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CONTENTS

RESOURCES AND EVENTS

SCIENCE POLICY AND DIPLOMACY

SCIENCE & TECHNOLOGY

GLOBAL

MIT Develops Workout Mat for Cells

MIT engineers have designed a sort of workout mat for cells that can help scientists zero in, at the microscopic level, on exercise's purely mechanical effects. The new design is not so different from a yoga mat: Both are rubbery, with a bit of stretch. In the case of the MIT mat, it's made from hydrogel — a soft, Jell-O-like material that is about the size of a quarter and is embedded with magnetic microparticles. The new platform can be used to see whether mechanical stimulation could help guide muscle regrowth after injury or lessen the effects of aging. It can serve as a quick and noninvasive way to shape muscle fibers and study how they respond to exercise.

Breakthrough in Perovskite Solar Cells

Researchers at City University of Hong Kong (CityU) have engineered a unique type of perovskite using a self-assembled monolayer, or SAM, and anchoring it on a nickel oxide surface as a charge extraction layer. The thermally robust charge extraction layer comprises nickel oxide (NiOx) nanoparticle film on a surface-anchored phosphonic acid (MeO-4PADBC) SAM that can improve and stabilize the NiOx /perovskite interface. The resulting 1.53–electron-volt devices retained over 90 per cent of their efficiency, boasting an impressive efficiency rate of 25.6 per cent, even after operating under high temperatures, around (65 degrees Celsius) for over 1,200 hours. Anchoring the SAM onto an inherently stable nickel oxide surface enhances the SAM's binding energy on the substrate. Also, they synthesised a new SAM molecule of their own, creating an innovative molecule that promotes more efficient charge extraction in perovskite devices. The team has laid the foundation for these cells to perform efficiently even in high-temperature conditions.

Magnetic Gel that Heals Diabetic Wounds Faster Developed by NUS

Researchers from the National University of Singapore (NUS) engineered an innovative magnetic wound-healing gel that promises to accelerate the healing of diabetic wounds, reduce the rates of recurrence, and in turn, lower the incidents of limb amputations. Each treatment involves the application of a bandage pre-loaded with a hydrogel containing skin cells for healing and magnetic particles. To maximise therapeutic results, a wireless external magnetic device is used to activate skin cells and accelerate the wound healing process. The ideal duration of

magnetic stimulation is about one to two hours. Lab tests showed the treatment coupled with magnetic stimulation healed diabetic wounds about three times faster than current conventional approaches. Furthermore, while the research has focussed on healing diabetic foot ulcers, the technology also has potential for treating a wide range of complex wounds such as burns. The specially designed wound-healing gel is loaded with two types of FDA-approved skin cells -- keratinocytes (essential for skin repair) and fibroblast (for formation of connective tissue) -- and tiny magnetic particles. When combined with a dynamic magnetic field generated by an external device, the mechanical stimulation of the gel encourages dermal fibroblasts to become more active. Lab tests showed that the increased fibroblast activity generated by the magnetic wound-healing gel increases the cells' growth rate by approximately 240 per cent and more than doubles their production of collagen -- a crucial protein for wound healing. It also improves communication with keratinocytes to promote the formation of new blood vessels. A patent has been filed for this innovation.The researchers are conducting more tests to further refine the magnetic wound-healing gel to improve its effectiveness. They are also collaborating with a clinical partner to test the effectiveness of the gel using diabetic human tissues.

Alternative to Cobalt Batteries for Green and Clean Power

A team including researchers from the University of Tokyo have developed a viable alternative to cobalt which in some ways can outperform state-of-the-art battery chemistry. It also survives a large number of recharge cycles, and the underlying theory can be applied to other problems. They used a novel combination of elements in the electrodes, more common and less problematic elements to produce and work with. The battery system uses a Silicon Oxide (SiOx) anode and a high-potential, Co-free spinel LiNi0.5Mn1.5O4 cathode in 3.4 M LiFSI/FEMC electrolyte. The new electrodes and electrolyte are not only devoid of cobalt, but they actually improve upon current battery chemistry in some ways. The new battery has an energy density about 60 per cent higher, which could equate to longer life, and it can deliver 4.4 volts, as opposed to about 3.2-3.7 volts of typical Lithium Ion batteries (LiB). Tests showed that batteries with the new chemistry were able to fully charge and discharge over 1,000 cycles (simulating three years of full use and charging), whilst only losing about 20 per cent of their storage capacity. Further work is ongoing to improve safety and longevity.This research has the potential to lead to improved batteries for many applications. The concepts that underlie their recent development can be applied to other electrochemical processes and devices, including other kinds of batteries, water splitting (to produce hydrogen and oxygen), ore smelting, electro-coating and more.

