



Low-carbon Pilots and Nero-zero Emission Zone Demonstration in China

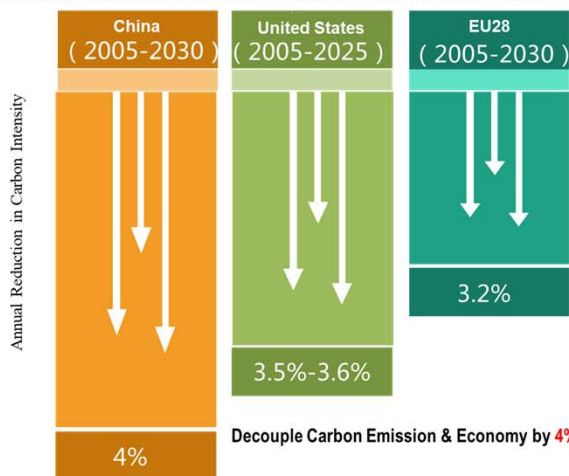
—A Case Study of the Low-carbon Pilots in China and Implications for Lancang-Mekong Cooperation

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2019.03.21

China's NDCs to 2030

To lower carbon dioxide emissions per unit of GDP by 60% to 65% from the 2005 level



Decouple Carbon Emission & Economy by **4% Annually** in China

1.6 Trillion RMB Investment Annually by 2030

12th FYP (2010-2015)



Energy Efficiency Investment: 2.7
 Low Carbon Energy Investment: 3.1
 Low Carbon Industry: 8.4 (Yield)

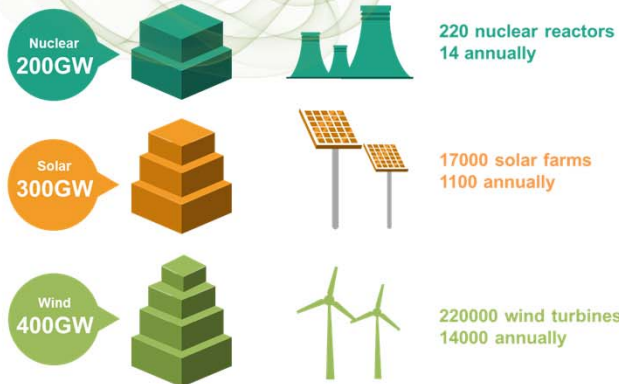
2005-2030



Energy Efficiency Investment: 15.2
 Low Carbon Energy Investment: 25.7 (Wind + Solar 11.3)
 Low Carbon Industry: 23 (Yield)
 GDP Contribution: >16%

To increase the share of non-fossil fuels in primary energy consumption to around 20%

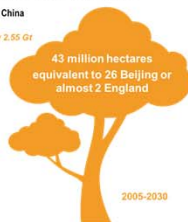
ONE ton Non-fossil Fuel per Capita Annually in China



To increase the forest stock volume by around 4.5 billion cubic meters on the 2005 level

Plant Whole Beijing Once Annually in China

Forest carbon stock will increase by 2.55 Gt

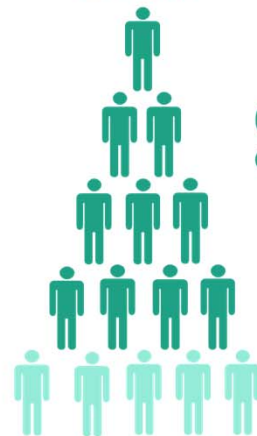


12th FYP (2010-2015)



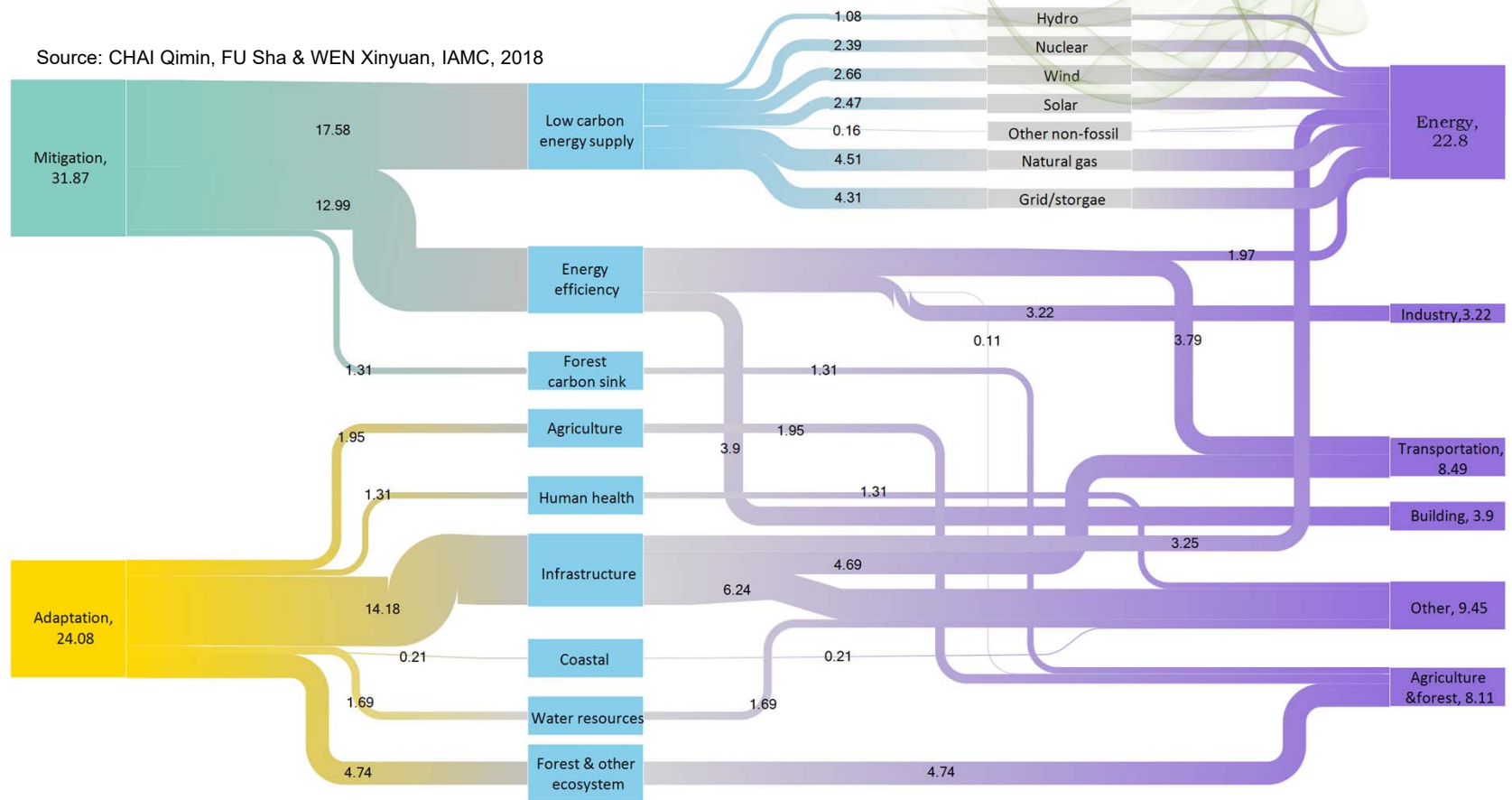
3 Million New Jobs (Directly & Indirectly) Annually by 2030

2005-2030



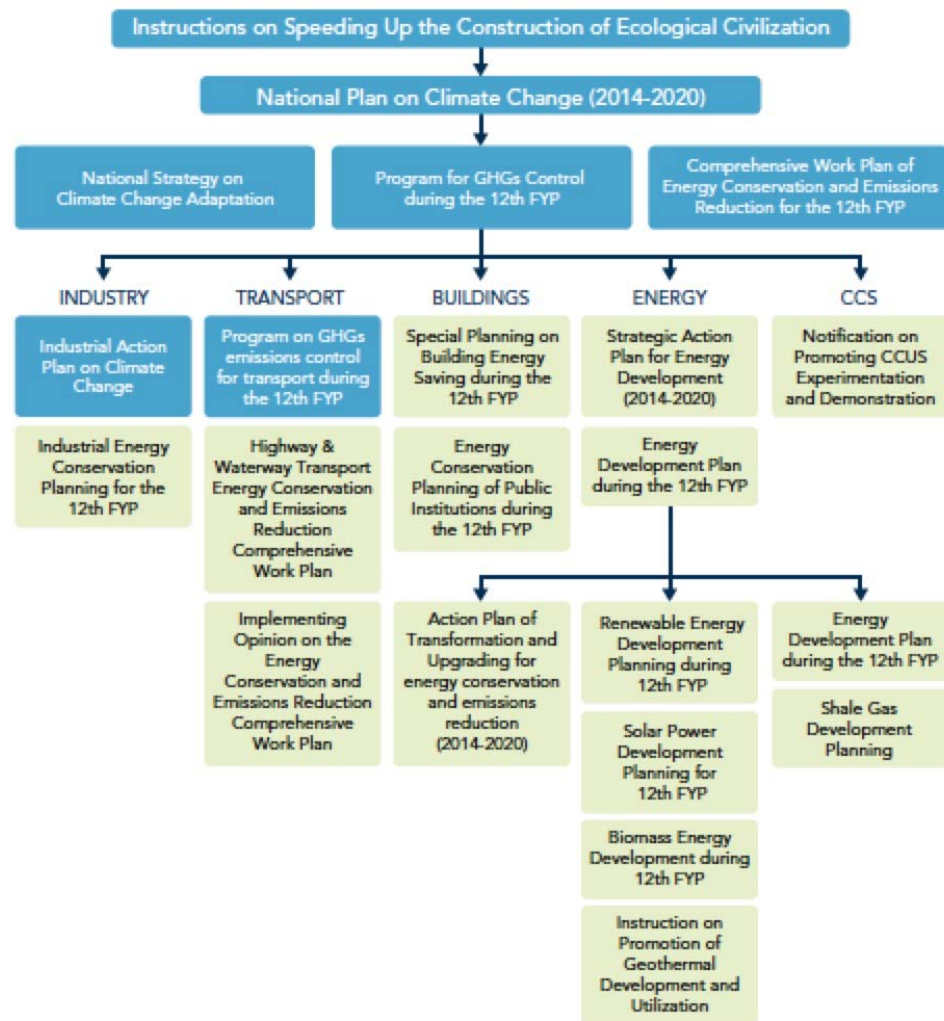
Financial Flow behind China's NDC

Source: CHAI Qimin, FU Sha & WEN Xinyuan, IAMC, 2018



Toward 2030, China's total financial investments to achieve its NDC will reach **¥56.0 trillion (\$8.4 T)**, an average of **¥3.7 trillion (\$0.6 T) per year**, of which financial needs for mitigation and adaptation will reach an average of ¥ 2.1 trillion (\$ 0.3 T) and ¥ 1.61 trillion (\$0.2 T) respectively.

