APEC LCTs Development in China based on the Experience of LCMT Project in Yujiapu

Li ZHU, President

APEC Sustainable Energy Center

APEC Low-Carbon Model Town Project Wrap-up Symposium

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Contents

Introduction of Yujiapu Financial District

- Yujiapu is located in Tianjin, China. Tianjin is the second largest city in the north of China, located at the north of the north China plain. Tianjin Binhai New Area, located at the eastern coast of Tianjin, is in the core area of the Bohai Economic Rim, with a total area of 2270 square kilometers.
- Yujiapu Financial District covers an area of 3.86 square kilometers and surrounded by water on East, West, and South side. The District is planning to build 120 buildings with a total construction area of 9.5 square kilometers which is a comprehensive international central business district with business and financial functions, including commercial, exhibition, leisure, cultural and entertainment functions.

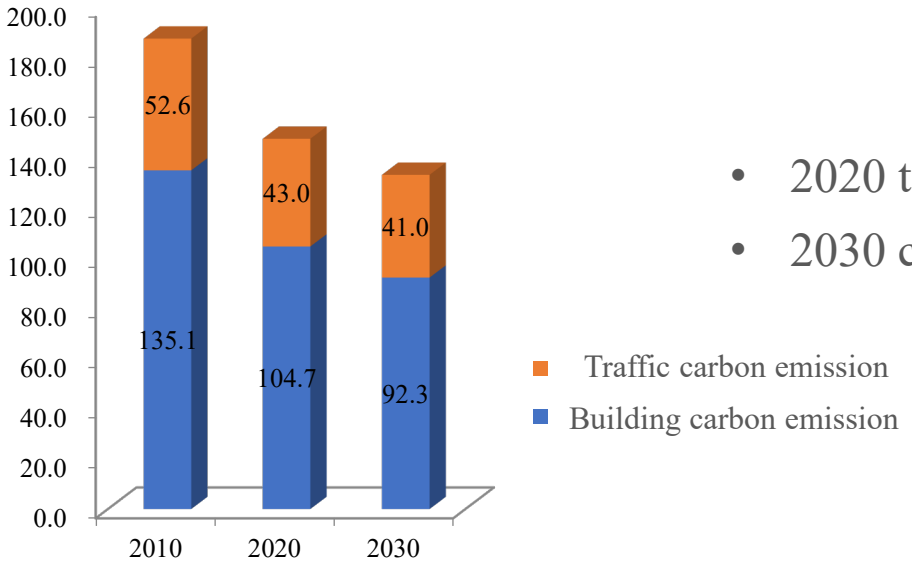
Low-Carbon Model Development in Yujiapu Financial District

Tianjin Innovative Finance Investment Co., Ltd.(TIFI) is the operator of Yujiapu Financial District, undertaking the overall planning, development and construction, investment attraction and management of the whole District. In terms of industrial clustering, TIFI cooperates with government departments, enterprises, institutions, the public and other APEC economies in Yujiapu. In terms of operation and management, with the goal of "low-carbon Yujiapu, smart financial district", TIFI will create a low-carbon smart industry chain covering the whole process of technology research, investment and construction, as well as operation and management to drive the development of the regional economy and the regional low-carbon town.

天津新金融投资有限责任公司
Tianjin Innovative Finance Investment Co.,Ltd.

CO_2 reduction results and roadmap

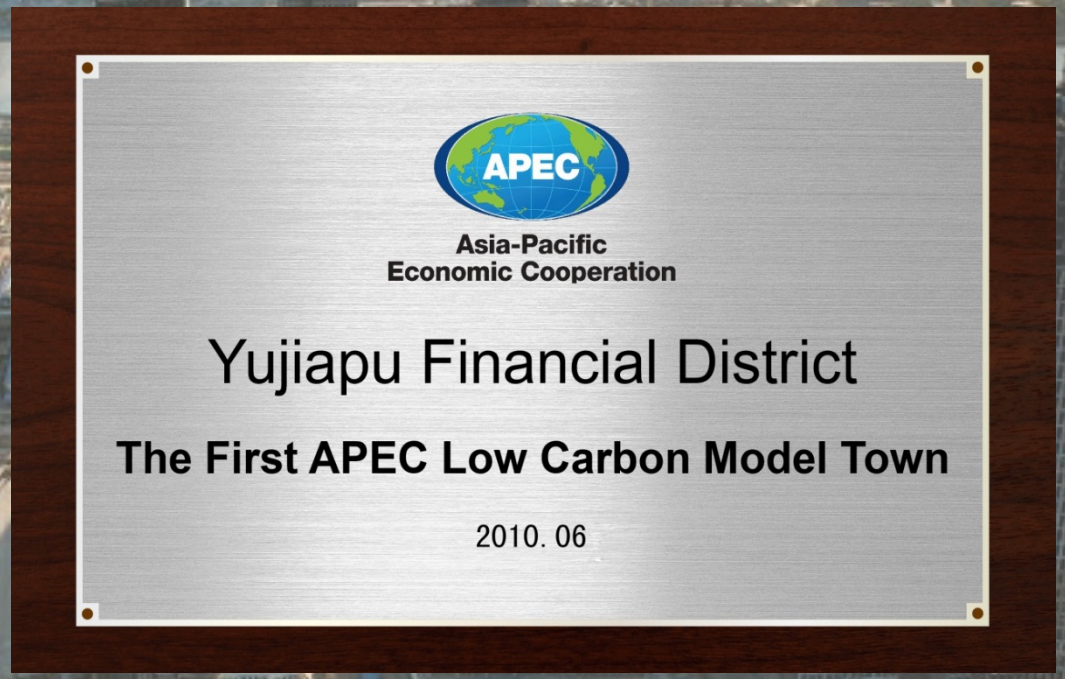
Taking the average carbon emission level of Tianjin in 2010 as the benchmark for target setting and the actual built-up area normal operation carbon emission level as the comparison object respectively, the total carbon emission target of Yujiapu is 1.466 million tons in 2020 and 1.322 million tons in 2030, which will achieve the absolute total target emission reduction of about 30%.



