Strategy for the Long-Term Strategy Task Force

Energy Foundation China

This strategy was presented to EF China board in Jun 2019, and subjects to regular updates.

Outline

- Background and Scene Setting
- Vision and Goals
- Conceptual Framework and Theory of Change
- Role of EF China and Its Priority Areas
- Appendix

Background and Scene Setting

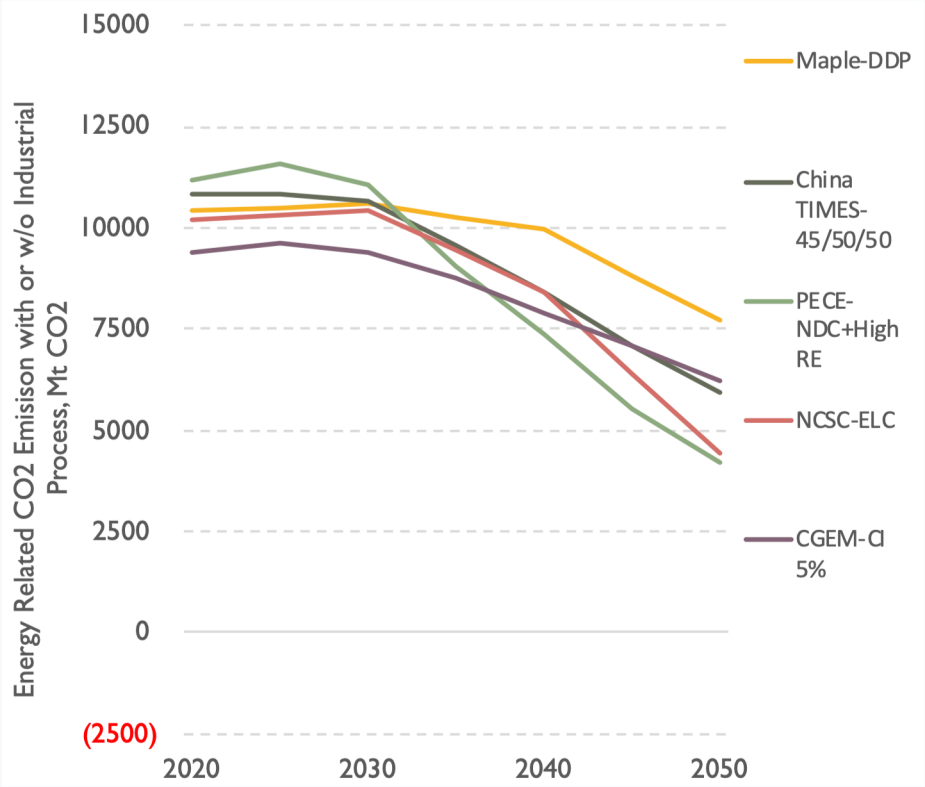
Background

Socio-Economic	Energy
1. Rapid urbanization & giant infrastructure needs 2. Middle class expansion & consumption upgrade demand 3. Restructuring & upgrading economy leads to continuous growth of electricity/coal and new landscape of the 3Es nexus	1. Growth & security of energy and electricity remain the central agenda 2. Energy revolution reflected in simultaneous deep decarbonization in power, electrification in end users, and new S-D interaction 3. Power sector reform plays a hub role for transformation
Environment	**Climate Change**
1. Ecological civilization serving as development philosophy 2. Political & policy momentum for clean air remains strong 3. Market demand for clean air has huge potential, may become new growth engine, and call for reform of public policies	1. NDC update, ambitious MCS and leadership in int'l agenda serve as major drivers 2. Synergy of strategies and policies for development & energy and air & GHG may work in short & medium term 3. Non-CO_2 and CDR should be prepared for longer term climate neutrality

Background: Ambition Gap b/w Domestic & Int'l

Domestic Modeling of China's Long-Term Low-GHG Emission Pathways

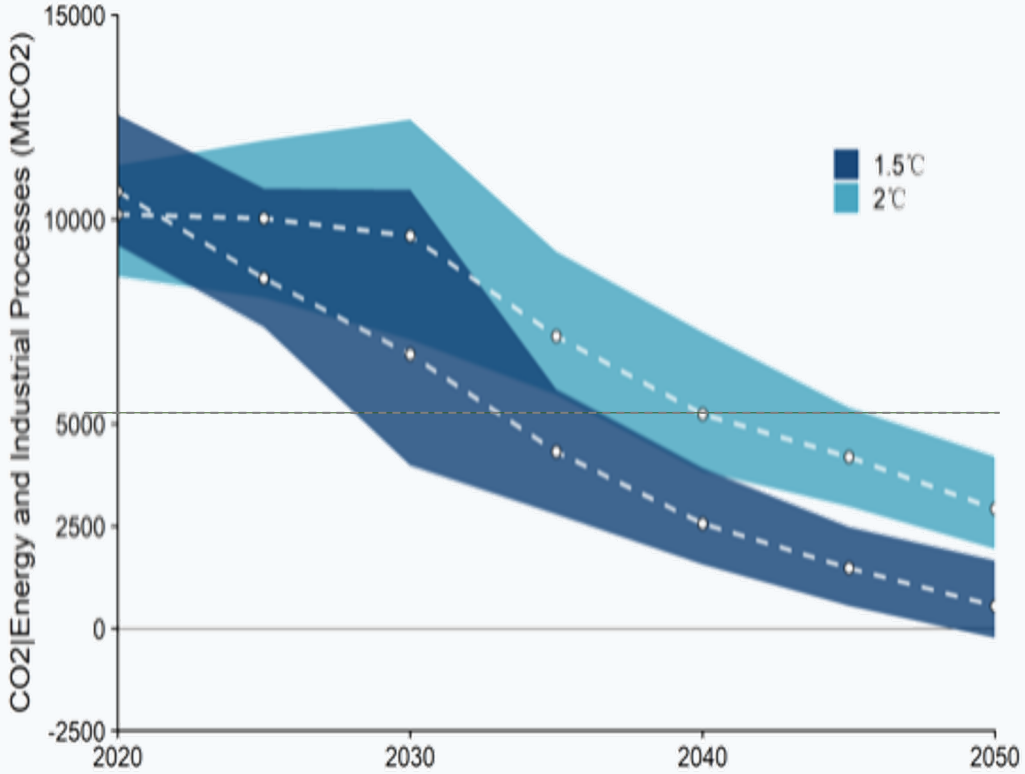
National DDPs in 2050: 7.9%（-26.1~37.4%）below 2005 level



