# China's New Growth Story: Linking the 14th Plan with the 2060 Carbon Neutrality Goal

中国新增长故事:联结"十四五"规划与2060碳中和目标

#### Nicholas Stern尼古拉斯·斯特恩

IG Patel Professor of Economics & Government, London School of Economics and Political Science伦敦政治经济学院(LSE)IG帕特尔经济与政府学教授 Chair of the ESRC Centre for Climate Change Economics and Policy英国经济和社会研究理事会气候变化经济与政策研究中心主席 Chair of the Grantham Research Institute on Climate Change and the Environment 格兰瑟姆气候变化与环境研究所主席 Co-Chair of the Global Commission on the Economy and Climate (New Climate Economy)全球经济与气候委员会(新气候经济)联合主席

Energy Foundation China's Synthesis Report Event, December 2020 能源基金会(中国)综合报告发布会,2020年12月
Prepared in collaboration with Chunping Xie.

与谢春萍合作编写















The Global Commission on the Economy and Climate

- Challenges of a changing world
   不断变化的世界中蕴含挑战
- China's new growth story中国新增长故事
- The 2060 carbon neutrality target
   2060碳中和目标
- Urgency of shaping the low-carbon agenda in the 14th Plan 在"十四五"规划中制定低碳议程的迫切性





## The world at great risk from COVID and climate crises; A sustainable recovery to tackle the two challenges together 世界面临新冠疫情和气候变化的威胁,应以可持续复苏方式应对双重挑战

- Major crisis in world economy, finance/debt, health, society and politics.
   世界经济、金融/债务、健康、社会及政治等多方面出现重大危机
- Danger of mass unemployment around the world. Youth unemployment, Children out of school. Potential undermining of the social fabric.世界范围内大规模失业的危险。年轻人失业、儿童失学以及对社会结构的潜在破坏。
- The crisis is **truly global**, unlike the 2008-09 financial crisis. Especially damaging for the developing countries (capital flight, fall in remittances, commodity prices).

  与2008-09年的金融危机不同,这是真正的**全球性危机**。尤其是对发展中国家造成损害(资本外逃、外汇下降、商品价格下跌)。
- Developed countries have taken strong actions to protect lives and livelihoods and stabilise their economies. They must now be prepared to put in place strong and sustainable recovery programmes. Much more difficult for developing countries because they cannot borrow internationally in their own currency.
   发达国家已经采取强有力的行动保护人民生命和生计,稳定经济。他们现在必须做好准备实施强有力的可持续的复苏计划。发展中国家复苏难度很大,因为无法以本国货币从国际借款。
- Huge though the pandemic impacts are, the **dangers from unmanaged climate change** are likely still bigger and longer lasting than those from COVID-19. 尽管新冠疫情的影响巨大,但因未有效应对**气候变化所带来的危险**可能比新冠疫情的危险更严重、更持久。
- A sustainable recovery is urgently needed for building back better. Must also lay the foundations now for the transformation of growth. Taking the opportunity can drive us forwards strong, sustainable, inclusive and resilient growth. The growth story of the 21st century. **迫切需要采取可持续的复苏以重建家园,**兼顾如何为增长方式的转变打基础。抓住这次机遇,推动世界实现强劲、可持续、包容和韧性的增长。 
  这是21世纪的增长故事。
- Do not repeat mistakes following the financial crisis of 2008-2010 of retreating into austerity. 2008-2010年金融危机后采取紧缩政策,不要重蹈覆辙。





