

Siemens Data Center

Eni's Green Data Center

"Cool technology" for the most energy-efficient data center in the world

Customer

Eni S.p.A., with headquarters in Rome, Italy

Location

Ferrera Erbognone, Italy

Project/plant

Electrical installation in a TIER IV data center

Project partner

CMB

Project time period

2009

Construction

2011-2013

Scope delivery

- Installation of all electrical, mechanical, and air-conditioning systems
- Building automation – building management system
- Transformers
- MV and LV switchgear
- Uninterruptible power supply
- Desigo PX control systems for air treatment systems
- Sinteso fire alarms, Vesda aspirating smoke detectors (ASD)
- Mega air ducting systems, cooling units, and cooling towers

In Ferrera Erbognone, Italy, Eni has constructed the most energy-efficient data center in the world. Its performance is directly comparable to the world's largest IT providers, such as Google and Facebook. With its TIER IV classification compliance, it is considered to be one of the most reliable data centers in the world. In concrete terms, this standard permits a maximum of 48 minutes of downtime per year (99.995 % availability). The hosted computers can generate from 5,000 to 15,000 W/m² of waste heat. This roughly corresponds to 3 to 10 times the thermal output of a conventional hair dryer – on each of the approximately 5,400 square meters in the data center, which houses over 7,000 servers with a total of 60,000 processor cores! The data center's estimated electrical power consumption amounts to 30 MW and is sometimes as high as 36 MW during peak load periods; this corresponds to the amount of energy that could be used, for example, to operate 3,000 to 4,200 state-of-the-art induction stoves.

The challenge: energy efficiency a hot topic

What to do with the heat? That is the crucial question in data centers, because too much heat can result in failures – and failures mean data loss and trouble with customers. To ensure that the high cooling requirements do not adversely affect energy consumption, however, the Green Data Center uses an intelligent combination of Totally Integrated Power, air conditioning technology and building automation to operate with a world-record PUE value less than 1.2. Power Usage Effectiveness (PUE) is the ratio of the total energy consumption to the power consumed by the processors. This ratio alone shows that very little power is used for the necessary cooling capacity. With this approach, Eni is fulfilling its environmental responsibilities – and is also saving energy. Just as important for the Green Data Center are the highest requirements when it comes



The Eni Green Data Center in Ferrera Erbognone

to safety, fire protection, and availability, which also need to be resolved technically.

That's why Siemens offered an integrated overall solution made up of electrical, mechanical, and air conditioning systems, cooling units, and building automation.

Benefits of this solution include achieving peak values in heat dissipation of up to 50 kW, which requires powerful and efficient technology.

"The integrated solution for all electrical and climate control systems from a single source – that convinced us and helped us to adhere to the ambitious schedule for the Green Data Center and support our climate goals over the long term."

*Gianluigi Castelli
Executive Vice President ICT
at Eni Milan Area, Italy
Industry Petrolio ed energia.*

The solution: systematic, coolly calculated technology

CMB, the general contractor responsible for the construction of the data center, decided to use the integrated turnkey portfolio from Siemens because it promised a complete solution with the highest level of quality and reliability. In addition, with the order Siemens took on a high level of responsibility to ensure on-schedule implementation and offered a single point of contact for the customer, covering a broad portfolio of solutions. While Siemens supplied the electrical equipment and building automation, the partner Mega was responsible for the optimized air ducting and cooling technology. The project launched in December 2011 with a total investment volume of €28 million and a duration of two years.

The cooling concept is particularly impressive, up to 75 percent of which relies on external air cooling and only 25 percent on air conditioning. In addition, a portion of the waste heat is stored and reused in the building. It was also necessary to achieve significant energy efficiency improvements in the uninterruptible power supply and power distribution: In conventional data centers, losses can amount to approximately 13 percent of the total energy, but in a Green Data Center they may only amount less than 0.6 percent.

Similar requirements apply to the drives of pumps, fans, and ventilators. To ensure optimal HVAC control and fire protection, Siemens relies on approximately 80 Desigo PX automation stations for air treatment systems and Sinteso fire alarms, and Vesda aspirating smoke detection systems (ASD).

The benefits: eco-friendly performance and efficiency

Eni deliberately chose the benefits of a complete solution consisting of an electrical and air-conditioning system and building automation: reduced coordination thanks to a responsible partner and perfectly coordinated technology. In addition, all systems were handed over on time as a turnkey solution. In addition to safe and reliable computing power, for Eni the Green Data Center is also an expression of its own corporate policy, the values it practices, as well as an expression of its active responsibility to the environment and society. The new data center, for example, not only operates with significantly lower energy consumption, it also has a much lower environmental footprint. The Green Data Center saves up to 335,000 t of CO₂ emissions every year – a figure that corresponds to one percent of the savings Italy is attempting to achieve by the year 2020 in line with the Kyoto Protocol.

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.