

# Framework of National-Local Policies and Regulatory Frameworks for District Cooling

# Singapore Study Trip

District Cooling and Passive Cooling Study Tour and Workshops

7-12 May 2023

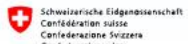
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# AGENDA

14:00-14:05	Welcome	Lie Yen, EMA Director (Economic Regulation & Licensing Department)
14:05-14:20	Framework of National-Local Policies and Best Practices for District Cooling	UNEP
14:20-14:50	Overview of Singapore's Energy Transition, strategies on clean energy deployment and institutional roles, Q&A	Singapore EMA
14:40-15:20	Overview of District Cooling in Marina Bay area, Q&A	Singapore EMA
10 mins break and networking		
15:30-16:15	Country overviews on current policies and approaches	Chile, Colombia, India, Malaysia
16:15-16:45	Case study UAE <ul style="list-style-type: none"> <li>• Strategic rationale for DCS regulation in UAE</li> <li>• Regulatory frameworks considered</li> <li>• Regulations adopted</li> </ul>	Hannah Khalid Ali Al Bustani, Vice President Commercial & Regulatory Affairs - Asset Management, Tabreed
16:45 – 17:15	Regulatory framework in Dubai <ul style="list-style-type: none"> <li>• About the RSB</li> <li>• Objectives and regulatory framework</li> <li>• Current status of implementation</li> </ul>	James Grinnel, Regulatory Services Bureau, Dubai (remote)
17:15-17:55	Structured discussion with countries <ol style="list-style-type: none"> <li>a. Getting started on regulation</li> <li>b. Performance standards and codes</li> <li>c. Licensing and tariffs</li> </ol>	
17:55-18:00	Closing remarks	UNEP



# District Energy in Cities Initiative Knowledge Platform

- A decade of UNEP global activities on district cooling and implementation activities with 70+ partners
- Global and national handbooks
- National potentials studies
- City and provincial policy assessments and urban plans
- Tailored tools and methodologies
- Training modules and case studies



[www.districtenergyinitiative.org](http://www.districtenergyinitiative.org)

[www.coolcoalition.org](http://www.coolcoalition.org)

<http://c2e2.unepccc.org/knowledge-management-system>

## WHY HOLISTIC REGULATORY FRAMEWORK IS REQUIRED?

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Define district cooling within national energy and climate strategies as part of holistic approach to cooling

Aggregation of demand (to ensure economies of scale)

