

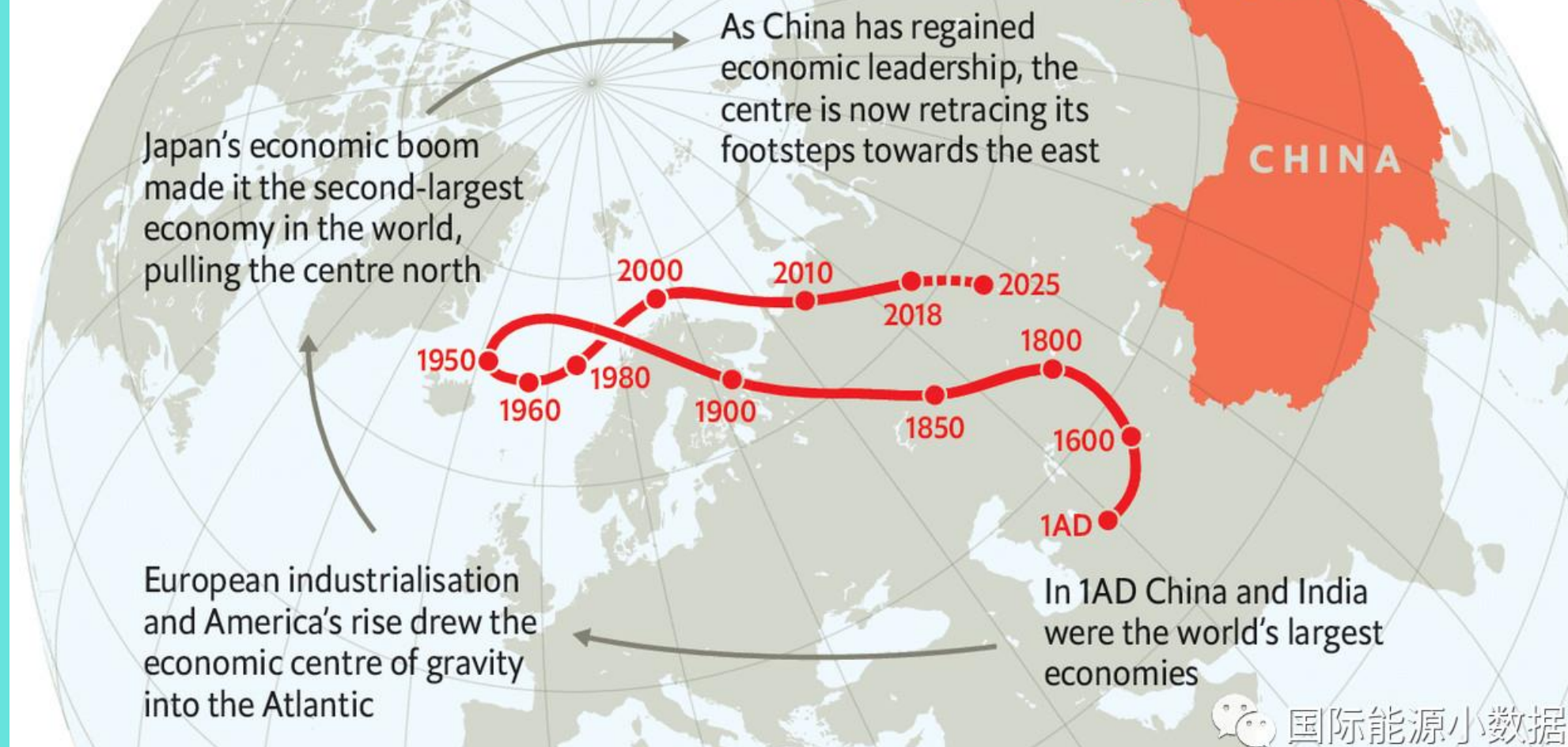
Chinese Path to Modernization: Research and Exploration

ZHANG Meng and GUO Man



Industry of China

The world's economic centre of gravity*





Xiaomi built a car in three years, and Apple disbanded the car-making team, wasting \$10 billion



The competitiveness of the manufacturing industry comes from the "industrial chain"

Germany's traditional fuel vehicles are excellent because the metal processing industry chain is complete.

Where is Industry 4.0 now?

比亚迪BYD

Goldman Sachs reports

EXHIBIT 3: We estimate BYD can manufacture a compact SUV for 50% cheaper than its EU peers

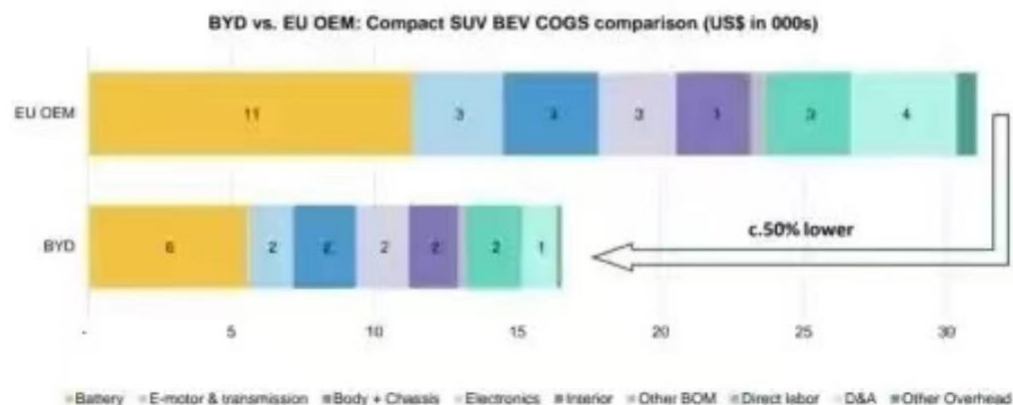
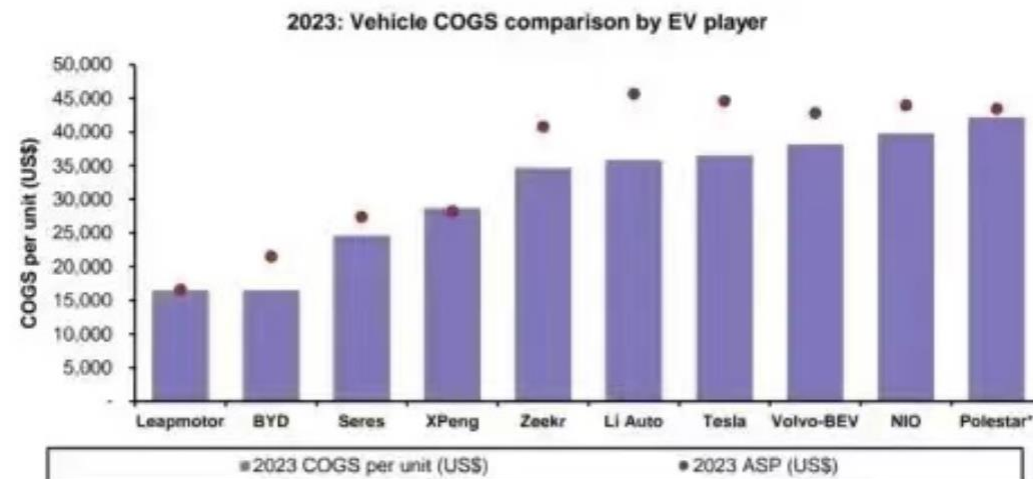


