Meishan Near-zero Carbon Zone of China

9/6/2019

Near-zero Carbon is a National Pilot Program of China's Comprehensive Low Carbon Policy Framework

Low-carbon Policy Framework:
Urban Development Pilot sets

China has set up a series of goals regarding low-carbon development pilots

50 Near-zero Carbon Zone pilot projects by 2020

100 National Low-carbon Pilot Cities

80 National low-carbon Industrial Park Pilots

20 National Low-carbon Industry Demonstration Parks

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 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 Zone pilot projects, to select up 50 pilot projects by 2020."

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

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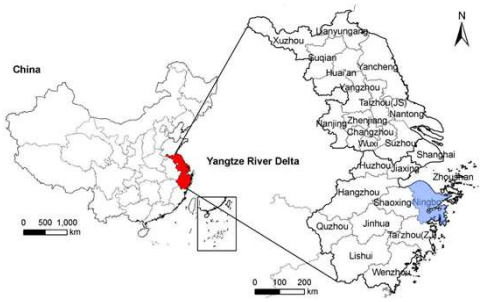
Meishan is a complex urban development project with ambitious carbon goals, located in the city of Ningbo.



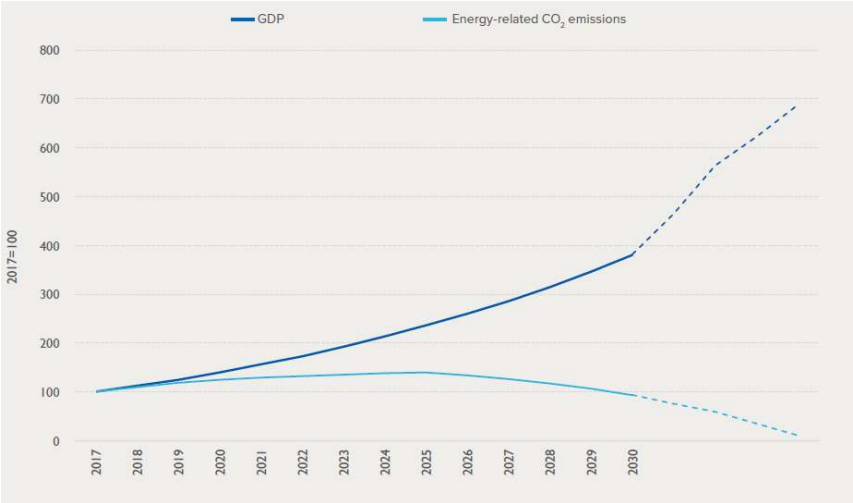
	Area	Population
Meishan	330 km^2	300k (2030)
Oakland	202 km^2	425k (2017)

An emerging east coast economic center: Meishan district is located in the city of Ningbo, 270 km from Shanghai. Over the past two decades it has grown from a fisherman village to an emerging economic center on the east coast of China.

Unprecedented scale and complexity: Meishan is a large-scale "port+industry+city" integrated urban development projects, with site area of 330 km^2 and population of 300,000 people.

Ambitious carbon reduction and economic goals: Meishan's ambitious carbon goal is setting the standard for low-carbon district-level projects.

Meishan develops international leading near-zero carbon demonstration zone with green "Meishan mode"

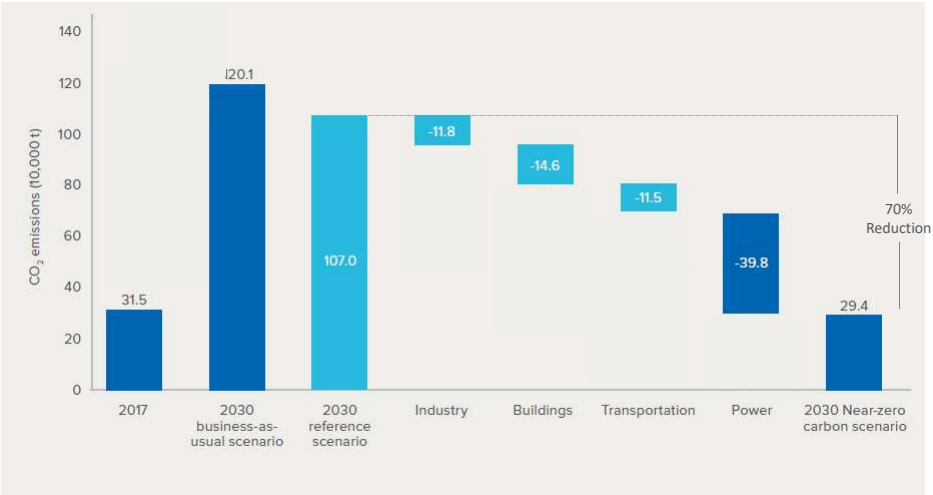


Meishan in 2030:

- Economy is expected to be 3.8 times higher.
- Population is 3.3 times larger.
- Per capita GDP is greater than $40,000 (equivalent to leading higher-income countries).