National perspective not yet in line with 2℃/1.5℃ goal

Global Modeling of China's Pathway Consistent With 2℃/1.5℃ goal

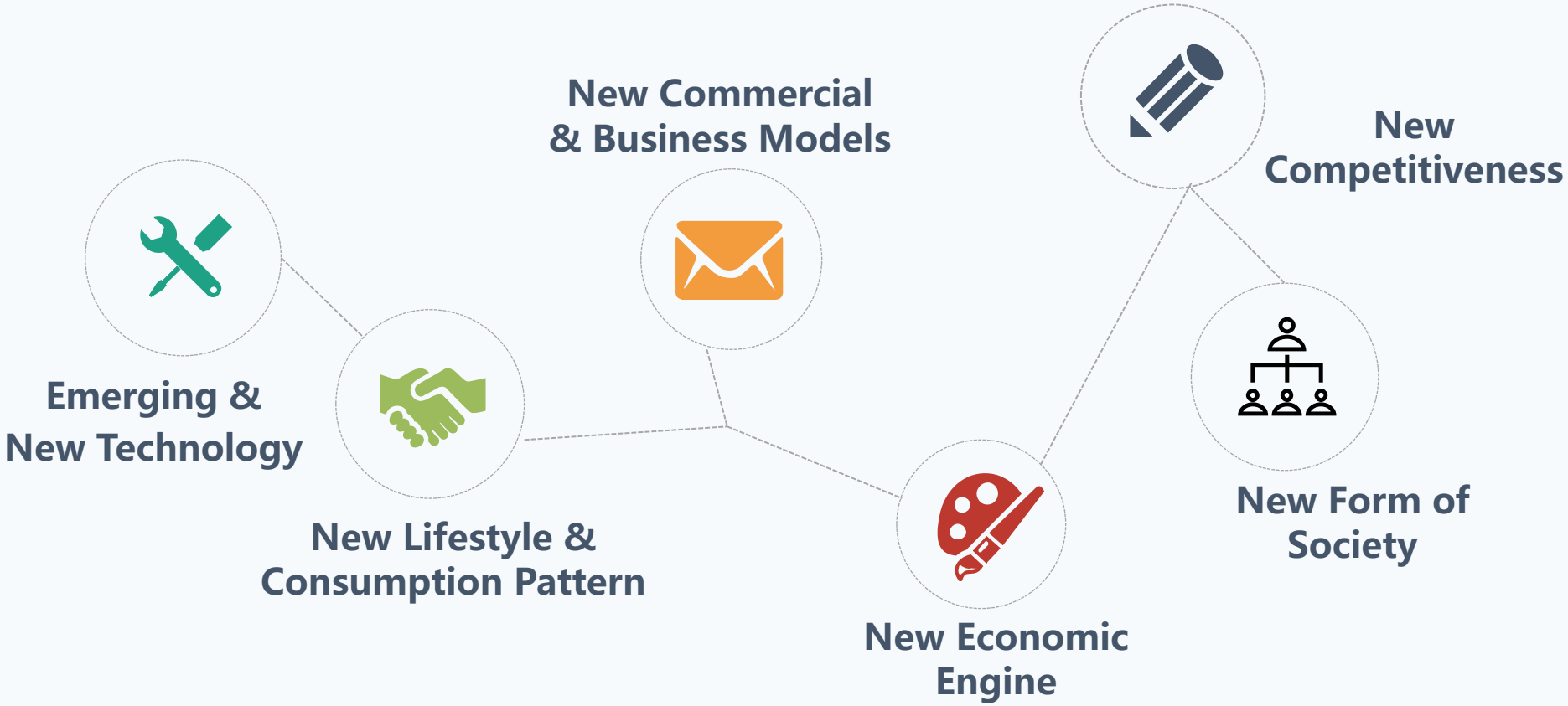
2 ℃ pathway in 2050 : 60.2% (42.7~73.6%) below 2005 level



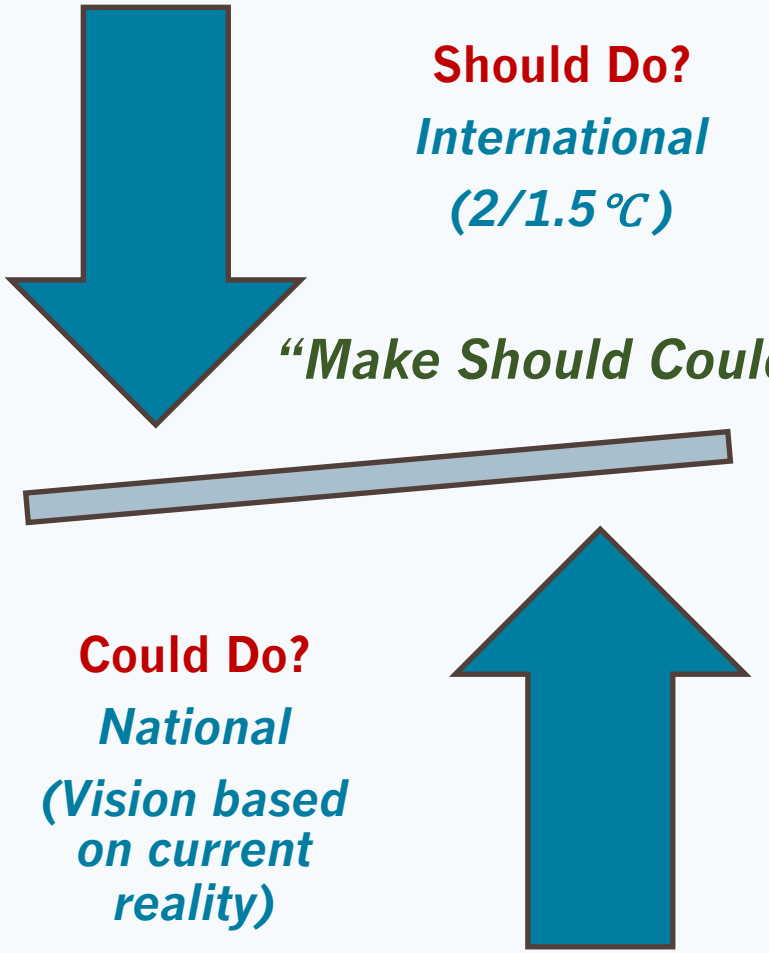
Source: Teng Fei; Chen Wenying; Jiang Kejun; Fu Sha; Liu Qiang; Zhang Xiliang, 2015-2018
Note: DDPs means Deep Decarbonization Pathways