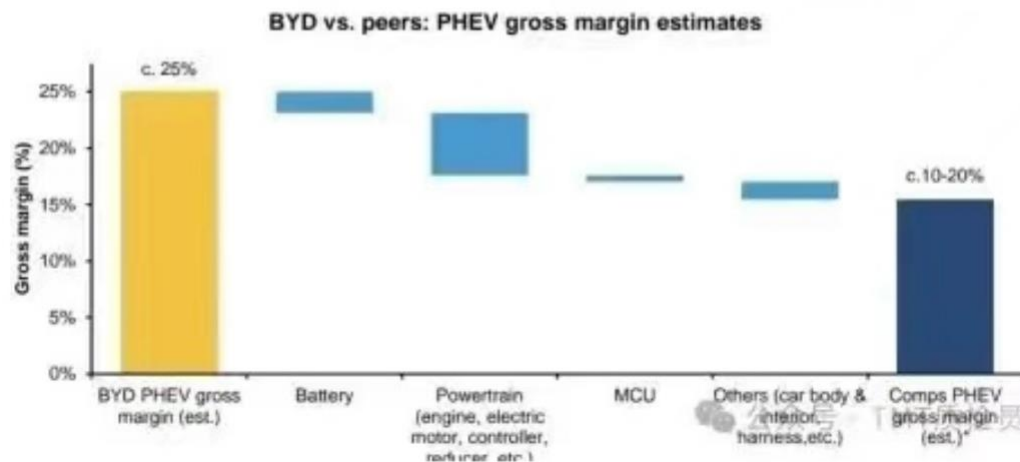
EXHIBIT 2: BYD has an enviable EV cost structure; its COGS per unit is roughly 50% of some of its peers in 2023



Advantages of the industrial chain

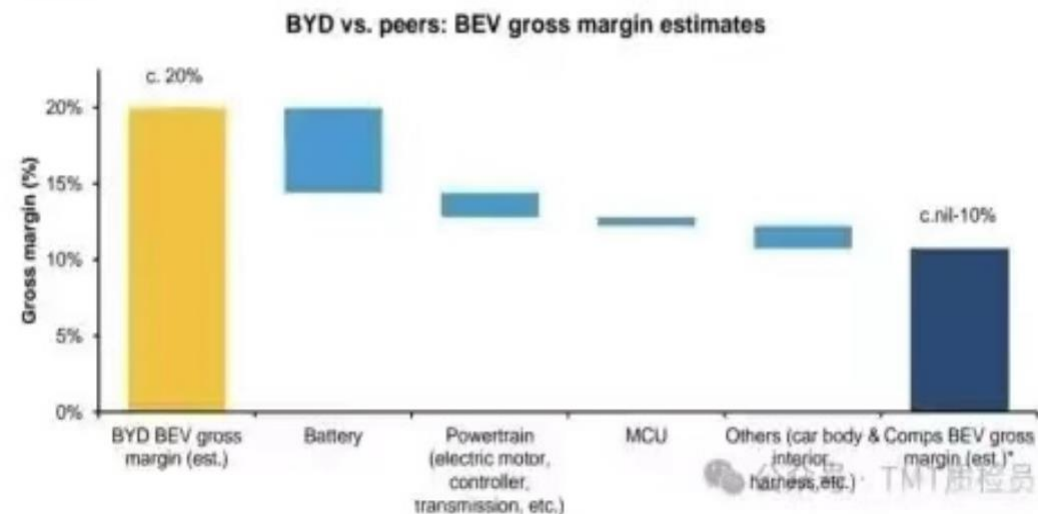
下图是插电式混合动力汽车这一品类，比亚迪和同行的毛利率差异对比，这个瀑布图显示了毛利率差异来源的要素

EXHIBIT 12: As for PHEV, we estimate BYD has c.10 percentage points of cost advantage over peers for a c.RMB150k PHEV; most savings come from BYD's simpler one-gear powertrain design that is largely made in-house, that lowers cost by c.RMB 5-10k compared with other OEMs' more complex double or triple gear designs



接下来是纯电力汽车这一品类，比亚迪和同行的毛利率差异对比

EXHIBIT 13: We estimate BYD has at least a c.10 percentage points' gross margin advantage over peers for a BEV that is priced around c.150k and with a 60 kWh battery; most savings come from BYD's vertical integration of batteries





