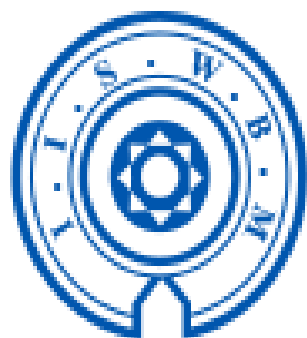




**ENERGY WINDOW**

**VOLUME 22**



**IISWBM**

**Address:**

***College Square West, Behind, Calcutta  
University,***

***Kolkata,***

***West Bengal 700073***

## **EDITORIAL BOARD**

### **ADVISORY PANEL**

*Prof. (Dr.) Arindam Dutta, Secretary, AEE Kolkata Chapter*

*Prof. Piyali Sengupta, Treasurer, AEE Kolkata Chapter*

*Prof. S. K. Dutta, Joint Secretary, AEE Kolkata Chapter*

### **EDITOR**

*Prof. (Dr.) Binoy K. Choudhury, Assistant Director, IMD Asia Subcontinent AEE Kolkata Chapter & Professor (MBA-PS), IISWBM*

### **JOINT EDITOR**

*Mr. P. K. Chakraborty, Ex.-Director, West Bengal Power Development Corporation Ltd., President, Energy Club and Guest Faculty Member, IISWBM*

*Prof. Piyali Sengupta, Assistant Professor, IISWBM.*

**EXECUTIVE EDITOR (STUDENT)**

***Mr. Sayantan Ganguly, Executive Editor (student) of  
AEE Energy Window (Kolkata Chapter)***

**EXECUTIVE EDITORIAL BOARD (STUDENT MEMBERS)**

***Mr. Arijit Das, President, AEE Kolkata Student Chapter***

***Ms. Arpita Dey, Vice President, AEE Kolkata Student  
Chapter***

***Mr Joydeep Datta, Secretary, AEE Kolkata Student  
Chapter***

***Mr. Arijit Chattopadhyay, Treasurer, AEE Kolkata  
Student Chapter***

## **MESSAGE FROM THE EDITOR**

*The fast changes taking place around the globe in almost every sphere of life has been a reminder to us to act now for whatever we can do in our own way in our respective areas. As energy professionals, we can proudly proclaim that we have the capability and the world deserves us in the matter of management of such change to be in favor of sustainability of human civilization. Also, we can be happy to recognize each other in the AEE Fraternity that collectively we can and we need to act as all the concerns are emerging to be global in nature, and Energy Management is definitely among the most important actuator to make each individual happy. We make take some more time to realize the truth that Swami Vivekananda &quot;expressed his view in his reply to 'The Calcutta Address' in 1894: 'Give and take is the law; and if India wants to raise herself once more, it is absolutely necessary that she brings out her treasures and throws them broadcast among the nations of the earth, and in*

*return be ready to receive what others have to give her. Expansion is life, contraction is death. Love is life, and hatred is death. We commenced to die the day we began to hate other races; and nothing can prevent our death unless we come back to expansion, which is life. We must mix, therefore, with all the races of the earth. And every Hindu that goes out to travel in foreign parts renders more benefit to his country than hundreds of men who are bundles of superstitions and selfishness, and whose one aim in life seems to be like that of the dog in the manger. The wonderful structures of national life which the Western nations have raised, are supported by the strong pillars of character, and until we can produce numbers of such, it is useless to fret and fume against this or that power. AEE is a platform of such give and take in a win-win situation for all. AEE Kolkata Chapter, along with Energy Club, gets associated with IISWBM every year in making the Annual Event on Observance of EnergyConservation Day on December 14, a success. A summary of the event is presented in this Issue along*

*with one of the papers, from abroad. The reports of Industry visits by the student members would inspire other student members and give an opportunity to seek guidance and suggestions from the senior members. Please feel free to let us know your views and contribute with your article, your support or guidance to make this march a success. On behalf of the Editorial Board, we wish every reader Happy New Year with sustainable peace and prosperity.*

