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SCIENCE DIPLOMACY**

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NEWS ALERT

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GLOBAL

Plant nanobionic sensor to monitor arsenic levels in soil

Scientists from Singapore have engineered a novel type of plant nanobionic optical sensor that can detect and monitor, in real-time, levels of the highly toxic heavy metal arsenic in the underground environment. This development provides significant advantages over conventional methods used to measure arsenic in the environment and will be important for both environmental monitoring and agricultural purposes. These novel optical nanosensors exhibit changes in their fluorescence intensity upon the detection of arsenic. Embedded in plant tissues with no detrimental effects on the plant, this method of coupling nanoparticle



them allows for the detection of arsenic uptake in living plants in real-time with portable, inexpensive electronics. The team also used a species of fern, *Pteris cretica*, for an ultrasensitive plant-based arsenic detector, capable of detecting very low concentrations of arsenic, as low as 0.2 parts per billion (ppb) much below the regulatory limit for arsenic detectors of 10 parts per billion. Notably, the novel nanosensors can also be integrated into other species of plants.

[New lab-on-a-chip infection test could provide cheaper, faster portable diagnostics](#)

Researchers from Imperial College London have developed a lab on a chip known as TriSilix, which performs a miniature version of the polymerase chain reaction (PCR) on the spot, and process and present results in a matter of minutes. Each lab-on-a-chip contains a DNA sensor, temperature detector and heater to automate the testing process. The new silicon chips in a standard laboratory, cuts the costs and time they take to fabricate, potentially allowing them to be produced anywhere in the world. They have so far used TriSilix to diagnose a bacterial infection mainly present in animals as well as a synthetic version of the genetic material from SARS-CoV-2, the virus behind COVID-19. The system could in future be mounted onto handheld blood sugar test-style devices and let people test themselves and receive results at home for colds, flu, recurrent infections like those of the urinary tract (UTIs), and COVID-19. This new test could be performed by citizens and also be used to diagnose and monitor infections like UTIs, which often recur despite antibiotics.

[Ultrasensitive transistor for herbicide detection in water](#)

Researchers from Japan have developed a new polymer-based, solid-state transistor that can more sensitively detect a weed killer glyphosate in drinking water. The sensor is an organic thin-film transistor based on semiconducting molecules of polythiophene (P3CPT) with added copper ion. When the device is placed in water that contains the herbicide glyphosate, the copper ions leave the P3CPT molecules to attach to the glyphosate molecules. This causes a detectable reduction in the flow of electric current through the device. The device was so sensitive that it could detect as low as 0.26 parts per million of glyphosate in drinking water much below the maximum allowable amount of glyphosate in drinking water 0.7 parts per million according to USEPA norms. This device could be a novel solid-state platform for sensing various target molecules in aqueous media.

[A semiconductor chip detects antigen concentrations at 1 parts per quadrillion](#)

Researchers at Toyohashi University of Technology, Japan have developed a chip that can sense antigens at one part per quadrillion molar mass using a minuscule amount of blood, urine, saliva, or other bodily fluid. The device uses a micro sensor chip that checks for diseases using a flexibly deformable nanosheet made using semiconductor micromachining technology. First, an antibody that catches the targeted antigens is fixed onto the nanosheet, and deformations to a thin film caused by electric repulsions among the adhered antigens is measured. To improve sensitivity, organic nanosheets two-times softer than semiconductor silicon is used. In addition, it uses signal detection technology for a smartphone camera to detect nanosheet deformation. The technology is expected to allow for quick detection of disease-derived molecules. In addition to blood detection, such sensors can be developed to detect odor and chemical substances. The technology can be used to detect viruses while also detecting a variety of biomarkers.