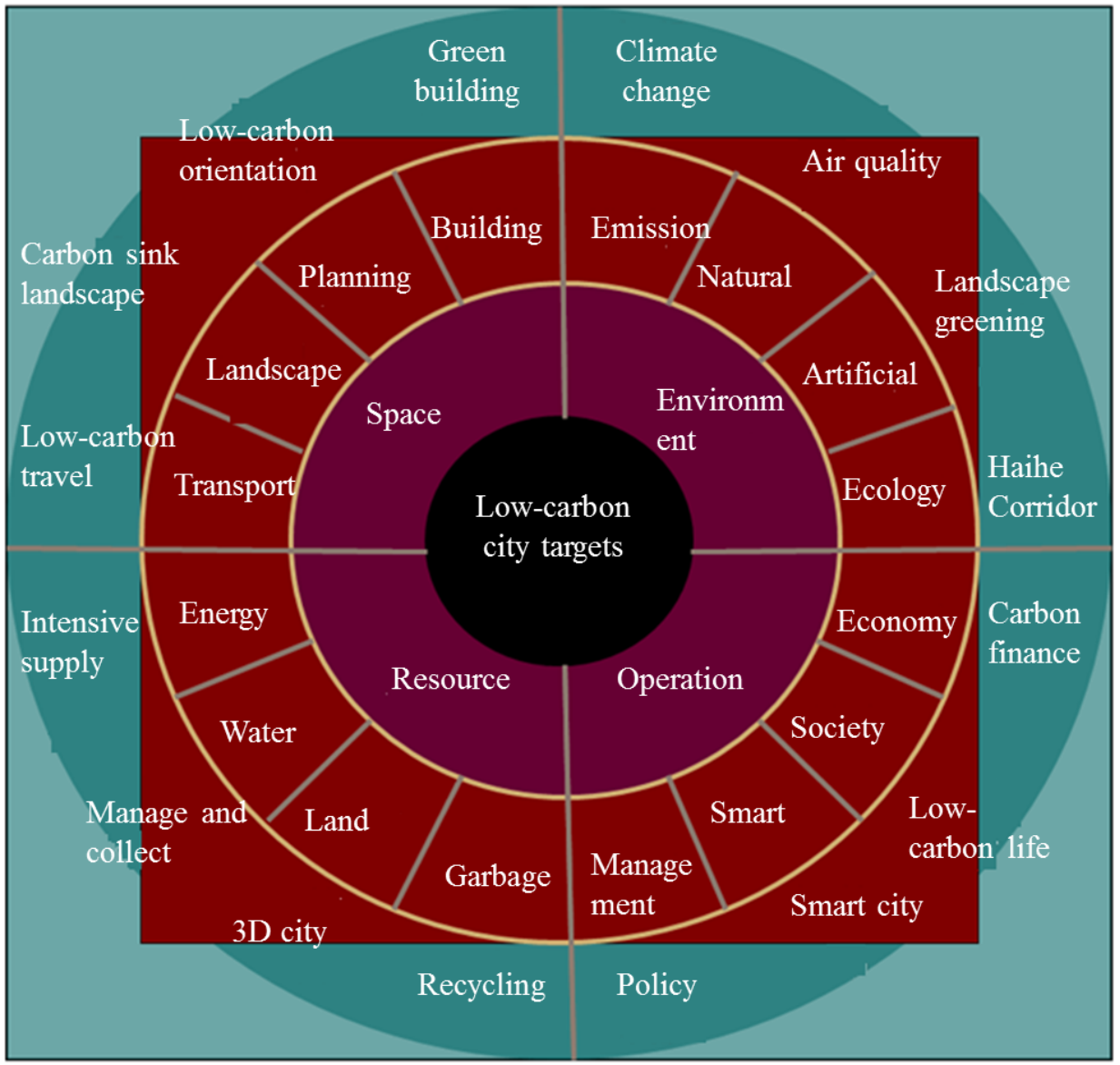
- 2020 to reduce carbon dioxide emissions by about 20% compared with 2010;
- 2030 cuts total carbon dioxide emissions by about 30% from 2010 levels.

Low-Carbon Model Development in Yujiapu Financial District

- At the 9th APEC Energy Ministerial Meeting held on June 19, 2010, Yujiapu Financial District was designated as the **First APEC Low-Carbon Model Town**.



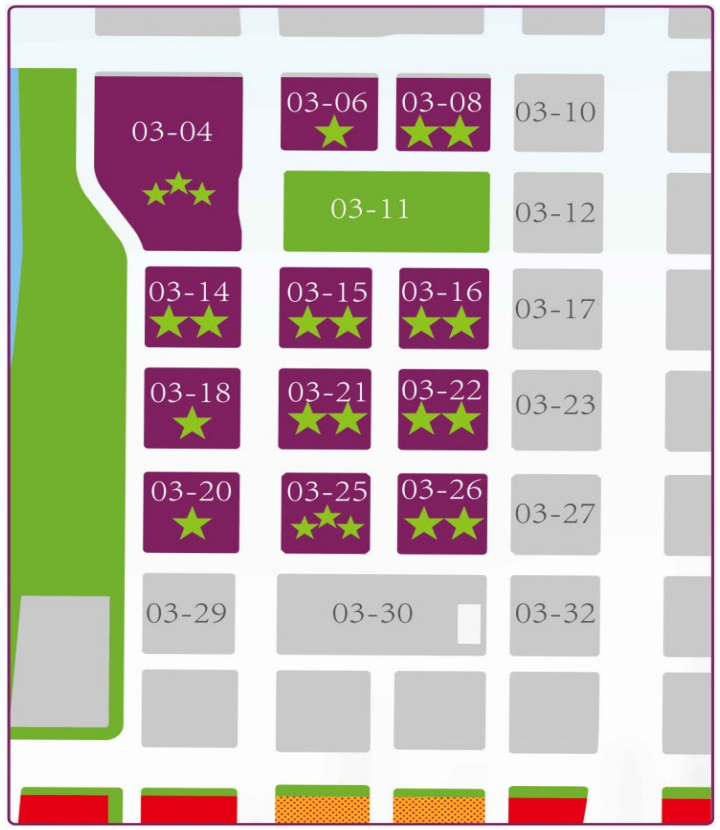
Technical Path of Low-Carbon City Construction



