Chinese overcapacity

Energy, industrial capacity and technology development

Karl Hallding, Chief analyst, strategic intelligence

VINNOVA

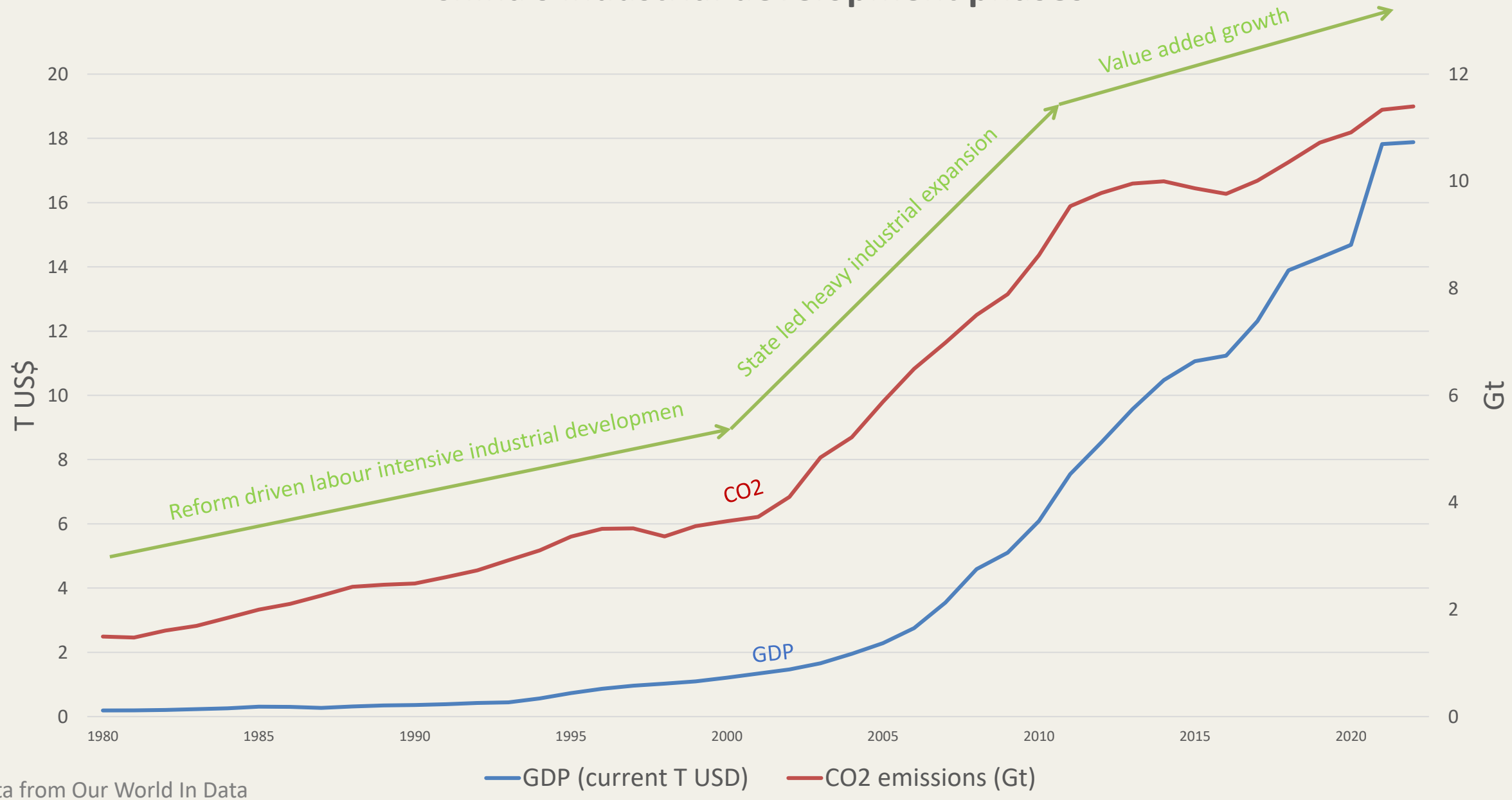
- How has industrial capacity developed in China?
- How does the Chinese economic model contribute to industrial overcapacity?
- What are the global implications of Chinese dominance in key industrial and technology sectors?