UC San Francisco scientists have found that a drug, called ISRIB (Integrated Stress Response Inhibitor) showed rapid restoration of youthful cognitive abilities in aged mice, accompanied by a rejuvenation of brain and immune. The Integrated Stress Response (ISR) normally weeds out misbehaving cells, but if it remains on in a tissue like the brain, it can lead to serious problems. The team found that in mice, brief ISRIB treatment can reboot the ISR and restore normal brain function almost overnight in mice. This cognitive rejuvenation lasted for several weeks after the initial ISRIB treatment. The findings suggest the drug could have implications for diseases from Alzheimer's to diabetes due to an aging immune system. A wide array of neurological conditions could potentially be treated with ISRIB. So far in all their studies, the researchers have observed no side effects.

[AI solves a 50-year-old grand challenge of protein folding.](#)

The AI enterprise DeepMind announced that the latest version of DeepMind's AlphaFold, a deep-learning system can accurately predict the structure of proteins to within the width of an atom, one of biology's grand challenges. For most proteins, there are typically a huge number of possible shapes for each sequence of amino acids. AlphaFold predicted the structure of dozens of proteins with a margin of error of just 1.6 angstroms—that's 0.16 nanometers, or atom-sized, in a few days. DeepMind trained AlphaFold on around 170,000 proteins taken from the protein data bank over a few weeks. The breakthrough could help researchers design new drugs and understand diseases and help design synthetic proteins, such as enzymes that digest waste or produce biofuels, increase crop yields and make plants more nutritious.

[Recycled concrete could be a sustainable way to keep rubble out of landfills](#)

Researchers at UBC, Canada have found that the recycled concrete had comparable strength and durability after five years of being in service. Waste materials from construction and demolition contribute up to 40 per cent of the world's waste. The researchers tested the compressive strength and durability of recycled concrete compared with conventional concrete. The recycled concrete replaces the natural aggregate for producing new concrete. The recycled concrete had a higher rate of compressive strength after 28 days of curing while maintaining a greater or equal strength during the period of the research. The researchers suggest the recycled concrete can be a 100 per cent substitute for non-structural applications.

[New possibilities for magnesium batteries](#)

Researchers from the University of Houston and the Toyota Research Institute of North America (TRINA) have developed a new cathode and electrolyte to demonstrate a magnesium battery capable of operating at room temperature and delivering a power density comparable to that offered by lithium-ion batteries. The ground-breaking results came from combining both an organic quinone cathode and a new tailored boron cluster-based electrolyte solution. The new battery is nearly two orders of magnitude higher than the power density achieved by previous magnesium batteries. The battery was able to continue operating for over 200 cycles with around 82% capacity retention, showing high stability. The results open up possibilities for developing high-performance cathode materials and electrolyte solutions for magnesium batteries and for using energy-dense metals for fast energy storage.

COVID-19



[Alcohol-free hand sanitizer just as effective against COVID as alcohol-based versions](#)

A new study from researchers at Brigham Young University finds that alcohol-free hand sanitizer is just as effective at disinfecting surfaces from the COVID-19 virus as alcohol-based products. The researchers treated samples of the novel coronavirus with benzalkonium chloride, which is commonly used in alcohol-free hand sanitizers, and several other quaternary ammonium compounds regularly found in disinfectants. In most of the test cases, the compounds wiped out at least 99.9% of the virus within 15 seconds. The results of the tests indicated that alcohol-free hand sanitizer works effectively and could be used to control COVID. The researchers also noted that alcohol-free hand sanitizers are also effective against common cold and flu viruses.

[UK approves Pfizer/BioNTech COVID-19 vaccine](#)

The UK's Medicines & Healthcare products Regulatory Agency (MHRA) has granted a temporary authorisation for the emergency use of Pfizer/BioNTech's COVID-19 vaccine and expects to receive the first batch of 800,000 doses by early December. The MHRA's decision includes data from the phase III clinical study, which demonstrated a vaccine efficacy rate of 95 percent from 7 days after the second dose. Pfizer and Bio-NTech are anticipating further regulatory decisions including from European Medicines Agency. The vaccine needs to be stored at minus 80 degrees centigrade and Pfizer has established cold chain infrastructure to supply the vaccine worldwide that can store vaccine doses for up to six months.