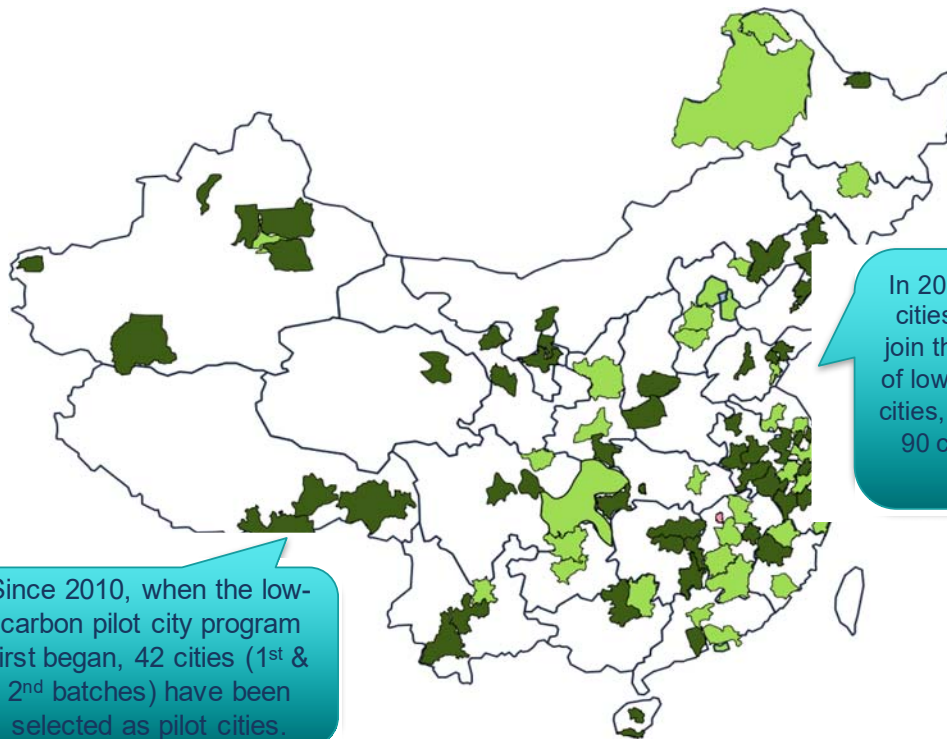
Overall Climate Policy Framework



Note: Blue boxes indicate special planning to address climate change.



Low Carbon Development Pilots



Since 2010, when the low-carbon pilot city program first began, 42 cities (1st & 2nd batches) have been selected as pilot cities.

In 2016, 52 more cities applied to join the 3rd batch of low carbon pilot cities, for a total of 90 cities in the pilot

2010:
13 pilot provinces and cities

2012:
29 pilot provinces and cities

2013:
51 pilot industrial parks

2014:
1000 pilot communities

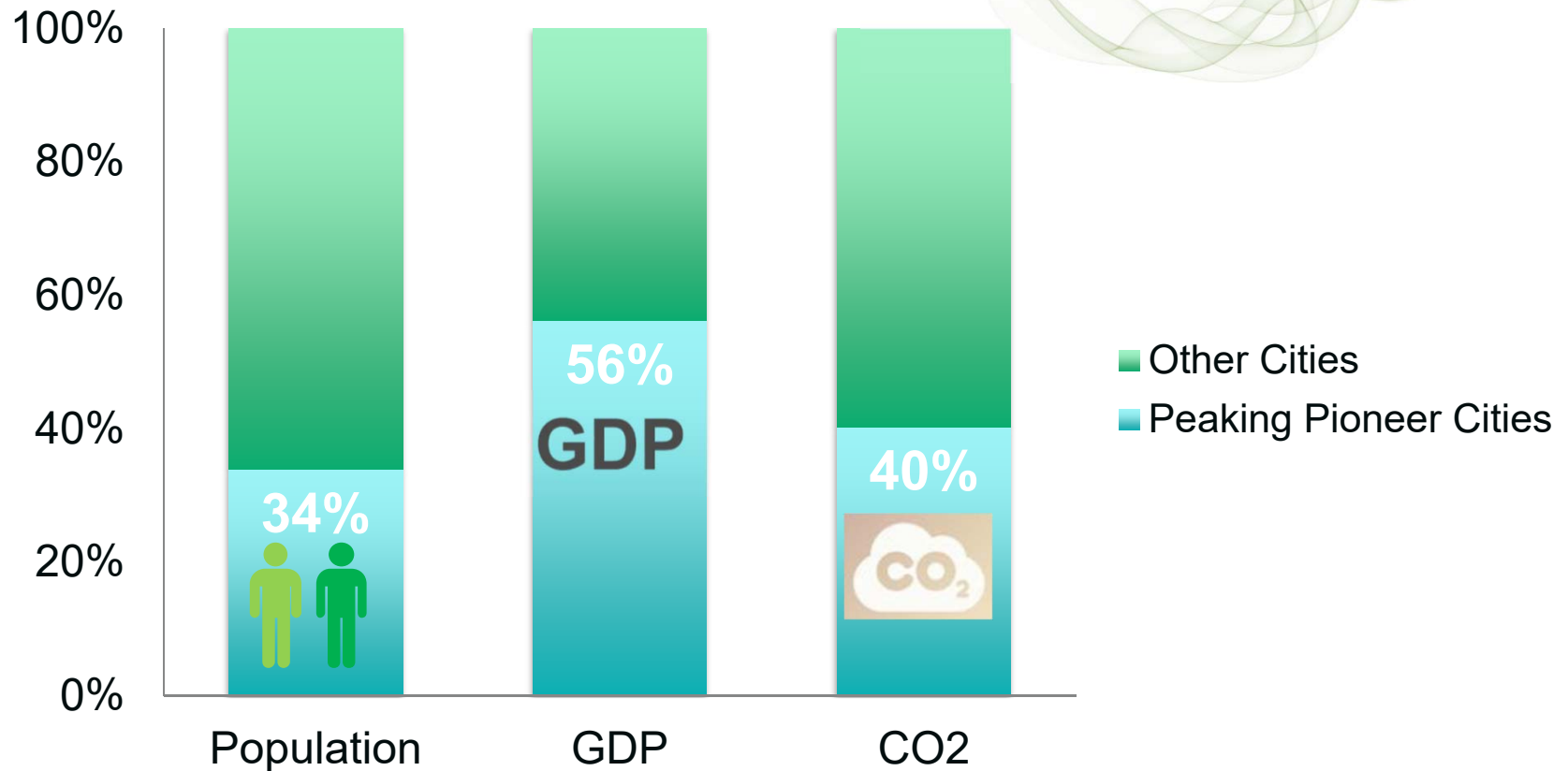
2015:
8 pilot towns

2016:
Increase pilot cities to 100

Peaking Pioneers for Pilot Cities

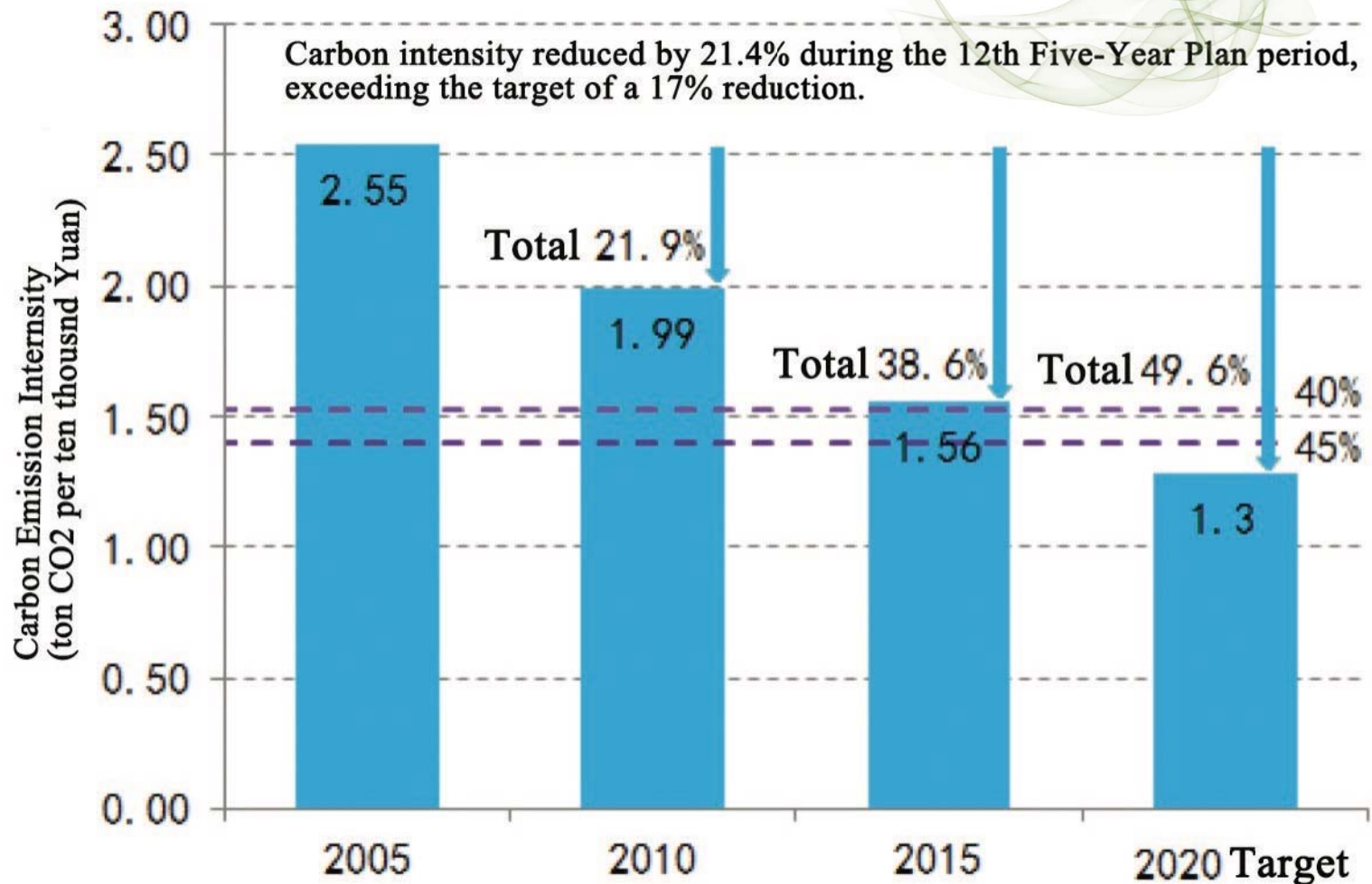
13 th FYP (2016-2020)		14 th FYP (2021-2025)		15 th FYP (2026-2030)	
Beijing	Around 2020	Tianjin	2025	Sichuan Province	2030
Yantai	2017	Shenzhen	2022	Hainan Province	2030
Ningbo	2018	Wuhan	Around 2022	Shenyang Province	2027
Wenzhou	2019	Xuzhou	Around 2022	Chenzhou	2027
Dunhuang	2019	Ganzhou	2023	Sanya	2028
Guangzhou	Before 2020	Jincheng	2023	Xiangtan	2028
Nanjing	2020	Shijiazhuang	2025	Hulun Buir	Around 2028
Hangzhou	2020	Changshang	2025	Yanan	Before 2029
Qingdao	2020	Dalian	2025	Urumchi	2030
Suzhou	2020	Lhasa	2025	Hunmin	2030
Nanping	Around 2020	Jilin	2025	Zunyi	Around 2030
Zhenjiang	Around 2020	Guiyang	2025	Turpan	2030
Jiyuan	2020	Hefei	Around 2024	Guangyuan	2030
Jinhua	Around 2020	Yichuan	2025	Chizhou	2030