New Tool to Fight Pancreatic Cancer

Pancreatic ductal adenocarcinoma (PDAC) is one of the deadliest cancers worldwide, with a 5-year survival rate of less than 10 per cent.To more efficiently combat this pancreatic cancer, a team led by researchers at Osaka University is combining diagnostic and therapeutic procedures into a single integrated process: 'theranostics'. The team has developed a 'radio-theranostics' strategy that uses a new radioactive antibody to target glypican-1 (GPC1), a protein highly expressed in PDAC tumors. The team used a monoclonal antibody (mAb), an antibody designed to target a certain molecule, to target GPC1. The mAb could be labeled with radioactive zirconium (89Zr) or radioactive astatine (211At). They worked with a xenograft mouse model, which involved human pancreatic cancer cells being injected into a mouse that developed into a full tumor that could be experimentally treated and monitored. These mice were intravenously administered 89Zr-labeled GPC1 mAb. They were also given 211At-labeled GPC1 mAb to

examine the antitumor effects. Administration of 211At-GPC1 mAb resulted in DNA double-strand break induction in the cancer cells, as well as significantly reduced tumor growth. Control experiments showed that these antitumor effects did not occur when mAb internalization was blocked. Additionally, non-radiolabeled GPC1 mAb did not induce these effects, suggesting that 211At-GPC1 mAb could be used for targeted alpha therapy to support suppression of PDAC tumor growth.

Technique to Distinguish Between Tumour and Normal Tissue

A team led by researchers from Mass General Brigham has developed a visualization tool that combines high-speed cameras and fluorescent injection to distinguish tumor tissue from normal tissue across cancer types. The new imaging technology, known as fluorescence lifetime (FLT) imaging, was tested and was over 97 percent accurate across tumor types, with the potential to improve the accuracy of cancer surgeries.The technology known as FLT imaging, uses high-speed cameras to detect changes in the property of the light emitted by tissue. In previous studies in preclinical models, it was found that tumors in mice injected with a dye known as indocyanine green (ICG) had a longer fluorescence lifetime compared to normal tissue. This difference allowed the researchers to accurately distinguish between tumor tissue and normal tissue. The team applied the same principle to samples from patients. The team evaluated specimens from more than 60 patients representing multiple cancer types, including liver, brain, tongue, skin, bone and soft tissue, and was able to detect an FLT shift at the cellular level that was consistent across tumor types and in multiple patients. The technique was also able to distinguish benign from metastatic lymph nodes. Overall, it was more than 97 percent accurate at distinguishing tumor tissue from healthy tissue.The researchers' next step is to perform a larger scale clinical trial to test the safety and efficacy of fluorescence lifetime imaging with ICG for tumor identification during surgeries.

Organic Nanozymes Developed for Agriculture Use

Researchers from the University of Illinois Urbana-Champaign have developed a nanozyme that is organic, non-toxic, environmentally friendly, and cost effective. The team developed fully organic compound-based nanozymes (OC nanozymes) which exhibit peroxidase-like activities. The OC nanozyme follows the catalytic activity of the natural enzyme but is predominantly based on agriculture-friendly organic compounds, such as urea acting as a chelating-like agent and polyvinyl alcohol as a particle stabilizer. The researchers also implemented a colorimetric sensing system integrated with the OC nanozyme for target molecule detection. Colorimetric assays, an optical sensing method, use color intensity to provide an estimated concentration of the presence of specific molecules in a substance, such that darker or lighter color indicates lower or higher quantity of target molecules. The organic-compound nanozyme performed on par with nanozymes typically used in biosensing applications within their kinetic profile with molecule detection performance. The researchers are also working on developing additional nanozymes, envisioning these environmental-friendly materials hold great potential for a wide range of applications.