仰望

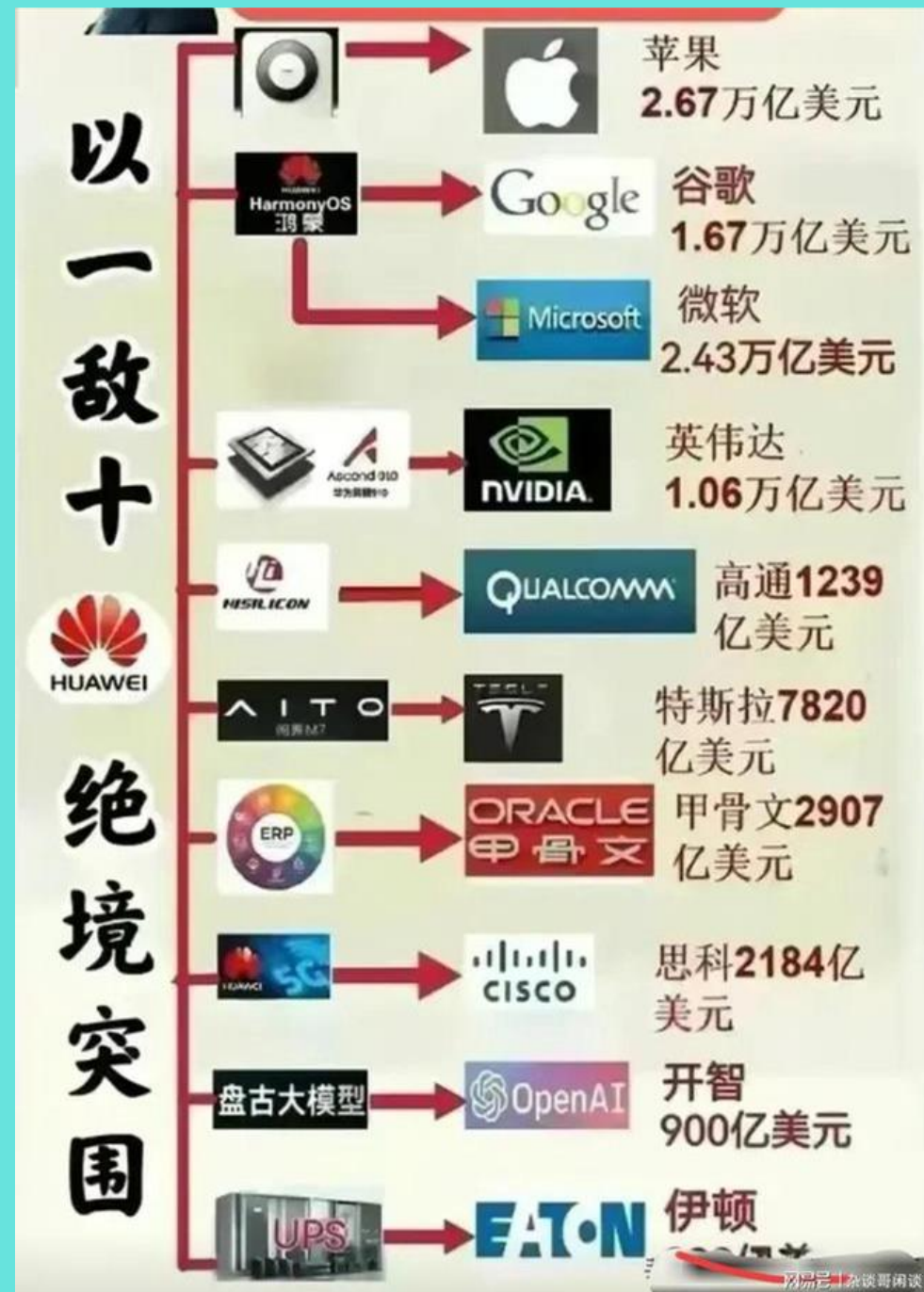


UEFA
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GERMANY

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Huawei competes against giants such as Apple, Samsung, Qualcomm, Tesla, Google, and Nvidia all together.



Challenges:

Global Warming

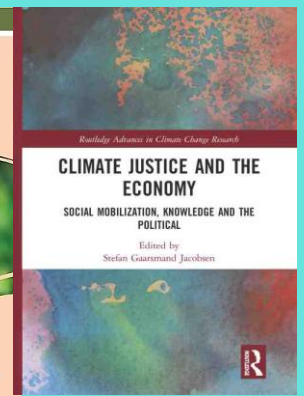
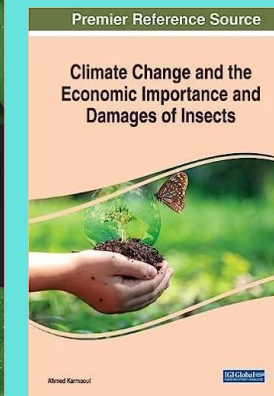
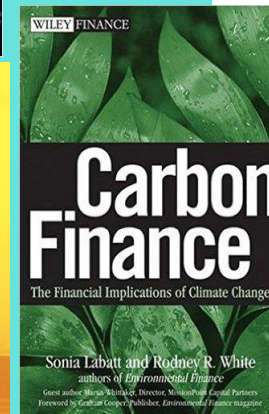
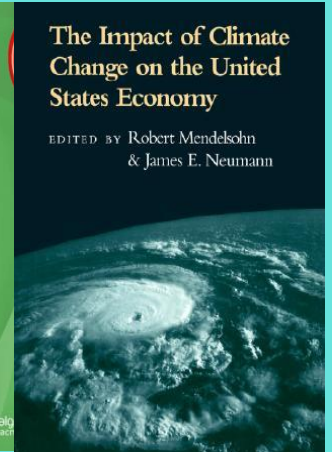
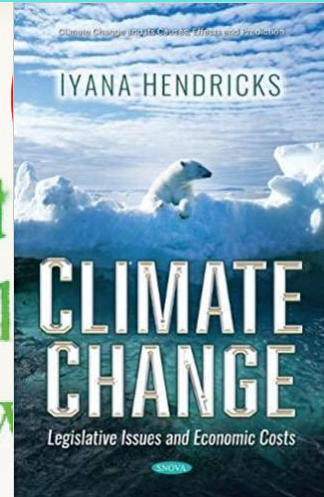
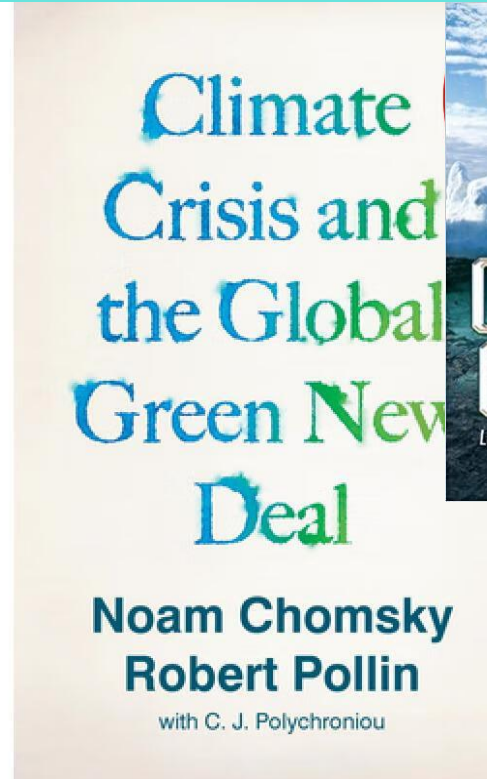
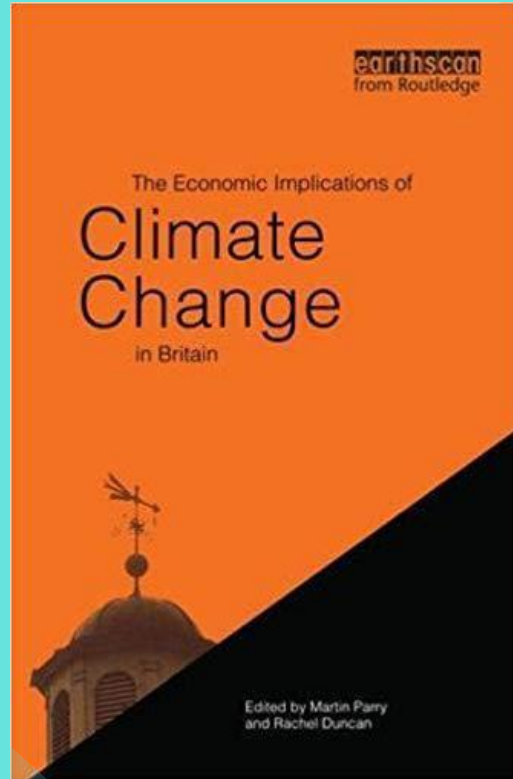




