

Saving the Earth: It's Now or Never

Voice of the World

Edited by QI Liming

According to the report released by the Intergovernmental Panel on Climate Change (IPCC) on April 4, greenhouse gas emissions must peak by 2025, and need to be nearly halved this decade. This is the last chance for the world to limit future heating to 1.5°C above pre-industrial levels.

Voices from scientists

The world can still hope to stave off the worst ravages of climate breakdown, but only through a "now or never" push to a low-carbon economy and society. The world's leading climate scientists have in effect given a final warning to governments on the climate.

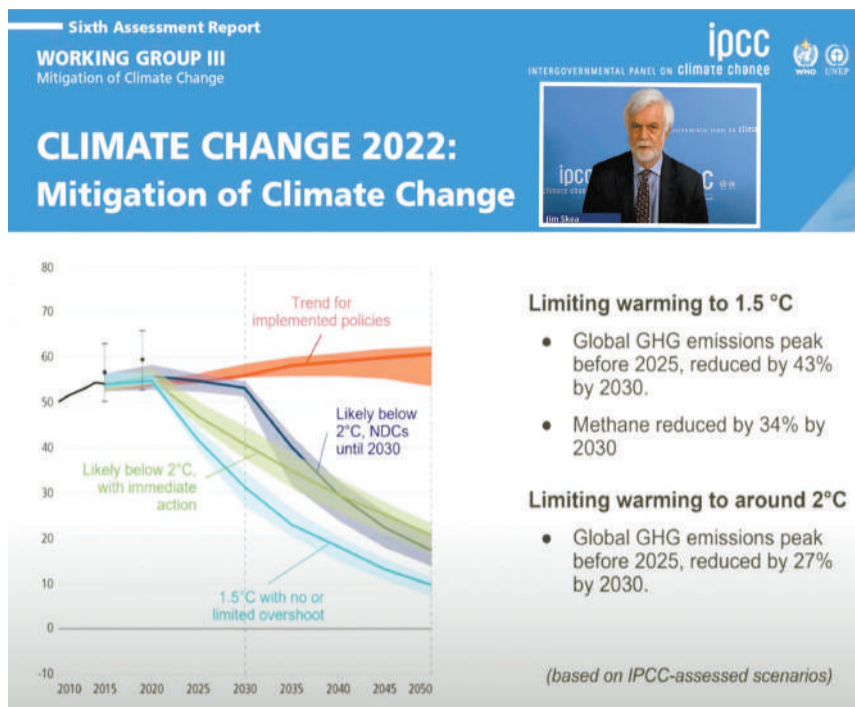
With the world failing to make the changes needed in the past, temperatures are predicted to soar by more than 3°C with catastrophic consequences, unless policies and actions are urgently strengthened.

Jim Skea, professor at the Imperial College London, said, "It's now or never, if we want to limit global warming to 1.5°C. Without immediate and deep emissions reductions across all sectors, it will be impossible."

Pete Smith, a professor of soils and global change at Aberdeen University, said, "The time of reckoning is now. We have one decade to get on track. We use fossil fuels in all these things that we need to change."

Meanwhile, less developed countries warned they were ill-equipped to make the changes needed. They require financial assistance from richer nations to cut emissions and help them adapt to the impact of the climate crisis.

Madeleine Diouf Sarr, the chair of



Jim Skea, co-chair of the working group behind the IPCC report, speaking at the press conference on April 4 GMT. (PHOTO: SCREENSHOT FROM IPCC)

the least developed countries group at the UN climate talks, said, "There can be no new fossil fuel infrastructure. The emissions from existing and planned infrastructure alone are higher than scenarios consistent with limiting warming to 1.5°C, with no or limited overshoot. We cannot afford to lock in the use of fossil fuels."

Ways to save our planet

Accordingly, UN scientists laid out a plan that they believe could help people avoid the worst impacts of rising temperatures.

