



The Innovation Engine of India

NEWS BULLETIN

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Compiled by Science Communication and Dissemination Directorate (SCDD), CSIR, Anusandhan Bhawan, New Delhi



# **CSIR and OIL sign an umbrella Memorandum of Understanding** (MoU)







The Council of Scientific and Industrial Research (CSIR), New Delhi and Oil India Ltd. (OIL), a Navaratna NOC inked an umbrella Memorandum of Understanding (MoU) to pursue technological partnership in select domains across the Energy value chain. This will be a collaborative arrangement between labs of CSIR and OIL.

The MoU was signed by Dr. N Kalaiselvi, DG, CSIR & Secretary, Department of Scientific and Industrial Research (DSIR) and Dr. Ranjit Rath, CMD, OIL. The event was graced by D(O) and D(E&D) of OIL, MD(NRL), JS&FA (CSIR), JSA(CSIR), LA (CSIR), Heads of Scientific Directorate of CSIR and other Senior Officers both from OIL and CSIR. The Directors of CSIR labs and eminent scientists of CSIR attended the event in the virtual mode.

The umbrella MoU puts in place a formal framework for collaboration between OIL and CSIR Labs. The objective of the MoU is to facilitate collaboration for pursuing research in advanced technologies for energy security. The preliminary areas identified for Joint R&D activities and technology partnership include:



New frontier areas in hydrocarbon exploration; Upstream and downstream operations; New and renewable energy, batteries/storage systems; Green and Renewable Hydrogen / Biohydrogen (H2) Reducing environmental pollution and bioremediation

Waste treatment including oil separation and recovery from wastewater and waste sludge including crude oil sludge;

Corrosion inspection and anti-corrosion coating; Extraction of Lithium and Rare Earth Elements from Oilfield Water; Stranded natural gas to fuel molecules; and Decarbonisation and net zero targets.

On the occasion, Dr. Ranjit Rath said that "OIL has a long association with CSIR labs like IIP and NEIST and has been working together in past. The present MoU will open the gateway for collaboration with all the labs of CSIR. OIL being an integrated energy company intends to be at the forefront in terms of technology adoption in the energy value chain with a global presence providing value to the stakeholders. The collaboration with CSIR would play a catalytic role to achieve these objectives in mission mode."

DG, CSIR expressed that "CSIR is a premier R&D Organization engaged in cutting-edge R&D and developing technologies & products in frontiers areas Science and technology. CSIR is known for its capabilities and competency in Industrial R&D. Thus, this collaboration would

not only be mutually rewarding but also beneficial for the country and the common man in long term."

Both organizations have also agreed to work towards capacity building through training and skill development. The OIL would also consider providing Corporate Social Responsibility (CSR) funding support towards achieving Sustainable Development Goals, Aspirational Districts, Rural Development, Govt missions/initiatives etc. Published in:







### Curtains came down on "One Week One Lab" programme of CSIR-NPL Delhi, with a Skill Conclave thrown open to the public, and about 400 persons from various academic institutions, business, students, and members of the general public participated in it







In the "One Week One Lab" programme of CSIR-NPL, Delhi, the program ended with a Skill Conclave held on April 21, 2023. The conclave was open to the public, and about 400 persons from various academic institutions, business, students, and members of the general public from a range of societal vocations were present.

Welcoming the gathering, Prof. Venugopal Achanta, Director CSIR-NPL, spoke about the nation's need for demand and supply of skilled resource persons during the Skill Conclave. Additionally, he spoke about how the grooming of new talents, upgrading of current ones, and the development of new ones, as well as innovative thinking, are crucial for the progress of any nation. "CSIR-NPL organises various training programs/ courses on a regular basis in the field of metrology to promote and train the skill man power for the country in order to bridge the gaps between the skill manpower supply and demand of the country", Prof Achanta added.

In his speech, the guest of honour, Dr. Nagahanumaiah, Director, CMTI, Bengaluru, discussed the problems faced by our education system and also discussed probable solutions for the same. He said "PSUs should revive themselves by introducing rigorous Graduate Engineering





### Training (GET) program." Also, he motivated young brains to develop skills related to applied field of engineering and also described the internship and skill development programs at CMTI.

The chief guest of the event, Prof. T. G. Sitharam, chairman of AICTE, delivered a visionary speech. In his lecture on "Building a coherent skilling ecosystem for India", he said, "Humans will be at the center even after the emergence of the artificial intelligence platforms like chat GPT as the technology is developed by humans only.