حدائق
Hadaeq
Mohammed Bin Rashid
الشارقة
Al Sharjah
(شمال)
(North)
DXB
11

عين دبي
Aln Dubai
29
شارع المرسى
Al Marsa St
شارع جرن السبخة
Gam Al Sabkha St
جزيرة بلوواترز
Bluewaters Island
مخرج
EXIT

تنبه
Attention
منع مرور مركبات
المواد الخطرة
No Hazardous Material
Vehicles
On Route
6:00 AM - 10:00 PM

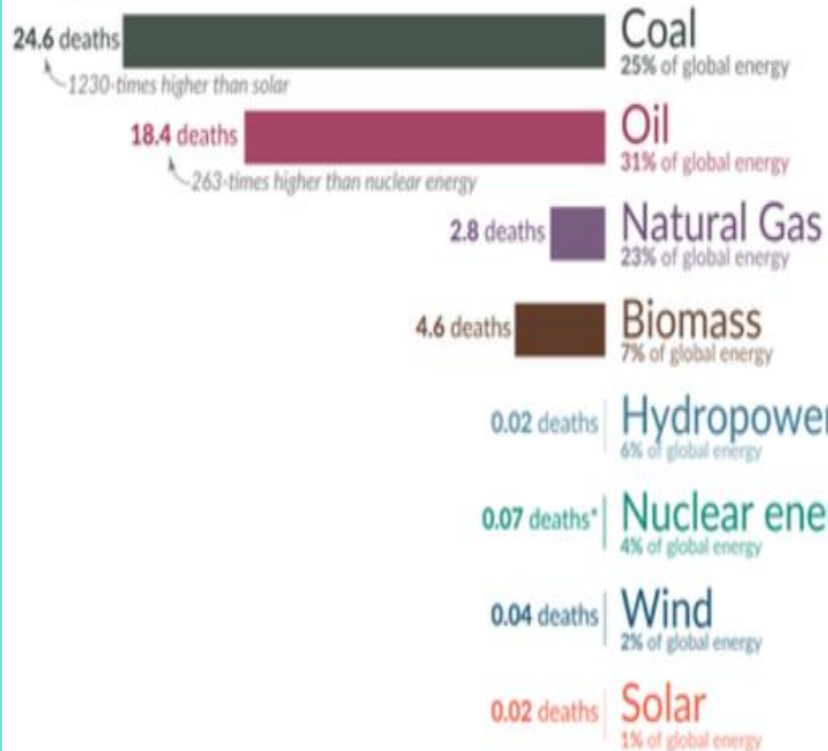


What are the safest and cleanest sources of energy?

Our World
in Data

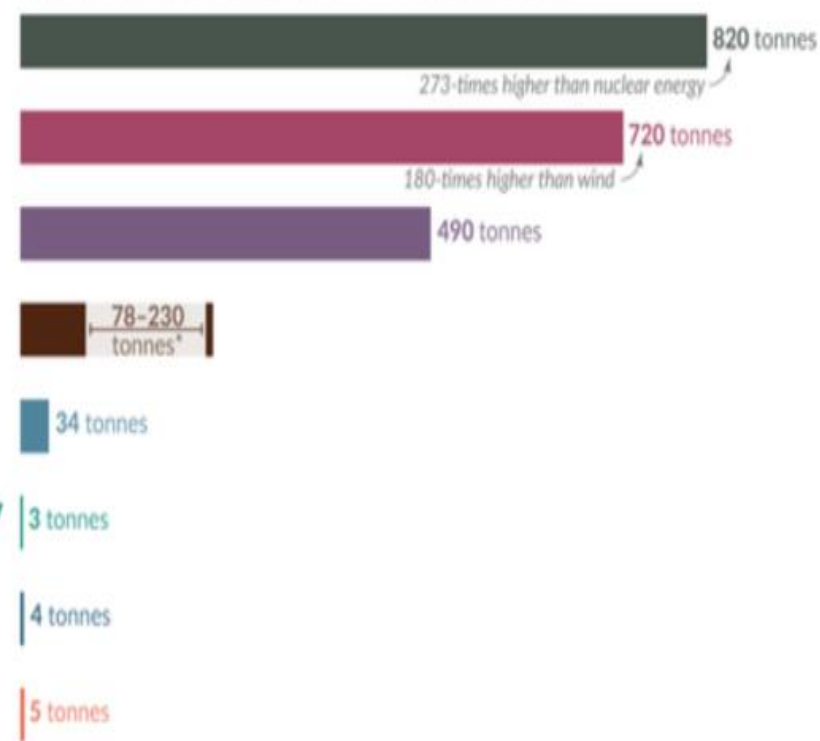
Death rate from accidents and air pollution

Measured as deaths per terawatt-hour of energy production.
1 terawatt-hour is the annual energy consumption of 27,000 people in the EU.



