



## Cooling your home: How to connect residential buildings to district cooling?

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## **Copenhagen Centre on Energy Efficiency**

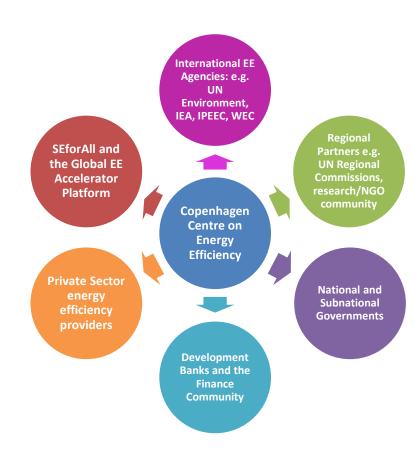
- is a research and advisory institution dedicated to accelerating the uptake of energy efficiency policies, programmes and actions globally
- serves as **Sustainable Energy for All** (SEforALL's) **Energy Efficiency Hub** and supports doubling the global rate of energy efficiency improvement by 2030

## **Key Focus Areas**

Assisting policy change in countries and cities

Accelerating action through innovative delivery models

Raising the profile of Energy Efficiency







The Copenhagen Centre's Knowledge Management System (KMS) engages stakeholders in energy efficiency initiatives through knowledge sharing and outreach. The KMS provides users with access to selected information, reports, publications, and databases on energy efficiency. The KMS is linked to many other energy efficiency initiatives.

For more details, please follow the link below

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**Tabreed** including its shareholders jointly are the largest District Cooling/Heating providers globally with a presence in over 23 countries. Tabreed's current portfolio comprises of 74 district cooling plants operating and serving over 1.1 million RT of cooling across the Gulf countries, developed over past 20 years. Tabreed is a publicly listed company with Mubadala and Engie (being the two largest shareholders.

**Bakulesh Kanakia** has worked for Tabreed for eight years, moving from Corporate Finance to Regional Asset management and since five years as a Business Developer. With Tabreed's strategy for developing international markets, Bakulesh has been assigned to develop the Indian market for district cooling and was instrumental in securing India's 1st District Cooling project on PPP basis for Amaravati Government Complex earlier this year.

**Vikram Murthy** is the National President of ISHRAE (Indian Society of Heating, Refrigerating and Air Conditioning Engineers) and has 44 years of experience in the HVAC industry. Vikram is also the director of Univac Environment Systems Pvt Ltd for Unitary and applied HVAC Products & Systems and a Trustee of the Tropical Air conditioning & Refrigeration Institute for Training HVAC & Refrigeration Professionals and HVAC Equipment Certification. Previously Vikram has been the President of ASHRAE Mumbai Chapter. Vikram holds a Bachelor of Technology, Electrical Engineering from the Indian Institute of Technology, Kanpur, India.

João Castanheira is Deputy Chief Executive Officer at ENGIE Portugal and also CEO at Climaespaço, a subsidiary of ENGIE in charge of building and operating the Lisbon District Heating and Cooling System which includes 21km of district energy network serving numerous tertiary customers but also 4000 residential customers. Vice-President of EFIEES, the European Federation of Intelligent Energy Efficiency Services and a Member of the Board of Directors at COGEN Portugal. With a career of 20 years in the energy sector, Castanheira was previously a member of the Board of Directors at EDP GÁS Distribuição. Castanheira graduated in Mechanical Engineering, specializing in energy, at IST - Instituto Superior Técnico.

**Zhuolun Chen** is senior advisor in the Copenhagen Centre on Energy Efficiency. He has a Ph.D. in building science. As a LEED AP, he developed, consulted and designed more than 30 projects of green buildings and communities. As a consultant and designer, he focused on optimizing energy systems in Internet data centre (IDC) to enhance the overall efficiency level, including the application of new cooling technologies and implementation of district energy systems in IDCs etc.

Since 2017, he is working as a technical expert on district energy system under the District Energy Initiative of UN Environment and Energy Efficiency Data Centre Initiative (EEDC). He focuses on promoting and developing projects for high-efficiency district energy systems in countries such as China, India, Malaysia, Egypt etc.

**Roshmi Sen** is an Architect, Urban Planner and an educator, working as an Assistant Professor at the National Institute of Technology Rourkela, India. She has done her bachelor In Architecture and masters in city planning (MCP) and is pursuing her PhD from the Indian Institute of Technology Kharagpur.

Her doctoral dissertation relates to the cost benefit analysis of energy efficient interventions for affordable mass housing in warm humid climates. The policy outcomes are applicable to government delivered mass housing schemes in India.

While pursuing PhD, she was a Fulbright Nehru doctoral research fellow for nine months working with CHAOS lab led by Prof. Forrest Meggers at the Andlinger Center for Energy and Environment at Princeton University. At CHAOS lab, she worked with alternative low-exergy air conditioning scenarios applicable in mass housing in India against the pre-existing unitized ACs. The study also explored the benefits of district cooling and the institutional mechanisms towards implementing such centralized cooling systems in high density mass housing stock for developing nations.







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