He also added that every day, the technology is changing at rapid speed, so to make pace with new upcoming technologies, we need to acquire knowledge and keep updating our skills to make India as Vishwa-Guru".

In this captivating event, the keynote speaker Dr. R. Chidambaram, (Padma Vibhushan), former Principal Scientific Advisor, Govt. of India emphasized the need to generate new knowledge, and the importance of skill to add on to the knowledge. He shared his views on the Statements of World Bank which says that low skills perpetuate poverty and inequality. However, "Over-skilling and under-skilling are also a major concern", he added. "To fight with the climate change and associated threats, we MUST need low carbon technologies and the relevant skills to address the issue" Dr Chidambaram said. Further in his speech he laid his views that skill conclave under One Week One Lab program has been good initiative and such programs will be very helpful to young generation that will help the country to attain a

### technological leadership position.

Several renowned scientists, administrators and industry invited experts including Dr. D. K. Aswal (Former Director, CSIR-NPL), Ms Priya Vyas (Springer Nature), Dr. H. C. Kandpal (Formaer Scientist, CSIR-NPL), Dr. S. K. Dhawan (Emeritus Scientist, CSIR-NPL), and Dr. Reena Sharma (Chief Scientist, CSIR-NPL) etc also delivered the lectures.

The conclave included a series of breakout sessions and panel discussions, which allowed





participants to share their ideas and experiences for the remedial measures to the underlying problems.

In this one-day program, a social awareness demonstration by Dr. Bipin Kumar Gupta was organized to help the people spot difference between fake and real currency notes and to create awareness among the people to raise their understanding of Indian currency. Around 100 devices were distributed among the common people which can be utilised for checking the fluorescent features of the Indian currency. In this program, an initiative was taken to train 25 visually challenged young women from All India Confederation of the Blind Braille Bhawan, Rohini Sector 5, New Delhi, for checking the Indian currency on their own as a part of the demonstration. It was also demonstrated that the Indian currency includes the security features for visually impaired people.

The event concluded with cultural evening in which Dr. Diwakar Sharma and group mesmerized the audience with their musical performance on "Science in Music" followed by the performances of research scholars and children of staff of CSIR-NPL.







# Governor inaugurates 'One Week One Lab' campaign





Governor C P Radhakrishnan on Monday inaugurated the curtain raiser ceremony of the 'One Week One Lab,' a campaign of National Metallurgical Laboratory, Jamshedpur at Ranchi. He said that over the next five days, CSIR-NML, a premier research organisation dedicated to various facets of Minerals, Metals and Materials would showcase its technological achievements for the socio-economic



development of India in general and Jharkhand in particular. On the occasion, N. Kaslaiselvi, Secretary DSIR, Government of India and Director General, CSIR and Dr. Avanish Kumar Srivastava, Director, CSIR-National Metallurgical Laboratory, Jamshedpur were present.

In his address, Radhakrishnan said that it is a matter of great pride that CSIR, established in the year 1942, is one of the world's largest publicly funded Research & Development organizations; nowadays its role is very important in 'Atmnirbhar Bharat'.

"There is a centre of CSIR-NML also at Chennai, which is taking pivotal strides in commercial mineral enrichment endeavours. From materials necessary for our strategic sectors such as defence and space to materials needed for medical purposes, NML has traversed the path successfully. I have noted with immense pleasure that NML has worked on Arsenic removal technology. Part of Jharkhand water is rich in Arsenic which causes serious health issues to the people consuming it. I would like to see its large-scale implementation. I am also happy to know that NML has developed a technology for reclamation of coal mine





# water, free of harmful microorganisms making it fit for the purpose of human consumption," noted Radhakrishnan.

# He went on to add that the latest gadgets are also the e-waste of tomorrow. It is of utmost

importance to know the right way of discarding an old device. Moreover, recycling and reuse of e-waste can also give a fillip to the economy. I am happy to learn that waste utilization is one of the major activities and many commercial technologies have been developed and implemented. CSIR-NML has already developed the technology for reclamation for precious and other metal recovery from e-waste and transferred it to entrepreneurs.

Recently India has found huge reserves of lithium. Lithium is the lifeline of our e-mobility vision. As NML is working on extraction of lithium from primary and secondary resources, I would like to see an indigenous technology for lithium extraction from lithium ore coming out

### from your institute.

On the 2nd of March this year The Research and Innovation Initiative Gathering (RIIG) conference on materials for Sustainable Energy was held under Indian's G20 Presidency in Ranchi which was coordinated by CSIR. Many G20 nations including India have enormous minerals and materials wealth that is required to be sustainably used for meeting our energy requirements. I am sure that CSIR and particularly NML would rise to the occasion to provide technological solutions in the areas of sustainable energy storage, distribution and management.