KPI Low-carbon Town Index System

Index category		No.	Index	Value	Time	Construction time sequence			Implementer		
						Near term	Mid term	Long term	Government	Enterprise	Public
Low-carbon environmental protection	Low-carbon environment	1	Total carbon emissions	Reduce by 30% in 2030 over 2010	2030			●	◆		
		2	Carbon intensity	≤150 t/million dollars of GDP	2020		●		◆		
		3	Per capita carbon emissions	≤4.4 t/person	2030			●	◆		
	Artificial environment	4	Green ratio of built-up areas	≥40%	2020		●		◆		
		5	Indoor PM2.5 daily average concentration	≤35μg/m3	Start from today	●				◆	
		6	Roof greening ratio	≥30%	2020		●			◆	
		7	Multi-level greening ratio	90%	2020		●			◆	
Low-carbon resource utilization	Energy use	8	Coverage rate of intensive regional energy supply	≥70%	2020		●		◆		
	Water resource utilization	9	Daily per capita water consumption	≤90/person•day	Start from today	●					◆
		10	Unconventional water resource utilization rate	30%	Start from today	●				◆	
	Intensive land use	11	Per capita area of land for construction	≤60m²/person	2020		●		◆		
	Garbage disposal	12	Daily per capita garbage generation	≤0.8kg/person·day	Start from today	●					◆
		13	Ratio of separate waste collection	100%	Start from today	●					◆
Low-carbon space organization	Green building	14	Ratio of green buildings	100%, ≥70% for buildings at or above 2 stars	2020		●		◆		
	Urban space	15	Ratio of small residential blocks	≥80%	2020		●		◆		
	Urban space	16	Underground space utilization rate	≥100%	2020		●		◆		
		17	Underground vehicle traffic share rate	≥20%	2020		●		◆		
		18	Length ratio of integrated underground pipe racks	≥35%	2030		●		◆		
Low-carbon travel	3D city	19	Low-carbon travel ratio	≥80%	2030			●	◆		
		20	Mass transit share ratio	≥60%	2020			●	◆		
	Green transport	21	Ratio of new-energy buses	100%	2020		●		◆		
		22	Transfer distance of public transit system	≤200m	2020		●		◆		
Low-carbon economic development	Economic vitality	23	Ratio of R&D input to GDP	≥5%	Start from today	●				◆	
	Low-carbon economy	24	Coverage rate of green procurement on public utilities	100%	2020		●		◆		
		25	Carbon emission investigation rate of large public buildings	80%	2020		●		◆		
		26	Carbon trading participation ratio of large public buildings	80%	2030			●	◆		
Low-carbon city operation	Smart city	27	Coverage rate of intelligent transport	100%	2020		●		◆		
		28	Coverage rate of smart grid	100%	2020		●		◆		
		29	Coverage rate of low-carbon system management service	100%	2020		●		◆		
	Low-carbon policy	30	Perfection rate of low-carbon policy	100%	2030			●	◆		

Green Building



- 100% green building coverage in the area
- over **70%** high-star green building

Low Carbon Transportation

Seven kinds of public transportation, TOD complex function

- **High speed rail** - Long distance foreign public transport services, implement the docking of Yujiapu and Beijing in 45min; In September 2015, It has been built and put into use;
- **Metro** - long and middle distance, both inside and outside, At present, Z4 subway is under construction;
- **Customized bus** - Long and middle distance connection between the two city;
- **Regular bus line** - the internal and external transportation service in middle and short distance;
- **Inside shuttle bus** - Transfer orbit and external bus stops;
- **Bicycle rental** - Internal short low carbon travel; Riverside park of slow-traffic system is under construction;
- **Sightseeing boat** - Haihe river tour.

Low Carbon Energy

Northern cooling center

Southern cooling center

Coverage rate of intensive regional energy supply≥70%

It planned 7 Cooling Supply Centers in Yujiapu Financial District to provide high quality cooling service to 120 plots, with the total service area of 6900000㎡, in the percentage of 72.9% of the planned construction area.