## **Topic 1: CIRCULAR ECONOMY**

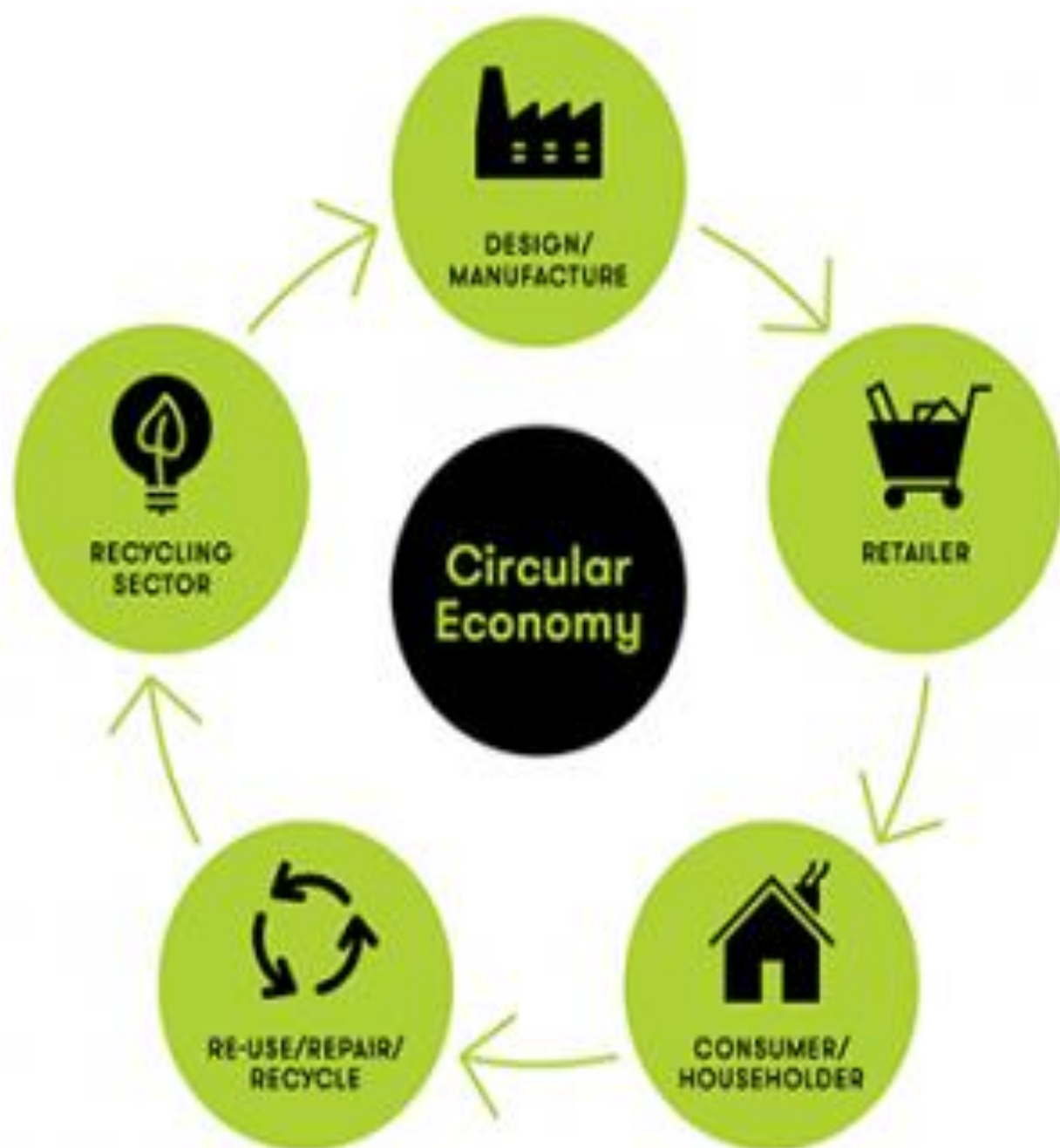
**Mr Sumit Shrivastava**

*A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems. It aims to redefine growth focusing mainly on positive society wise benefits. Moving towards a more circular economy can deliver immense benefits such as reduction of pressure from the environment, improvement of the security of supply of raw materials, increasing of competitiveness, paving the way for new innovative ideas, boosting the economic growth & creation of several new jobs around the globe. Circular economy basically has 3 main principles:*

- a.) To eliminate waste and pollution*
- b.) To keep all the products and materials in use*
- c.) Regeneration of Natural Systems*

***A sustainable circular economy basically involves the designing and promoting of the products which can last for a long time and can be reused, repaired and manufactured. This actually retains the functional value of the products.***





## **a.) REPORT ON SCOPE OF CIRCULAR ECONOMY**

*The circular economy has a broad range of scope around the entire planet. The circular economy includes projects, infrastructures, equipments and applies to every industry sector. It includes both technical as well as biological resources like metals, minerals, food , fibre etc.*

### **The opportunities in a new, circular economy**



#### **New Jobs**

A broad range of industries, particularly in recycling and manufacturing will create new jobs.



#### **Costs Reductions**

Application of these principles will reduce the cost of raw materials, recycling, repurposing and repair.



#### **Technological Advances**

Innovation will streamline manufacturing processes, waste management and collection and recycling.

## **b.) NEED OF CIRCULAR ECONOMY**

*The global population continues to grow rapidly, increasing demand for raw materials, while supplies are decreasing. For example, the Dutch government is therefore working with industry to ensure that by 2050 the Dutch economy will run entirely on reusable materials. In this circular economy, there will be no more waste, as resources will be reused again and again.*

*A healthy planet and a strong economy have a smarter use of resources which in the future will enable people to enjoy a prosperous life on a healthy planet, with a strong and sustainable economy. A circular economy is needed for three reasons:*

### **1.) Resource consumption**

*The global population is growing fast. It has quadrupled over the past 100 years, and is forecast to exceed nine billion by 2050. This is rapidly increasing demand for raw materials, while their availability is declining.*

*Resources are needed for such things as food, water, shelter, clothes and electrical goods.*

## ***2.)Dependence on other countries***

*Many raw materials are currently imported. The Netherlands imports a lot of magnesium from China, for example. In a circular economy the Netherlands will be much less dependent on other countries. Products that used to be discarded and incinerated will be used as a source of raw materials in the future.*

