

BEST PRACTICES IN ACCELERATING THE DEPLOYMENT OF DISTRICT ENERGY



DISTRICT ENERGY IN CITIES

A GLOBAL INITIATIVE TO UNLOCK THE POTENTIAL OF ENERGY EFFICIENCY AND RENEWABLE ENERGY



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LAUNCH AT CLIMATE SUMMIT

Sustainable Energy for All
(SE4All) Sub-Committee's

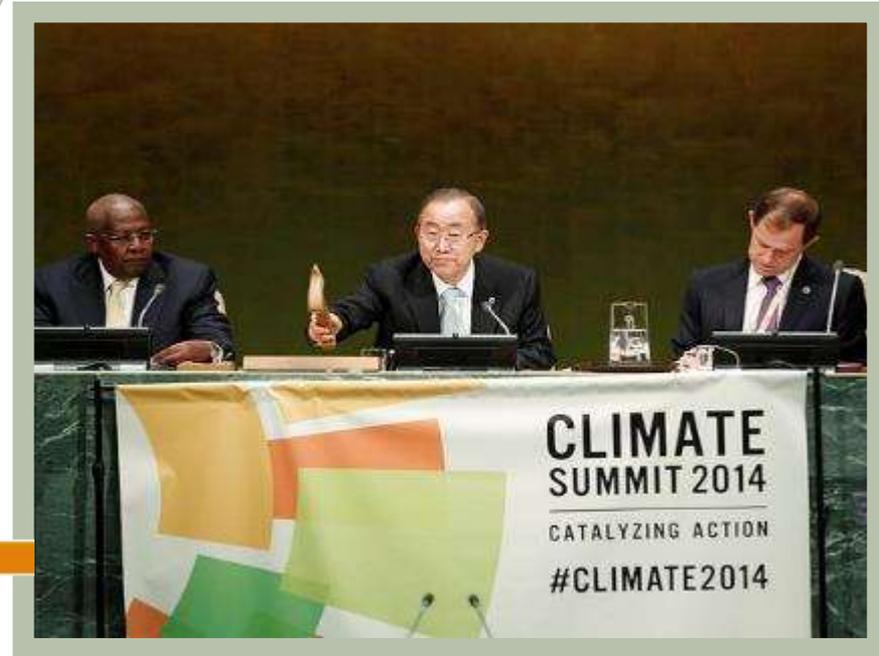


Co-chairs:

- UNEP Executive Director
- CEO Accenture
- Minister for Trade and Development Cooperation, Denmark

Global Energy Efficiency Accelerator Platform: to scale up efficiency gains and investments at the national, sub-national and city levels through technical assistance, support and public-private sector collaboration
Individual accelerators focus on specific energy efficiency sectors

- Buildings
- Transport
- **DISTRICT ENERGY**
- Lighting
- Appliances & Equipment



Our donors:



Double Global Rate of Improvement of Energy Efficiency by 2030

OUR APPROACH:

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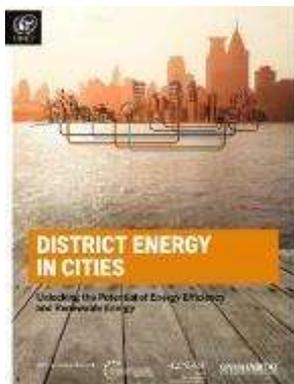
TAKE BEST PRACTICES, ADAPT AND REPLICATE

Methodology and Key Steps

- 45 Champion Cities
- Technology and benefits
- City policies
- Business models
- National policies



1. **Assess** existing energy and climate policy objectives, strategies and targets and identify catalysts.
2. **Strengthen** or develop the institutional multi-stakeholder coordination framework
3. **Integrate** district energy into national and/or local energy strategy and planning
4. **Map** local energy demand and evaluate local energy resources
5. Determine relevant **policy design** considerations
6. Carry out **project pre-feasibility** and viability
7. Develop **business plan**
8. Analyse **procurement options**
9. Facilitate **finance**
10. **Replicate**





Our goal:

Helping cities tackle the energy transition through district energy

Our model:

A private-public partnership with over 40 partners

What we do:

MARKET TRANSFORMATION



1. Increase **knowledge** of multiple benefits of district energy
2. Provide **technical assistance** to identify potential pilot projects, undertake pre-feasibility studies, design business models, support the tender process and develop long-term local district energy strategies.
3. **Scale-up** locally through the establishment of local multi-stakeholder coordination units and nationally through a National Delivery Unit and the development of a regulatory framework.
4. **Unlock investments:** Design financial mechanisms to address financial barriers and support the first projects in new markets.



WHERE ARE WE?

