency from being a boiler-room issue to a boardroom issue, facilitating earlier and strategic investments in energy efficiency. Most importantly, systems for energy-use measurement and reporting are also established. For, at the end of the day, what gets measured gets done.

### Pathways to Green Publishing



TERI Press announces a first-of-its-kind event in India. Titled Pathways to Green Publishing, the event will bring together stakeholders from the print, paper and publishing industries to raise issues of immense concern related to the impact of existing practices on natural resources like water and forests. To institutionalize its ideas on green publishing, TERI Press has established the Green Publishers' Guild. The Guild aims to create a common platform for everyone involved in these industries to interact with each other, identify the critical issues of environmental concern in publishing and printing, and work towards finding innovative solutions.

### Shree Group of Companies

In recognition of its best energy-efficiency practices and environment and quality excellence, the Shree Group of Companies has been given the award for Excellence in Electrical and Thermal Energy, Environment and Quality by the National Council for Cement and Building Material in 2007. Further, the group has received the National Award for Energy Conservation 2007 from the Ministry of Power, Government of India; the Water Efficient Unit Award at the National Award for Excellence in Water Management 2007 Summit conducted by the CII (Confederation of Indian Industry) - Godrej GBC; and the India Manufacturing Excellence Award 2007.

**Heartiest congratulations from TERI-BCSD India!**

# FOCUS

## TERI-BCSD member companies: climate change initiatives

### RBS Home Appliances Pvt Ltd (representing Bosch and Siemens Home Appliances Group)



BSH's underlying conviction is

that driving forward new technologies not only generates a competitive edge and provides greater convenience for customers, but also benefits the environment. To this end, over the last 15 years, we have consistently reduced the resource consumption of our main products. This includes an 80% reduction in energy use by refrigerators, 40% for dishwashers (57% less water use), 37% less for washing machines (67% less water), and 31% less energy for ovens. Additionally, BSH has designed and launched protos, the plant-oil stove, focused on reducing emissions in households that use kerosene, wood, and charcoal in cooking.

### Dr Reddy's Laboratories Ltd



We believe that viewing

environmental threats from a business perspective always helps. Our approach while managing the climate change issue is in line with this thought. We have initiated the following steps.

- The CEO (chief executive officer) addressed various groups across the company.

- Film shows of 'Inconvenient Truth' were organized.
- Special poster campaigns to emphasize the linkage between global warming and energy consumption were launched.
- Energy targets for manufacturing and offices have been defined.
- GHG inventory has been initiated.
- Energy audits for manufacturing and offices are being carried out.
- We participated in the Carbon Disclosure Project.
- A detailed review is presented in our *Sustainability Report of 2007*.

### The GMR Group



The GMR Group is committed

to an environment-friendly business; addressing its goals of efficiency, environmental protection, and safety; and emphasizing its belief that 'What is good for the environment could equally be good for business'.

In almost all its ventures in the areas of agri business, airports, energy, highways, and urban infrastructure, GMR has striven to set very stringent environmental standards. It is worth mentioning here that though the 'Gazette Publication

Specification' allows up to 2% sulphur in LSHS (low sulphur heavy stock) used for power generation, GMR resolved to use LSHS with only 0.6% to 0.8% sulphur, and went as far as procuring a customized engine capable of using such fuel.

### SHELL Group of Companies in India



As a leading energy

provider to the world, Shell is committed to finding solutions to climate change while addressing the developmental and economic needs of societies. Shell has a portfolio of businesses including liquefied natural gas, retail fuels and lubes, technology, and services in India. We acknowledge the realities of climate change and address them in the way we do business. Environmental performance is integrated into each one of our operations. We are active in the development of business models and technology for renewable and low-carbon energy. Equally, we lead in environmental education and via the Shell Foundation, develop low-carbon alternative energy solutions for the market at the bottom of the pyramid.

