

Sustainable cooling solutions: Efficient Office and Data Centre Cooling at the Tecnopolo Meteorological Weather Forecasting Building in Bologna, Italy

CATEGORY:

Data centres

THE CONTEXT:

In 2020, datacentres are projected to use 4% of the EU's total annual energy consumption. Cooling is crucial to ensure the reliable operation of datacentres and typically accounts for more than one third of that energy use. Efficient solutions are therefore important. A real estate complex of a former tobacco factory, built in the 1950s and now owned by the Emilia-Romagna Region, will become the headquarter of the new Technopolo in Bologna hosting one of the biggest datacentres in Europe, widely known for its role in forecasting the weather in Europe and equipped with latest technology to keep the data processing computers cooled whilst they calculate the weather data. The project, the result of an international competition, plans to demolish the most dilapidated structures, renovate some of the existing ones, and build new buildings, for a total area of more than 100,000 m². The new Technopolo will be a center for innovation and experimentation and will host various institutions (Region Agencies, ENEA, Rizzoli Orthopedic Institutes), research laboratories, the new National Agency for Meteorology and Climatology (ItaliaMeteo) and the data centre for the European Centre for Medium-range Weather Forecasts (ECMWF).



SUSTAINABLE COOLING SOLUTION:

- One joint HVAC system to provide comfort in ECMWF offices and cooling of the ECMWF data centre
- Designed to ensure maximum efficiency with reduced environmental impact with:
 - 28 w-NEXT 2 K 180 RC branded hydronic close control units for the server rooms
 - 2 NX-W/ N 0262 heat pumps
 - 2 NECS-W/ Q 0904 multipurpose heat pumps
 - 3 WZ-E air handling units (Climaveneta branded)
 - 9 RC branded i-FR-G05-Z/E/S 3602 screw inverter air source chillers, dedicated to cooling the supercomputer.
- The project is based on a cold-water loop at the service of the datacenter, which supplies the close control units and acts as the source for the heat pumps. In winter, the heat pumps extract the heat directly from the water loop, decreasing the overall cooling demand. In summer the heat pumps rely on the chillers to satisfy any peaks as needed.
- The chillers have been specially selected with new generation R513A low-GWP (Global Warming Potential) refrigerant and zero ODP (Ozone Depletion Potential).



BENEFITS:

- The centralized cooling system and the presence of the cold-water loop allow for significant reduction in the total electrical consumption of the building.
- All units are managed by ClimaPro, which optimizes system operation by choosing the best source to keep the average seasonal Power Usage Effectiveness (PUE) of the data centre below 1.5.

TOPIC:

- Energy Efficiency
- Synergies with Heating
- Heat Recovery
- Heat Pumps
- Refrigerants
- Building Automation and Control

GENERAL INFORMATION

NAME OF THE COMPANY: Mitsubishi Electric Hydronics & IT Cooling Systems S.p.A.

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HYPERLINK TO LEARN MORE ABOUT THE SUSTAINABLE COOLING SOLUTION:

<https://www.melcohit.com/EN/Download/Download/13199.dl>

