

Introducing the Low Carbon Economic Growth (LCEG) strategy

China's historic growth model has run its course.

It is beset by:

- overcapacity, indebtedness, and declining profitability
- decreasing competitiveness of low-value exports
- demographic headwinds
- environmental challenges that affect health and public legitimacy

EFC engagement in six key initiatives can help bring about transition to...



1. Setting the vision and targets for a new growth model



2. Engaging banks and investors in a new growth model



3. Creating markets for natural capital



4. Sustainable infrastructure investment for a new growth model



5. Zero-carbon technology and innovation



6. Economic diversification and the Just Transition

...a new low-carbon economic growth model.

In which:

- growth is driven by productivity increases realized by investments in human, social, intellectual, and natural capital
- China competes in high value export markets and consumption becomes more important
- carbon emissions peak ASAP, and GHGs are on a trajectory for net-zero before 2060

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Strategy development and consultation

This strategy was developed in consultation with a wide range of EFC stakeholders and external experts, including:

EFC colleagues:

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EFC partners and external experts:

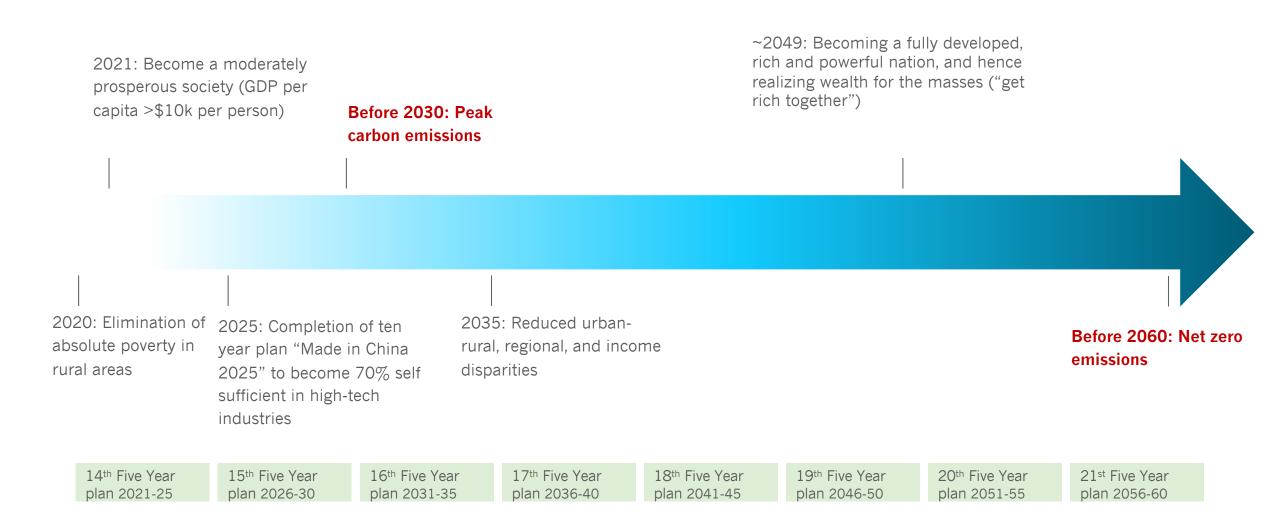
- Mr Liu Qiang (Director of Programmes, China, CIFF)
- Dr Ma Jun (Director of Center for Finance & Development, Tsinghua University)
- Dr Chai Qimin (Director of International Cooperation Department in National Center for Climate Change Strategy and International Cooperation (NCSC))
- Professor Frank Jotzo (Director, Centre for Climate Economics & Policy, Australia National University)
- Professor Cameron Hepburn (University of Oxford)
- Bob Ward and Chunping Xie (Grantham Institute)
- Lina Li (ICAP)
- Dimitri Zenghelis (LSE)
- Zhou Dadi (Executive Vice President, China Energy Research Society)
- LI Jifeng (Deputy Director, Energy Policy Research Office)
- CHEN Yaqin (Director, Professional Support Division, Green Finance Department, Industrial Bank)
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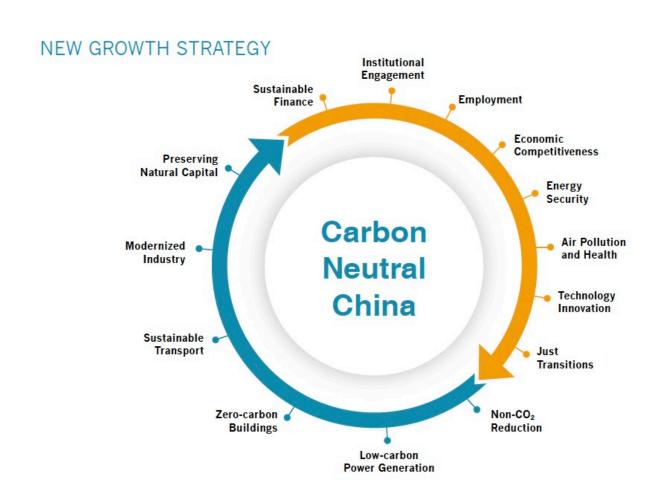
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- 3. Key initiatives
- 4. Implementation and roll out