## Rabo India Finance Ltd



Rabobank aims to be a driver and an innovator that contributes towards sustainable development. Based on this mission, Rabobank has allocated 18 billion euros globally for sustainable

ventures such as clean technology funds, renewable energy project financing, low energy housing, and so on. Rabobank has also been a major player in the evolving the CDM market, starting as a founder member of the World Bank Prototype Carbon Fund, and sourcing CERs (certified

emissions reductions) from Rabobank's Food & Agri and Renewable Energy Corporate Client Franchise in Asia and Latin America. Rabobank has also introduced a climate change credit card to make cardholders 'carbon neutral' by investing directly in 'Gold Standard' climate projects.

## PARTNERS IN CHANGE

### Biomass gasifier as DSM option for Indian crumb rubber industry

A large amount of mechanical, electrical, and thermal energy is used in the processing of rubber. The use of diesel and electricity involves a substantial part of the processing cost. In recent years, producer gas made from a variety of biofuels such as rubber wood, coconut shells, and cashew shells has been established as a viable alternative to replace diesel. The replacement value is about 3.2 kg of rubber wood or coconut shells for 1 litre of diesel.

The BETA (Biomass Energy Technology Application) group of TERI had developed biomass



A downdraft gasifier with cleaning system installed at Always Rubex (P) Ltd

gasifiers for various thermal applications. These systems have demonstrated fuel savings of the order of 50%–60%, along with a significant increase in overall productivity at the enterprise level. Devices based on gasifier technology for thermal applications are now available commercially through manufacturers, licensed by TERI.

A gasifier-based rubber drying oven was designed and developed by TERI. The technology for developing this device has been transferred to Paramount Enviroenergies Pvt Ltd for commercialization. The first biomass gasifier system, installed and tested at Always Rubex Pvt Ltd, Always in March 2001, was integrated with the existing tunnel dryer. Subsequently, almost all the crumb rubber processing units in the private sector have been shifted to biomass gasifier system. A few photographs of the systems installed are shown in the figure. It is estimated that the crumb rubber



An updraft gasifier installed at Specified Rubber Pvt. Ltd

manufacturing industry alone has a potential of replacing 30 MW (megawatt) of electrical power in Kerala, translating to about 4 million tonnes of CO<sub>2</sub> saved during the project cycle of 15 years.

#### For further details contact:

Mr Sunil Dhingra  
 Fellow  
 Biomass Energy Technology  
 Applications  
 Energy-Environment Technology  
 TERI

## New members at TERI-BCSD India

### Dr. Reddy's Laboratories Ltd



**D**r Reddy's Laboratories is a global and vertically integrated pharmaceutical industry. It has a presence across the value chain through its various businesses, including APIs (active pharmaceuticals ingredients), branded formulations, generics, biologics, speciality projects, and NCEs (new chemical entities). The company's products are marketed in over a 100 countries with a major focus on North America, Europe, India, Russia, and other emerging markets. The company conducts NCE research in the areas of

metabolic disorders, cardiovascular indications, and infectious diseases at its research facilities in Atlanta (USA) and Hyderabad (India). The annual turnover of the company is approximately Rs 65 billion. It has over 9000 associates across 40 geographical regions.

Dr Reddy's social responsibility initiatives address the needs of our key stakeholders—the people, patients, doctors, customers, business partners, and society. We focus on employee development, product safety, patient assistance, human rights,

harmony with neighbourhood community, and active participation in addressing critical social issues that impede economic development.

#### Areas of interest include

- Biotechnology
- Climate change
- Environmental education and awareness
- Green Buildings
- Health care and sustainable livelihoods

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### BAJAJ ECO-TEC PRODUCTS LTD



Bajaj Eco-Tec Products Ltd is involved in the business of building material industry. However, the commercial production is yet to begin. It has around 1200 employees. The company's factories are located in Kinnauri, Meerut; Kunderki, Gonda; and Palia Kalan, Lakhimpur Kheri.

The Bajaj Eco-tec Products Ltd manufactures wood-free particle boards, MDFs (medium-density fibreboard), HDFs (high-density fibreboards), and laminated flooring from bagasse. This saves the felling

of matured lush green forest resources.