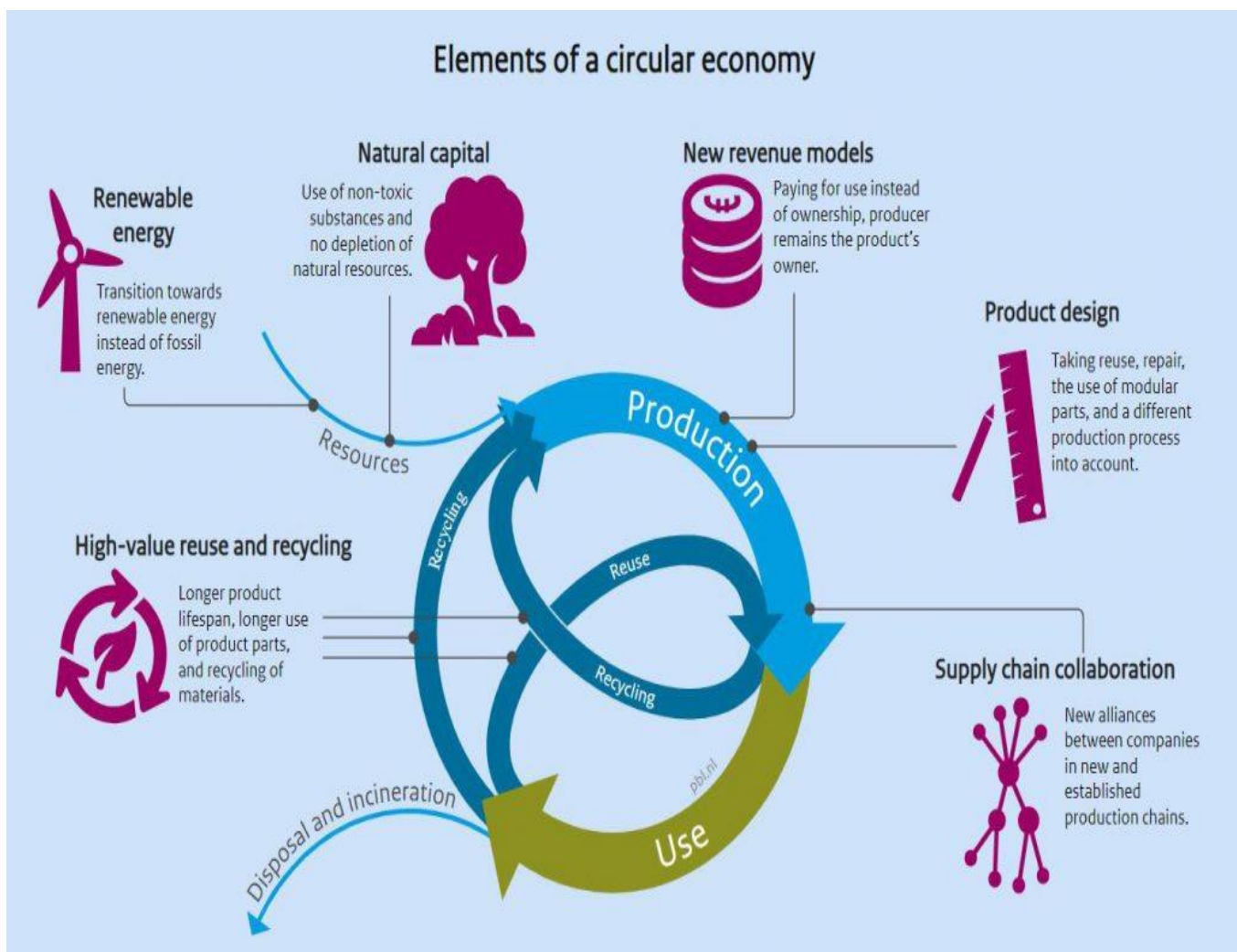
## ***3.)Impact on the environment***

*Cars, trains and planes run on fuels like diesel, petrol and kerosene. The extraction and consumption of these resources have an impact on the environment. Higher energy consumption also increases carbon emissions. A circular economy will have a less negative impact on the environment and will reduce carbon emissions.*

## **c.)ELEMENTS OF A CIRCULAR ECONOMY**

*The circular economy has gained immense popularity over the past few years as it is totally a new way of recycling the products and has new innovative ideas.*

**However there are 7 key elements of circular economy:**



### **d.) CLIMATE CHANGE**

*The global economy is heading towards a wrong direction. It suggests that closing the circular gap will be a fundamental step in fighting climate change. Circular economy estimates of around 2/3 rd of the GHGs that are released during extraction, processing and manufacturing of goods. The remaining 1/3 rd happens when the goods are transported.*



## **e.) LINEAR ECONOMY VS CIRCULAR ECONOMY**

### **a.) Linear Economy**

**i.) Technical and Biological materials are mixed up**

**ii.) Energy drawn from finite resources**

### **b.) Circular Economy**

**i.) Technical and biological materials are separate.**

**ii.) Energy drawn from renewable resources.**



## LINEAR ECONOMY



TAKE

MAKE

DISPOSE

## CIRCULAR ECONOMY





## **f.) PROBLEMS OF CIRCULAR ECONOMY & ITS SOLUTIONS:**

### **PROBLEMS:**

- i.)Lack of Achievability and Desirability*
- ii.) Lack of Social Sustainability*
- iii.) Lack of proper strategic guidelines .*

### **SOLUTIONS:**

*The Solar Impulse Label certifies that a particular product or service contributes to CE and is economically and ecologically capable of creating jobs and reducing toxic emissions in one of the 6 areas i.e Water, Energy, Construction, Mobility, Industry and Agriculture. The solar impulse label can bring innovative circular economy solutions that meet high standards of sustainability and profitability.*

*Applying the circular economy principles properly can ensure a safe and healthy environment around the globe.*

# **CONCLUSION**

*Circular economy (CE) is a sustainable development strategy that is being proposed to tackle urgent problems of environmental degradation and resource scarcity. CE's 3R principles are to reduce, reuse and recycle materials. The principles account for a circular system where all materials are recycled, all energy is derived from renewable activities support and rebuild the ecosystem and support human health and a healthy society and resources are used to generate value. This article is a review of the rapidly growing literature on CE covering its concept and current practices and assessing its implementation. This article also serves as an assessment of the design, implementation and effectiveness of CE related policies. It first presents the concept of CE and compares it with the current linear economy of taking materials, producing goods and disposing waste. It explains why it is imperative to move away from a linear economy towards regenerative sustainable industrial development with a closed loop.*