China has set ambitious goals for the coming decades

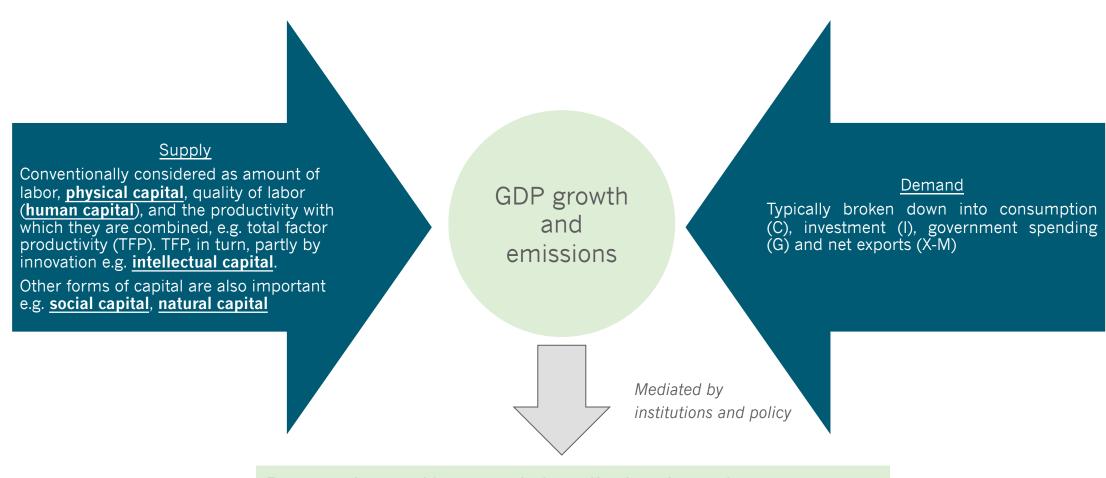


Carbon neutrality before 2060 provides political stimulus for a new growth story

- 14th Five-Year Plan has begun the process of translating the long-term target into short-term actions:
 - decrease CO2 intensity by 18% between 2021-25
 - increase share of non-fossil energy in total energy consumption to 20%
- New Growth Story:
 - International leadership, industrial expansion, and competitiveness
 - Jobs and prosperity
 - Structural reform
 - · Improved health, cleaner air
 - Enhanced energy



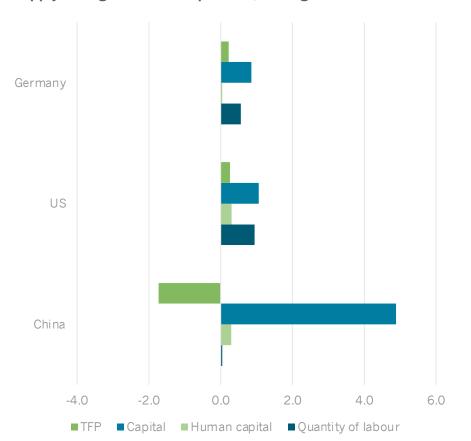
Attainment of these goals depends on both the demand and supply sides of the Chinese economy



Prosperity, welfare, and the elimination of poverty

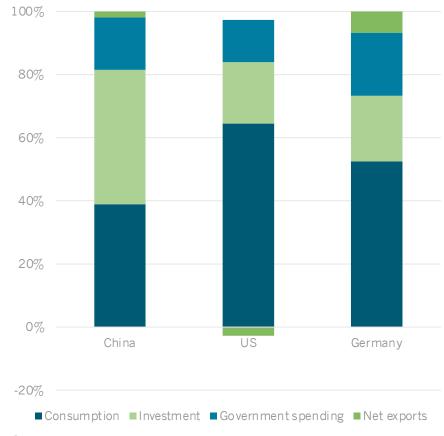
Traditionally, China's supply-side has been dominated by growth in physical capital leading to demand dominated by investment and net exports

Supply-side growth decomposition, average 2015-2019



Source: The Conference Board Total Economy Database, using adjusted China data **Note:** following conventional growth accounting, this database only decomposes growth into the stated elements. As discussed below, other growth drivers e.g. natural capital are also important.

Demand-side components of GDP, average 2015-2019



Source: World Development Indicators

But this model is now running into problems on both the demand and supply side

Reliance on low-value, carbon intensive exports is increasingly difficult

- Chinese mean monthly earnings in manufacturing exceeds the rest of developing Asia
- Border carbon adjustments set to penalise carbon intensive exports

Intensive investment is leading to overcapacity, declining profitability, and indebtedness

- China's incremental capital output ratio the amount of capital needed to yield extra unit of output – doubled between 2008 and 2018
- China's non-financial corporate debt is 155% of GDP, the highest of any major economy

Demographic trends will be a further headwind for growth

 China will have a higher dependency ratio than the U.S. by 2038

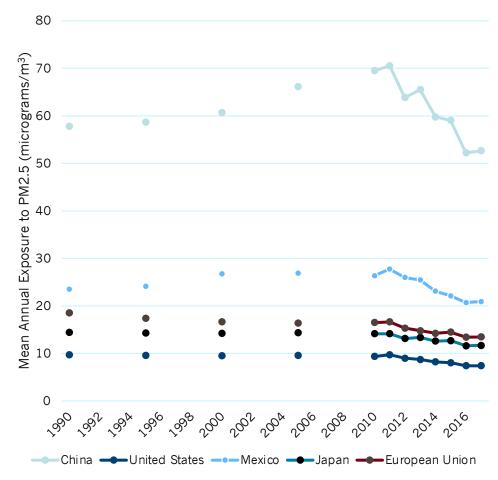
Supply

Demand

While the current model has created environmental challenges that threaten to undermine it