Greenhouse gas emissions

Measured in emissions of CO₂-equivalents per gigawatt-hour of electricity over the lifecycle of the power plant.
1 gigawatt-hour is the annual electricity consumption of 160 people in the EU.



*Life-cycle emissions from biomass vary significantly depending on fuel (e.g. crop residues vs. forestry) and the treatment of biogenic sources.

*The death rate for nuclear energy includes deaths from the Fukushima and Chernobyl disasters as well as the deaths from occupational accidents (largely mining and milling).

Energy shares refer to 2019 and are shown in primary energy substitution equivalents to correct for inefficiencies of fossil fuel combustion. Traditional biomass is taken into account.

Data sources: Markandya & Wilkinson (2007); Sovacool et al. (2016); IPCC AR5 (2014); Pehl et al. (2017); BP (2019); Smil (2017).

[OurWorldinData.org](https://www.ourworldindata.org) - Research and data to make progress against the world's largest problems.

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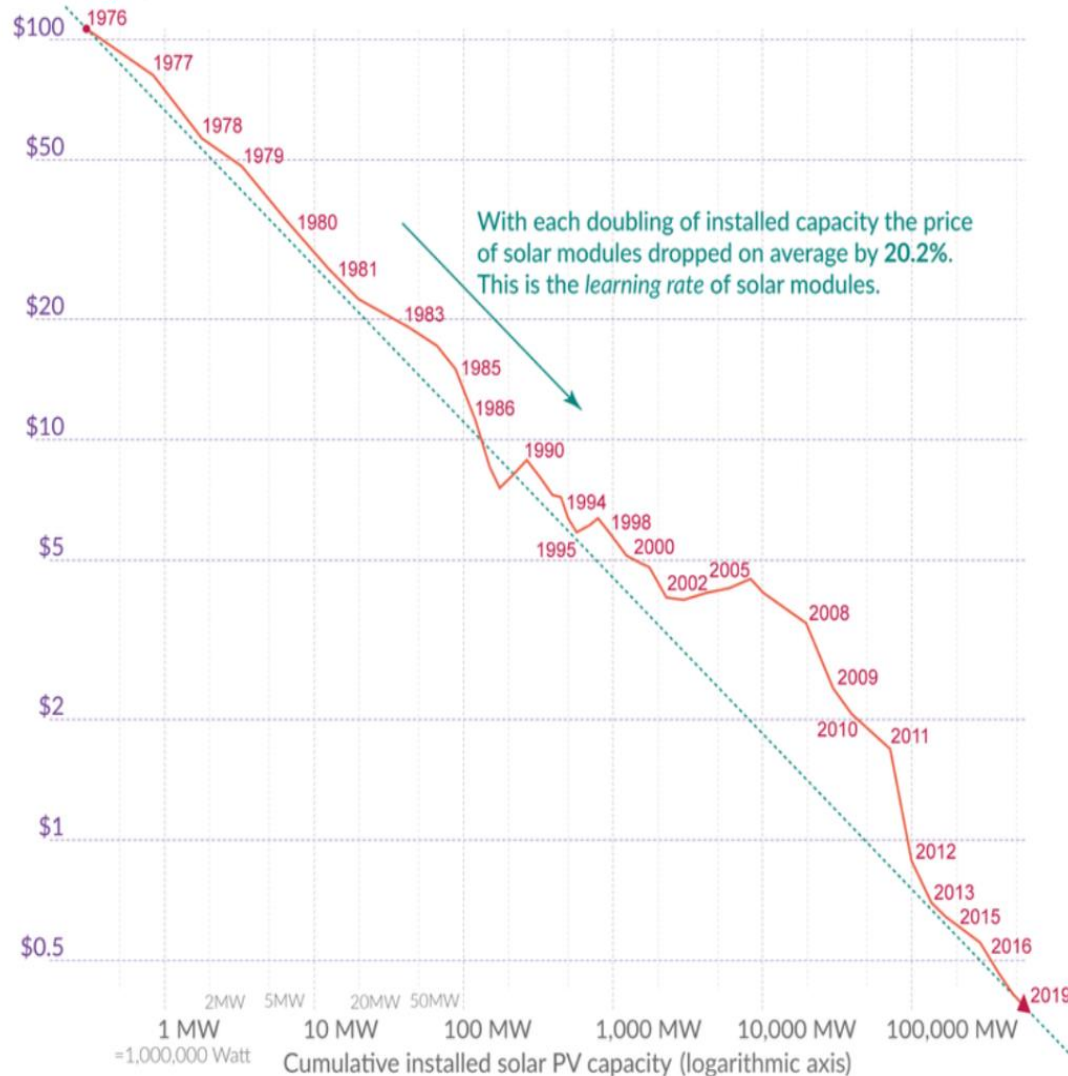
Fossil fuels come with a major detriment to our health.

Image: Our World in Data

The price of solar modules declined by 99.6% since 1976

Our World in Data

Price per Watt of solar photovoltaics (PV) modules (logarithmic axis)
The prices are adjusted for inflation and presented in 2019 US-\$.