Underground Space

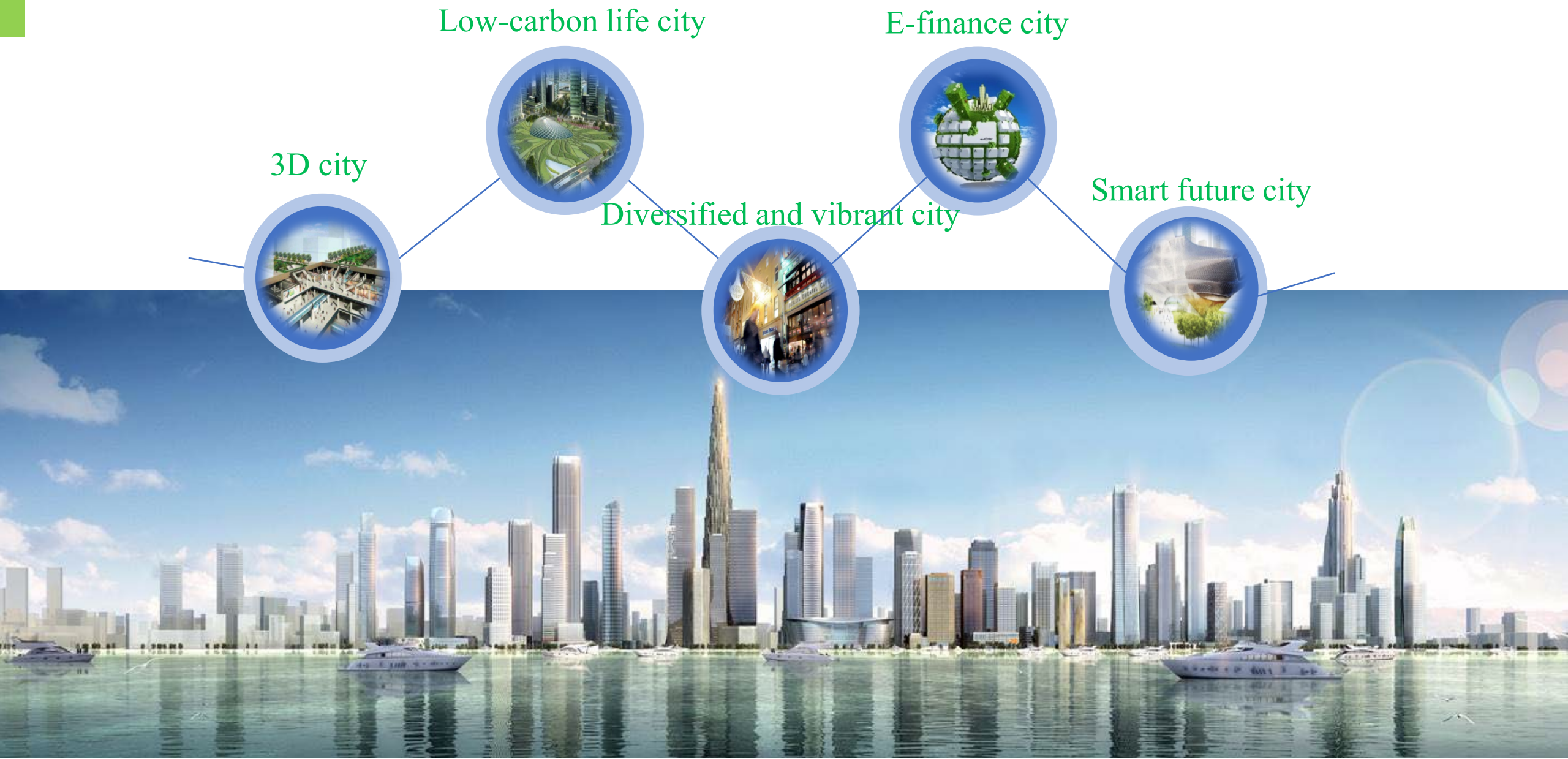
- The underground space within boundary line of building is nearly 4 million square meters
- Function: Transportation/commerce/culture/leisure/parking /disaster prevention

- Vehicle system
- Pedestrian system
- Commercial system
- Common ditch system
- Rail transportation system

Low Carbon Landscape

River landscape, Open space, green belt of Central Avenue and the green roofs, Green ratio close to 40%

Low-Carbon Decomposition of City Orientation



Low-Carbon Targets

C1 a new town realizing absolute carbon emission reduction (CER);

C2 a town with all CER indexes reaching international leading level.

Environmental targets

E1 a high-density metropolis with a good natural environment;

E2 a city at a leading level in intensive utilization of resources and energy;

E3 a smart city owning intellisense technology and environment.

Spatial targets

S1 a 3D city with a high-density intensive layout;

S2 a city with high-performance green buildings and high-carbon-sink low-carbon landscape;

S3 a highly accessible city realizing convenient traffic through mass transit and non-motorized traffic;

S4 a mixed-function city with characteristic urban blocks and vibrant streets.