## The challenge of the external environment; and a new way of growth for the 14th Plan 外部环境带来的挑战;"十四五"期间的新增长方式

- The US-China strategic relationship and the shape of the global economy after COVID-19 contribute to an external environment that is less favourable to China.
  - 中美战略关系以及新冠疫情后的全球经济格局给中国带来不利的外部环境。
- In the meanwhile, as a result of COVID-19, the world will likely see a phase of de-globalisation, a trend that had already begun since the middle of the past decade. China's share of trade in goods to GDP decreased over the past decade, but is still over 30%.
   受疫情影响,世界可能会进入去全球化阶段,这一趋势在过去几年就已开始。过去十年间,中国国际贸易占GDP的比重有所下降,但目前仍超过30%。
- The 14th Plan needs to take into account these external challenges, in relation to external demand and geopolitical tensions, and put forward a new way of growth that shapes future development, contributing to China's own prosperity and a better world.
   "十四五"规划需要考虑这些外部挑战,尤其是外部需求和地缘政治紧张局势,提出决定未来发展的新增长方式,为中国自身的繁荣和更美好的世界作出贡献。
- Sustainable growth is the only feasible path forward, and it is one of the few areas where a broad consensus might be reached across the rapidly changing world.
  可持续增长是唯一可行的前进道路,也是在迅速变化的世界环境中有可能达成广泛共识的少数领域之一。
- As China leads the world out of the COVID-19 crisis, it has a great opportunity, for building a new vision for the country's development and its relationship with the world. As one of the first major G20 countries to have made the transition from rescue to recovery in the COVID-19 pandemic, China can show how recovery measures can also accelerate the transition to the inevitable low-carbon economy.
  中国在引领世界走出新冠疫情的同时,面临着构建中国发展新愿景、构建与世界新关系格局的重大机遇。作为二十国集团(G20)中率先从救援向复苏过渡的主要国家之一,中国可以向世界展示,如何利用复苏措施加速向低碳经济转型的可行性和必然性。
- Failing to take this opportunity would give us a **deeply dangerous world**. China is at centre stage. 如果错失这个机会,我们将面临一个**极其危险的世界**。中国处于世界舞台的中心。





## The old approaches to development are coming to an end in China 旧的发展方式在中国正在走向终结

- Past growth has been driven by strong investments in physical and human capital, with a focus on manufacturing, high-carbon infrastructure and fossil-fuel energy.
  - **过去经济增长**主要依靠对**物质资本和人力资本**的大量投资,尤其是对制造业、高碳基础设施和化石燃料能源的投资。
- The old era or approach to development is coming to an end for a number of reasons. Threats to natural, human and social capital are being reflected in: pressures on the environment; social strains, including inequality; changing technologies and the need for new skills; and the demographic challenges of an ageing population.
  - 许多原因共同导致**旧的时代或发展方式正在终结**。对自然、人类和社会资本的威胁主要体现在:对环境的压力、社会紧张(包括不平等)、不断变化的技术和对新技能的需求以及人口老龄化带来的挑战。
- We have seen how dangerous and fragile is the old model. Clarity necessary on **not going back**. Damage to climate and biodiversity make pandemics more likely. Rigidity and fragility of old systems. 我们已见识旧增长方式的危险性和脆弱性的。有必要发出清晰信号**不再重蹈覆辙**。对气候和生物多样性的破坏大大增加了流行传染病爆发的可能。旧系统的刚性和脆弱性。
- · Jobs of the past are insecure in a changing world. Stranded assets lead to stranded jobs. 在这个不断变化的世界里,过去的工作机会是不安全的。搁浅资产会导致工作机会的丧失。
- If we continue to invest in traditional and polluting production methods and infrastructure, ramping up fossil-fuel consumption, it could locking in decades of polluting and high-carbon development. **The consequences for the world would be devastating**.

  如果我们继续投资于传统污染的生产方式和基础设施,增加化石燃料消耗,将会锁定之后几十年的污染和高碳的发展。**对世界造成的后果将是毁灭性的**。





- Challenges of a changing world 不断变化的世界中蕴含挑战
- China's new growth story 中国新增长故事
- The 2060 carbon neutrality target 2060碳中和目标
- Urgency of shaping the low-carbon agenda in the 14th Plan 在十四五规

划中制定低碳议程的迫切性





## Why sustainable growth is the way to future prosperity 为什么可持续增长是通向未来繁荣的道路

- Sustainable growth, with low-carbon transition at its core, is not only good for environment and climate, but can also offer new drivers of growth and poverty reduction, and lasting improvements to well-being. 以低碳转型为核心的可持续增长,不仅有利于环境和气候,还可以提供新的动力促进增长、减贫和持久改善民生。
- Sustainable growth does not mean expensive ways of doing things, quite the opposite, it can actually push the cost down in two
  ways: 可持续增长并不意味着昂贵的生产方式,恰恰相反,它实际上可以通过以下方式降低成本:
  - It helps **move the production possibility frontier (PPF) outward** (movement of the PPF curve itself) through discovery and innovations. 通过探索和创新,让**生产可能性边界线(PPF)外移**。
  - It can push the economy towards lower costs through the *increasing returns to scale (IRS)* and through improved efficiency that achieves a certain level of output with less material inputs. Learning by doing will be important. 它可以通过增加规模收益(IRS)和通过提高效率,以更少的物质投入实现同样水平的产出,从而推动经济向低成本发展。 干中学(learning by doing)很重要。

These effects can mutually support and reinforce each other. 这些效应是相互支持、相互加强的。

• We need investment and innovation to get there. Government commitment, providing a clear sense of direction, can foster innovation and investment. And help manage the transition as efficiently and fairly as possible.

