Climate Change Research Institute

"Environment and Earth Care" (EEC) Lecture Series

Mentoring and Inspiring Youth to Take Climate Change Action

Program Coordinator: Dr. (Mrs.) Malti Goel

Environment and Earth Care (EEC) Lecture Series

Introduction

The Climate Change Research Institute (CCRI) has started Environment and Earth Care (EEC) Lecture Series at the recommendation of Prof. D.P. Agrawal, Chairman of the Governing Council. The EEC Lecture Series has received unique response from youth in schools and colleges. It sensitizes school students from class VIIIth to XIIth, teachers and college students as well as public to learn about the scientific & technological solutions for the contemporary issues related to Environment, Energy and Climate Change.

Awareness Campaigns and Competitions among school students are held for youth from different strata of society.

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Future Energy Paradigms for Clean Environment

Sh. V.S. Verma, Former Member, Central Electricity Regulatory Commission (CERC) delivered the EEC Lecture

13th FEBRUARY 2015

at

India International Centre, New Delhi

"Sustainable energy will never use up or depleted"

"Renewable energy technologies are clean sources of energy"

"Coal energy is nonrenewable energy resource increasing demand on fossil fuels"

"Solar is clean, green and Safe"

Prof. D.P. Agrawal Chairman, Governing Council, Climate Change Research Institute said I am happy that we are having lecture on topics connected to energy sector challenges in India. In this lecture the aim is to make youth aware about the encounters and control measures taken in the Indian power sector. I commend Dr. Malti Goel, President of the Institute for starting the Earth Care Lecture Series for Youth.

Highlights of the Lecture

- Energy is the quantitative property that must be transferred from one form to another in order to perform work. Electricity is form of energy widely used for providing power to buildings, industrial machines, electric devices, and automobiles.

- The three major categories of energy sources for electricity generation are; fossil fuels (coal, natural gas, and petroleum), nuclear, and renewable sources.

- Access to cheap energy (relatively) has become essential to the functioning of modern economies. Power generation from fossil fuels can potentially harm the environment and can cause global warming. Thus, the next-generation energy system must be sustainable and carbon-free.

- Hydropower plants capture the energy of falling water to generate electricity. In 2015, hydro power generated 16.6% of the world's total electricity and 70% of all renewable electricity, and was expected to increase by about 3.1% each year for the next 25 years. In India, only 40,000 MW of electricity developed from Hydro power.

- Coal continues to be a major energy source for power generation worldwide. In India, a coal fired power plant has average efficiency of 34% (66% of heat energy is going waste in the environment). However, technologies to reduce emission from coal-fired plants have become more pertinent. Supercritical (operate at 600◦C) and ultra-supercritical (operate at 700◦C) technologies are becoming popular in power generation.

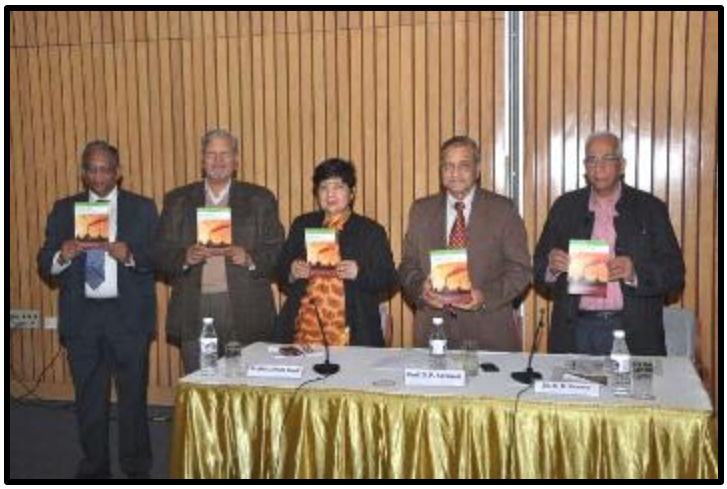
- Solar power is arguably the cleanest, most reliable form of renewable energy available, and it can be used in several forms to help power your home or business. Solar power is pollution free and causes no greenhouse gases to be emitted after installation. Reduced dependence on foreign oil and fossil fuels.

- A unit is represented in kWh or Kilowatt Hour. This is the actual electricity or energy used. If you use 1000 Watts or 1 Kilowatt of power for 1 hour then you consume 1 unit or 1 Kilowatt-Hour (kWh) of electricity. One KW is 3600 Kilojoules per hour. For producing 1 kWh electricity we need 0.378 kg of coal.

- Energy efficient buildings are designed to provide a significant reduction of the energy need for heating and cooling, independently of the energy and of the equipment that will be chosen to heat or cool the building. Towards promoting energy efficiency in the building sector, Ministry of Power, Government of India launched Energy Conservation Building Code (ECBC) on May 2007.

Interactive Discussions

Inauguration of EEC Lecture Series



Release of Climate SAR Bulletin on GLOBAL WARMING

Waste Management Strategies

Prof. D. P. Agrawal, Former Chairman, Union Public Service Commission (UPSC) and Founder Director IIITM, Gwalior delivered the EEC Lecture

24th
APRIL 2015

at
India International
Centre, New Delhi

"Public awareness and understanding of important environmental issues"

"Waste Management Strategies – (3Rs) Reduce, Reuse and Recycle"

"Swachh Bharat Abhiyan – A Cleanliness campaign for clean India"

"Government has a role in policy making and Public–Private–Partnership in solid waste disposal"

Dr. (Mrs.)Malti Goel President, CCRI said I am elated to see students participating in large numbers from Navyug School, Sardar Patel School, New Horizen Public School and Universal Public School. She introduced the importance of Earth Day, its genesis and current status. The World Earth Day 2015 Campaign for youth is held jointly with India International Centre supported by Ministry of Earth Sciences.

Highlights of the Lecture

- Waste is defined as unwanted and unusable materials and is regarded as a substance which is of no use. Waste can be solid, liquid, or gaseous and each type has different methods of disposal and management.

