

MAKING STRIDES TOWARDS A LOW-CARBON FUTURE

HARNESSING BIG DATA AND ENHANCING METALLURGICAL TECHNOLOGIES are two proposals presented by experts who came together in Shanghai to share insights on combatting climate change and building a sustainable future.

From melting of the ice caps to forest fires, from flooding to droughts, climate change is hitting the planet harder and faster than many had anticipated. This pressing global challenge of making meaningful action on climate change is Goal 13 of the 17 Sustainable Development Goals (SDGs), the United Nations' flagship plan to end poverty and set the world on the path towards environmental sustainability by 2030.

Scientists have a key role to play in helping to monitor and realize the SDGs. "Data is the key to achieving these goals," said Huadong Guo, an academic at the Chinese Academy of Sciences in Beijing and director of the International Research Center of Big Data for Sustainable Development Goals (CBAS). "Without data, it is impossible to monitor and evaluate the SDGs."

To discuss strategies and share experiences towards realizing a low-carbon future, scientists, heads of industry and political leaders gathered in Shanghai, China, for the 15th Pujiang Innovation Forum 2022 — a platform to pool global wisdom and empower technological innovation. The hybrid online and in-person event was jointly organized by the Ministry of Science and Technology of the People's Republic of China and Shanghai Municipal People's Government.

Held in August 2022, the forum had a theme of 'Low Carbon: A New Mission for



▲ Data plays an important role in achieving the Sustainable Development Goals.

Global Innovation'. Its plenary session featured five experts, who discussed topics ranging from the role of data in sustainable development and carbon neutrality to innovative green solutions in the agricultural and heavy-industry sectors.

DATA MATTERS

Spatial data is vital for better monitoring the SDGs. To that end, CBAS has launched an Earth-science satellite equipped with high-tech thermal infrared, laser and multispectral sensors. It can monitor signs of human activity in fine detail. For example, by monitoring the brightness of the Earth's surface at night, it can measure the level of development of different regions.

By drawing on big Earth data, a team led by Guo has evaluated dozens of key indicators, reports on which will be presented at the United Nations' General Assembly. Guo presented data for one of these indicators — global carbon sinks in terrestrial ecosystems — and showed that it has increased over the past 20 years, mainly due to rising temperatures and increasing forest cover in some regions (for example, the carbon sequestered by China's 'Great Green Wall' forest programme over the past four decades is equivalent to about 5.2% of China's industrial emissions over the same period).

Another person who sees the huge potential of data is Boris Otto, director of the

Fraunhofer Institute for Software and Systems Engineering in Dortmund, Germany. His team is exploring how data sharing can help achieve carbon-neutrality goals, especially in industrial networks. For example, transportation could have been reduced if logistics partners had shared data on transportation needs and capacity earlier. The information sharing now results in better utilization of assets and higher overall efficiency, Otto explained.

He also highlighted the importance of using consistent and mutually agreed metrics. With this view, his institute launched the International Data Space Association of more than 130 organizations, to develop

Pujiang Innovation Forum



▲ (Up) Huadong Guo gave a talk on big Earth data. (Down) Dimitri de Vreeze shared insights from the industry.

standards for facilitating data sharing, guaranteeing data sovereignty and securing data exchange.

A CALL FOR COLLABORATION

The private sector can and must make a significant contribution to realizing a low-carbon future by providing sustainable innovation and working in partnership with the public sector. In this spirit, Dimitri de Vreeze, co-chief executive officer and chief operating officer of Royal DSM Netherlands, in Heerlen, shared how industry can use its expertise to help local areas to decarbonize.

One example is methane emissions, which mainly originating from livestock, oil

and gas operations. Methane has an outsized impact on the climate, trapping vastly more heat in the Earth's atmosphere than carbon dioxide. Curbing methane emissions is critical for combating climate change, De Vreeze pointed out. Researchers in Royal DSM Netherlands have developed an additive for livestock feed that inhibits cows and other cattle from producing methane. This has been approved by the European Union and the company has started the registration process for approval in China.

Another industry leader from China presented green solutions for the steel industry. Steel is an indispensable material in many industries,

including energy, construction and transport, but the steel industry is a major carbon-dioxide emitter. "Although Chinese steel companies are reducing their overall emissions, they still face the challenges of their large-scale and homogeneous energy mix," said Wangming Hu, president of China Baowu Steel Group Corporation Limited, based in Shanghai.

To reach its goal of net-zero emission by mid-century, one priority of this steel giant is developing innovative low-carbon, metallurgy technology. It has set up a pilot project in western China using a hydrogen-rich, carbon-recycling blast furnace which achieves self-circulation of gas as a way to reduce emissions. Baowu is also building a megaton, hydrogen-based shaft furnace, where hydrogen is generated from clean-energy sources. The goal is to achieve ultralow carbon-dioxide emissions, while producing high-quality steel products by 2025, Hu said.

Global cooperation could bring more opportunities. In October 2019, Baowu launched the Global Low Carbon Metallurgy Innovation Alliance to develop, cooperate and transfer the technology in this sector. In total 62 companies, universities and research institutes from 15 countries around the world have joined the group; its fund to support innovation has already received 150 applications from 42 institutes.

The future of humanity hinges on sustainability, said Micky Adriaansens, the Minister of Economic Affairs and Climate Policy in the Netherlands, in the opening ceremony. The sooner we recognize this, the sooner we can help each other become stronger and share solutions to the challenges we all face. ■

GUEST SPEAKERS



HUADONG GUO
Academician, Chinese Academy of Sciences
Director of International Research Center of Big Data for Sustainable Development Goals



BORIS OTTO
Director of the Fraunhofer Institute for Software and Systems Engineering ISST



DIMITRI DE VREEZE
Co-CEO, COO and Member of the Managing Board of Royal DSM



WANGMING HU
President, China Baowu Steel Group Corporation Limited



BØRGE BRENDE
President, World Economic Forum



en.pujiangforum.cn