Representatives of Peaking Cities



Source: 2015 national and local statistics year book, peaking pilot cities implementation plans, APCC analysis

Progress in Pre-2020 NAMAs



More Pilots in 13th FYP

Low-carbon Policy Framework by 2020

50 Near-zero Carbon Emission Zone Pilots

100 National Low-carbon City Pilots

80 National low-carbon Industrial Park Pilots

20 National Low-carbon Industrial Park Demonstrations

1000 Low-carbon Community Pilots

100 National Low-carbon Demonstration Communities

“Support optimized development zones to be the first to achieve carbon emission peaking. Over come barriers and implement Near-zero Carbon Emission Zone pilot projects.”

The 13th Five-Year Plan for National Economic and Social Development

“Select development-restricted zones and development-prohibited zones, ecological function zones, industrial and mining areas, and cities, which are in favorable conditions, to carry out Near-zero Carbon Emission Zone pilot projects, to select up 50 pilot projects by 2020.”

Work Program on the 13th Five-Year Plan of Greenhouse Gas Emission Control

Where is Meishan as the Case?



MEI SHAN

Maritime Silk Road of the 21st Century

Area: 333 Km²

Population: 90 Thousands in 2017

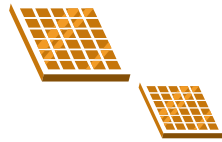
GDP: 21 Billion RMB in 2017

Area under rapid development

Why Meishan to Near Zero Emission?



