Battery Storage FAQ

Questions and answers about VPI large-scale battery storage systems

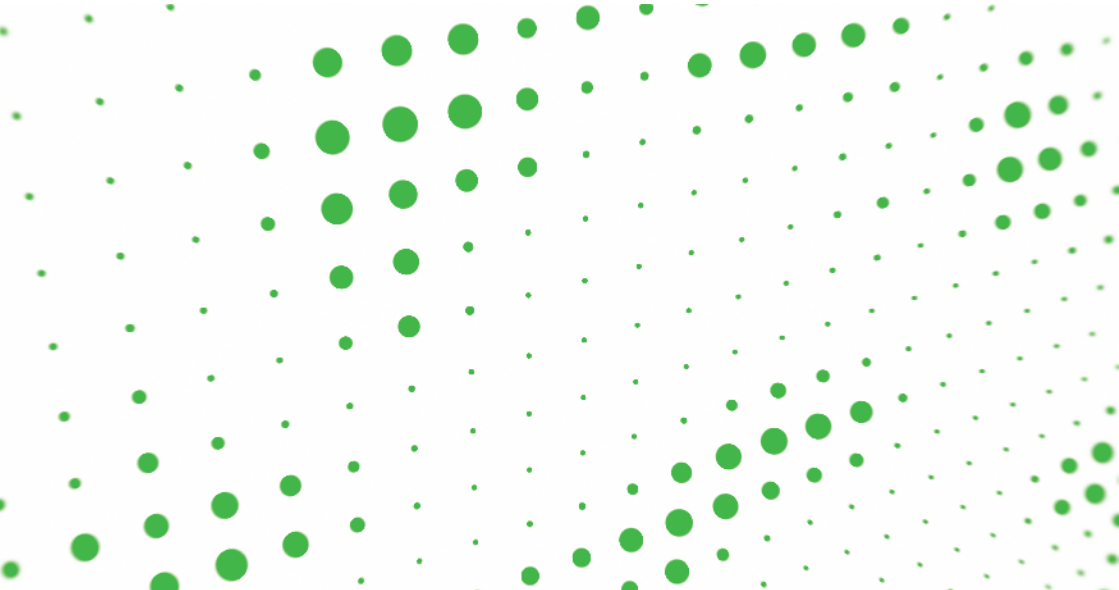
VPI

About VPI

VPI is a leading energy company backed by Vitol, the world's largest energy and raw materials company. We see ourselves as a system solver. Our mission is to anticipate and then solve challenges that arise during the energy transition. We have 3.5 GW of flexible and reliable power generation assets in the UK and Ireland and are also the largest battery operator in Ireland.

We believe that meeting climate targets is fundamental to all our futures. To achieve this goal, we need to embrace a new energy reality by operating and evolving the current energy system while introducing new energy sources and new technologies.

Our portfolio includes reliable thermal power plants, battery storage and carbon capture projects that enable decarbonized and flexible power generation in the UK, Ireland and Germany.



Batteries: Cornerstone of a clean energy supply

The German government has set itself the target of achieving an 80% share of renewable energy by 2030 to achieve the energy transition at zero cost. While there is a lot of discussion about the expansion of renewable energy, we sometimes forget to talk about how we can make this level of renewable energy possible in our energy system.

For example, the expansion of renewable energies also brings new challenges, such as the interruption of the power supply. On a sunny or windy day, we may supply too much electricity compared to demand. On another day, when it is cloudy or windless, we may not have enough electricity to meet our everyday needs. These fluctuations lead to grid congestion and price fluctuations - when too much electricity is supplied, prices are low, when too little is supplied, prices are very high.

Battery storage solutions are one way of solving this problem. Batteries can store electricity in times of oversupply and feed it back into the grid when demand is high. By smoothing out interruptions, they can also reduce extreme price fluctuations.

This type of flexible energy supply will become increasingly important as sectors such as industry, heating and transport are electrified, and AI and data centers increase electricity demand. According to estimates by the Fraunhofer Institute, around 100 GWh of flexible electricity will be needed in the energy system in Germany to achieve the German government's target of 80% renewable energy by 2030. Two thirds of this (70 GWh) will come from large-scale battery storage systems. Only around 2 GW are online today.

We therefore want to provide 500 MW / 1 GWh of battery storage in the next 3 to 5 years to support the country's goal of achieving 80% renewable energy by 2030. Starting in the north-east of Germany, we will develop, operate and optimize batteries to drive the uptake of renewable energy in Germany. As a company that has built close relationships with its stakeholders, we will repay the trust placed in us by local communities and municipalities with results in the development and operation of these projects.