INDIA

Flexible Supercapacitors with Efficient Energy Storage Developed

The Materials for Energy Storage and Optoelectronic Devices Group in the Department of Physics, Sanatana Dharma College, Alappuzha has developed a hybrid electrode-based flexible symmetric supercapacitor that shows excellent electrochemical properties, cycle stability and high energy density. The binder-free hybrid electrode consists of high-molecular weight polyaniline (PANi) prepared via self-stabilized dispersion polymerization and vanadium pentoxide nanostructures prepared by a facile microwave assisted method. The incorporation of this high molecular weight PANi with nanostructured V2O5 effectively addresses the shortcomings of these individual materials and exhibits a synergistic effect as evident from the performance of the hybrid electrode. The flexible supercapacitor device made using these electrodes exhibits superior electrochemical characteristics with very high energy density and cycling stability, being the highest among the values reported for supercapacitors using aqueous electrolytes.

IIT Develops Indigenous Rice which Thrives in Scanty Rain

In collaboration with the technical intervention of IIT Kharagpur, the NGO, Centre for World Solidarity (CWS) has helped farmer producer organisation in a village in Ghatshila block of East Singhbhum district develop a nutrition-rich indigenous variety of rice which can thrive in scanty rain and fewer fertilisers, while increasing income of the farmers. The first sent samples of Bali-Bhojuna rice to the analytical food testing laboratory operated by the agriculture and food engineering department of the IIT Kharagpur, for analysis. IIT with advanced technology and machinery helped in making the cultivation of this nutritious rice variety simple and practical. The variety can grow in any soil variety, does not require chemical fertilisers and is weed-resistant.

Nanoparticles Vital for Water Purification Produced

IISER Bhopal produced magnetic nanoparticles, which are minuscule particles approximately one hundred thousand times smaller than the width of a human hair. These nanoparticles have been engineered for multiple applications, such as heat and light-induced removal of salt from seawater, the extraction of potable water from contaminated wastewater with dyes, deicing and anti-icing processes. The creation of magnetic nanoparticles has diverse applications, from efficient desalination processes to dye removal and de-icing all of which represent a significant step towards sustainable and accessible water resources. The researchers used a simple method inspired by Indian earthen lamps to produce the magnetic Porous Carbon Nanoparticles. The process involved saturating cotton with nickel salt and mustard oil, and igniting it using a lighter, resulting in the formation of these specialized MNPs. The synthesized MNP was assessed for its photothermal activities.

IISc and Samsung to Collaborate on Quantum Technologies

Samsung Semiconductor India Research (SSIR) has collaborated with the Indian Institute of Science (IISc) in Bengaluru to help set up a unique Quantum Technology Lab. The lab will serve as a centre for technological innovation, manpower training, and collaboration with national and international quantum research institutions. With a focus on building indigenous quantum technologies, it will significantly contribute to building local development and putting India's

research innovations on the international map. The lab will provide students pursuing higher education, particularly in the field of physics, engineering, computer science, and mathematics, unparalleled opportunities for hands-on training, research experience, and skill development in quantum technologies, thereby enhancing their employability and career prospects. Researchers and scientists engaged in quantum research will benefit from the advanced infrastructure, collaborative environment, and access to cutting-edge resources, enabling them to push the boundaries of knowledge and make significant contributions to the field. Additionally, it will also support and provide resources for faculty members from other colleges and institutions who are unable to carry out capital-intensive research. The Quantum Technology Lab will integrate cryogenic control chips with qubits, single photon sources, and detectors, and address reliability challenges in quantum technologies. The lab will provide a platform for interdisciplinary research, industry collaborations, and the exchange of knowledge, which will cultivate a dynamic ecosystem for innovation.

