

OpenBlue Pioneers

Powerhouse Brattørkaia

How powering sustainability for the world's northernmost energy-positive building is a model for transformational design and development worldwide



The importance of net zero buildings to a sustainable future is clear. According to the United Nations Environment Programme's 2020 Global Alliance for Buildings and Construction Status Report, the buildings and construction industry accounts for 40 percent of total global energy-related carbon emissions, with three-quarters of those emissions attributable to building operations.

Addressing this reality is extremely important and reducing energy demand in buildings is the most cost-effective path to achieving impactful sustainability. Not only will this energy reduction contribute to tackling the climate crisis, it will also promote improved health and quality of life for people all over the world.

Ten years ago, a team of visionaries moved to create a structure of extraordinary advancement in design, energy efficiency and technology.

Enter Powerhouse Brattørkaia. Designed by the Powerhouse Alliance, located in Trondheim, Norway and completed in 2019, it is the shining star of energy-smart office buildings in the northern hemisphere. Exceeding net zero, it is the country's first energy-positive commercial building.

Johnson Controls, the global leader for smart, healthy and sustainable buildings, played a significant role in bringing

Powerhouse Brattørkaia to fruition and helping it to achieve BREEAM Outstanding certification.

Collaborating for net zero excellence

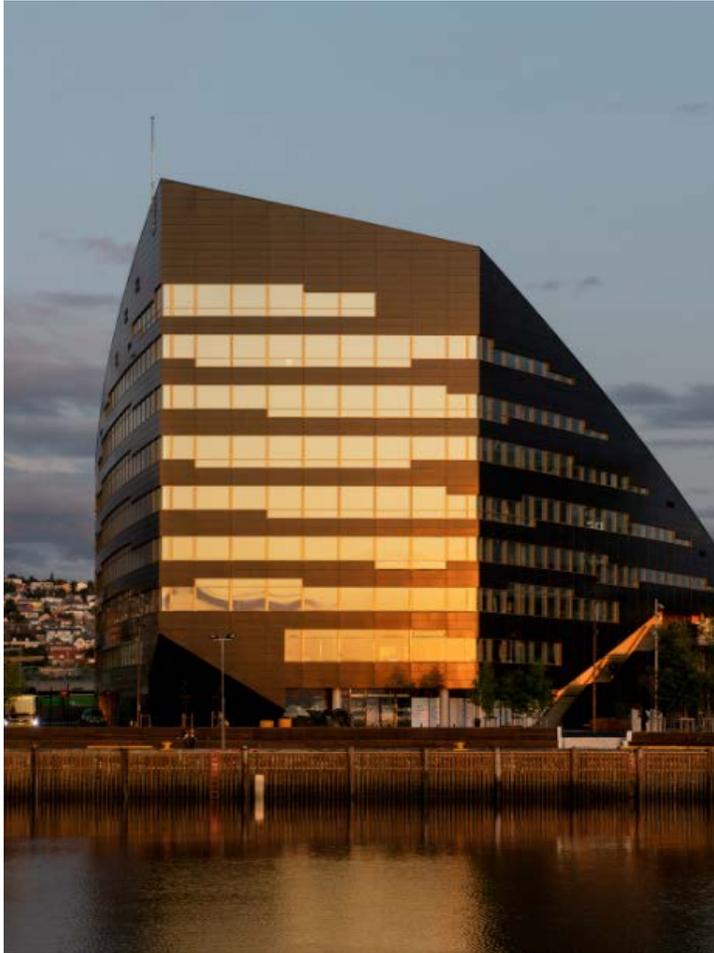
The Powerhouse Alliance is a 10-year collaboration consisting of Norwegian firms Entra, Snøhetta, Asplan Viak, Skanska, and the environmental organization ZERO, whose objective is to be the most climate-ambitious player in the construction sector.

For Powerhouse Brattørkaia, the Alliance wanted to build a net-zero, energy-smart building that would serve as a leading example for the northern hemisphere.

The project had three aims: to maximize the amount of clean energy produced by the building, to minimize the energy required to run it, and to serve as a pleasant space for its tenants and the public.

In its operational phase, an energy-positive Powerhouse should generate more renewable energy than it consumes during its lifetime.

In fact, in 2019, Powerhouse launched Powerhouse Paris Proof, a new standard for futureproof buildings based on the Paris Agreement's 1.5-degree objective. One of its core requirements is that the building must be energy positive.



Leading in design and technology

An iconic design shaped by the environment, Powerhouse Brattørkaia draws upon solar, water and other renewables to power the energy-positive property, embodying ecological ingenuity and inspiring occupant wellness.

For this Powerhouse project, Johnson Controls delivered state-of-the-art building management solutions for the eight-story, 3,000m² office building. The company followed the Smart by Powerhouse digitalization strategy for the design, development and communication of smart commercial buildings, both new construction and rehabilitation projects.

Johnson Controls was the perfect partner for a cutting-edge project of this type. This is because of its large portfolio of smart buildings technology, its vast expertise in designing and implementing building solutions, and its strong commitment to sustainability.

Certified quality

Today, the Powerhouse Brattørkaia is energy-positive across the entire building life cycle, including embodied energy in construction materials and end-of-life deconstruction. Therefore, it is producing more electricity than it consumes daily, supplying renewable energy to itself, neighboring buildings and vehicles via a local microgrid.

Major achievements

- Solar photovoltaic array produces 485,000 kWh annually, which is enough excess electricity to charge 200 electric vehicles.
- Seawater-sourced natural refrigerant heat pump provides complete cooling and heating for the office and some neighboring buildings through a district energy system.
- Utilization of air-side heat recovery, a super-insulated envelope, control of thermal mass for heating and cooling, and occupant-adaptive lighting and ventilation systems further enhance energy efficiencies.
- Its high efficiency has earned it the BREEAM Outstanding certification for green building standards. BREEAM is the world's leading sustainability assessment method for master planning projects, infrastructure and buildings.

Powerhouse, the center of the energy grid for Entra, can count on an excellent relationship with Johnson Controls and a broad offering of solutions to meet its needs. Our major installed base and central ADX server are superb examples of this.

The role model for smart development

These diverse global projects demonstrate that focusing on decarbonization, electrification, efficiency and digitization can deliver net-zero buildings and communities that are smart, safe, sustainable and affordable.

At this critical juncture in the climate crisis, fully decarbonizing the world's buildings by 2050 is vital to meet the Paris Agreement Goals.

Johnson Controls and its partners are paving the way across different industries to make the transition towards net zero easier.

Introducing OpenBlue Pioneers

OpenBlue Pioneers are developing the stories of tomorrow. Futurists, their visions revolutionize the built environment, drawing upon the advanced innovations of Johnson Controls to realize their commitment to sustainability.

As advocates of possibility, these Pioneers envelop the OpenBlue suite of connected solutions to transform business and align

with our commitment to creating smart, healthy and sustainable environments that focus on outcomes for people, places and the planet.

“Johnson Controls and Powerhouse are both dedicated to protecting the environment and providing a fundamental shift in the energy efficiency of buildings,” said Rune Stene, managing director of Powerhouse.

We are pleased to be a part of the Powerhouse Brattørkaia story.



About OpenBlue

OpenBlue is a complete suite of connected solutions that serves industries from workplaces to schools, hospitals to campuses, and beyond. This platform includes tailored, AI-infused service solutions such as remote diagnostics, predictive maintenance, compliance monitoring, advanced risk assessments, and more. A dynamic new space from Johnson Controls, OpenBlue is how buildings come alive.