我们需要投资和创新来实现这一目标。政府的承诺可以提供明确的方向感,以促进创新和投资。并有助于尽可能高效和公平地转型。





## The new growth story will be far more attractive than the past, unlocking economic, social, and environmental benefits 新的增长故事将比过去更具吸引力,充分释放经济、社会和环境效益

- The new growth story, which will be innovation driven and requires investment to achieve, will make China more competitive and much cleaner and healthier. The returns on investment will be strong.
  - 新的增长故事以创新作为驱动力,吸引大量投资,这将使中国更具竞争力、更清洁、更健康。新投资的回报将是丰厚的。
- Economic upgrading: It will involve structural transformation of industry towards higher skills and technologies.
   经济升级:以工业结构转型促技能和技术提高。
  - China is already a leader in technologies of the emerging green economy (e.g. batteries, solar PV cells, and electric vehicles). If structured well, this new growth pathway can give rise to accelerated technology innovations, building foundation for long-term economic prosperity and competitiveness. 中国在新兴绿色经济技术(如电池、太阳能光伏和电动汽车)方面已经处于世界领先地位。如果合理布局,这种新的增长方式可以加速技术创新,为长期的经济繁荣和竞争力奠定基础。
  - It can establish China's competitive leadership in the world economy, as China's investments in low-carbon transition would lower the cost of clean energy and thus lead to a positive "spillover" effect in other countries. 树立中国在世界经济中的竞争性领导地位,因为中国的低碳转型投资将降低清洁能源的成本,从而对其他国家产生积极的溢出效应。
- Good employment opportunities: The job-creation rate of renewable industries is between 1.5 and 3 times that of traditional energy industries (IEA,2020). 更好的就业机会:可再生产业的就业创造率是传统能源产业的1.5-3倍(IEA,2020)。
- Other benefits: Reducing the use of coal would save huge societal costs, mostly associated with climate change and public health damage. Renewables are scalable in areas where there is little electricity, and the economic effects of getting access to electricity can be far-reaching. 其他好处:减少煤炭的使用将节省巨大的社会成本,这些成本大多与气候变化和公共健康损害有关。可再生能源可以在电力不足的地区规模化,获得电力供应的经济影响是深远的。





### Concerns on possible negative economic impacts of a low-carbon transition do not stand scrutiny 低碳转型和经济增长并不矛盾

- The devastating effects of climate change cause direct damage (e.g. more frequent wildfires, floods, droughts and heat waves). A growing body of research shows economic benefits of the low-carbon transition. 气候变化的破坏性影响造成直接损失(例如更频繁的自然火灾、洪水、干旱和热浪)。越来越多的研究显示了低碳转型的经济效益。
- The relationship between economic growth, energy consumption and carbon emissions has long been discussed. In general, lower carbon emissions can be achieved through: 经济增长、能源消耗和碳排放之间的关系一直是人们热议的话题。总体而言,可通过以下方式降低碳排放:
  - Reducing energy intensity of economic output (decoupling of energy use and economic growth), which can reshape an economy through causing the contraction of some industries (e.g. coal mining, steel and cement), transforming some (e.g. transport), and providing great opportunities for others (clean-energy and energy-efficiency industries) which offers jobs of the future. The new opportunities greatly exceed the job loses. Dislocation of jobs can and should be managed.

