APEC Sustainable Urban Performance Evaluation Framework

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- **Previous Work**
- **Background Information**
- **APEC Sustainable Urban Performance Evaluation Framework**
- **Future Work**

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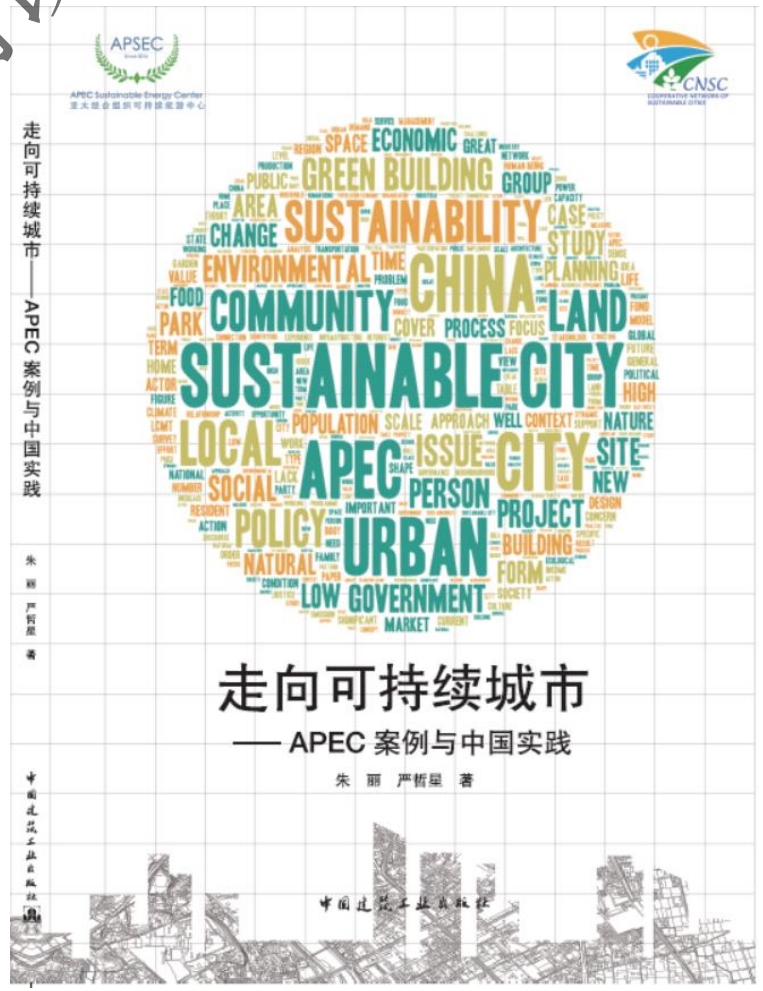
Towards Sustainable Cities-APEC Cases and Chinese Practices

According to the five years working plan of APSEC, APSEC will establish “APEC Sustainable Urban Development Report” as the flagship publication.

- Research on the theories, modes and concept of sustainable cities;
- Share APEC Cases and Chinese Practices
- Chinese publication at China Architecture & Building Press

“Towards Sustainable Cities – APEC Cases and Chinese Practices”



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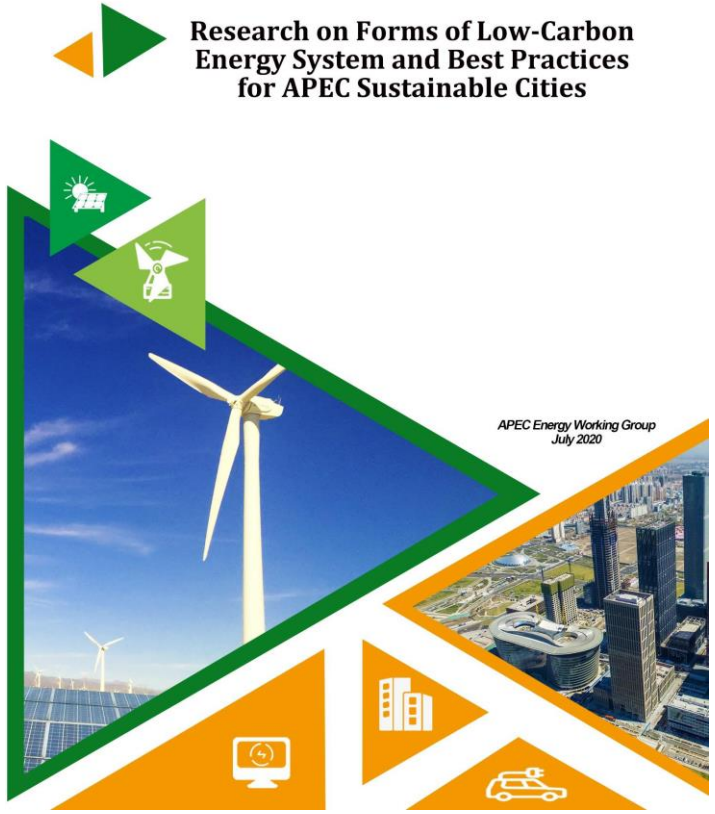
Research on Forms of Low-Carbon Energy System and Best Practices for APEC Sustainable Cities

- Research on city energy supply and city energy use;
- Cases studies of 122 excellent practices;
- Forms of Low-carbon Energy System;
- APEC publication

"Research on Forms of Low-Carbon Energy System and Best Practices for APEC Sustainable Cities"



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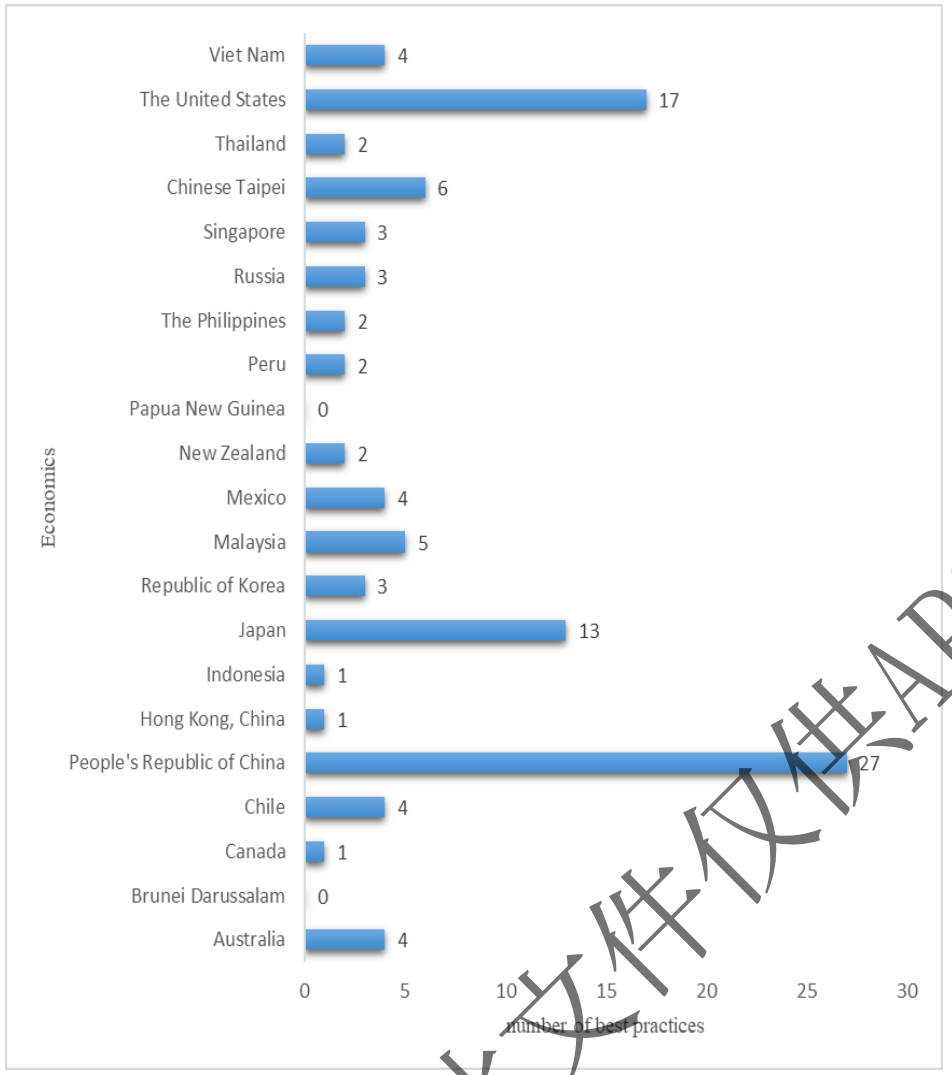