An efficient and an environmentally beneficial usage of bagasse, through the manufacture of bagasse-based wood substitutes, shall encourage the rural population to cultivate sugar cane as a staple crop. It will provide a source of employment for the rural masses. The domestic produce of wood substitute shall make India self-sufficient, and shall plug the demand gap of the domestic markets for wood substitutes which are being

imported. This would further add to our foreign exchange reserves.

#### Areas of interest include

- Climate change
- Environmental education and awareness
- Green Buildings

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 Mr S Samadder  
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 General Manager (North Zone)  
 Bajaj Eco-tec Production Ltd  
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 Noida – 201 301

## GMR Group

The GMR Group is involved in the business of infrastructure development. It has around 2000 employees working in its factories and plants located in various parts of the country.



GMR Group has been committed to environment-friendly business in all its areas of operation like agri business, airports, energy, highways and urban infrastructure. In one of its

recent initiative in this direction, GMR resolved to use LSHS with only 0.6% to 0.8% sulphur and even forced the engine manufacturer to redesign the engine for use with such fuel.

### Areas of interest include

- Biofuels
- Climate change
- Environmental education and awareness
- IT applications for rural development
- Rural and renewable energy

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## RBS Home Appliances Pvt Ltd (representing Bosch and Siemens Home Appliances Group)



RBS Home Appliances Pvt. Ltd is involved in the production of consumer durables. The annual turnover of RBS in India is Rs 500 million and BSH Rs 8 billion. At present, it has around 135 employees.

The company's present efforts are directed towards environmental management

and social responsibility. BSH issues an environmental report every year.

### Areas of interest include

- Biofuels
- Climate change
- Forestry and biodiversity
- Rural and renewable energy

- Rural extension activities  
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## Contributions invited

**EnCoRE invites contributions from TERI-BCSD India members on themes related to sustainable development in the form of**

- |                 |                   |                |
|-----------------|-------------------|----------------|
| • News          | • Articles        | • Case studies |
| • Announcements | • Technical notes | • Suggestions  |

All members are requested to send latest company annual reports; environment, corporate social responsibility, and sustainable development reports

**For details on advertising and contributing in EnCoRE, please contact**

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## ON THE MOVE

### Towards reaching energy efficiency in buildings – a business initiative

The global energy scenario has undergone a drastic change in the last two decades. It is estimated that almost two-thirds of the global energy demand is due to buildings, as far as their construction, operation, and maintenance are concerned and is expected to grow by an additional 45% by 2025.

In this scenario, the introduction of energy efficient building design concept has become critical for achieving the collective objectives of energy security and environmental protection, which in turn can ensure economic and social development.

TERI in India has been working in the areas of green building for the past 15 years. TERI GRIHA (Green Rating for Integrated Habitat Assessment) provides an integrated approach to design green buildings in the Indian context, with primary focus and emphasis on energy efficiency aspects of building design and operation.

TERI-BCSD (Business Council for Sustainable Development) India, in association with WBCSD (World Business Council of Sustainable Development) organized the EEB (Energy Efficiency in Buildings) India Forum on 31 October 2007 at Hotel Le Meridien, New Delhi. The forum brought

together more than 120 stakeholders from national and international arena to discuss and deliberate on the concept of 'EEB – a national competitive advantage'.

'EEB, a project initiated by WBCSD, brings together leading companies in the building, equipment, and



Inaugural session of EEB India Forum 2007

energy industries from across the globe to examine the entire value chain. It aims at producing a roadmap for reaching energy self-sufficiency in buildings by 2050, while at the same time being economical and socially acceptable.

In the opening remark at the forum, Dr Pachauri said that energy-efficient design concept has become critical for achieving collective objectives of energy security and sustainable development. He said that if the industry takes the initiative in coming up with solutions that lead to energy efficiency building, then clearly, that's the most

sustainable path that we could perhaps adapt.

Mr V Subramanian, Hon'ble Secretary, MNRE (Ministry of New and Renewable Energy) mentioned that the MNRE is trying to coordinate with Ministry of Power, Ministry of Urban Development, various NGOs, and research institutions to promote green building. He proposed that local municipal bodies give tax break to buildings rated by the Indian system. Subsequent to the EEB India Forum, on the 1 November 2007 the MNRE signed a MoU (memorandum of understanding) with TERI. With the signing of this MoU, the rating

system of TERI-GRIHA, a tool developed by TERI for rating the environmental performance of buildings, has now become a national rating system.