ISRO Prepares for Human Spaceflight

On October 21, ISRO conducted an uncrewed in-flight abort test. One minute into the flight, the Crew Escape System fired for just over two seconds, pulling the crew module away from the launch vehicle. The momentum took the crew module to an altitude of 17 kilometers, where the Crew Escape System itself separated from the crew module. Neither the launch vehicle nor the Crew Escape System were recovered. The crew module descended to a safe splashdown ten kilometers downrange, first using a pair of drogue parachutes and then three main parachutes. About nine minutes after launch the mission concluded having met all the mission objectives successfully. ISRO concluded this in-flight abort test a complete success despite the poor weather that obscured the launch and the descent. Infrared cameras and the telemetry provided ISRO with the data it required. The ISRO chairman explained that the unexpected hold at T-5 seconds during the first launch attempt was due to the automatic launch sequence detecting a weather threshold breach. The rescheduled launch attempt 45 minutes later was successfully completed despite the crew capsule initially floating upside down. This is not an unexpected outcome for NASA, as the Apollo 11 crew capsule was discovered just after splashdown in July 1969. NASA referred to this position as “Stable 2”. Launch escape systems have been activated in three instances and saved the lives of the crew in each case in 1975(Soyuz 7K-T No.39), 1983(Soyuz-T-10), and 2018(Soyuz MS-10). Developing and testing Gaganyaan’s Crew Escape System is one of the many prerequisite critical systems ISRO must develop and demonstrate prior to the first crewed flight. ISRO has been developing critical technologies including environmental control systems, prototypes of spacesuits, and human-rating the LVM3.

Advancing India's Wireless Communication Technology

The Technology Development Board (TDB) has announced its support for M/s Lekha Wireless Solutions Pvt Limited, Bengaluru for their innovative project "Tactical Advanced SDR for Space, Defence and Aviation Applications." The project's primary aim is to bring to market an array of cutting-edge products under the brand name "Antares." These products encompass: Handeld Software Defined Radio (SDR) for L, S and C bands for tactical applications; Multi-Channel SDR; Satcom SDR; and High Power Add-On power modules.The proposed Tactical SDR can operate within both licensed and unlicensed bands, supports frequency hopping, and is compatible with both legacy and advanced digital waveforms. This indigenous technology-based

radio system serves as an import substitute for the Indian Armed Forces, offering eight different form factors to address a wide range of use cases.

G-20 AND GLOBAL CHALLENGES

G20 Roadmap to Deal with Crypto Assets

The finance ministers of the G20 nations have called for swift and coordinated implementation of the G20 roadmap to deal with the issues related to crypto assets. The G20 Roadmap on Crypto Assets adopted by the G20 Finance Ministers was spelt out in a Synthesis Paper prepared jointly by the International Monetary Fund (IMF) and Financial Stability Board (FSB). The Finance Ministers and Central Bank Governors (FMCBG) of G20 nations met on the sidelines of IMF-World Bank annual meetings in Marrakesh, Morocco. The G20 Roadmap on crypto assets is a detailed and action-oriented roadmap that will help coordinate global policy as well as develop mitigating strategies and regulations on such assets while also taking into consideration the specific implications on Emerging Markets and Developing Economies (EMDEs). Regular updates on the progress of the roadmap will be provided by the IMF and the FSB in G20 meetings.The G20 has asked to identify an appropriate and coordinated timeline to commence exchanges by relevant jurisdictions under the Crypto Assets Reporting Framework (CARF), formed in September 2023. The information exchanges by CARF will start by 2027.

IN BRIEF

Gene Therapy for Glioblastoma

Glioblastoma (GBM), an aggressive brain cancer, is notoriously resistant to treatment, with recurrent GBM associated with survival of less than 10 months. Immunotherapies, which mobilize the body's immune defenses against cancer, have not been effective for GBM, in part because the tumor's surrounding environment is largely impenetrable to assaults from the body's immune system. Researchers from Brigham and Women's Hospital (BWH) have engineered a novel oncolytic virus that can infect cancer cells and stimulate an anti-tumor immune response. Results demonstrated the safety and preliminary efficacy of the novel gene therapy approach in high-grade glioma patients, with prolonged survival in a subgroup of recurrent GBM patients immunologically "familiar" with the virus.This phase I, first-in-human trial examined the safety of an oncolytic virus, called CAN-3110, which was designed and subjected to preclinical testing by researchers at BWH and licensed to Candel Therapeutics as the trial was ongoing.The cancer-attacking virus is an oncolytic herpes simplex virus (oHSV), which is the same type of virus used in a therapy approved for the treatment of metastatic melanoma. Unlike other clinical oHSVs, this therapy includes the ICP34.5 gene, which is also genetically "programmed" not to attack healthy brain cells. Overall, the trial demonstrated the safety of CAN-3110 in 41 patients with high-grade gliomas, including 32 with recurrent GBM. The most serious adverse events were seizures in two participants. After CAN-3110 treatment, the investigators also observed an increase in the diversity of the T cell repertoire, suggesting that the virus induces a broad immune response, perhaps by eliminating tumor cells resulting in the release of cancer antigens. These immunological changes after treatment were also shown to be associated with improved survival.