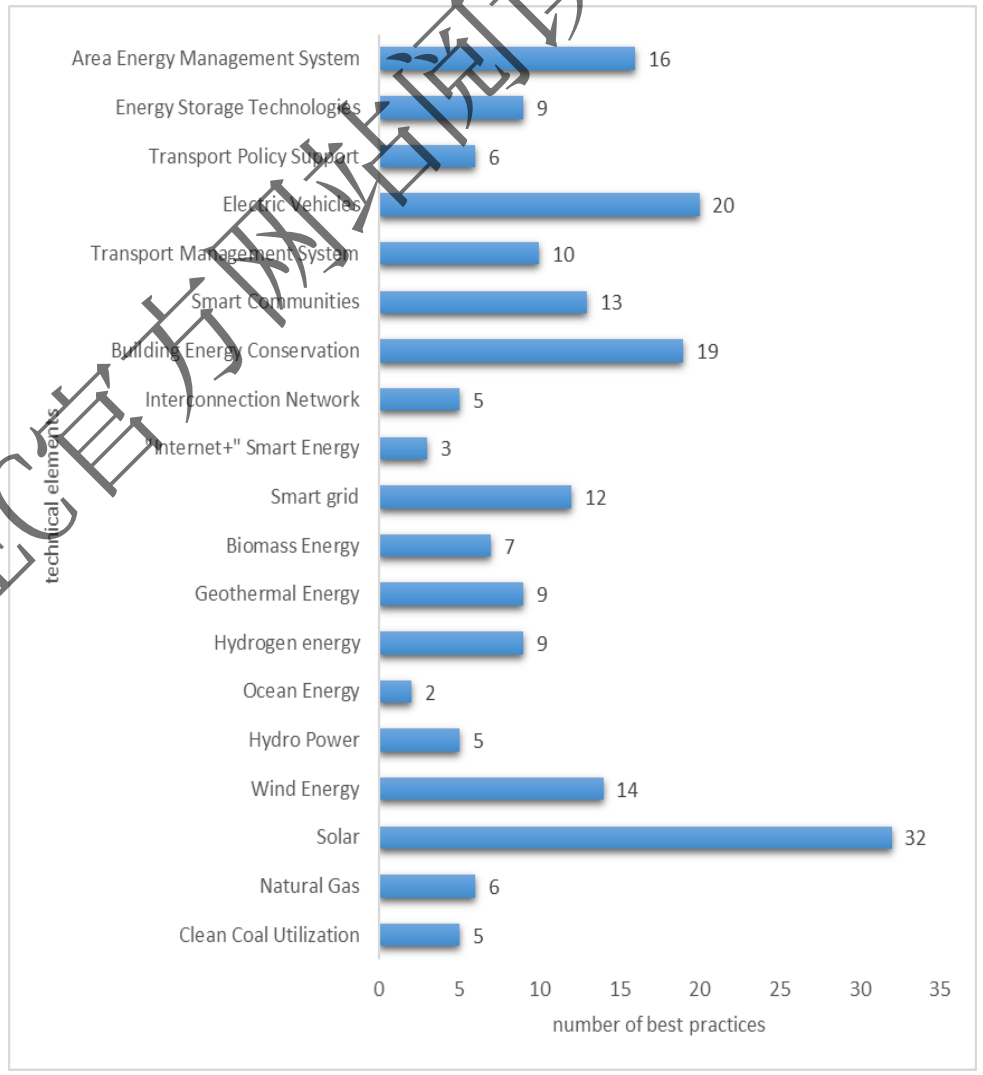

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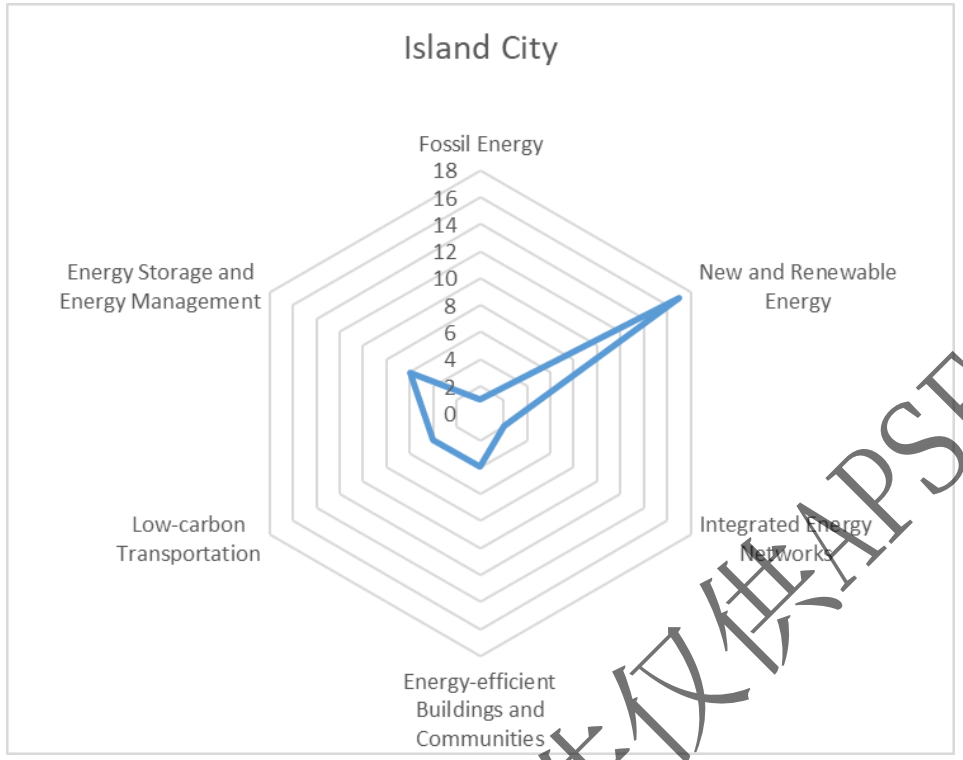

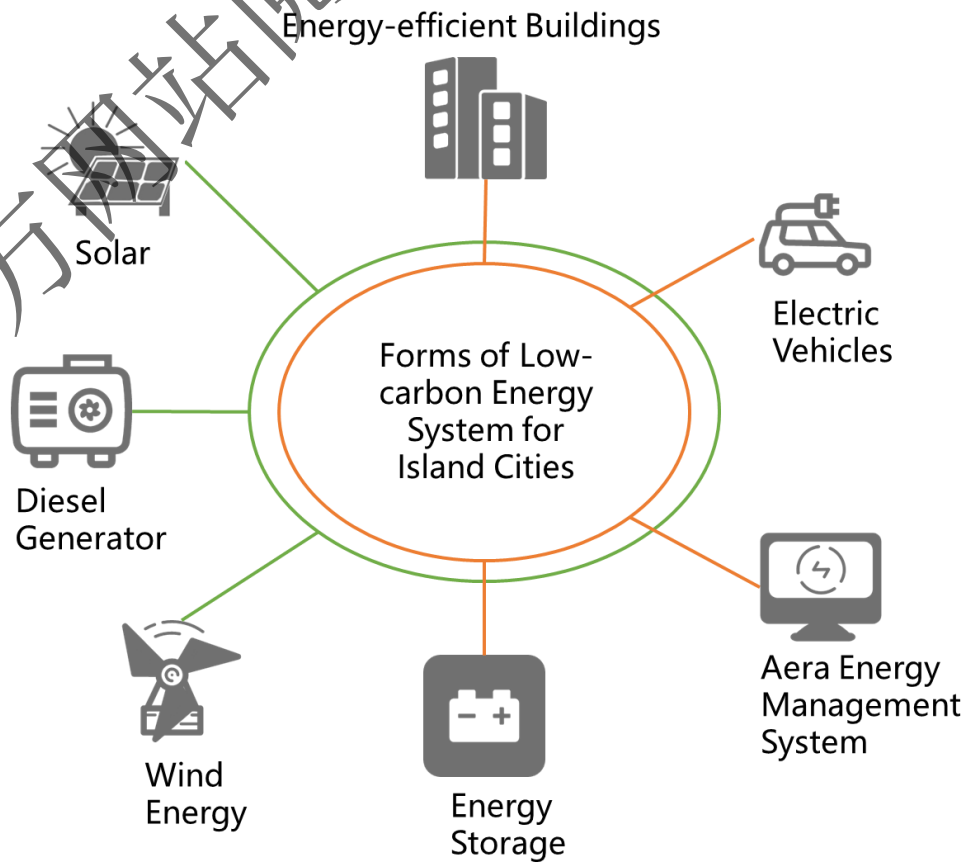

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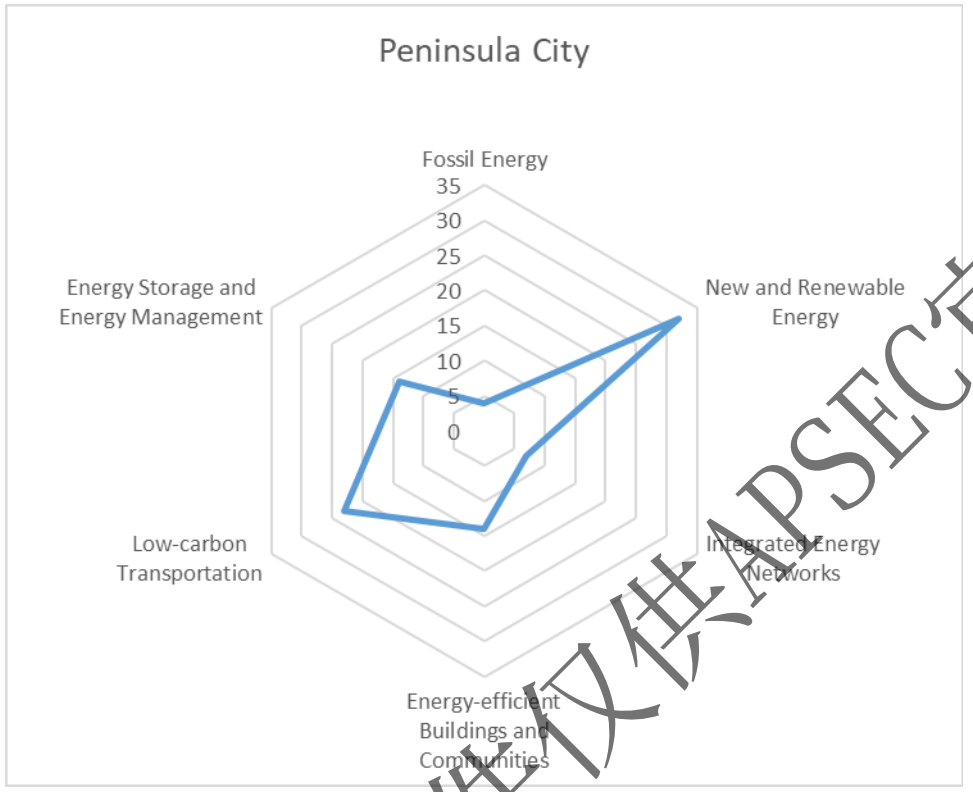

