UNLOCKING THE POTENTIAL OF DISTRICT ENERGY

DISTRICT ENERGY IN CITIES

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

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4DH Conference, Aalborg November 13-14 ,2018

DISTRICT ENERGY IN CITIES INITIATIVE

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LAUNCH AT CLIMATE SUMMIT

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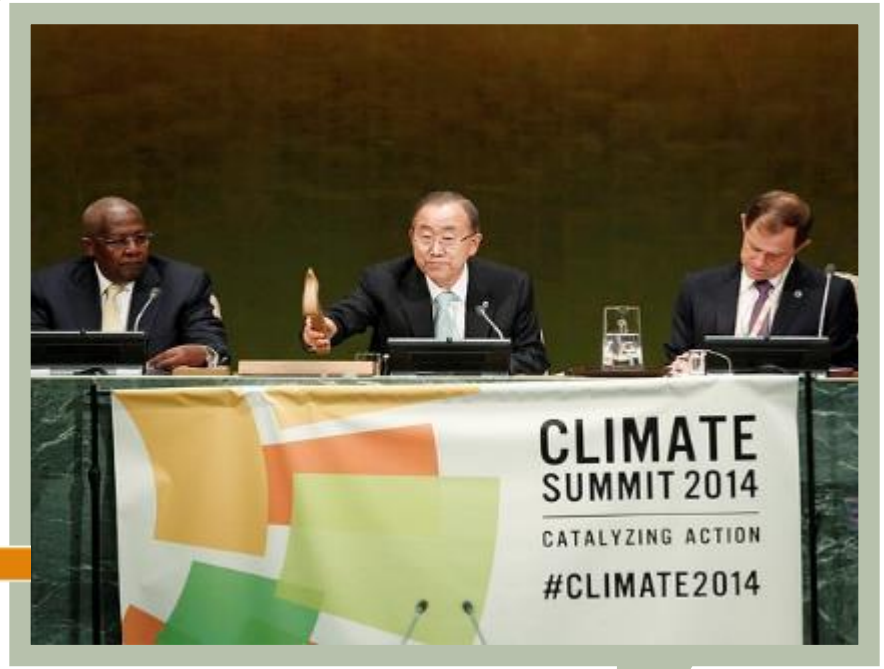
Sustainable Energy for All (SE4All) Sub-Committee's

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



Double Global Rate of Improvement of Energy Efficiency by 2030

Our donors:

gef GLOBAL ENVIRONMENT FACILITY

MINISTRY OF FOREIGN AFFAIRS OF DENMARK DANIDA INTERNATIONAL DEVELOPMENT COOPERATION

KIGALI COOLING EFFICIENCY PROGRAM

OUR APPROACH:

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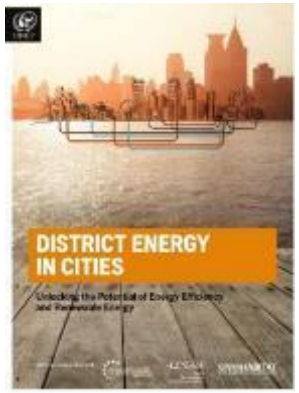
TAKE BEST PRACTICES, ADAPT AND REPLICATE



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

Methodology and Key Steps

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**

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WHAT DO WE DO?

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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.

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WHERE ARE WE?