# Soon, aromatic oil extraction tech to go solar way





To cut down input costs and carbon emission, plans are afoot to introduce solar powered steam distillation units and junk conventional wood/straw stubble-fuel based tech which is presently being widely used by farmers and industries for extraction of aromatics and medicinal oils from flowers and herbal plants.

Essential oils are complex mixtures of volatile organic compounds distilled from various plants and flowers and find huge demand in various industries like cosmetics, food and pharmaceuticals. As more and more farmers and entrepreneurs are showing interest in growing aromatic plants that offer higher and assured returns, it is being felt that water-steam distillation run on wood fuels/electricity for extracting essential oils will become major energy guzzlers in near future.

Hence, as an alternative, solar energy can be used to generate heat for the distillation of essential oils.

"Designing solar distillation units to reduce carbon emissions is the need of the hour," said Dr Prabodh Kumar Trivedi, Director, of the Palampur-based Institute of Himalayan Bioresource Technology, a lab of the Central Scientific and Industrial Research (CSIR) under the Union

of Science and Technology Ministry.

He was speaking at a workshop organized recently by the Essential Oils Association of India (EOAI) with CSIR-IHBT Himalayan Phytochemicals and Growers Association (HIMPA), Mandi (Himachal Pradesh), and Indian Institute of Technology (IIT), Mandi (HP) in Palampur, HP. The workshop on Himalayan Damask Rose under the theme "Development of Aromatic Cultivation and Essential Oil Industry of Western Himalayan Region" was attended by around 200 delegates from across India including scientists, researchers, entrepreneurs,





and farmers in the field of essential oils. Developing the solar powered steam distillation system is one of the mandates of the Aromatic Mission which would soon enter in its third phase. It was launched in 2017 by the Prime Minister Narendra Modi to help farmers add up their income through aromatic plant cultivation.

"Soon our scientists will commence R&D in the direction of developing solar based distillation units. The idea is to cut down carbon emission as well as check on air pollution, since present fuels are carbon intensive," explained Dr. Rakesh Kumar, co-nodal of Aroma Mission at CSIR-IHBT and coordinator of the workshop,

Sanjay Varshney, President of, EOAI stressed on promoting aromatic crops and the essential oil industry which was presently being catered through imports. "India imports about 2 tons of rose oil every year worth Rs 200 crores, which is a huge expenditure, so we should

emphasize the production of rose oil in India. The Himalayan region has the potential to produce quality roses, so we should focus on its cultivation in this particular region," he added.

Under the Mission in the last six years, the IHBT has already brought 3000 hectares of area under aromatic crops and set up 61 processing units across India. The global essential oil market demand is projected to expand at a compounded annual growth rate of 8.6 per cent from 2019 to 2025.







### CSIR-NGRI

25<sup>th</sup> April, 2023

# World's Largest Climate clock assembly event celebrated by CSIR-NGRI on Earth Day 2023

DECCAN NEWS SERVICE HYDERABAD

CSIR-National Geophysical Research Institute, a premier research institute in the field of Earth Sciences, celebrated



Earth Day 2023 to commemorate the 'World's Largest Global Climate Clock Assembly' under the umbrella of the CSIR-JIGYASA program. This was organized by Energy Swaraj Foundation in association with Atal Innovation Mission (NITI Aayog) and the All India Council for Technical Education (AICTE). Around 320 students and 25 teachers of different schools visited NGRI on this occasion. The director of the institute, Dr. Prakash Kumar, briefed students about the importance of Earth system science and how climate change is related to all of us. The students had an interactive session on 'Climate

change; concepts; consequences and commitments' with Dr. EVSSK Babu, Chief Scientist of the institute. The teachers and students got information and hands-on experience about the climate clocks. The students visited the institute's Open-Air Rock Museum and Groundwater Project.Dr. Sandeep Gupta, Nodal, NGRI-JIGYASA program announced that these climate clocks would be provided to the schools participating in today's Earth Day celebrations. The students and teachers will be given training on "How to assemble the climate clocks" on their school premises. The JIGYASA team of NGRI Scientists namely Dr.