Shape-shifting Fiber Can Produce Morphing Fabrics

Researchers from MIT and Northeastern University developed a liquid crystal elastomer fiber that can change its shape in response to thermal stimuli. The fiber, which is fully compatible with existing textile manufacturing machinery, could be used to make morphing textiles.The liquid crystal elastomer (LCE) material contracts when heated up, and on cooling the material returns to its original length. By carefully mixing chemicals to synthesize the LCE, the researchers can control the final properties of the fiber, such as its thickness or the temperature at which it actuates.The fiber is made from thick and viscous LCE resin is heated, squeezed through a nozzle and cured using UV lights that shine on both sides of the slowly extruding fiber.Then the fiber is dipped in oil to give it a slippery coating and cured again with UV lights, creating a strong and smooth fiber. Finally, it is collected into a top spool and dipped in powder so it will slide easily into machines for textile manufacturing.The resulting fiber, called FibeRobo, can contract up to 40 percent without bending, actuate at skin-safe temperatures, and be produced with a low-cost setup for 20 cents per meter, which is about 60 times cheaper than commercially available shape-changing fibers.The fiber can be incorporated into industrial sewing and knitting machines, as well as nonindustrial processes like hand looms or manual crocheting, without the need for any process modifications.

Small Molecule Can Suppress Growth of Breast and Ovarian Cancers in Animal Models

Researchers at Baylor College of Medicine have identified a small molecule named 5D4 that can suppress the growth of breast and ovarian cancers in animal models. 5D4 works by binding to TopBP1 protein in cancer cells, disrupting its interactions with several pathways that promote cancer growth. Combining 5D4 with another cancer inhibitor, talazoparib, enhances the effectiveness of the anti-cancer activity.The researchers screened more than 200,000 compounds followed by multiple rounds of structure-based compound optimization and discovered that 5D4 can bind to and effectively inhibit TopBP1 from stimulating several cancer-promoting molecular pathways. Importantly, 5D4 can inhibit MYC activity in cancer. MYC has been known to be very difficult to target. Their finding may open a new avenue to target MYC indirectly with TopBP1 inhibitors. 5D4 shows anti-cancer activity without toxicity to normal tissues. These findings strongly support the potential use of TopBP1inhibitors as a targeted cancer therapy.

Increasing Risk of Invasive Species Colonization on Marine Debris

A groundbreaking scientific study conducted along the Southeast coast of India has unearthed a pressing environmental concern -the increasing risk of invasive species colonization on marine debris. The research delves into the critical interplay between plastic pollution and the introduction of non-indigenous organisms into Indian waters. A team, led by the Institut de Ciències del Mar (ICM-CSIC) made a comprehensive examination of fouling organisms on various types of stranded litter, including plastic, glass, rubber, foam sponge, cloth, metal, and wood. Their meticulous efforts unfolded a startling reality: a total of 3,130 specimens/colonies belonging to seven phyla and representing 17 species.The results unveil the presence of the invasive mussel Mytella strigata attached in high density groups to fishing nets. This research is the first documentation of marine litter as a vector for species dispersal in India. The results highlight the increasing risk of invasive species colonization on plastics along the southeast coast of India.

Mechanics of Breast Cancer Metastasis Discovered

New research led by Penn State reveals for the first time the mechanics behind how breast cancer cells may invade healthy tissues. The finding that a motor protein called dynein powers the movement of cancer cells in soft tissue models, offers new clinical targets against metastasis and has the potential to fundamentally change how cancer is treated.The researchers used live microscopy to watch the migration of live breast cancer cells in two different systems modeled after the human body. The team found that by blocking the dynein protein, the cancer cells cannot effectively move and infiltrate solid tissues. This suggests a whole new method for cancer management by stopping the cancer cells from moving.After surgical removal of the main tumor, it could prevent the cancer from spreading without damaging healthy tissues and cells.The researchers noted that any potential clinical treatment is still far off — as they have yet to run human or animal trials. The team has filed multiple patents related to this platform and plans to use the technology to study a myriad of diseases, including other cancers.