Source: IPCC Database, 20th-80th range

Background: New Trends



Scene Setting: Building up Master Strategy



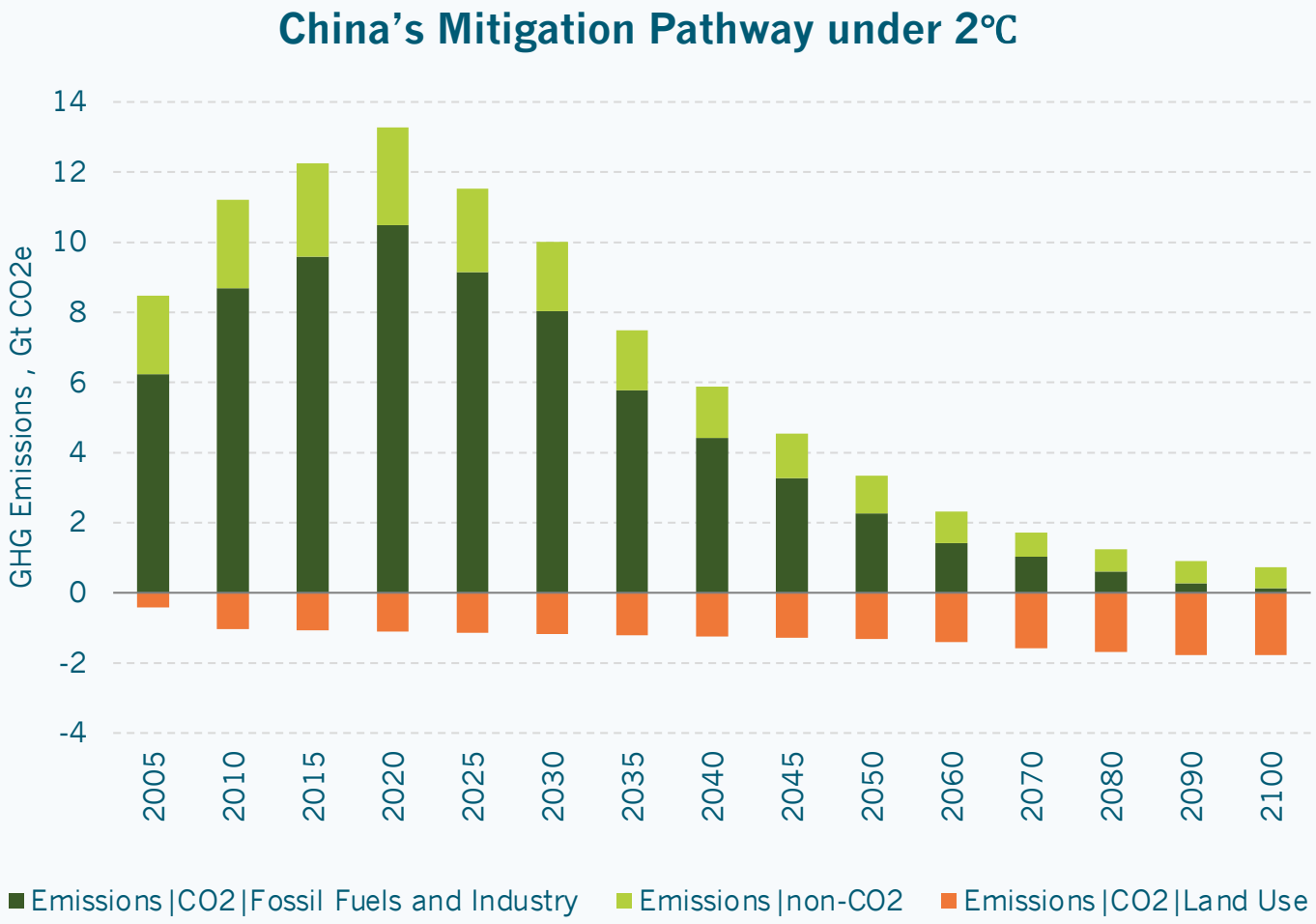
1. ***China is at a crossroad for the transformation towards a deeply decarbonized economy***
2. ***An urgency to avoid locked-in, which takes us away from global 2/1.5 ℃ goals and pathways***
3. ***Accelerate Innovation for technologies, investment & finance patterns, stakeholder behavior and institutions & policies***

Vision and Goals

Vision

Pursue a Win-Win Long-Term Low-GHG Emission Development Pathway for China, which should		
be in line with the global efforts towards well below 2°C or 1.5°C	be consistent with the initiatives to build a Beautiful China	be adapted to the reform of the transition to high-quality development