    降低经济产出的能源强度(能源消耗与经济增长脱钩),重塑经济结构。这会造成部分行业的萎缩(如煤矿、钢铁和水泥),部分行业的改变(如交通),同时也为其它行业提供巨大的机会(清洁能源和节能行业)。这些行业提供了未来的工作机会,从而为传统行业工作流失问题提供解决方案。
  - **Driving down carbon intensity of energy** (shifting from fossil fuels to renewables). Some worry about the relatively higher costs of renewables compared to fossil fuels, which can have negative impacts on growth. But renewables with storage are now cheaper than fossil fuels for electricity production around much of the world. And grid management (including digital) is improving rapidly. Further, **the conventional production functions fail to capture resources and environment restraints and natural capital depletion** and they fail to capture rapid technical change.

**降低能源的碳强度**(从化石能源转向可再生能源)。一些人担心,与化石燃料相比,可再生能源的成本相对较高,这可能会对经济增长产生负面影响。 但在世界很多地方,可再生能源发电加上储能的成本比化石燃料低。电网管理(包括数字化)正在迅速改进。此外,传统生产函数无法反映资源和 环境的限制以及自然资本的消耗,也无法反映快速的技术变更。





## Stop building more coal-fired plants in China: it is too costly both economically and environmentally

- 停止在中国新建燃煤电厂:新建煤电的经济和环境代价太昂贵
- Bloomberg NEF suggests that **solar farms and onshore wind are now the cheapest source of new electricity** for at least two-thirds of the world's population. 彭博新能源基金(Bloomberg NEF)认为,对于世界至少三分之二的人口而言,太阳能发电和陆上风力发电是目前最便宜的电力来源。
- As coal faces cleaner rivals and the prospect of more regulation, banks and investors are turning away, raising coal's cost of capital. 考虑到清洁能源竞争力提升,未来对煤炭行业的监管越发严格,银行和投资者开始避开煤炭行业,增加煤炭行业的资金成本。
- Example from the US: the Trump administration has favoured the coal industry with deregulation and political support—and still it has declined. Main reasons are: 1) coal faces competition from cheap natural gas produced in the US by fracking; 2) tax credits and subsidies have prompted renewables to scale up, which has in turn helped drive down their costs. 3) potential investors recognise that society and politics are moving strongly against coal and that costs of renewables and storage falling fast. 美国的案例:特朗普政府通过放松管制和政治支持帮助煤炭行业,但煤炭行业仍在萎缩。主要原因有:1)煤炭面临来自美国水力压裂法生产的廉价天然气的竞争;2)税收抵免和补贴促使可再生能源的规模扩大,新一步降低可再生能源的成本;3)潜在投资者认识到,社会和政治正在强烈反对煤炭,可再生能源和储能的成本正在快速下降。
- A <u>recent study</u> by Tsinghua University suggests China would need to transform its energy mix dramatically by boosting its **share of non-fossil fuel energy to 84% by 2060** to meet its carbon neutrality goal, with **coal-fired plants completely phased-out**. 清华大学最近一项研究表明,为实现2060碳中和目标,中国需要显著转变能源结构,到2060年**非化石能源的比重提高到84%,并彻底淘汰燃煤电厂**。
- This calls into question dozens of power plants currently under construction or planned, which will either lock in decades of polluting and high emission or have to be stranded assets. 这让人们对目前在建或计划中的数十家发电厂产生了质疑,这些发电厂在未来几十年里要么将我们锁定在高污染和高排放,要么将被迫成为搁浅资产。





- Challenges of a changing world 不断变化的世界中蕴含挑战
- China's new growth story 中国新增长故事
- The 2060 carbon neutrality target 2060碳中和目标
- Urgency of shaping the low-carbon agenda in the 14th Plan

在"十四五"规划中制定低碳议程的迫切性



## The significance of China's 2060 carbon neutrality commitment to its national development and to the world 2060年碳中和承诺对中国自身发展和对世界的意义

- China has been seeking a new form of high-quality development for some years now, and this extremely important pledge will be a major boost in that direction, promoting economic growth that is more sustainable, inclusive and resilient.
   近年来中国一直在寻求高质量发展的新增长方式。2060碳中和承诺具有重大意义,将促进经济沿着更具可持续性、包容性和韧性的方向增长。
- President Xi's ground-breaking announcement provides a clear signal to other countries that the pandemic should not prevent more ambitious action to tackle climate change.
   习主席开创性的声明向其他国家发出了一个明确的信号,即应对新冠疫情不应成为阻止采取更大力度行动来应对气候变化的理由。
- Many countries are now recognising that the transition to a net-zero economy will help to deliver economic development and growth that is more robust, sustainable and resilient and recognise and influenced by China's commitments and model.
   许多国家现在认识到,向净零经济的转型有助于实现更强劲、更可持续、更有韧性的经济增长,认可中国碳中和承诺,接受承诺带来的影响。
- As the world's largest single emitter of greenhouse gases, **China's pledge should help to increase momentum** ahead of the 26th session of the Conference of Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC). China is now a world leader.
  - 作为世界上最大的温室气体排放国,**中国的承诺将有助于**在《联合国气候变化框架公约》第26届缔约方大会召开之前促进其他国家的减排决心。中国是世界的领导者。