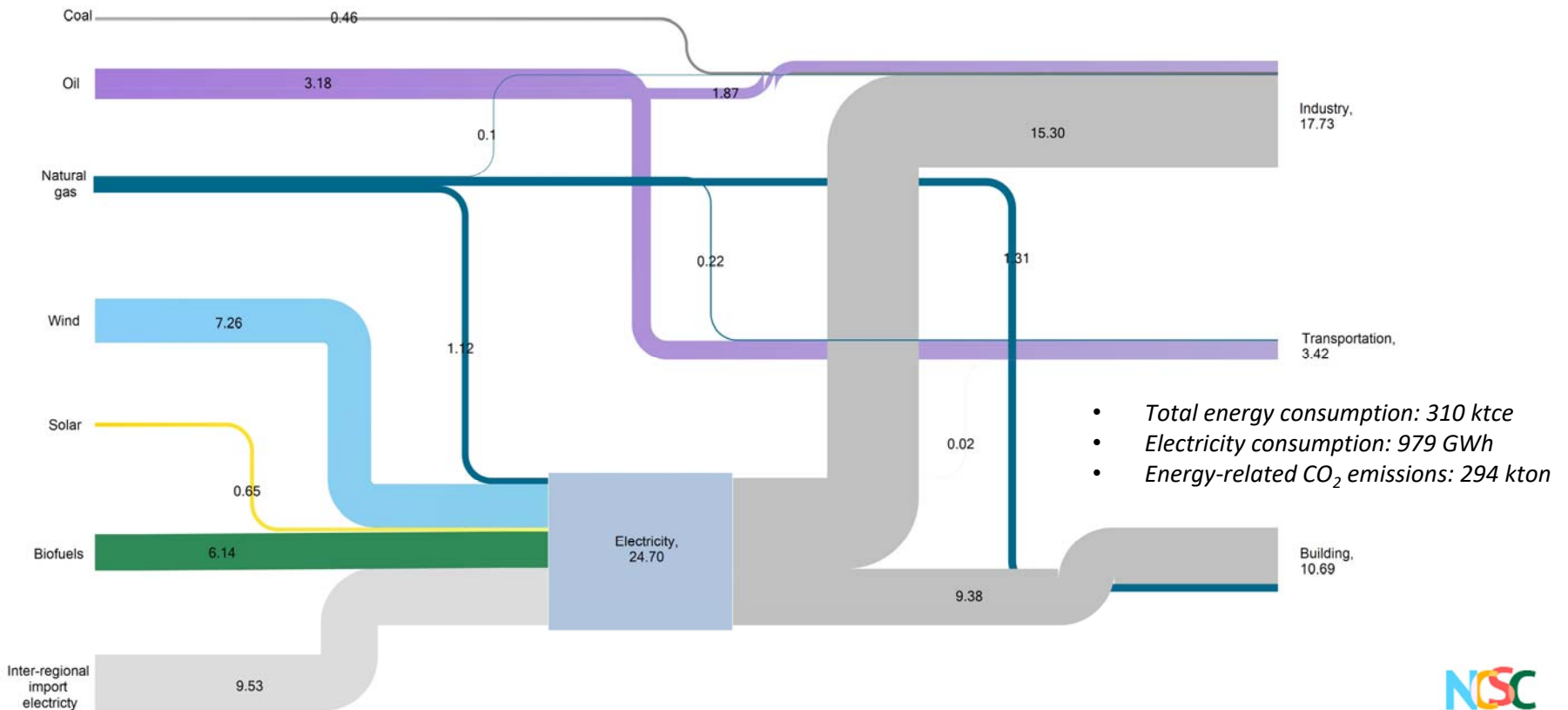
Wind:
90 MW
234 GWh



PV:
21.38 MW
21 GWh

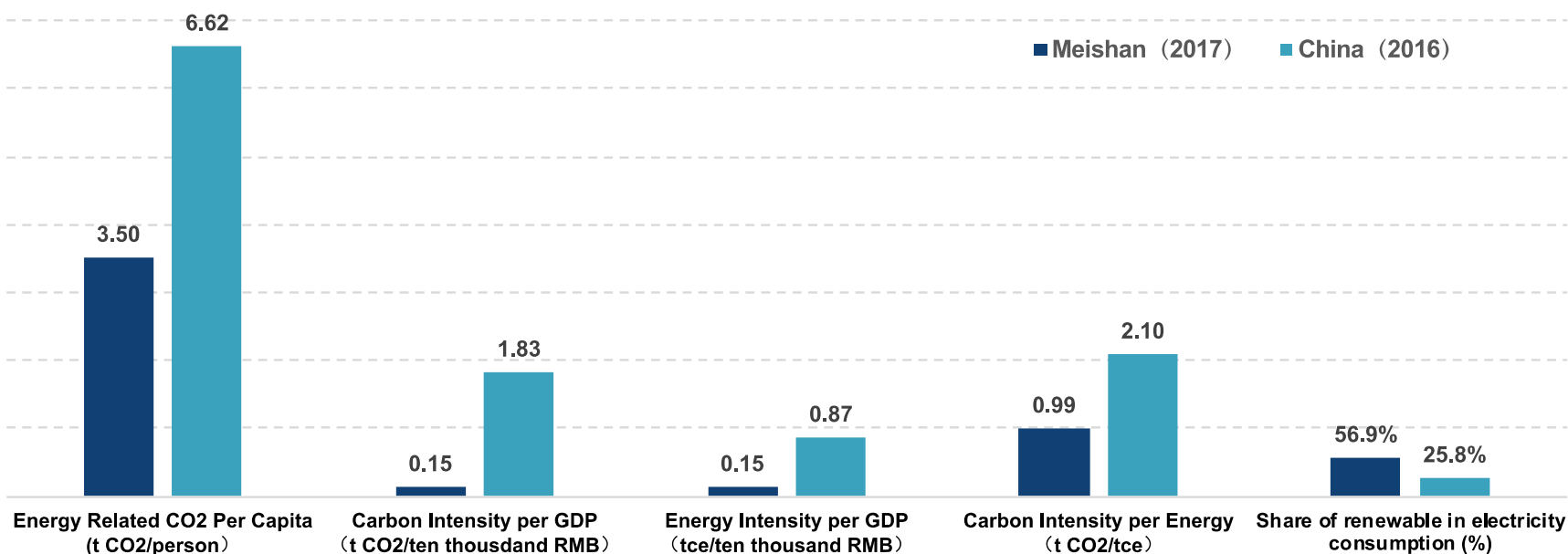


Biomass:
32 MW
198 GWh

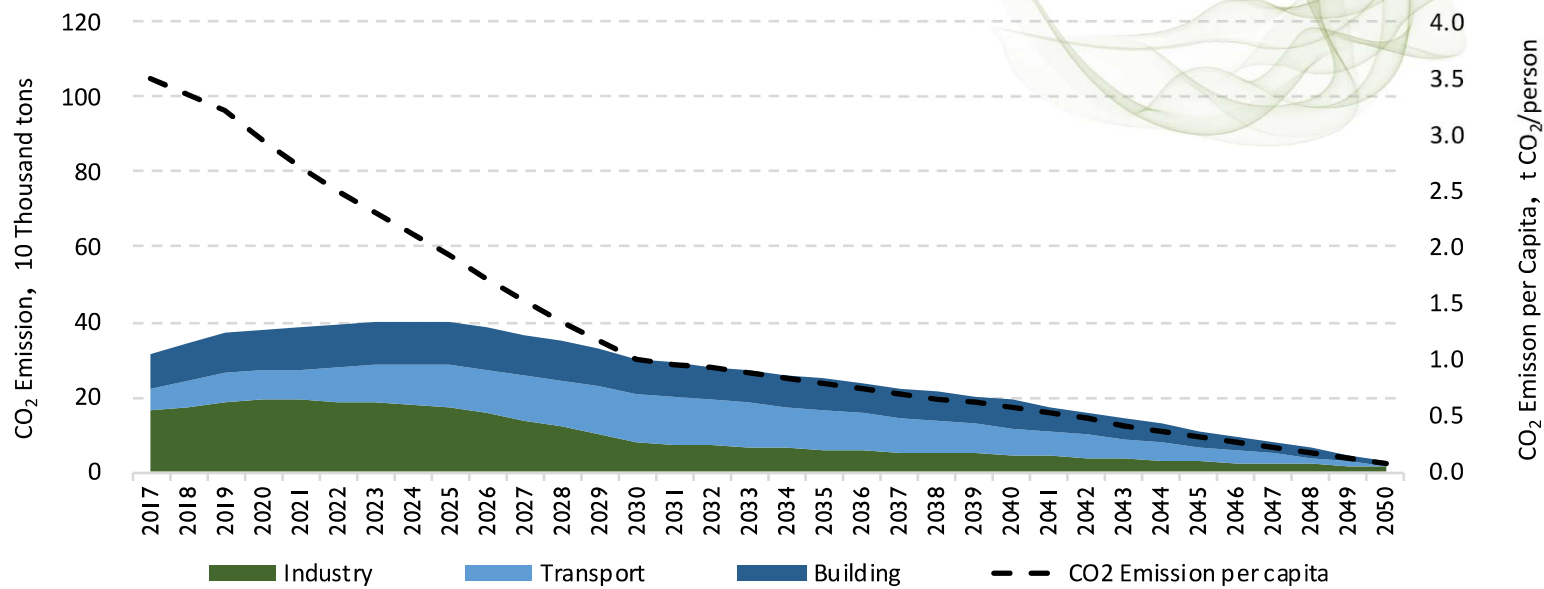


Why Meishan to Near Zero Emission?

- CO₂ emission per capita is **1/2** of the national level
- CO₂ Intensity per GDP is **1/13** of the national level
- Energy consumption per unit of GDP is only **1/6** of the national level
- Carbon intensity per unit of energy usage is **1/2** of the national level
- Share of renewable power accounts for **2 times** of the national level



Where do Meishan want to go?



By 2030: Nero Zero Carbon Emission

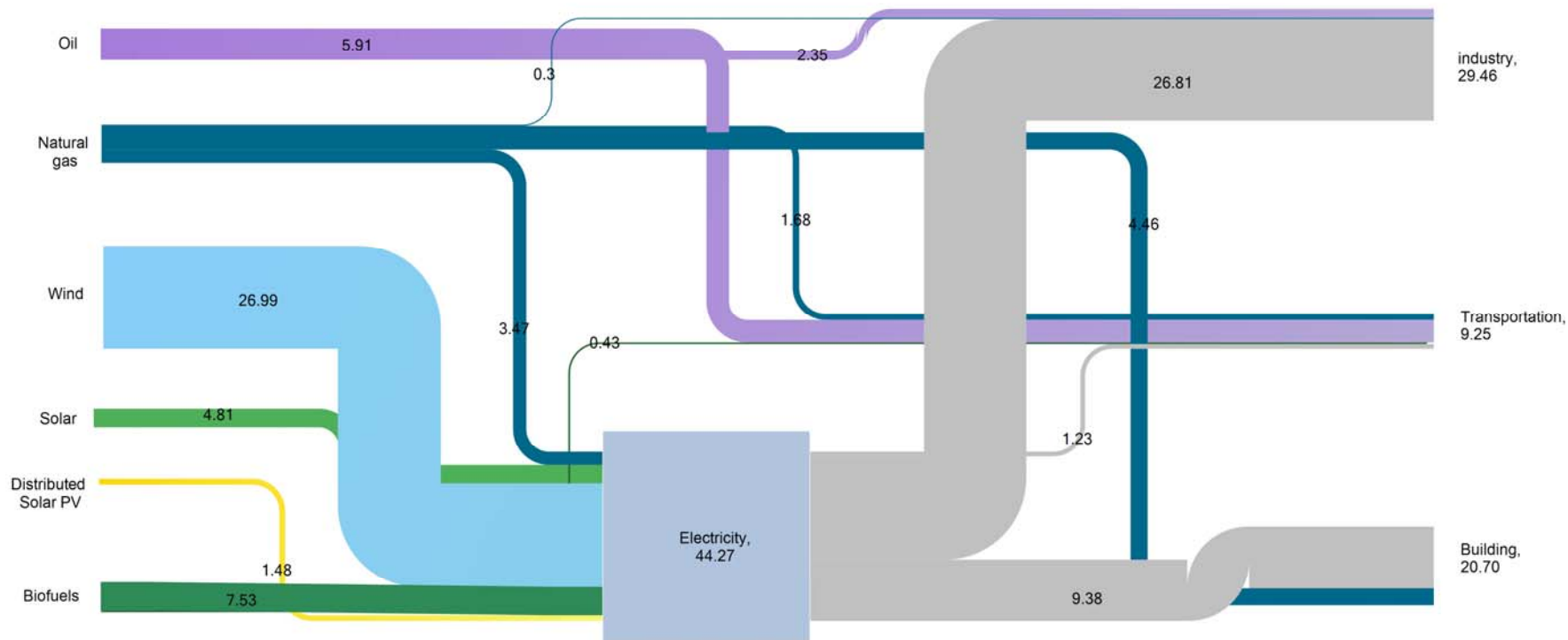
- The carbon emission per capita less than 1 ton;
- Coal-free;
- Near-100% Renewable Power;
- Near-zero carbon advanced technologies be widely used;
- Energy efficiency exceed world advanced level.



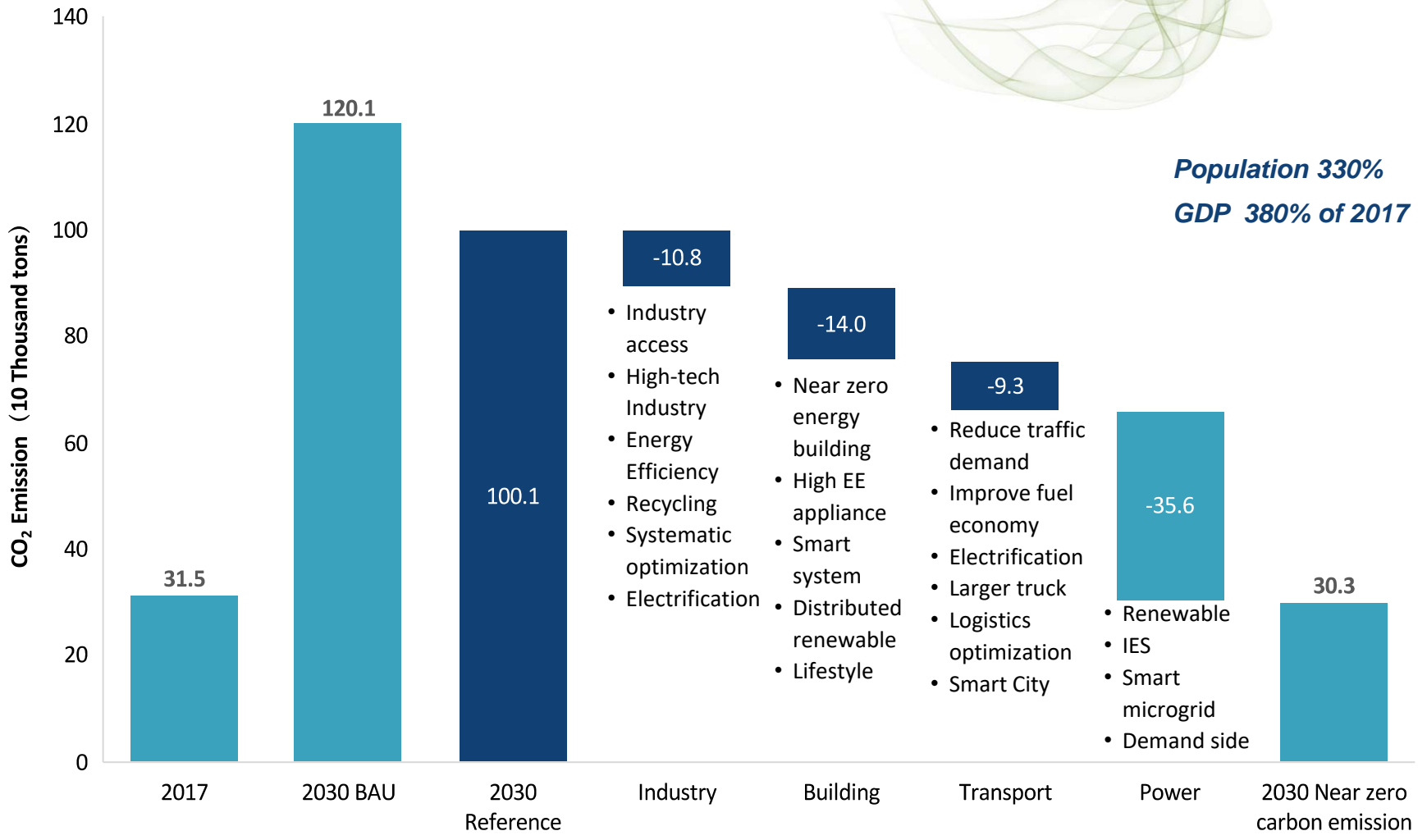
**Net Zero
Carbon
Emission in
2050**

Where do Meishan want to go?