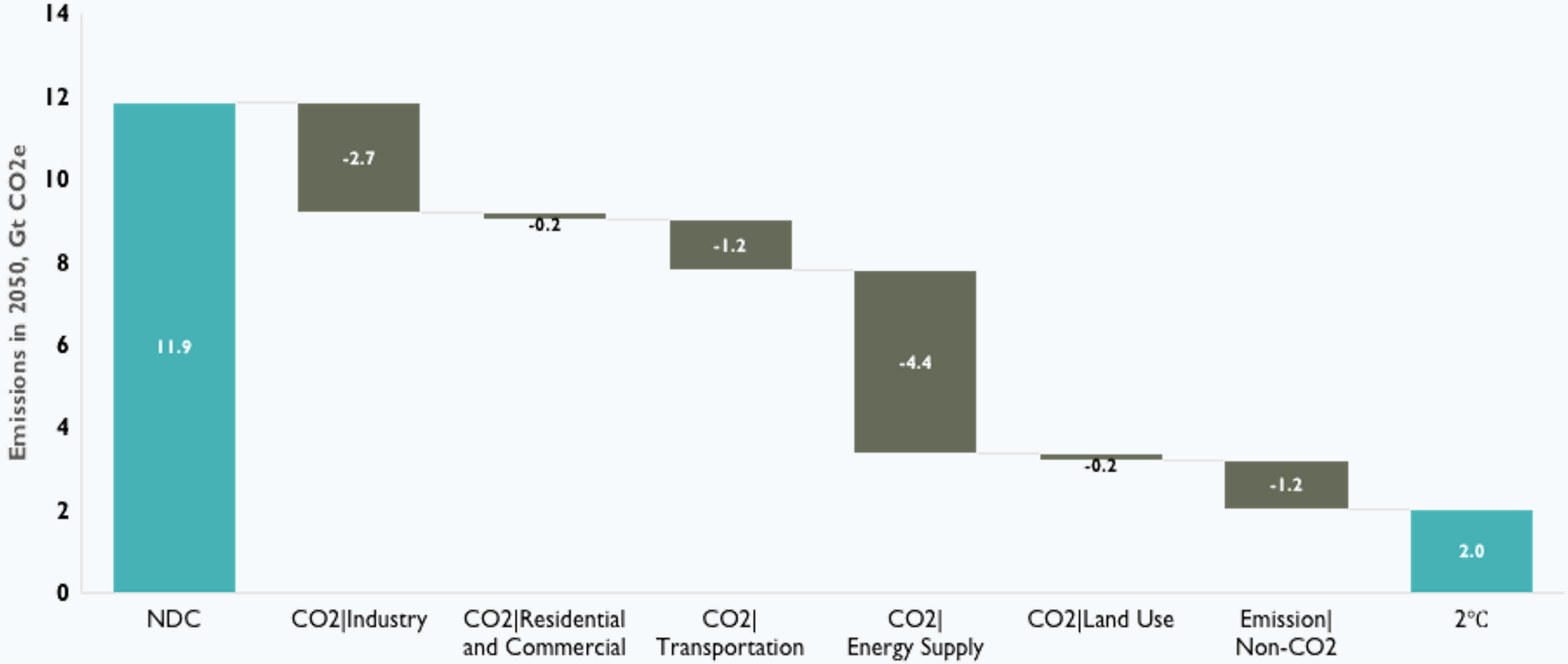
Overall Goal



Source: IPCC database and EF China's own modeling

BY 2050	Beyond 2050
• **Net-zero** CO_2 emissions in energy supply • CO_2-eq emissions: at least **70% below 2005 level (1.5 tCO_2e per capita)** • Non-CO_2 emissions: around **50% below 2005 level**	• Climate Neutrality **by 2060-2070**

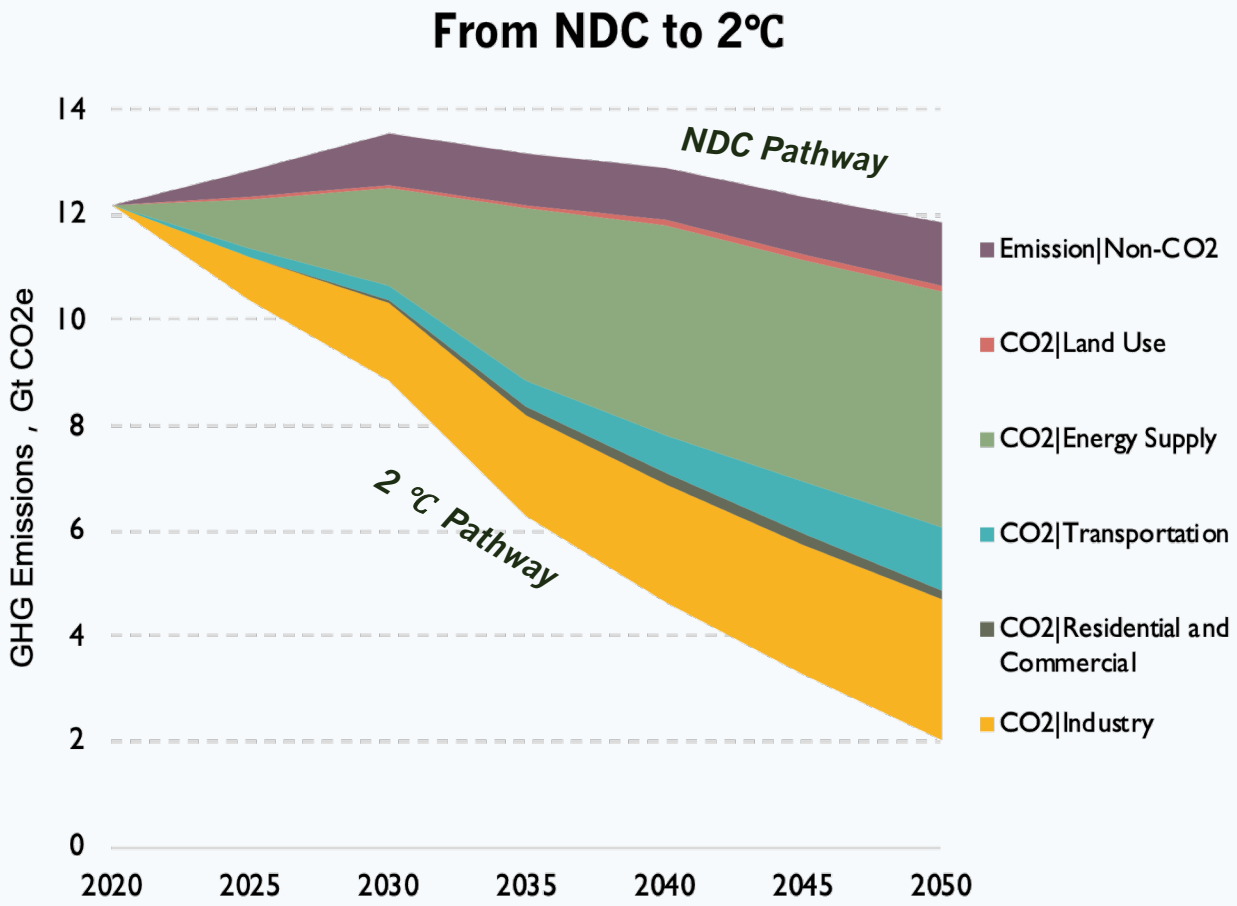
Contribution of Different Sectors/Gases



Source: IPCC database and EF China's own modeling

Note: NDC here stands for a Nationally Determined Contribution (NDC) scenario, which considers the full implementation of NDC and same mitigation level beyond 2030. Indirect emission reductions from decarbonization of electricity and heating are allocated to energy supply sector