*This article shows the current practices that have been introduced and discusses standards for the assessment of CE's development and performance. The main focus here is on providing a summary of the key CE indicators to give a picture of CE practices. Third, based on an analysis of literature, this article identifies the underlying problems and challenges to CE in an entrepreneurial perspective. Finally, this article provides a conclusion on CE's current development and gives policy suggestions for its future development as part of an entrepreneurial and very efficient innovative national level development strategy.*

***Based on the lecture delivered on October 3, 2020, to Energy Management students, IISWBM by Mr. Sumit Shrivastava, M. Tech Energy & Environment Mgmt.(Silver Medalist), ESOS Certified EMA, London, UK, Lead Auditor – EMS (ISO 14001:2015). Presently Mr. Shrivastava is Senior Director – Corporate Sustainability at M/s TELEPERFORMANCE GLOBAL SERVICES, MUMBAI, MAHARASHTRA, INDIA.***

## **Topic2:**

### **Hydrogen mission; Solar energy, clean air among focus areas:**

*Finance minister Nirmala Sitharaman speaks during a press conference in New Delhi, on February 1, 2021. Centre's clean air programme got a shot in the arm with Sitharaman announcing a fund of Rs2,217 crores for air pollution control in 42 cities. The Centre will launch a Hydrogen Energy Mission in 2021-22 for generating hydrogen from green power sources. Finance minister Nirmala Sitharaman announcement of a hydrogen mission could go a long way in reducing India's carbon footprint, expert. "The Potential Role of Hydrogen in India – Harnessing the Hype" by The Energy and Resources Institute (TERI) released in December last year, demand for hydrogen could increase by at least 5-fold by 2050, continuing to grow in the second half of the century in India.*

*Demand for hydrogen is at around 6 metric tonne (MT) per annum, mainly from industry sectors, such as*

*fertilizers and refineries. This can increase to around 28 MT by 2050 mainly due to cost reductions in key technologies and a push to reduce carbon footprint. Demand will mainly grow in steel and road transport, shipping and aviation sectors. The report also projected that India would require 40 MT of green hydrogen to achieve net zero carbon emissions by 2060. “I am glad this is happening now,” said TERI Director general Ajay Mathur.*

*Hydrogen from renewable can be produced through various methods; one of them is to use renewable electricity to split water into hydrogen and oxygen in an electrolyzer, according to the International Renewable Energy Agency.*

*Hydrogen from renewable sources can play a critical role in heavy-duty, long-distance transport. While battery operated electric vehicles (BEV) will become competitive for heavy-duty transport, hydrogen production will be needed. It will also play a critical role in production of ammonia which is currently being produced from fossil-fuel based hydrogen.*

***“The Hydrogen Energy Mission will be critical because hydrogen may be the only way to have zero carbon emissions from heavy industries like cement and steel - - provided that hydrogen is produced by electrolysis from renewable electricity,” said Ulka Kelkar, director, Climate Program, World Resources Institute, India.***

***The Budget also gave a boost to solar energy by proposing to provide a capital infusion of Rs 1,000 crores to the Solar Energy Corporation of India and Rs 1,500 crores to the Indian Renewable Energy Development Agency. “To build up domestic capacity, we will notify a phased manufacturing plan for solar cells and solar panels. At present, to encourage domestic production, we are raising duty on solar inverters from 5% to 20%, and on solar lanterns from 5% to 15%,” Sitharaman said in her Budget speech.***

***Centre’s clean air program also got a shot in the arm with Sitharaman announcing a fund of Rs 2,217 crores for air pollution control in 42 cities with a million plus population.***

***The Centre had approved the release of Rs 2,200 crores last year based on recommendation of the 15th Finance***

***Commission. The grant is meant to be utilized for air quality improvement measures under the National Clean Air Programme including capacity building of the local urban bodies as well as state pollution control boards to improve monitoring of air pollution levels in these cities. Delhi, however, is not among cities to receive funds under this grant.***

***Further, under the Swachch Bharat Mission, Sitharaman has announced a focus on complete faecal sludge management and waste water treatment, segregation at source of garbage, reduction in single-use plastic, reduction in air pollution by effectively managing waste from construction-and-demolition activities and bioremediation of all legacy dump sites. This will be implemented with a total financial allocation of Rs 141,678 crores over a period of five years from 2021-2026.***

***The Budget announced an outlay of more than Rs 4,000 crores over five years for a Deep Ocean Mission which will cover deep ocean survey exploration and projects for the conservation of deep sea biodiversity.***



***“Drawing from the government’s Blue Economy policy, the budget makes allocations for expansion of shipping and inland waterways infrastructure along with Rs 2,000 crores for PPP model in all major ports. In another section it discusses the need for the conservation of deep ocean biodiversity. Neither policy documents nor budget allocations recognize that these priorities could be in conflict. This is already visible in several new proposals including those proposed in the Little Andaman Islands or in the west coast in places like Karwar and Dahanu,” said Kanchi Kohli, legal researcher, Centre for Policy Research.***

***Environment ministry was allocated Rs 3,100 crores for various programmes, including control of air pollution in Budget 2020-21. The revised estimates for 2020-21 was Rs 2,015 crores and the new budget estimates for 2021-22 is Rs 2,869 crores.***

***The newly formed Commission for Air Quality Management in National Capital Region and adjoining areas got a budget provision of Rs 20 crores for its activities.***