## An early peaking and the 2060 carbon neutrality target: the earlier, the better 碳排放提前达峰和2060年碳中和目标:越早越好

- While President Xi's announcement that China will seek to reach net-zero emissions by 2060 is extremely welcome, China would face a very great challenge in achieving this target if its emissions do not peak earlier than 2030.
   习主席宣布中国努力在2060年实现净零排放受到国际社会的欢迎,但如果中国不能在2030年之前达峰,实现2060碳中和目标将面临巨大挑战。
- Timing for peaking emissions is of great significance, as there is no time to waste for enabling such dramatic transformation to take place within 40 years.

  何时达到排峰至关重要,要想在40年内实现如此巨大的转变,行动刻不容缓。
- The earlier that China peaks its emissions, the lower the peak value is, the more favourable it will be for the realisation of the 2060 carbon neutrality target.
  中国越早达峰,峰值越低,就越有利于实现2060年碳中和目标。
- New <u>CAT report</u> shows **UN goals 'within reach'** (bring warming to 2.1°C), based on new climate promises from China and other nations, along with the carbon plans of US President-elect Joe Biden. However, **long-term pledges need to be matched by short-term plans to cut emissions**. And the Paris target is "well-below 2°C" and ideally 1.5°C.

  其子中国和其他国家的最新气候承诺,以及美国当选总统乔·拜登的碳排放计划,来自气候行动跟踪器(CAT)的新报告估计,联合国全球温升
  - 基于中国和其他国家的最新气候承诺,以及美国当选总统乔·拜登的碳排放计划,来自气候行动跟踪器(<u>CAT</u>)的新报告估计,联合国全球温升 控制在2.1°C的目标"触手可及"。然而,**长期减排承诺需要与短期减排计划相匹配**。并且《巴黎协定》的目标是"远低于2°C,最好是1.5°C。





#### Linking the 2060 carbon neutrality goal with China 14th Plan and long-term development goals through 2035 将2060年碳中和目标与中国"十四五"规划以及2035长期发展目标相关联

- The new growth pathway that is implied by the 2060 carbon neutrality goal will also need to be rooted in existing goals and policies that have been articulated by China. The upcoming five-year plan is crucial in spearheading such efforts.
   2060年碳中和目标所隐含的新增长路径必须与中国现有的目标和政策紧密结合。即将出台的"十四五"规划是关键。
- The 14th Plan is of special significance as the plan period (2021-2025) will mark the first five years of China's new journey toward basically realising a modern socialist country (the Long-Range Goals for 2035) and marching toward the second centenary goal of "a great modern socialist country" (by 2049).
  - "十四五"规划具有特殊意义,因为2021-2025年是中国迈向基本实现社会主义现代化国家(2035年远景目标)新征程的前五年,也是中国迈向 "到2049年建成社会主义现代化强国"第二个百年奋斗目标的开局之年。
- In the meanwhile, the 14th Plan covers one-eighth of the four decades before the 2060 deadline for the carbon neutrality target, so a good starting point could be established.
  与此同时,"十四五"规划涵盖了2060年碳中和目标实现周期的前八分之一,建立一个良好的开端至关重要。
- If China can reach a carbon peak by the end of the 14th Plan at around 10 Gt CO2, and then bend the emissions curve downwards quickly through a plateau in emissions as short as possible, it would significantly increase the likelihood to reach its neutrality target by 2060. And greatly increase the likelihood of the world achieving the climate targets. 如果中国能在"十四五"期间达到100亿吨左右的排放峰值,并在尽可能缩短平稳期,而后实现排放快速下降,将极大地增加2060年碳中和目标实现的可能性,也极大地增加世界实现气候目标的可能性。