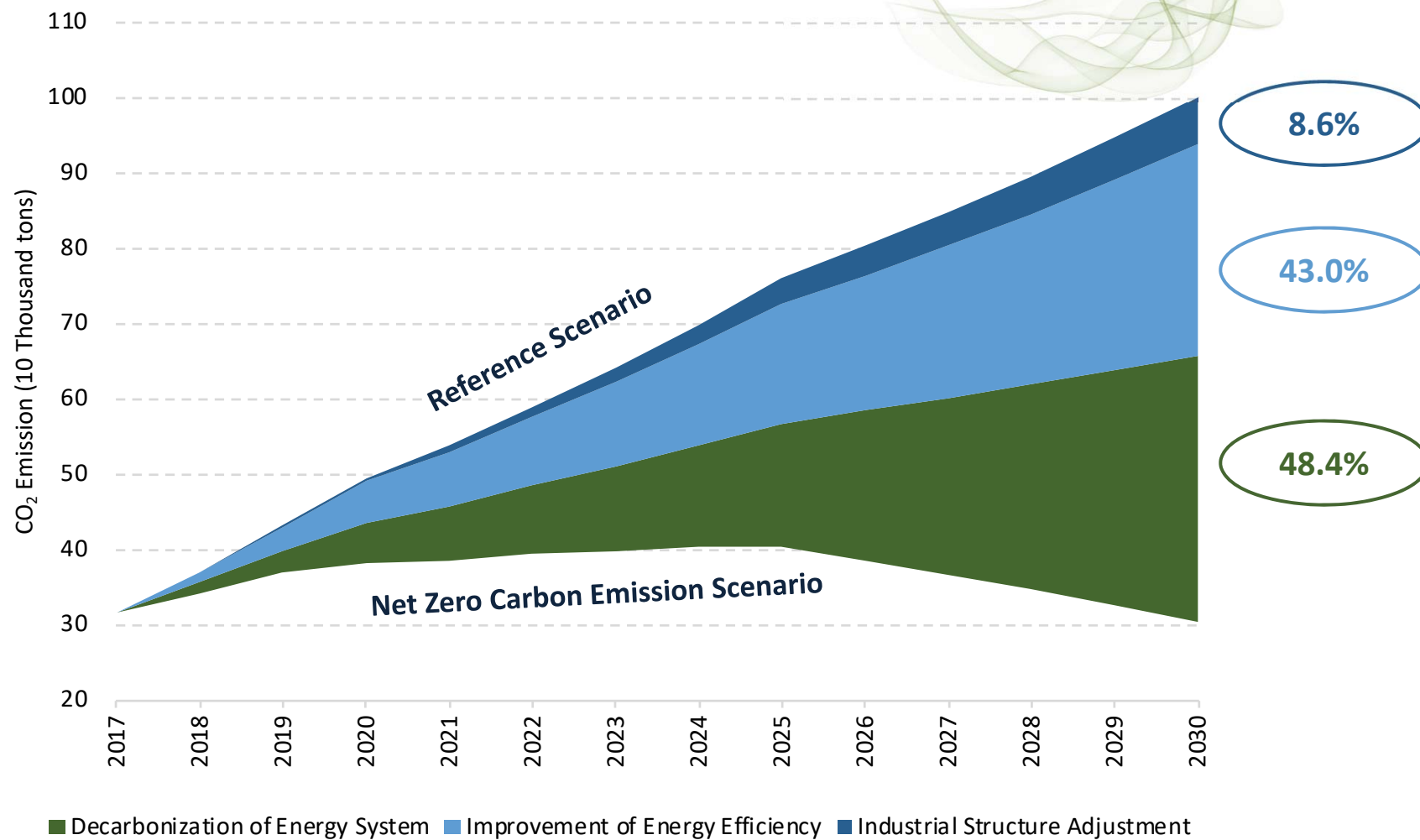
2030 Energy Flow



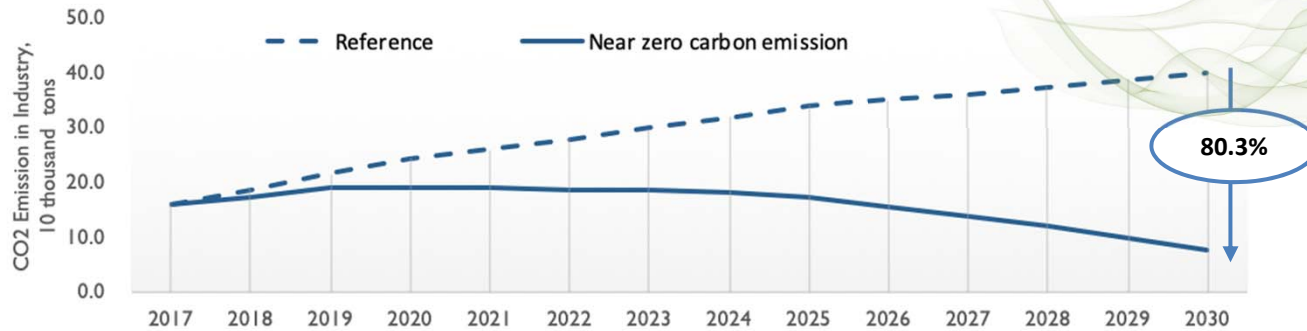
How do Meishan get there?



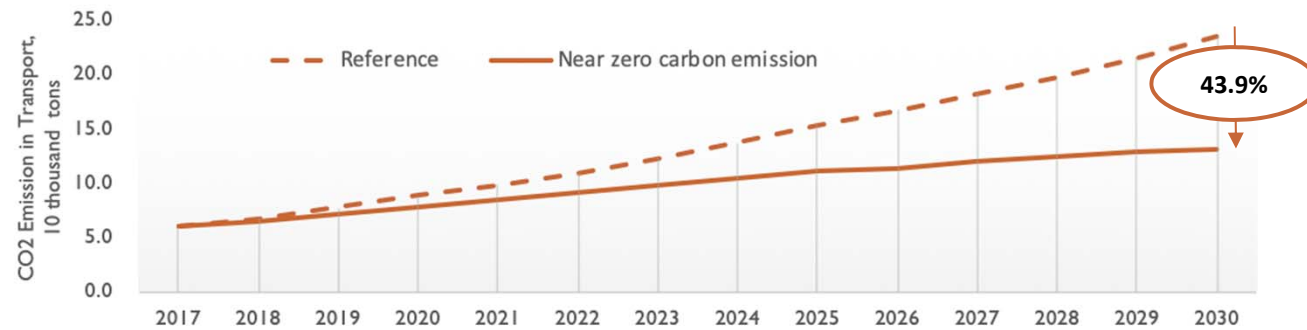
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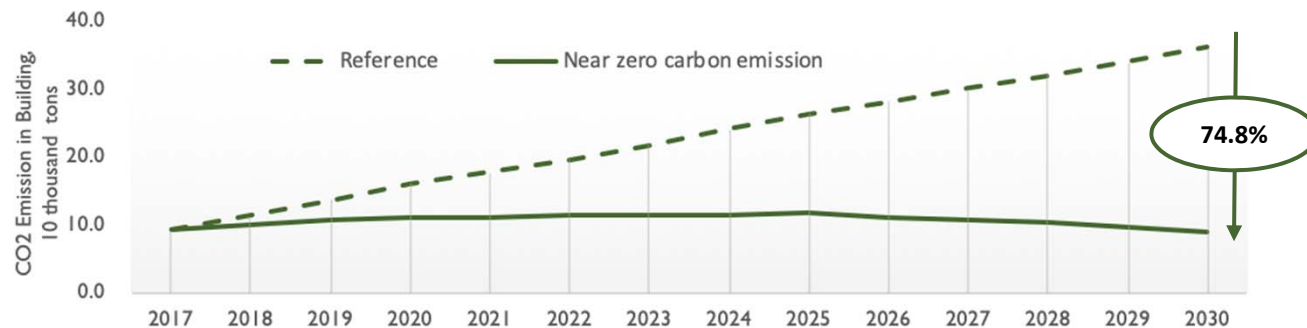
How do Meishan get there?