14 COUNTRIES
25 CITIES





INVESTMENT

\$ 26.5 M leveraged in-kind and cash investment, including \$21M in project financing...so far!

\$3.4 M direct investment, including Global Environmental Facility, Danish International Development Agency, Italian Ministry of Environment and Danfoss Foundation



PARTNERS AND CITIES

43 Partners
14 Countries
25 learning cities
11 champion cities



DISTRICT ENERGY IN THE COUNTRIES AGENDA

- District cooling under Indian National Cooling Action Plan
- District heating in the Chilean National Decontamination Plan
- District heating in the new Presidential Plan of Chile
- Belgrade selects the Initiative to co-develop its DH Action Plan to unlock €380 million of investment



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THE INITIATIVE IN ACTION



ASIA





INDIA: DRIVERS AND BARRIERS

DRIVERS

- Exponential growth in building energy consumption mainly due to space cooling demand.
- Most of this energy will come from grid-based electricity (mainly coal power).
- Increasing stress on electricity grid. Utilities struggle to meet summer peak demand
- Low-cost and sustainable solutions required



BARRIERS

- Lack of awareness among building owners, national and local governments, utilities.
- Lack of data, no track of cooling demand, lack of operation costs.
- Very fast real state developers. DC operators need to be faster to get earlier in the planning process.
- No centralized cooling in public buildings.





- **Awareness raising:**
 - ✓ Four workshops building local stakeholder engagement
 - ✓ FAQs document published for local stakeholders
- **Technical support:**
 - ✓ Rapid assessment reports on 5 cities published (identification of barriers and potential for DC in each city)
 - ✓ Two project pre-feasibility studies ongoing
- **Capacity building:**
 - ✓ Stakeholder coordination training



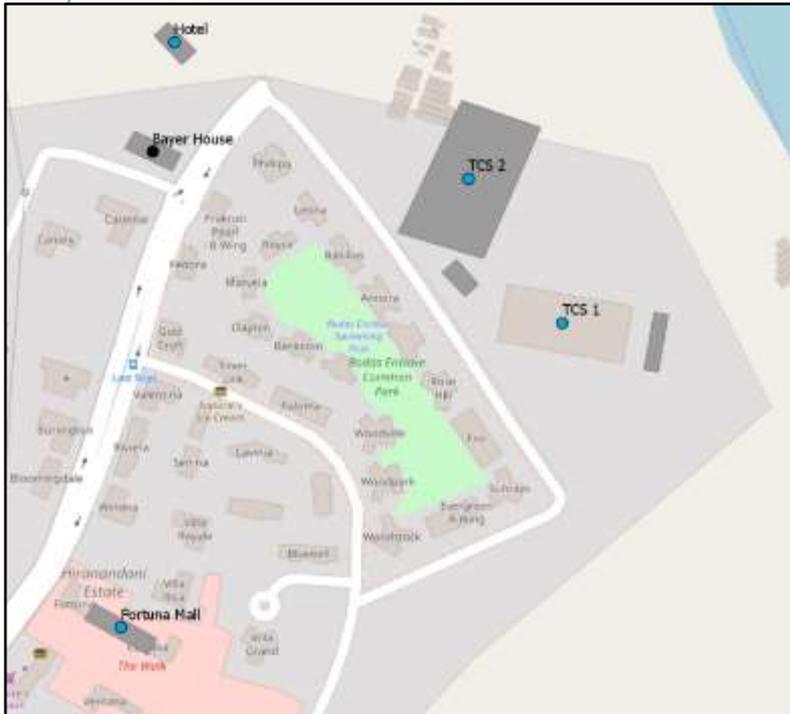
INDIA: THE PROJECTS



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HIRANANDANI ESTATE PROJECT (GREENFIELD)



- Will connect two large IT office buildings from Tata Consulting Services with data centers
- Approximately 10,000 TR for phase 1
- Other local consumers being considered and more large buildings in planning
- Electric chillers and trigeneration most likely technologies
- Prefeasibility study to finish in two months
- **Risks:**
 - Need to agree on DCS system before TCS(Tata Consulting Services) 2 construction of plant room.
 - TCS 1 already operating own system
 - Very fast real estate construction



VIVIANA MALL AREA PROJECT (BROWNFIELD)



- Eight different building owners highly engaged (malls, offices, hospital, data center)
- Proposed phase 1 will be 10-20,000 TR with 2km of network (still confirming optimal phase 1 connections)
- Electric chillers and trigeneration most likely technologies
- Prefeasibility study to finish in two months