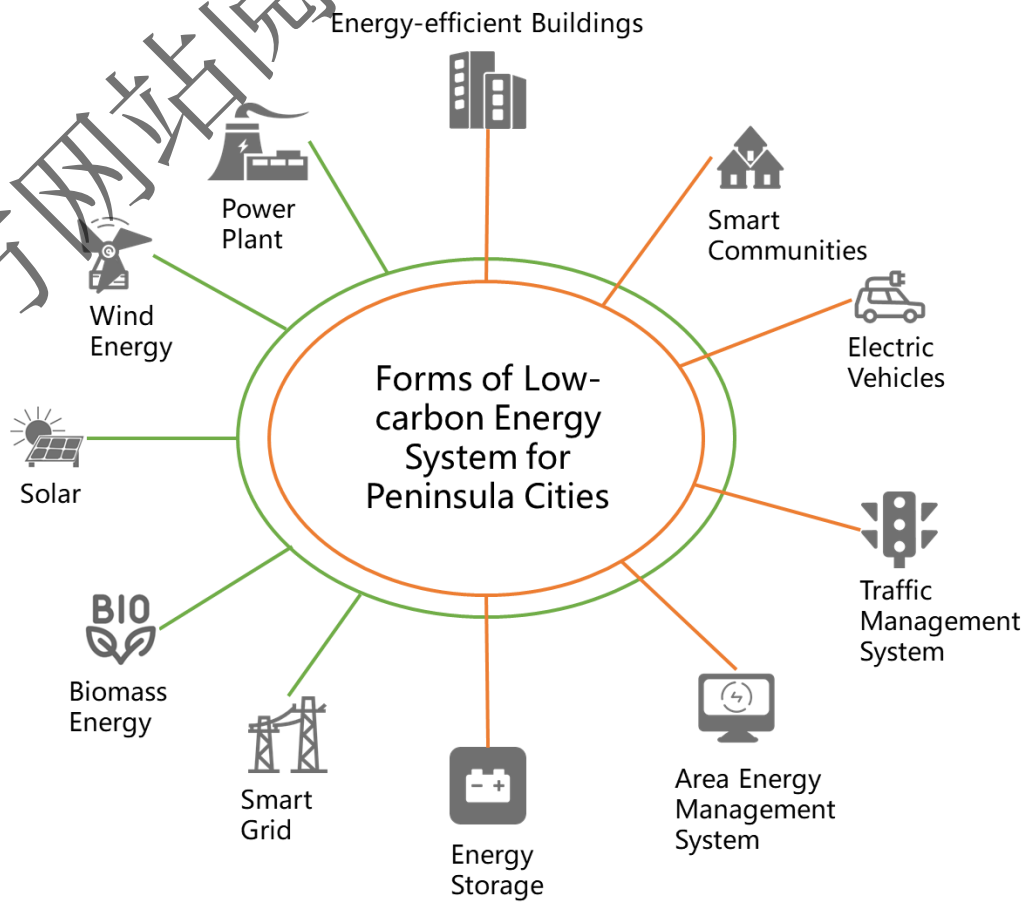

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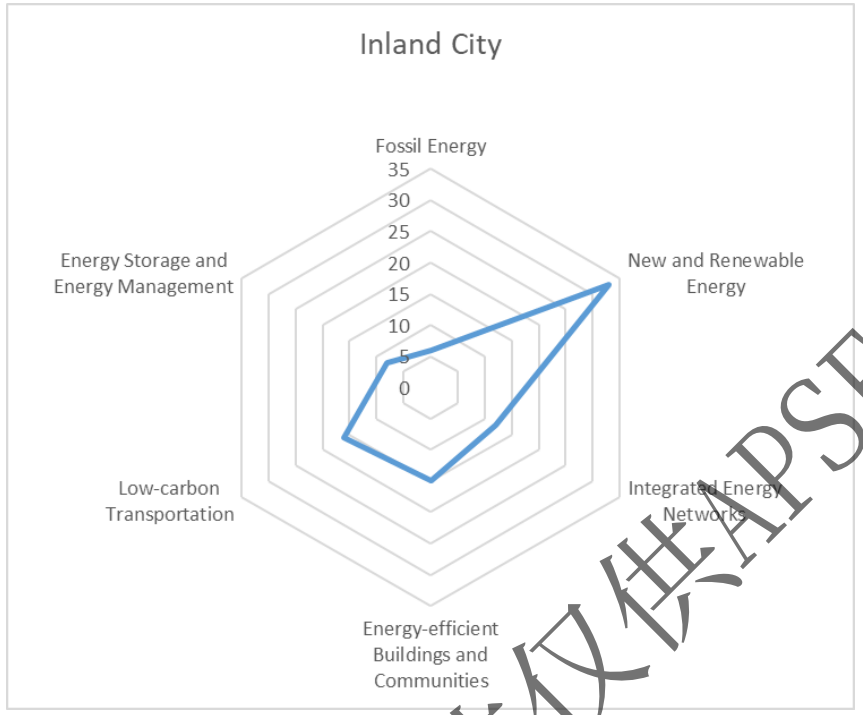

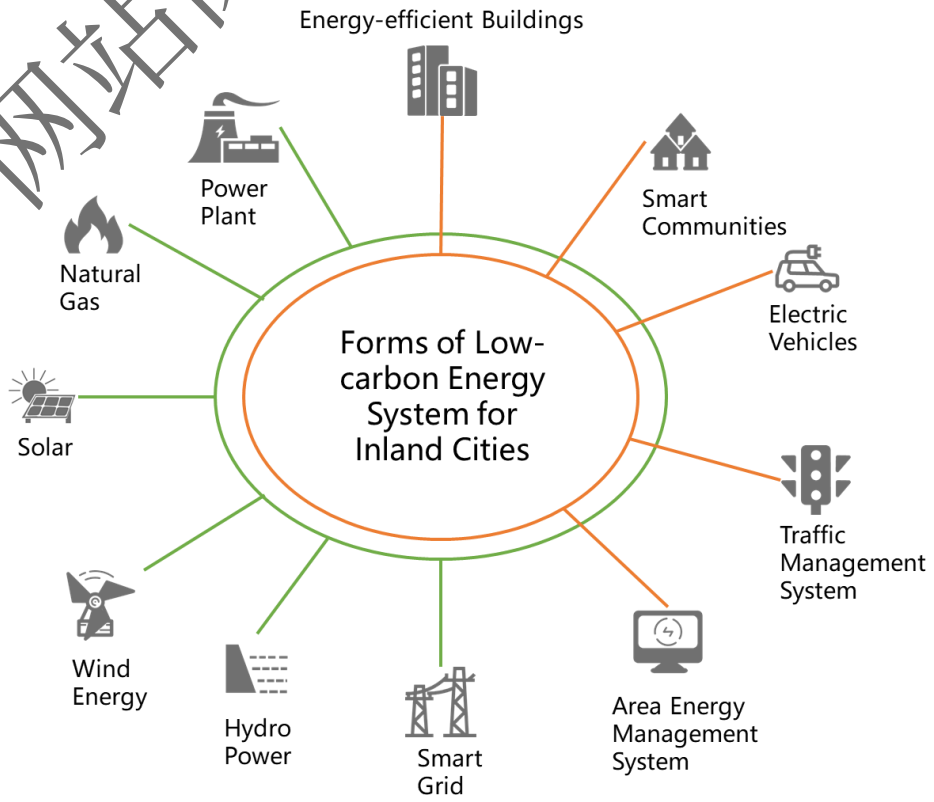

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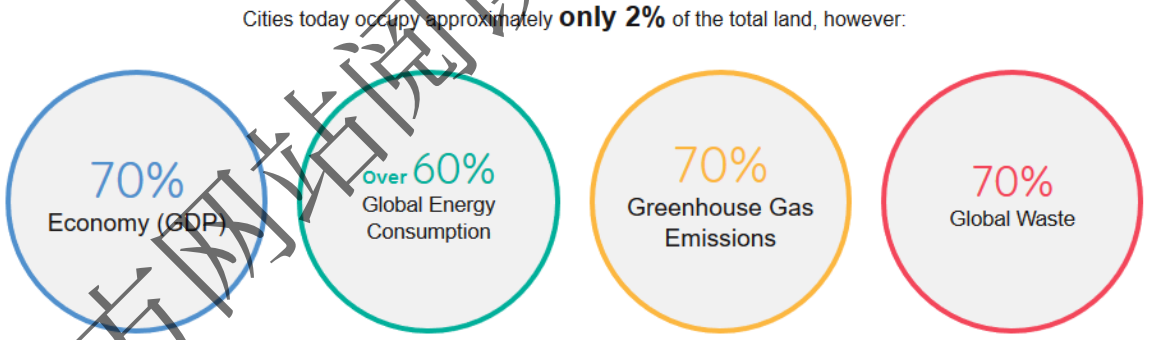
Background Information

Cities today occupy only about **2%** of the total land, but they are responsible for over **60%** of Global Energy Consumption and **70%** of Greenhouse Gas Emissions. During the rapid increase of urbanization and energy demand, APEC member economies need to face the challenge of global climate change.