Unlocking Sugar to Generate Biofuels and Bioproducts

Plant biologists at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory have engineered enzymes to modify grass plants so their biomass can be more efficiently converted into biofuels and other bioproducts. These enzymes modify molecules that make up plant cell walls to provide access to fuel-generating sugars normally locked within complex structures. The researchers used engineered enzymes called monolignol 4-O-methyltransferases (MOMTs). which can alter the chemical structure of monolignols—the main building blocks of lignin. Two versions of the enzyme MOMT4 and MOMT9 were tested.The plants expressing MOMT4 produced up to 30 per cent more sugar while those expressing MOMT9 yielded up to 15 per cent more sugar compared to unaltered plants. Through a process called fermentation, this sugar can be converted into biofuels like ethanol, which is a common additive used to lower the fossil fuel content of gasoline. In addition to acting on the monolignols, both MOMTs acted on other cell wall components—the cross-linking phenolics and also a phenolic called tricin, which is a lignin precursor unique to grass plants.The broader effects of expressing the enzymes were positive in terms of optimizing sugar yield from grass cell walls. The scientists plan to maximize the ability to extract sugars without affecting fertility or growth, and from other grass plant species like sorghum and bamboo.

RESOURCES & EVENTS

World Health Summit 2023 Held in Berlin during 15-17 October

The World Health Summit 2023, Berlin was organised by Germany, France and WHO, under the motto "A Defining Year for Global Health Action," discussed topics such as climate change and health, pandemic prevention, digital technologies, the role of the G7 and G20 in global health, and 75 years of WHO. The three day meeting witnessed 370 speakers in 63 sessions. Around 3,100 participants from 106 countries including over 20 Ministers took part on site in Berlin. A joint statement on Green Health by the World Health Organization (WHO) and the World Health Summit, underlined the need to build climate-resilient, low-carbon and sustainable health systems. The M8 Alliance Declaration, issued at the end of the World Health Summit, urged a move from fragmentation to cooperation and integration, address disparities within and between countries, address the needs of the most vulnerable.The M8 Alliance with 31 members around the world is the academic backbone of the World Health Summit.

Biodiversity Discussed at CBD Bodies Meeting Held in Nairobi during 15-20 October

The 25th Meeting of the CBD Subsidiary Body on Scientific, Technical, and Technological Advice (SBSTTA 25) and Resumed Second Part of the 15th Meeting of the CBD Conference of the Parties of the Convention on Biological Diversity (CBD) convened in Nairobi from 15-20 October 2023. The meeting discussed aspects of the Glonal Biodiversity Framework (GBF) implementation, including the monitoring frameworks, mechanisms for planning and review, scientific and technical needs, and plant conservation. Discussions also extended to the implications of the assessments of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6) on GBF implementation and the Convention's work programme. SBSTTA 25 adopted resolutions on topics including plant conservation, sustainable wildlife management, and biodiversity and climate change. The resumed second part of the CBD COP 15 convened concurrently with the tenth meeting of the COP serving as the Meeting of the Parties (MOP) to the Cartagena Protocol on Biosafety (CP-MOP-10) and the fourth MOP to the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilization (NP-MOP-4). The meeting discussed procedural issues including the date and venue of the next COP16.