## **ACKNOWLEDGEMENT**

*I would like to convey my regards & special thanks to the members of the Bengal Chamber for sharing this valuable idea regarding Hygrogen mission, Solar energy, clean air that is included in the allocation of budget (2021-22) in energy and environment (including natural gas and deep ocean). It is indeed a very valuable part as far as the future of the sustainable energies are concerned.*

### **Topic 3**

#### **Green activists hail budget policy on green hydrogen**

*Environment activists and experts said that the Budget announcements that India will soon have a policy on green hydrogen is a welcome step but expressed displeasure over the lack of policy on closing inefficient coal plants and clarity on electric public transport vehicles. Responding to the budget announcements, Ms Aarti Khosla, Director Climate Trends, told IANS there were several key indicators that the budget was in line with global trends. "The announcement that India will soon have a policy on green hydrogen is very much welcomed. Germany and many other EU countries have already set an ambitious green hydrogen policy. Even countries like UAE and Australia that are traditionally considered as the laggards of climate action have moved towards green hydrogen," she said.*

*"There is a sum allocated to tackle air pollution and on the other hand, the government is extending the*

*timeline for compliance of emission norms by power plants, which is a major cause of pollution. There needs to be a holistic approach, whereby pushing clean energy on one hand should not be weakened by pushing dirty fuels along with it," the New Delhi-based Garg said.*

*Charu Lata, Lead Electric Mobility and Clean Energy Consultant, India Programme, Natural Resources Defense Council (NRDC), said: "The scrappage policy announced by the government is a welcome step. It will not only increase vehicle demand but will also put older polluting vehicles off the road."*

*"For effective implementation, the policy can be made mandatory in a few years and regulations can be put in place to ensure that the scrapped vehicles are recycled to reduce environmental impact."*

*Renewable energy capacity is set to expand 50% between 2019 and 2024, led by solar energy. This is*



*according to The International Energy Agency (IEA)'s 'Renewable 2019' report, which found that solar, wind and hydropower projects are rolling out at their fastest rate in four years.*



## **ACKNOWLEDGEMENT**

*I would like to convey my regards & special thanks to the members of the Bengal Chamber for sharing this valuable information regarding Green activists hailing the budget policy on green hydrogen. This is a type of environmental activism whose main aim is the protection of natural resources, plants, and animals. The movement encourages the use of natural resources in a sustainable manner, conservation of biodiversity, and wilderness preservation. The simple goal of Greenism is to raise awareness about the importance of environmental conservation. It sheds light on how the environment is directly linked to human health and the only way in which the environment can be restored is through the application of science and conscious, sustainable, natural practices.*

## **Topic 4**


## **Deep Ocean Mission: Rs 4,000 crores allocated to help India strengthen links with its oceans**

*India has embarked on a major mission aimed at improving understanding about oceans, its biodiversity and impact of climate change, along with development and demonstration of technology to undertake future ocean explorations. , Union Finance Minister Nirmala Sitharaman announced an allocation of over Rs 4,000 crores over the next five years for the Deep Ocean Mission. This is in addition to the Rs 1,897 crores allocated for the ministry in the current financial year. “Our oceans are a storehouse of living and non-living resources. This Mission will cover deep ocean survey exploration and projects for the conservation of deep sea bio-diversity,” said Sitharaman. The Deep Ocean Mission, which is part of the Blue Economy envisioned to be developed by 2030, will place India among select countries — US, France, Japan, Russia and China — to have special missions dedicated for ocean studies. The launch of this mission is being seen as a strategic and geo-political move in order to further strengthen India’s position in the Indian Ocean region. Several*



*learnings from this mission, experts share, will unearth vital information from the deep ocean and have a number of applications in areas including marine biodiversity, minerals, and effects of climate change on biodiversity and a host of others.*

*Studies are planned at depths close to 6,000 meters under six major components mineral exploration on the sea-bed; study and mapping of biodiversity; study of climate change; exploration of marine biology and developing allied courses, training; development and demonstration of ocean exploration and off-shore technologies for future. The mission will be spearheaded by the MoES in collaboration with an UN organization for mineral exploration. The same body is also responsible in identifying areas for exploration in the region.*



The deep sea is the largest museum  
on earth, it contains more history than  
all the museums on land combined,  
and yet we're only now penetrating it.

Robert Ballard

quote fancy

## **ACKNOWLEDGEMENT**

*I would like to convey my regards & special thanks to the members of the Bengal Chamber for sharing this valuable information regarding Deep Ocean Mission. Deep Ocean mission is the Government of India mission to study the various aspects of ocean in an integrated frame work as the Indian Space Research Organization has been studying the space. It focuses on giving a boost to exploration of India's Exclusive Economic Zone and Continental Shelf. As much as 95 per cent of India's trade is handled via these seas. The Deep Ocean Mission, which is part of the Blue Economy envisioned to be developed by 2030, will place India among select countries — US, France, Japan, Russia and China to have special missions dedicated for ocean studies.*

## **Topic 5**

### **INDIA'S SHIFT TOWARDS A SUSTAINABLE ENERGY FUTURE:**

**AUTHOR: SayantanGanguly, Executive Editor (Student), AEE (Kolkata Chapter), MBA PS (Energy Management) student , IISWBM( Indian Institute of Social Welfare & Business Management)**

**EMAIL ID:sayantang1995@gmail.com**

*India is facing a huge energy scarcity which is hampering its industrial growth and economic progress. India has tremendous energy needs and an increasing difficulty in meeting those needs. India is largely dependent on coal to meet its energy needs. Coal meets more than 50 per cent of the current commercial energy needs and generates more than 70 per cent electricity. We are the third largest producer of coal in the world after China and the USA. But the energy from coal comes at a huge environmental and health cost. Also*