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Background Information

Sustainable Development Goals/Goal 11

"Make cities and human settlements inclusive, safe, resilient and sustainable"

Two Specific Aspirational Goals of EWG

"To double the share of renewables in the APEC energy mix, including in power generation by 2030; to reduce APEC's aggregate energy intensity by 45% from 2005 levels by 2035."

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SDG Indicators

Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development

United Nations » Department of Economic and Social Affairs » Statistics Division

SUSTAINABLE DEVELOPMENT GOALS

HOME NEWS HLG-PCCB IAEG-SDGs EVENTS SDG INDICATORS REPORTS UNCT TOOLKIT

SDG Indicators

Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development

The global indicator framework for Sustainable Development Goals was developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and agreed upon at the 48th session of the United Nations Statistical Commission held in March 2017.

The global indicator framework was later adopted by the General Assembly on 6 July 2017 and is contained in the **Resolution adopted by the General Assembly on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313), Annex.** According to the Resolution, the indicator framework will be refined annually and reviewed comprehensively by the Statistical Commission at its fifty-first session in March 2020 and its fifty-sixth session, to be held in 2025. The global indicator framework will be complemented by indicators at the regional and national levels, which will be developed by Member States.

Annual refinements of indicators are included in the indicator framework as they occur. In line with the mandate of the group, the IAEG-SDGs proposed 36 major changes to the framework in the form of replacements, revisions, additions and deletions as part of the 2020 Comprehensive Review, which were approved by the 51st Statistical Commission in March 2020.

The official indicator list below includes the global indicator framework as contained in A/RES/71/313, the refinements agreed by the Statistical Commission at its 49th session in March 2018 (E/CN.3/2018/2, Annex II) and 50th session in March 2019 (E/CN.3/2019/2, Annex II), and the changes from the 2020 Comprehensive Review (E/CN.3/2020/2, Annex II) and annual refinements (E/CN.3/2020/2, Annex III) from the 51st session in March 2020.

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing
11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate
	11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional

From: Global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda for Sustainable Development

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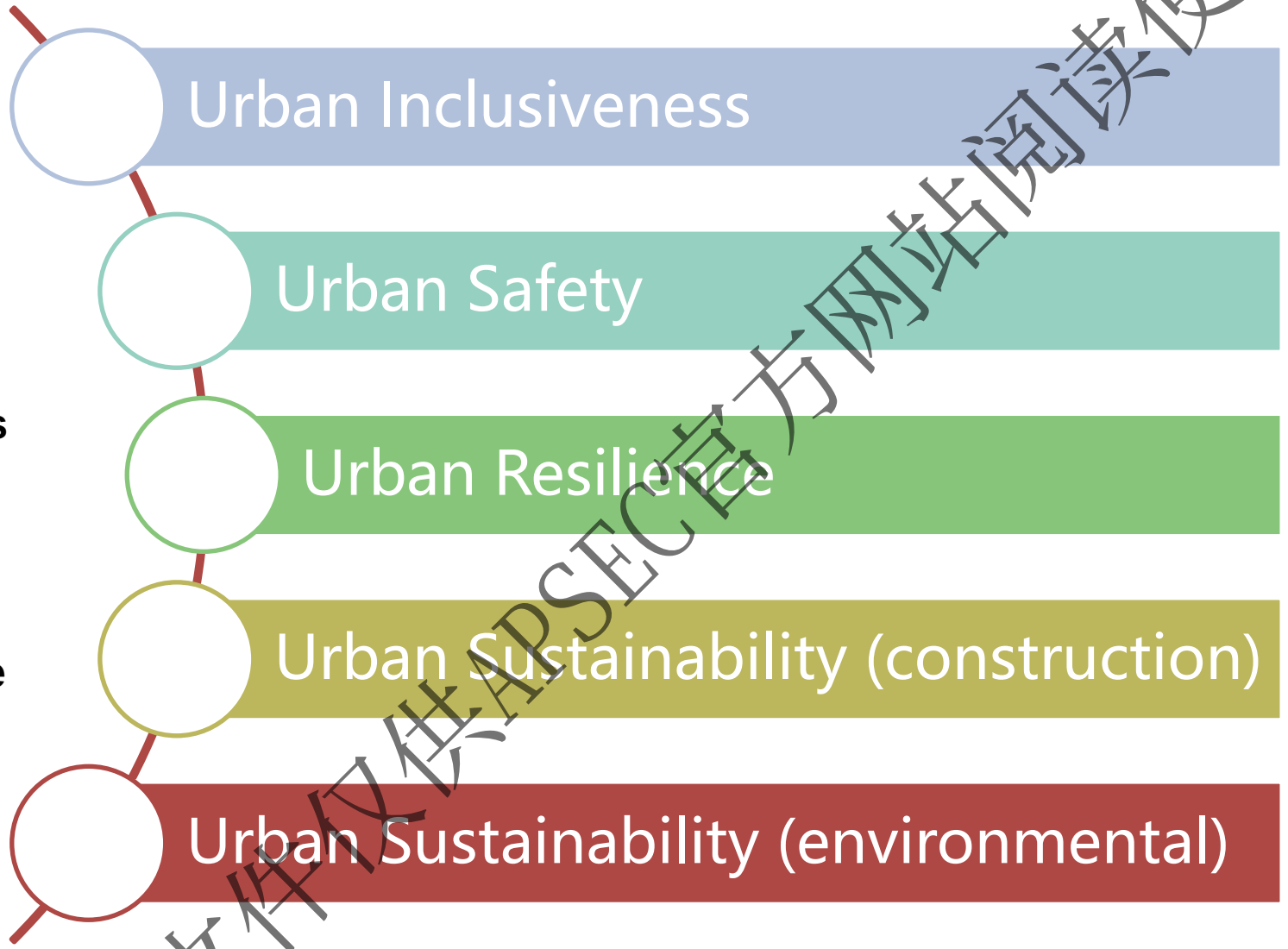
Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable



11.1.1
11.3.2
11.4.1

11.7.2

11.5.1
11.5.2
11.b.2

11.2.1
11.3.1
11.7.1

11.6.1
11.6.2

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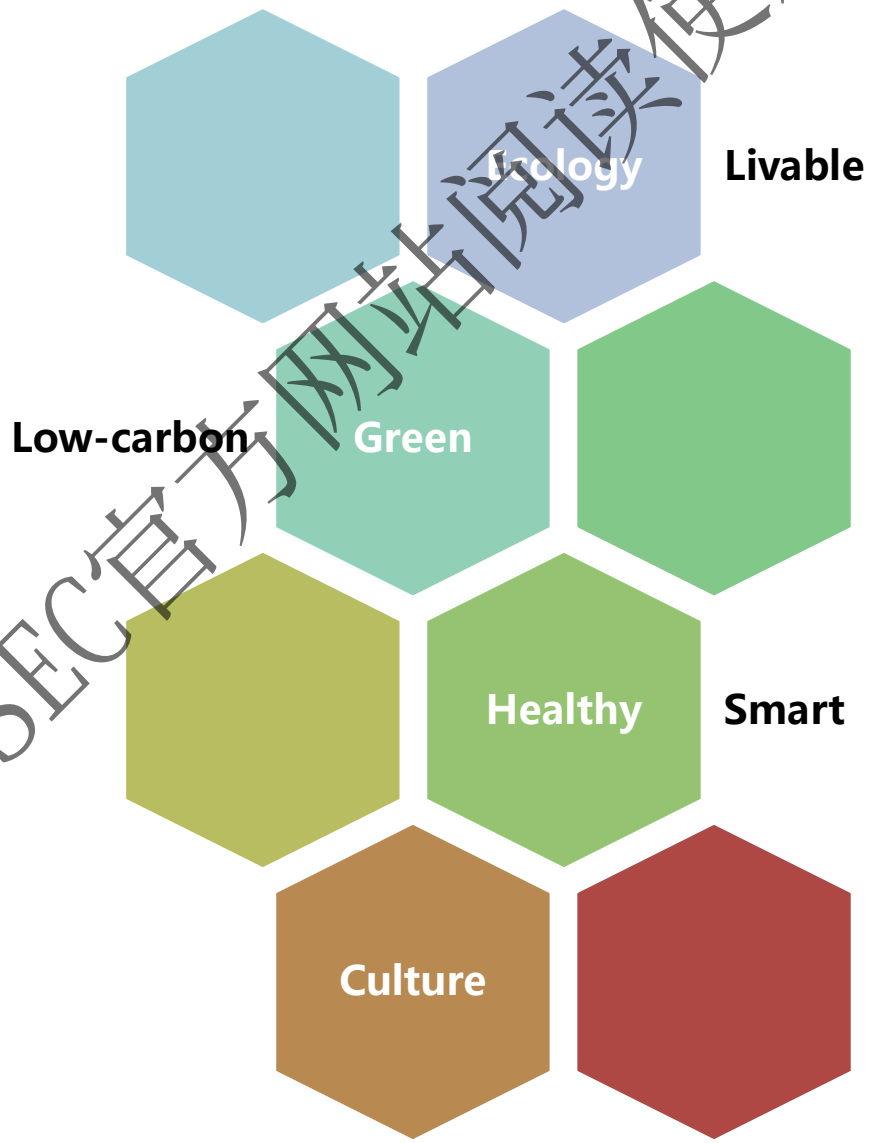
City Indicators