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14 Countries
25 Cities

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THE INITIATIVE IN ACTION

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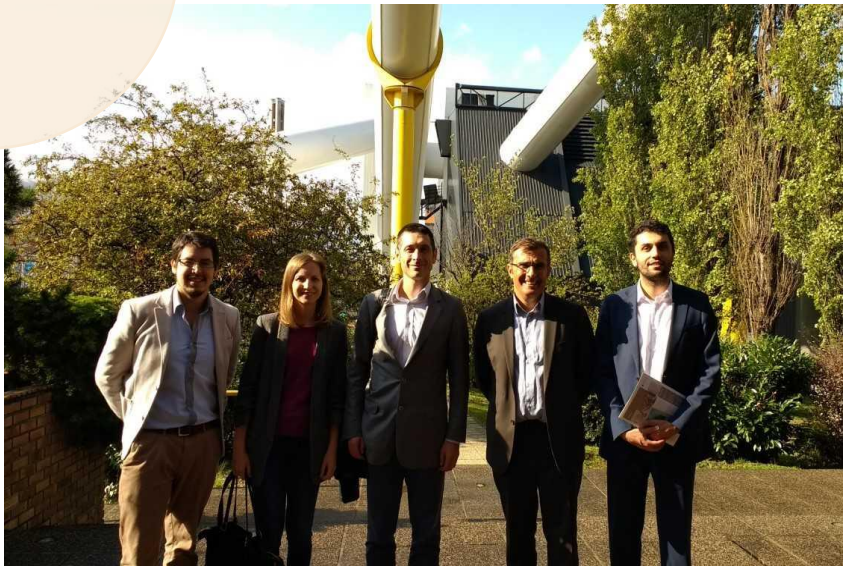

Air Pollution, a huge challenge

Coyhaique

Temuco

10 million people
in Chile are exposed to high levels of PM2,5

Wood burning for heating is responsible for approx. 56% of PM2,5 emissions at national level. In cities like Temuco it is 93%.

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CHILE

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WHAT ARE WE DOING ?

- 10 cities have joined the Initiative, including Santiago.
- A pre-feasibility study on a potential project in Temuco has been finalised
- We will support the city of Temuco to bring one project to tender phase
- Techno-economic assessments to identify potential projects on-going in 7 additional cities.
- Projects identified consider as energy source, biomass or waste heat. There is also interest in exploring geothermal and waste to energy plants
- Heat Roadmap Chile in collaboration with Aalborg University to be started by the end of the year.

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MOROCCO

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PARTNERS INVOLVED:

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United Nations Environment Programme

TERO DELL'AMBIENTE
TUTELA DEL TERRITORIO E DEL MARE

POLITECNICO MILANO 1863

amee
Agence Marocaine pour l'Efficacité Energétique

WHAT ARE WE DOING…

- Engage local stakeholders
- Identify a high opportunity area for development of DC and undertake a techno-economic analysis
- Business model development
- Matchmaking sessions with potential investors to attract finance
- Synthesis report on policy recommendations

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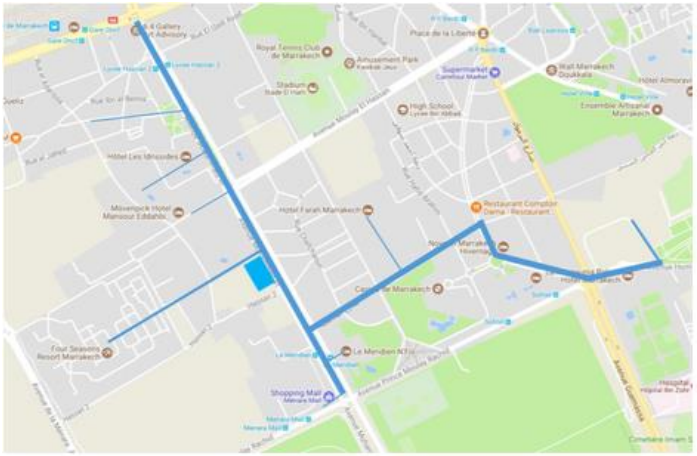
THE PROJECT - MARRAKECH

- Touristic area of Hivernage
- 6,500 TR
- Estimated total investment $17.5 million
- Return on Investment 21.9%
- Payback period 23 years
- 10% costs reduction for consumers
- 46% CO2 emissions reduction
- 34% refrigerants emissions reduction



INDIA

DRIVERS FOR DISTRICT COOLING

- 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.
- Very fast real state developers. DC operators need to be faster to get earlier in the planning process.
- No centralized cooling in public buildings.