- The Waste Management hierarchy is made up of four levels from most preferred to least preferred methods based on their environmental soundness as: Source reduction and reuse; Recycling or composting; Energy recovery; Treatment and disposal.
- Solid Waste Management is associated with the control of generation, collection, storage, transfer and transport, processing and disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics and other environmental considerations.
- Waste management rules in India are based on the principles of "sustainable development", "precaution" and "polluter pays". The most important reason for waste collection is the protection of the environment and the health of the population.
- Waste management strategies involve stack holders participation, door to door collection and role of government in policy making. Technologies such as Composting, Incineration, Waste to electricity and Fuel oil from waste have been developed.
- Happy to see participation from Navyug School, Motibagh, Universal Public School, Preet Vihar' Sardar Patel Vidyalaya, Lodhi Road, Amity International School, Saket and New Horizon School, Nizamuddin, students are to be encouraged towards cleanliness and to promote *Swachh Bharat Abhiyan* in their society and locality. The *Abhiyan* launched by the Prime Minister Narendra Modi on 2nd of October, 2014 at Rajghat, New Delhi aims to make India clean. The target is to provide sanitation facilities to every family, including toilets, solid and liquid waste disposal systems, village cleanliness, and safe and adequate drinking water supply.
- In Rural India, this would mean improving the levels of cleanliness through Solid and Liquid Waste Management activities and making villages Open Defecation Free (ODF), clean and sanitized. There is need for effective campaigns to raise public awareness about waste management issues, to understand the consequences of improper management of waste and how it may ultimately pose a serious threat to their lives and well-being.

Lighting the Lamp - World Earth Day Awareness Campaign

Clean India – Green India

Inter-School Slogan Competition for youth

Winners

Mr. Sahil Yadav, Navyug School - First Prize

Ms. Lakshay Punia, Universal Public School - Second Prize

Ms. Prerna Mugam, Navyug School - Third Prize

Mr. Abhinav Sachdev, Universal Public School - Consolation

Ms. Shreya Yadav, Amity International School - Consolation

Ms. Neha Malhotra, Universal Public School- Consolation

CO_2 Sequestration: a fresh outlook

Prof. (Mrs.) Malti Goel, Former Advisor & Emeritus Scientist, Ministry of Science & Technology, Government of India delivered the EEC Lecture

5th JUNE 2015

at India International Centre, New Delhi

"Climate change will impact the lives of future generations"

"Producing and using of biofuels provide solutions to many environmental problems"

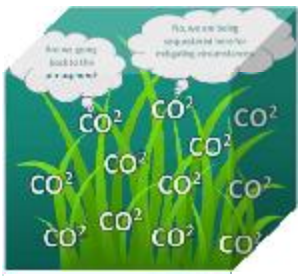
"The best way to capture carbon dioxide is at source"

"Carbon sequestration has emerged as an option to reduce the concentrations of carbon dioxide getting accumulated from increasing use of fossil fuels."

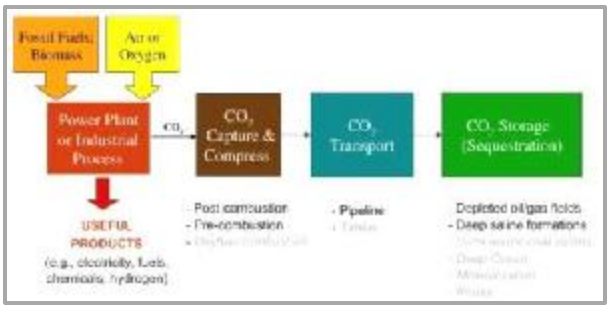
Prof. G. D. Sharma

Former Secretary, UGC presided over the event and set the agenda about the need to address climate change through technology measures. He emphasized that understanding of greenhouse gas mitigation and carbon sequestration is necessary to take actions to stop environmental degradation. Economic, Social and Environmental components need to be considered in an integrated manner to ensure that there are minimum conflicts.

Highlights of the Lecture



- Climate Change science due to anthropogenic effects has a history of 120 years. The Global warming is a long-term rise in the average temperature of the Earth's climate system. One of the greatest challenges relating to global warming is that greenhouse gases result—directly or indirectly—from almost every major human industry and activity. Total global emissions grew 12.7% between 2000 and 2005, an average of 2.4% a year.
- Carbon sequestration refers to the provision of long-term storage of carbon in the terrestrial biosphere, underground, or the oceans so that the buildup of carbon dioxide (the principal greenhouse gas) concentration in the atmosphere will reduce or slow.
- Carbon Capture and Storage (CCS) is the process of capturing waste carbon dioxide usually from large point sources, such as thermal power plants, a cement factory or biomass power plant, transporting it to a storage site, and depositing it in a manner that it will not enter the atmosphere, normally an underground geological formation.
- In Engineering processes CO2 is stored in geologic formations by a number of different trapping mechanisms, with the exact mechanism depending on the geological formation type. Geological sinks for CO2 include depleted oil and gas reservoirs, unminable coal seams, saline aquifers and deep porous formations.



- Terrestrial system carbon sequestration is essentially the process of transforming carbon in the air into stored soil carbon. Carbon dioxide is taken up by plants through the process of photosynthesis and incorporated into living plant matter. As the plants die, the carbon based leaves, stems and roots decay in the soil and become soil organic matter.
- A biofuel is a fuel that is produced through contemporary processes from biomass, rather than a fuel produced by the very slow geological processes involved in the formation of fossil fuels, such as oil. Examples of biofuels include ethanol, bio-diesel, green diesel and biogas.
- Clean coal technology is a collection of technologies being developed in attempts to lessen the negative environmental impact of coal energy generation and to mitigate worldwide climate change. It includes Pre-combustion capture, Post-combustion capture and Oxy-fuel combustion options for capturing carbon dioxide so that the emissions in the atmosphere are reduced.
- In India, the studies on Carbon Capture started in 2006 onwards were initiated by the Department of Science & Technology in R&D Laboratories, PSU industries and also Academic institutions.

Interactive Discussion

World Environment Day 2015 – Awareness Campaign

Distribution of Plants and Saplings among the Participants

Energy and Fossil Fuel

Shri Gautam Sen, Ex-Executive Director, Oil and Natural Gas Corporation (ONGC) delivered the EEC Lecture

16th OCTOBER 2015

at

India International Centre, New Delhi

"Energy is essential to life and all living organisms"

"Energy conserved is energy produced"

"Petroleum is a fossil fuel derived from ancient fossilized organic materials"

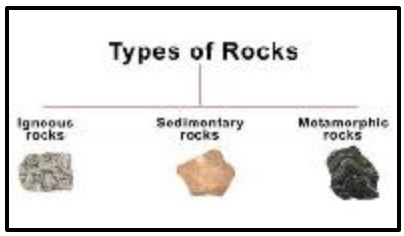
"Save fuel for next generations"

Prof. D. P.Agrawal Former Chairman, UPSC said we need to understand the causes of Ozone Depletion. We should work together and address the issue. I am happy to see students participating in large number from Amity International School, Saket, DAV Public School, Ashok Vihar, Universal Public School, Preet Vihar, Apeejay School, Pitampura, Navyug School, Motibagh, New Horizon School, H.Nizamuddin, Bal Bharti Public School, GRH Marg, and Balwant Rai Mehta Vidya Bhawan.