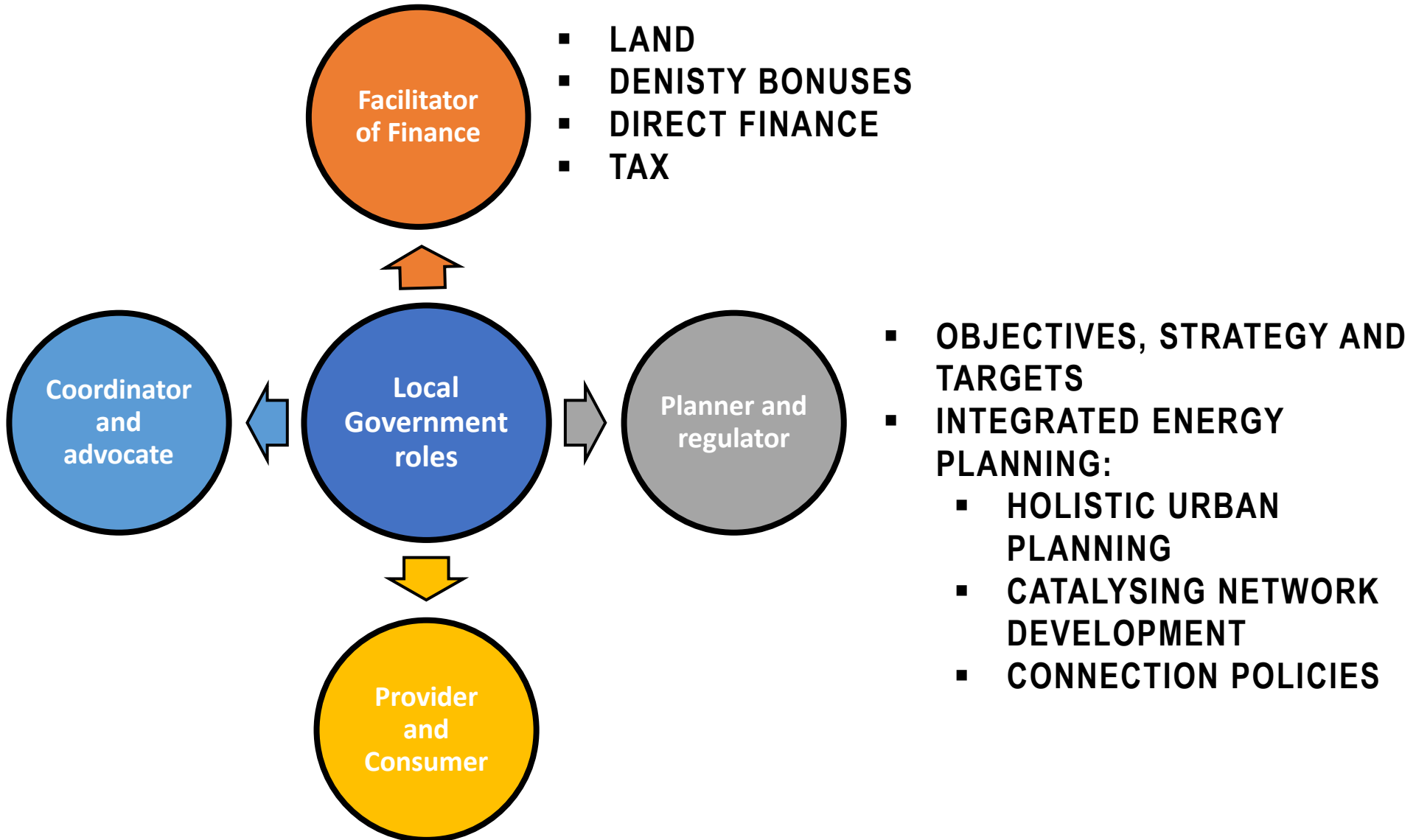
Customer Protection

Capital requirements

Financial and demand risks

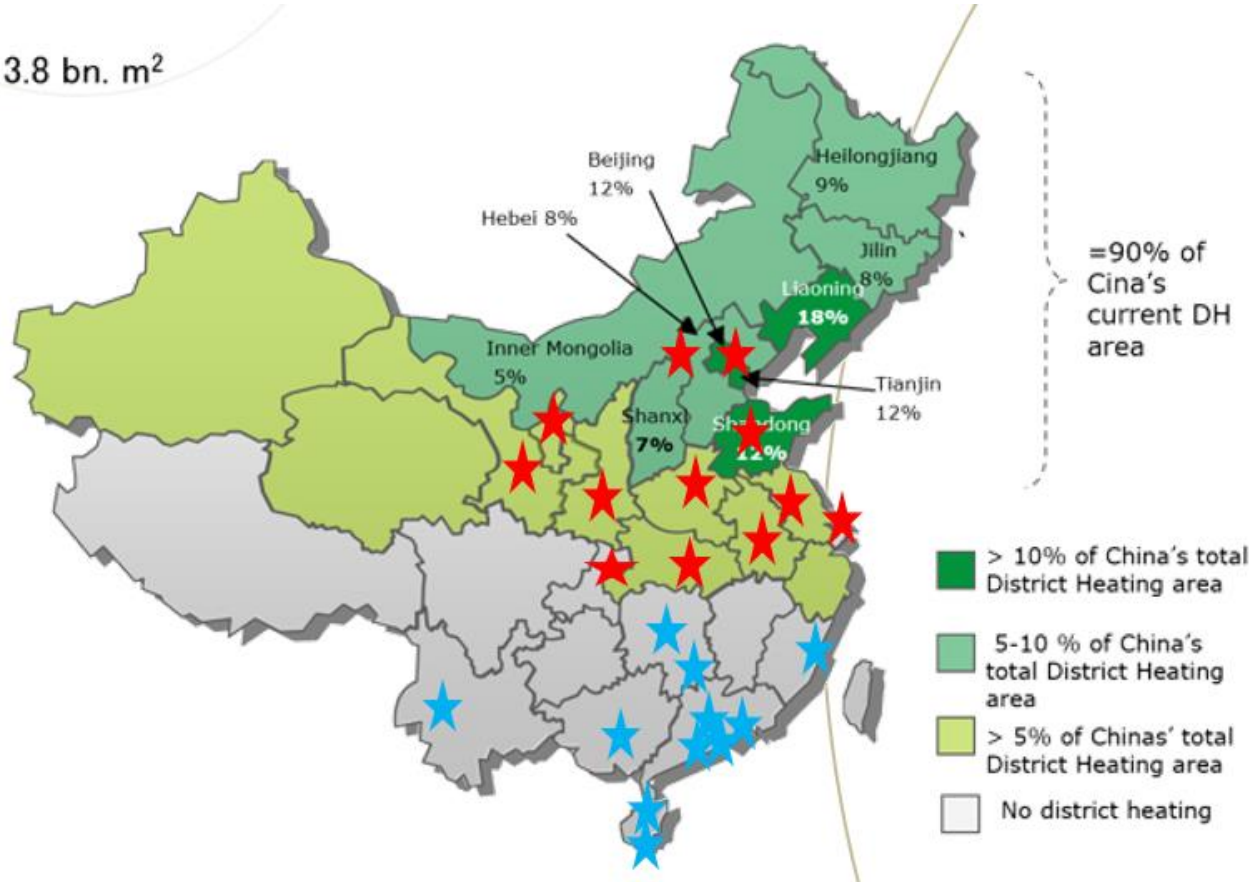
Overcoming other challenges

# WHY HOLISTIC REGULATORY FRAMEWORK IS REQUIRED?



# CASE STUDY: CHINA

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## DISTRICT COOLING

- Fast growing since 2010, **DHC** and **DC** for higher quality of comfort
- CBDs of high economic level cities in Middle and South China (mainly capital cities)
- Service area: 1,5-3 sq. km
- >25 DC/DHC projects operating, > 35 projects constructing, >30 projects developing

## DISTRICT HEATING

- Half of all major cities in Middle and North China have district heating

- Boilers and CHPs in near equal amounts
- 4.5% of national energy consumption (2019)
- Industrial waste heat close to cities

# CASE STUDY: CHINA

Area	Heating		Cooling	
	Period	Status	Period	Status
1	6-7 months	Mandatory	0.5-1 months	Comfort
2	4-5 months	Mandatory	1-3 months	Comfort
3	2-3 months	Comfort	3-4 months	Comfort
4	0.5-1 months	Comfort	5-7 months	Comfort
5	1-2 months	Comfort	1-2 months	Comfort

- New markets come out to provide heating and cooling in area 3 and 4.
- The ceiling price of heating in these areas are always high, because of short time of usage and low demands. However, when combine with DC and sharing the pipeline, the prices decrease almost 50%, which makes it profitable. Win-win situation comes out.

- Even in area 2, small scales of DH upgraded their systems to combine with DC, making it more cost-effective.



# CASE STUDY: CHINA

## National strategy:

Five-year plans include clear quantitative targets, to be met at a certain date; **adaptability**: the national targets are adapted at the local level, taking into consideration local characteristics; priority zones identified to lead demonstration.