Tanvi Arora (Co-Nodal), Dr. T. Vijay Kumar, Dr. Biswajit Mondal, Sateesh Chandrapuri and Dr. Rajeev Yadav contributed immensely to the successful completion of this world's largest assembly of climate clock event at CSIR-NGRI Hyderabad

### Published in:

Deccan Vision, The Hindu





# **World Laboratory Animal Day: Experts discourage use of lab animals, discuss alternatives**





LUCKNOW For centuries, humans have been using lab animals for research and tests and in process, thousands of them have died, hence, we should be respectful and use them ethically and intelligently, said Sujit Kumar Dutta, joint commissioner, ministry of animal husbandry, dairying and fisheries.

"We should reduce animal usage in various



research as much as we can. There is an urgent need for replacement of Animal Models in laboratories," he added. Dutta made these remarks while delivering an inaugural speech on animal's role in making different medicine and performing various experiments as a guest of honour of one-day symposium titled "Preclinical Animal and Available Alternatives". The symposium was organised at CSIR-Central Drugs Research Institute (CDRI), Lucknow on Monday to commemorate the World Laboratory Animal Day. It was held in Collaboration with Laboratory Animal Science Association of India.

"We should pick up the right animal in the right quantity or, if possible, use an alternative method. Use of new approaches, methodologies, also known as New Alternative Methods (or NAMs), to establish Drugs Safety and Effectiveness may be adopted in place of animal testing," said Suresh Poosala, Founder, Oncoseek Bio Private Limited and Acasta Healthcare Private Limited. He emphasised on 3R's of animal usage alternatives which refers to the "Replacement, Reduction and Refinement" of animal in research and testing.

On the occasion, director of CDRI, Radha Rangarajan, shed light on the purpose of this symposium. Later, posters on alternative and novel animal models were presented by research





students. Later, in the second half of the symposium, sessions on Computational Toxicology Platform toward replacing animal testing, Zebrafish as a model for human disease, elegans as alternative to animal model for disease research, 3D Bioprinting as an alternative to animal testing were also discussed.











#### **CSIR-NEERI**

### 24<sup>th</sup> April, 2023

# Various events mark World Earth Day

#### Staff Reporter

DIFFERENT government, social and educational organisations of the city celebrated World Earth Day to show their commitment towards the Mother Earth, on Saturday. Various awareness campaigns, lecture sessions, and activities were orgaised to mark the day.

Nagpur Municipal Corporation



NAGPUR Municipal Corporation, Green Vigil Foundation and Earth Day Network jointly commemorated 'World Earth Day 2023' on Saturday. The theme of the event was 'Invest in Our Planet'. The organising team conducted a citizen outreach campaign at Maharajbag Zoo.

Members of Green Vigil Foundation interacted with citizens with colourful posters and placards on building green economy, end plastic pollution, grow earth's canopy, support climate literacy, switch to sustainable lifestyle, energy conservation, adopting green living practices and other issues of environment protection. Surbhi Jaiswal, Team Lead, Green Vigil Foundation, said, "Earth Day is a reminder for citizens to help restore our planet in every possible way we can, taking responsibility to fight the environmental crisis we are facing."

Representatives of NMC, Green Vigil Foundation and Earth Day Network creating awareness on the theme, 'Invest in Our Planet', at Maharajbag Zoo, on Saturday.

#### Warhade, Deputy Commissioner, NMC; Manish Soni, PRO, NMC; Deendayal Tembekar, Zonal Officer, NMC; Neha Thakur, Kaustav Chatterjee, Mehul Kosurkar, Sheetal Chaudhary, Bishnudeo Yadav, Priya Yadav, Parth Jumde, Rakshit Gondode, Tushar Deshmukh, Dipak

on the occasion of World Earth Day, on Saturday.

Bhumika Parihar, Associate, Technical and Research, ESF was the chief guest.

Addressing the participants, Parihar informed that Energy Swaraj Foundation in association with Atal Innovation Mission (NITI Aayog) and All India Council for Technical Education (AICTE) has organised the mega event - 'World's Largest Global Climate Clock Assembly' in Delhi on the Earth Day. As part of the event, about 10,000 organisations will assemble their own climate clocks and install them on the buildings, she mentioned. Millions of people can see the ticking time everyday and get encouraged to take actions for climate correction, she added. Parihar also said that the temperature of 1.5 Celsius holds a great significance for everyone, as it marks the start of irreversible changes in the climate.