VINNOVA

Industrial development

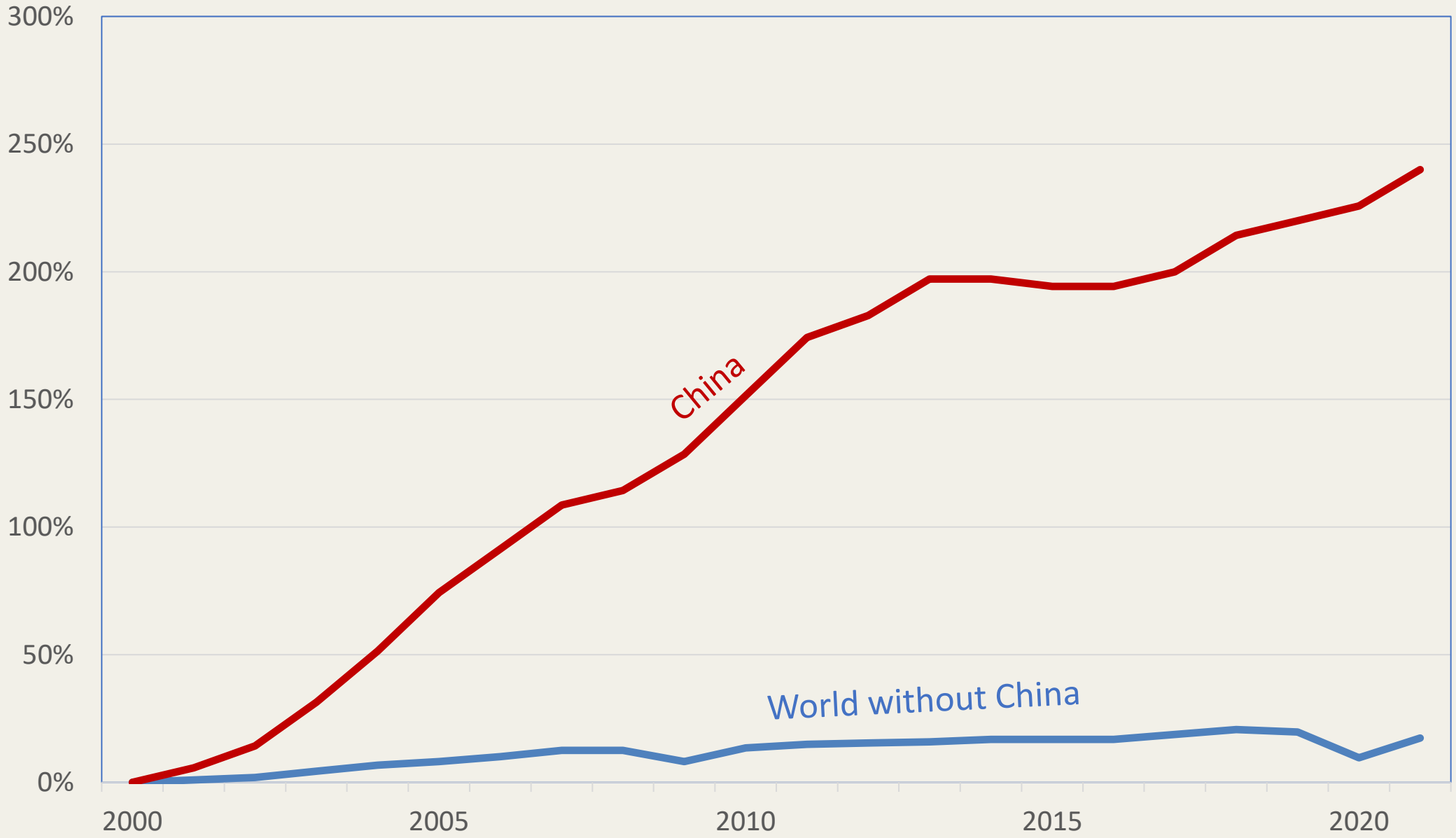
VINNOVA

China’s industrial development phases



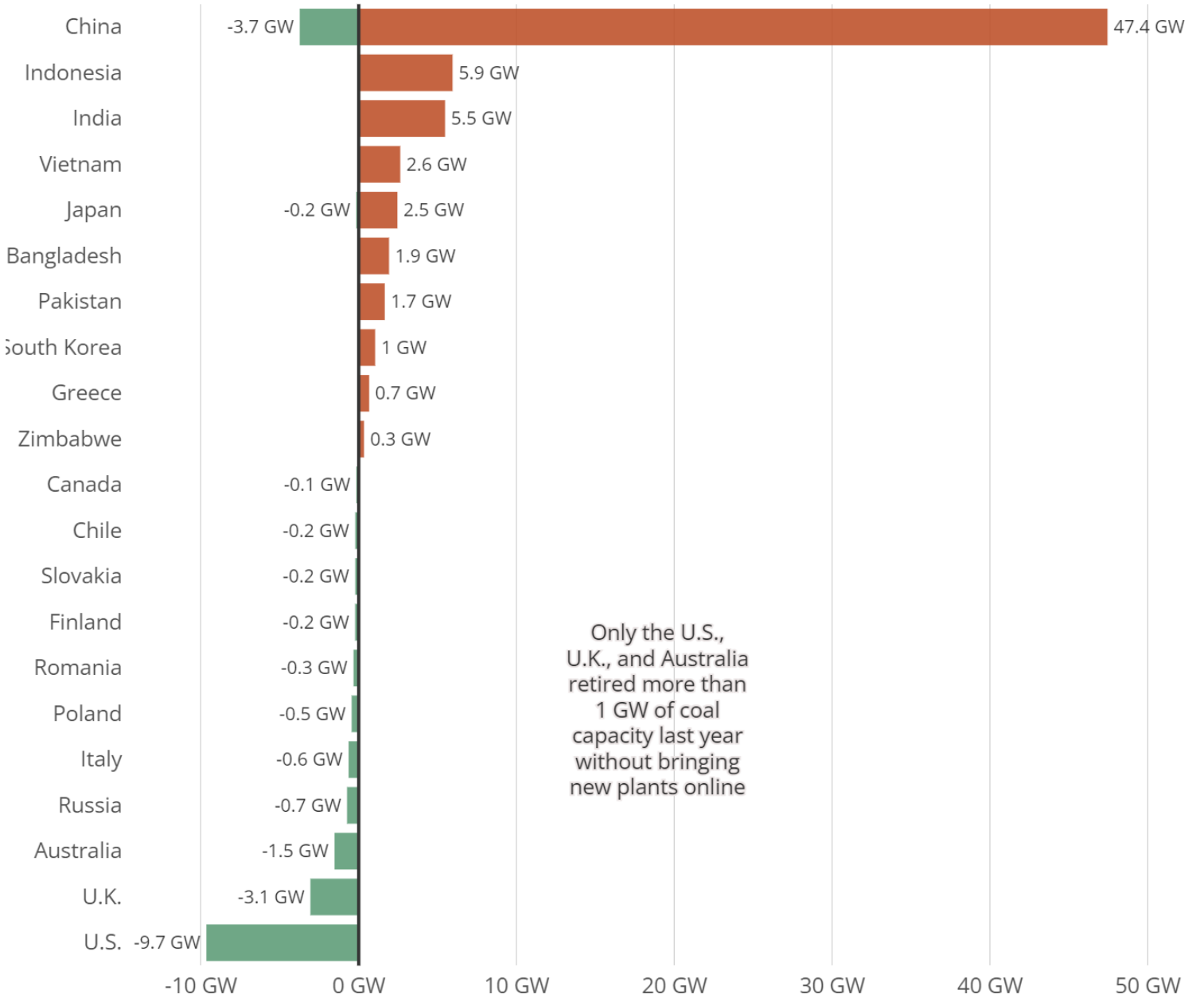
Data from Our World In Data

Percentage Increase in Carbon Dioxide Emissions Since 2000



Data from IEA