[Paper-based electrochemical sensor can detect COVID-19 in less than five minutes](#)

Researchers at Grainger College of Engineering have developed a graphene-based electrochemical biosensor with an electrical read-out setup to selectively detect the presence of SARS-CoV-2 genetic material. In this sensor, the hybridization of the viral RNA with these probes causes a change in the sensor electrical response. The AuNP caps accelerate the electron transfer and when broadcasted over the sensing platform, results in an increase in the output signal and indicates the presence of the virus. During the tests, the sensor showed a significant increase in the voltage of positive samples compared to the negative ones and confirmed the presence of viral material in less than five minutes. With unique properties, the researchers foresee the applications of biosensor for many different biomarkers.

[Battling COVID-19 using UV light](#)

A research team at University of New Mexico's Center for Biomedical Engineering have found a possible breakthrough in how to manage COVID-19, as well as future viruses. Their research finds that certain polymers and oligomers, when combined with UV light, to almost completely kill the coronavirus. The materials when activated with UV light provide a fast acting and highly effective, coating reducing the concentration of the virus by five orders of magnitude. The research showed that these materials have shown to have broad-spectrum antiviral properties allowing the absorption of light that generates the reactive oxygen intermediate at the surface of the virus particle.

[Understanding COVID-19 infection and possible mutations](#)

Penn State researchers computationally assessed how changes to the virus spike makeup can affect binding with ACE2. The researcher found that the SARS-CoV-2 spike protein is highly optimized to bind with human ACE2. Simulations of viral attachment to homologous



and chickens. The binding behaviour of the virus spike with ACE2 and the virus tolerance of these structural spike changes is important for future research on vaccine durability and the potential for the virus to spread to other species.

[Computer model can predict how COVID-19 spreads in cities](#)

A team of researchers from Northwestern University, USA has created a computer model that accurately predicted the spread of COVID-19 in 10 major cities by analyzing three factors that drive infection risk: where people go in the course of a day, how long they linger and how many other people are visiting the same place at the same time. For the study, the researchers traced the movements of 98 million Americans in 10 largest metropolitan areas and computed the probability of infectious events at different places and times. The model revealed that most COVID-19 transmissions occur mainly at “super-spreader” sites, like full-service restaurants, fitness centers and cafes, where people remain in close quarters for extended periods. The specificity of the model, according to researchers, can serve as a tool for officials to help minimize the spread of COVID-19 as they reopen businesses at 20 percent or 50 percent of capacity.

COVID-19 (INDIA)

[Indigenous mRNA vaccine candidate gets nod for Human clinical trials](#)

India’s first indigenous mRNA vaccine candidate has received approval from Indian Drug regulators to initiate Phase I/II human clinical trial. The novel mRNA vaccine candidate, HGCO19 has been developed by Gennova, Pune and supported by the Ministry of Science & Technology. Gennova, in collaboration with HDT Biotech Corporation, USA, has worked together to develop an mRNA vaccine candidate which uses the most prominent mutant of spike protein (D614G) and also uses the self-amplifying mRNA platform. HGCO19 uses adsorption chemistry so that the mRNA is attached on the surface of the nano-lipid carrier to enhance the release kinetics of the mRNA within the cells compared to the encapsulation chemistry. HGCO19 is stable at 2-8°C for two months. Gennova has completed all preliminary work and will be initiating the Phase I/II Human clinical trial after getting approval from the DCGI office.

[Covid-19 vaccines may get license in coming weeks, says health ministry](#)

India’s Ministry of Health & Family Welfare indicated that emergency use approval (EAU) is being considered for several national and international vaccine developers such as Serum Institute of India, Bharat Biotech, AstraZeneca and Pfizer for their respective vaccine candidates against coronavirus in India. Currently, 6 vaccine candidates are in clinical trial stage in India, 3 vaccine candidates are under active consideration for license approval. The health ministry also noted that the Covid-19 vaccination drive will have minimal impact on routine health services including routine immunisation. There are around 239 thousand vaccinators (Auxiliary Nurse Midwife-ANM) across the country of which only 154 thousand ANMs will be used for Covid-19 vaccination.

