

Indian Rapid Assessment Methodology

Introduction

The concept of a ‘rapid assessment’ came from 1) the need to identify strong cities to champion modern district energy in the Initiative’s pilot countries; 2) the private sector’s typical methodology of assessing a range of factors before proceeding to more costly engagement and assessments in a city; and 3) the need to understand the potential, barriers and policy levers present in countries with limited district energy installations.

In India given most cities do not have district cooling the city rapid assessments of district energy should focus on: 1) identify suitable cities for district energy development to focus the Initiative’s resources; 2) build the case for city action on space cooling and growing power demand; 3) identify high priority projects and 3) provide best practice recommendations to cities on how to advance district energy projects and the policy levers they can use to support this approach.

Rapid assessments set out high-level analysis of the current impacts of space cooling in a city, the potential of district cooling and its benefits in the city, policy options to accelerate district cooling and the high-level feasibility of specific district cooling projects. Following a rapid assessment the District Energy in Cities Initiative will endeavor to further support cities to realize their district cooling potential.

Deliverables

The rapid assessment will analyse the following:

- Current and projected impact of cooling demand locally
- Identify specific demonstration projects in the city and complete simple cost-benefit analysis, including range of consumer groups.
- Analysis of long-term district cooling growth potential
- Analysis of long-term benefits of district cooling to the city (cost, CO₂, refrigerants, fossil fuel reduction, reduced peak load & electricity consumption, increase in local renewable energy)
- Potential to connect as part of the demonstration project a renewable source (e.g. free cooling, biomass, geothermal) or a waste heat source (e.g. existing power plant, industrial waste heat etc.).
- Whether city has the coordination and willingness to develop a demonstration project, in particular, the willingness to change local policy (e.g. local planning policy).
- Barrier analysis (including: financial, political, capacity, regulatory, planning, etc.)
- Potential for private sector participation in district cooling development in the city.

Data points

To achieve the above deliverables the following **non-exhaustive** list of data/information should be collected by the team completing the rapid assessment.

Area	Data/information	Effort Level Required to Access Information	Possible Source(s) of Information
General	Basic city information (economy & growth, population, employment level)	Low	CDP, Master Plan, Municipal Corporation

	Current energy strategy and city's objectives	Low	Solar Master Plan, Electricity Board/Distribution Company
	Energy market structure	Low	Internet, Municipal Corporation- Town Planning Department, Electricity Board/Distribution Company, State Renewable Energy Development Agency
Policy/regulation	Relevant regulations related to urban development and planning including building efficiency standards.	Low	CDP, Master Plan, Town Planning Department, Urban/City Development Authority, Energy department, Energy Management Cell/Centre, BEE
	Local regulations around cooling e.g. daytime/ night time temperature minimums	Medium	Municipal Corporation, Town Planning Department, Pollution Control Board, Energy department, Energy Management Cell/Centre, BEE
	Local, regional or national policy programmes designed to incentivise changes to the cooling system such as refrigerant switching subsidies, air con efficiency payments, etc.	Medium	State Electricity Board, Bureau of Energy Efficiency, Renewable Energy Development Agency, Energy department, Energy Management Cell/Centre, BEE
	Status of National PPP, Concession and Acquisition Laws	Medium	
	Whether the city is covered under smart city programme of GoI. If yes, Relevant features/specification defined under smart city program		
Cooling demand	Previous assessments of cooling in the city/region.	Medium	Electricity Board/Distribution Company, Renewable Energy Development Agency, Solar Master Plan
	Electricity consumption by demand-user (total, seasonal profile, daily profile).	Medium	Electricity Board/Distribution Company, Renewable Energy Development Agency, Solar Master Plan
	Temperature and humidity information and any local demand modelling	Low	Indian Meteorological Department Website, Municipal Corporation
	Approximate length of cooling season.	Low	Indian Meteorological Department Website, Municipal Corporation

	Cooling demand growth projections	High	Electricity Board/Distribution Company, Renewable Energy Development Agency, Solar Master Plan, HVAC manufacturers/ industry associations, City planners, Architect Association,
	Efficiency programmes for air conditioners and buildings.	Medium	Electricity Board/Distribution Company, Renewable Energy Development Agency
Alternative/current technologies.	Information on current cooling technologies (kW, COPs, refrigerants) in use and typical cooling demand/m ²	Medium	HVAC manufacturers/ industry associations, Previous assessments/studies
	Cost of local air conditioners and installation	Low	HVAC manufacturers/ industry associations
	Fuel and electricity subsidy information including tariff structure for electricity	Low	Electricity Board/Distribution Company, Renewable Energy Development Agency
	'Reference price' for cooling in the city by consumer group	Medium	
District cooling costs	Availability and cost of land for energy centres	High	Town Planning Department, Urban Development Authority
	Electricity price structuring by demand-user (fixed, variable and time of use).	Medium	Electricity Board/Distribution Company, Renewable Energy Development Agency
	Electricity/fuel price projections (medium/long-term)	Medium	Electricity Board/Distribution Company, Renewable Energy Development Agency
	Amount of centralised cooling in buildings, (water based systems), particularly in high potential areas, by consumer group type	High	Electricity Board/Distribution Company, Renewable Energy Development Agency
	Local cost of earthworks (e.g. road resurfacing, labour costs)	Medium	Municipal Corporation, Public Works Department
	Taxes and duties on ?	Medium	Municipal Corporation, Tax Department
District cooling design: network	City plan(s) detailing building locations, building use, zones and floor space to determine demand density and new network designs	Very High	Town Planning Department, Urban Development Authority
	Information on anchor loads (existing and planned) for electricity and cool consumption such as airports, hospitals, housing, commercial areas, hotels, religious venues, municipal	Very High	Town Planning Department, Urban Development Authority

	buildings. (Where information is new development plan, expected cooling demand, floor area, location, build time/commission date)		
	Density of underground services/utilities under roads and pavements	Very High	Town Planning Department, Urban Development Authority
	Access to water	Medium	Town Planning Department, Urban Development Authority, Water Supply Department
	Floor area to plot area for new development and estimated peak load per unit of floor area	High	Town Planning Department, Urban Development Authority, Electricity Board/Distribution Company
District cooling design: sources	Waste heat sources in city.	High	Town Planning Department, Urban Development Authority, Pollution Control Board, State Renewable Energy Development Agency , Municipal Corporation, Power generation company, Industry Associations
	Information on sources of free cooling (e.g. location, temperature, depth, etc.).	High	Town Planning Department, Urban Development Authority, Pollution Control Board
	Availability of gas/biogas in the city for direct absorption chillers or tri-generation (biomass as well)	High	Town Planning Department, Urban Development Authority, Pollution Control Board, Energy Development Agency, Piped Gas Supplier, State Renewable Energy Development Agency ,
	Can the local electricity network support the required demand of an electric chiller or the production of a CHP	High	Electricity Board/Distribution Company, Renewable Energy Development Agency
Benefits	Blackout information and use of private back-up generation in the city	Very High	Electricity Board/Distribution Company, Renewable Energy Development Agency, Pollution Control Board, Few selected Residential Welfare Association(RWAs)
	Electricity network investment due to growing cooling demand	Very High	Electricity Board/Distribution Company, Renewable Energy Development Agency

	Emission intensity of electricity production	Low	Electricity Board/Distribution Company, Renewable Energy Development Agency, Central Electricity Board Publications, CEA databook
	Information relating to floor or space saving, maintenance reduction, roof space saving etc. of DES that would benefit private sector developers	Medium	
	Refrigerant consumption in city	Very High	HVAC Manufacturers, Industry Associations, Pollution Control Board