SMART SAVINGS

College lowers heating and electricity costs with Lithium-Ion battery storage

TESVOLT
THE ENERGY STORAGE EXPERTS

PROFILE

Client:
Wirral Metropolitan College

Industry:
Educational institution

Special characteristics:
Optimization of combined heat and power plant operation

Region, country:
Liverpool, England

THE BACKGROUND

In recent years, the price of electricity and gas in the UK has risen enormously. Households and public institutions are therefore looking for ways to optimize their consumption. Wirral Metropolitan College near Liverpool is one such institution. The college started out as a small art school 160 years ago and now has over 10,000 students per year across four campuses in Wirral.

THE CHALLENGE

Like most educational institutions, Wirral Metropolitan College mainly uses energy for heating, hot water provision, and lighting. The college is open 40 weeks a year from 7 am to 11 pm, but electricity consumption fluctuates greatly over the course of each term.

Consumption is lower in the summer not only because of the outside temperatures, but also because the college is used much less during the holidays, meaning that electricity and heat demand is much lower than in the cold winter months.

To cut heating and electricity costs, the college installed two gaspowered combined heat and power plants (CHP) each rated 65 kW. One of the plants provides heat and electricity around the clock, while the other only runs in winter to meet the increased heating and electricity needs during the day when the students are in class.

Since the amount of electricity and heat generated during a day does not always meet demand, storage solutions were needed to absorb excess energy and release it again later, aligning consumption and supply more closely with one another. In addition to a thermal phase-change storage unit for excess heat, the college was also looking for a reliable electric battery storage system.

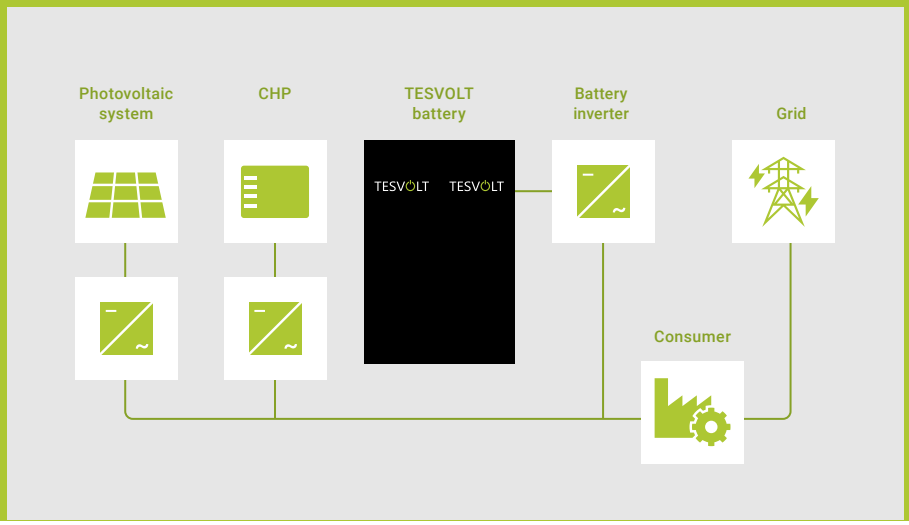
Requirements for an electrical storage solution were:

- Powerful storage system with high depth of discharge and high number of guaranteed cycles to ensure a sustainable and long-lasting investment
- Easy installation and seamless interaction with the existing setup

INCREASE SELF CONSUMPTION

THE SOLUTION

Scotia Energy, a specialist installer, convinced the college to opt for the top-quality lithium-ion battery storage systems produced by German company TESVOLT and installed the high-voltage TS HV 70 system with an energy capacity of 134.4 kWh and an output of 60 kW in the basement of the college's Twelve Quays campus. The TESVOLT system has been running alongside the phase change battery ever since, storing energy at times when demand is low and then releasing this excess energy when demand is high.



"While the acquisition costs have been significant, in the long run this campus will be able to reduce its energy consumption, CO2 emissions and costs enormously – we expect savings of more than 55,000 pounds per year after a payback period of about 6 years. That's remarkable!"

George Norrie, Technical Director at Scotia Energy

THE ADVANTAGES

In addition to the enormous savings in heating and electricity costs (estimated at £ 55,000 per year once the initial investment has been recouped after 6 years), the college and the region also benefit from the storage system in other ways:

- The new system significantly reduces maintenance costs. TESVOLT storage systems have an above-average lifespan of up to 30 years due to their advanced battery management system, with a depth of discharge of 100 % and only 5 W of self-consumption.
- As part of a training programme, STEM students can use the monitoring and control system to access stored or real-time data on plant performance, offering them practical insights into the operation of CHPs and storage systems.
- The system allows its owner to offer profitable grid services by feeding surplus electricity into the grid. TESVOLT battery systems are ideally suited for this as they are not only powerful but also 1C capable, which means that they can be fully charged or discharged in one hour if suitably configured. They can therefore be used to help run powerful equipment or responsively stabilize the public grid.

PROJECT: FACTS AND FIGURES

Storage system	TS HV 70
Energy content	134,4 kWh
Discharge power	60 kW
Cell	Lithium NMC prismatic (Samsung SDI)
Efficiency (battery)	up to 98 %
Cycles	6.000–8.000 (0,5C- to 1C at 23 °C +/-5 °C with 100 % depth of discharge)
Operating temperature	-10 °C to 50 °C
Battery inverter	SMA Sunny Tripower Storage 60
Installer	Scotia Energy

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