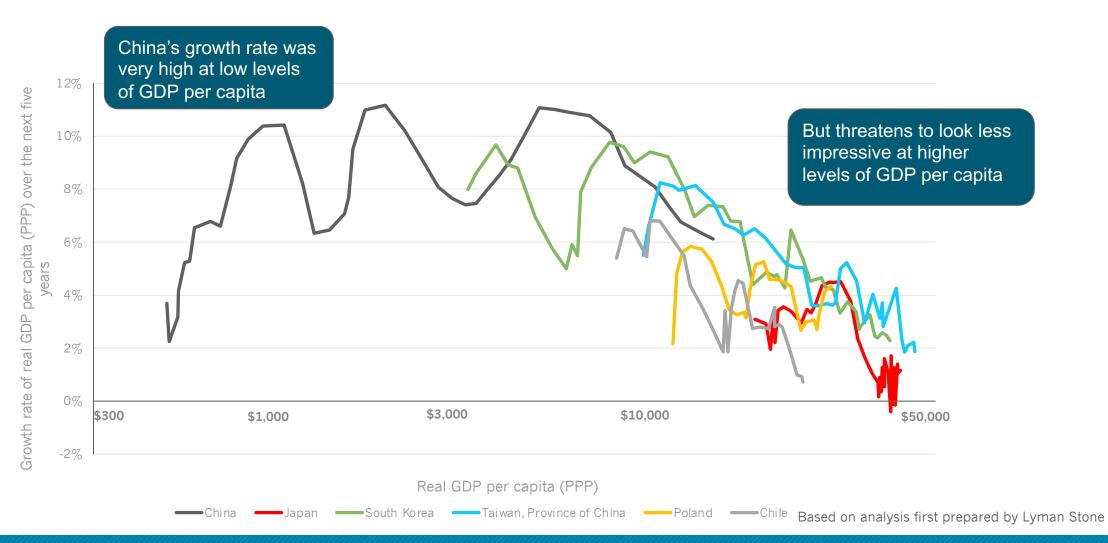
- Although on a downward trend since 2010, air pollution remains much higher than in many developed and middle income countries
- The impact of air pollution will grow as the population ages
- Non-communicable diseases associated with air pollution could cost China \$500bn between 2015 and 2030 (<u>Chen and Bloom</u>, 2019)
- Groundwater resources in 60% of cities are poor or very poor, and more than 25% of major rivers in China are unsuitable for human contact (Khan and Chang, 2019)

Mean Annual Exposure to PM2.5 (micrograms/m³)



Source – World Bank

International comparisons further illustrate the growth challenge China faces



China needs to rejuvenate its growth model in a number of ways



Supply

- FROM: catch-up growth that relies on physical capital and population growth
- **TO:** frontier growth where human, intellectual, natural, and social capital drive productivity gains



Demand

- FROM: demand based on output of heavy manufacturing industries and low-value exports
- TO: greater consumer spending including on services, high tech manufacturing and high-value exports



Interaction and Measurement

- FROM: narrow focus on GDP growth
- **TO:** greater focus to long term sustainability and people's quality of life

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The transition to net zero can be an integral catalyst for this new growth model



Supply

Promote <u>intellectual capital</u> as low-carbon innovation are higher than for high-carbon technologies and comparable to transformative innovations such as IT and nano-technology

Promote <u>human capital</u> by reducing air pollution, and allowing the retention of high skilled workers (<u>Wang</u> and Mu, 2021)

Enhance <u>natural capital</u> by recognizing the additional value nature can play in sequestering carbon



Demand

Grow <u>high value exports</u> through dominating global markets in opportunities created by the low-carbon transition e.g. EVs, energy storage technologies. China already has 38% of the global renewable energy jobs, more than the EU, U.S., and India combined

The interaction between the low-carbon transition and Al, automation and digitization can create demand for **consumer goods and services**, e.g. smart and energy efficient buildings and transport services.



Interaction and Measurement

The need to address climate change as part of a broader reformulation of China's development objectives creates a powerful argument for **looking beyond income or output** as a measure of success.

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The virtuous circle between the transition to net zero and the new growth model

Shifting the composition of the economy towards greater consumer spending including on services, high tech manufacturing and high-value exports makes it easier to reduce emissions



A balanced composition of wealth stocks with more focus on human, intellectual, natural, and social capital reduces the emissions intensity of the economy

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Our vision

China adopts a new economic model that harnesses fresh growth drivers to deliver high quality development, facilitates initiatives to build a Beautiful China with world-class air quality, peaks carbon emissions as soon as possible, and places the country on a trajectory for net-zero greenhouse gas emissions before 2060.