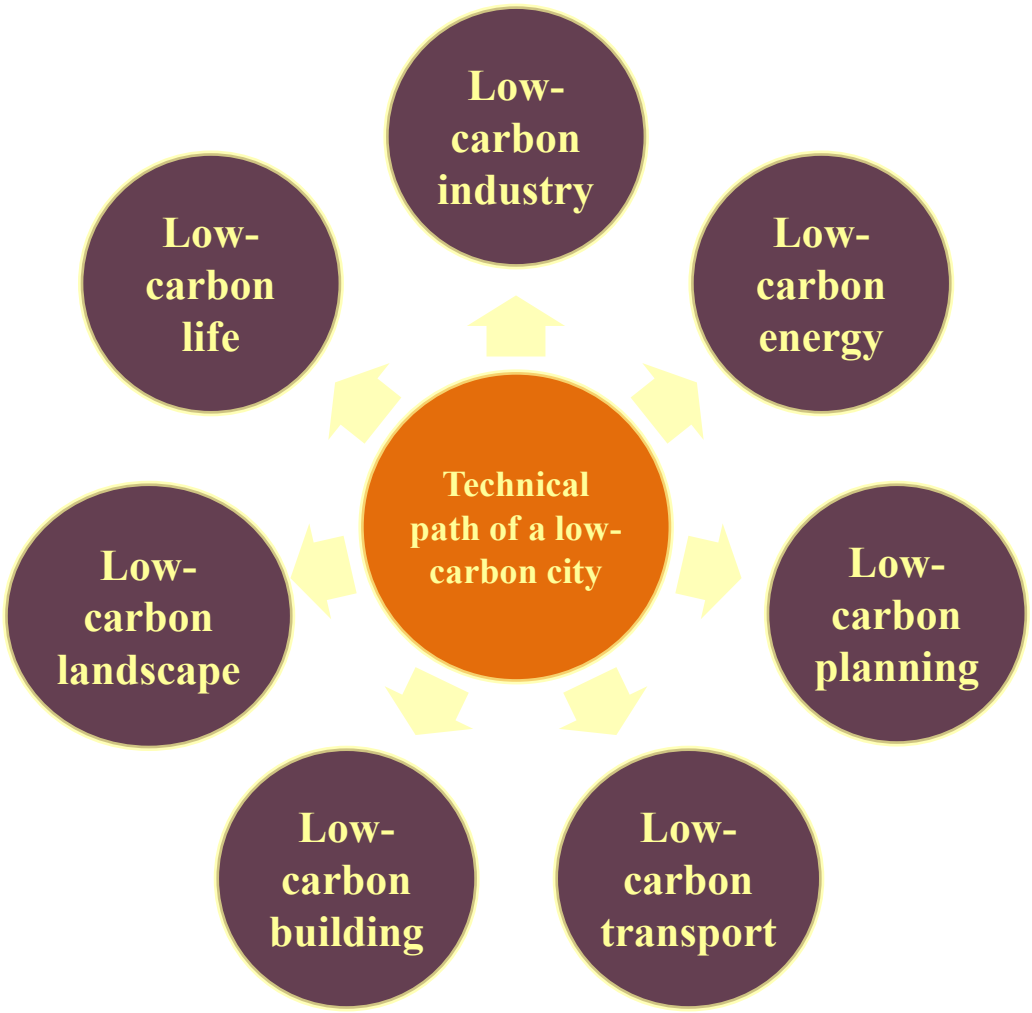
Social and economic targets

SE1 a regional financial center attractive to individuals and companies;

SE2 an innovative city in low-carbon economy, leading carbon finance and carbon trading;

SE3 a city guiding low-carbon life and low-carbon operation by low-carbon policy.

Technical Path of Low-Carbon City Construction



- Compact city
- TOD model
- Mixed use of urban functions
- Develop green buildings
- Reduce energy demand
- Select low-carbon energy
- Raise energy efficiency
- Reduce and recycle wastes
- Encourage mass transit and non-motorized traffic
- Raise carbon sink of natural landscape

China LCT Promotion Activities

2012.11.14 Start Ceremony of Low-Carbon Town Tour in China, Tianjin

"New Energy·New City APEC Forum of Low-Carbon Town development and Start Ceremony of Low-Carbon Town Tour in China" is supported by APEC, National Energy Administration (NEA) and Tianjin Development and Reform Commission, and held by Tianjin University and Tianjin New Financial Investment Company.

2012.11.16
The Tianjin Yujiapu LCMT

2012.12.21
Songhuajiang Farm,
Heilongjiang

2014.3.7
Shenzhen City

2013.8.30
Dongxiang,
Jiangxi Province

2012.12.14
Dalian City

Milestone Meetings

2013.7.22 Kick-off meeting of APEC Low-Carbon Town Promotion Actitivities

National Energy Administration held kick-off meeting of APEC Low-Carbon Town Promotion at Diaoyutai Hotel.

The President Assistant of Tianjin University, Liu Yaochang led a group of members from APEC Sustainable Energy Center Preparatory Working Group for participation, and further clarified the role of Tianjin University in promotion activities and responsibilities and implementation plan of APEC Sustainable Energy Center Preparatory Working Group.

2014.1.22 APEC LCT Index System Review Meeting, Beijing

Zhang Yuqing,
Deputy Director of the National Energy Administration hosted APEC LCMT Index System Review and Communication Meeting in China People's Palace.

More than a hundred delegates from the Foreign Ministry, the NEA, the NDRC, the MHURD, the CDB, local governments, research institutions, the project unit and business representatives participated.

Milestone Meetings

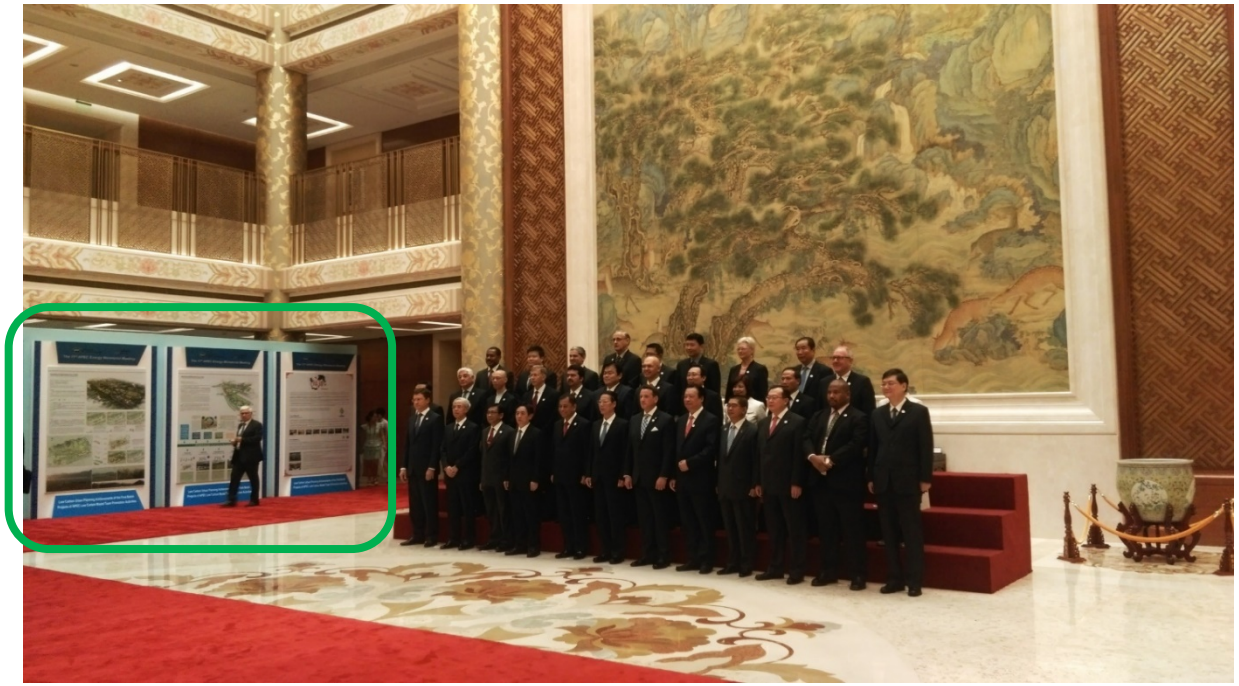
2014.3.21 Seminar on foundation of APEC Sustainable Energy Center