[India’s COVID vaccination drive: 60 crore vaccine shots, 100 people per session](#)



each site per day going up to 200 if logistics allow. The vaccine will be first given to health care workers (10 million), frontline workers (20 million), and people above 50 years (260 million). After this, vaccines will be given to those below 50 years of age who are suffering from a chronic critical illness (10 million) (for a total of 300 million people in phase-1 planning). The people in different age groups will be identified based on the voter list prepared for elections. Also, the beneficiaries will be tracked through a digital platform called Co-WIN. For full detailed presentation see here

INDIA – SCIENCE & TECHNOLOGY

[Indian Quantum Communication Technology for QKD developed](#)

DRDO developed Quantum Key Distribution (QKD) technology was successfully tested in Hyderabad between two DRDO labs, DRDL and RCI, over a 12 km fiber optic channel to show secure communication. The technology is developed by CAIR, Bengaluru and DYSL-QT, Mumbai. Quantum Communication using time-bin Quantum Key Distribution (QKD) scheme was performed under realistic conditions. The setup also demonstrated the validation of detection of a third party trying to gain knowledge of the communication. Software was developed for data acquisition, time synchronization, post-processing, determining Quantum bit error rate and extracting other important parameters. The work being done at DRDO will be used to enable start-ups and SMEs in the domain of Quantum information technologies and to define standards and crypto policies.

[Organic composting offers hope to deal with stubble burning](#)

Indian scientists have developed an organic composting solution that farmers can use as an alternative to burning crop stubble. Capsules containing various fungi were developed by microbiologists at the Indian Agricultural Research Institute (IARI) in New Delhi. The “bio-decomposer” naturally degrades about 90 percent of the rice straw. After harvesting the rice, farmers need to chop off the left-over straw into small pieces, spread them over the entire field, and spray the solution on the straw. The fields are then irrigated and left for 25 days. The institute has licensed the technology to 10 companies for large-scale production. The low cost four capsules cost USD 1.35 and are enough to decompose rice straw over a one-hectare field. The new technique adds to other techniques currently used instead of burning crop residue. Around 35 million tonnes of biomass is burnt every year, creating serious pollution problems over Northern India.

[Indian Labs develop supercapacitors, artificial colours, and injectable hydrogels](#)

Scientists from International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad have developed a supercapacitor with a coat of nano carbon powder, derived from petcoke, an oil refinery waste. The new capacitor has achieved capacitance of about 1,198 Farads and the scientists now aim to scale it up to 3,000 Farads. Scientists at the Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, have produced artificial colours by coating titanium dioxide (TiO₂) on titanium sputtered (hard or flexible) substrates. The CeNS team showed that the colours could be manipulated by varying the thickness and refractive index of the TiO₂ layer, and could get an entire range of colours, from blue to red. Lastly, scientists at the Institute of Nano Science and Technology (INST), Mohali have developed an injectable hydrogel derived from spirulina can heal internal injuries, a development that may particularly help diabetes patients.



A new study looking at seven centuries of water flow in the Brahmaputra River suggests that the river's potential for catastrophic flooding as climate warms may be greater than estimated earlier. The Brahmaputra delta alone is home to 130 million Bangladeshis, and many millions more live upstream. The new study examined tree rings, which showed rainfall patterns going back centuries before instrumental and historical records., showing that there have been much wetter periods in the past, driven by natural oscillations that took place over decades or centuries. This led the researchers to infer that destructive floods probably will come more frequently than estimated so far, even without human-driven climate change, calling for preparing for a higher frequency of flooding.

[Successful Trials of 5.56 x 30 mm Joint Venture Protective Carbine \(JVPC\)](#)

Defence Research and Development Organisation (DRDO) designed 5.56x30 mm Protective Carbine has successfully undergone the final phase of user trials. JVPC is a Gas Operated Semi Bull-pup automatic weapon having more than 700 rpm rate of fire. The effective range of the carbine is more than 100 m and weighs about 3.0 kg with key features like high reliability, low recoil, retractable butt, ergonomic design, single hand firing capability, and multiple Picatinny rails etc. These features make it a very useful weapon for operations by security agencies. The carbine has been designed by Armament Research and Development Establishment (ARDE) and is manufactured at Small Arms Factory, Kanpur while the Ammunition is manufactured at ammunition Factory, Kirkee Pune.