Contribution of Different Measures



Demand reduction in the end-use sector by increasing resource and material efficiency and lifestyle changes

Restructuring the economy and energy efficiency improvement

Fuel switching on the demand side (e.g. electrification, hydrogen and E-fuels)

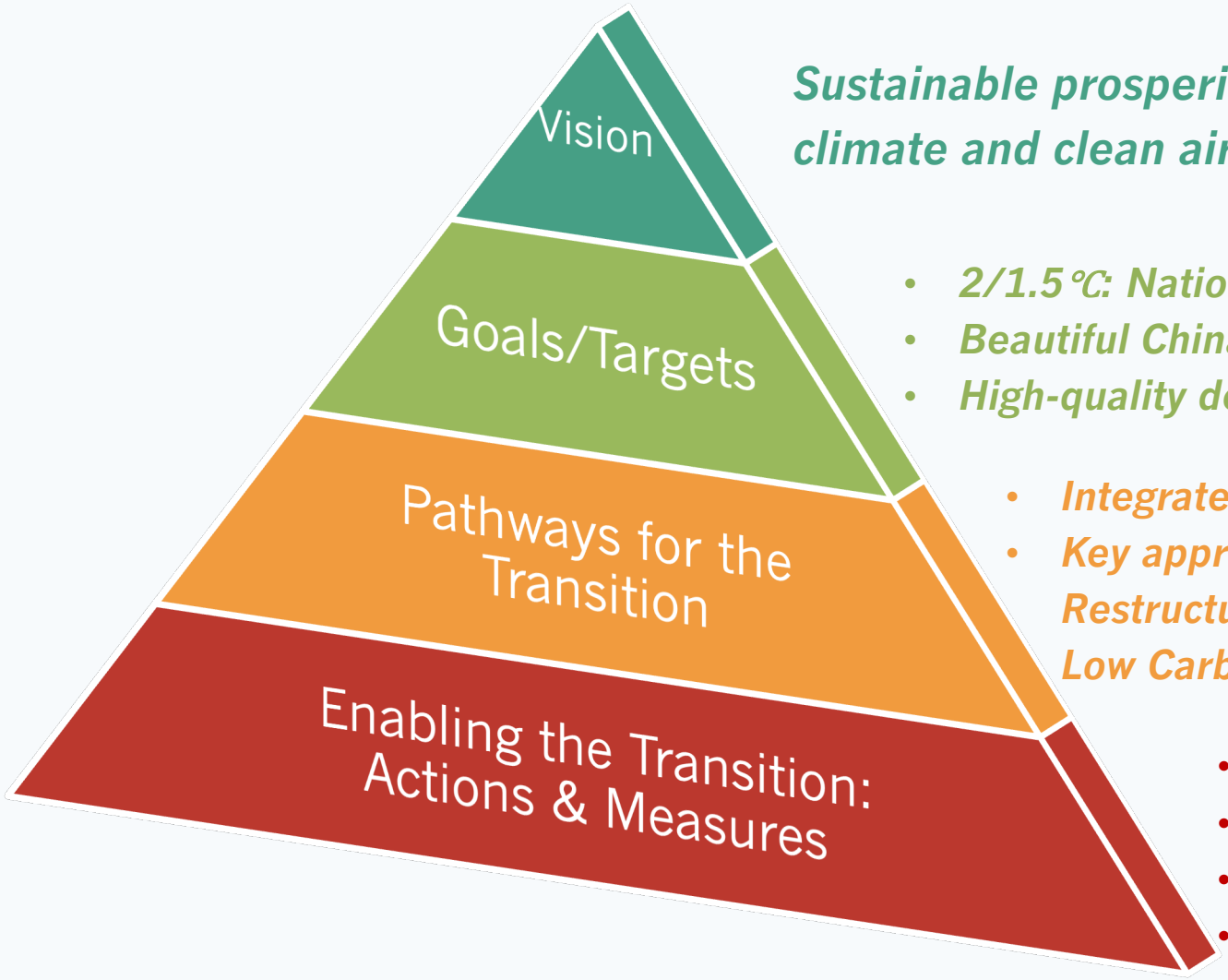
Zero-carbon electricity supply system

Negative emissions from the agriculture, forestry and other land-use change sectors (AFOLU)