Highlights of the Lecture

- We understand Energy as the ability or the capacity to do work and its standard unit is the joule (J). Energy exists in many forms; mechanical, potential, heat and kinetic energy. Fission and fusion are two physical processes that produce massive amount of energy through atoms.

- A rock is any naturally occurring solid mass or aggregate of minerals or mineraloid matter. Rocks are usually grouped into three main groups: igneous rocks, metamorphic rocks and sedimentary rocks.



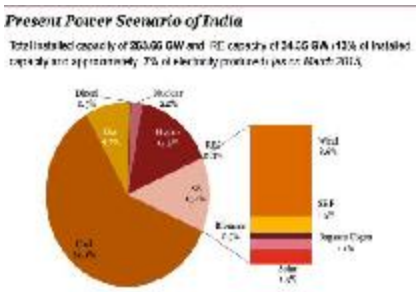
- Plate tectonics theory suggests large-scale motion of seven large plates of the Earth's lithosphere takes place continously. Where the plates meet, their relative motion determines the type of boundary: convergent, divergent, or transform. No life could have existed without Plate Tectonics. The Wilson Cycle explains the process of the opening (beginning) and the closing (end) phases of ocean basins and fossil fuel sources.

- Petroleum is a fossil fuel derived from ancient fossilized organic materials, such as zooplankton and algae mixing with sediments and being buried under anoxic conditions. Petroleum is any hydrocarbon recovered from the subsurface of the earth after drilling such as oil and gas. Oil and gas provide about 40% of all the energy used by the society today.

- Plants and other life forms, after their death, drifted down to the bottom of the swamps, where they were compressed and decomposed to form peat. Coal was formed due to the compression of the peat at high temperature and pressure.

- India's fossil fuel resources, their genesis and current status were explained. India is the fourth largest energy consumer in the world. The primary energy consumption in India grew by 7.9% in 2018. Proved fossil fuel Reserves are; 800 MMt of oil (0.3% world), 1400 BCM of gas(0.8%), 60600 MT of coal (6.8%).

- The utility electricity sector in India has one National Grid with an installed capacity of 274,904 GW as on 31 March 2015. Renewable power plants which include large hydro also, constituted 28.5% of total installed capacity.



- Anthropogenic activities like emission of CFCs have created holes in stratospheric ozone layer. Montreal Protocol was agreed in 1987 and countries have reduced production of CFCs.

World Ozone Day Awareness Campaign

Participation in Ozone Quiz

Awards and Facilitation

Participating Schools Snapshots

Refreshments

Science Diplomacy

Prof. Pranav N. Desai, Centre for Studies in Science Policy, JNU delivered

12th
MAY 2016

at
India International
Centre, New Delhi

Dr. Kavita Sharma
President, South Asian University said we need to make a high pitch for collaborations among ourselves. From my experience in South Asian University, the SAARC region has potentially the highest demographic dividend that it can cater to many young people. The education level and gross enrolments ratio are poor, but we have a shared geography and therefore climate change and other issues of environment obviously become center stage.

""Science can provide advice to inform and support foreign policy objectives."

"Scientific cooperation improves international relations."

"Science Diplomacy can facilitate international scientific cooperation."

Highlights of the Lecture

- Science diplomacy in foreign policy is becoming important in providing new opportunities for collaborations among countries. It is being seen as a vital policy instrument to enhance and enable building of trust towards a common goal.

- International Corporation in science and technology has been one of the instruments to operate our diplomatic science relations. Country should have to strike a fine balance between science diplomacy or technology diplomacy. There are different ways of collaboration such as; Bilateral collaboration; Regional collaboration and Multilateral collaboration.

- The development of productive linkages is possibly prevented not only due to socio-economic, political, historical and technological factors but also due to the structure of international innovation system. Such linkages are tilted in favor of those where science & technological (S&T) infrastructure is concentrated.

- Most economically useful kinds of knowledge have a tacit dimension and that such knowledge can only be obtained in a social process of interaction. Some of the factors contributing to this phenomenon are: unfolding of globalizing forces including changing nature of emerging technologies, heightened significance of national and international S&T collaboration and changing nature of international innovation system.

- In 2000, 574 new technology or research alliances worldwide were reported in six major sectors: information technology, biotechnology, advanced materials, aerospace, and defense, automotive, and non-biotechnology chemicals. In many countries, the diplomatic objectives have overbearing influence, or socio-economic and scientific objectives are subordinated to political, diplomatic objectives.

- The developing countries will require not only higher investment in S&T but take advantage of science diplomacy as well for augmenting these resources to move up in the innovation ladder.

- In India, the policy governing outward FDI has been progressively liberalized which has resulted in changing destination and structure of Outward Foreign Direct Investment (OFDI). This geographical and sectoral shift illustrates greater technological competence through learning and not only a result of liberalization.

- The R &D part was the most unfragmented component of the MNCs, and that part was never setup in developing countries, but now in this globalized world, developed countries are setting up many R & D units in developing countries like India and China.

Awareness on Science Diplomacy

Facilitation of Guests

From left: ***Mr.Gautam Sen, Reliance; Mr. A. B. Agrawal, NHPC; Dr. (Mrs) Malti Goel, CCRI; Prof P. N. Deasi, JNU; Dr. R.K.Sharma, DST; Prof D. P. Agrawal, CCRI; Dr. Kavita Sharma, SAU; Mr.A. K. Jain, DDA***

Sustainable Green and Smart City

Shri A.K. Jain, Ex-Commissioner (Planning), Delhi Development Authority (DDA) delivered the EEC Lecture

7th JUNE 2016

at India International Centre, New Delhi

"Sustainable Development Goal (SDGs) & Smart Cities"

"Urban and Environment Planning strategies are important for implementation of SDGs"

"Problem cannot be solved by the same mindset, which created it"

"Smart cities reduce anticipated complexities and expenses that accompany future urbanization"

Dr. S.Y.Quraishi

Former Chief Election Commissioner of India, Chief Guest highlighted the need for reducing consumption and conservation of natural resources. Water crisis is one of biggest threat looming before us and there is need for taking planned actions in water conservation by all sectors of activity. .