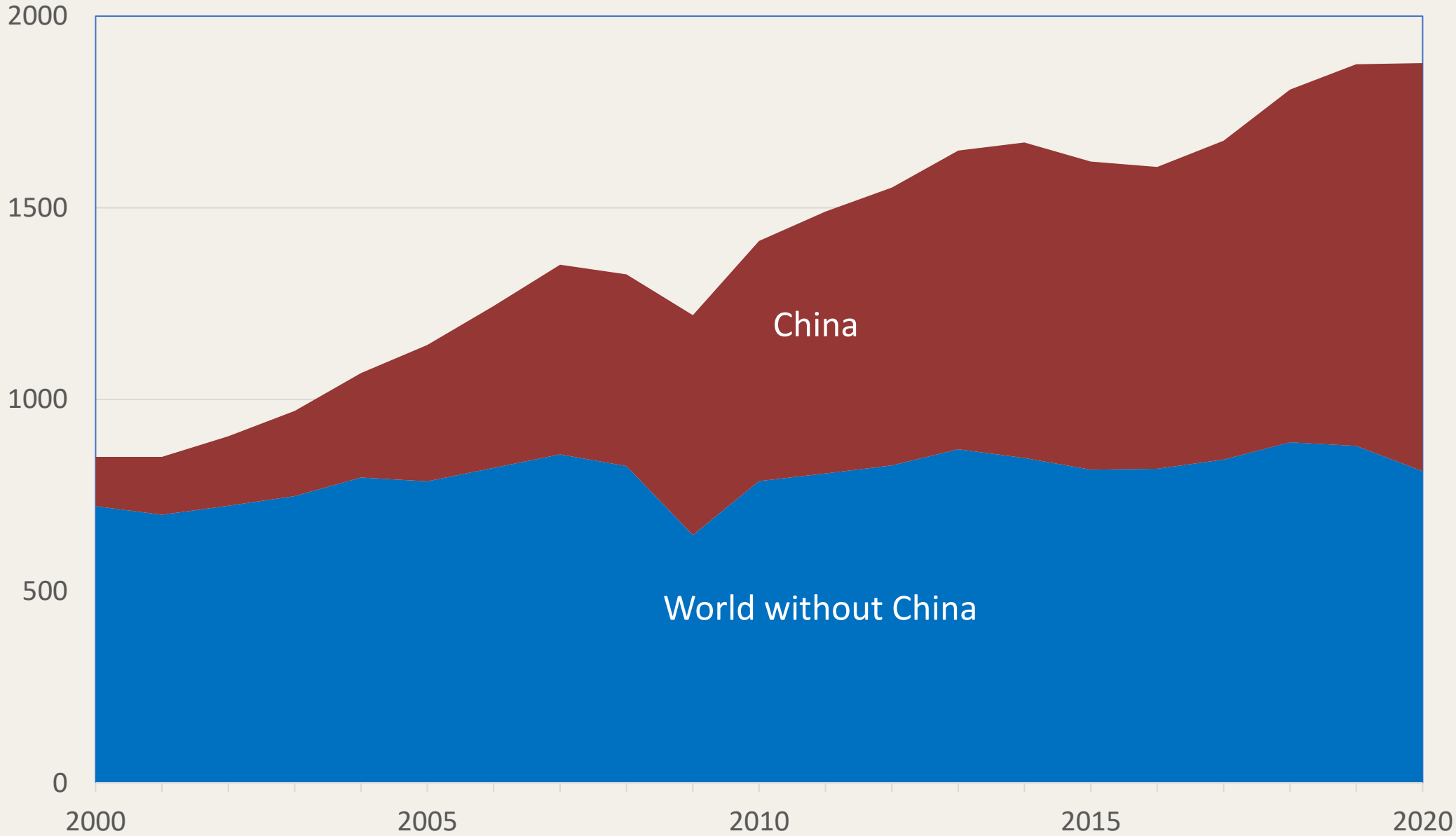
Newly **added** and **retired** operating coal-fired power capacity in 2023, in gigawatts (GW)



Source: Global Coal Plant Tracker, January 2024

Global Energy Monitor

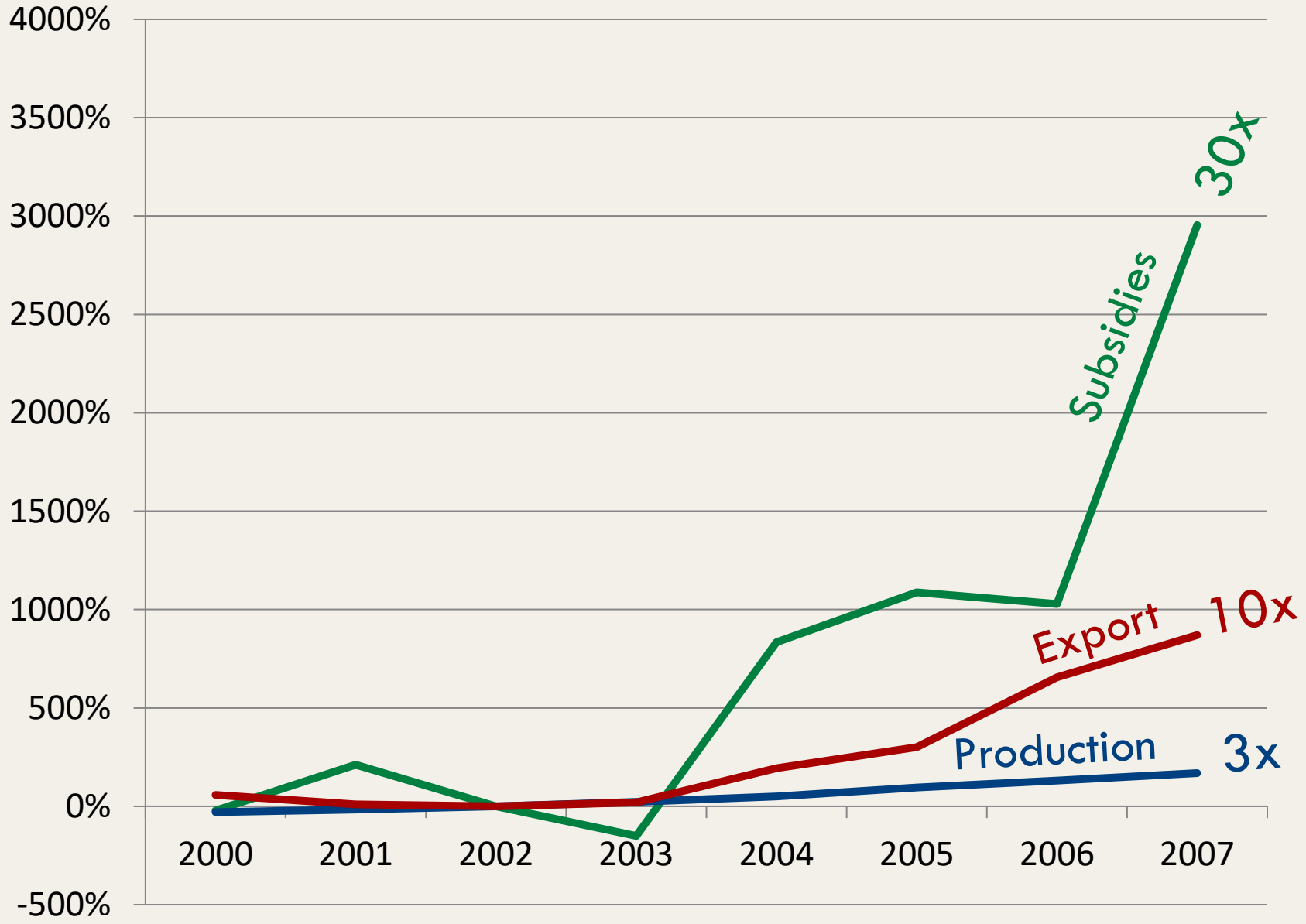
Global and Chinese steel production 2000-2020 (Mt)