Data: Lafond et al. (2017) and IRENA Database; the reported learning rate is an average over several studies reported by de La Tour et al (2013) in Energy. The rate has remained very similar since then.
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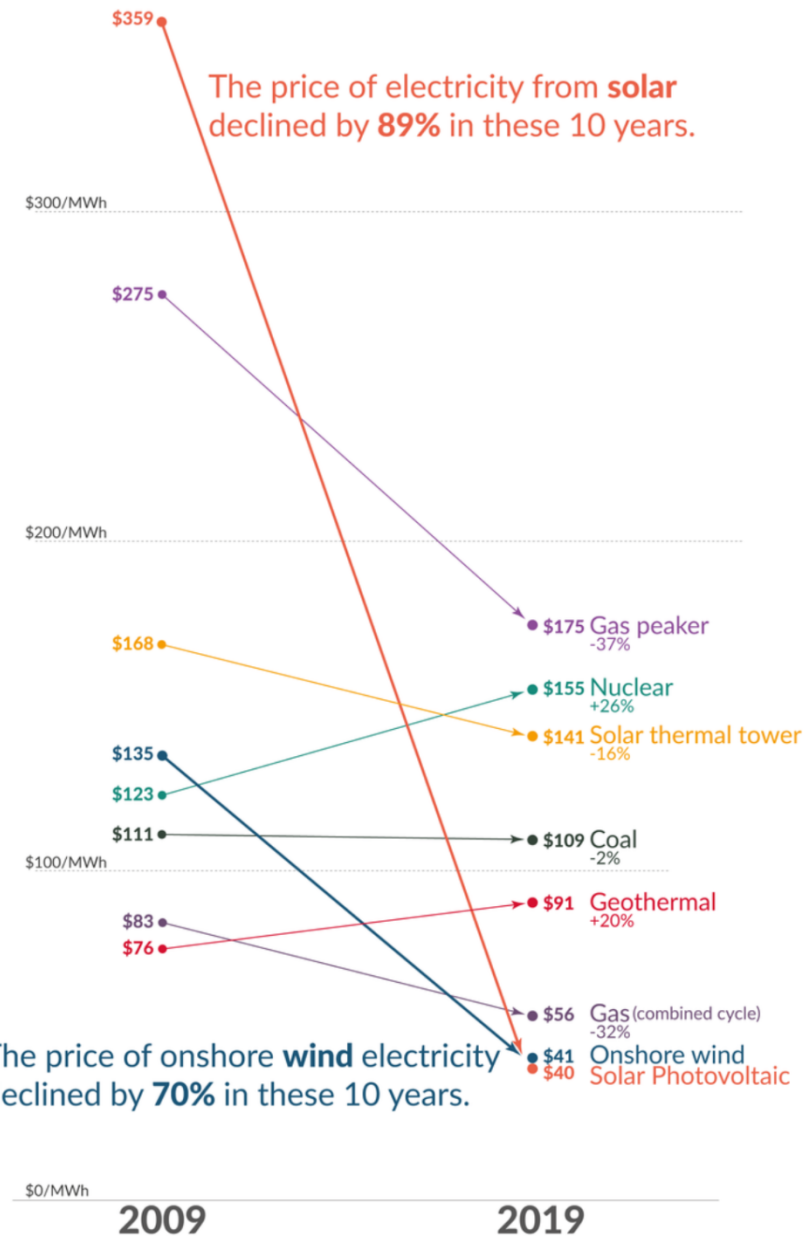
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Solar modules have fallen by 99.6% since 1976. Image: Our World in Data

The price of electricity from new power plants

Our World in Data

Electricity prices are expressed in 'levelized costs of energy' (LCOE). LCOE captures the cost of building the power plant itself as well as the ongoing costs for fuel and operating the power plant over its lifetime.



Data: Lazard Levelized Cost of Energy Analysis, Version 13.0

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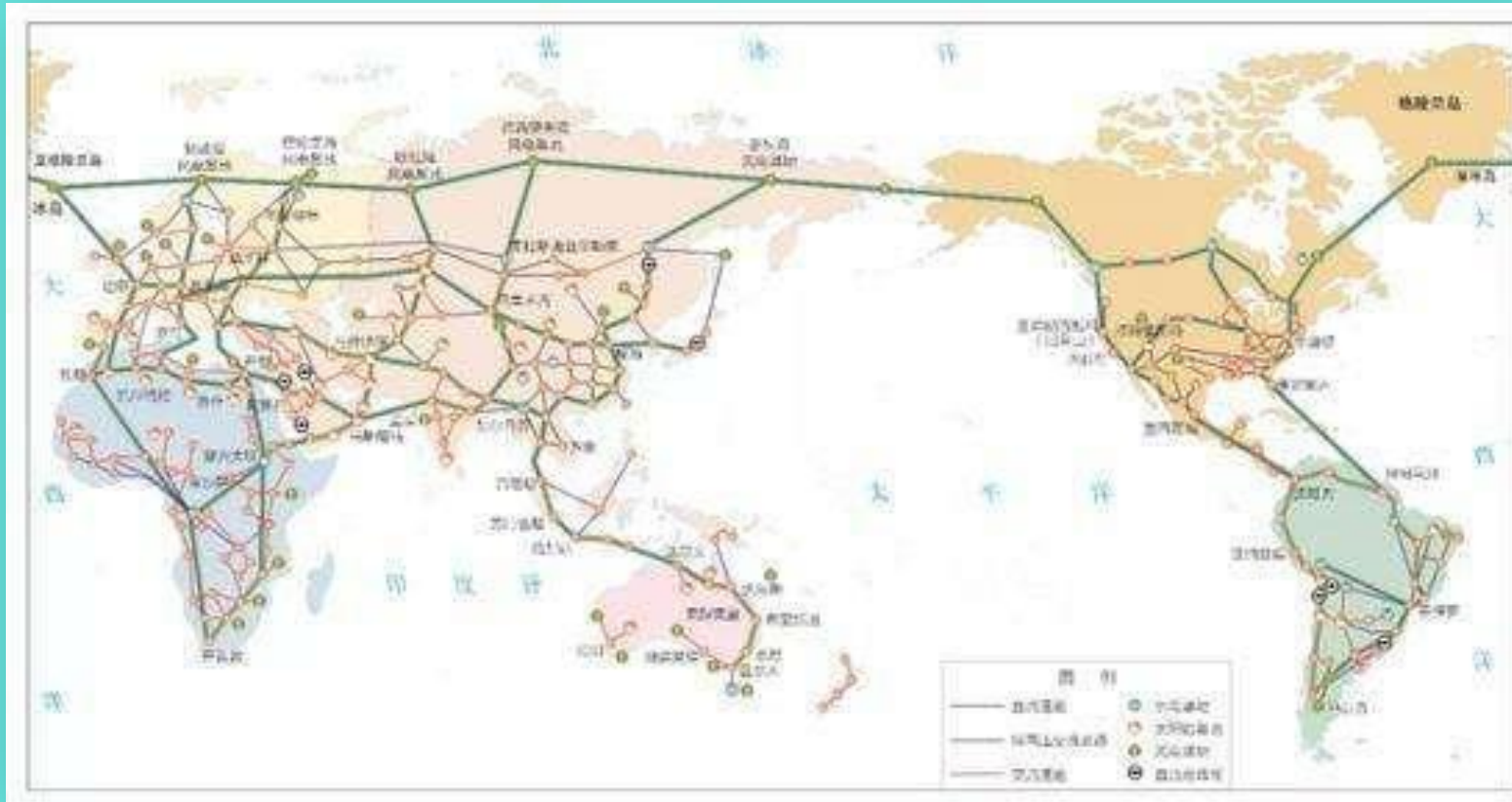
特高压UHV