INDIA: WORK TO DATE

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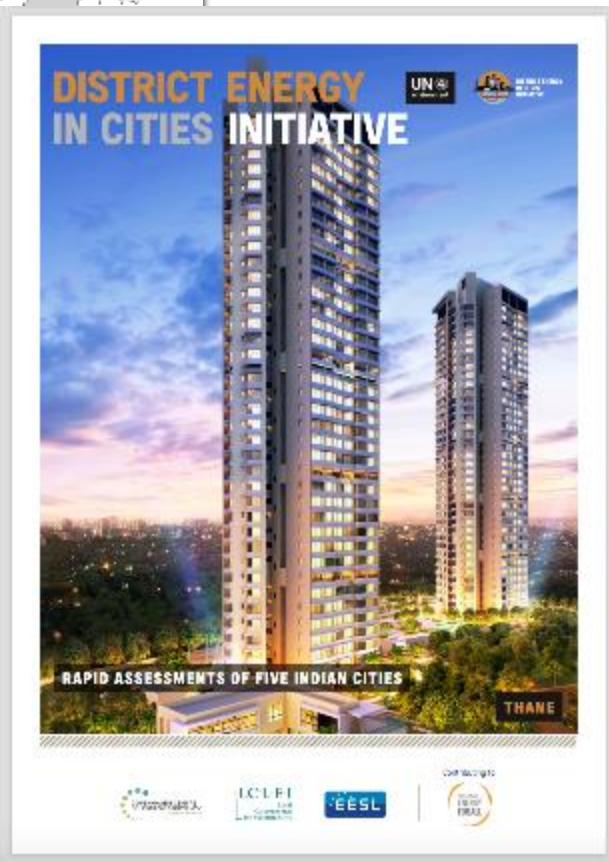
- **Awareness raising**:
  - ✓ Four workshops building local stakeholder engagement
- **Technical support**:
  - ✓ Rapid assessment reports on 5 cities published (identification of barriers and potential for DC in each city)
  - ✓ Two project pre-feasibility studies ongoing
  - ✓ Project identified in Hiranandani State
    - 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



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MALAYSIA

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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

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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

Tri-generation+electric chiller+TES)

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

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CHINA

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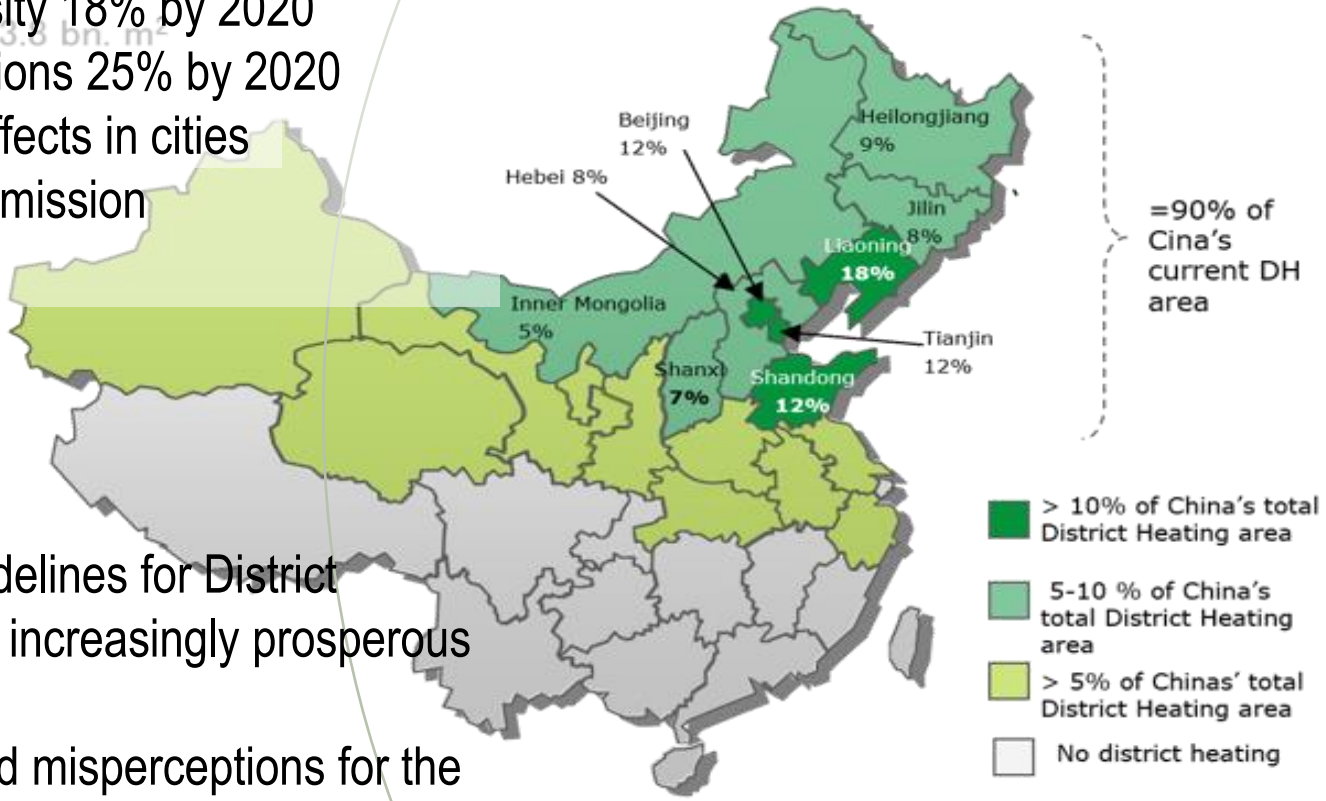
DRIVERS:

- 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.

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SERBIA

SUSTAINABLE ENERGY FOR ALL

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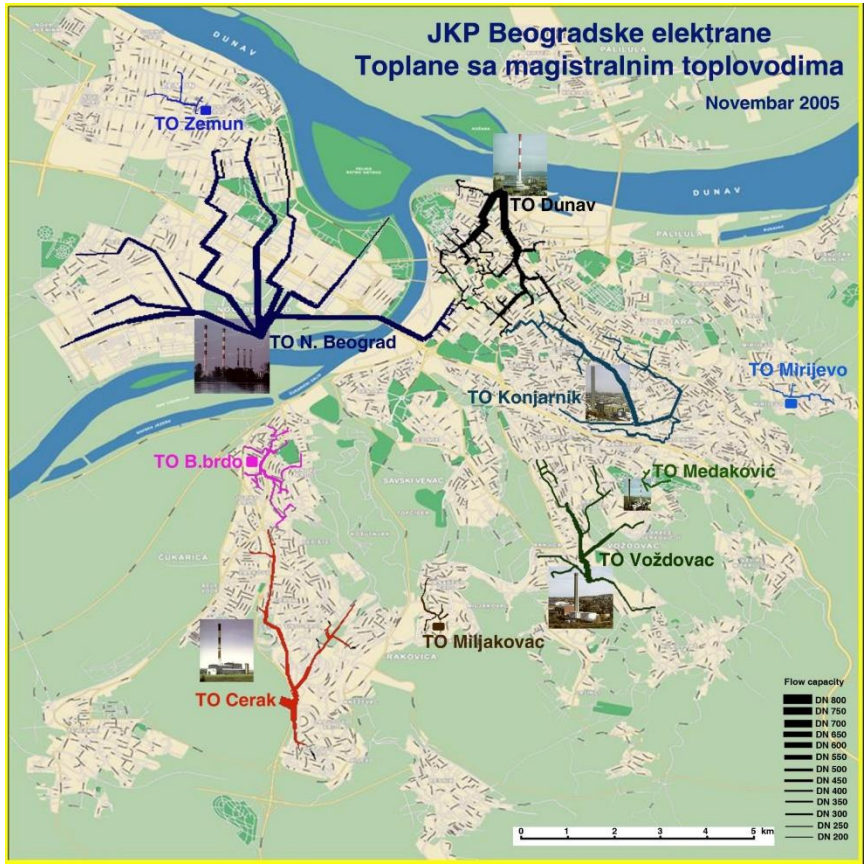
BELGRADE

- Support to deliver an Action Plan to modernize the district heating network including network rehabilitation, connection of renewables and waste heat
- Metering strategy
- Training modules (e.g energy mapping)



COMING SOON

Egypt

KIGALI COOLING EFFICIENCY PROGRAM

- starting January 2019
- Deep sea water cooling in El Alamein

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THANK YOU!