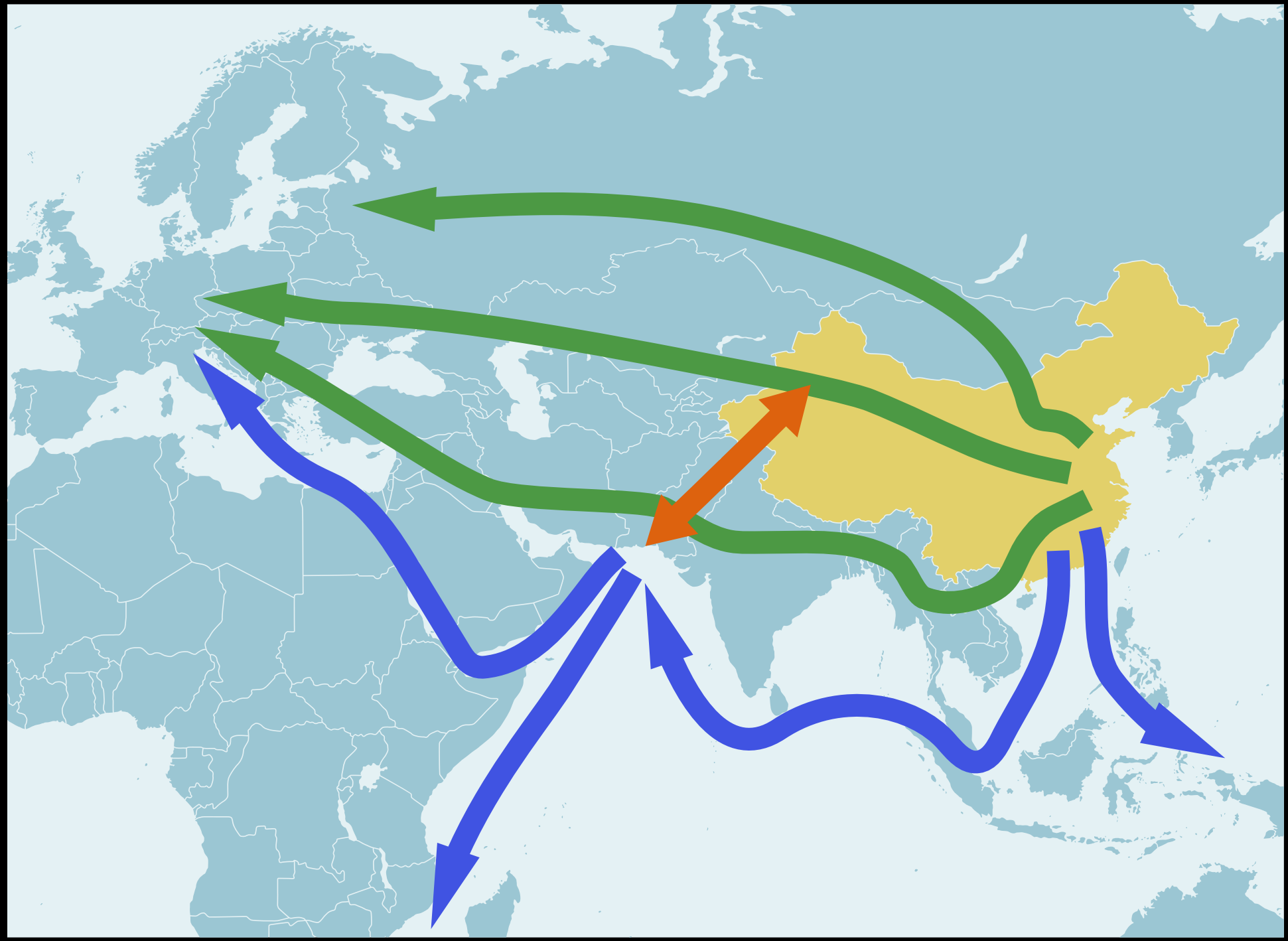
Data from World Steel Association (www.worldsteel.org)

The Chinese growth model

VINNOVA



Data från Haley & Haley (2013) ”Subsidies to Chinese Industry”

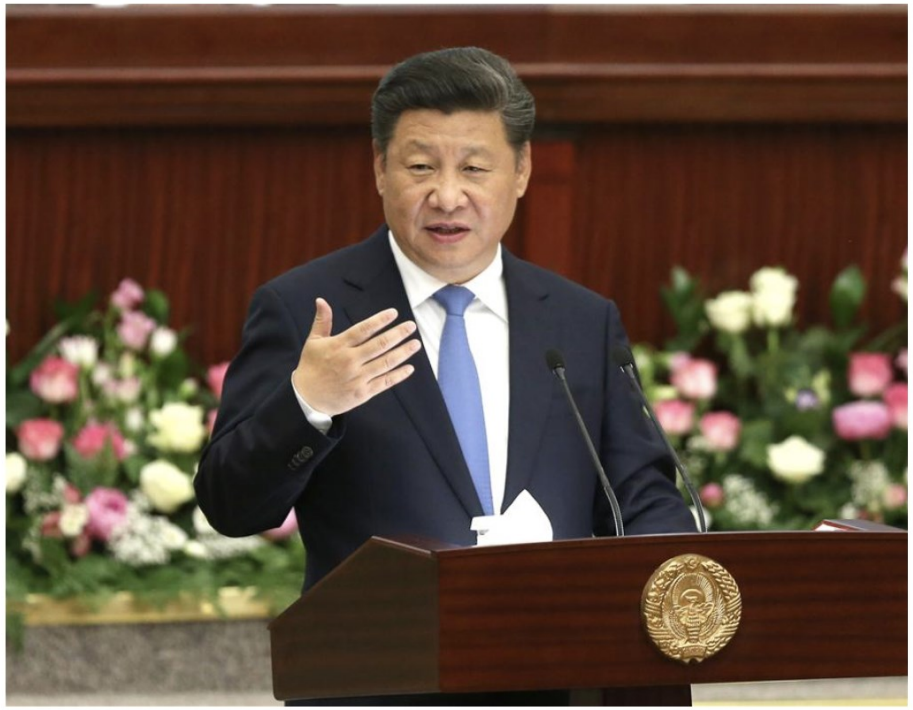


中华人民共和国国务院新闻办公室

The State Council Information Office of the People's Republic of China

President Xi calls for building 'green, healthy, intelligent and peaceful' Silk Road

国务院新闻办公室网站 www.scio.gov.cn 2016-06-23 来源：Xinhua



hese President Xi Jinping delivers a speech at the Legislative Chamber of the Uzbek Supreme Assembly in Tashkent, Uzbekistan, June 22,