The event concluded with the agenda that TERI-BCSD, along with its member companies, would convert the deliberations of the forum into action, and with the support of WBCSD, mobilize a national EEB project in India.

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## International initiatives

### CDM Bazaar web-portal

The UNFCCC CDM (Clean Development Mechanism) Bazaar is a web-based facility that serves as a platform for exchange of information on CDM project opportunities. The web portal is designed to facilitate exchange of information among buyers, sellers, and service providers engaged in the CDM. The UNFCCC CDM Bazaar covers the supply of and demand for CDM projects, that is, the actions taken by project sellers, buyers, and service providers (in a broad sense).

The key objective of the Bazaar is to facilitate the creation of an efficient global CDM market through shared information related to the project activities and transactions of CERs (certified emissions reductions) among stakeholders worldwide. The UNFCCC CDM Bazaar is a global 'virtual information exchange place' open to all interested parties. It aims at facilitating an initiative that will help reduce transaction costs in the CDM project cycle as well as encourage increased information exchange and dialogue among current and potential future project participants and other market players. The UNFCCC CDM Bazaar has three main market corners—the seller section, the buyer section, and the service provider section. Market players can upload user profiles to be viewed by

others. They can also upload information of specific projects or make notices of CERs for sale. In addition to the three market corners, there is an announcement area. This section shows announcements of employment opportunities, events, and publications related to carbon market.

*www.cdm-bazaar.net*

### WBCSD on energy and climate

The WBCSD (World Business Council on Sustainable Development) recognizes that energy and climate change are of high importance for today's societies and a key challenge in the 21st century. The Energy and Climate project is working on developing innovative ways for business to address global warming within a sustainable development framework. By devising practical mechanisms, measurement tools, and market-based solutions, the project helps companies reduce the impact of their operations today. WBCSD helps them prepare for a carbon-constrained future by exploring the energy frameworks, sources, and technologies.

The WBCSD launched the GHG (greenhouse gas) Protocol Initiative with the World Resources Institute to develop a set of practices that companies can use to account for, and report on their GHG emissions. The GHG Protocol aims at harmonizing GHG

accounting and reporting standards internationally to ensure that different trading schemes and other climate related initiatives adopt consistent approaches to GHG accounting. The GHG Protocol Initiative consists of two modules, the Corporate GHG Accounting and Reporting Standard (corporate module) and the Project GHG Accounting and Reporting Standard (project module).

*http://www.wbcsd.org/includes/getTarget.asp*

### Carbon Disclosure Project

The CDP (Carbon Disclosure Project) is an independent not-for-profit organization aiming to create a lasting relationship between shareholders and corporations regarding the implications for shareholder value and commercial operations presented by climate change. Its goal is to facilitate a dialogue, supported by quality information, from which a rational response to climate change will emerge. CDP leverages its data and process by making its information requests and responses from corporations publicly available; helping catalyse the activities of policy-makers, consultants, accountants, and marketers.

The CDP also launches the CDLI (Climate Disclosure Leadership Index), a prestigious roll of honour for global corporations addressing the challenges of

climate change. The CDLI comprises 68 FT500 companies that show distinction in their responses to the CDP survey based on their reporting of GHG emissions and assessment of

climate change strategies. In the 2007 FT500 Report, there is also a Climate Leaders Matrix, which ranks the CDLI companies against environmental performance. This helps analysts and

investors assess how a company is performing as compared to its quality of disclosure on climate issues.

<http://www.cdproject.net/index.asp>

## RESOURCES

### Publications

**Investing in a Low-Carbon Energy Future in the Developing World**  
WBCSD. 2007  
Geneva: World Business Council for Sustainable Development. 15 pp.  
Price: \$10.00

The report explores how governments and business can work together to solve challenges by aligning policies, mechanisms, and tools with the commercial conditions under which a business enterprise invests, in order to scale up private investment. The ability of a technology or infrastructure project to attract investment depends heavily on commercial returns. The report provides a clear commercial business perspective by addressing how and why business invests, investment risk profiles, and the incentives needed in order to scale up investment in new technology research, development, demonstration, and deployment.

