At the East China University of Science and Technology, new research and talent are contributing to the future of China's carbon-neutrality.

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MAKING A GREENER CHINA

The East China University of Science and Technology in Shanghai is SHAPING THE FUTURE OF THE NATION'S MANUFACTURING INDUSTRY.

For 11 consecutive years, China's manufacturing sector has been the world's largest, bringing the environmental downside of significant carbon emissions. However, a national target to achieve carbon neutrality by 2060 is possible, says Shan-Tung Tu, a professor from East China University of Science and Technology (ECUST) in Shanghai.

Tu is a mechanical and chemical engineer who has been advocating reliability-centered manufacturing (RcM), a new paradigm of sustainable manufacturing for heavy and process industries. RcM is driven by human and machine intelligence to learn from failures and achieve high reliability and reduce carbon emission in four major ways: develop environmental-friendly and durable materials, build robust and recyclable designs, manufacture with zero defect and reduced emission, and efficient maintenance and recovery.

ACCELERATING INDUSTRY TRANSFORMATION

Implementing RcM processes contributes to carbon neutrality. Tu says that intelligent monitoring and management of small defects in nuclear power plant equipment can extend its life from 30 to 60-80 years and save resources.

"Our commitment not only addresses climate change, but also drives innovations within the industry to transform and achieve high-quality and sustainable manufacturing," says Tu. "Developing reliable and efficient equipment, as well as civil facilities, is crucial to energy saving and carbon emission reduction."

At the core of manufacturing is the chemical industry's development of materials. The International Energy Agency estimates the emission from primary chemical production must be reduced by 10% by 2030 to limit warming to 1.8°C. New technologies and processes for the chemical industry are therefore essential.

According to Tu, ECUST, with its 70-year history in supporting China's chemical industry, has made many achievements in the sector, including the development of gasification to replace combustion in the process of transforming coal and biomass into chemical material. Riding on its success, ECUST is committed to spearheading innovations for improving green manufacturing.

SUPPORTING TALENT

ECUST is soon to open the College of Carbon-neutral Future Technologies, a new hub for nurturing talent.

"ECUST aims to integrate environmental science, synthetic biology and RcM into its curriculum and ride on a collaborative learning environment towards China's carbon neutrality targets," says Tu. ■

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