- Ecology City
- Livable City
- Green City
- Low-carbon City
- Healthy City
- Smart City
- Culture City
- … …



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Typical urban sustainability indicator sets

Dimension	First level	Specific indicators
Environmental indicators	Air quality	Air quality index; nitrogen oxide emissions; sulfur dioxide emissions; PM2.5 emissions; PM10 emissions
	Emission of greenhouse gases	Residential greenhouse gas emissions; commercial greenhouse gases; industrial greenhouse gases; total greenhouse gases (CO2, CH4, N2O, and chlorofluorocarbons); CO2 emissions per unit of electricity consumption; CO2 emissions per capita in cities
	Water	Number of damaged waterways; water leakage in the water distribution system; total water consumption; water consumption per capita; drinking water quality; water consumption
	Land	Green space; vegetation coverage; landslide vulnerability; area of thousand-person park; urban expansion (spreading)
	Waste	Solid waste production; municipal solid waste recycling ratio; waste management indicators; solid waste management
	Natural disaster vulnerability	Natural disaster vulnerability; natural disaster exposure
Economic Indicators	Income	City income; GDP per capita
	Price	Consumer Price Index
	Employment	Unemployment; commodity employment; service employment
	Energy	Energy consumption; energy consumption per capita; residential energy intensity; electricity consumption per capita; electricity consumption per GDP; energy efficiency; renewable energy consumption; renewable energy share
	Financial health	Urban economic vitality; urban fiscal deficit; community credit demand meets performance indicators; lender rating under the reinvestment method
	Traffic	Shared transportation; the proportion of workers who rely on public transportation, bicycles or on foot; annual car mileage per capita; average number of public transportation passengers; average commuting time at work; average number of public transportation passengers; walking reviews (Walkscore.com); transportation infrastructure length
Social indicators	Demographic	Population; population density
	Education	High school, university, master's degree; university ranking; literacy
	Public health	Mortality rate of 1,000 infants under 5; life expectancy at birth; proportion of population with health insurance; proportion of population affected by crime or traffic accidents; rate of violent crime
	Equality	Gini coefficient; the urban poor; the proportion of the population affected by poverty, unemployment and lack of education, information, training and leisure opportunities; the proportion of low-income households within a quarter mile of a neighborhood center or public transportation station; the economically active population and Proportion of economically inactive population; poor children
	Housing and buildings	Housing affordability IV; the proportion of the homeless population; the proportion of the population affected by poor housing conditions; the number of buildings certified by Leadership in Energy and Environmental Design (LEED); the number of houses certified by certification agencies as energy-saving; median house size number
	Citizen participation	Proportion of the number of people participating in local elections or as active members of the Association for Urban Improvement and Quality of Life; Proportion of voters participating in population

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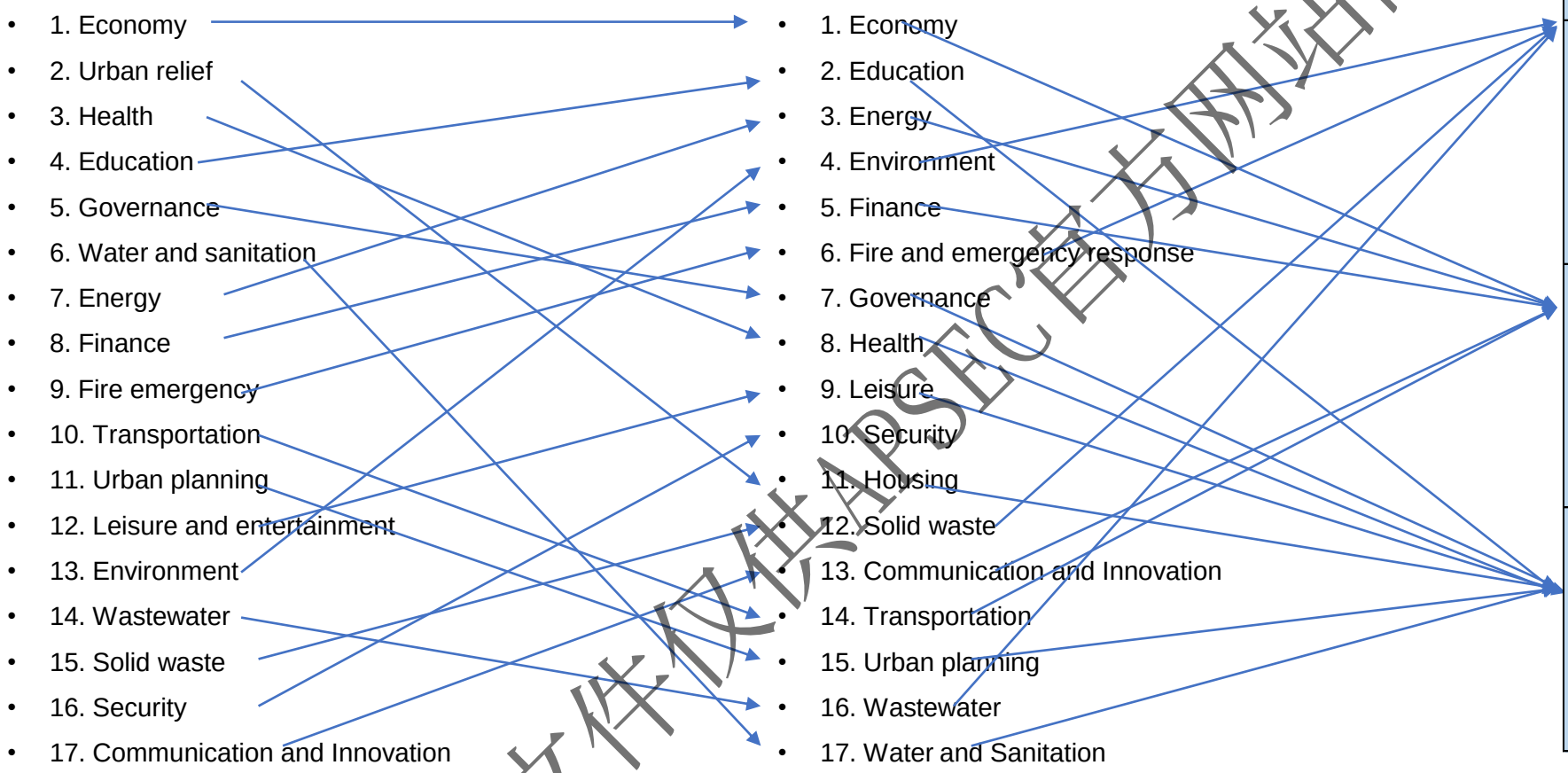
CityFusion ISO 37120: 2014



Dimension	First level
Environmental indicators	Air quality
	Emission of greenhouse gases
	Water
	Land
	Waste
	Natural disaster vulnerability
Economic Indicators	Income
	Price
	Employment
	Energy
	Financial health
	Traffic
Social indicators	Demographic
	Education
	Public health
	Equality
	Housing and buildings
	Citizen participation