The transition to net zero will require fundamental changes to all aspects of the Chinese economy

Vision, targets, and pathways Produced capital Pricing (including infrastructure) Consumption International Innovation capital co-operation (including technology) Investment Laws, regulations, Natural capital and institutions Gov't spending Public attitudes Human capital and behaviours Institutional capital Net exports Finance Wealth stocks Enablers Economic activity The transition to net zero will require fundamental changes to all aspects of the Chinese economy

3. Sustainable infrastructure investment for a new growth model

Vision, targets, and pathways

1. Setting the vision and targets for a new growth model

Produced capital

(including infrastructure)

Pricing

Consumption

Innovation capital (including technology)

4. Zero-carbon technology and innovation

International co-operation

Public attitudes

and behaviours

Investment

Natural capital

5. Creating markets for natural capital Laws, regulations, and institutions

Gov't spending

Human capital

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Institutional capital

6. Economic diversification and the Just Transition

Finance

Net exports

2. Engaging banks and investors in a new growth model

2. Engagand inv

A summary of the six key initiatives

1

Setting the vision and targets for a new growth model

Build policymaker awareness of the value of a low-carbon growth model, support setting targets and pathways, and facilitate the development of new metrics to support measurement. 2

Engaging banks and investors in a new growth model

Enhance understanding in the finance sector of the opportunities and risks from a low-carbon transition, and facilitate the capital flows that will finance the natural, produced, and human capital needed for net zero emissions.



Creating markets for natural capital

Support markets for – and hence investments in – natural capital and the technologies that help to preserve or enhance it.



Sustainable infrastructure investment for a new growth model

Facilitate the delivery of sustainable infrastructure by increasing understanding of what it is and why it is important, how much is needed, and what enabling conditions it requires.



Zero-carbon technology and innovation

Redirect China's innovation activity towards low carbon products and technologies that support net-zero goals.



Economic diversification and the Just Transition

Enhance human and social capital by ensuring that there are economic opportunities for those currently involved in high carbon activities.





Vision, impact and outcome objectives

LCEG Program vision

China adopts a new economic model that harnesses fresh growth drivers to deliver high quality development, facilitates initiatives to build a Beautiful China with world-class air quality, peaks carbon emissions as soon as possible, and places the country on a trajectory for net-zero greenhouse gas emissions by 2060

Inputs

- Connections and partners
- Financing (grant budget)
- Content knowledge and expertise
- Building evidence base and information gathering
- Internal data models and research

Core competencies

- Strategic regranting
- Strategic facilitating
- Strategic advising

Initiatives

- 1. Setting the vision and targets for a new growth model
- 2. Engaging banks and investors in a new growth model
- 3. Creating markets for natural capital
- 4. Sustainable infrastructure investment for a new growth model
- 5. Zero-carbon technology and innovation
- 6. Just Transition and economic diversification

Impact objectives

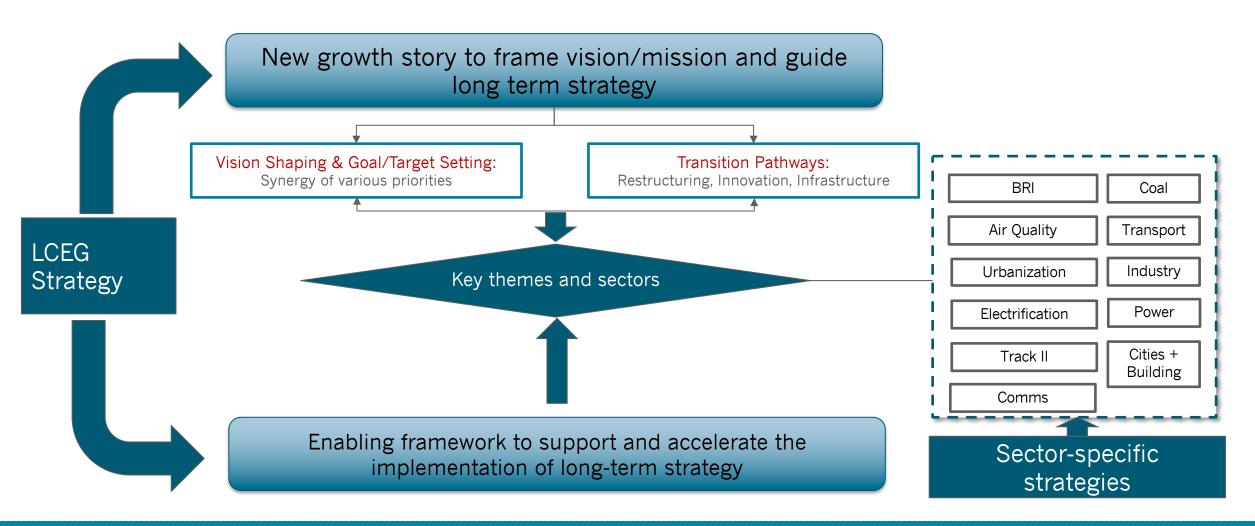
- 1. China adopts a new low-carbon growth model by 2025 which places the country on a trajectory for net-zero by 2060. This will be evidenced by:
 - Average annual growth rate of both human and renewable natural capital exceeds 10% between 2020 and 2030
 - Peaking CO2 emissions as soon as possible and declines thereafter
 - 70-75% reduction in CO2 intensity per unit of GDP by 2030 (from 2005 levels)
 - Annual low carbon energy investment of \$300 billion or more by 2030
 - Doubling the percentage contribution made by green industries as measured by the NDRC Green Industry Catalogue – to GDP between 2020 and 2030
 - Sustainable economic performance measures integrated into decision-making