Highlights of the Lecture

- Urban Dynamics is the force that shape and reshape cities over time. Urbanisation occurs mainly because people move from rural areas to urban areas and it results in growth in the size of the urban population and the extent of urban areas.
- India is the 3rd largest energy consumer in the world. Energy consumption in India in the past decade has increased at a compound annual growth rate of more than 5%. In future too, energy consumption in India is expected to rise by more than 4% annually.
- In the context of energy the problems associated with urbanization are: High population density, inadequate infrastructure, lack of affordable housing, flooding, pollution, slum creation, crime, congestion and poverty.

- The Government of India has launched the Smart Cities Mission on 25 June 2015 with objective is to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart Solutions'.
- Application of Smart Solutions will enable cities to use technology to improve infrastructure and services. A Smart city is an urban area that uses different types of electronic Internet of things (IoT) sensors to collect data and then use these data to manage assets and resources efficiently.
- The strategic components of area-based development in the Smart Cities Mission are city improvement (retrofitting), city renewal (redevelopment) and city extension (greenfield development) plus a Pan-city initiative in which Smart Solutions are applied covering larger parts of the city.

- Several government schemes (Swachh Bharat Mission, Heritage City Development and Augmentation Yojana (HRIDAY), Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Pradhan Mantri Awas Yojana etc.) focus on establish infrastructure that could ensure adequate robust sewage networks and water supply for urban transformation by implementing urban revival projects. It will improve quality of life, create employment and enhance incomes for the poor.
- Disruptive technology refers to any enhanced or completely new technology that replaces and disrupts an existing technology, rendering it obsolete.

Lighting the Lamp – SDGs Awareness Campaign

From left: ***Dr. (Mrs) Malti Goel, President CCRI; Prof D. P. Agrawal, Chairman, GC; Prof Meenakshi Dhote, Head DEP, SPA; Honored Chief Guest Dr. S. Y. Quraishi, Chief Election Commissioner***

Chief Guest Dr. S.Y. Quraishi Former Chief Election Commissioner delivered the Inaugural Address.

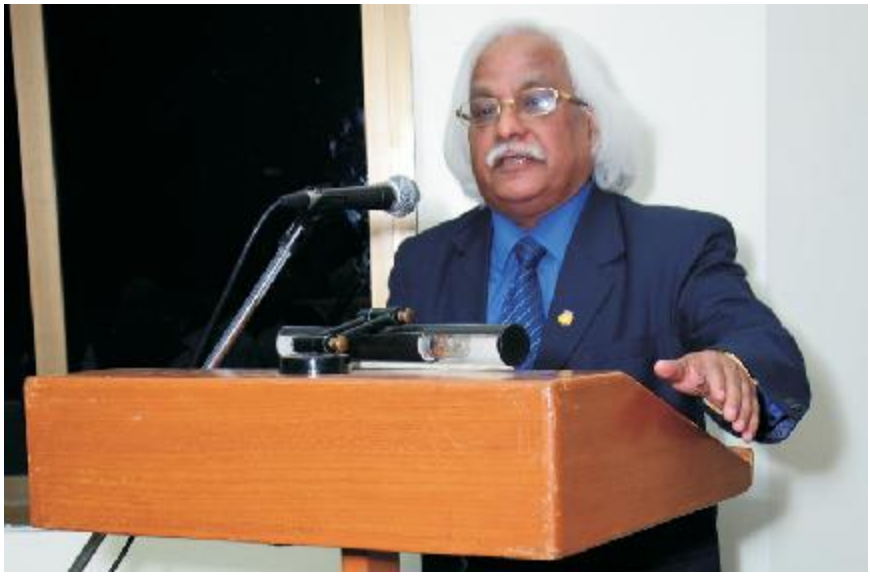
Sustainable Development Goal 17

Prof. Meenakshi Dhote, Head-Environment planning Division, (SPA) highlighted the Urban & Environment Planning Strategies for Implementation of SDGs.

SNAPSHOTS – Students Presentation and Facilitation

Innovative Solutions to Tackle the Monumental Challenges of Climate Change

Prof. P.B. Sharma, Vice-Chancellor, Amity University Gurgaon, Rajiv Gandhi Technological Institute, and Delhi Technological University, delivered the EEC Lecture



16th NOVEMBER 2016

at India International Centre, New Delhi

"Our fore fathers during the Vedic period mastered the Science & Technology to concur the environment"

"Healthy life was sustained in ancient times because we cared for environment"

'You should dream big and act to achieve highly efficient solar cells using new materials and new technologies, so that efficiency increases from 18 to 48%, and 48 to 98%, that's the future'.

Dr. Neha Tripathi Secretary, CCRI and Assistant Prof. School of Planning and Architecture (SPA) thanked the distinguished speaker for a mesmerizing, thought provoking lecture which is not only raising the issues but is it also giving you a direction for finding solutions. It is possible to find solutions to the mess we are in; provided we ask the right questions. This was one of the unique lectures in the Environment and Earth Care (EEC) Series.