CSIR-NEERI also participated in this mega event to raise awareness about global warming on the Earth Day. The students and teachers were given information about the climate clocks and handson experience on 'How to assemble the climate clocks.' CSIR-NEERI will provide climate clocks to few schools and impart training on 'How to assemble the climate to students clocks' and teachers.

Prominently present at the campaign were Prakash Prasad, Kajal Pilley and others. Students from Kamla Nehru Mahavidyalaya also joined the campaign.

**CSIR-NEERI** 

CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) in association with Energy Swaraj Foundation (ESF) organised a talk on 'climate clock and its significance'

### Published in:

The Hitavada





# **Workshop On 'Gerobiotics Supplementation Through Millets Products' Held At CFTRI**





A two-day National workshop on 'Gerobiotic supplementation through fermented millet beverage and millet curd' was held recently at CSIR-CFTRI. This workshop was sponsored by the Probiotic Association of India (PAi).

Dr. Sridevi Annapurna Singh, Director, CSIR-CFTRI, who inaugurated the two-day workshop, highlighted the benefits of millets and their potential anti-aging role. She also emphasised that fermentation may be the possible solution for reduction of anti-nutrient factors in millet. She noted that even though microbes are small, their benefits are numerous as many new fields are emerging as part of microbiology such as probiotic, prebiotic, postbiotic, parabiotics and now gerobiotics.



Dr. Prakash M. Halami, Organising Secretary and Head, Microbiology and Fermentation Technology, welcomed and explained about CSIR-CFTRI recent activities and its involvement in the celebration of the International Year of Millet-2023 and also the importance of conducting this workshop with reference to millets for georobiotics supplementation and role as Shree Anna for gut microbiota and its products as well as their health benefits.

Dr. B. Sesikeran, former Director of ICMR-National Institute of Nutrition, Hyderabad and former RC member of CSIR-CFTRI, spoke about gut microbiome – ageing and probiotics. He stated that aging is a complex process associated with a combination of genetic and environmental factors and gut health would also change with age and possibly prebiotics and probiotics could be part of natural healthy aging.





Prof. Ramesh Sharma, former Dean, Life Sciences, North-Eastern Hill University, Shillong, spoke about calorie restriction as an anti-aging intervention with emphasis on gut microbiome and correlation between longevity and brain size.

Dr. R. Baby Latha, Principal Technical Officer, CSIR-CFTRI, spoke about Pearl millet, a healthy-cereal and explained about nutritional profile, processing techniques, health benefits, products through probiotic incorporation and problem associated with pearl millet, in order to bring out the great potential of this important small grain to producers and consumers.

This workshop had seven practical sessions on the techniques associated with anti-aging markers and supplementation of gerobiotics through millets product. Panel discussion was also organised to interact with experts in the field of millet, gut microbiota and probiotics.

Over 90 participants from various parts of the country attended the workshop — 29 of them in offline mode. A poster presentation session was also held wherein online as well as offline participants had the opportunity to present the research findings. Participation certificates and prizes were distributed to the poster presenters during the valedictory function.







# **CSIR-NML** Jamshedpur celebrates International Earth Day





CSIR-National Metallurgical Laboratory (NML), Jamshedpur celebrated 'The World's Largest Global Climate Clock Assembly and Display Event' on Earth Day. This Program was organised under CSIR-Jigyasa Virtual Laboratory Project. The main objective of the program was to create awareness regarding climate change and the requirement for a corrective action to minimise the impact of



### global warming.

### Nine teachers and 60 students from five schools including Motilal Nehru Public School, Baridih High School, BPM +2 High School, Kerala Public School, Kadma and Jawahar Navodaya Vidyalaya, West Singhbum visited CSIR-NML.

CSIR\_NML authorities said that the aim of organizing this event was to inculcate scientific temperament among school students and also to connect scientists with school children

### through CSIR-Jigyasa Programme.

In the morning an inaugural programme was organized to ensure that the entire exercise was enjoyable, informative and at the same time interactive for the students and teachers.

The welcome address was delivered by Dr Mita Tarafder, Chief Scientist & Head, KRIT Division, CSIR-NML. Providing a deep insight on climate change, Dr Tarafder proposed that a proper solution to resolve the challenges had to be worked out and suggested that young minds should be involved in this vital task.





A pledge towards minimising electrical energy usage and reducing carbon emissions was taken by the participating school students and teachers.