Extreme High Voltage

China's UHV construction potential is still huge, the current country has planned all kinds of UHV projects between 50-60, which means that there are still about 30 lines that have been included in the planning in the future is expected to land, the recent State Grid announced the opening of UHV investment to social capital, by solving the problem of funds to further increase the certainty of UHV sustainable construction. As a key technology of the global energy Internet, UHV has successfully realized the export of UHVDC power engineering and core equipment of the second phase of Meili Mountain in Brazil. China's medium and long-term demand and more overseas space will enhance the performance sustainability of equipment companies.



"Nine horizontal and nine vertical" power grid covering six continents



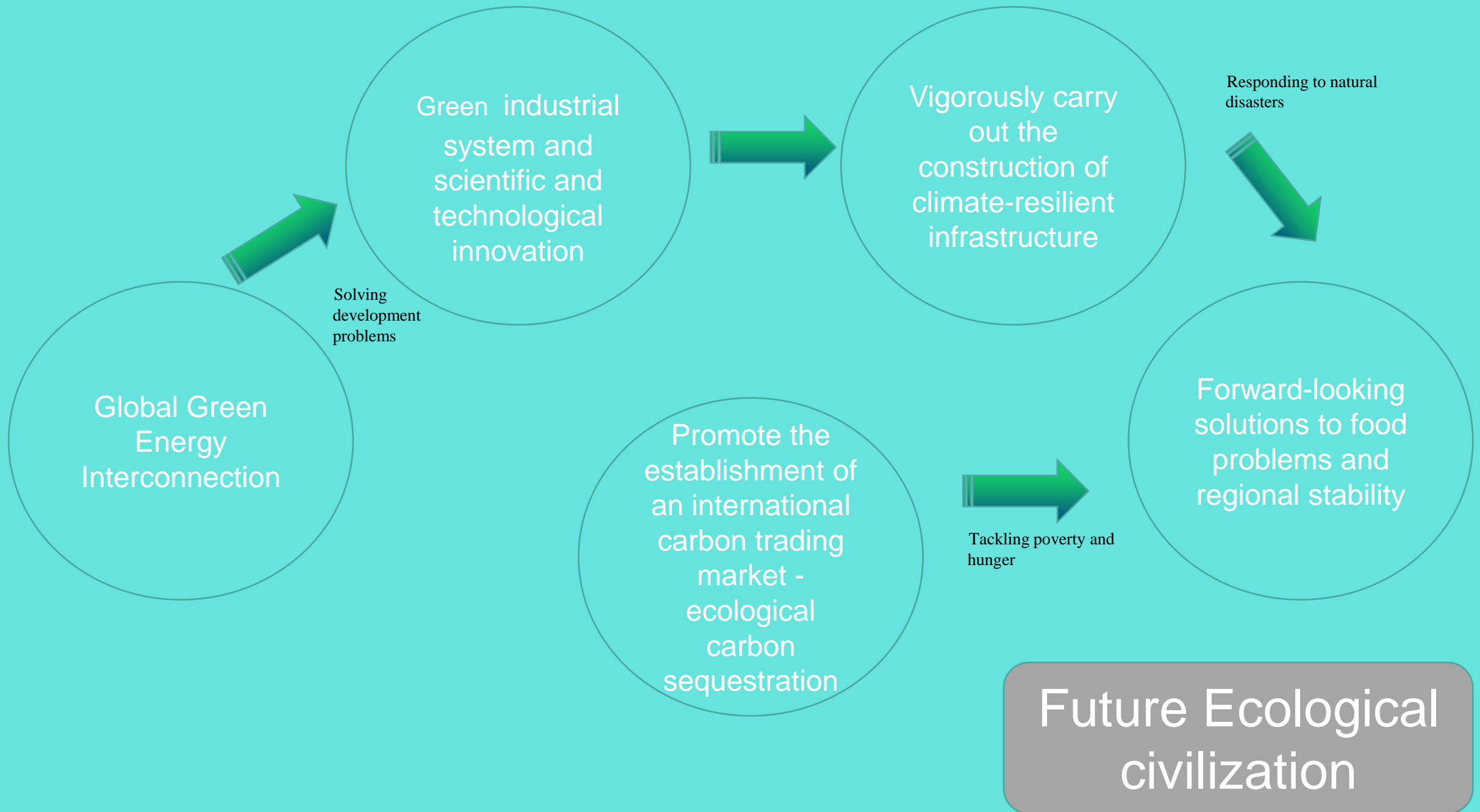
In 2035, the "five horizontal and five vertical" interconnection channels will be built, and Asia-Europe-Africa will take the lead in realizing cross-continental networking. By 2050, the "nine horizontal and nine vertical" global energy Internet backbone network will be built, forming a new pattern of global development, allocation and use of clean energy



科研团队乔婧科研助理、蔡韬副研究员、马延和研究员、朱蕾蕾研究员、孙红兵科研助理

在《科学》杂志发表研究成果

BEIJING, Sept. 24 (Xinhua) -- Using carbon dioxide as a raw material, directly synthesizing starch without relying on plant photosynthesis -- a seemingly sci-fi scene, it really happened in a laboratory. For the first time, Chinese scientists have realized the de novo synthesis of carbon dioxide to starch, and the relevant results were published online by the internationally renowned academic journal Science on the 24th Beijing time.