INDIA: RESULTS AND NEXT STEPS

INITIAL RESULTS

- District cooling has been included under the National Cooling Action Plan
- GEF-7 country programme on district cooling , including the establishment of a national fund to support the development of district cooling projects
- Thane commits to deliver district cooling pilots
- EESL incorporated district cooling within its investment targets
- Preferred business model Public-Private partnership



NEXT STEPS

- Trainings, tools and methodologies developed in India will be made available through our virtual platform.
- A national study on DC in collaboration with EESL
- 10-year city plan for district energy in Thane
- Demonstration project (design, business model, tendering)
- New local policies



One of the most active district cooling markets in South East Asia

DRIVERS:

- Very fast real-state market growth
- Nearly 60% of energy use in high-rises comes from air-conditions.
- Achieve its Paris Agreement pledge: reduce GHG emissions 45% by 2030 and comply with Kigali Amendment of Montreal Protocol.



BARRIERS

- Lack of a regulatory framework: No guidance and requirements for cities to integrate District Cooling into the cities' infrastructure planning and construction.
- The lack of the standardization or benchmark across the District Cooling industry.
- The lack of the demonstrations where district cooling connect the large sustainable sources, such as local renewables, waste energy and tri-generation etc.,.

MALAYSIA

RAPID ASSESSMENT OF ISKANDAR

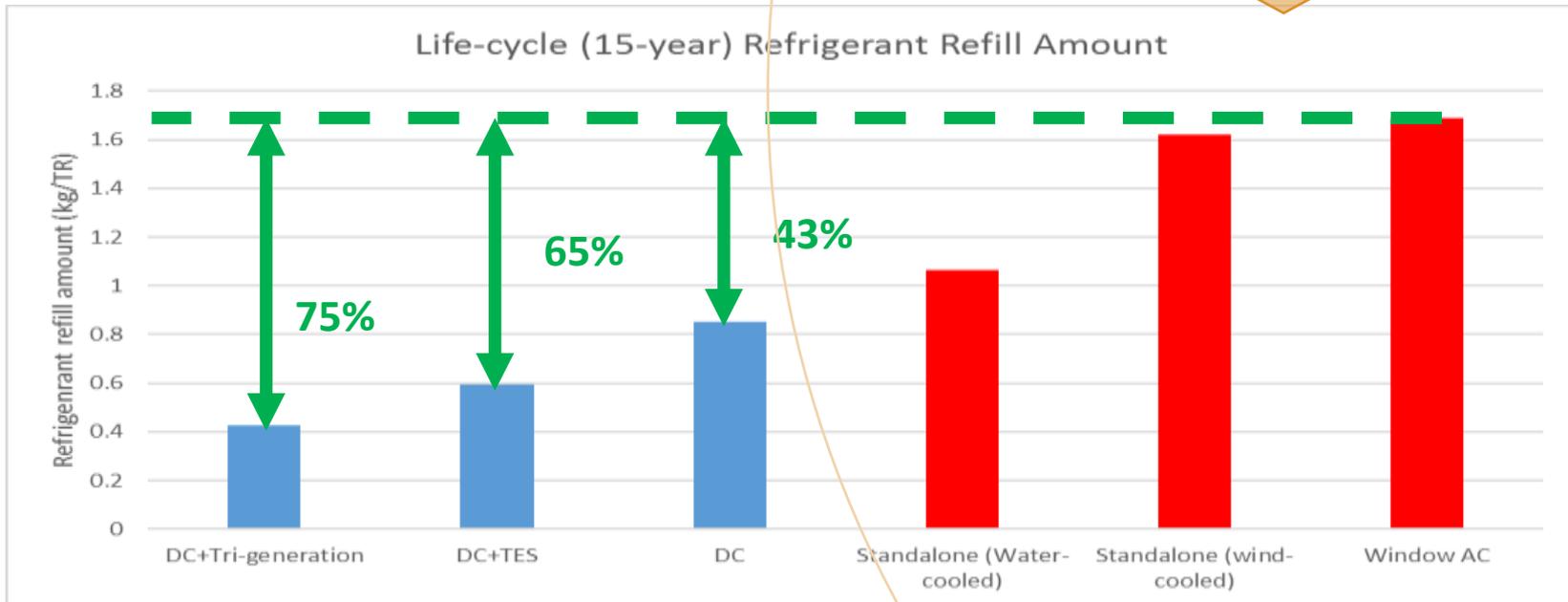


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Including: barrier analysis, technical assessment, identification of regulatory gaps and development of initial strategies to unlock full potential of district cooling in Iskandar.