The participating school students and teachers were divided into groups and each group was guided by the organizing team members. Demonstration and assembly of climate clock were presented by the participating students who were guided by scientists and the organizing team of CSIR-NML. Two Climate Clocks were installed at CSIR-NML premises and another three were distributed among Baridih High School, BPM +2 High School and Jawahar Navodaya Vidyalaya, West Singhbum.

Udaya Bhaskara Rao , Principal Scientist and Head of Engineering Division, Dr Nikhil Kumar, Scientist, Dr Satyajit Mukherjee, Senior Scientist, Mr Sudip Kundu, Principal Scientist and Dr Arvind Kr Arya, Head Medical Division of CSIR-NML were present at the event. Dr Animesh Jana, Senior Scientist and Project leader of CSIR-Jigyasa Virtual Laboratory Project coordinated the event. The organizing team expressed gratitude to the Director, CSIR-NML for giving permission to conduct the program. The participating students and teachers were satisfied with the overall experience.







# **Pradhan Inaugurates Exhibition On Future Of Work In Bhubaneswar**





Union Education Minister Dharmendra Pradhan on Sunday inaugurated an exhibition here on the future of work to showcase the need for acquiring new skills and knowledge as a result of the fast-evolving world. The initiative was taken on the sidelines of the 3rd Education Working Group meeting under the G20 presidency at CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar, Odisha. The exhibition will continue till April 28. Taking to Twitter, Pradhan said, "Inaugurating a special exhibition on #G20FutureofWork at @csirimmt, Bhubaneswar... I welcome you to a world of endless possibilities."

It will act as a unique platform for technology leaders and academia to showcase their perspectives and vision around the future of work, an official statement said. Several institutes and organisations from diverse sectors, including NIT Rourkela, IIT Bhubaneswar, IIM Sambalpur, Meta, UNICEF and NCERT, participated in the exhibition to display technologies that would drive the future of work, constant innovations in the modern workplace, skills and innovative delivery models. More than 100 exhibitors from India and G2O member countries would demonstrate their products at the programme, the statement said.

The ministry of skill development & entrepreneurship and the ministry of education are also hosting precursor events in the first two days of the event. "For Day 1, the theme is 'Deep Tech with a focus on advanced technology in Future of Work', the statement said. A unique 'Future of Work' experience zone is also set up along with the exhibition. Job aspirants will get to know how the future of work will evolve and will have access to a preview of the required advanced technical skills at this experience zone, an official said.

The zone will showcase the use of cutting-edge technologies, such as holograms and





interactive surface tables and walls, which will enable visitors to get ideas of the future of work, he said. "They will be able to visualise how automation and digitisation are transforming the way we work in several sectors," he said. During the exhibition, visitors will witness reverse engineering and automated design solutions, drone technology, Ed-tech

### solutions, and industry 4.0 skills among others.







# Earth Day world record attempt: NBRI to be part of setting up DIY climate clock





CSIR- National Botanical Research Institute (NBRI), Lucknow will participate in an attempt to create a world record in an event titled 'World's Largest Global Climate Clock Assembly' on its premises on Saturday. The event at NBRI is part of a larger event being held across India and numerous other countries to raise awareness about global warming on Earth Day.



"The event will witness setting up a DIY digital climate clock which will display how much time is left before we touch global warming of 1.5 degrees Celsius. A similar clock is set to be unveiled on Saturday on the NBRI campus which will be unveiled by the Institute's director, Ajit Kumar Shasany, in the presence of several scientists and school children.

"Later, the clock will be put up at an ideal place from where people would be able to see the countdown year till 2030 when global temperature will cross 1.5 degrees Celsius," said a

### spokesperson of the Institute.

The climate clock is a clock that tells us how much time is left before we touch global warming of 1.5 degrees Celsius. According to the Paris Agreement 2015, it sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

According to the Energy Swaraj Foundation, the budget for 1.5 degrees Celsius of global warming is 280 billion tonnes of CO2 and the current annual rate of CO2 emission is about





43 billion tonnes. Dividing the first number by the second number gives the time left. For 1.5 degrees Celsius of global warming, the time left is about 6.5 years, which is reducing every passing second. This countdown is shown by the climate clock.

'World's Largest Global Climate Clock Assembly' which is set to make a world record is being attempted by Energy Swaraj Foundation in association with Atal Innovation Mission (NITI Aayog) and All India Council for Technical Education (AICTE) in accordance with Mission LiFE and G20 event.

According to the organisation, about 10,000 organisations including academic institutions, research institutes, government bodies among others are aiming to assemble their own climate clocks and install them on the buildings across India to which NBRI is also a part.









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