Ambitious reduction of other non-CO2 and deployment of CDR

Conceptual Framework and Theory of Change

Conceptual Framework



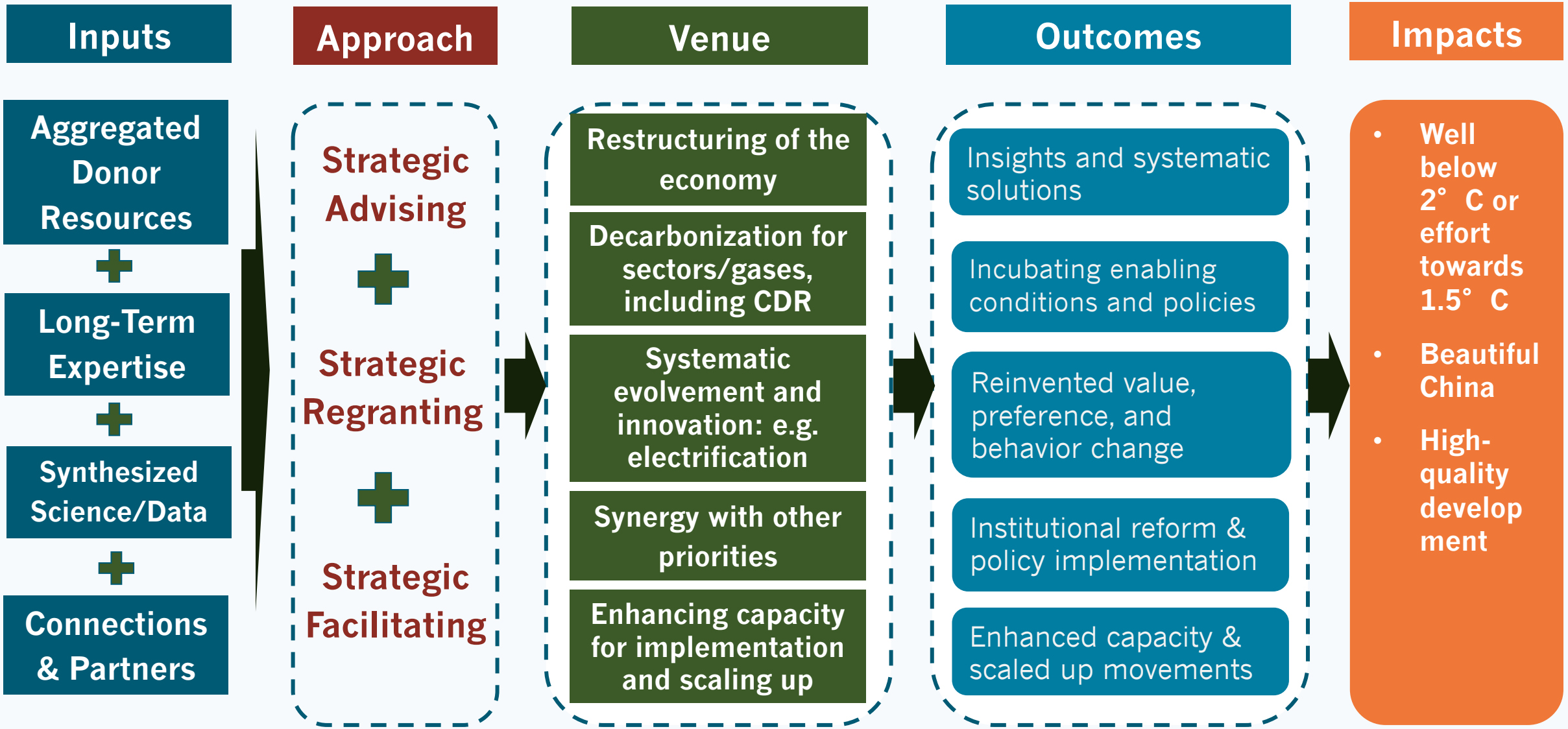
Sustainable prosperity with safe climate and clean air

- ***2/1.5℃: National/Sectoral/regional targets***
- ***Beautiful China: 10 μg/m³ for PM2.5***
- ***High-quality development***

- ***Integrated and systematic solutions***
- ***Key approach and prioritized areas: e.g. Economic Restructuring, Innovation, Electrification, Infrastructure, Low Carbon Urbanization, Investment and Finance***

- ***Targeted actions for sectors/gases***
- ***Policy and institutional changes***
- ***Stakeholder engagement and capacity building***
- ***Platforms and communications***

Theory of Change



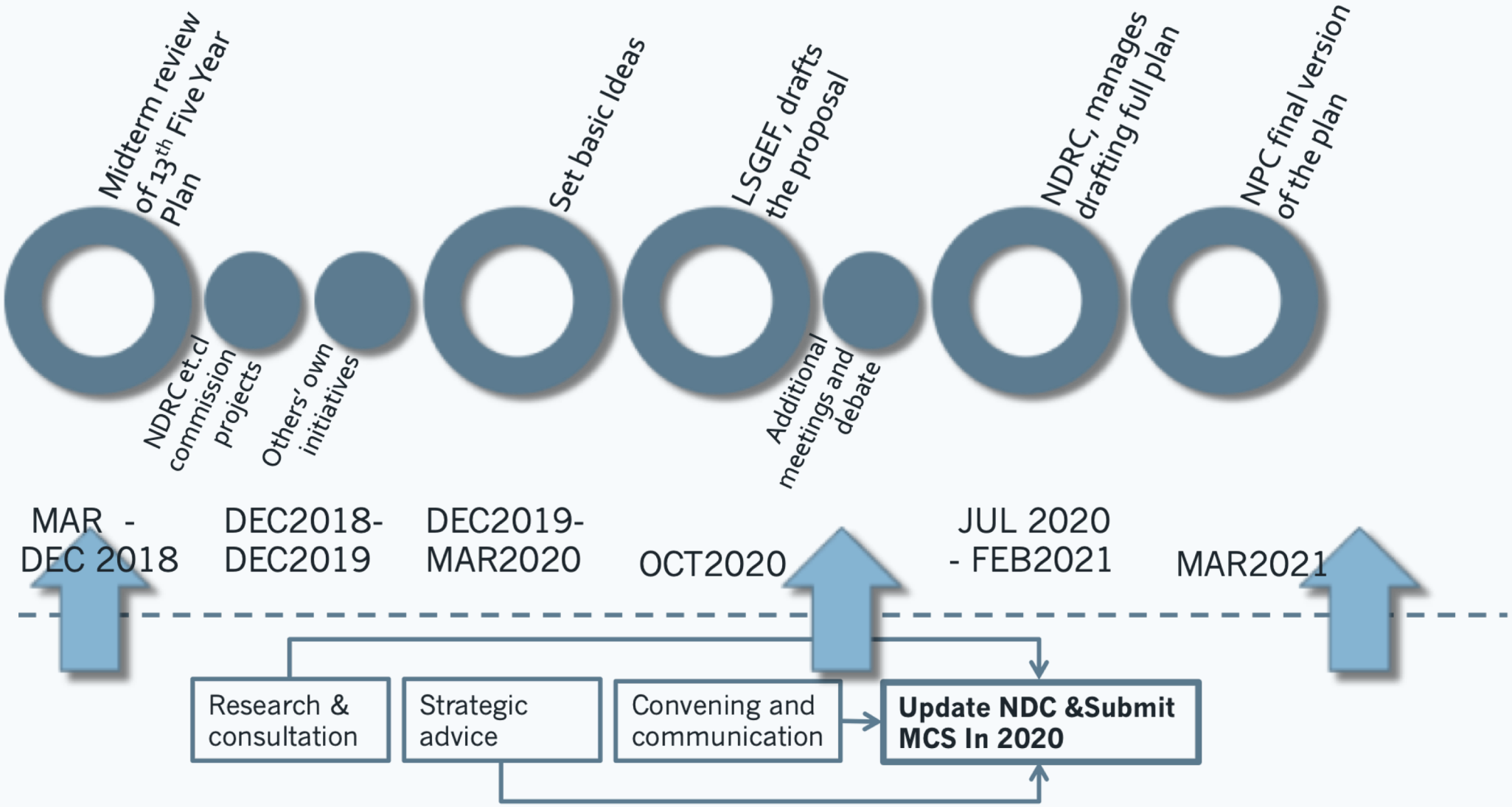
Role of EF China and Its Priority Areas

Philanthropy/EF China's Leverage point

Leverage points where philanthropy/EFC should play roles

- Shaping vision and setting up aspirational goals by knowledge synthesis and communication
- Linking climate vision, goals, and pathways with mainstream development agenda
- Studies on strategies for developing pathways to achieve goals/targets
- Assist design, implementation, and enforcement of policies on national, sectoral, and regional levels
- Capacity building by strategic communication and knowledge & convening platforms
- Promote China's global climate leadership