Highlights of the Lecture

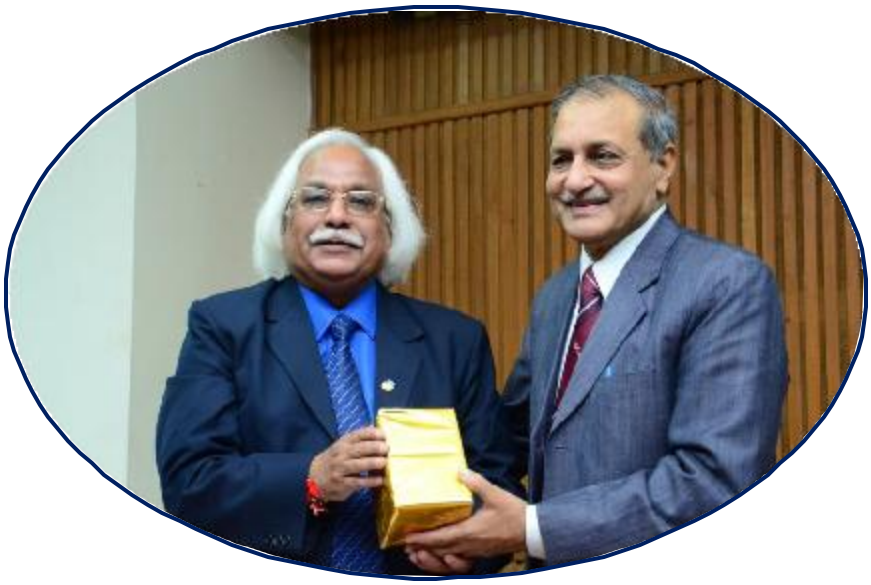
- India, one of the largest economies of the world requiring ever-increasing use of energy to sustain growth. The country's per capita electricity consumption has reached 1010 kilowatt-hour (kWh) in 2014-15, compared with 957 kWh in 2013-14 and 914.41 kWh in 2012-13.
- Government of India, National Action Plan on Climate Change (NAPCC) includes eight national missions being implemented by various Ministries in specific areas of Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Sustaining the Himalayan Ecosystem, Green India, Sustainable Agriculture and Strategic knowledge for Climate Change.
- As the climate warms, it changes the rainfall pattern, evaporation, snow melt, stream flow and other factors that affect water supply and quality. Warmer water temperatures affect water quality and accelerate water pollution.
- In G-8 summit in Japan, India supported the call from the 5 outreach countries for developed countries to cut their emissions by 25-40 per cent by 2020 and more than 80 per cent by 2050.
- Delhi Technical University (DTU), recognizing national need to support the National Mission on Bio Fuels and to significantly augment the country's efforts to mitigate the adverse effects of climate change, has taken up a number of initiatives to strengthen technology innovations in the area of Green Energy Technologies. DTU Greentech, provided consultancy in World Bank funded project "Fences for Fuel".
- The students of Delhi College of Engineering (DCE) developed hybrid car (gasoline-electric vehicle), Super Mileage Vehicle and Solar car. On September 2012, The President of India, flagged off DTU passenger Solar Car at Rashtrapati Bhavan. Amity and RGTU are required to strengthen India's Mission on Climate Change i.e. solar hybrid vehicle, Gyroscopically Controlled Aircraft, 3D Printing Machine, Thermo Electric Quad Bike, Autonomous Underwater Vehicle and many more.

- The world's first hydrogen-powered passenger train is expected to come to Germany in December 2017, powered by fuel cell and utilizes regenerative breaking energy.
- We need to focus on both the development and deployment of Green and Clean Energy Technologies to arrest Climate Change. Up gradation of technology and innovative solutions provide a major gateway to arrest climate change.

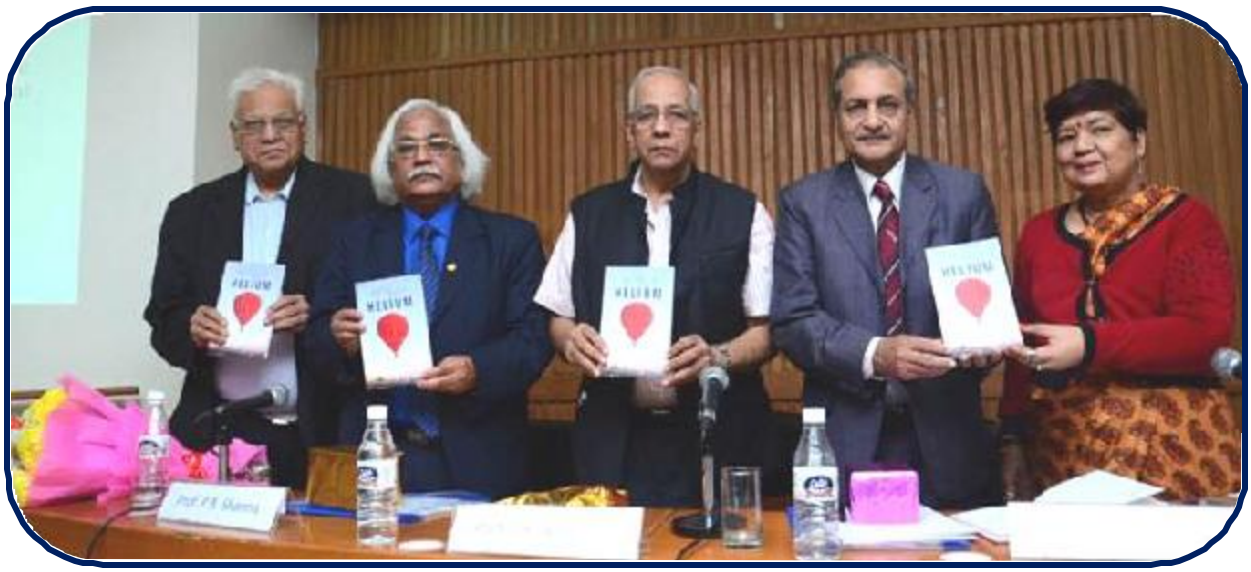
Lighting the Lamp for Creating Awareness

Awareness and Inspiring Learning

Awards and Facilitation



Snapshots



Science, Technology & Innovation and Sustainable Development in India

Dr. Akhilesh Gupta, Adviser & Head, Climate Change Program, Department of Science & Technology, Govt. of India delivered the EEC Lecture

27th
JULY 2017

at
India International Centre, New Delhi

"2030 Agenda for Sustainable Development of United Nations is having great significance for the well-being and progress of the human kind"

"Science, technology, and innovation (STI) are crucial for making progress on every one of SDGs."

"Innovation is a key driver for sustainability. It improves entities' sustainability trajectories and performance."

Dr. H. Purushotham CMD National Research Development Corporation said that NRDC is sourcing technologies from different organizations. These initiatives are helping to achieve the SDGs targets especially in employment generation, industry, food security among others and finding implementation mechanisms for achieving the goals through regional cooperation.

Highlights of the Lecture

- Science and technology have contributed significantly to the evolution of human society. Science has opened new vistas of knowledge, transforming human interaction and social structures. Science and technology also offer enormous economic opportunities, which fuel economic growth. Science may drive technological development, by generating demand for new instruments to address a scientific question, or by illustrating technical possibilities previously unconsidered.

- Technical and scientific innovations provide excellent prospects for environmental protection. Sustainable development can succeed only if all areas of the political sector, of society, and of science accept the concept and work together to implement it.