## Codes and guidelines:

- 3 national codes for design, construction and operation of district cooling (updated in 2021-2022)
- 6 provincial guidelines for implementations of district cooling
- Over 12 guidelines for end-users of district cooling projects implementation and management
- Potential development on guidelines of GHG emission credit, including monitoring, reporting and trading through carbon market in 2023

## Incentives

E.g. Power tariff support for DCS with thermal storage: Peak : flat : off-peak; 1.65:1:0.25

## Planning

- District cooling can be mandated in specific concession area
- Full integration into urban masterplanning required in specific zones
- Central government authorized subnational development plans defining

### DCS growth strategy:

- E.g. Guangdong-Hong Kong-Macao Greater Bay Area (56,000sqm): development plan towards 2035, total cooling demand in the region will reach 56 million RT. The district cooling capacity will reach 20 million RT, compared to 3.4 million RT in 2017.





# CASE STUDY: CHINA. CODE EXAMPLES



T/CECS 666-2020

中国工程建设标准化协会标准

## 区域供冷供热系统技术规程

Technical specification for district cooling and heating system



中国建筑工业出版社



中国工程建设标准化协会标准

## 高效制冷机房技术规程

Technical specification for high performance chilled-water plant

T/CECS 1012-2022

主编单位：中国建筑科学研究院有限公司

批准单位：中国工程建设标准化协会

施行日期：2022年7月1日

2022 北 京

# DEVELOPMENT OF DCS POLICY



DISTRICT ENERGY  
IN CITIES  
INITIATIVE



## POLICY

Cities can incentivize and remove barriers and risks to DCS development through streamlined **approvals and permitting** procedures, **local policy** development and **advocacy** for state or national-level policy changes

*The Initiative will work with Rajkot to design new policies and provide training material on urban, state and national policies for DCS*

### Analysis of local policy options

- Fiscal incentives
- FSI bonus
- District cooling ready buildings
- Connection policies
- Concession contracts
- 'Open-access'/low power tariffs

### District Cooling Cell

### Advocate for state/national policy

- VAT/GST incentives
- Power tariffs for thermal storage
- Trigeneration grid connection
- Standards
- Building codes

### Streamlining

- Clear permitting procedures
- Fast approval process

# HOW DO WE DELIVER IT?



DISTRICT ENERGY  
IN CITIES  
INITIATIVE



## But support is needed:

- Stakeholder coordination
- District cooling into area planning
- Development costs and tendering
- Long-term contracts with building owners
- Land for district cooling plant
- Fair power price / city renewables
- Connect public buildings
- Strategic city investment in early years (then can refinance)



Contributing to:





# LESSONS LEARNT: THE ROLE OF LOCAL GOVERNMENTS



- **OBJECTIVES, STRATEGY AND TARGETS**
- **INTEGRATED ENERGY PLANNING:**
  - **HOLISTIC URBAN PLANNING**
  - **CATALYSING NETWORK DEVELOPMENT**
  - **CONNECTION POLICIES**



**District energy systems can make returns from 6 to 20 per cent, with a break-even point from 6 to 10 years depending on the market and the project. But to really take advantage, we need to address upstream barriers and make it easier for the private sector to invest.**

### **Main financial barriers:**

- 1) lack of low-cost capital with cities and utilities
- 2) lack of upfront finance to cover project development and tendering costs
- 3) lack of capacity in national and subnational governments to create the enabling environment to unlock investment
- 4) lack of political will to improve heat tariff regulation and utility structuring;

### **Examples of solutions implemented in some markets:**

- ✓ In India, UNEP supported IFC and Tabreed to establish a \$400 million investment platform for district cooling
- ✓ UK has established a Heat Networks Investment Programme to help municipalities overcome financial barriers and scale-up the market. The District Energy in Cities Initiative is trying to replicate this model in new markets
- ✓ Subsidies, tax incentives