In their view, to avoid very dangerous warming, carbon emissions need to peak within three years, and fall rapidly after that. Even then, technology to pull CO₂ from the air will still be needed to keep temperatures down.

One key component of reducing

emissions is to limit demand, which the IPCC has divided into three types of change. First, "Socio-cultural factors" are behavioral choices individuals make. Second, "Infrastructure use" refers to changes in the design of infrastructure that makes it possible for individuals to make different choices. Third, "End-use technology adoption" refers to changes in the uptake of technologies by end users.

"Having the right policies, infrastructure and technology in place to enable changes to our lifestyles and behavior can result in a 40-70 percent reduction in greenhouse gas emissions by 2050. This offers significant untapped potential," said IPCC Working Group III Co-Chair Priyadarshi Shukla, in a written statement, adding that, "The evidence also shows that these lifestyle changes can improve our health and

well-being."

The immediate goal is to accelerate those efforts and ramp up climate finance to ensure that it's a truly global effort, said Nathaniel Keohane, president of the Center For Climate and Energy Solutions in Virginia, and a White House adviser for former U.S. president Barack Obama.

In the longer term, governments need to invest in research and development activities to explore the feasibility of carbon-removal technologies that could help to bend the curve in decades to come. "It's a Herculean effort, and so we better get started," said Keohane.

Powering China's net-zero energy goal

As a member of the international community, China proposed its emission reduction target by 2060, and energy researchers are helping China achieve this goal. Research teams at Chinese universities and research institutes presented their solutions in *Nature* magazine.

Baoshan Zhu, a hydraulic engineer at Tsinghua University, believed that development of storing clean energy technology is very important. Pumped hydro-power is the most common type of energy storage in use globally, often supporting electricity grids that rely on solar or wind power.

Additionally, new energy technologies, such as harnessing offshore green energy and turning air into electricity, are being studied by researchers at Tsinghua University and Institutes at the Chinese Academy of Sciences.

As demand for wind and solar power increases, systems for accurately forecasting their availability are becoming more important to power companies in China, said Fei Wang, a researcher at North China Electric Power University, adding that it is indispensable to forecast future needs.

Opinion

How to Prevent the Next Pandemic

By YU Haoyuan

Over the past two years, the COVID-19 pandemic has had a massive negative global impact and unfortunately it continues to cause suffering to many daily. No matter when and how the pandemic will end, what is of vital importance is that humanity learns from the lessons of the current pandemic, in order to be better prepared for the next one.

Apart from viruses leaking from labs, a pandemic could also occur in the future for a variety of reasons. What we are doing now may be totally inappropriate when the next one comes around. Therefore, four aspects must be put in place in order to handle whatever virus outbreak follows.

Firstly, before the outbreak of any disease, mental preparation is necessary. We need to conquer our fear of unknown diseases, and with motivation from awareness, human response to the virus could be accelerated, and an increased number of people could be protected.

"For many of us during this pandemic, the motivation was at the fear of illness and even death. Our motivation should be maintaining public health ... if the motivation is right, we can protect a lot of people," said Ahmed E. Ogwell Ourma, Deputy Director of Africa CDC.

Meanwhile, mental preparation will help people pay more attention to the task at hand, resulting in increased efficiency in combating the virus. The government and local medical facilities could also respond to the outbreak immediately and lower the risk of massive virus transmission.

Secondly, local medical capabilities must be enhanced. When COVID-19 broke out, the greatest pressure in response came from the lack of medical infrastructure and medical staff. Even countries with advanced medical facilities, let alone those countries with poor health systems.

As one of the solutions, countries could create more jobs, particularly in the fields related to public health, or hire those people who have trained in medicine, such as retired doctors or medical students on the verge of graduating to help out. Perhaps this could provide a backup platoon of medical personnel to help take up the strain when the next pandemic arrives.