## China's mutually supporting economic and social development objectives and climate goals 中国经济和社会发展目标与气候变化目标相互支持

- Proposals of the Central Committee of the Communist Party of China on Formulating the 14th Five-Year Plan for
  National Economic and Social Development and the Long-term Goals for 2035 outline China's major development
  objectives for the next 15 years, including notable emphases on: 《中共中央关于制定国民经济和社会发展第十四个五年规划和二〇三五年远景目标的建议》,对未来15年中国发展的主要目标作出了规划,其中包括以下重点:
  - · Technological innovation; 技术创新
  - Modernised economy (new industrialisation, new urbanisation, and digitalisation);
     现代化经济(新工业化、新型城市化和数字化)
  - · Eco-friendly ways of work and life; 环境友好的工作方式和生活方式
  - · Steadily declining carbon emissions; 碳排放量稳步下降
  - · Fundamental improvement in the environment. 环境得到根本改善
- The next phases of discussion and planning in China will focus on the policies and programs needed to connect China's current situation through these 2035 goals, and continue this transition to 2060. These are surely goals which all should recognise and support. The challenge is delivery. 中国下一个阶段的讨论和规划重点应是政策和计划,推动当前政策与2035的目标相衔接,并保证转型方向与2060年长远目标相一致。上述目标应当得到广泛的认可和支持。如何贯彻执行这些目标是挑战的根本。





- Challenges of a changing world 不断变化的世界中蕴含挑战
- China's new growth story 中国新增长故事
- The 2060 carbon neutrality target 2060碳中和目标
- Urgency of shaping the low-carbon agenda in the 14th Plan 在"十四五"规划中制定低碳战略的迫切性



## What are the key factors restricting the development of low-carbon economy in China? 制约中国低碳经济发展的关键阻力有哪些

- The controversial role of coal in China: 煤炭在中国的作用备受争议:
  - In many cases, the pressure to continue with coal mining comes from local governments that are dependent on royalties from mining operations; 继续开采煤矿的压力更多地来自地方政府,开采业务的特许权使用费是地方税收的主要来源;
  - Energy industry lobbies may seek additional support under the name of "promoting energy security".
     能源行业利益集团可能会以"促进能源安全"的名义寻求额外的支持。
- Social consequences and just transition: 社会影响和公平转型:
  - Transparent and comprehensive policies on 1) occupational retraining programme to help these affected workers build a future; 2) investing in places which are particularly affected; 3) economic and and medical support of laid-off workers from phased-out industries; 制订透明和全面的政策:1)实施再就业培训计划,帮助受影响的工人建设未来;2)投资于受转型影响特别严重的地区;3)对下岗职工提供经济、医疗保障;
  - Investing in people and places for ensuring a just transition 对人员和地区进行投资,以确保公平转型
- Regional difference that could become a barrier and needs to be well managed: 区域差异可能成为转型阻碍,需要妥善管理
  - Governance ability; Fiscal sustainability; Local industrial structure;
     治理能力;财政可持续性;当地的产业结构





## Policies in the 14th Plan to accelerate the low carbon transition and push an early peaking (I) "十四五"规划中加速低碳转型和碳排放达峰的相关政策(一)

- Stop building more new coal-fired plants; 停止新建燃煤发电厂
  - The urgent need to reappraise the traffic light risk rating system for permitting new coal-fired power project; 新建燃煤发电项目的风险评价体系亟待重新评估;
  - Investing in innovative technologies (e. g. energy storage) to support the development of renewables rather than relying on coal-fired plants to provide the flexibility.
     投资于创新技术(如储能),以支持可再生能源的发展,而不是依赖燃煤电厂来提供灵活性。
- Promote power sector reforms; 促进电力行业改革
  - The running of current grid system implies there is a limit for the share of renewables that can be absorbed by the grid;
     these limits are costly and out of date.
     当前电网系统的运行方式给可再生能源在电网中预留的份额有限;这些限制造成高额成本,需要改革。
  - A modern grid system is urgently needed, not only to upgrade the grid infrastructure but also the technical guidance and standard that decides how the grid runs. Digital technologies give great scope for managing demand and supply. Many storage possibilities and costs are falling. Link across regions.
     电网系统现代化已经提上日程。包括电网基础设施的升级,以及提高电网技术指导和标准。数字化技术可以很好地实现供需平衡管理。各种储能方式不断出现,成本也在下降。可考虑可再生能源的跨区域传输。
  - Push forward market-based economic dispatch in a way that the generation unit with the lowest costs has priority for meeting electricity demand, to improve renewable integration by taking advantage of the near-zero marginal cost wind and solar generators.