DC with tri-generation and/or thermal energy storage (TES) can also contribute to the refrigerant phasing out in a life-cycle period (15 years)!. (Kigali Amendment)



MALAYSIA

WORK TODAY – PROJECT ANALYSIS



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- Analysis of two potential pilot projects (Medini and Sedenak data hub) including environmental benefits, contribution to phasing out refrigerants and GHG emissions. The study is on-going.

New Development:

Sedenak Iskandar Data Hub



Existing Development:

Medini



- Save 30% of electricity, 25% of water annually
- Save over 35% of CO2 emission annually
- Save over 25% of refrigerant refill in the life cycle of 20 years

Tri-generation+electric chiller+TES)



- Prepare a general framework on district cooling to be incorporated into the Structure Plan for Johor State
- Co-develop planning guidelines on district cooling for Iskandar Region, to be scaled-up nationally
- Establish a taskforce of Initiative partners to provide advisory services to the region
- Build a global task force on the viability of connecting data centers to district energy.
- Explore international funding opportunities to finance and support DC studies, energy master planning and policy development.



CHINA



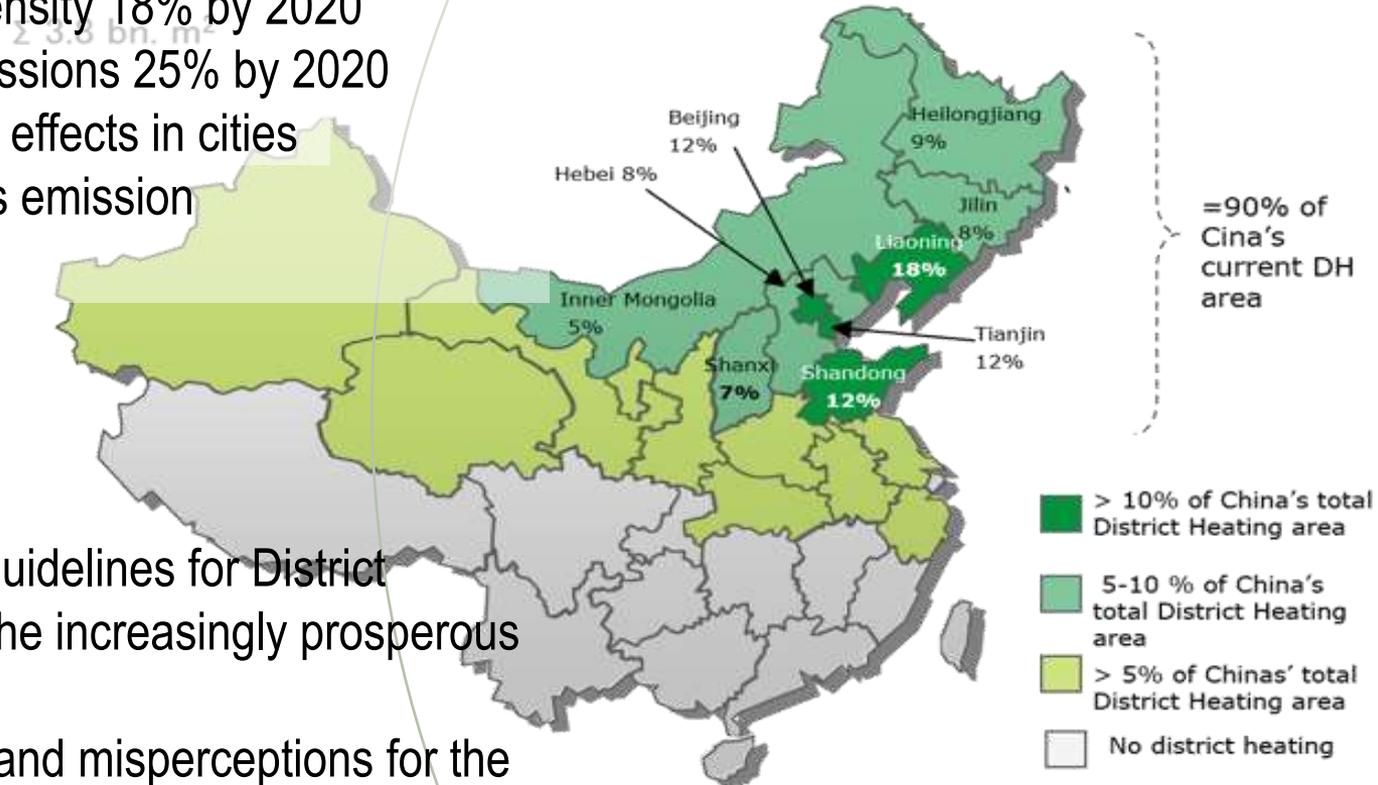
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DRIVERS AND BARRIERS



DRIVERS:

- Reduce energy intensity 15% by 2020
- Reduce carbon intensity 18% by 2020
- Reduce PM2.5 emissions 25% by 2020
- Reduce heat island effects in cities
- Reduce refrigerants emission



BARRIERS

- Lack of policies or guidelines for District Cooling to support the increasingly prosperous market
- Lack of awareness and misperceptions for the modern District Energy system
- Lack of data on heating and cooling consumption in cities.