Outcome indicators

- Declining flows of capital to high-carbon assets and activities and increasing flows to low-carbon assets and natural capital
- Sustained growth of new low-carbon sectors providing decent jobs to those currently reliant on the high-carbon economy
- Emissions and environmental impacts factored into decision making and economic performance assessment

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The LCEG strategy provides overarching support to EFC's other sector specific strategies



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Setting the vision and targets for a new growth model

Trends

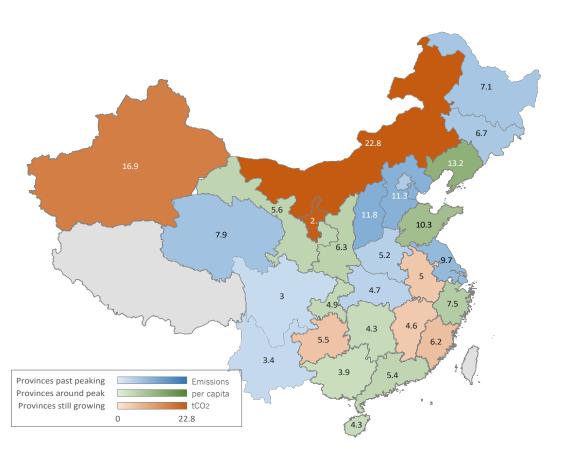
 The central government has a high political willingness to achieve the early carbon peaking and carbon neutrality goals, and to restructure the economic system based on green, low-carbon, and circular principles. Many provinces are already on track.

Challenges

- Some local governments cannot link the long-term target with nearterm decision due to a lack of awareness, willingness, capacities, and instruments.
- Considerable institutional legacy in the primacy of using GDP, and associating this with carbon intensive growth.
- Carbon peaking is considered the last chance for high-carbon investment; a high peaking value would hamper the neutrality target.

Opportunities

- The central government has set clear goals e.g. 14 FYP, NDC, 2060.
- The need for implementation support is well recognized, with actors asking for, for example, timeline and roadmap to net zero, national/sub-national/sectoral carbon peaking action plan.



Source: EFC own analysis



Setting the vision and targets for a new growth model

Tactic 1: Pathway development

- Develop early peaking action plans at the national level and for key provinces: Guangdong, Hainan, Qinghai, Inner Mongolia, etc.
- Reshape the vision and build up capacity for less advanced provinces such as Inner Mongolia
- Set net zero targets and design implementation roadmaps for both the overall economy and key sectors/sub-industries, including the enabling environment etc.
- Set up a knowledge hub on data and policies relating to net zero

Tactic 2: Evidence building

- Support economists to elaborate the benefits of a carbon neutral economy
- Analyze the socio-economic impacts of the low-carbon transition: GDP, employment, trade, etc.
- Convene dialogues and communicate to key policymakers on the economic benefits of shifting onto a net zero pathway

Tactic 3: Performance measurement

• Support the implementation of a pilot of alternative metrics for measuring economic performance such as ecological unit accounting or wealth accounting metrics

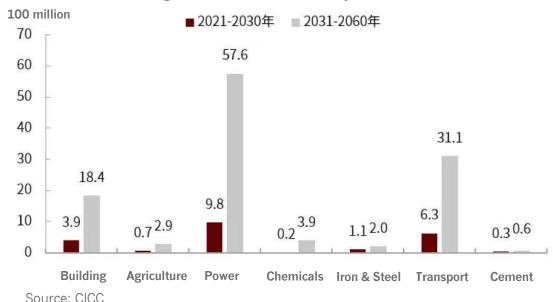


Engaging banks and investors in a new growth model

Trends

- Huge investment demand for China carbon neutrality goal:
 138-140 trillion RMB (THU, CICC)
- Financial supervisors and financial institutions are becoming aware of the key challenges: both the risks of high-carbon assets + opportunities of low-carbon transition

Annual green Investment needs by sector



Challenges

- Many financial institutions still lack the motivation and/or suffer from low awareness in relation to managing environmental and climate risks
- Capacity and technology barriers prevent financial institutions from identifying and mitigating environmental and climate risks
- The business and financing models to facilitate low carbon projects are not well known to many stakeholders
- Transition finance is needed to support the just and steady transition of high-carbon sectors and regions

Opportunities

- Proactive and ambitious actions from financial supervisors
- A relatively complete green taxonomy system and rapidly increasing number of green financial products
- Significant pressure from public opinion on Chinese high-carbon outbound investment

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Engaging banks and investors in a new growth model

Tactic 1:
Opportunity and risk identification

- Taxonomy: support taxonomy development for green bonds, green loans, information disclosure, and research on carbon accounting methodology
- Disclosure: support standards, tools formulation (carbon accounting/stress testing), and work with financial institutions to pilot climate risk disclosures and related information
- Dialogue: support dialogue between financial institutions and policymakers to build strategic insight on transition risks, between green finance stakeholders and real economy opportunities, and between domestic and foreign stakeholders on policies and practice (including taxonomies)