推进市场化手段,以成本最低的发电机组优先满足电力需求,充分利用边际成本接近于零的风能和太阳能发电,提高可再生能源消纳。





## Policies in the 14th Plan to accelerate the low carbon transition and push an early peaking (II) "十四五"规划中制定相关政策加速低碳转型和碳排放达峰(二)

- Mobilise investments towards clean energy industries, including wind, PV, hydrogen and nuclear energy; 调动对清洁能源行业的投资,包括风能、光伏、氢能和核能;
  - Fiscal and monetary policies; 财政和货币政策
  - Sustainable finance and finance innovations;可持续金融和金融创新
  - Promote energy and storage efficiency, energy management—great scope for improvement. And resource efficiency generally, e.g. through a circular economy.
     提高能源效率、储能效率和能源管理—有很大的改进空间。提高资源效率,例如通过循环经济。
- Quantified targets in the 14<sup>th</sup> Plan:
  - "十四五"规划量化目标:
    - Besides the carbon intensity target, establish a target to control total carbon emissions, e. g. setting an absolute carbon emissions cap; 除碳强度目标外,还应制定对碳排放总量控制目标,如设定碳排放绝对上限;
    - Pushing for cleaner electricity generation through a strengthened target on the share of non-fossil fuel; 强化非化石能源比重,推动更清洁的发电;
- Clear definition on the degree of green technologies and green infrastructure supported in the New Infrastructure Plan. 明确新基建计划对绿色技术和绿色基础设施的支持程度





## China's leadership on climate change and sustainable growth 中国在气候变化和可持续增长方面的领导作用

- The commitment of the world to tackling climate change will depend on what China does in the coming months and years. This influence is even greater than is implied by China's size; it comes also from its technologies, its strategies, and its leadership coming out of the COVID crisis.

  世界应对气候变化的承诺将取决于中国在未来数月乃至数年的行动。这种影响力甚至比中国的巨大体量所隐含的影响力还要大;
  它还来自于中国的技术,战略,以及中国在带领世界走出新冠疫情危机的领导能力。
- China's work together with the BRI countries will be crucial, including moving beyond coal.
   中国与"一带一路"国家的合作至关重要,包括在弃煤方面。
- This decade, 2020-2030, is of fundamental importance to human history. If we lock in dirty and high-carbon capital, we will head for profound and irreversible damage to our climate, biodiversity and environment. The 14th and 15th Five-Year Plans shape the future of the world.
   2020-2030年对人类历史意义重大。如果锁定污染和高碳资本,将对气候、生物多样性和环境造成深刻和不可逆转的破坏。"十四五"和"十五五"规划决定着世界的未来。
- China is already at the forefront of the development of new low-carbon technologies and China has a great deal to gain by being in the **vanguard of the new global growth story** driven by the stimulus of higher investment in renewables, energy efficiency, more healthy cities, restoration of degraded land, reducing pollution...
  - 中国已走在新低碳技术的前沿,在可再生能源,能效,更健康城市,退化土地修复,减少污染等领域的大量投资,将使中国成为**全球新增长故事的领航者**,并在其中获得 丰厚回报。
- President Xi's commitment to achieve carbon neutrality by 2060 is important to shape the future of China's socioeconomic development and show the right direction for China's own modernisation and its relations with the international community.

  习主席承诺到2060年实现碳中和,这对于中国未来社会经济发展至关重要,并为中国自身的现代化以及中国与国际社会的关系指明正确方向。
- The 14<sup>th</sup> Plan will be a crucial period for China to achieve its 2060 neutrality target. **Peaking emissions in the 14<sup>th</sup> plan**, bringing forward the peak to no later than 2025 could change commitments across the world, at the same time as greatly benefitting China.
  - "十四五"期间是中国实现其2060碳中和目标的关键时期。如能在"十四五"期间达峰,可以改变世界各国的承诺,同时极大地利于中国自身发展。