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

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http://www.districtenergyinitiative.org/

INDIA:
THE PROJECTS

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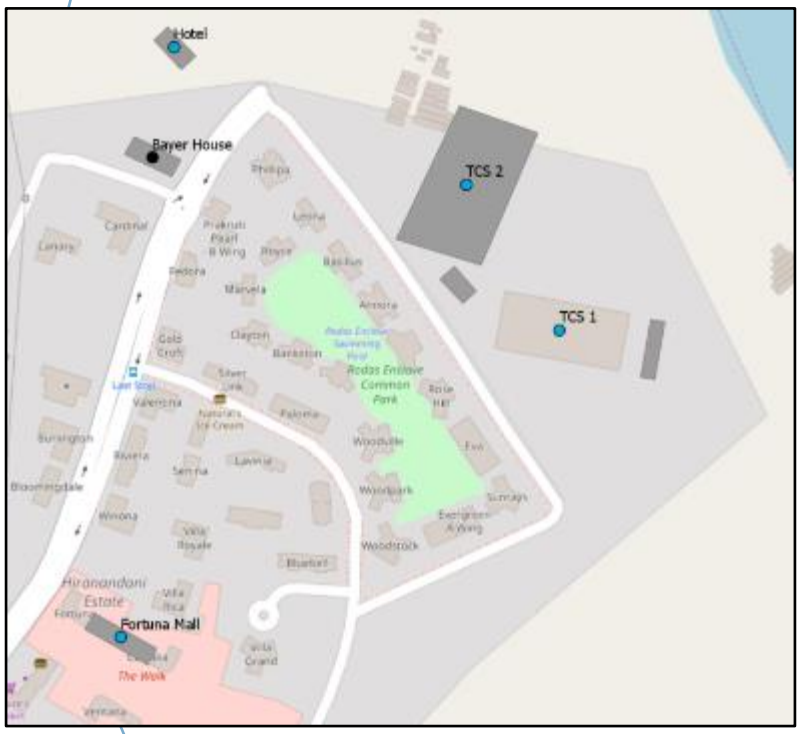
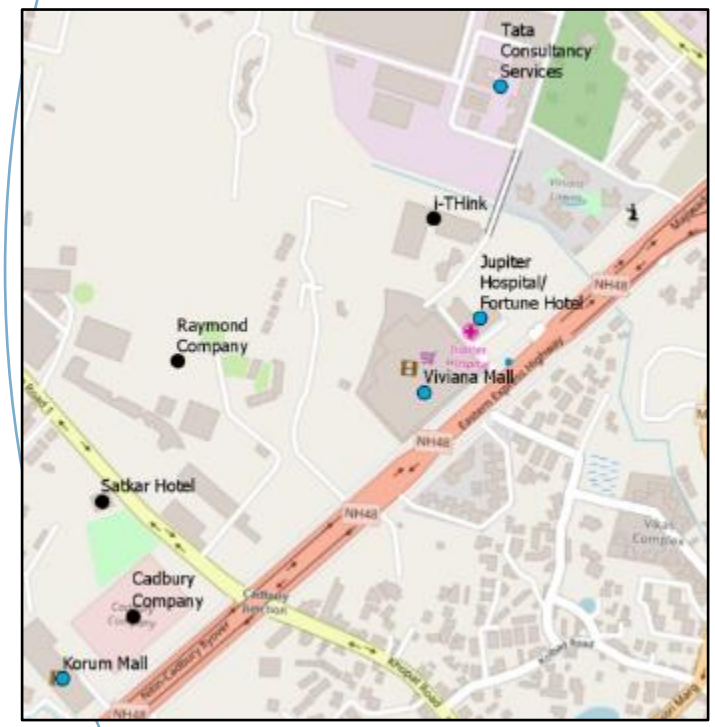
HIRANANDANI ESTATE PROJECT (GREENFIELD)



- 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

INDIA: THE PROJECTS

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

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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