Tianjin University successfully held the Forum of APEC Sustainable Energy Development and Seminar on establishment of APEC Sustainable Energy Center, nearly hundreds of leaders and delegates from NMFA, NEA ,NMST, the Development and Reform Commission of Tianjin, Tianjin Science and Technology Committee attended.

During the meeting, Li Jiajun, the president of Tianjin University officially announced the establishment of Tianjin Energy Research Center and Sustainable Energy Research Center of Tianjin University.

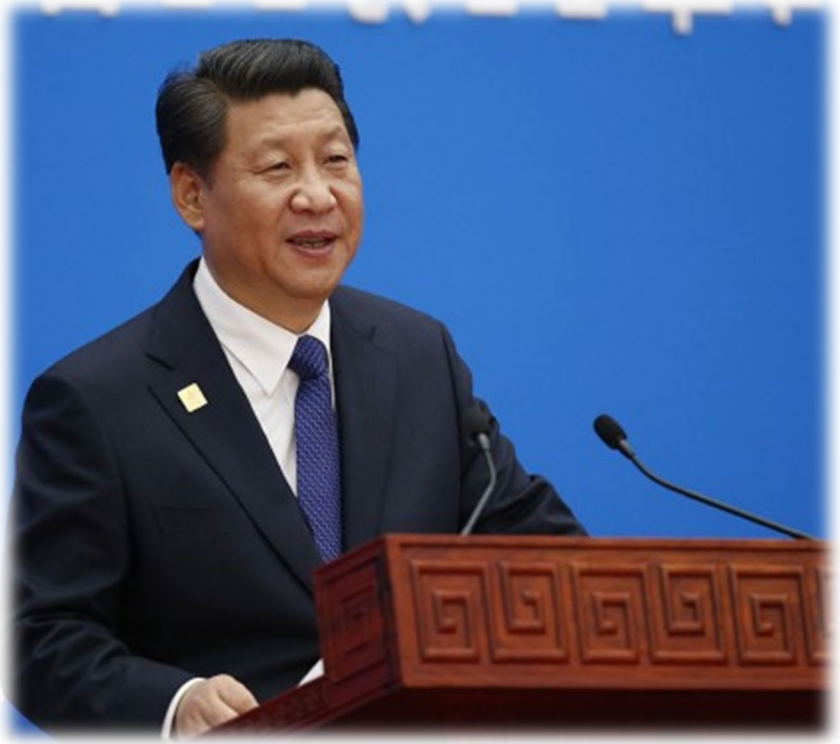
Tianjin Energy Research Center and Sustainable Energy Research Center of Tianjin University gather a lot of wisdom and insight from experts and scholars in terms of technical consulting, academic contributions and international communication, providing a strong intellectual support to establish sustainable energy system in China. In addition, Tianjin University is leading the preparatory work of APEC Sustainable Energy Center based on these two centers, which serve as a solid foundation.

Exhibition on Promotion Activities



Establishment of APEC Cooperative Network of Sustainable Cities

ADOPTED FIRST TIME



The 22nd APEC Economic Leaders' Meeting

2014 APEC Leaders' Declaration

APSEC is the official institute to implement CNSC

- The APEC Cooperative Network of Sustainable Cities was first adopted in the *2014 APEC Leaders' Declaration* in response to the *Beijing Agenda* for establishing APEC Urbanization Partnerships in the 2014 APEC Economic Leaders' Meeting.

51. We recognize that the Asia-Pacific is currently experiencing booming urbanization. We realize that sustained and healthy development of urbanization is conducive to promoting innovative growth and realizing robust, inclusive and sustainable development in the Asia-Pacific.

52. We commend the constructive work undertaken by APEC this year in promoting urbanization cooperation in the Asia-Pacific region, and **endorse *the APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership*.**

53. Recognizing the range of urbanization challenges and opportunities across APEC economies, we commit to collectively promote cooperation projects, and to further explore pathways to a new-type of urbanization and sustainable city development, featuring green, energy efficient, low-carbon and people-orientation.

——2014 APEC Leaders' Declaration

CNSC Work Contents – Urbanization

26. Under the pillar of Urbanization, we seek to identify new drivers of economic growth by pursuing urbanization and sustainable city development. We support APEC partnership initiatives on urbanization and undertake to establish a cooperative network of sustainable cities in APEC economies. We will organize forums, hold policy dialogues, and utilize international sister-cities programs to promote cooperation and share experiences on urbanization and sustainable city development.

27. We will facilitate the use of existing resources for research and capacity building on urbanization. We encourage member economies to support urbanization cooperation and urbanization-related projects, including by making voluntary contributions to establish a sub-fund within the APEC framework.

28. We applaud progress made in the APEC Low Carbon Model Town Project and the promotion activities under it. We underscore the importance of eco-city and smart city cooperation programs, and undertake to explore pathways to green urbanization and sustainable city development.