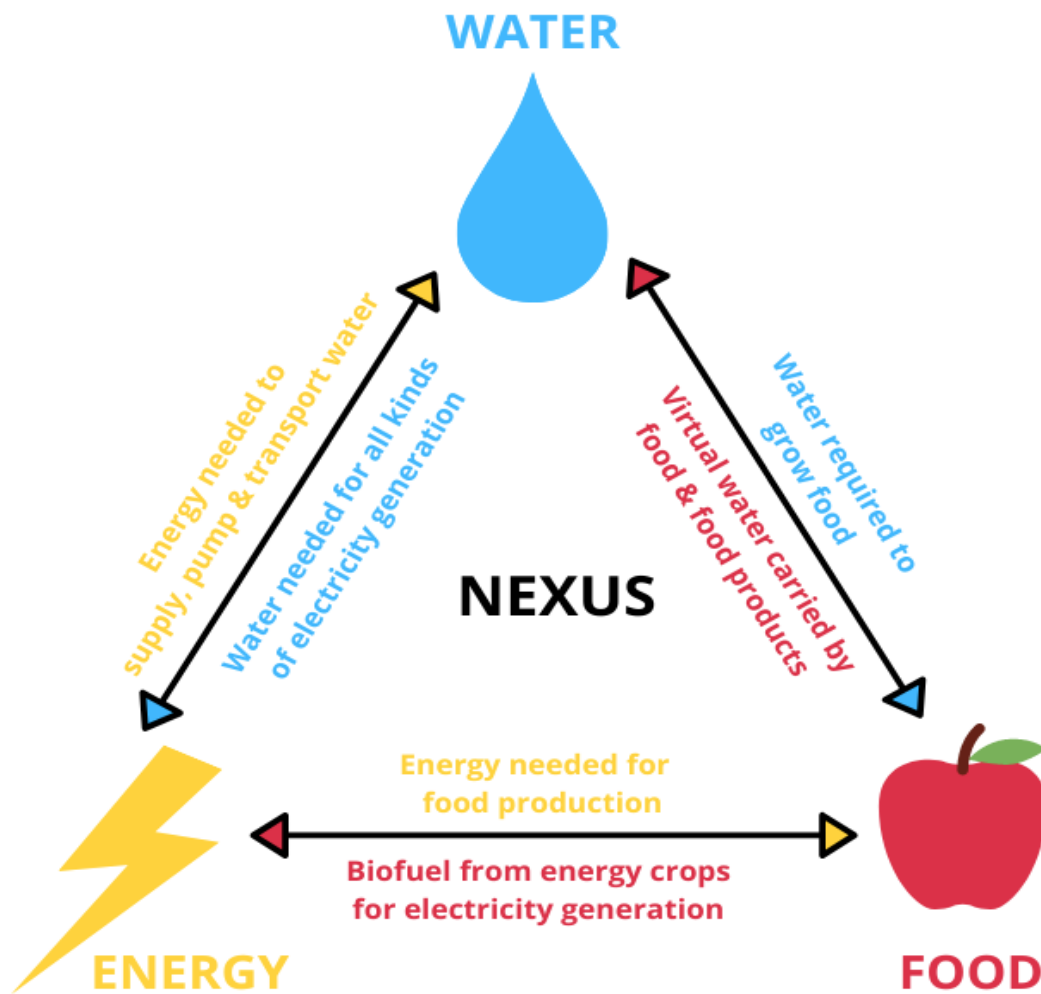
*we have limited sources of coal to meet our energy needs. Thus India is thinking about renewable sources as an alternate source of energy because they are completely natural and also does not cause any pollution. Thus India is aiming to attain 175 GW of renewable energy which would consist of 100 GW from solar energy, 10 GW from bio-power, 60 GW from wind power, and 5 GW from small hydropower plants by the year 2022.*

*The primary objective for deploying renewable energy in India is to advance economic development, improve energy security, improve access to energy, and mitigate climate change. Sustainable development is possible by use of sustainable energy and by ensuring access to affordable, reliable, sustainable, and modern energy for citizens. The government has designed policies, programs, and a liberal environment to attract foreign investments to ramp up the country in the renewable energy market at a rapid rate. It is anticipated that the*

*renewable energy sector can create a large number of domestic jobs over the following years.*

*A great opportunity for India lies ahead. As the country and the International Energy Agency build closer policy ties, it has a huge chance to restructure its energy market toward a more sustainable future. Big improvement plans are made by the Indian government for future in energy efficiency, renewable energy, and technological innovation. It also assesses energy policy responses on their contribution to the Sustainable Development Goals. By 2030, more than half of India's 1.3 billion people will live in urban areas. India aims to be energy independent by 2030, and there is a growing commitment to the importance of low carbon growth. The future looks bright as nearly 293 global and domestic companies have committed to generate 266 GW of solar, wind, mini hydel and biomass-based power in India over the next decade.*