**Markets for Ecosystem Services – New Challenges and Opportunities for Business and the Environment**  
WBCSD. 2007  
Geneva: World Business Council for Sustainable Development. 20 pp.  
Price: \$10.00

The report shows how at a fundamental level, all economies and businesses depend directly or indirectly on the conservation of biodiversity and the sustainable supply of ecosystem services. The perspective paper is intended for both the business and conservation communities, and attempts to establish a shared vision of market-based approaches to nature conservation. The publication states that conserving ecosystems, and sustaining the services they provide, is a prerequisite for prosperity. Environmentalists have long argued this. Business, governments, and society at large are catching up.

**World Sustainable Development Outlook 2007**  
Ahmed A (ed.). 2007  
UK: Greenleaf Publishing. 400 pp  
Price: £65.00

The theme of this year's *Outlook* is about different dimensions of knowledge and technology management in the new era of information revolution and how they relate to sustainable development. The *World Sustainable Development Outlook* series has been developed to provide an overview of sustainable development and to discuss its importance. Furthermore, it provokes forward thinking on the development of a more coherent approach in solving global problems related to sustainability through science and technology. In doing so, a holistic approach is used to critically examine the interrelationship between the natural, governmental, economic, and social dimensions of the world, and to see how science and technology can contribute to solutions. The book uses case and country studies in technological

innovation and experience so that lessons in effective management of ICTs (Information and communication technology) can be learned from successful initiatives, ideas, and innovations.

**The State of Responsible Competitiveness 2007: Making Sustainability Count in Global Markets**  
**AccountAbility. 2007**  
**London, UK: AccountAbility.**  
**156 pp**

The publication is a progress report on countries' efforts in

advancing competitiveness based on responsible business practices. It provides a unique health check on responsible globalization. The report identifies major opportunities in more responsible markets in climate change, gender, human rights, and anti-corruption. The report notes that smart businesses, climate-friendly cities, sunrise sectors, and responsible countries can win massive market shares in the global markets of tomorrow. Others will fail to coordinate their strategies and lose out. The

responsible competitiveness index, covering 108 countries accounting for 96% of global economic activity, blends 21 data streams from authoritative sources in assessing countries' progress in advancing responsible business practices at the heart of their competitiveness strategies and practices.



## Internet resources

### CSR Center

<http://www.csrcenter.net/>

CSR Center is a global initiative aimed at creating a dynamic community. It provides an online platform for young students, graduates, and professionals who are active in the fields of corporate social responsibility and sustainable development. CSR Center enables browsing through a diverse and expanding database of CSR knowledge and bringing the analytical talents of highly motivated students to CSR issues that are relevant to an organization. The CSR Center library includes books, papers, thesaurus, courseware, audio, and video resources.

### Chicago Climate Exchange

<http://www.chicagoclimatex.com>

The CCX (Chicago Climate Exchange) is a global marketplace for integrating voluntary legally binding emissions reductions with emissions trading and offsets for greenhouse gases. CCX is a self-regulatory, rules-based exchange, designed and governed by the CCX members. CCX facilitates capacity building in both public and private sector to facilitate greenhouse gas mitigation, and build the skills and institutions needed to manage greenhouse gas emissions in a cost-effective manner.

### CARBON yatra

[www.carbonyatra.com](http://www.carbonyatra.com)

The web site gives the Indian CDM (Clean Development Mechanism) registration, CDM validation lists, CDM CER (certified emissions reductions), CDM methodology, and CER lists; spot prices; and baseline data. *Service request* allows users to fill up their service requirements in the forms. *Carbon classified* features the service requests by companies. Other sections include links, news, and experts corner.

### Carbon Free Zone

<http://www.carbonfreezone.com/>  
 The web site is a common information-sharing platform for various parties involved in

CDM project related activities. Information for those interested in CDM projects include Carbon Market and CDM Bazaar which further include search for CDM projects, CER/VER sellers, CDM project investors, CER/VER buyers, services companies, technical experts, and call for expression of interest. Other information

resources comprise market news, events, and links.