The Belt and Road Initiative Boosts Green Development

2018-10-11 10:32:00 Source：China Today Author：staff reporter DANG XIAOFEI

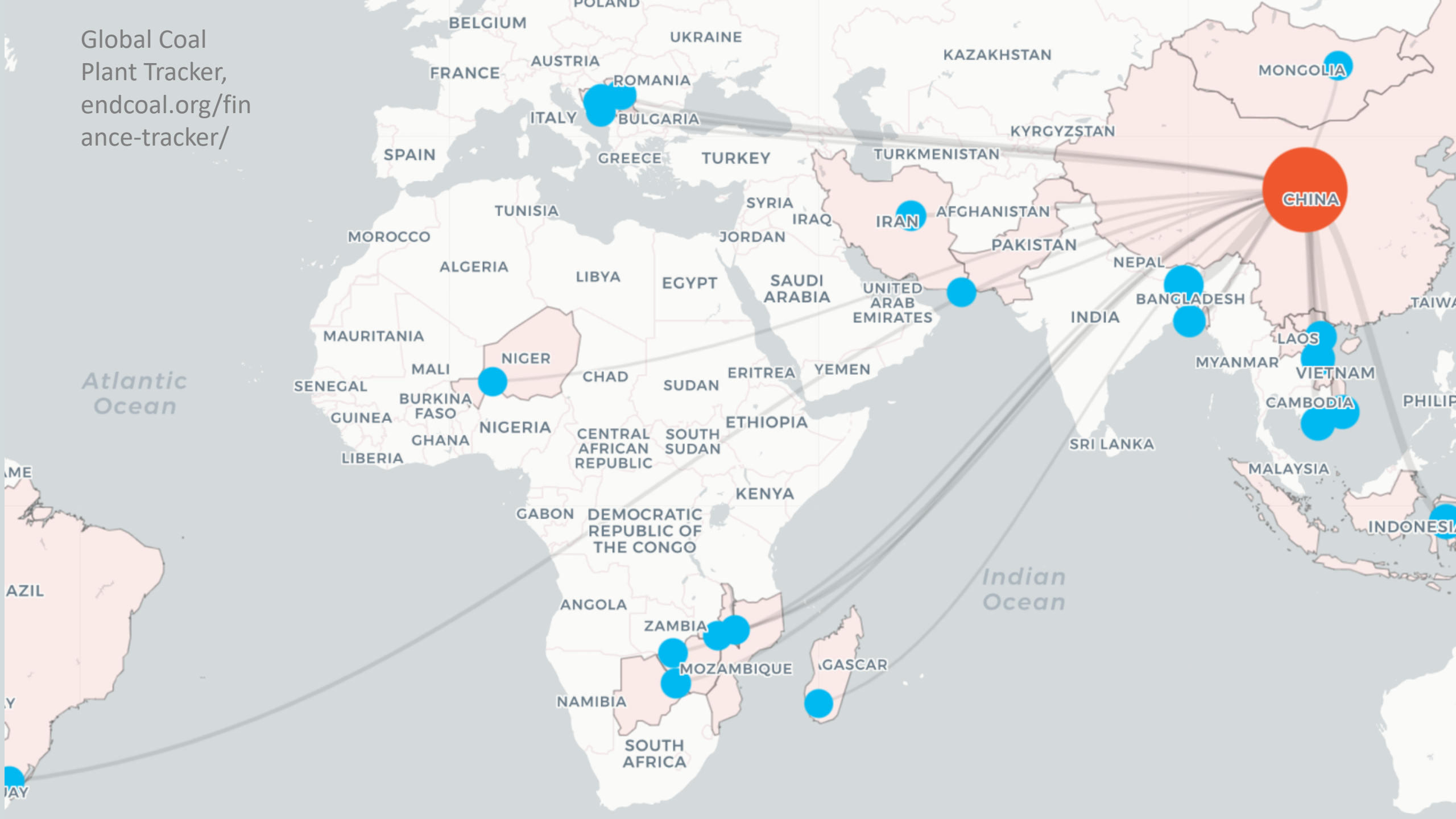
AS people become more consciously aware of the world around them, environmental protection is high up on the list of priorities from both public and private sectors across the globe. In the process, the contradiction between development and environmental protection is always a subject of much heated debate. Being acutely aware of this, China highlights the concept of ecological progress in the Belt and Road Initiative, promoting green development and strengthening ecological conservation.

