

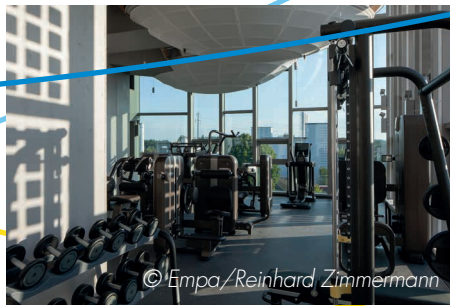
Renewable energy for the health club

Wellness facilities and fitness centres are extremely popular but require a lot of energy to run. They need energy-efficient solutions that do without fossil fuels. "Solar Fitness & Wellness" in Dübendorf near Zurich is an impressive example of how sustainable sources and an intelligent automation solution can reliably power even energy guzzlers like steam baths and saunas.



In August 2017, the Swiss Federal Laboratories for Materials Science and Technology (Empa) and the Eawag aquatic research institute opened the "Solar Fitness & Wellness" unit on their research and innovation platform NEST (Next Evolution in Sustainable Building Technologies). The aim is to run this fitness centre and wellness area without any fossil fuels and reduce the energy requirement to one sixth of the energy normally used.

The "Solar Fitness & Wellness" unit is located on the top floor of the NEST building, behind two glass facades around eight metres high. In the open-plan room there are two saunas and a steam bath hanging from the ceiling. Underneath, gym-goers can use a wide range of equipment for strength and stamina training.



Empa and Eawag commissioned an intelligent building automation system that enables the energy needed for the new fitness and wellness facility to be precisely regulated. SAUTER's existing collaboration in NEST enabled it to showcase its extensive expertise and innovative products in this latest project.

Heat pump and solar energy

In order to significantly reduce energy consumption, the planners opted for a high-temperature CO₂ heat pump. Three photovoltaic systems on the facade and roof supply the remaining approx. 20,000 kWh of power required per year. A thermal solar facility also provides hot water for the centre's showers.

The entire installation is integrated in an overall automation solution from SAUTER. Digital interfaces connect all the third-party bus systems to the SAUTER automation system (EY-modulo 5 family). The higher-level modular building management solution – SAUTER Vision Center – enables staff to easily and effectively monitor and operate the various sub-systems.

Putting sustainable energy to optimum use

Visitors to the "Solar Fitness & Wellness" unit will enjoy ideal temperatures in the two saunas and steam bath. However, because the operating company does not want energy wasted on heating units that are not in use, the installation is linked to a reservation system. BACnet delivers data from the intelligent automation system straight to the high-temperature CO₂ heat pump, which generates temperatures up to 130 °C and directs the heat to the various units.

The electricity and heat meters integrated into the system via Modbus and M-Bus are already showing that the heat pump alone enables "Solar Fitness & Wellness" to reduce its power consumption by around two thirds. Heat and moisture recovered from the sauna and steam bath also allow ventilation losses to be halved. Finally, optimum thermal insulation minimises the heat lost in transmission.

Automation is key

SAUTER's integrated building automation solution not only regulates the heating at the fitness and wellness facility but also the demand-led lighting, sunshading and room climate. Presence sensors integrated via DALI control most of the lighting, for example, thus reducing power consumption. When the sun is strong, the SMI-integrated blinds on the giant window facades respond immediately to prevent room temperatures from rising. A ventilation system in the changing rooms provides cooling fresh air after a hard workout or sauna session.

Intelligent systems for sustainable wellness

By running this unique concept of "Solar Fitness & Wellness", Empa and Eawag hope to learn how renewable energy can fulfil the requirements of the energy-intensive wellness sector. They are relying on intelligent, efficient systems – both for energy production and building automation.

Visions of the future in Dübendorf

In their modular research and innovation building NEST (Next Evolution in Sustainable Building Technologies) near Zurich, Empa and Eawag research, test, develop and validate new technologies, materials and systems – all under real conditions. Their close cooperation with partners from research, industry and public sector enables innovative building and energy technology to be launched on the market faster.

<http://nest.empa.ch>