IN BRIEF

[Tomatoes modified to produce L-DOPA](#)

Scientists from the UK have produced a tomato enriched in the Parkinson's disease drug L-DOPA which could become a new, affordable source of one of the world's essential medicines especially for developing nations and avoids adverse effects including nausea and behavioural complications of chemically synthesized L-DOPA. The team inserted the gene responsible for the synthesis of L-DOPA in beetroot and also a gene encoding a tyrosinase, an enzyme that uses tyrosine to build molecules such as L-DOPA. The levels achieved in the tomato fruit was 150mg of L-DOPA per kg of tomatoes. The aim now is to create a production pipeline where L-DOPA is extracted from the tomatoes and purified into the pharmaceutical product.

[New semiconductor detector shows promise](#)

North-western University researchers have used cesium lead bromide in the form of perovskite crystals, to create highly efficient detectors in both small, portable devices for field researchers and very large detectors. The new method for detecting gamma rays is also highly capable at differentiating between rays of different energies. Detectors like these are critical for national security, where they're used to detect illegal nuclear materials smuggled across borders and aid in nuclear forensics, as well as in medical diagnostics imaging where resolution is also critical. A new company, Actinia, has been formed to commercialize the technology.

[Flexible and rechargeable battery is 10 times more powerful](#)

A team of US researchers has developed a flexible, rechargeable silver oxide-zinc battery with a five to 10 times greater areal energy density. The battery also is easier to manufacture; and can be screen printed in normal lab conditions. The printed battery cells were recharged for more than 80 cycles, without showing any major signs of capacity loss. The cells also



electrochemical stability and conductivity, and an ink formulation that makes AgO viable for printing. As a result, the battery can be printed in only a few seconds once the inks are prepared. It is dry and ready to use in just minutes. The batteries are printed onto a polymer film, and current collectors, the zinc anode, the AgO cathode and their corresponding separators each constitute a stacked screen-printed layer. The device can be used in flexible, stretchable electronics for wearables as well as soft robotics.

[Gene therapy gives man with sickle cell disease the chance for a better future](#)

An experimental stem cell gene therapy for sickle cell disease developed by a team from UCLA using blood-forming stem cells that had been genetically modified to overcome the mutation that causes sickle cell disease has yielded promising results. Three months after this treatment, blood tests indicated that 70% of a patient's blood stem cells had the new corrected gene. Even a 20% correction would be enough to prevent future sickle cell complications.

[New software cuts time, cost of gene sequencing.](#)

A team of Johns Hopkins University researchers has developed a new software that will revolutionize DNA sequencing which targets; collects; and sequences specific genes without sample preparation, and without having to map surrounding genetic material. This reduces the time taken for profiling gene mutations, from 15 days or more to just three and allows scientists to understand and diagnosis conditions almost immediately. The technique also saves money by eliminating preparation and additional analysis. In cancer genomics, for instance, there are a few dozen genes known to increase cancer risk, but to read it is necessary to sequence the whole genome. The adaptive sequencing however allows researchers to “pick and choose” the molecules to read and to skip others thereby allowing unprecedented flexibility in targeted sequencing.

[Cooling electronics efficiently with graphene-enhanced heat pipes](#)

Researchers at Chalmers University of Technology, Sweden, have developed graphene-based heat pipes which have high efficiency and unique ability to transfer heat over a large distance. The specific thermal transfer coefficient of graphene-based pipes is about 3.5 times better than that of copper-based heat pipes. The new findings pave the way for using graphene enhanced heat pipes in lightweight and large capacity cooling applications such as avionics, automotive electronics, data centres, space electronics, etc.