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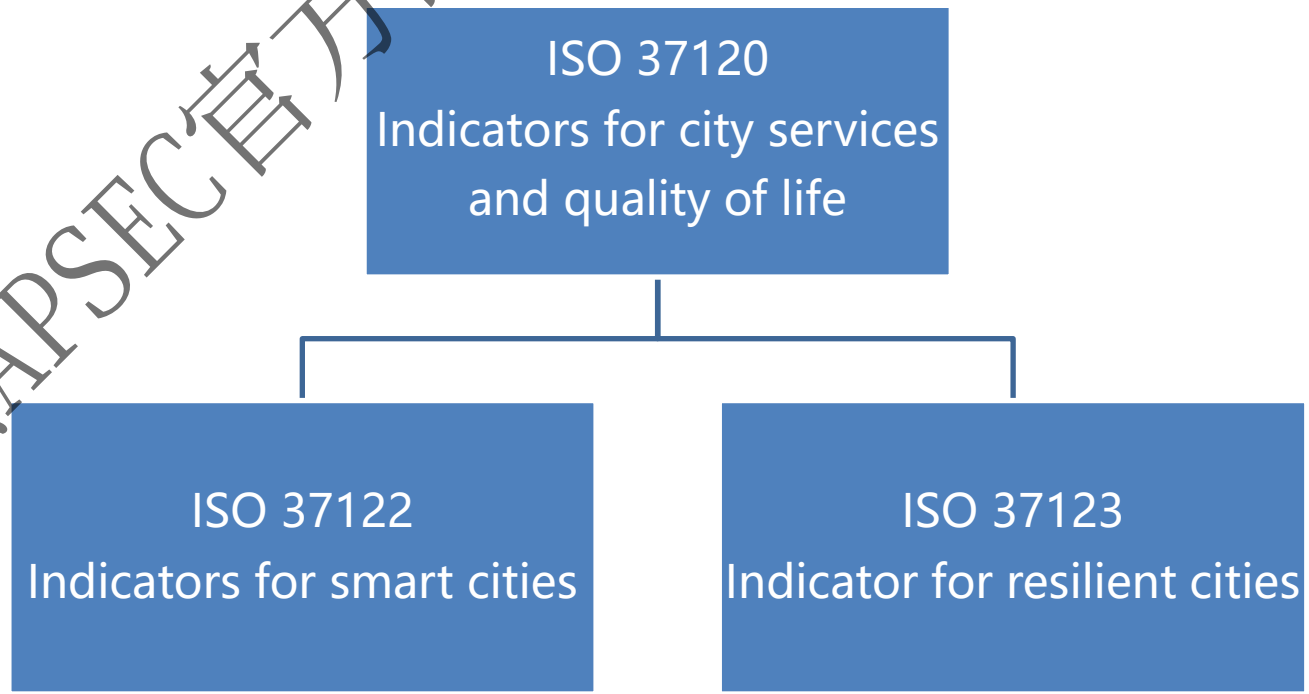
ISO 37120:2018
Sustainable cities and communities — Indicators for city services and quality of life

- 1. Economy
- 2. Education
- 3. Energy
- 4. Environment and climate change
- 5. Finance
- 6. Governance
- 7. Health
- 8. Housing
- 9. Population and social conditions
- 10. Recreation
- 11.Safety
- 12. Solid waste
- 13. Sport and culture
- 14. Telecommunication
- 15. Transportation
- 16. Urban planning
- 17. Wastewater
- 18. Water

SUSTAINABLE DEVELOPMENT GOALS

This standard contributes to the following Sustainable Development Goals:

3 4 5 6 8 10 11 13 16



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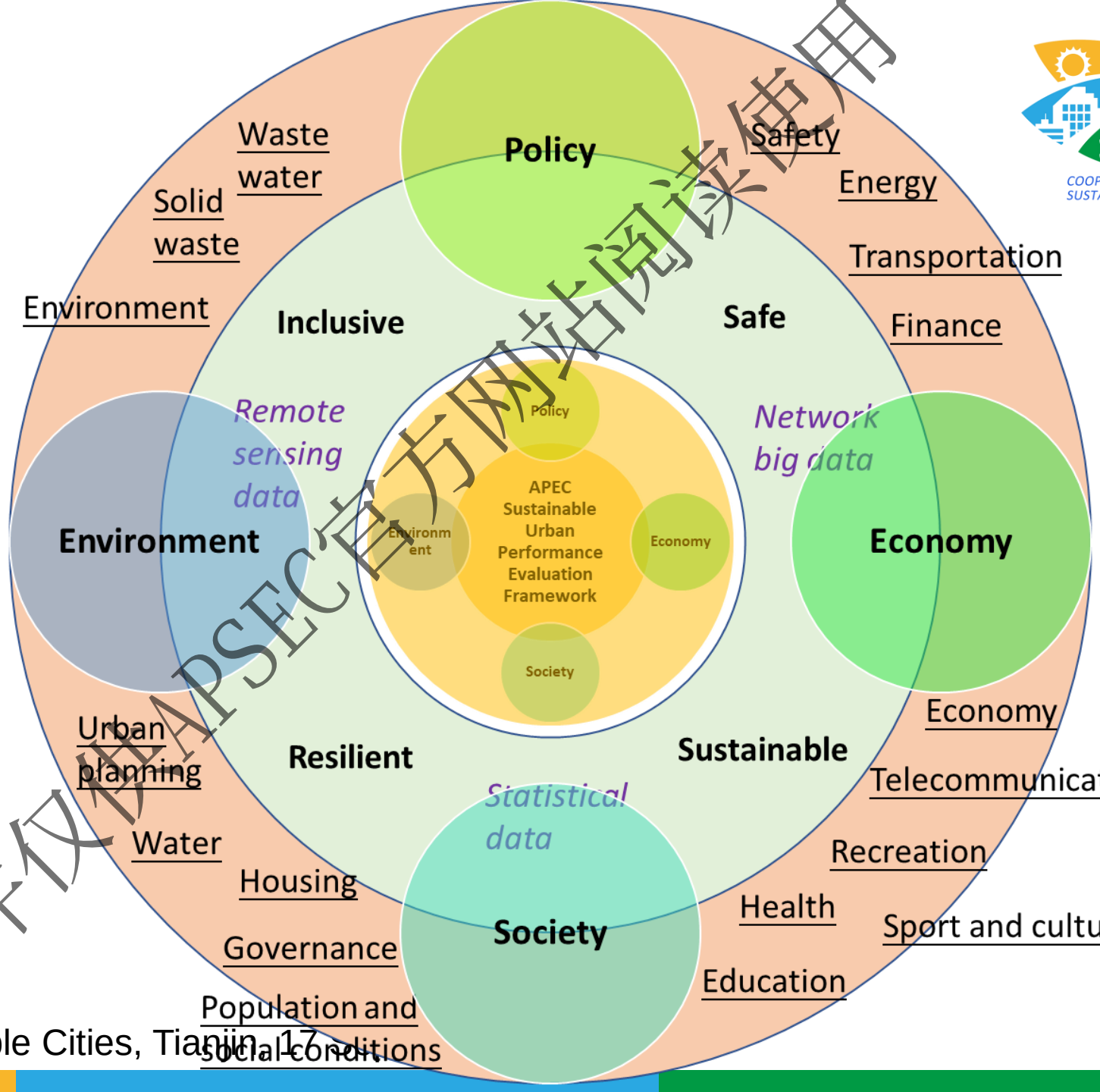
APEC Sustainable Urban Performance Evaluation Structure



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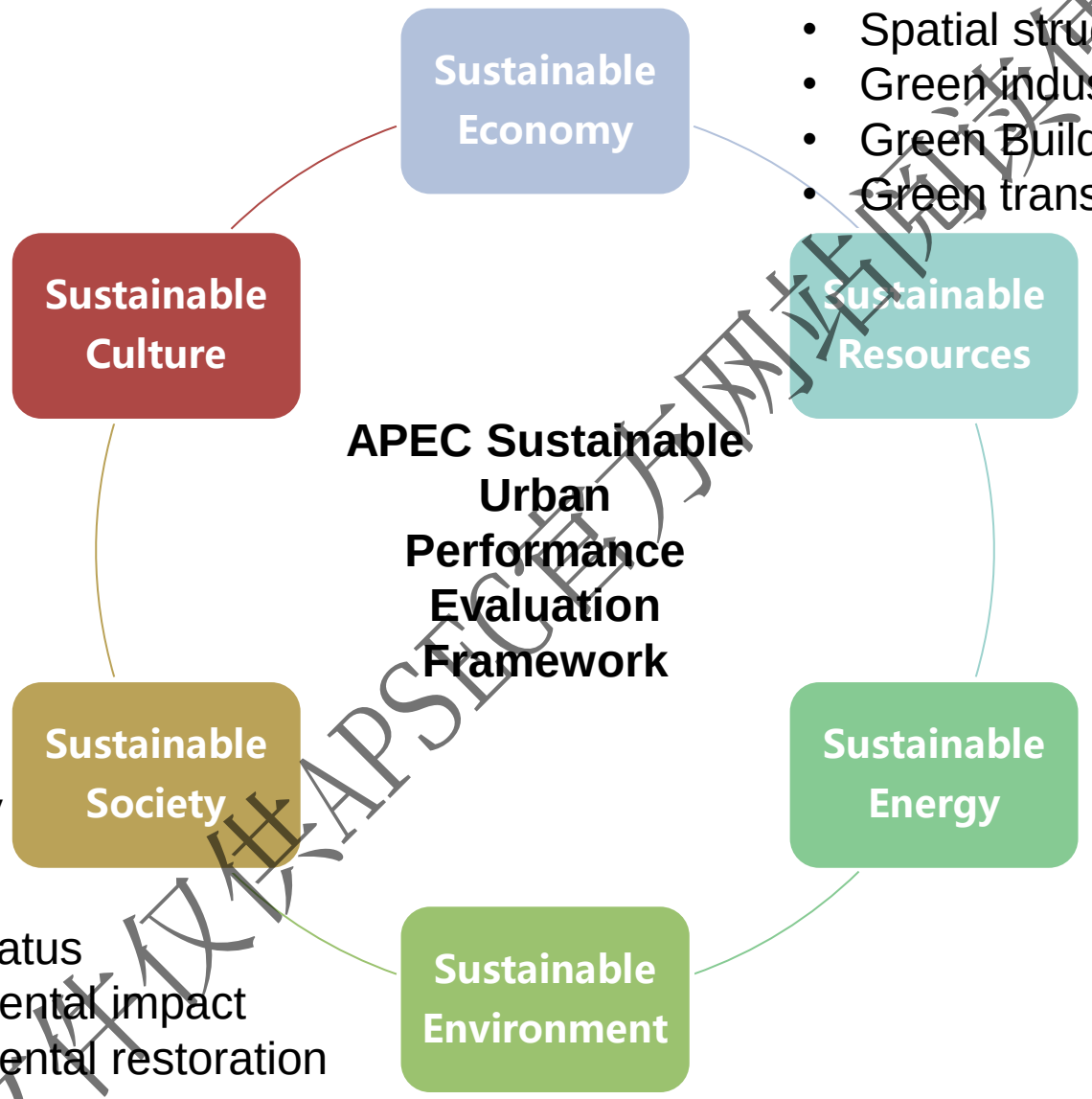
- Driving force
- City planning
- Spatial structure
- Green industry
- Green Building
- Green transportation