- **Engaging the national authorities:**

- ✓ Partner with China Energy Conservation and Environmental Protection Group and the National Development and Reform Commission.

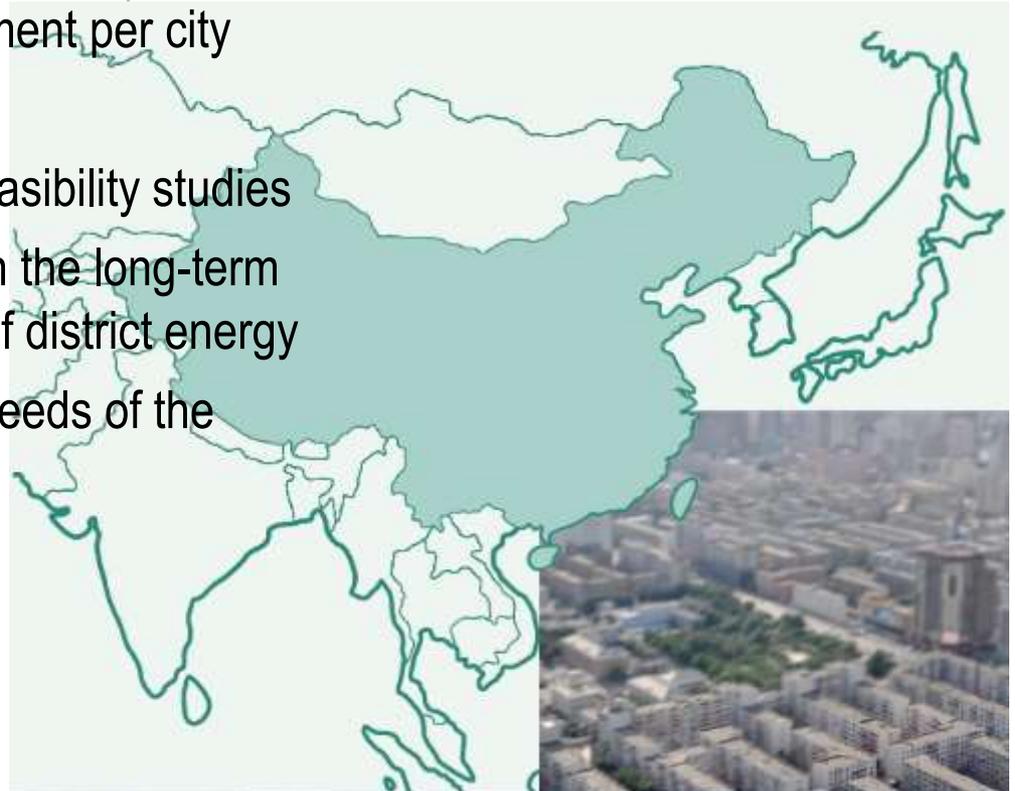
- **Technical support:**

- ✓ Establishment of a virtual center for district energy technical research and engineering applications in collaboration with South China University of Technology.
- ✓ Development of some case studies on district cooling project in the cities of Zhuhai, Zhengzhou and Qianhai





- Call for city selection: 3 to 6 pilot cities for district cooling and district heating
- Development of one rapid assessment per city
- Selection of a deep-dive city
- Development of at least two pre-feasibility studies
- Development of a city wide plan on the long-term technical and economic potential of district energy
- Training sessions adapted to the needs of the pilot city





- ✓ **Strengthen engagement with Initiative's partners present in Asia-Pacific region**
- ✓ **Develop tailored tools for the region:**
- ✓ **ASEAN((Association of South-East Asian Nations):**
- ✓ **Kigali Cooling Efficiency Programme:**
- ✓ **Mongolia:**



Develop a assessment tools tailored to the region, benchmarks for DC, promote best practices based on lessons learnt in the region

Preparing a concept for a regional commitment to DC

Concept proposal under preparation. Looking for countries, cities which might need support and partners to collaborate with us.

Support the preparatory phase of a GCF proposal to scale-up the use of energy efficient district e energy to improve air quality



For more information on the District Energy in Cities Initiative and to become a partner, please visit the website or contact:

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<http://www.districtenergyinitiative.org/>