Industry

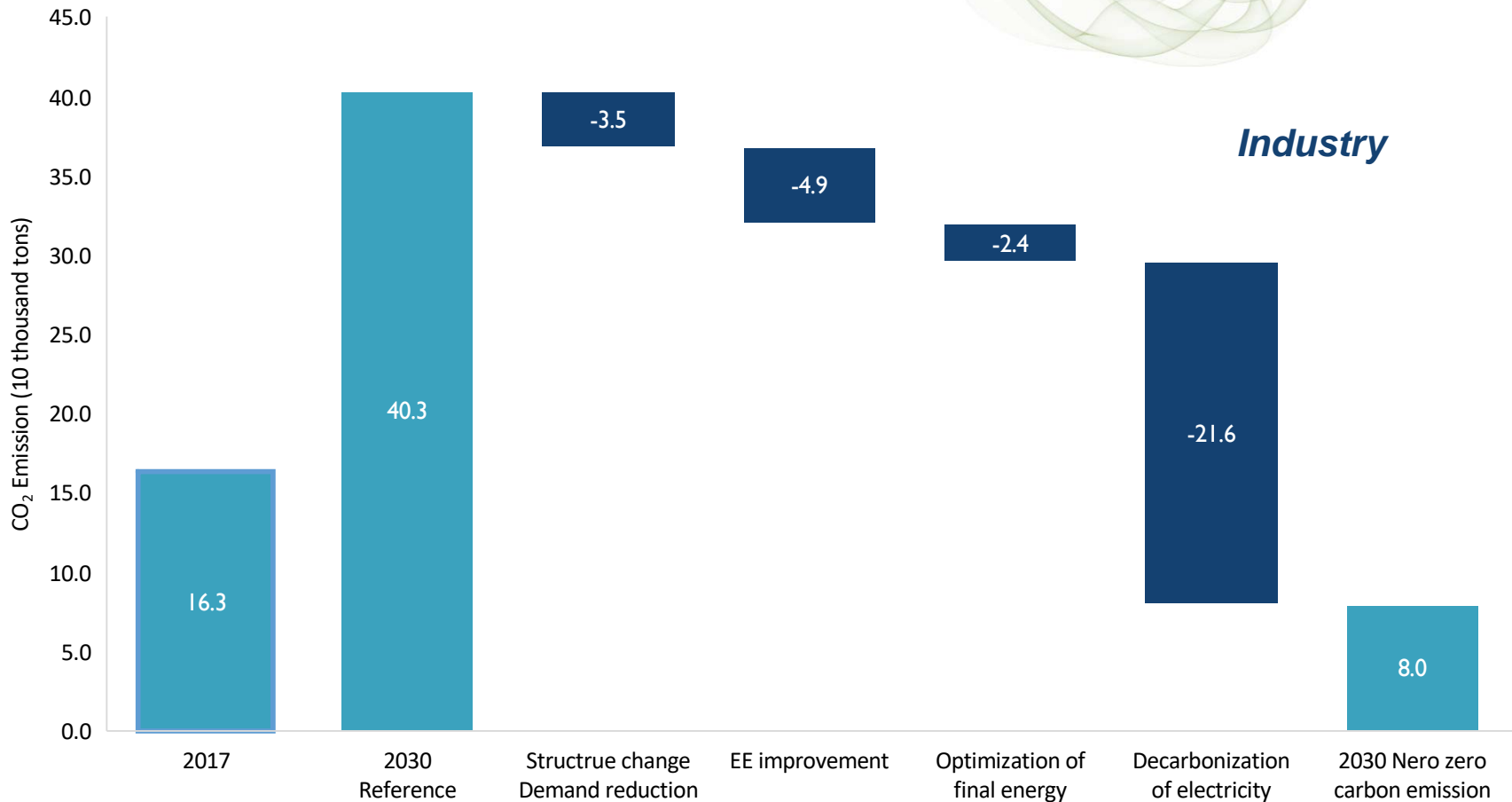


Transport

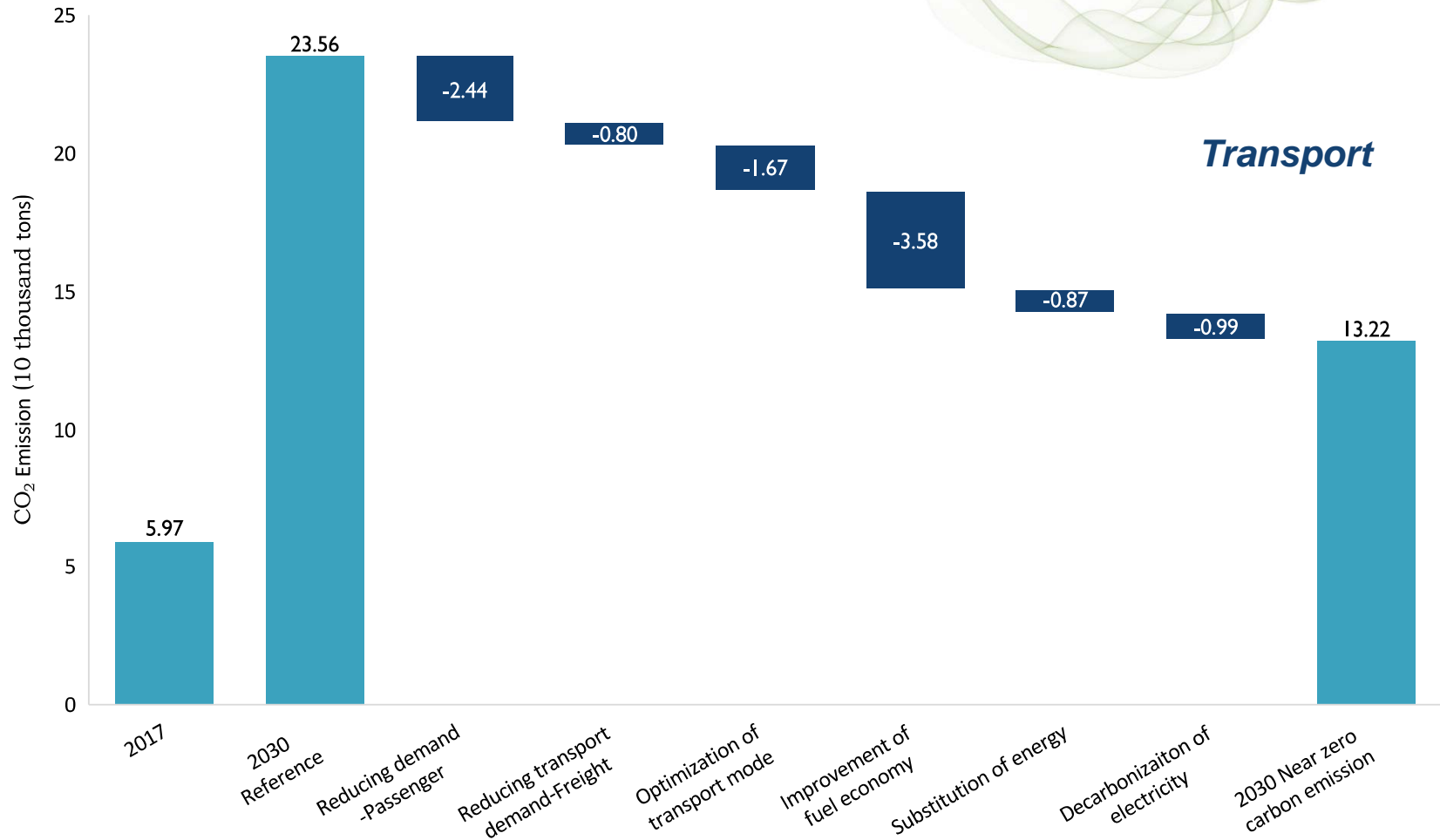


Building

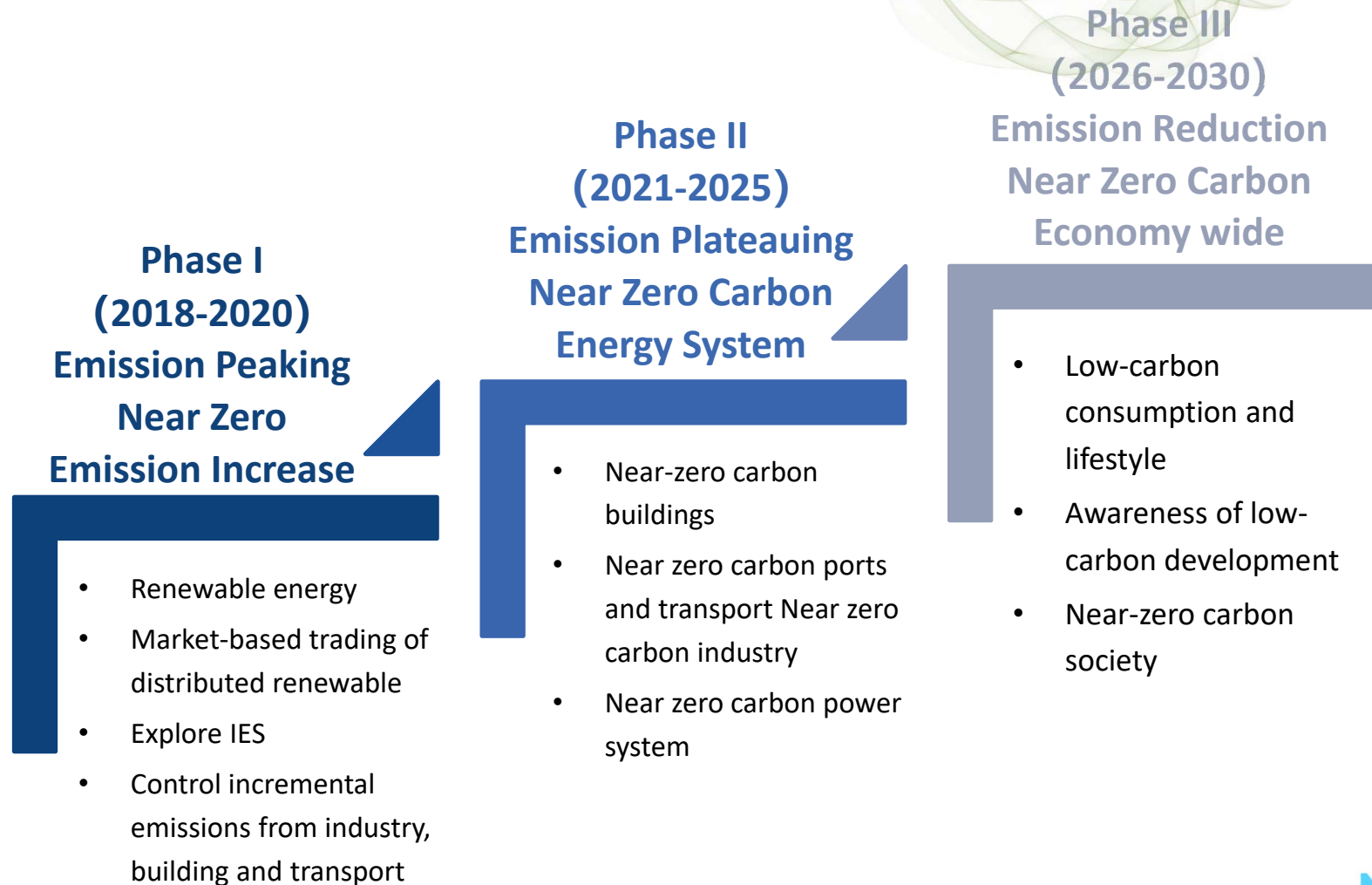
How do Meishan get there?



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How do Meishan get there?



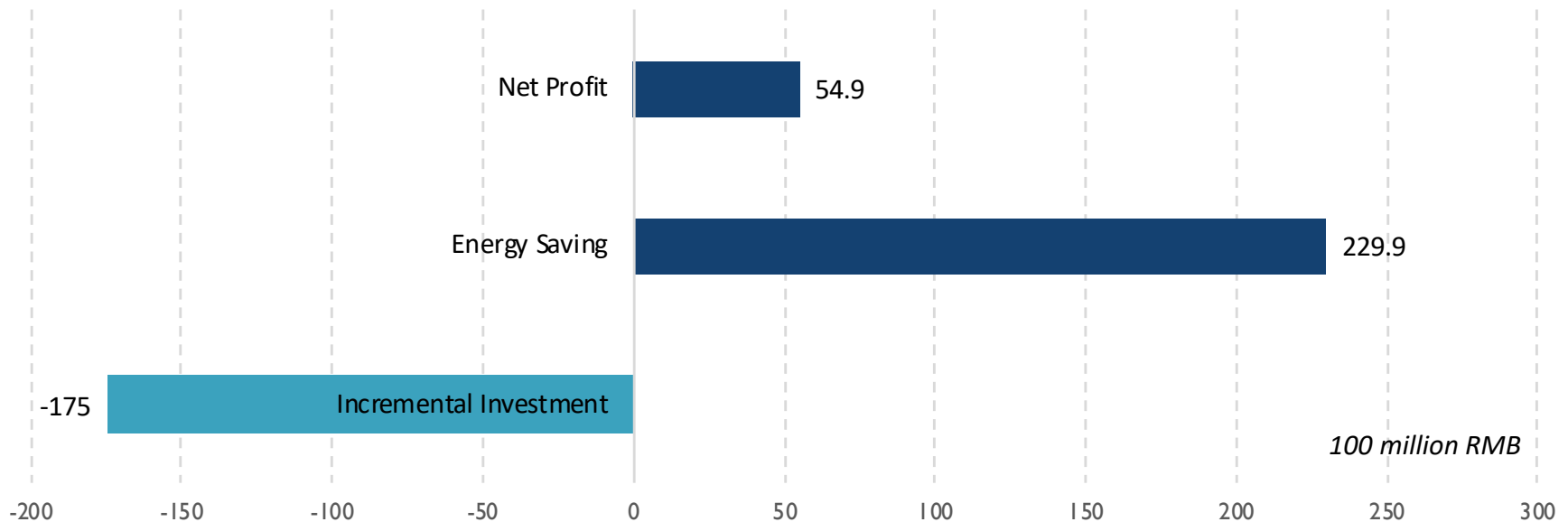
How do Meishan get there?

