

Vertiv **A Smarter Way to Keep the Digital World Cool**

Every time we stream a video, use AI tools, or store data online, vast data centres work silently in the background. But keeping these centres cool is one of their biggest challenges, consuming significant energy and resources.

At IIT Bombay, a simple but powerful idea began to take shape: what if cooling could be made more efficient, without increasing complexity or cost?



If scaled, this innovation has the potential to reduce data centre cooling energy consumption by 15 to 30% and lower water usage by 5 to 30%, leading to significant cost savings across operations. It could also support more sustainable cooling for AI data centre facilities, contributing to reduced environmental impact as digital infrastructure continues to grow.

Sustainable Cooling Innovation

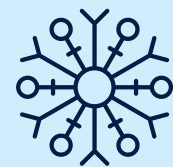
Preliminary experiments at the HPLIITB on a 30 kW RCD Evaporative Pre-Cooler coupled with a Fin Tube Water Cooler (RCD FTWC) Module indicate heat dissipation of 30 to 40 kW, using fan and RCD water pump power input of less than 0.9 kW during January 2026 at IIT Bombay. The cooling COP is in the range of 33-45. This is significantly higher than the conventional cooling pad-based dry-wet cooling, currently deployed commercially.

This unit was developed with partial support from the National Supercomputing Mission (NSM) through a joint project with C-DAC Pune. It is now installed at Indian Institute of Science Education and Research (IISER) Pune, where it will be demonstrated first using hot water generated by an air-source heat pump water heater developed at the HPLIITB, and then integrated with the DC cooling loop.

The impact is clear: a solution that helps data centres run more efficiently, lower costs, and reduce environmental impact.

Just as importantly, the journey does not end with the project. The system will then be recommissioned at IIT Bombay as a live learning platform, enabling students and researchers to continue experimenting, learning, and innovating. After successful tests the technology will be offered for licensing and commercialisation.

This collaboration reflects the best of both worlds—academic ingenuity and industry expertise—coming together to solve a pressing global challenge.



This initiative not only advances cooling technology but also strengthens India's path toward self-reliant, high-impact innovation.

Through a collaboration with Vertiv, this idea is now becoming reality. At the heart of this effort is an indigenous innovation—the **Rotating Contacting Disk (RCD)** technology to be deployed as the Evaporative Pre-Cooler. When combined with Vertiv's industry-grade cooling systems, it creates a hybrid solution that can adapt to different conditions, improving efficiency while reducing energy and water use.

But this is not just a lab experiment. **The Heat Pump Laboratory at IIT Bombay (HPLIITB)** is building and testing a 30 kW module. A field prototype module of 40 kW will then be built and tested along with the Vertiv's Dry Cooler - first at IIT Bombay, and then under real operating conditions at Vertiv's facilities—ensuring it works where it matters most.