——APEC Accord on Innovative Development, Economic Reform and Growth

CNSC Work Contents – Urbanization

- The initiative is re-emphasized in the 2015 APEC Leaders' Declaration and APSEC is recognized as the official institute to implement CNSC

14. We encourage **APSEC** to continue its work in expanding sustainable city development across the region, cutting-edge clean energy technologies and other programs on energy resiliency.

We instruct EWG to **work with APSEC** with the assistance of the LCMT-TF to undertake APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership endorsed by APEC Leaders in 2014.

——12th EMM, Cebu Declaration, Philippines

137. We welcome efforts in implementing the APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership. We encourage relevant fora and sub-fora, including platforms like the Asia-Pacific Sustainable Energy Center (**APSEC**), to make contribution to the implementation process.

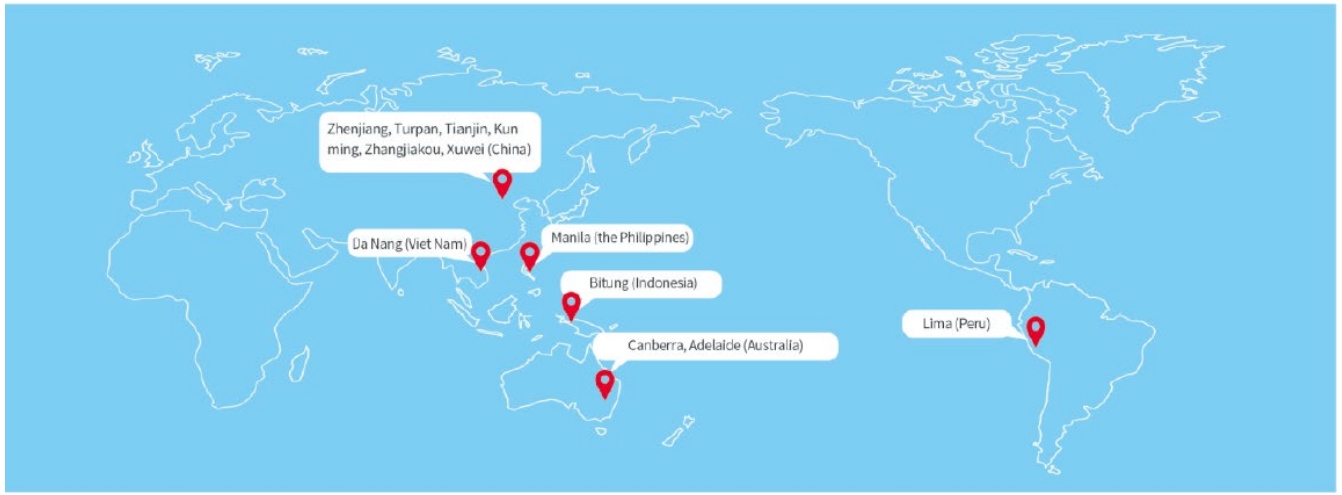
——27th JMS, Manila Philippines

Establishment of APEC Cooperative Network of Sustainable Cities Program Joint Operation Center

- After preliminary communication and efforts, APSEC held a preparatory meeting with China State Construction Co., Ltd. in Tianjin University in July 2017.
- Establishment Ceremony of APEC Cooperative Network of Sustainable Cities Program Joint Operation was held in September 2017.

Cooperative Network

APEC Cooperative Network of Sustainable Cities is an open, share and equitable network for 21 APEC economies by APSEC at the 51st Meeting of APEC Energy Working Group in 2015 in Canberra, Australia, which is consist of “APEC Cooperative Network for Low Carbon Energy Efficient Cities” and “APEC Sustainable City Service Network”.

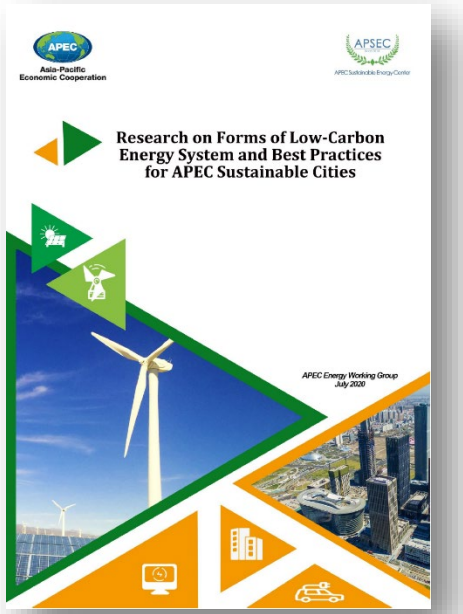


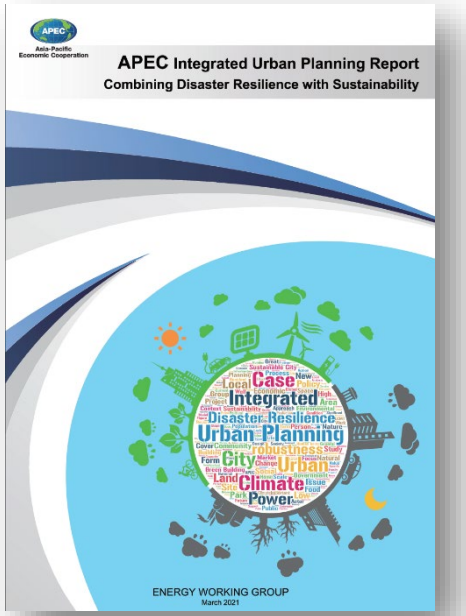
➢ APEC Cooperative Network for Low Carbon Energy Efficient Cities