- In the year 2000, India ranked 15th in terms of number of research papers in SCI journals whereas as per the latest data, India has secured 6th position in the world. As on date, only US, China, UK, Germany and Japan are ahead of India in this regard. India spends nearly 0.88% of its GDP on R&D whereas most of the advanced economies spend more than 2% of their GDP on R&D. Private sector investment into R&D in India is around 34% of Gross Expenditure on R&D (GERD) which is much less than the global benchmark of around 65-80%. The Full Time Equivalent (FTE) R&D professionals in India per million of population is very low (~200).

- The Science, Technology and Innovation Policy of India 2013 aims to achieve 2% of GDP investment into R&D through several steps that include; quadrupling the FTEs in R&D profession; right sizing of GERD per FTE; stimulating investments of private sector into R&D and into sizing of FTE base and technology-led creation of jobs, inputs to high technology-led export and technology and innovation-led wealth creation.

- The Indian science sector has been making concerted efforts to deliver technology products and services to the needs of different socio-economic sectors included in the UN SDGs (Sustainable Development Goals). These sectors include; health care, agriculture, water, education and literacy, energy, habitat, environment, industry, etc. There is a range of government departments, institutions, organizations, NGOs, Civil society organizations contributing to such efforts. There are numerous examples and success stories.

- With astounding growth of STI sector in the country; willingness and awareness of scientists, technologists and innovators to take up problems concerning common man and increasing convergence and collaboration between public and private sectors to address socio-economic issues, it is expected that science, technology and innovation would greatly contribute to sustainable development issues in the time to come, to help India achieving SDG goals by 2030.

Lighting the Lamp – SDGs Awareness Campaign

Facilitation of Guest Speaker


INDIA INTERNATIONAL CENTRE

Facilitation and Awards

SNAPSHOTS


AWARENESS AND CAPACITY BUILDING
WORKSHOP
on
Advancing Sustainable Development Goals: Role
of Science, Technology & Innovation


Global Compact
Network India
GOALS


AWARENESS AND CAPACITY BUILDING
WORKSHOP
on
Advancing Sustainable Development Goals: Role
of Science, Technology & Innovation

Plastics : A Boon or A Bane

Prof. R.K. Khandal, President, R&D and Business Development, India Glycols Limited, Ex-VC, UPTU & Former Director, SIIR, delivered the EEC Lecture

8th JUNE 2018

at India International Centre, New Delhi

"Plastic is a unique material that can substitute metal, wood, paper and, not depleting natural resources"

"Plastic is harmful because it is 'Non–Biodegradable'"

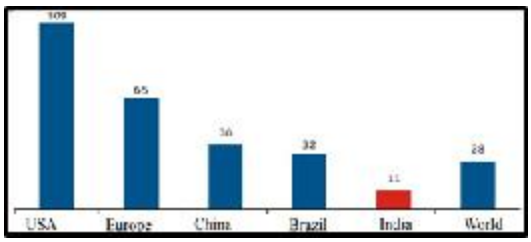
"Burning of plastic in the open air, leads to environmental pollution"

"Stop massive plastic pollution from destroying the ocean. At least 267 different marine species are known to have suffered from entanglement or ingestion of plastics debris."

Dr. (Mrs.)Malti Goel President, CCRI said with the growing concern for environment degradation caused by increasing plastic pollution on Land and Sea, we organized this lecture as World Environment Day campaign on Implementing Sustainable Development Goals in India: Beating Plastic Pollution" for youth in association with India International Center. A Policy Paper on Strategies for Controlling Plastics Pollution in India is brought out for its wider dissemination.

Highlights of the Lecture

- Plastic, the most wide spread material in use is synthetic or semi-synthetic polymerized product. Plastics are polymeric materials comprising of thousands of 'monomers', i.e., a single molecule repeated in a long chain to make a polymer.
- The Global plastics consumption is ~200 million tons; 5% of Compound annual growth rate (CAGR). At least 267 different marine species known to have suffered from entanglement or ingestion of plastics debris. Currently, as low as 10% of the total Plastics is recycled. The world average per capita plastics consumption is 26 kg. In India it is 11 kg/person (2017).
- The Indian plastics industry produces and exports a wide range of plastic extruded goods, polyester films, soft luggage items, writing instruments, plastic woven sacks and bags, polyvinyl chloride (PVC), leather cloth and sheeting, packaging, consumer goods, sanitary fittings, electrical accessories etc.



- Extrusion process is the most commonly used process in India and accounts for ~65% of total processed output by downstream plastic processing companies. In volume terms, the plastics processing industry grew at a CAGR of 10% in volume terms from 8.3 million metric tonnes per annum (MMTPA) in FY10 to 13.4 MMTPA in FY15.
- Plastics have emerged as the most preferred choice of packaging material for various products- from food, beverages, chemicals, electronic items and so on. Plasticulture, or the use of plastics in agriculture, is evident in the form of lining of farm ponds, greenhouse cultivation, micro-irrigation (drips and sprinklers) and plastic mulching.
- Plastic items can't tolerate high temperatures and release harmful gases (at high temp.) which cause pollution. Plastic is not easily disposable and it will take thousands of years to completely dispose in soil. Toxic chemicals leach out of plastic and are found in the blood and tissue of nearly all of us. Exposure to them is linked to cancers, birth defects, impaired immunity, endocrine disruption and other ailments.
- India generates around 56 lakh tonnes of plastic waste annually, where Delhi alone accounts for 9,600 metric tonnes per day. Humans have created about 8.3 billion metric tons of plastics till date outgrowing all other man-made materials other than steel & cement.
- Plastic waste is a growing problem across the world. Around 100,000 marine animals and million birds are killed each year due to plastic, either consuming it or becoming entangled.

World Environment Day Awareness Campaign

Interactive Discussion

From left: ***Dr Sauarbh Manuja, TERI; Mr. V.S. Verma, CERC; Mr. Gautam Sen, Reliance; Dr. (Mrs) Malti Goel, CCRI; Prof D. P. Agrawal, UPSC; Dr. R. K. Khandal, Glycols; Dr. R. K. Solanki, Consultant; Mr. Satish Sinha, Toxic Links***

Carbon Capture and Sequestration - Implications and Opportunities for India

Prof Anjan Ray, Director, CSIR-IIP Dehradun, delivered the EEC Lecture

29th AUGUST 2018

at India International Centre, New Delhi

"Energy access is essential for economic development"

'India depends significantly (>80%) on crude oil imports"

"Land limitations in India constrain availability of landfill space and supply–demand economics of urban land planning"

"We need to replace carbon energy with non–carbon energy wherever possible"

Dr. (Mrs.)Malti Goel President, CCRI said that India's energy being coal dominant, the Climate Change Research Institute has been organizing Capacity Building workshops to address critical challenges of carbon capture, storage and utilization for the benefit of youth in Academia and Industry. Intangible benefits are expected in terms of knowledge sharing and strengthening capacity through science & technology solutions.