Tactic 2: Financial instruments

- Green Finance: conceive, develop and pilot innovative financial instruments (green credits/green bond/green fund/low-carbon indices) and performance assessment to support low-carbon opportunities
- Transition Finance: develop a transition finance taxonomy grounded in science-based targets, support product design and analysis on sustainability loans and bonds, and facilitate pilots of these products in Shanxi and Inner Mongolia

Tactic 3:
Outbound finance

- Develop policies to prevent outbound financing of carbon-intensive projects, or the use of carbon intensive technology and equipment within overseas projects, based on a green/dirty project catalogue
- Support framework and tools for managing the environmental and social risks of financial institutions engaged in BRI financing
- Communications: facilitate international dialogues between financial institutions, BRI countries, and corporates to build strategic insights on BRI finance

Creating markets for natural capital



Trends

- National ETS in China will be formally in function by June 2021
- Ecosystem Function Conservation Areas (EFCAs) account for 49% of China's land area
- China has co-led a Nature-Based Solutions Coalition in the international negotiations

Opportunities

- Crucial issues of national ETS are yet to be finalised
- Rich evidence base from the pilot ETSs
- No systematic valuation or pricing of natural capital by public bodies, nor use of shadow carbon prices in government decisionmaking.
- Small but growing evidence base on how natural capital pricing can support natural capital development
- Recognition on how natural capital development aligns with China's long-term development and Ecological Civilization.
- Interest in carbon markets from financial regulators

Challenges

- Lack of regulations that allow recognition of emissions rights as valuable assets
- Strong lobbying power from SOEs who will be negatively affected by carbon pricing and fossil fuel subsidy reform
- Lack of knowledge, capacity, and policy instrument framework in favor of the development of noncarbon-based natural capital pricing/valuation schemes
- Perception that natural capital protection may impede development



Creating markets for natural capital

Tactic 1: Supporting ETS Development

- ETS sectoral expansion: Support accelerating the ETS sectoral expansion to achieve China's peaking targets and deliver sectoral emissions peaking. Key sectors include steel, cement, aluminum, coal mining, and chemicals.
- Enhancing interactions between ETS and capital market: Conduct research in pilot ETS (Hubei, Guangdong) to show how the more liberal approach and trading rules support market development.
- Convene working groups to explore and support ETS development among BRI countries.

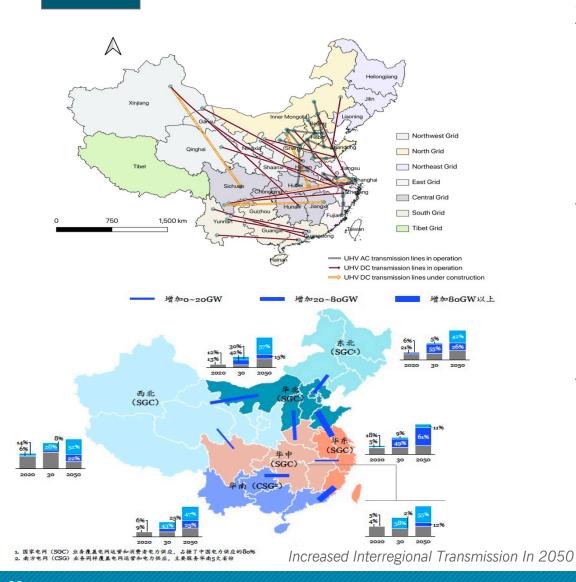
Tactic 2: Evidence Building

- Convene a panel of national and international experts to provide advice to the Chinese government on the importance of natural capital.
- Support third parties in developing evidence base linking pricing and valuing of natural capital with China's long-term development and Ecological Civilization, potentially akin to Stern Review.
- Convene round table dialogues between leading international environmental economists and Chinese academics/policymakers on the economics of natural capital.

Tactic 3: Natural Capital Pricing Development

• Support research activities on translating "Green is Gold" into fiscal and other policies that enable natural capital pricing.

Sustainable infrastructure investment for a new growth model



Trends:

- China's energy landscape keeps changing. More than 1.2 TW of wind+solar capacity will be installed by 2030, changing the geography of energy production and requiring new infrastructure.
- The overall low carbon energy infrastructure needs to grow by 40-110% from 2015 levels by 2035.

Opportunities:

- Recognition that achieving carbon neutrality before 2060 requires significant changes to transform energy system.
- The Zero Emission Energy System is beginning to take shape, including pre-planned grid expansion, the upgrading of interregional transmission capacity and a more networked distribution grid.

Challenges:

- Technically, different levels of increasing renewable integration will impose great challenges on power system security and create higher demand for power system flexibility.
- Public and private sectors lack capacity and technology to identify and manage environmental and climate risk in infrastructure investment.
- Insufficient incentives to facilitate low carbon energy infrastructure demonstration and construction without innovative business models.