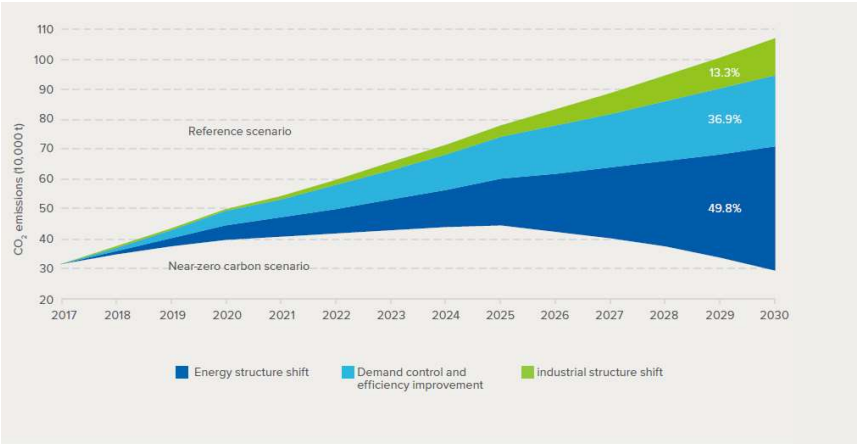
Total carbon emissions remain below 2017 levels (about 300,000 tons of CO2).

Meishan achieves emissions reduction in various sectors through low-carbon technologies and market innovation



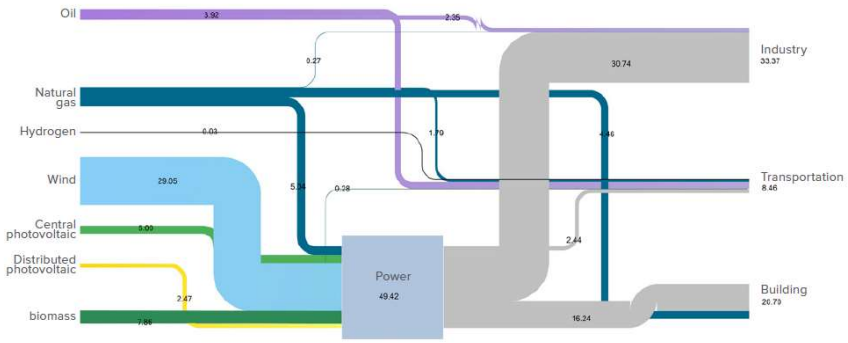
- Compared with the reference scenario of undertaking common low-carbon measures, Meishan can achieve an overall emissions reduction of up to 70% by 2030.
- Decarbonization in the power sector will be a major source of emissions reduction potential.
- The buildings, industrial, and transportation sectors have huge potential for energy conservation and electrification given the rapid growth of energy demand.

Meishan accelerates the transformation of the industry and energy sectors and enhancing economic advantage



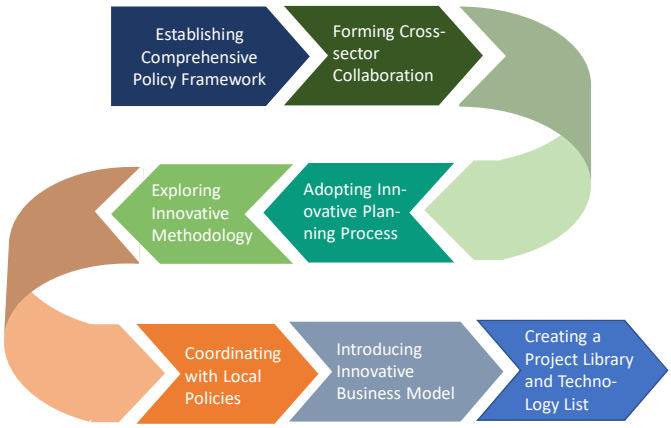
- **Energy structure shift: 49.8% contribution.** Energy supply in Meishan will be dominated by electricity and natural gas, with the aim to establish a coal-free city. Its electricity supply will come mainly from local renewable energy to form a near-zero carbon power system.
- **Demand control and efficiency improvement: 36.9% contribution.** Meishan is also widely utilizing advanced near-zero carbon technologies so that its energy efficiency and emissions reductions will reach or exceed global leading standards.
- **Industrial structure shift:13.3% contribution.** Meishan's economic growth will be driven mainly by efficient, environmentally protective, low-carbon industries, building a green and low-carbon industrial system.