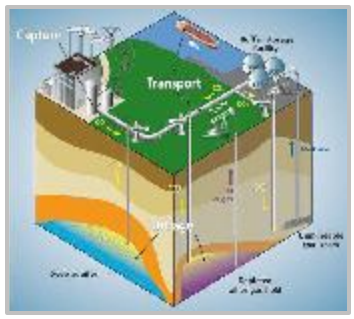
Highlights of the Lecture

- Energy is an important aspect of economic development. The energy sector is in a state of significant transformation with increased global demand and limited supply of natural resources.

- Fossil fuels currently supply 80% of the world's energy needs. Global energy demand is projected to be around 40% higher in 2035 than in 2010. India's carbon dioxide (CO_2) emissions are growing at a faster rate than in any other major energy-consuming nation, emitted 2,299 million tonnes of carbon dioxide in 2018, a 4.8% rise from last year.

- The natural sinks of CO_2 are the oceans and plants and other organisms that use photosynthesis to remove carbon from the atmosphere by incorporating it into biomass. We need to find about 350 MMT of domestic carbon (on current basis) to fully replace our carbon imports. The largest contributor of climate change and global warming is burning of fossil fuel followed by deforestation. The impact of fossil fuels combustion on air quality, emits a number of air pollutants that are harmful to both the environment and public health.

- Carbon capture and storage (CCS) is the process of capturing waste carbon dioxide (CO_2) usually from large point sources, such as a cement factory or biomass power plant, transporting it to a storage site, and depositing it normally an underground geological formation.



- CCS applied to a modern conventional power plant could reduce CO_2 emissions to the atmosphere by approximately 80–90% compared to a plant without CCS.

- Geological storage of CO_2 is a technique designed to reduce greenhouse gas emissions in the context of climate change. The three main types of geological storage are oil and gas reservoirs, deep saline formations, and un-minable coal beds.

- A carbon credit is a generic term for any tradable certificate or permit representing the right to emit one tonne of carbon dioxide or the equivalent amount of a different greenhouse gas. The goal is to allow market mechanisms to drive industrial and commercial processes in the direction of low emissions.

- We need to take some action to replace carbon energy with non-carbon energy, imported carbon with domestic carbon and set policy mechanisms for pricing of carbon.

Lighting the Lamp - Awareness and Capacity Building

From left: ***Prof D. P. Agrawal, Chairman, GC; Honorable Union Minister, Govt. of India Shri Suresh Prabhu; Prof Anjan Ray, Director IIP and Dr. (Mrs) Malti Goel, President CCRI***

Inaugural Address

Honorable Minister Released the Pre-Workshop Bulletin for the Awareness Workshop

Capacity Building in Carbon Capture & Utilization

Facilitation - Guest Speakers

Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future

Dr. M. Sudhakar, Director, Centre for Marine Living Resources and Ecology (CMLRE), delivered the EEC Lecture

25th APRIL 2019

at India International Centre, New Delhi

"Biodiversity can be Genetic diversity, Species diversity and Ecosystem diversity"

"Ecosystems with a high variety in processes and components are more resilient to change than ecosystems with fewer functional roles"

"Ours is an ocean planet: 70% of it is covered by the sea with 80% Marine pollution originating from land based sources"

"Eliminating harmful subsidies is the single greatest action that can be taken to protect the world's oceans"

Dr. (Mrs.) Malti Goel Chief Executive and President, CCRI spoke on Global Warming and its relation to the World Earth Day theme on 'Protect Our Species'. She said in addition the ECC lecture we have organized an Essay Competition among students of class X-XII from different schools in Delhi on Environment in Delhi to express our concerns for the need of improving our Air Quality.

Highlights of the Lecture

- The world's oceans contain about 500,000 to 2 million marine species, bacteria, other microbes and viruses. Today 60% of the world's major marine ecosystems that underpin livelihoods have been degraded or are being used unsustainably.
- The SDGs 14 and 15 of the 2030 Agenda for Sustainable Development are devoted to protect, restore and promote sustainable use of marine and terrestrial ecosystems. Nearly 80% of marine pollution originates on land and the pollution accompanies most kinds of human activities, including offshore oil and gas production and marine oil transportation.
- The World Register of Marine Species (WoRMS) is a biodiversity information system designed as a global open access inventory contains 613 499 taxon names of which 243 081 are accepted marine species. Marine tourism, marine fisheries, and aquaculture are estimated to provide global economic benefits worth $161 billion, $80 billion and $57 billion, respectively.
- The development of science and the evolution of technology have enhanced knowledge of the ocean. Approximately 20% of the world's coral reefs were lost and an additional 20% degraded in the last several decades of the twentieth century, as well as approximately 35% of mangrove area.

- Principles 5 and 6 of the Rio Declaration on Environment and Development focus on poverty eradication and reinforce the need to ensure that overfishing and habitat destruction do not deprive developing countries and the poor of the marine resources they are dependent upon.
- India has 25 Marine Protected Areas in the peninsular region and 106 in islands collectively covering approximately 10,000 square km of the country's geographical areas and more than 14.50 million people depend on fisheries for their livelihood.
- The First World Ocean Assessment released in 2016 found that much of the ocean is now seriously degraded, with changes and losses in the structure, function and benefits from marine systems. India has ratified numerous international conventions related to the use of oceans and their resources, including the United Nations Convention on the Law of the Sea. In 2016. The Sagarmala, is launched for promoting port connectivity, development and industrialization in a phased manner during 2015 – 2025..
- The United Nations has proclaimed a Decade of Ocean Science for Sustainable Development (2021-2030) to ensure ocean science can fully support countries in creating improved conditions for sustainable development of the Ocean.