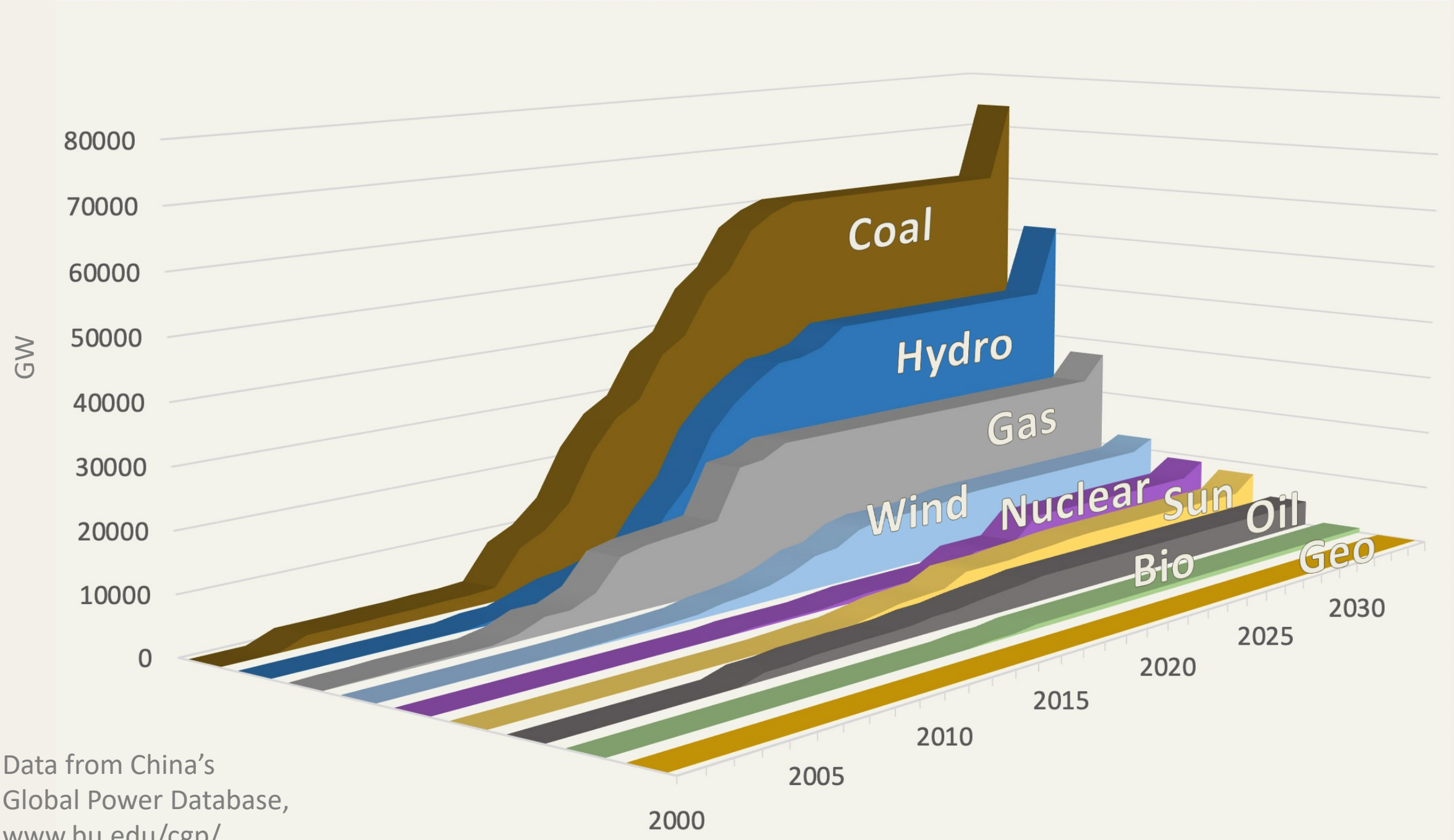
Engine for Sustainable Development

China has always attached much importance to environmental issues, and environmental protection was set as a basic state policy at the 1983 National Working Conference on Environmental Protection. Entering the 21st century, supporting measures, laws, regulations, publicity, and education on environmental issues has been gradually improved. Ecological progress, being an effort to achieve sustainable development in the light of natural conditions, was given the status of a political program and national strategy at the 18th National Congress of the Communist Party of China (CPC) in 2012.

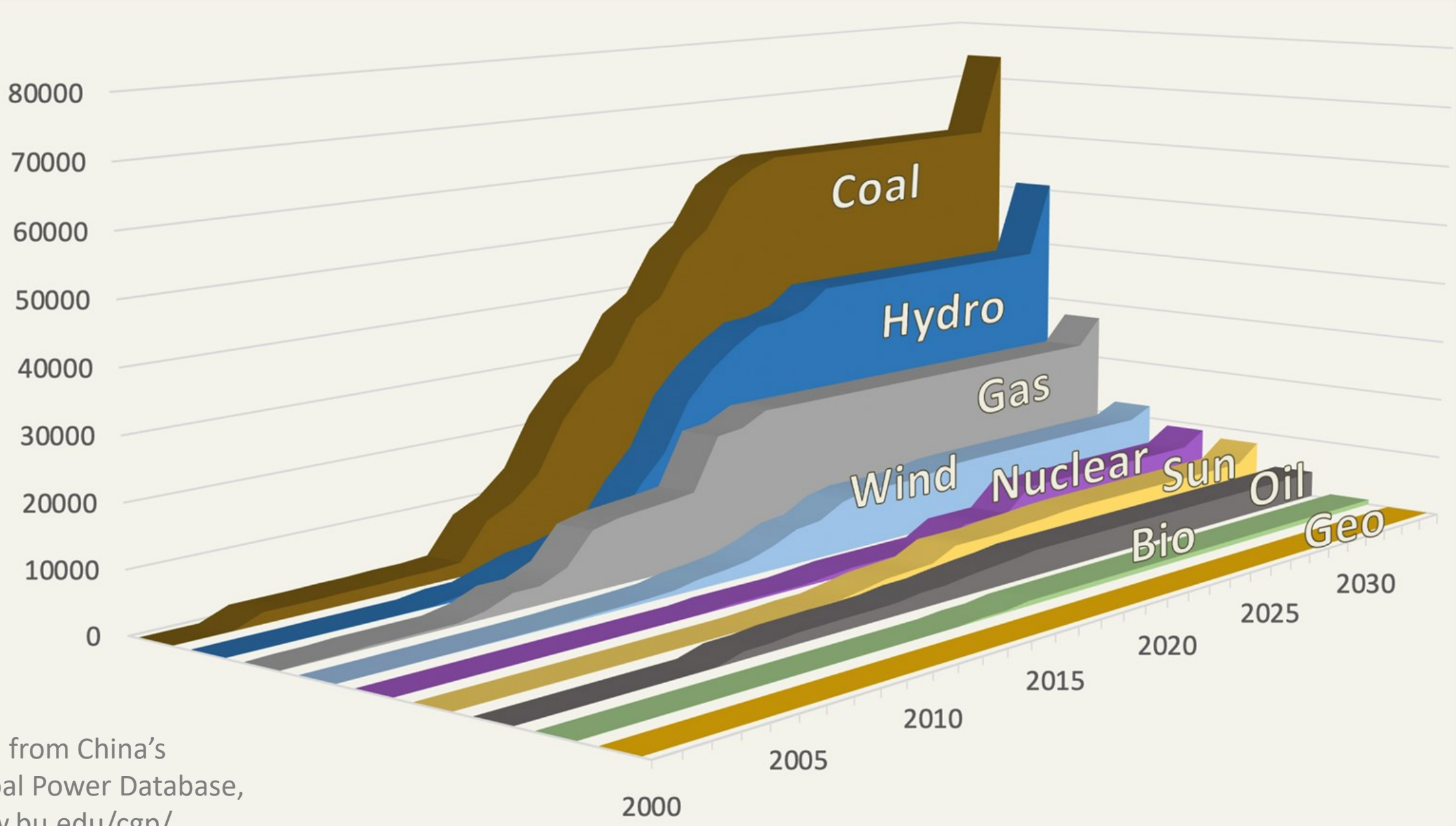
A train arrives at Mombasa Station, terminus of the Mombasa-Nairobi Railway, a China-funded project, in Kenya.