## ***THE NEXUS TRIANGLE***

## **PAST, PRESENT AND FUTURE OF ENERGY**

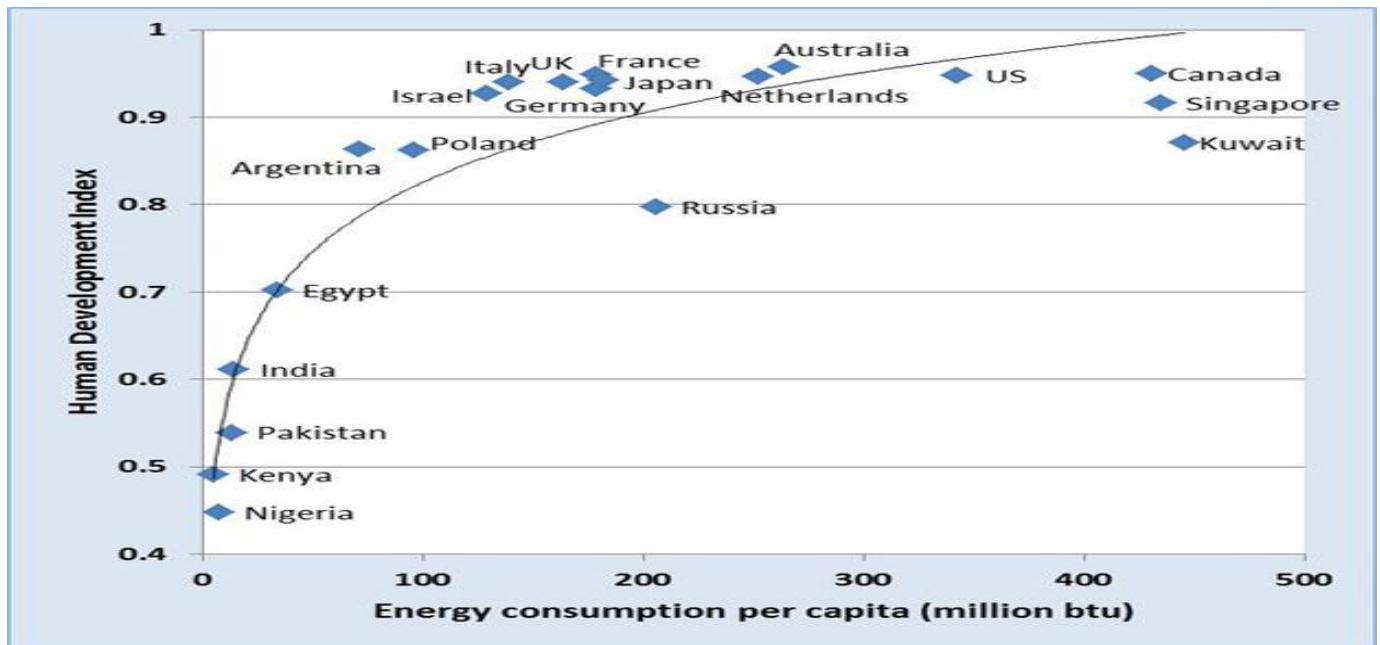
### **✓ THE PAST:**

*In the ongoing age, sustainable power source has taken another swing to lime light on the planet, particularly in created and creating nations, as it assumes a noteworthy part both in economy and the general job of the world. Why sustainable power source for India? Since India, has in the past endured control deficiencies, high oil and gas costs, biological perils and all the more significantly India is supplied with awesome regular assets particularly an incredible sun powered vitality potential, which can be changed over for the advantage of a superior domain, with perfect, practical and sustainable power source. Directly in the following couple of years, Indian power part has a speculation capability of around 250 billion US dollars in elective sources to help their monetary choices. Every one of the states have offered agree to sustainable power source movement and have joined the battle, "make in India". This thus can likewise make work*



*livelihoods, all the more so in Indian vitality examine division. A large number of these vitality framework advances have been discovered extremely valuable in urban and semi urban zones, generally in preservation of power and petroleum derivative. Sun oriented water warming has helped vitality request administration in different zones in top circumstances, and furthermore, remain solitary sun based photovoltaic frameworks are getting to be basic housetop advancements, subsequently, dying down diesel utilization in regions of regular power blackout. Above all, the sponsorship of the Indian government as respects to environmentally friendly power vitality is a noteworthy spine to the advancement of sustainable power source in future India. A relationship exists the utilization of power and the nature of human life in a nation which is the human improvement list (HDI). The estimation of advancement of a nation can be gotten by joining a few parameters like the future, level of training and the measure of salary earned by a resident of a nation should be possible utilizing the human improvement file.*

*Connection between Human Development and Per Capita Electricity Consumption demonstrates that 4,000 kWh (14 million BTU) per individual every year is the isolating line amongst created and creating nations. In examination, India at show has around 700 kWh (2.3 million BTU) per capita every year accessibility of power. The principle destinations of national strategies and projects are to diminish neediness and increment the way of life of a nation or country. Coal is the fundamental asset being utilized at present and coal-let go plants will keep on being the essential wellspring of power generation in the nation for a long while to come (S.A Bhardwaj, 2013).*



## **PAST ENERGY STATUS**

*The utilization of energy in the past was low in light of the fact that there was no industrialized insurgency and no popularity for energy utilization. Now India had low level of contaminations and the future was high on the grounds that the accessible vitality was sufficient for the populace.*