Infrastructure development

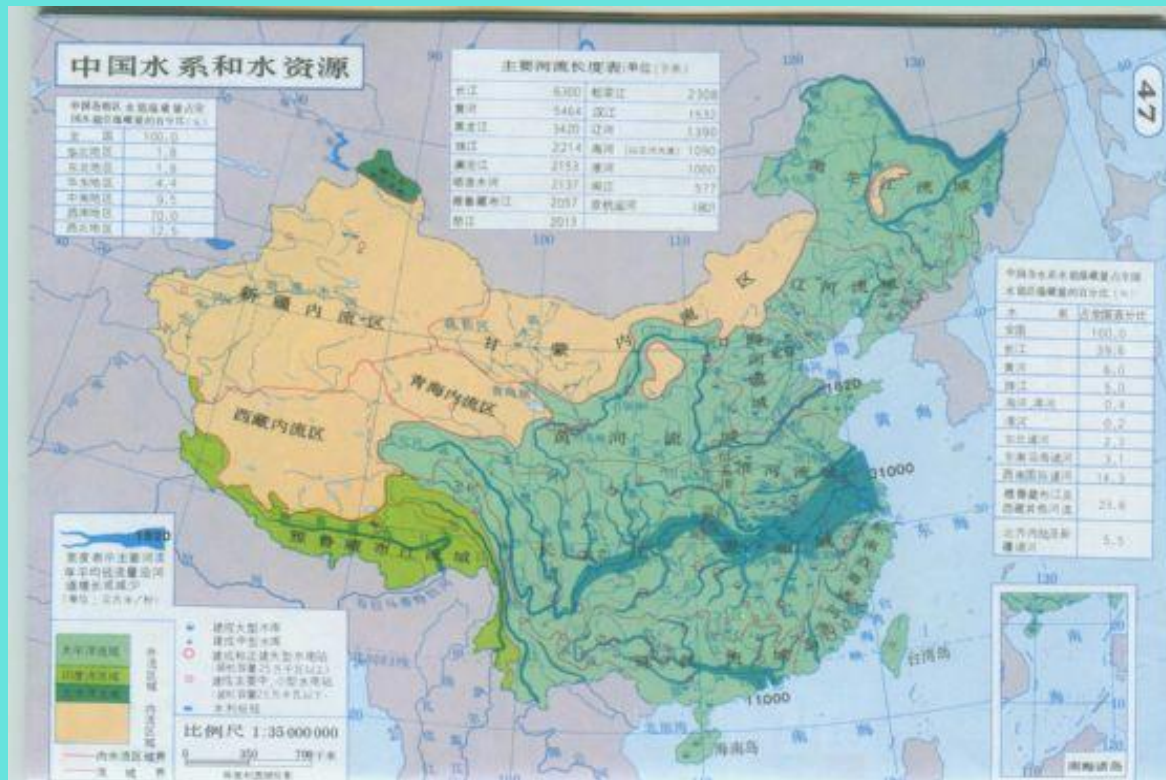


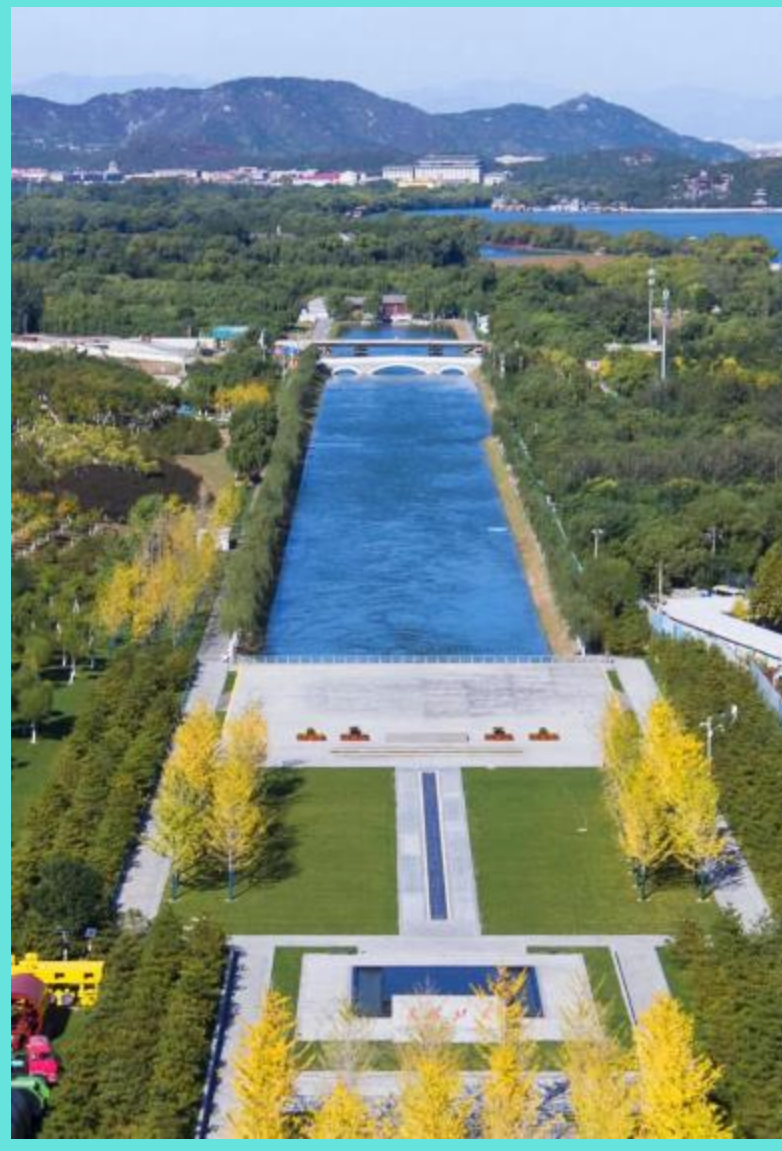
Water diversion projects

China's per capita freshwater resources are only 1/4 of the world's per capita level. This means that China is relatively short of water per capita. China is ranked as one of the "water-stressed" countries, and more than 300 cities are facing water shortages.

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Aorta vs blood capillary







China's high-speed rail mileage is more than 60% of the world's, so it is competitive.



End of part II.