EF China's Contribution to Policy Windows



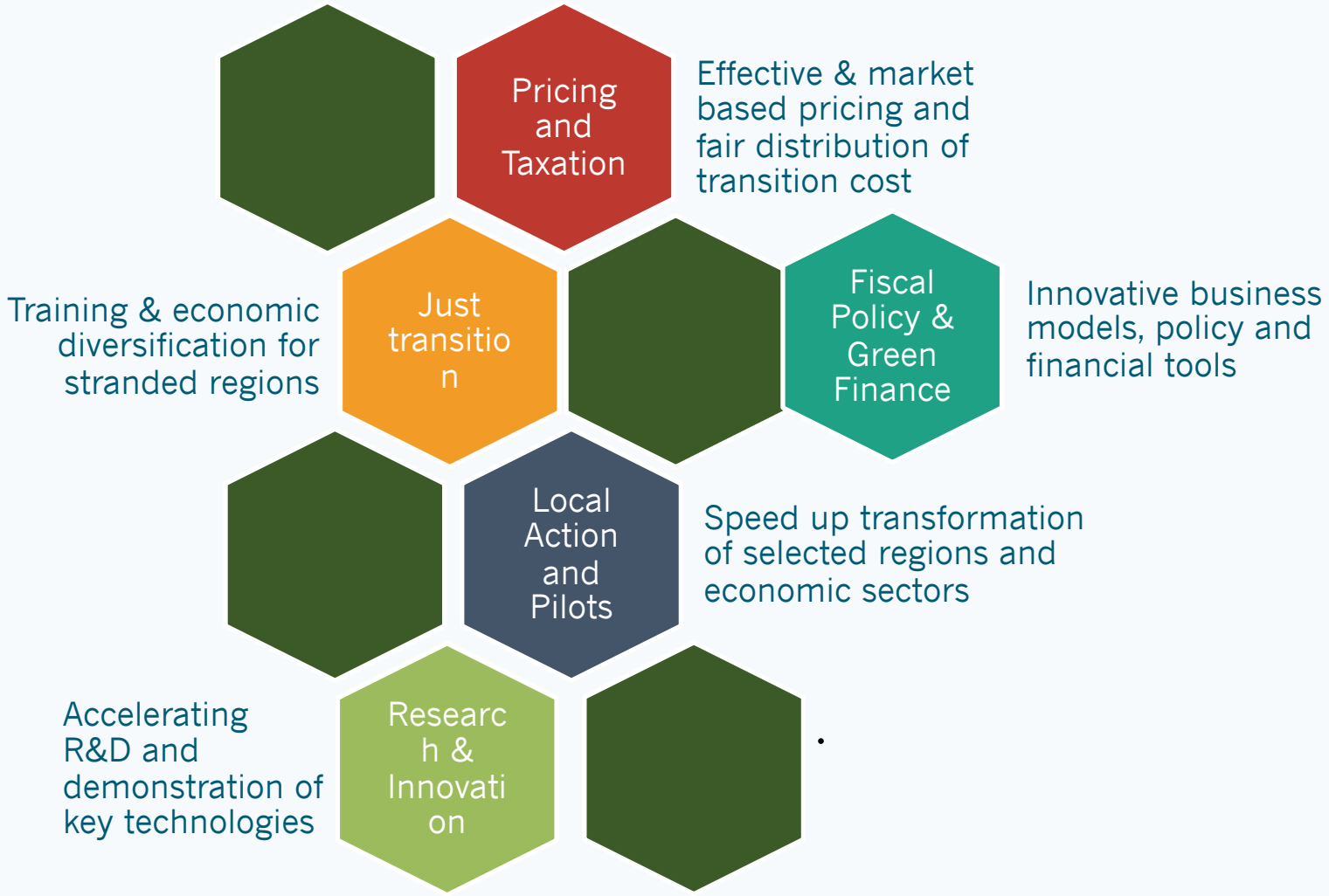
EF China's Advantages and Roles

Prioritized fields	Triggers/Venues	EFC's roles	Advantages
Vision/goals	14th FYP, NDC, MCS PA/FCCC, IPCC	Facilitate studies, dialogue, and comm	Belief, inspiration, mindset, expertise, convening power
Mainstreaming climate strategy and policies	14th FYP; modernization milestones 2035/2050	Studies, dialogues, stakeholder convening, comm	Broader expertise, network, convening power
Synergy of different policy goals	Trade-off of growth, energy, air quality	Dialogues, knowledge platform	Systematic expertise, network, convening power
Deep decarbonization in power, industries, and transportation	Power sector reform, Sectoral policies	Policy studies, dialogues, pilots, CB, comm	Sectoral expertise, network, convening power
Systematic solutions	Grid Edge, Sustainable Infrastructure, Innovation	Policy studies, dialogues, pilots, CB, comm	Systematic expertise, network, convening power
Non-CO_2 control	F-gases,CH_4, N_2O	Studies & dialogues	Expertise
CDR	BECCS, DAC	Policy studies, dialogues	Initial
Synthesis and knowledge/data hub	Transparency, Strategic adviser	Platform development & operation, dialogues, comm	Leverage of broader expertise, public access