SCIENCE POLICY AND DIPLOMACY

EU Members Approve Common Position for COP-28

The EU will seek a global phase-out of fossil fuels and for their use to reach a peak in this decade, according to the member states' common position adopted unanimously on 16 October. They will also call for eliminating "as soon as possible" subsidies for fossil fuels which do not serve to combat energy poverty or ensure a "just transition"—but without setting a deadline. They will advocate the importance of having the energy sector predominantly free of fossil fuels well before 2050 without the mention of "unabated".The EU is looking to triple the amount of global renewable energy used by the end of this decade and double energy efficiency in line with the goals of the COP28 presidency. The EU has already set itself a horizon of 2050 to abolish "unabated" fossil fuels—meaning those reliant on coal, oil and gas that do not have mechanisms to capture or store carbon. Some governments wanted the "unabated" label withdrawn or have strict conditions attached to the use of carbon capture technology, to prevent them being used as justification for continued fossil-fuel burning. The EU has also called for global action towards the tripling of installed renewable energy capacity by 2030 as well as a doubling of energy efficiency, in line with the roadmap of the president of COP28.The EU has set a target of reducing its emissions "by at least 55 percent by 2030 compared to 1990 levels".The EU will also call for strengthening existing funding arrangements evoked in COP27 to compensate poorer countries as they shift to greener energy production and use.

Talks on Loss and Damage Facility Fail Before COP-28

The fourth meeting of the Transitional Committee on Loss and Damage Fund (LDF) held in Aswan, Egypt (17-20 October), ended without a clear consensus on operationalising the fund last week, exposing a deep trust deficit among rich and emerging economies over historic responsibility, climate reparations and making money available for compensation.The committee, comprising 24 members from parties to UNFCCC and Paris Agreement, with 10 members from developed countries and 14 members from developing countries, has now decided to reconvene

in Abu Dhabi from November 3 to 5 to try and resolve differences ahead of the key COP28 summit in December. The committee could not agree on recommendations for the operationalization of the fund. Differences centred on the location of the fund. Developed countries pushed for the fund to be hosted by the World Bank, a demand rejected by developing countries.Developing countries demanded a new stand-alone Fund, with an independent international legal personality, and an independent dedicated secretariat. The two other sticking points that emerged were the sources of funding and financial inputs, and the system of allocation of resources. Developed countries rejected the foundational principle of common-but-differentiated responsibilities and respective capabilities (CBDR&RC) between developed and developing countries, and thus, their lead role in providing finance to developing countries as part of their financial obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and its Paris Agreement.The countries instead pushed for the phrase "countries in a position to do so" for contributing to the Fund. They also resisted the reference to at least $100 billion a year by 2030 in terms of the scale of resources needed that were proposed by developing countries. The United States, supported by other developed countries, has been the lead proponent of the fund to be hosted by the World Bank as a Financial Intermediary Fund (FIF), whereby it could play different roles, such as trustee only; trustee and an implementing entity. Following the collapse of the talks, COP28 president Sultan Al Jaber called on the committee to deliver strong recommendations so that the Fund can be activated and capitalised as soon as possible. Last year, the UN Climate Conference (COP27), saw polarised debates on responsibility and accountability among the global North and South. But the conference made history with a decision to create a Loss and Damage Fund which will provide support to developing countries in efforts to avert, minimise and address the adverse effects of the climate crisis.

Montreal Protocol MOP35 Meeting

The high-level segment of the thirty-fifth Meeting of the Parties (MOP 35) to the Montreal Protocol on Substances that Deplete the Ozone Layer (22-28 October, Nairobi) discussed the replenishment of the Multilateral Fund (MLF) for the implementation of the Protocol, dumping, energy efficiency, and proposed adjustments to the Protocol occasioned by the COVID-19 pandemic. They approved the MLF replenishment for 2024-2026 of USD 965,000,000, which is the largest replenishment in the history of the Fund. They also approved the Protocol's budget in the amount of USD 5,852,835 for 2024. Other decisions related to Stratospheric aerosol injection and protection of the ozone layer; impacts of the COVID-19 pandemic; Energy efficiency; Very short-lived substances; Trade of prohibited cooling equipment, etc. In recent years, the Kigali Amendment to the Montreal Protocol seeks to deal with additional challenges from hydrofluorocarbons (HFCs) which are potent greenhouse gases. It was reported that 155 states have ratified the Kigali Amendment and 43 ratifications are pending. It was agreed that the 13th Conference of Parties to the Vienna Convention for the Protection of the Ozone Layer and MOP 36 would be held in Bangkok, Thailand, from 28 October – 1 November 2024. Also the 46th meeting of the Open-ended Working Group (OEWG 46) would be held from 8-12 July 2024 in Montreal, Canada.

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