	Quantitative target	Implementation Pathway	Finance and marketization
Industrial structure	Formulate industry access guidance (low energy intensity, low emission intensity, etc.)	Promote industrial upgrading, accelerate the construction of green and low-carbon economic system	Issue the “Guidance for Investing and Financing High-quality development”
Final Consumer	Develop access standards and assessment systems based on energy efficiency, electrification rate, vacancy rate/empty running rate	Establish an integrated management system for planning, design, acceptance, operation, and supervision, as well as establish a carbon emission information disclosure and publicity mechanism	Pilot energy efficiency financing mechanism, green leasing mechanism and other financial innovation models
Energy System	Formulate a comprehensive energy indicator system, take full consideration of renewable energy utilization rate and carbon intensity per energy as core indicators	Create a regional energy planning system that matches the urban planning, and use the planning specials, technical guidelines, and bidding documents to guide the implementation of the project.	Emphasis the importance of early stage planning, while promote the healthy development of Integrated energy service provider market
Long-term mechanism	Establish the International Energy Finance Innovation Center of Ningbo “Belt and Road” Comprehensive Experimental Zone		

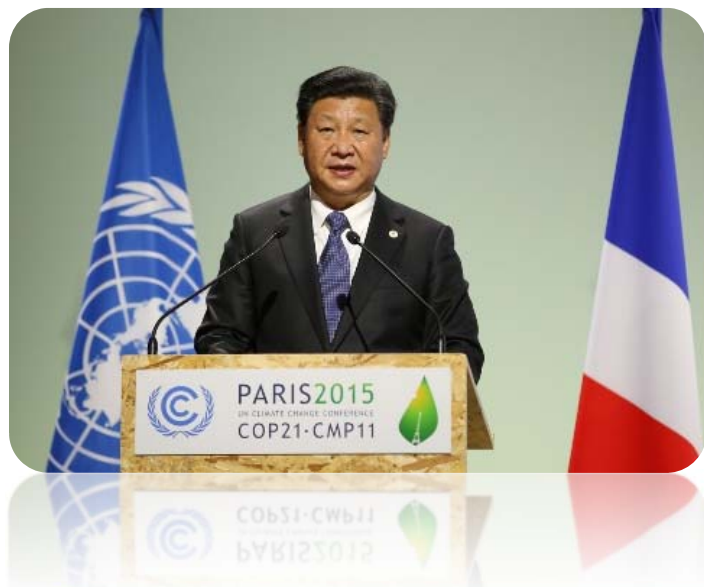
Implication for Meishan

During 2017-2030, the total energy cost saved by the near zero carbon emission scenario can reach to about **23 billion RMB** (2017 price), and the total incremental investment required is about **17.5 billion RMB**. The revenue is about **5.5 billion RMB**.

Although the near-zero carbon emission development model has a larger initial investment in adopting advanced energy-saving technologies and developing renewable energy, these additional investments can achieve more returns by improving consumer behavior, controlling demand, reducing energy expenditure, system optimization, and improving overall efficiency.



SSC for Low-carbon Pilots



President Xi announced in the UNFCCC high-level segment in Paris that China would

Establish the **China South-South Climate Cooperation Fund** with RMB 20 Billion (US\$3.1 billion)

Launch China South-South Cooperation 10-100-1000 Program

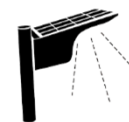
- ✓ Set up 10 low-carbon pilots;
- ✓ Start 100 mitigation and adaptation programs; and
- ✓ Provide 1,000 training opportunities.

Progress in SSC

Country	Region	Product
Nigeria	Africa	Air conditioning
Ethiopia	Africa	LED light
Benin	Africa	Air conditioning
Madagascar	Africa	Air conditioning
Cameroon	Africa	LED light, Air conditioning
Burundi	Africa	Air conditioning
Uganda	Africa	Air conditioning, LED light
Chad	Africa	Solar power system
Ghana	Africa	Air conditioning, Solar LED road lights, Solar photovoltaic power generation system
Egypt	Africa	LED light, Air conditioning, Household Solar PV System, LED road light
Ethiopia	Africa	Micro satellite system
Maldives	Asia	LED light, Solar PV system, Household Solar PV System
Myanmar	Asia	Household Solar PV System, Clean cook stove
Pakistan	Asia	Household Solar PV System, Microsatellite
Iran	Asia	Household Solar PV System and LED light
Nepal	Asia	Household Solar PV System
Mongolia	Asia	To be determined
Vietnam	Asia	To be determined
Bangladesh	Asia	LED light
Grenada	Caribbean	LED light, Air conditioning
Dominique	Caribbean	Solar LED road lights
Barbados	Caribbean	LED light, Air conditioning
Antigua and Barbuda	Caribbean	Solar LED road lights
Cuba	Caribbean	Household Solar PV System
Samoa	Oceania	Air conditioning, LED road light, LED light, Solar LED road lights
Tonga	Oceania	LED light, Air conditioning, Solar LED road lights
Fiji	Oceania	LED light
Bolivia	South America	Data Receiving system
Seychelles	Africa	Low Carbon Pilot