Therefore, for the lower and lower-middle income countries, governments could implement policies to encourage anti-pandemic behavior. "[In these countries, we could] create those national vaccination plans that prioritize vaccinating fully at risk populations, ensure

that there's implementation of a test and treat strategy at the community and primary care level, expand support for frontline and community health workers and ensure that they use this crisis as an opportunity to invest in long term capacity for preventing the next pandemic," said Dr. Raj Panjabi, special assistant at White House National Security Council.

Thirdly, in the event of another pandemic, the public should take action immediately. Over the past two years, the WHO has recommended, on several occasions, the need for people to take various actions to combat the pandemic, but many refused to follow such recommendations.

"It is becoming tiring to continue to wear masks, keep social distance, and stay away from friends and family. But these things have to be done," said Ogwell Ourma. Such behavior recommendations were mentioned often by medical experts and it is considered the only way to try and buy time so that people can deploy better tools to control the pandemic.

Finally, the world should collaborate on virus research as well as vaccines.

Many viruses come from animal and natural mutation, thus we should abandon the idea of "If we don't look for the viruses, they cannot hurt me," and find viruses through active surveillance instead. However, since the pandemic is a disease affecting the entire world, rather than one country, virus research and analysis should be worked on together under global supervision. This will help reduce the possibility of deadly virus mutation and accelerate vaccine production.

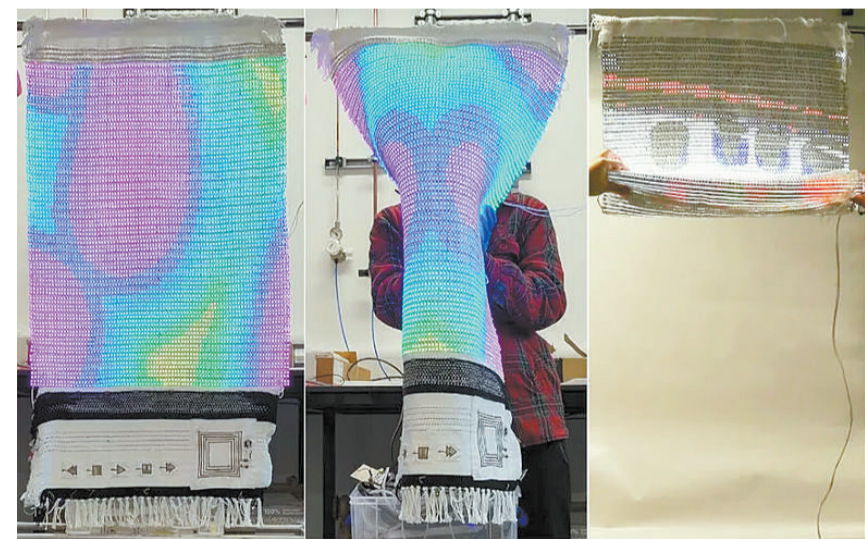
Moreover, according to WHO official Ann Lindstrand, the world should work on a collective vaccine roll out. Taking the current COVID-19 pandemic as an example, she cited that so far, a third of the world's population still remains unvaccinated because of the insufficient supply and unequal distribution of COVID-19 vaccines that we witnessed in 2021. This must be improved, said Lindstrand.



The way need to be found to prevent the next pandemic. (PHOTO: VCG)

Hi! Tech

Wearable Smart Sensor Monitors Your Health



A prototype smart display, fully reproducible using industry-standard looms, is shown here being folded and rolled while retaining its performance. (SCREENSHOT FROM VIDEO)

Edited by QI Liming

A smart sensor is a device that monitors and is fed input from the physical environment. It uses built-in resources to perform predefined functions upon detection of specific input, and then processes data before passing it on.

Smart sensors are able to collect more accurate and automated data from the environment with less noise among the accurately recorded information.

There are five main types of smart sensors used in industrial environments:

- Level sensors that could monitor the level of fuel in a tank.
- Temperature sensors that can be used to make sure machinery is not overheating.
- Pressure sensor that could indicate a leak or a flow control issue.

• Infrared sensors that are used in medical equipment, such as pulse oximetry devices.

• Proximity sensors used to detect the location of a person or object with relation to the sensor.