Menu of Options

Infrastructure	• Market coordination for sustainable infrastructure • Integrated, interconnected smart electricity and data/information grid • Hydrogen pipelines & smart charging/refueling station • Retrofit of existing infrastructure & avoid lock-in • Synergy and integration between transport, energy and other sectors	Buildings	• Increased deployment of heat pumps • Deployment of H2/e-gas for heating/cooling • Increased renovation rates and depth • Deployment of NZE buildings and smart buildings • Efficient equipment and lifestyle change • Sustainable planning
Power	• Strong penetration of VREs • Decentralized, smart, flexible and market-based power system • System optimization (demand-side response, storage, interconnections, role of prosumers) • Nuclear and CCS/BECCS plays a role	Transport	• Faster electrification and fuel economy improvement for all transport modes • H2 deployment for HDVs and some for LDVs • E-fuels deployment for all modes • Increased modal shift and innovative mobility through smart planning and behavior change • Digitalization, data sharing & interoperable standards
Industry	• Competitiveness through higher recycling rates, material substitution, circular measures • Reducing energy demand via improve EE • Electrification and innovation of processes • Use of H2/e-gas/biomass in targeted applications to replace feedstock or fuel • Deployment of CCUS	LULUCF and Non-CO2	• Reduce emissions from agriculture through increase productivity, reduce fertilizer, dietary change • Sequestering carbon in soil and forest • Reduce fugitive emissions from coal, oil & gas • Reduce emissions from solid waste & wastewaters • Reduce F-gases from air conditioning, refrigeration and industry

Enabling Framework



Priorities for 2020-2022

EFC LTS Initiative	Priorities
1. Vision shaping and goal setting	support vision-shaping and strategic planning to provide long-term signals as well as near term ambition in 14th FYP, NDC, MCS, High quality development strategy;
2. Mainstreaming and synergy	Cross-Ministry coordination; New engine, new industry of economy; Coordination with AQ/green growth
3. Deep decarbonization in Industry/Power/Transportation	Lists in Menu of options, both long hanging fruits and hard to abate area, highlights of pilots e.g. Pilots of new low-CO2 production routes, Digitalization, System optimization (demand-side response, storage, interconnections, role of prosumers), Enabling policy framework and innovative commercial model
4. Systematic solutions and pilots	Cross-sectoral coordination/cross-cutting issues, e.g. Infrastructure, innovation, grid edge, consumption, coal phase out; Synergy and integration between transport, energy and other sectors
5. Enabling policy and institutional evolvement	Sectoral reform (power & transportation); Standards; Pricing, taxation, subsidy & finance (systematic financial risks); Local/region/zone pilots
6. Stakeholder engagement, communication and capacity building	High-level engagement; Convening of Multi-divisions; Pursue sustainable consumption through communication; capacity building at local level
7. Synthesis and knowledge/data hub	Synthesis of LTS outputs & communication; Establish on-line China-focused data hub to enhance transparency and information accessibility
8. Non-CO_2 & CDR	Analysis and policies to address costs, uncertainties, risks and barriers associated with large scale deployment; HFC phase out; Methane phase out in coal/oil/gas industry

Examples

INNOVATION

- Mapping of radical technologies & targeting stakeholders and partners
- Accelerate R&D and systematic evolution through strategy & policy development, barrier removing, and broader alliances with Chinese practitioners

NET ZERO INDUSTRY

- Pilots of new low-CO_2 production routes in Iron & Steel, Cement, and Chemicals
- Enabling policy framework to increase recirculation, R&D, and commercialization of high-quality materials

CDR, incl. BECCS, DAC

- Analysis and policies to address costs, uncertainties, risks and barriers associated with large scale deployment

KNOWLEDGE/DATA HUB

- Establish on-line China-focused data hub to enhance transparency and information accessibility

Appendix

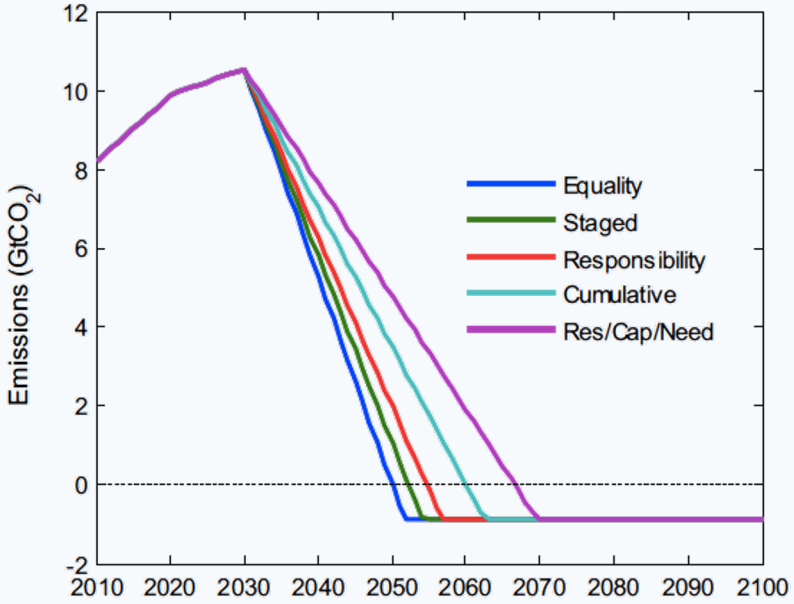
Overall Target

China's mitigation requirements from IPCC scenarios by sharing mitigation burden based on the least cost principle

	Cumulative CO_2 Emissions (Excl. LULUCF) (Gt CO2)		CO_2 Reduction Relative to 2015 (%)		Year of Neutrality	
	2020~2050	2020~2100	2030	2050	CO2	CO2e
1.5℃	150 (130~210)	115 (60~160)	34.8 (-4.3~61.3)	94.6 (83.8 ~102.0)	2060 (2050 ~2080)	2070 (2060 ~after2100)
2℃	220 (190~275)	225 (155~330)	6.7 (-20.9 ~31.3)	71.6 (59.1 ~81.2)	2070 (2065 ~after2100)	2095 (2080 ~after 2100)

Source: IPCC Database, China mitigation pathways, 20th-80th range

China's mitigation requirements based on different equity principles



Source: Pan Xunzhang, 2017

Balancing science and equity

EF China's overall target towards long-term low emission society

2060: Carbon Neutrality

2020-2050 Cumulative CO_2: 180 Gt


ENERGY FOUNDATION
能源基金会
YEARS 20 周年
清洁能源繁荣未来
SUSTAINABLE ENERGY, PROSPEROUS FUTURE

THANK YOU