Lighting the Lamp – Earth Day Awareness Campaign

From left: ***Prof D. P. Agrawal, Chairman, GC; Dr. M. Sudhakar, Director CMLRI; Dr. (Mrs) Malti Goel, President CCRI and Mr. V.S. Verma, Distinguished Professor CPRI***

Essay Writing Competition for School Children

Winners

Facilitation and Awards

Dr. Malti Goel and Prof D. P. Agrawal facilitating Guest Speaker Dr. M. Sudhakar

Release of Climate SAR Bulletin on **Cimate Change and Plastic Pollution,** Vol V, No.2, 2018


Environment and Earth Care (EEC) Lecture
"Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future"
&
Earth Day Cel tion 2019


Theme : Protect Our Species


Environment and Earth Care (EEC) Lecture
"Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future"
&
Earth Day Celebration 2019


Environment and Earth Care (EEC) Lecture
"Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future"


Environment and Earth Care (EEC) Lecture
"Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future"
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Environment and Earth Care (EEC) Lecture
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Environment and Earth Care (EEC) Lecture
"Conservation and Sustainability of Biological Resources on the Planet Earth: Present and Future"
&
h Day Cele tion 2019

Facilitation and Awards

Dr. Malti Goel Receives Token of Appreciation

Honored Guest Speaker Dr. M. Sudhakar presented book TAXONOMIC DISCOVERIES FROM NORTHERN INDIAN OCEAN, Eds. M. Sudhakar et al. to Dr. (Mrs.) Malti Goel, President of the Institute in appreciation of her untiring efforts in public engagement and sustainability education. Prof. D. P. Agrawal, Chairman presided over the event.

Snapshot

Beat- Air Pollution

Mrs. Maya Gupta, Director-Principle, Universal Public School delivered the EEC Lecture

6th
JUNE 2019

at
India International
Centre, New Delhi

"The whole Universe is created and based on Deities."

"Hawan Samigri when burnt causes rain and purify the atmosphere."

"3R's are at the heart of the 'Go Green' global movement"

"There is need for changing our life styles to deal with the environment crisis due to climate change."

Dr. V.K. Garg
Ex- CMD, Power Finance Corporation Ltd and Chairman Joint Electricity Regulatory Commission, Chief Guest said that future development of any nation is in the hands of teachers. I am happy to see large number of science teachers present from various schools in NCR Delhi. Chemistry has an important role in our life and we can find innovative ways to mitigate plastic pollution, which is a key concern today.

Highlights of the Lecture

- Environment is everything that is around us. It can be living or non-living. It includes physical, chemical and other natural forces which have direct or indirect impact on us.
- World Environment Day (WED) Theme this year is BEAT-AIR POLLUTION. China is the host country. Air pollution may seem complex, but we can all do our part to reduce some of it. Understanding the different types of pollution, and how it affects our health and environment will help us take steps towards improving the air around us.
- The five elements i.e. Akash, Vayu, Agni, Prithvi and Jal are considered as Deities. Many of the Rig Vedas venerates the five elements in the form of deities like Mitra (friends) life elements. It is also true that these five elements are responsible for maintaining the requisite balance in functioning of all entities of nature.

- Upanishads narrate that after creating the Universe the Creator permeated all beings equally and the each and every object is intrinsically associated with one aspect of nature or other.
- Seers and Sages, people of that time had recognized the high level of vast knowledge and cognizance, and revealed the effect of environment degradation whether caused by Natural factors or in-discrete human activities could result in imbalance and effect.
- There are two natural energy systems in the physical world: heat and sound. In performing *Yagya*, these two energies, namely, the heat from *Yagya's* fire and the sound of the chanting of the *Mantras* and *Shlokas* are blended together to achieve the desired physical, psychological and spiritual benefits.
- *Agni Kunda* (Pyramid Shape) acts as an initiator of unusual energy fields and spreads it in its surrounding atmosphere. *Hawan* and *Hawan Samaigri pu*rify air. Mango wood which when burnt releases Formic Aldehyde, a gas which kills harmful bacteria's thus purifies the atmosphere.

- *Yagya* creates a pure, nutritional and medicinal atmosphere. In Hindu Mythology its benefits like it renews the brain cells, revitalizes the skin, purifies blood and prevents growth of pathogens are described.
- Using 3 R's (reduce, reuse and recycle), saves energy and the natural resources and it also helps to reduce the pollution. Responsibilities of youth and teachers as well as initiatives taken by Government of India i.e. *Hawa aane de"* campaign for raising air pollution awareness were highlighted.

Lighting the Lamp – World Environment Day Awareness Campaign

Facilitation of Guest Speaker

Teachers Training Workshop – Chemistry and Environment

From left: ***Prof G. D. Sharma, UGC; Dr. V.K. Garg, PFC; Dr. (Mrs) Malti Goel, CCRI; Mrs Maya Gupta, UPS; Mrs Vimala Oak, RSC***

Future Vision – EEC Lecture Series

- A recent study shows that world temperature is rising faster in the 21st century than at any other time in last 2000 years. To live in harmony with environment, one needs to find science & technology solutions to stabilize the atmospheric temperature by controlling and reducing carbon emissions. It requires all energy producing as well as consuming industry viz. Power, Buildings, Industry, and Transport to take technology actions.
- Future Vision for the Environment and Earth Care Lecture Series comes from the need to make efforts for controlling emissions from energy industry through innovations including improving energy efficiency and conserving energy so as to avoid built up of greenhouse gases in the atmosphere. We need to search for alternatives for CFCs and HCFCs and make solar & wind power profitable. The attainment of 'Sustainable Development Goals' demand solutions supported by the ideas and practices of science, technology and innovation.
- These challenges would be giving rise to new and important subjects in public understanding about Sustainable Energy future. Following are the topics to be taken up among others, for creating awareness and igniting minds of youth from various schools and colleges under the Lecture series;
  - Grid balancing transmission challenges
  - Solar Cities
  - Maintaining coal based energy generation efficiencies
  - Emission of various pollutants from the energy sector
  - Microbial Capture and Utilization of CO_2

About CCRI

The Institute is a not-for-profit organization registered under societies Registration Act of 1860*. The Institute is founded with a mission to disseminate science & technology research in the field of climate change mitigation and adaptation. It educates and informs youth in schools and colleges about the ecosystem changes and consequences of climate change. It seeks to achieve this through organizing awareness and capacity building workshops, scientific events of international relevance, lectures, campaigns on topics of scientific & societal interest in energy and environment.

*Donations can be made by cheque or NEFT. The tax exemption is 50 % as per 80-G of Income Tax act 1961. For details; www.ccri.in

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