[Producing ammonia with a much smaller carbon footprint](#)

Researchers at University of Illinois's College of Engineering have developed a new process to produce ammonia with a potentially much lower carbon footprint using a mesh screen coated in copper which helps bind nitrogen to hydrogen to make ammonia. The electrification of the screen helps drive the reactions. The new process uses far fewer fossil fuels than traditional methods. The electrification of the screen using solar or wind energy can help to reduce greenhouse gas emissions significantly. UIC Office of Technology Management has filed a provisional patent for the new process.

[New device offers faster way to detect antibiotic-resistant bacteria](#)

Researchers at Binghamton University USA have now developed a device that allows simple, inexpensive, and rapid testing to assess antibiotic effectiveness against exoelectrogenic bacteria. The device continuously monitors bacteria's extracellular electron transfer to assess the antibiotic effectiveness against bacteria. A lower rate would mean that the antibiotics are working. The readout by the device would be sensitive enough to show



['Anti-antibiotic' allows for use of antibiotics without driving resistance](#)

A team led by Penn State University showed that an FDA-approved drug cholestyramine when taken in conjunction with an antibiotic prevents the antibiotic from driving antimicrobial resistance. Cholestyramine works by reducing daptomycin activity in the GI tract and prevents the emergence of daptomycin-resistant *E. faecium* in the gut. They found that cholestyramine reduced fecal shedding of daptomycin-resistant *E. faecium* in daptomycin-treated mice by up to 80-fold. The research is regarded as a major milestone in the fight against antimicrobial resistance.

[Microplastic particles coated with biomolecules can find their way into living cells](#)

A research team at the University of Bayreuth has discovered that microplastic particles with a diameter of around three micrometres which are often found in the environment when exposed to the natural environment and coated with biomolecules can not only pass through the digestive tract when ingested with food but may also be incorporated into tissue. The coating of biomolecules may act as a kind of Trojan horse that allows plastics to be internalized into living cells. The precise damage that the particles can cause here has not yet been sufficiently investigated. The results indicate the need for action to control microplastics in the environment.

[New material enables hydrogen use for fuel cells under hot, dry conditions](#)

A team led by Los Alamos National Laboratory has found that a phosphonated poly(pentafluorostyrene) showed a good proton conductivity, higher than Nafion in the temperature range $>100^{\circ}\text{C}$, and an unexpected excellent chemical and thermal stability of $>300^{\circ}\text{C}$. The team in turn developed high-temperature fuel cells to use with the phosphonated polymers. The fuel cells employing the phosphonated polymer exhibited an excellent power density (1.13 W cm^{-2} under H_2/O_2 conditions with $> 500\text{ h}$ stability at 160 C) making this technology commercially viable.

RESOURCES AND EVENTS

[Dr Harsh Vardhan inaugurates IISF 2020](#)

Dr. Harsh Vardhan, Union Minister of Science & Technology, Earth Sciences and Health & family Welfare inaugurated IISF-2020, the India International Science Festival -2020 with participation of 10,000 researchers, scientists and experts from different subjects to discuss their research findings and exchange innovative ideas on the identified research themes. The 6th India International Science Festival (IISF)-2020 is being organised from 22 to 25 December 2020 in virtual mode. It is in this context that a series of curtain raisers are being organised in different regions of country so that maximum population can benefit from the event. This is the largest science festival on virtual platform. This year, 41 events will be organized under 9 verticals. The IISF 2020 website is at <https://www.scienceindiafest.org/#/home>.

[India needs well-crafted approach to spur R&D investments: Prof. Ashutosh Sharma](#)

In a recent interview, Prof Ashutosh, Secretary, Dept of Science & Technology said that the need for new policy i.e., STIP 2020 arose due to priorities like enhancing start-ups, sustainable development, climate change etc along with rapid advances in intelligent machines, industry 4.0, IoT, 5G, quantum technologies, smart grids, energy storage, etc. which needs a well-crafted policy approach. The new policy will have a strong focus on



connections and partnerships to enhance both science for diplomacy and diplomacy for science.