13K+ Distributed Solar PV



10K+ LED Street Lighting



1170K+ LED Lighters



10K+ Clean Stoves



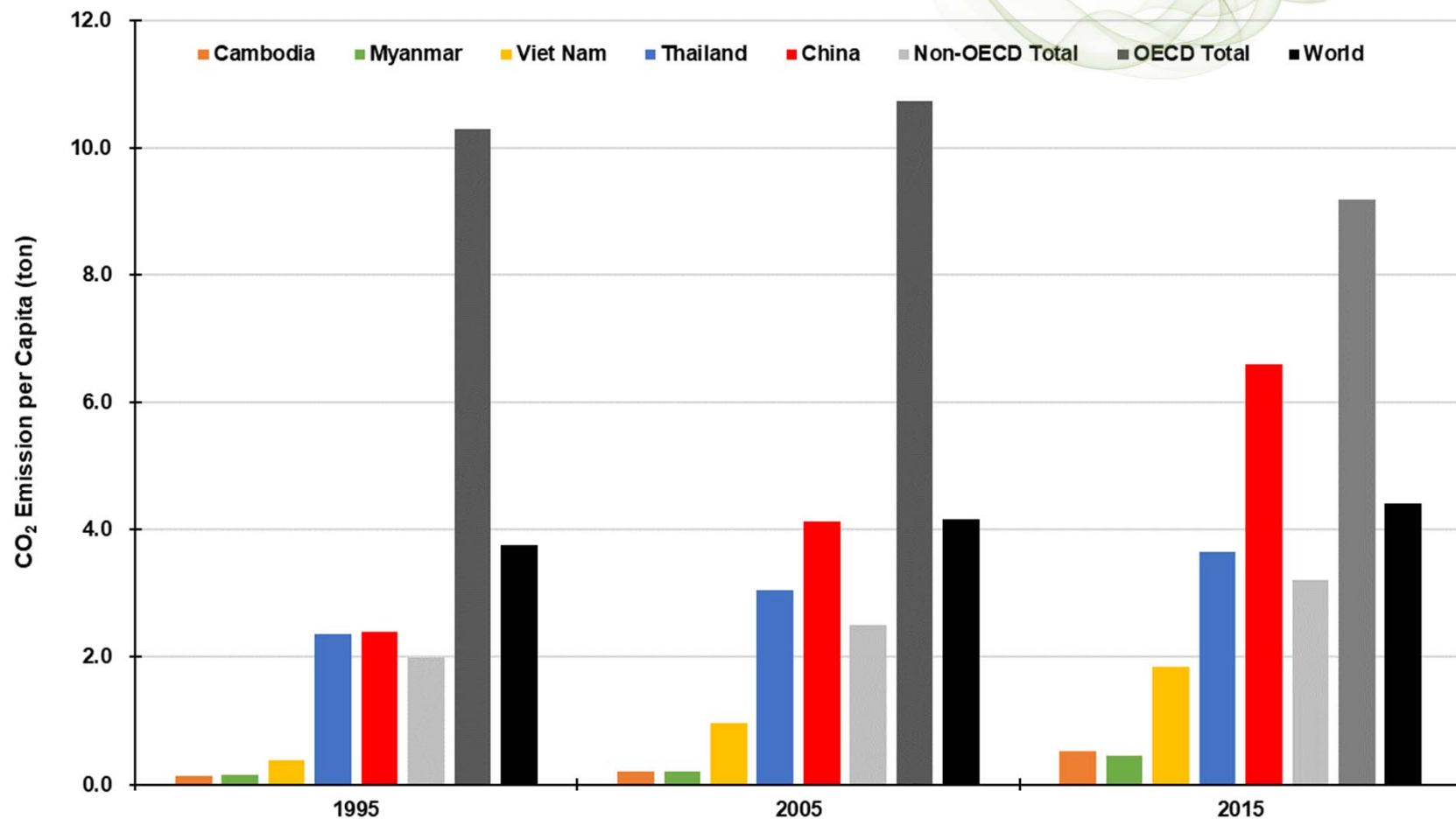
20K+ Energy Efficient Air Conditioners



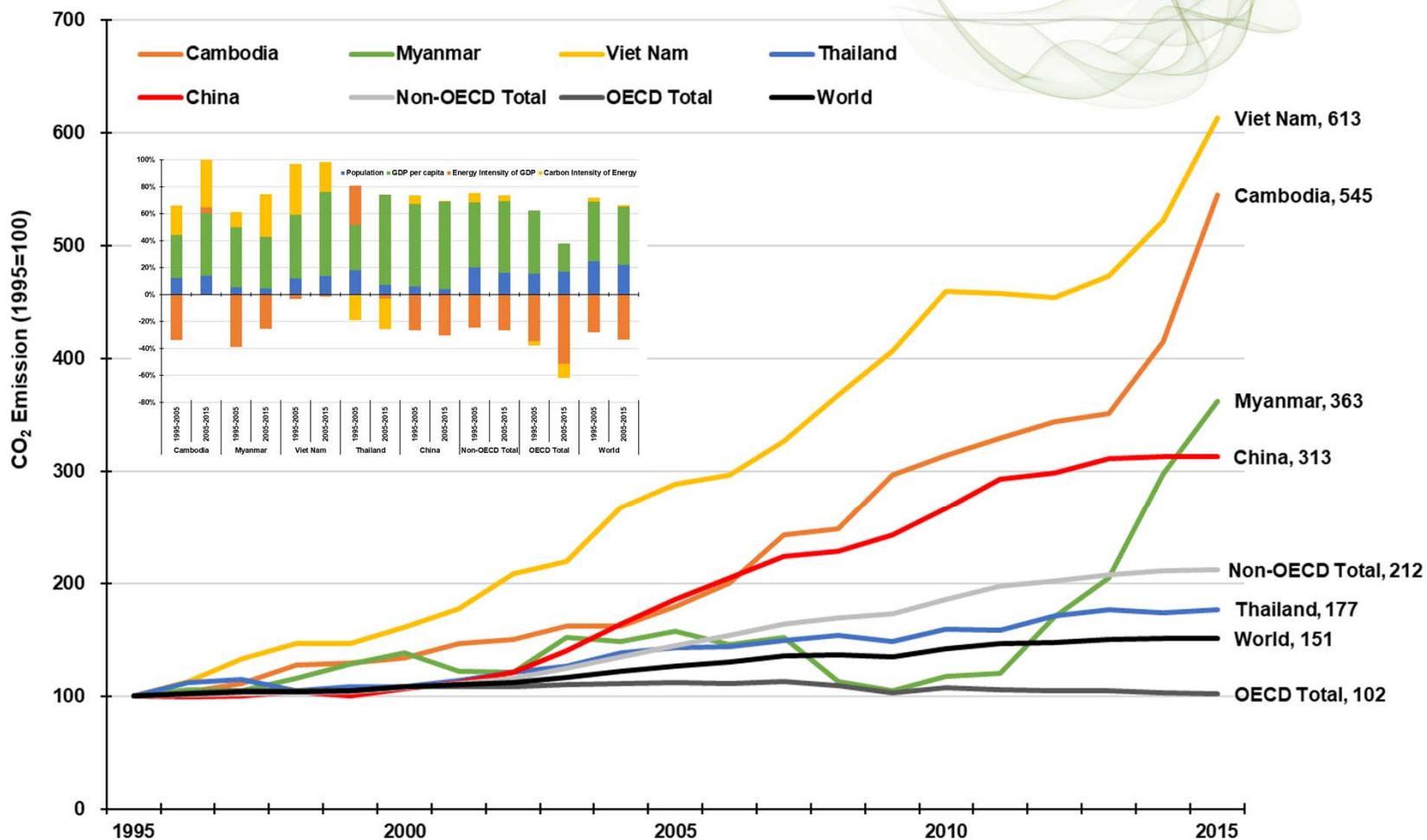
1+ Multispectral Microsatellite & Ground System

Signed MOU with 30 Developing Countries for 48 Projects in 2012-2018

Carbon Emission in LMC

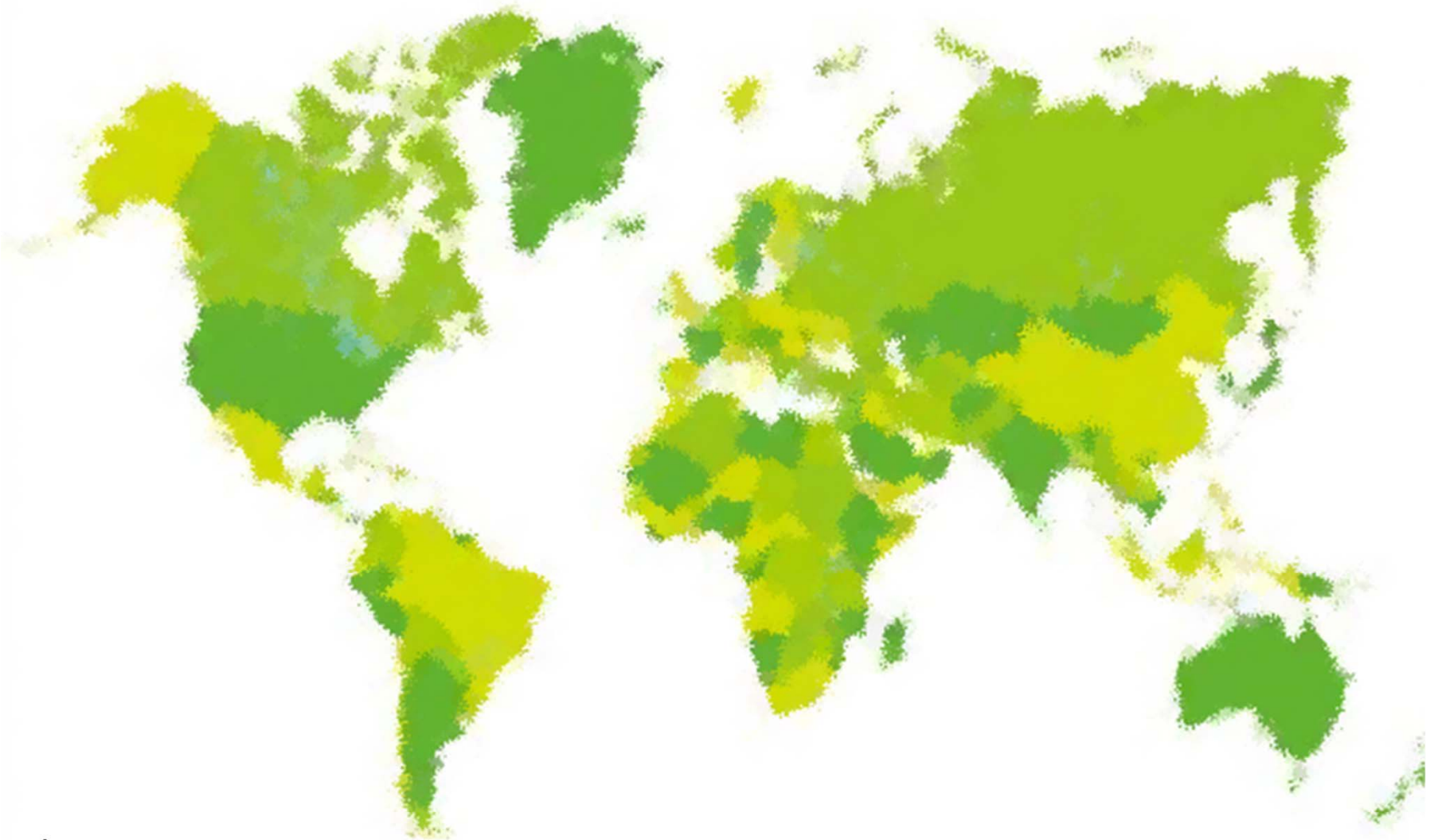


Challenges in Emission Growth



Cooperation Opportunity in LMC

	Emission Reduction Targets	Sector Contribution	Measures
Lao PDR		<ul style="list-style-type: none"> To increase the share of renewable energy to 30% of energy consumption by 2025; To increase the share of biofuels to meet 10% of the demand for transport fuels by 2025; To make electricity available to 90% of Households in rural area by 2020; Total installed capacity of the hydropower plants will be 5,500 MW by 2020. 	<ul style="list-style-type: none"> Implementation of Renewable Energy Development Strateg Implementation of Rural Electrification Programme; Expansion in the use of large-scale hydroelectricity;
Cambodia	Max reduction of 3,100 Gg CO ₂ eq compared to baseline emissions of 11,600 Gg CO ₂ eq by 2030.	Energy Industry:16%; Manufacturing Industry: 7%;Transport: 3%.	<ul style="list-style-type: none"> National grid connected renewable energy generation; Off-grid electricity such as solar home systems,promoting mass public transport; Promoting use of renewable energy and adopting energy efficiency for garment factory, rice mills, and brick kilns;
Myanmar		<ul style="list-style-type: none"> Increase the share of hydroelectric generation within limits of technical Hydroelectric potential: Indicative goal - 9.4 GW by 2030; Rural electrification through the use of at least 30% renewable sources as to generate electricity supplies; To realise a 20% electricitysaving potential by 2030 of the total forecast electricity consumption. 	National Comprehensive Development Plan (2011-30); Long Term Energy Master Plan; National Electrification Master Plan; Comprehensive Village Development Plan; National Energy Efficiency and Conservation Policy
Vietnam	Domestic resources GHG emissions will be reduced by 8% by 2030 compared to the Business as Usual scenario, with emission intensity per unit of GDP will be reduced by 20% compared to the 2010 levels;	<ul style="list-style-type: none"> Improve effectiveness and efficiency of energy use; Change the fuel structure in industry and transportation; Exploitation and increase the proportion of new and renewable energy sources in energy production and consumption; Promote effective exploitation and increase the proportion of new and renewable energy sources in energy production and consumption. 	<ul style="list-style-type: none"> Change the energy structure towards a reduced share of fossil fuel, encouraging the exploitation and use of renewable and low GHG emission energy sources; Assure national energy security by developing and exploiting different energy sources, while simultaneously using energy sources effectively; Develop and implement financial and technical mechanisms and policies to support research and the application of appropriate advanced technologies.
Thailand	7-20% GHG emission reduction by 2020 below business-as-usual in the energy and transport sectors.	<ul style="list-style-type: none"> 20% share of power generation from renewable sources in 2036; 30% share of renewable energy in the total final energy consumption in 2036; LoweringThailand's energy intensity by 30% below the 2010 level in 2036. 	<ul style="list-style-type: none"> Ambitious targets are defined in the Power Development Plan (PDP), Alternative Energy Development Plan (AEDP) and; Energy Efficiency Plan (EEP).



Thanks for Your Attention!

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