Meishan generates the majority of energy with renewables and significantly increasing the electrification rate



- By 2030, energy supply in Meishan will be dominated by electricity and natural gas, with the aim to establish a coal-free city.
- Renewable energy in Meishan is expected to account for more than 71% of its primary energy consumption by 2030.
- Meishan's wind, solar, biomass, marine energy, and other renewable energy sources will account for 90% of its power supply

Meishan demonstrates an effective way to develop a near-zero carbon zone



- The development of each near-zero carbon zone is unique, but they all share some general characteristics.
- By examining the development of world-leading near-zero carbon zones, it's not difficult to see that most near-zero carbon construction follows a general procedure, from the initial stages to final implementation, to ensure the project can achieve its carbon-reduction goal

Establishing a Integrated Organization Structure to Promote Cross-Sector Collaboration

City level working group

Leader Secretary General of the municipal government

Associate leader Main leader of the management committee

Group members Ningbo DRC
Relevant departments

Office

Administrative Committee level working group

Leader Main leader of the management committee

Associate leader Division leader of the management committee

Group members

- Economic development bureau
- Main person in charge of the relevant functional department
- Key research institutions
- Head of port and electric power enterprise

Office

Director Main head of Economic development bureau

Members

- Management Committee Office
- Economic development bureau
- Construction Bureau
- The Bureau of Finance
- Planning branch

Research project level working group

Leader Main leader of the management committee

Associate leader

- NCSC
- Ningbo DRC
- Management Committee
- Rocky Mountain Institute

Group members

- NCSC
- Ningbo DRC
- Ningbo development and plan research institute
- Meishan management committee
- Rocky Mountain Institute

International Energy Finance Innovation Center (IEFIC)

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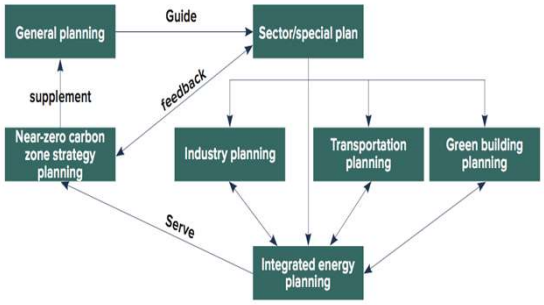

Adopting Innovative Planning Process

An innovative planning process proposes to frontload whole-system strategic planning, conduct technical-economic analysis to support decision- making, and set a roadmap and goals before the urban planning document is completed.

- As a complement to the master plan, the near-zero carbon strategic plan is made with full consideration of the region's development status and technical and economic studies. The near-zero carbon strategic plan clarifies the objectives of the near- zero carbon zone and specific sector targets with the support of quantitative analysis. Relevant policy recommendations are proposed based on the plan.
- The objectives of the strategic plan will be expressed as specific indicators and included in the master planning, and the relevant indicators will be used to further guide the sector-based planning, including industrial spatial planning, transportation network planning, green building planning, and integrated energy planning. It is important to carefully coordinate all sector-based planning to reflect the systematic nature of the regional energy system as a whole.

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Exploring Innovative Methodology

Introduction of ZERO (Zero Emission Reinventing Operator)

ZERO (Zero Emission Reinventing Operator), based on LEAP (Long-Term Energy Alternative Planning), is a model developed for analyzing the pathways for greenhouse gas emissions reduction. It simulates the process of converting primary energy to secondary energy and to different forms for end use. The model uses detailed techniques to describe the process of energy ow and logistics that can be used for both service-oriented and scenario-oriented analysis to estimate energy savings- and emissions reduction- potential in specific target years.