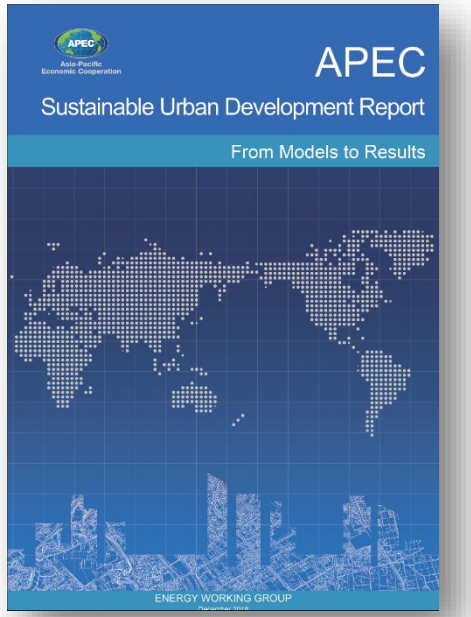
➢ APEC Sustainable City Service Network

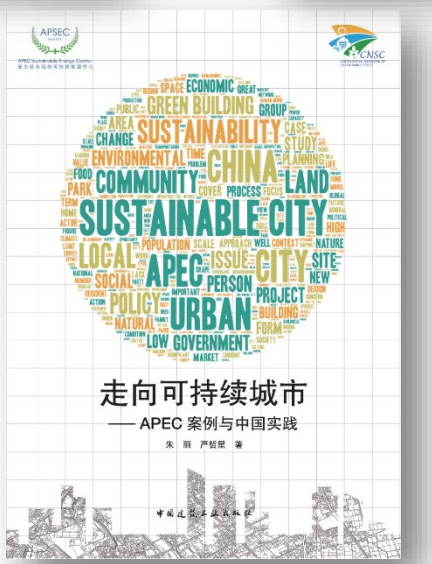
APEC Forum on Sustainable Cities

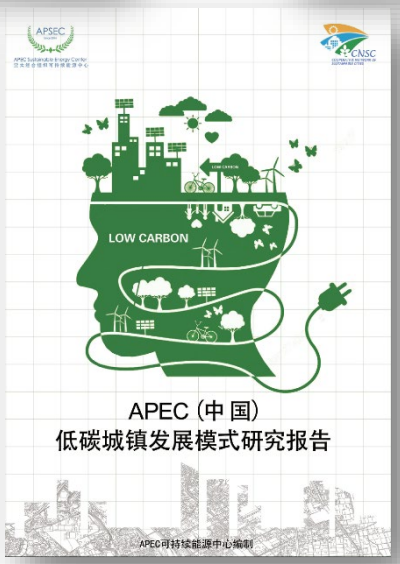
Achievements of CNSC

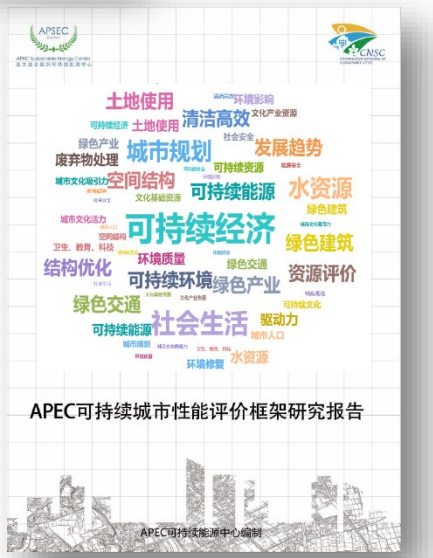












Achievements of CNSC

Program-Indicator System of Zhangjiakou Sustainable Cities

Primary indicator： 6
Secondary indicators： 21

Sustainable Cities	**Internationalization of the City**	International City Branding
		Internationalized service capability
	Energy intensive and efficient utilization	Greenhouse gas emissions
		Energy supply
		Energy consumption
		The promotion of renewable energy
	Resources environment and urban construction	Water conservation
		Ecological support and environmental quality
		Sustainable Urban Space
		Transportation and Regional Connectivity
		Waste disposal
	Urban development and social livelihood	Urbanization development level
		Poverty alleviation and poverty relief
		Health and welfare
	Development quality and innovation drive	Basic economic indicators
		Industry Coordination and Economic Resilience
		Innovation Environment and Innovation Capability
	Urban governance and government efficiency	Legal System and public participation
		Public safety and disaster resistance and reduction
		Government service efficiency
		Smart service and governance

Achievements of CNSC

Achievements of CNSC

☐ Award-Energy Smart Communities Best Practice Award

List of China's Winning Cases in 2019 the 4th ESCI Best Practices Awards Program

Category	Name	Award
Smart Building	Design and Construction Integration(EPC)Project of PNG and China Friendship School	GOLD
	Building Energy Efficiency Program	SILVER
Smart Grids	Smart Integrated Energy Microgrid in Customer Service Center	SILVER

☐ Project-APEC Self-funded Projects

NO.	Project Number	Project Name
1	EWG 07 2015S	Workshop on the Establishment of a Cooperative Network of Sustainable Cities (CNSC) in APEC Economies
2	EWG 06 2018S	Capacity Building on Biomass Energy Utilization based in Moutai Circular Economy Ecological Industrial Park in APEC Region
3	EWG 11 2018S	Research on Effective Strategies for Overcoming the APEC Sustainable Urbanization Gaps
4	EWG 12 2018S	Research on Forms of Low-Carbon Energy System and Best Practices for APEC Sustainable Cities
5	EWG 03 2019S	Energy Smart Communities Initiative (ESCI) Promotion Program in China and Training
6	EWG 09 2019S	Research on the Role of Urban Planning for Addressing Climate Change and Disasters
7	EWG 04 2020S	Innovative Approaches for Scaling-Up Renewable Energy Deployment in APEC Region
8	EWG 04 2021S	Research on Means to Overcome Shortage of Basic Urban Energy-Climate Data

Li ZHU
zhuli1997@tju.edu.com
President, APEC Sustainable Energy Center
Professor, School of Architecture, Tianjin University
Web: apsec.tju.edu.cn

Thank you for your attention !