When the Chinese government first put forward the Belt and Road Initiative in the second half of 2013, environmental protection was naturally included in the strategic plan. Since then, Chinese President Xi Jinping has called for joint construction of the green Belt and Road several times. At the Belt and Road Forum for International Cooperation in May 2017, President Xi made clear that China should carry out the new concept of green

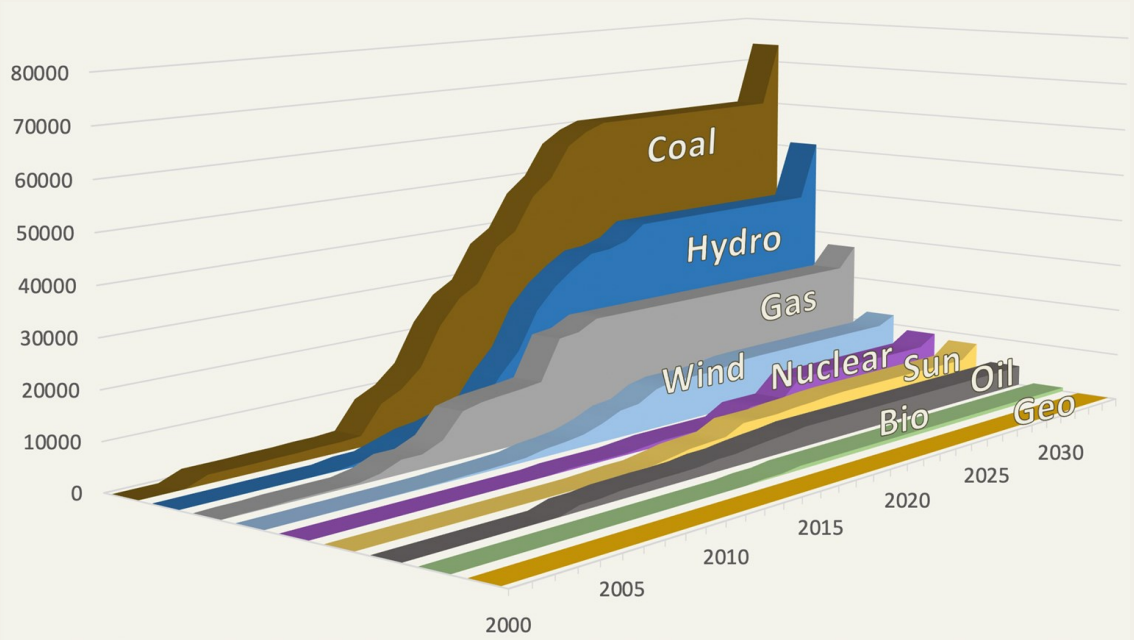

Global Coal Plant Tracker, endcoal.org/finance-tracker/
POLAND
BELGIUM
UKRAINE
KAZAKHSTAN
MONGOLIA
FRANCE
AUSTRIA
ROMANIA
ITALY
BULGARIA
KYRGYZSTAN
SPAIN
GREECE
TURKEY
TURKMENISTAN
CHINA
SYRIA
IRAQ
IRAN
AFGHANISTAN
TUNISIA
MOROCCO
JORDAN
PAKISTAN
NEPAL
ALGERIA
LIBYA
EGYPT
SAUDI ARABIA
UNITED ARAB EMIRATES
BANGLADESH
INDIA
TAIWA
MAURITANIA
NIGER
LAOS
MALI
CHAD
ERITREA
YEMEN
MYANMAR
VIETNAM
SENEGAL
SUDAN
BURKINA FASO
CAMBODIA
PHILIP
GUINEA
ETHIOPIA
NIGERIA
GHANA
CENTRAL AFRICAN REPUBLIC
SOUTH SUDAN
SRI LANKA
LIBERIA
MALAYSIA
KENYA
GABON
DEMOCRATIC REPUBLIC OF THE CONGO
INDONESI
Atlantic Ocean
Indian Ocean
ANGOLA
ZAMBIA
MOZAMBIQUE
GASCAR
NAMIBIA
SOUTH AFRICA

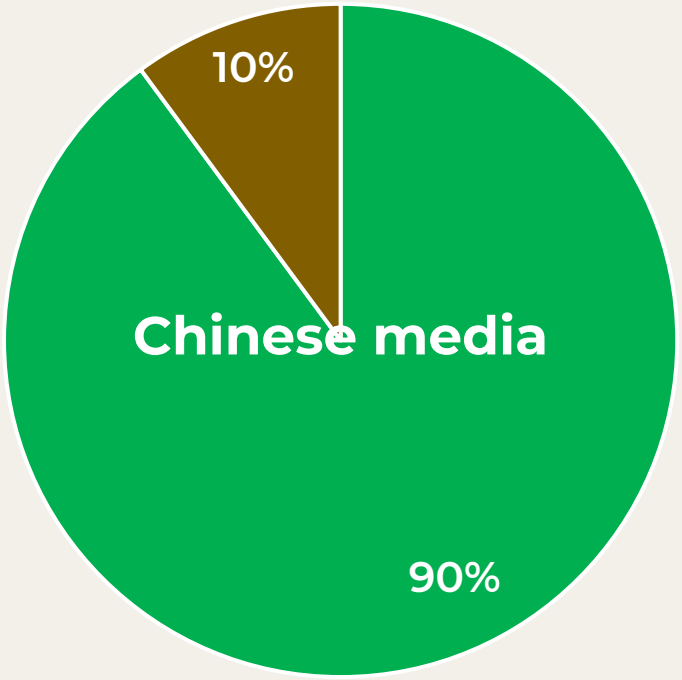


Data from China's
Global Power Database,
www.bu.edu/cgp/



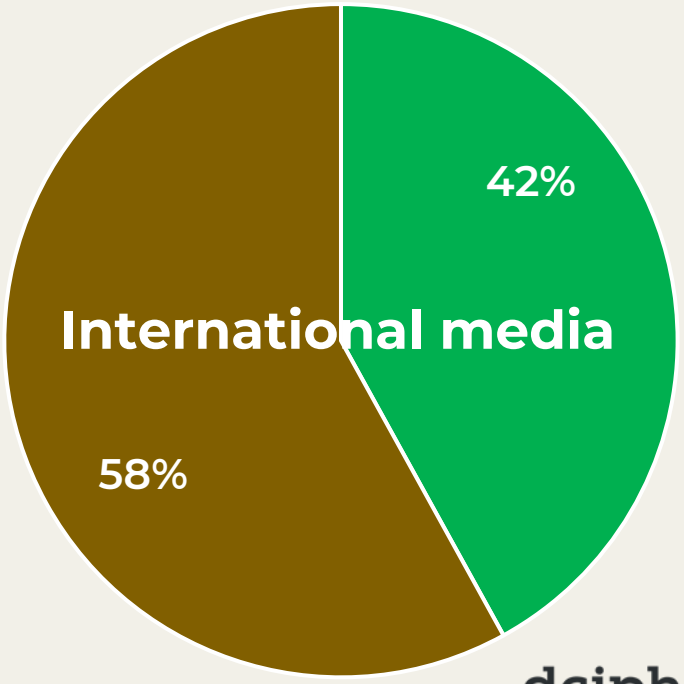
Data from China's
Global Power Database,
www.bu.edu/cgp/