In addition to the industrial environment, combining temperature and infrared sensors could be woven into our everyday life in the near future.

Recently, a paper released in *Nature* reported an innovative approach to fabricate hybrid piezoelectric fibers that can act as flexible, robust acoustic sensors, pushing audible sensing to a new high.

The hybrid design combines sensitivity and flexibility to create an acoustic single-fibre sensor that can be knitted into fabric. The future of tracking our health and fitness looks wearable, and perhaps even implantable.

Brain-computer Interface A Reality

By Staff Reporters

During a craniotomy, surgeons can precisely recognize the nerve nuclei and cortical functional areas in the brain by using a new flexible electrode. The new tool is composed of 2 μm size electrode points placed on the brain to maximize the protection of brain function and minimize the probability of disability and death from surgery. It can be applied to fields like brain-computer interface for rehabilitation of paralyzed patients.

A China-U.S. research team has recently proposed this new tool solution named "a flexible microarray electrode

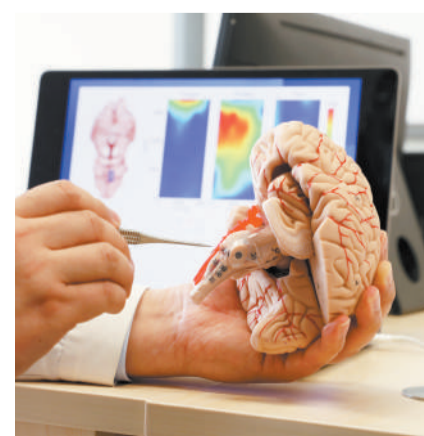
that fits tightly to irregular areas of the brain" and developed a novel conductive polymer material. As a major breakthrough in the field of stretchable organic electronic devices, the material remains conductive after being stretched several times, and stretchable and highly conductive even after being processed to 2 μm.

The flexible and stretchable electrode may be safely used in a variety of irregular or vulnerable areas of the brain, such as the brain stem and neurosurgical cavity. This means it will not be damaged by pulling or twisting of surgical instruments.

In addition, with high electrical con-

ductivity and high density, the electrode can locate individual cells precisely, thus helping surgeons to "observe" the nerve nuclei in the brain directly in the form of a "heat map," which is conducive to the protection of brain function.

According to relevant reports, this is the most precise flexible stretchable microarray electrode in the world. Such flexible electrodes and electronic devices are expected to play an important role in brain science research and relevant clinical transformation, for they can not only promote the precision of neurosurgery, but also serve as a core technology for the brain-computer interface.



A researcher is demonstrating the use of the new flexible electrode on a brain model. (PHOTO: XINHUA)

Wetland Protection in China Benefits All Life

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More than seven million mu of degraded wetlands were repaired.

A law on wetland protection was passed in China in 2021 and will take effect on June 1 this year. However, well before this date there were already regulations on wetland conservation at national and provincial levels.

China is also the world's first country to complete national investigation of wetland resources for three times. Monitoring stations have been built all over the country for wetland investigation, real-time monitoring and information management with the help of high-tech.

China's international involvement
In addition to domestic responsibility, China has also been actively engaging with the international community regarding wetland conservation, since the country joined the Convention in 1992.

The monitoring data of 2021 showed that Wetlands of International Importance in China retained a stable

status. The area of those wetlands increased compared with that of 2020, and most of them enjoyed stable or increased water supply. The water quality has become better in general and the biodiversity has been enriched.

With only four percent of the world's wetlands, China managed to meet the production, living, ecological and cultural needs of 20 percent of global population for wetlands, contributing to the protection and reasonable utilization of global wetlands.

From November 11 to 29 this year, the 14th Meeting of the Conference of the Contracting Parties to the Ramsar Convention on Wetlands (COP14) will take place in Wuhan, central China's Hubei province, which is also the first time the country will host the conference.

Together with the international community, China is ready to exert more efforts to strengthen wetland protection, monitoring and management in the future.