### Voluntary Carbon Standard

<http://www.v-c-s.org/>

The Voluntary Carbon Standard has been launched at the London Stock Exchange boosting business, consumer, and government confidence in the voluntary carbon market.

The Voluntary Carbon Standard provides the much needed quality assurance for certification of credible voluntary offsets. The rigour and transparency of the Standard is expected to boost market confidence for many companies and individuals keen to take a lead on tackling climate change by going carbon-neutral.



## The CEO Forum 2008 Sustainable Development and Climate Change: The Business Outlook 6 February 2008, New Delhi

Recognizing the increasingly important role played by the business sector in transforming the world economy and the stake it has in global development, TERI-BCSD (Business Council for Sustainable Development) India, in partnership with the WBCSD (World Business Council for Sustainable Development), Geneva, introduced the CEO Forum as a curtain raiser to the DSDS (Delhi Sustainable Development Summit) in 2004. Since then, the CEO Forum has become one of the foremost global CEO meets to discuss the challenges facing companies in the context of sustainable development. Since the last 4 years the CEO Forum has attracted more than 100 Indian and International companies, International Organisations and Institutions and various Heads of State and Government officials.

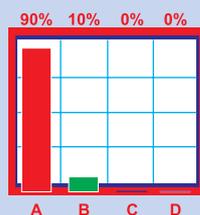
This year the CEO Forum will seek to deliberate on issues, challenges, and opportunities related to industry in the context of climate change. It will bring better understanding of the risks faced by different sectors of

industry; their level of preparedness; and the opportunities, barriers and scope for partnership among industry, research, and international organizations. The discussions would focus on specific themes like: Business challenges of climate change; adaptation of businesses and mitigating opportunities and drivers for change.

Preceding the CEO Forum this year, TERI-BCSD India had organised its Executive Committee Special Dinner Meeting on 31st October 2007, to catch the pulse of the business sector's perspective on climate change. More than 70 CEOs (Chief executive officer) of leading companies; other special dignitaries included Mr Bjoern Stigson, President - WBCSD and Dr R K Pachauri, President - TERI-BCSD India; Mr Jairam Ramesh, Hon'ble Minister and Industry participated in the meeting. Through a voting system business outlook to climate change was brought forth, where India Inc. voted for proactive action against climate change. Some of the poll results are as follows:

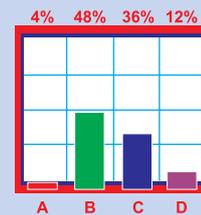
#### How should the industry address the issue of climate change?

- A Act proactively
- B Wait for government
- C Business-as-usual



#### In coming 5 years, what will be the share of renewable energy in your business?

- A None
- B 1%-10%
- C 11%-20%
- D >20%



For more insight on the business perspective and poll results please visit [www.teriin.org/bcsd](http://www.teriin.org/bcsd)