[India-Portugal Tech Summit](#)

The DST-CII India-Portugal Tech Summit has identified several opportunities for engagement amongst stakeholders to address societal challenges. Bilateral cooperation between India and Portugal in the science and technology is centred on water tech, agritech, healthtech, energy, climate change, cleantech, IT, ICT, advanced technologies, and space-ocean interactions. The three days summit was attended by 2,200 delegates (200 from Portugal, 2000 from India & 64 from other countries) and had 85 speakers. Around 49 Indian industries and 11 Portugal industries showcased their technology in areas like water, health, energy, cleantech, etc. at the digital exhibition.

[Australia Pledges AUD\\$ 4 Million For Joint Research With India](#)

The Australian government has invested 4 million Australian dollars under the Australia-India Strategic Research Fund (AISRF) for six new projects, ranging from farming technology to coronavirus detection. The agriculture projects focus on developing risk management systems and food-drying technology using renewable energy. Apart from new technologies for early detection of COVID-19, the researchers are focusing on the longer-term effects of the virus on the heart and lungs of patients who have recovered.

SCIENCE POLICY AND DIPLOMACY

[Prime Minister's message at the Climate Ambition Summit](#)

Speaking at the Climate Ambition Summit Prime Minister Modi said that India is not only on track to achieve its Paris Agreement targets, but to exceed them beyond expectations. We have reduced our emission intensity by 21% over 2005 levels. India's solar capacity has grown from 2.63 Gigawatts in 2014 to 36 Gigawatts in 2020 and the renewable energy capacity is the fourth largest in the world. It will reach 175 Gigawatts before 2022. India has set an even more ambitious target now - 450 Gigawatts of renewable energy capacity by 2030. India also succeeded in expanding forest cover and safeguarding our biodiversity. And, on the world stage, India has pioneered two major initiatives: The International Solar Alliance, and Coalition for Disaster Resilient Infrastructure.

[India -Africa Healthcare collaboration gets a boost](#)

Healthcare Federation of India and Africa Healthcare Federation (AHF) signed a Memorandum of Understanding (MoU) to increase healthcare collaboration between the two federations. The agreement identifies specific areas of partnership such as sustainable and medical value travel, infrastructure development for hospitals and diagnostics, training and research, skill transfer and artificial intelligence and manufacturing. Both federations will establish task forces over the next year that will work closely to further this partnership.

[EU agrees on budget for Horizon Europe](#)

EU institutions reached agreement on the bloc's next research programme and the breakdown of its budget. The final agreed budget for Horizon Europe (2021-27) is €95.5 billion, in current prices. The deal will go for formal approval by The European Parliament and Council before the end of the year. The Commission wants Horizon Europe to open up to other big science countries, such as Australia, Canada and Japan, to join as associate



[EU makes tech alliance offer to Biden administration](#)

The European Commission has proposed a new 'Transatlantic Trade and Technology Council' with the US to set joint standards on new technologies. Areas of work would include 5G mobile networks, artificial intelligence and data flows. The commission paper also said the bloc and the US should jointly develop "a pandemic playbook" for preparedness and response to the next big virus threat. The EU is offering to do more with the US on climate change and says it will help the US to reform the World Health Organisation (WHO).

[Member States review measures for protection of Ozone layer](#)

The 32nd Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer (MOP 32) and the 12th meeting of the Conference of the Parties to the Vienna Convention for the Protection of the Ozone Layer (Part I) (COP 12(I)) ended on 27 November. The virtual setting made it difficult to hammer out compromises through informal meetings on sidelines, and the meeting finally authorized the Secretariat to organize an Extraordinary MOP in 2021 when the circumstances related to the global COVID-19 pandemic permit it.

[Member states review Biodiversity situation and related Protocols](#)

The meeting of the Parties to the Convention on Biological Diversity (CBD) (ExCOP 2), the Cartagena Protocol on Biosafety (CP ExCOP/MOP 1) and the Nagoya Protocol on Access to Genetic Resources (NP ExCOP/MOP 1) convened virtually until 27 November. The meeting agreed on an interim budget for 2021. The effort for the adoption of an ambitious post-2020 Global Biodiversity Framework at COP 15 (to be held in Kunming, China in the second quarter of 2021), has been maintained despite the Covid-19 pandemic.

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