- Cultural basic resources
- Cultural industry resources
- Urban cultural vitality
- City cultural attraction
- Urban cultural security



- Resource evaluation
- Green energy
- Water resources
- Waste disposal

- Urban population
- Social life
- Health, education, technology
- Safe society

- Structure optimization
- Clean and efficient
- Development trend
- Energy security

- Quality status
- Environmental impact
- Environmental restoration

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Sustainable economy	Driving force	Urban economy	Sustainable Net GDP (or Green GDP)
			Sustainable Economic Welfare Index
			Net population growth rate, employment rate
		Citizen quality	The average number of years of education for the newly added labor force reaches 14 years or more
			More than 60% of residents receive cultural life education
			Per capita reading
			Perfect digital learning network service platform
			The social, cultural and educational functions of libraries, cultural centers, museums, archives and other public cultural facilities at all levels have been brought into full play.
			Perfect digital learning network service platform
		public space	The proportion of urban public space in urban area should reach more than 50%.
	City planning	Basic conditions for urban development	Water resources per capita
			Land red line control
			Renewable resources acquisition
		Planning for sustainability	Whether sustainable construction standards are adopted in the plan
	Spatial structure	City street	Urban plot ratio
			Public transportation coverage
			Chronic system integrity
			Perfect bike lane
		infrastructure	Job-living balance
			Flexible control of business district function ratio
			Public service facilities have bus stops within 600 meters
	Green industry	Industry cluster	Industry Specialization Index
			Industry increase proportion
			Urban industry labor force scale
			Industry's first labor scale
			The ratio of industrial labor force growth rate to industrial output value growth rate
		Advanced nature of green industry	Energy consumption per ten thousand yuan GDP
			Water consumption per 10,000 yuan GDP
			Strong carbon emission per 10,000 yuan GDP
			Resource output rate
	Green Building	Green construction	Whether to build a green construction system
		Green Building Materials	The use of green building materials as a percentage of total construction costs
		Construction Equipment	Energy saving rate of building equipment
		Building use	Energy consumption per building area
			BIM system use
			Percentage of green buildings in total building area
	Green transportation	Efficient operation	BRT, subway, light rail system access
			Complete intelligent transportation system
			Public transport share rate
		Environmentally friendly	Strengthen vehicle performance and reduce environmental impact.
			Indicator settings:
			Vehicle emission compliance rate
		Save resources	New energy vehicle utilization rate
			Electric vehicle penetration rate
			Coverage rate of public charging piles
			Energy consumption per unit of transportation
		Social Harmony	The proportion of urban public transport investment
			Traffic accident rate per 10,000 vehicles

Sustainable resources	Resource evaluation	Resource evaluation	Evaluation of water resources utilization potential
			Evaluation of Renewable Energy Utilization Potential
			Land resource evaluation
			Evaluation of waste recycling resources
			Evaluation of ecological resources in the region
	Green energy	Structure optimization	Share of renewable energy in energy consumption
			Direct supply rate of green energy
			Distributed energy (regional energy) cooling and heating as a percentage of urban heating
		Efficient use	Multi-energy complementary mode application
			Data center PUE indicator
		Development trend	Energy carbon neutral rate
			Energy Cascade Utilization
			Urban energy consumption per unit area
		Energy security	Energy self-sufficiency rate
			Smart microgrid technology
	Water resources	Water resources carrying capacity	Water accessibility
			Per capita water resources
			Water Resources Smart Management System
		Water saving and unconventional water utilization	The proportion of agricultural water-saving irrigation
			Industrial water consumption
			Rainwater recycling
			Unconventional water utilization ratio
		Wastewater recycling	Sewage recycling rate
			Reclaimed water utilization rate
		Water security	Water quality compliance rate
	Waste disposal	Urban solid waste treatment	Domestic waste classification rate
			Comprehensive utilization ratio of domestic waste resources
			Proportion of comprehensive utilization of industrial waste resources
			Comprehensive utilization ratio of food waste resources
			Construction waste classification recycling and utilization ratio
			Percentage of hazardous waste handled by the intravenous industrial park

Sustainable energy	Structure optimization	Energy production and supply	Renewable energy development intensity
			Installed scale of renewable energy power generation
			Direct supply rate of green energy
			Clean energy replacement rate
			Electricity replacement rate
			Low-carbon energy application rate
			Ratio of liquid biofuels to total transportation fuel consumption
			Ultra-low emission cogeneration
			Clean coal utilization rate (or promotion of clean coal technology)
		Energy consumption and demand side management	Multi-energy complementary mode application
			Distributed new energy access application ratio
			Distributed energy (regional energy) cooling and heating share
			Energy storage system application
			Demand side power peak-valley difference management
			Unused energy (including waste heat and pressure) usage
			Low temperature waste heat usage
			Smart energy network construction planning
	Clean and efficient	Clean energy	Primary energy cleanliness
			Fuel quality improvement
			Energy Pollution Control Index
			Air pollutant emissions from the energy system
			Liquid discharge of energy system (including oil discharge)
			Energy system solid waste output
		Efficient application	Energy processing conversion efficiency
			Energy transmission and distribution efficiency
			Final energy consumption efficiency
			Energy recycling rate
			Energy Cascade Utilization
			Multi-energy complementary mode application
			Data center PUE indicator
	Development trend	Low-carbon technology	Energy carbon neutral rate
			Carbon footprint measurement
			Carbon storage
		Application trend	Establish a price system suitable for power applications
			Low Carbon Policy Implementation Index
			Urban energy consumption per unit area
	Energy security	System standard	Energy security system construction
			Energy Security Technology Development Index
		Security	Energy self-sufficiency rate
			Inventory and emergency capability index
			Smart microgrid technology
			Power crest factor
			Energy diversification
			Energy security

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Sustainable environment	Quality status	air quality	CO concentration
			SO2 concentration
			Suspended particulate matter (SPM) concentration
			O3 concentration
			Average PM2.5 concentration compliance days
		Water quality	Fecal coliform counts in surface water
			Water transparency
			Heavy metal compliance rate
		Sound quality	Acoustic environmental quality
		Soil quality	Soil pollution degree of heavy metals
			Soil pesticide pollution degree
			Soil organic matter pollution degree
	Environmental impact	Industrial impact	Industrial waste gas emission compliance rate
			Industrial solid waste disposal compliance rate
		Agricultural impact	Pesticide and fertilizer use rate
		Life impact	Disposal rate of domestic solid waste
			Wastewater discharge compliance rate
			Construction waste disposal rate
	Environmental restoration	Water and soil environment	Returning farmland to forest management
			Returning farmland to grassland
			Soil remediation
			Desertification control
			Soil erosion control
			Water environment governance
			Forest restoration and governance
		Air environment	Smoke emission control
			CO2 reduction

Sustainable society	Urban population	Population management	Total urban population
			Natural population growth rate
	Social life	community	Barrier-free design (or universal design that can be used by different groups of people)
			School-age children enrollment radius
			Outdoor space quality
			Types and integrity of public open space facilities
			Types and levels of health services provided by the community
			Per capita living area and combination of different functional spaces
			Use of green building materials and energy-saving design in residences
			The proportion of electricity used to create an artificial climate
			The main types of community services actually used by residents
			Proportion of various modes of community construction financing
			Retention status of natural water bodies and land patches in the community
			Proportion of native plants used in greening
			Whether to encourage the development of community vegetable gardens and other forms to build a fully circular community
			Percentage of non-degradable domestic waste in total waste
			Graded utilization of water resources
			Reconstruction and utilization ratio of old residential resources
			Heating method and temperature adjustability
			Convenience of public transportation around
		Social Security	Social security rate
			Urban unemployment registration rate
		Urban economic development level	Engel coefficient
	Health, education, technology	Science, Education, Culture and Health Career	Number of high school students per 10,000 people
			Thousands have health technicians
			Thousands of people have hospital beds
			Number of scientific and technical personnel per 10,000 people
			The proportion of three expenditures in fiscal revenue
	safe society	Urban disaster	Emergency response time
			Accuracy of disaster forecast
			Hazard Equivalence Index
			Strengthen the disaster detection and forecast system
			Integrity rate of disaster prevention project
		Social Security	Crime rate per 10,000 people
		Life security	Per capita power supply, power supply reliability
			Gas penetration rate, heating penetration rate
			Per capita domestic water supply and drinking water quality compliance rate
			Energy Reserve Index
			Percentage of dilapidated shanty houses
			Food sampling qualification rate
			Social assistance system perfection index
			Resident Security Index
			Security monitoring rate in public places
		medical hygiene	Public Health Investment Index
			Public health disease visit rate
			Food hygiene conformity index
			Food poisoning rate
			Strengthen protective measures for occupational health, infrastructure and human safety and hygiene
			Medical staffing rate
		economic status	Unemployment insurance rate
			100 million yuan GDP death rate
		ecosystem	Air quality good rate
			Water Safety Index
			Ecological Security Index
			Environmental governance compliance rate
			Acoustic environmental quality