## New arrivals at TERI library

- UNEP. 2007  
 Nairobi, Kenya: United Nations Environment Programme. 540 pp  
***Global Environment Outlook: GEO-4***  
 GEO-4, the latest in UNEP's series of flagship reports, assesses the current state of the global atmosphere, land, water and biodiversity; describes the changes since 1987 and identifies priorities for action. GEO-4 is the most comprehensive UN report on environment, prepared by about 390 experts and reviewed by more than 1000 others across the world. GEO-4 acknowledges that technology can help to reduce people's vulnerability to environmental stresses, but says there is sometimes a need 'to correct the technology-centred development paradigm'. It explores how current trends may unfold by 2050 in four scenarios.
- Keokhane N O and  
 Olmstead S M. 2007  
 Connecticut: Island Press. 274 pp  
***Markets and the Environment***  
 The book provides a comprehensive introduction to the economic theory of environmental policy and natural resources management. It examines the benefits and costs of environmental protection, markets and market failures, and natural resources as capital assets. The book covers efficiency of markets, market failures, market-based instruments, and sustainability and economic growth.
- Worldwatch Institute. 2006  
 New York: WW Norton & Company. 160 pp  
***Vital Signs 2006-2007: the trends that are shaping our future***  
 From the growth in world population and the global economy to a decline in the world's ecosystems, the book documents the trends that are shaping the future. The report paints a grim picture of the planet's vital signs, and warns that dramatic changes in the global economy are needed to fend off ecological, economic, and social catastrophes. The report notes that fossil fuel burning over the past 150 years has caused a massive influx of atmospheric carbon dioxide (a leading contributor to global warming).
- Cunningham N, Kagan R A,  
 and Thornton D. 2003  
 Stanford, California: Standard University Press. 210 pp  
***Shades of Green: Business, Regulation, and Environment***  
 This in-depth study of fourteen pulp manufacturing mills in the United States, Canada, Australia, and New Zealand reveals that steadily tightening regulatory standards have been crucial for raising environmental performance. Overall, the findings provide significant and intriguing suggestions as to why some firms are 'greener' than others. In particular, the authors make a compelling case for the key influence of management style on environmentally sound performance.
- Sarkis J (ed.). 2001  
 Sheffield, UK: Greenfield Publishing. 387 pp  
***Greener manufacturing and operations: From design to delivery and back***  
 The books aims to capture state-of-the-art and future practices in environmental manufacturing, operations, and issues in one concise volume. A number of levels of decision-making are represented from long-term strategic issues such as supply chain design, to traditional short-term operations decision-making and planning issues such as production planning. Many of the principles developed and presented here can also be extended to the general process management of service organizations. The book is organized into four major sections—operations strategy and policy; manufacturing and operations practice; tools for managing greener operations and manufacturing; and case studies.

## CALENDAR OF EVENTS

New Delhi, **India** **DSDS (Delhi Sustainable Development Summit) 2008**  
7-9 February 2008 **Sustainable Development and Climate Change**

The Summit Secretariat, TERI, Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi - 110 003, India  
*Fax:* +91 11 24682144 / 24682145  
*E-mail:* dsds@teri.res.in  
*Website:* <http://www.teriin.org/dsds>

London, **UK** **The Climate Change Summit 2008**  
12-13 February 2008 Ethical Corporation, 7-9 Fashion St. London E1 6PX, UK.  
*Website:* <http://www.ethicalcorp.com/climate/>

Honolulu, Hawaii, **USA** **7th International Symposium on Advanced Environmental Monitoring**  
25-28 February 2008

Young J Kim, Symposium Chair, Director, Advanced Environmental Monitoring Research Centre, Professor, Department of Environmental Science and Engineering, Gwangju Institute of Science and Technology, 1 Oyrong-dong, Buk-gu, Gwangju 500-712, Republic of Korea  
*Fax:* +82 62 970 3404  
*E-mail:* vjkim@gist.ac.kr  
*Website:* [ademrc.gist.ac.kr/7th\\_sym](http://ademrc.gist.ac.kr/7th_sym)

Berlin, **Germany** **Global Corporate Responsibility Reporting Summit**  
3-4 March 2008 Ethical Corporation, 7-9 Fashion St. London E1 6PX, UK.  
*Website:* <http://www.ethicalcorp.com/globalreporting>

New Delhi, **India** **Pathways to Green Publishing: a stakeholders' dialogue on ecological and sustainable publishing practices**  
5 April 2008 Organized by TERI (The Energy and Resources Institute) Press Le Meridian Hotel, 8, Windsor Place, New Delhi - 110 001, India  
*E-mail:* ambikas@teri.res.in

Alexandria, **Egypt** **International GEF Workshop On Evaluating Climate Change And Development: Results, Methods And Capacities**  
10-13 May 2008 Secretariat of the International Workshop on Evaluation Office of the Global Environment Facility - GEF EO, 1818 H Street. NW 20433 Washington, DC. USA  
*Fax:* 1+ (202) 522 1691  
*Tel.:* 1+ (202) 458 8537  
*E-mail:* IntWorkshop@TheGEF.org  
*Website:* <http://www.esdevaluation.org/>