## **✓ THE PRESENT**

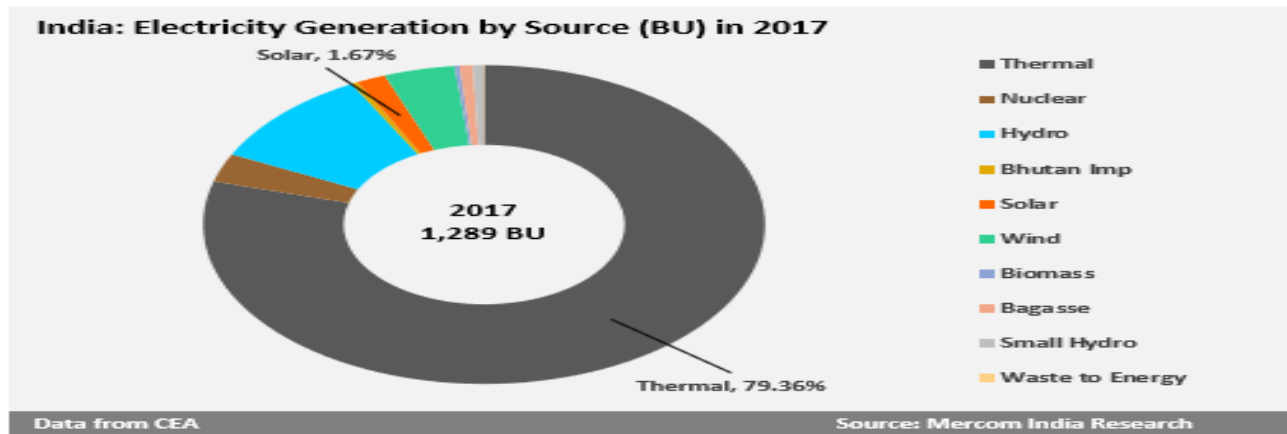
*India is a nation with cutting edge atomic innovations. In all parts of atomic power fuel*

*cycles there has been the improvement of the far reaching indigenous capacities. There is overwhelming innovative work, nearness of qualified accessible HR and offices for the expanded and stable advancement of the human labor to help mechanical ability and limit and additionally hearty administrative structure. There has been an examination between the universal norms and the execution of the Indian power stations.*

*India is the third biggest maker and third biggest customer of atomic vitality on the planet. As at 2017 there were around 20 atomic power reactors in task with a limit of 10080 MW. India has surplus power age limit yet needs sufficient framework for providing power to all destitute individuals. With a specific end goal to address*

*the absence of satisfactory power supply to every one of the general population in the nation by March 2019, the Government of India propelled a plan called "Power for all". This plan will guarantee consistent and continuous power supply to all family units, businesses and business foundations by making and enhancing fundamental framework. It's a joint coordinated effort of the Government of India with states to share subsidizing and make general monetary development.*

*India's power segment is ruled by petroleum derivatives, and specifically coal, which in 2017-18 created around three fourths of all power. Be that as it may, the legislature is pushing for an expanded interest in sustainable power source.*



## **PRESENT ENERGY STATUS(upto 2017)**

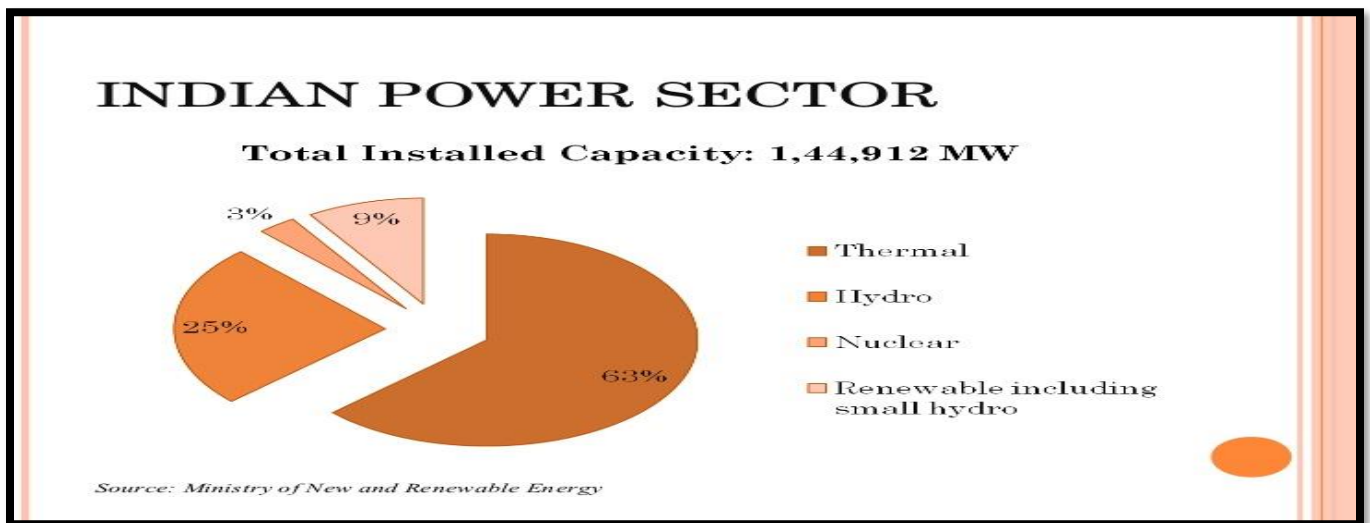
### **✓ Future Plans**

***Despite the fact that India is the third biggest maker of power, around 40 % of the number of inhabitants in the nation does not approach power today. The per capita utilization of power, which has an immediate connection with the Human Development Index, is low at around 700 kWh per annum, about a fourth of world normal and route beneath that of cutting edge nations. There exist deficiencies in vitality and pinnacle control in the range 10-15%.***

***Quick financial development is likewise basic to accomplish formative targets and destitution lightening. Truth be told, a maintained monetary development of around 8 to 10% is required throughout the following couple of decades. As power is a key driver for monetary development, it is essential that there is a monstrous increment or extension in power limit, aside from transmissions and dispersion frameworks. The Integrated Energy Policy of the nation extends the requirement for an introduced limit of around 778 GW constantly 2032 for a development rate of 8%, of which atomic power is conceived to be around 63 GW by 2032.***



***In any case, given India's vitality asset profile, it is unavoidable that the long haul power needs need to originate from atomic vitality.***



## **SCOPE OF FUTURE ENERGY AREAS**

Thank  
you