Innovative analytical tools are the basis for quantitative analysis for regional development. The energy system analysis tools are developed based on energy modeling that demonstrates the balance between energy supply and consumption, and are also based on the collection of data needed to carry out a relevant scenario analysis. The energy model should be able to analyze the difference between the business-as-usual scenario and the near-zero carbon scenario based on an analysis of regional economic development, future economic goals, the status of renewable energy resources, and historical energy consumption. The goal of adopting an innovative energy model is to ensure quantitative targets that are both economically and technically feasible and are tailored to meet local needs.

Coordinating with Local Policies

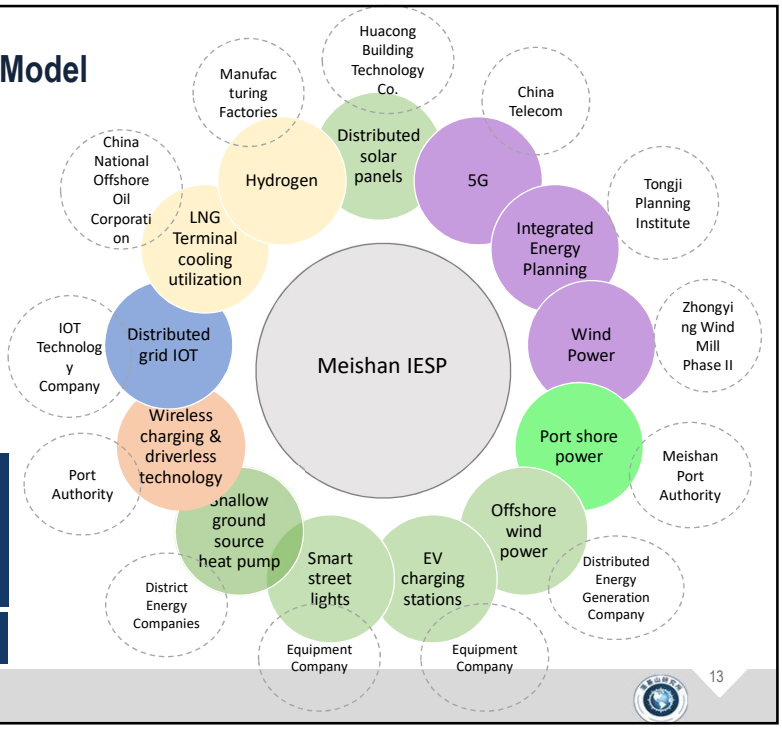
- The construction of a near-zero carbon zone is a complex process that involves all levels of government and covers all sectors in daily operations;
- Coordinating high-level planning with local policies is often critical to implementation.

The general steps to ensure efficiency in coordination:

1. Releasing the targets and goals of the near-zero carbon zone, and releasing the construction plan;
2. Integrating carbon-related targets into sector-based planning to balance development needs and carbon emissions-reduction efforts; and
3. Utilizing local fiscal funds to support the near-zero carbon zone through promoting public–private partnerships (PPP) and other market-based innovative financing mechanisms.

Introducing innovative Business Model

- IESP Model Forms an Open Platform for Ecology
- IESP plays a key role in combine energy companies, internet companies, telecom companies, equipment companies, financial companies to incentive cutting-edge technology application.



Funding Sources:

- Zhejiang Province IESP Company
- Jili Car Group
- State Grid Special program
- Government and research fund
- Major repairment program
- Other

Implementing Entities

Creating a Project Library and Technology List

- A project library and technology list are policy tools to better support implementation by clarifying the technical and economical roadmap of the near-zero carbon zone.
- A project library is an important tool to coordinate a large-scale, complex project that requires cross-institutional collaboration.
- The technology list provides technical support for the entities that implement projects, demonstrating clear technical selection criteria and setting priorities to enhance project delivery.

Project library

Project name
Schedule
Scope
Stakeholder
Fiscal condition

Technology List

Building
Envelope
Cooling system
Heating system
Lighting
Equipment
Transportation
Industry
Energy

Next Steps: Policies, Actions and Investments

National Policy	Local Policy Release:	Business Collaboration:	Star Projects
• NDRC • Major Ministries • UN Climate Summit	• NZC Master Plan • LCA building code	• Integrated Energy Service Provider (IESP)	• 5G Full Coverage • Smart Port • Light Rail • Hydrogen Utilization • LNG Cooling Power

Thank You!