Sustainable infrastructure investment for a new growth model

Tactic 1: Design the layout for sustainable infrastructure

- Help national, provincial and local authorities to identify the sustainable infrastructure needs associated with reaching net zero by 2060 and to embed these needs within respective planning documents.
- Develop policy mechanisms that will facilitate the early retirement of coal fired power generation and other high-carbon infrastructure, especially in <u>Inner Mongolia and Shanxi</u> provinces.
- Deploy appropriate spatial layout of RE capacities, grid extension, and installation of storage facilities to fulfill the demand and secure power system flexibility, i.e., to link <u>Inner Mongolia and Qinghai</u> provinces, the newly-emerging RE energy supply bases, with regions of high energy demand, such as <u>JJJ area, Zhejiang and Guangdong</u> provinces, etc.

Tactic 2: Incentivize infrastructure investment towards GHG neutrality

- Support the formulation of the strategy and planning of infrastructure investment and the updating of related standards and codes, that drive the need for low-carbon infrastructure towards the "30/60 targets".
- Support the development of fiscal and other policy instruments that support public private partnerships for low-carbon infrastructure development.
- Support tools for the identification and management of physical climate risks associated with lowcarbon energy infrastructure.









Trends

 China has made impressive progress on some measures of zerocarbon technology and innovation. Chinese energy R&D expenditure has increased by 27% since 2015, the highest growth rate in the world. Meanwhile, the number of climate change patents has increased 300% over the past decade (IEA, 2020).

Opportunities

- New low-carbon technology will make it easier and cheaper to meet the net zero goal, will improve the quality of life for Chinese citizens, and will unlock new high-value export market opportunities for Chinese firms.
- Significant overlap with other areas of Chinese technological progress especially Internet of Things and digital technologies.

Challenges

- With China's rapid growth in energy R&D expenditure, sustainable innovation levels still remain below that of the U.S. or Europe, who spend 11% and 6% more respectively (IEA, 2020).
- Large levels of capital involved in technology and innovation make identifying the niche role for philanthropic capital challenging. It expected that some spending in this initiative will fail to deliver results.



Zero-carbon technology and innovation

Tactic 1: Enhance the innovation system

- Build a "Green Technology Gateway" database for investment and innovation
- Develop policy briefs for how Chinese organizations can better support the country's low-carbon technology leadership ambitions
- Facilitate international exchanges on building low-carbon innovation ecosystems
- Share best practice from low-carbon innovation practices in pioneer pilot provinces to the rest of China (e.g., Shenzhen, Zhejiang, Shanghai, etc.)

Tactic 2: Strategic technology development

- Develop China-specific technology roadmaps identifying barriers to be addressed and plausible development and deployment targets
- Identify the policies needed to support the integration of digital technology with electric power system
- Co-ordinate 'platforms' to support co-operation across researchers in both international and domestic universities (e.g. THU, RUC, LSE, Maryland, and Harvard), companies and the public sector in relation on specific strategic technologies

Tactic 3:
Coordinate
demonstrations

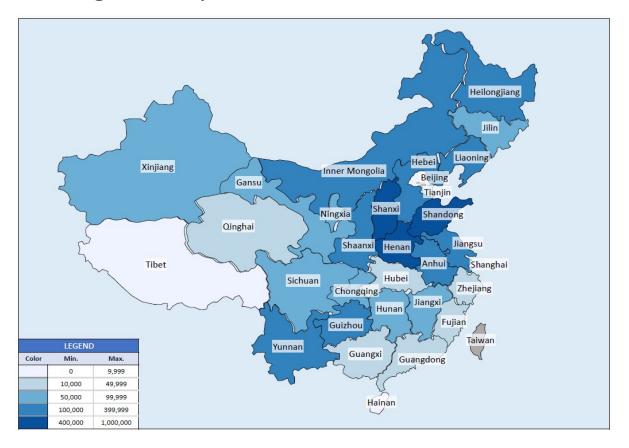
Facilitate 'living laboratories' that test the use of innovative new technologies, including, potentially, zero-carbon communities





Economic diversification and the Just Transition

Chinese coal sector employment is heavily concentrated in Shanxi, Shandong, and Henan provinces



Source: He, G. et al. (2020). Enabling a Rapid and Just Transition away from Coal in China. One Earth, 3(2), 187–194.

Trends

- Coal-mining is already declining from a peak in 2013 of 4.24 billion tonnes, falling to 3.75 billion tonnes in 2019 (NBS, 2020). Coal mining jobs have fallen from 5 million to 3.3 million.
- Most of this decline in activity has been in Shanxi, Shandong, Henan, Anhui, and Heilongjiang provinces, risking the exacerbation of regional inequalities.
- In 2016 China established a \$15.7bn fund to help with low-carbon transition through retraining, the creation of public sector jobs, and the option of early retirement, with the funds focused towards the Western and North-Western regions.

Opportunities

 Huge scope for job and wealth creation, alongside direct benefits to the environment. There are over four million jobs in the Chinese renewable energy sector, and some projections suggest it could create a further 13.8 million jobs in China by 2050 (IRENA, 2020).

Challenges

 Use of Just Transition issues as an argument for slowing down the low-carbon transition.

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Economic diversification and the Just Transition

Tactic 1: Eliminate the social and economic cost of the transition

- Support research activities to better understand the scale of the challenge from those employed in the coal industry, providing geographic granularity and considering the whole supply chain.
- Develop a comprehensive policy package that will cover resettlement for older workers, retraining programs for younger workers, and fiscal policies to provide compensation/financial support.
- Advocacy for inclusion of Just Transition within China's long-term low-emissions strategies (e.g. EFC is developing synthesis report series on China's Carbon Neutrality and the series reports include just transition as an important topic).

