

Global Cooling Prize – Ensuring Climate Action and Access to Comfort

Room Air Conditioners (RACs) are one of the most significant energy loads in modern buildings. With the warming climates and increasing RAC use, typically in the tropics, it was pertinent to address the cooling challenge through a leapfrogging international initiative in the Global Cooling Prize (GCP).

GCP was initiated with an aim to identify and scientifically evaluate the novel RAC technologies from across the world which were scalable, cost-effective, and had at least five times lower climate impact than the market-available RACs. A scaled adoption of such RAC technologies reserves the opportunity to reduce up to 100 gigatons of CO₂-equivalent emissions by 2050 and help mitigate up to 0.5°C of global warming by 2100 while ensuring affordable access to a comfortable indoor thermal environment.

GCP was launched in November 2018 from New Delhi, India, with the support of varied international partners including the Rocky Mountain Institute; Department of Science and Technology, India; Mission Innovation; and others. The call

for innovative and efficient RAC technologies received about 450 international responses, out of which, the Technical Review Committee selected eight finalists. The theoretical evaluation of the detailed technical applications involved an assessment based on the direct and indirect climate impact of the RAC, affordability, power drawn, water consumed, equivalent emissions, refrigerant use, scalability, materials, and operations.

CEPT University was one of the four administration partners of the prize and undertook the field and lab assessment of the finalist RAC prototypes. The finalists were awarded a sum of US\$200,000 each, aimed to support the development of two RAC prototypes to be used for real-world testing.

The subsequent year, the two RAC prototypes from each participant were transported to India for the Lab, Field, and ISEER Testing conducted by the CEPT Team. The Lab tests were performed at the Low-Energy cooling Test Bed (LECTB) facility located at CEPT University, Ahmedabad; the Field tests



Figure 1. LECTB facility for lab testing at CARBSE, CEPT University

were performed at eight unoccupied, thermally identical apartments in Bahadurgarh, Haryana; and the ISEER tests were performed at a NABL-certified HVAC test facility in Chennai. The Lab and Field tests involved constant coordination with the respective participating teams and daily reporting of the test data. The overall climate impact of the field test prototypes was displayed on a public, online dashboard on a day-to-day basis.

After the Technical Review Committee's detailed assessment of the findings from the months-long execution of rigorous test protocols in the field and lab settings, the joint winners of the US\$ 1 Million prize were announced in April 2021. The two teams were: team Daikin with Nikken Sekkei (Japan and India) and team Gree with Tsinghua University (China). The two winning RAC technologies integrate highly optimized compressive cooling systems with alternative approaches for offsetting or reducing energy consumption. A scaled adoption of such RAC technologies paves the way for climate action from its unique standpoint and helps ensure popular access to thermal comfort.

Initiated By



Sponsored By



Administered By