Sustainable culture	Cultural basic resources	Historical and cultural resources	Number of world cultural and natural heritage
			Number of other heritage/sites
			Number of religious buildings
		Cultural infrastructure	Number of museums
			Number of public art galleries
			Number of libraries occupied per 100,000 people
			Number of theaters
	Cultural industry resources	Cultural industry resource investment	Number of cultural industry companies
			Number of well-known laboratories and scientific research centers
			Per capita R&D expenditure as a percentage of GDP
			The proportion of employees in the cultural industry in the total employed population
		Cultural industry resource output	Added value of cultural industry
			Tourism value added
			Book publication volume
			Film circulation
	Urban cultural vitality	Urban cultural influence	Number of top 200 universities in the world
			Technology Talent Index
		City cultural events	Number of theatrical performances such as music, theater, and dance
			Number of urban art festivals and celebrations held annually
			Number of major international sports events held
			Number of international conferences held
		Urban cultural consumption	Cinema box office revenue
			Total box office revenue of music, theater, dance and other theatrical performances
	City cultural attraction	Cultural tolerance and communication	Number of inbound tourists
			Number of foreign students
			Proportion of non-national-born population in urban population
			Number of international sister cities
		International organizations and multinational companies	Headquarters of United Nations agencies and major international organizations
			Headquarters of Fortune 500 Multinational Companies
	Urban cultural security	Cultural foundation guarantee	Public education investment level
			Number of higher education institutions
			Number of broadcasting stations
		Government cultural support and management	The proportion of cultural and educational expenses in fiscal expenditure
			Intellectual Property Protection Index
			Judicial system and property rights protection

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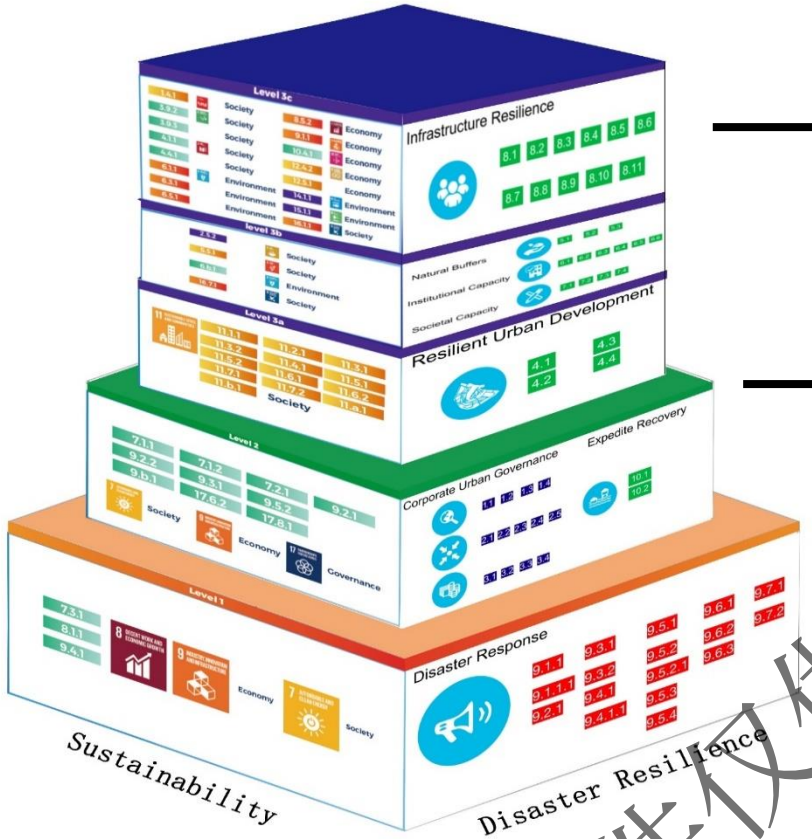
Urban SDG Tracker



Commitment level 3: Implementing and evaluating local action plan
Objective: In-depth transformation towards integrated sustainable development and disaster resilience. Data requirement aiming at monitoring equilibrated in-depth development in all major urban areas

Commitment level 2: Local 2050 vision, 2030 targets, elaborating integrated holistic local action plan
Objective: Data requirement aiming at achieving rapid progress, driven by key areas: Energy, Industrial Innovation, IT

Commitment level 1: Improve sustainable development and disaster resilience and showcase results
Objective: Allowing APEC communities of any size to participate in the CNSC city network with little data requirement

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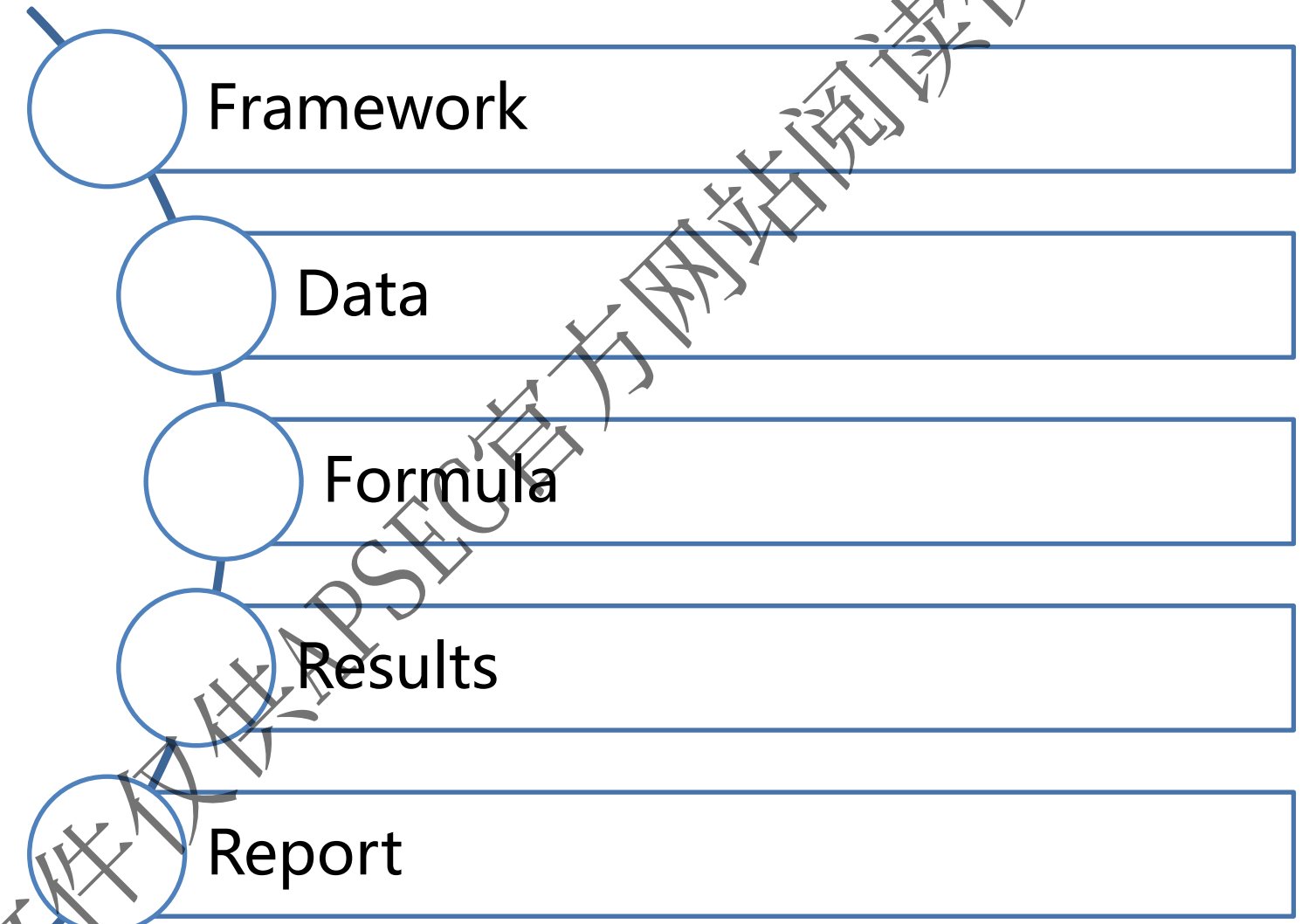
Future Work



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CNSC
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THANKS!

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