Dirty and unsustainable

Clean and sustainable

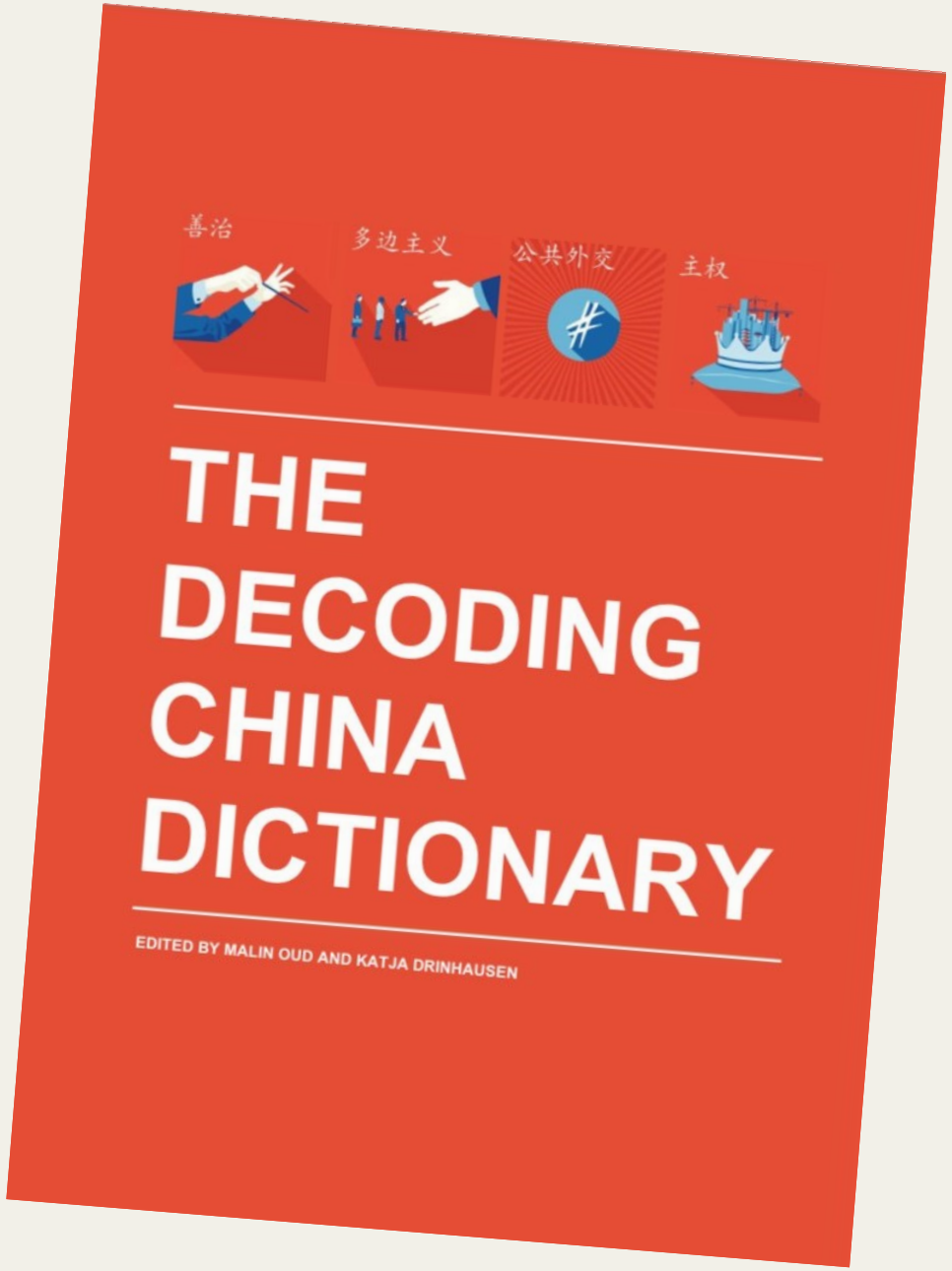


dcipher analytics

Global implications

	Technology Area	Technologies* *The technologies listed for each area are a likely focal point for risk assessment but are not exhaustive
1.	**ADVANCED SEMICONDUCTORS TECHNOLOGIES**	• Microelectronics, including processors • Photonics (including high energy laser) technologies • High frequency chips • Semiconductor manufacturing equipment at very advanced node sizes
2.	**ARTIFICIAL INTELLIGENCE TECHNOLOGIES**	• High Performance Computing • Cloud and edge computing • Data analytics technologies • Computer vision, language processing, object recognition
3.	**QUANTUM TECHNOLOGIES**	• Quantum computing • Quantum cryptography • Quantum communications • Quantum sensing and radar
4.	**BIOTECHNOLOGIES**	• Techniques of genetic modification • New genomic techniques • Gene-drive • Synthetic biology
5.	**ADVANCED CONNECTIVITY, NAVIGATION AND DIGITAL TECHNOLOGIES**	• Secure digital communications and connectivity, such as RAN & Open RAN (Radio Access Network) and 6G • Cyber security technologies incl. cyber-surveillance, security and intrusion systems, digital forensics • Internet of Things and Virtual Reality • Distributed ledger and digital identity technologies • Guidance, navigation and control technologies, including avionics and marine positioning
6.	**ADVANCED SENSING TECHNOLOGIES**	• Electro-optical, radar, chemical, biological, radiation and distributed sensing • Magnetometers, magnetic gradiometers • Underwater electric field sensors • Gravity meters and gradiometers

	Technology Area	Technologies* *The technologies listed for each area are a likely focal point for risk assessment but are not exhaustive
7.	**SPACE & PROPULSION TECHNOLOGIES**	• Dedicated space-focused technologies, ranging from component to system level • Space surveillance and Earth observation technologies • Space positioning, navigation and timing (PNT) • Secure communications including Low Earth Orbit (LEO) connectivity • Propulsion technologies, including hypersonics and components for military use
8.	**ENERGY TECHNOLOGIES**	• Nuclear fusion technologies, reactors and power generation, radiological conversion/enrichment/recycling technologies • Hydrogen and new fuels • Net-zero technologies, including photovoltaics • Smart grids and energy storage, batteries
9.	**ROBOTICS AND AUTONOMOUS SYSTEMS**	• Drones and vehicles (air, land, surface and underwater) • Robots and robot-controlled precision systems • Exoskeletons • AI-enabled systems
10.	**ADVANCED MATERIALS, MANUFACTURING AND RECYCLING TECHNOLOGIES**	• Technologies for nanomaterials, smart materials, advanced ceramic materials, stealth materials, safe and sustainable by design materials • Additive manufacturing, including in the field • Digital controlled micro-precision manufacturing and small-scale laser machining/welding • Technologies for extraction, processing and recycling of critical raw materials (including hydrometallurgical extraction, bioleaching, nanotechnology-based filtration, electrochemical processing and black mass)



- Human rights
- Sovereignty
- Modernisation
- Right to privacy
- Science
- Security
- Transparency