

Energy Efficient Cooling

Context

India, with a population of 1.3 billion people, more than 3,000 annual Cooling Degree Days, and an air-conditioner penetration of 5-10 per cent, is very vulnerable to the impact of rising and extreme temperatures. In March 2019, India escalated the opportunities and challenges in cooling to the national priority level, manifested in the India Cooling Action Plan (ICAP). The ICAP was developed under the aegis of the Ministry of Environment, Forest & Climate Change (MoEF&CC), Government of India, with support from the Bureau of Energy Efficiency (BEE) and other Indian line ministries. As per ICAP, the energy consumption from space cooling in buildings is estimated to be ~135 TWh in 2017-18. Projections show that this will increase up to four times (~585 TWh) in the next two decades.

This lays down the context for the overwhelming need for space cooling in India. One of ICAP's recommendations for the buildings sector is to promote the use of alternate cooling technologies, such as trigeneration system, district cooling, and thermal energy storage.

District Cooling (DC) is a modern and efficient way to air-condition clusters of buildings in urban areas and on campuses. A large central plant produces chilled water for supply to multiple buildings in a district cooling system through an insulated underground piping network. It avoids the capital costs of installing chillers and cooling towers at the building level and frees up valuable rooftop and building space.

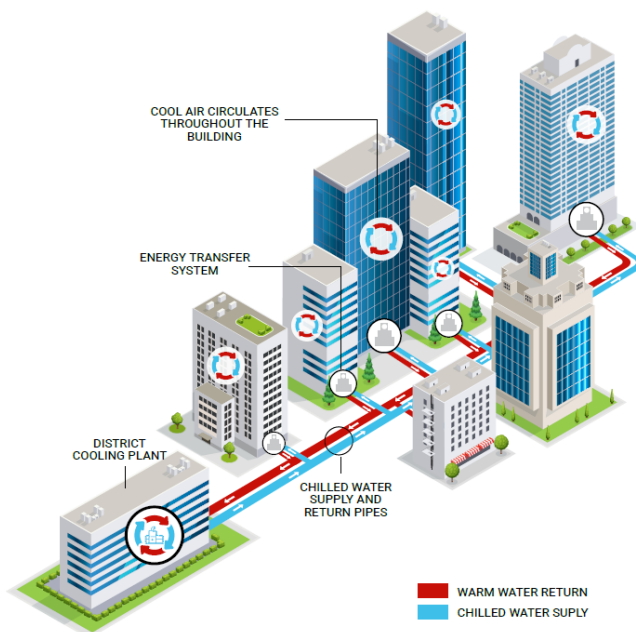


Illustration of a District Cooling System | Source: GIZ India

There are various ongoing activities in this space by different organisations, covering feasibility assessment, and pilots. In close consultation with BEE, the Indo-German development cooperation project will build on ongoing and past initiatives and focus on removing the barriers identified and developing techno-economic viable solutions and innovative business models to implement the DC system in India successfully.

“ District cooling is already happening in India. ”

Published by GIZ



Supported by



on the basis of a decision by the German Bundestag



In cooperation with



About the Project

The project supports the BEE and MoEF&CC in the implementation of the ICAP with regard to energy-efficient District Cooling Systems (DCS).

Impact

Cooling related greenhouse gas (GHG) emissions have been reduced in the Indian building sector (compared to the business-as-usual scenario).

Results

In the implementation of the ICAP, the conditions for the application of energy efficient DCS have improved and the use of natural refrigerants with low or zero global warming potential (GWP) is encouraged in these systems wherever possible.

Result 1

Technical and economic solutions to reduce GHG emissions in the cooling of large buildings with DCS are known to the partners and included into the regulatory processes and policies.

Result 2

Viable business models for the application of energy-efficient DCS in buildings are described.

Result 3

A centre of excellence for applied research, technology transfer, training and capacity building is in place to provide long-term support for the uptake of district cooling in India.

Result 4

An open application to fund incentives for energy-efficient DCS in buildings has been developed by BEE with the support of the project.

Contributions to the 2030 Agenda



Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn, Germany

Bureau of Energy Efficiency, Ministry of Power
West Block 2, R.K Puram, Sector 1
New Delhi – 110066, India

T +49 61 96 79-0
F +49 61 96 79-11 15
E info@giz.de
I www.giz.de/India

Key Stakeholders

To ensure the successful implementation and avail the identified benefits of DCS, adequate support and coordination is required from various institutions, including policymakers and implementors at national and state/city level, design consultants, technology providers, system integrators, financial institutions, and real estate developers.

“
A collaborative approach
is necessary for successful
implementation.”

Government

Governmental institutions provide national context and prioritise action in accordance with national policies.

- Ministry of Power
- Ministry of Environment, Forest and Climate Change
- Ministry of Housing and Urban Affairs
- Central Public Works Department
- NBCC (India) Limited



Facilitators

Facilitator institutions facilitate a project and provide means for the development of a project.

- Financial Institutions
- Knowledge Partners and Associations



Implementors

Implementing institutions bring project to reality.

- Design consultants
- Technology providers
- Developers
- System integrators



Project:
Energy Efficient Cooling

Responsible:
Nitin Jain
nitin.jain@giz.de

Photo credits/sources:
GIZ

On behalf of
Federal Ministry for Economic Affairs and Climate Change

Delhi, June 2024