Tactic 2:
Capture the benefits of the transition

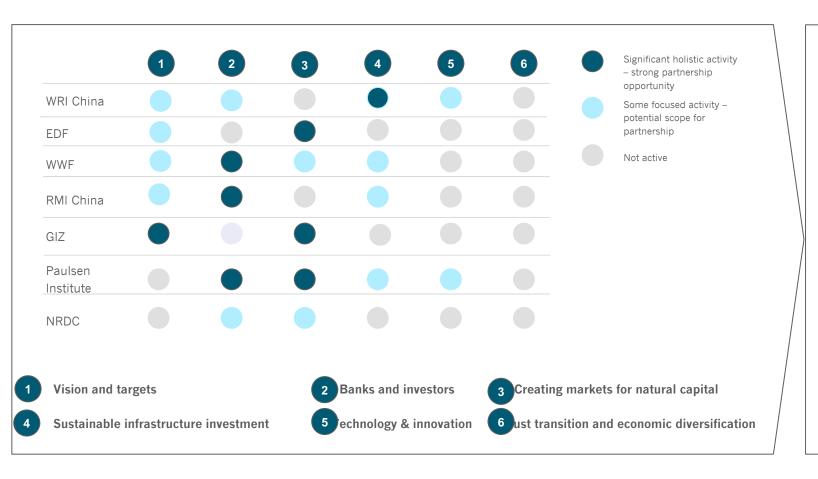
- Facilitate information exchange between provinces and cities that are realizing the socioeconomic benefits of the low-carbon transition and those that are less advanced.
- Work will focus on Shanxi, Shandong, and/or Henan provinces where, collectively, around 2m people work in the coal sector.
- EFC will support the co-operation across researchers, companies, local governments, and the public sector in relation to specific economic incentives for the local economy.

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We have identified a range of organizations that we can partner with

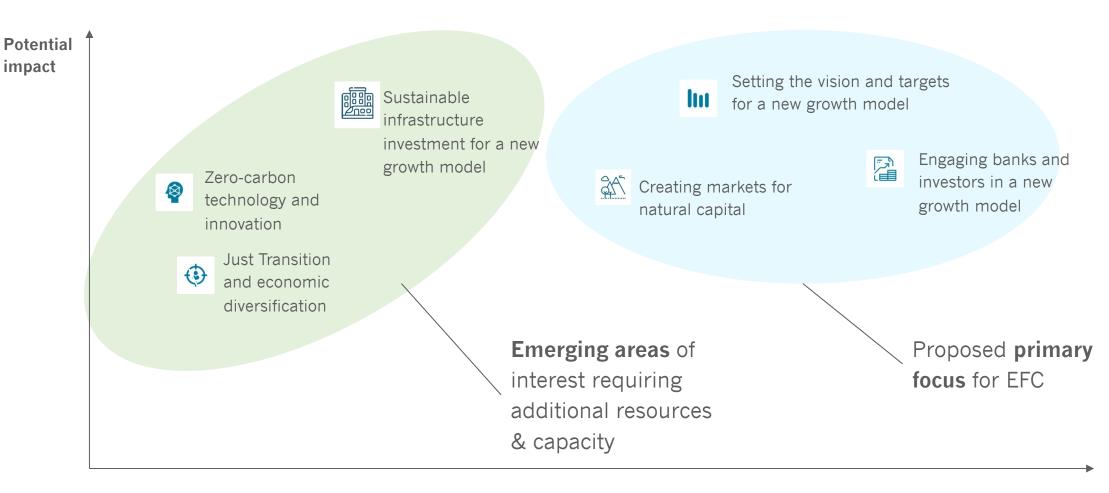


a number of strengths that can bring to these collaborative relationships

- Holistic approach to the topic of low-carbon economic growth
- International experience and credibility seen as a bridge between international and domestic actors
- Access to Chinese ministries & decisionmakers. Perceived as cooperative and supportive, providing relevant policy research, methods and tools.
- Domestic network of experts, reach across China and our position as a "Chinese" organization

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But we recognize our level of capacity varies across the 6 areas



Current capacity within EFC to catalyze outcomes

And so we will deploy a staged approach – beginning with current strengths and capacity

We will **prioritize the primary focus areas** in which EFC can have **high potential impact with current capacity**. This will be the focus of current LCEG program budget commitments:

- Setting the vision and targets for a new growth model
- Engaging banks and investors in a new growth model
- Creating markets for natural capital

We recognize the importance of the **emerging areas**. EFC will continue **to develop internal knowledge and networks** in these to be able to ramp up at pace upon securing further budget:

- Sustainable infrastructure investment for a new growth model
- Zero-carbon technology and innovation
- Just transition and economic diversification

This approach allows EFC to act holistically as a connector across initiatives. Dilution risk (spreading too thin) is mitigated by only entering the new areas once additional funds are secured.

Our approach will focus on strengthening national level decision making and action through:

- Funding and supporting national-level initiatives
- Connecting international experience and expertise with domestic-decision makers
- Supporting local demonstration projects and translating national policy to local regional / city level

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THANK YOU

谢谢