What does a battery storage system look like?

Battery storage systems are usually modular container systems that can be configured according to specific site and capacity requirements. If necessary, battery storage systems can be screened by hedges or other visual barriers to minimize potential visual impact.

The battery supplier and model will be selected as part of the financial decision-making process for the project. The chosen supplier and model will influence the final design of the storage system, as battery storage systems can vary in size, shape and configuration.

How are battery storage systems connected to the power grid?

Wherever possible, storage facilities are built close to a substation, which minimizes the need for additional connection infrastructure. The storage facilities are connected either via an overhead line or an underground connection.

Construction and Operation

We strive to reduce the impact of construction work on communities and the environment and to ensure the safety of workers and residents during the work. We achieve this through the following measures, among others:

1. Working during normal construction hours where possible
2. Monitoring and active management of construction activities
3. Use of well-maintained equipment
4. Compliance with planning conditions, legislation, industry standards and guidelines
5. Regular communication with the surrounding community and local council
6. A strong safety culture and clear procedures

How long does it take to build a battery system?

The construction time depends on the size of the storage tank. As a rule, it is between 2 and 6 months.

How do you ensure that construction is carried out responsibly?

There are several requirements, standards and guidelines to ensure that construction is well planned and effectively executed. The requirements are defined by the state building authorities, developed as part of the planning process and included in the construction contract between VPI and the construction companies.

What should I expect during the construction work?

Traffic

During the construction phase, the delivery of materials and the battery system may result in a high volume of traffic. As far as possible, main roads and main traffic routes and, where necessary, local roads will be used to access the construction site.

Working hours

The environmental protection authority in each federal state recommends standard construction times. These are generally from Monday to Friday between 7 am and 6 pm and on Saturdays between 8 am and 1 pm.

Noice

The targets for construction noise are based on the legislation of the respective federal state. If construction activities are expected to exceed the noise targets at any time, we take measures to limit the impact on local residents as much as possible.

The use of well-maintained equipment and machines, minimizing noise by using reversing beepers and switching off machines that are not in operation are further measures to reduce noise at our sites.

Security

Safety is our top priority. All employees and contractors are trained in safety and emergency procedures before starting work on site.

How long does a battery storage system last?

Grid-connected battery storage systems are generally expected to operate for around 20 years and are usually monitored remotely without the need for personnel to be on site. However, the site must be accessed from time to time to carry out inspection and maintenance work. Major maintenance in the form of replacing the battery cells takes place once every 10 years.

Are battery storage systems a fire risk?

Fire protection is already a key criterion when planning the system and designing the battery containers.

Automatic operation monitoring

The battery containers are equipped with battery management systems (BMS) that monitor the operating and fault status of the system. All safety-relevant parameters are considered, including state of charge (SOC), voltage, current, power limits and temperatures. The parameters are monitored at battery cell, module and container level. The BMS reduces the risk of fires by switching off the battery modules if the monitored parameters are outside the permissible values for safe operation.

Fire protection system

In addition to monitoring the battery parameters, our battery containers have a separate fire protection system that can identify smoke, gas and heat development and initiate countermeasures. In the event of a fire, the fire protection system can start a sprinkler system and send an alarm directly to the local fire department. All systems comply with the relevant directives and standards and are operated in accordance with the legislation applicable to the system's area of responsibility.

Can chemicals leak from the battery?

In the event of mechanical damage to the battery cells, acid or other corrosive liquids may escape. To minimize the risk of contamination with such chemicals, suitable containment measures such as drip pans and chemical absorbents are already installed in our battery containers.

Will I be able to hear the battery storage?

Like other systems in the supply sector, battery storage systems can also generate noise. The main source of noise is the cooling fans required to regulate the operating temperature of the individual battery cells. The muffled, whirring noise they produce is comparable to an air conditioning system.

Typically, the noise level of a battery system at approx. 200m is around 45 dB, which is well below the typical noise level of road traffic, for example.

Employment and local benefits

The construction and operation of battery storage systems creates direct and indirect jobs and supports local communities through tax payments.

What kind of jobs do battery storage systems create during construction and operation?

During the construction phase, workers are needed in the construction industry for electrical installation, planning, commissioning and acceptance. In addition, services are typically provided in the hotel and catering industry.

During the operation of a battery system, employment is generally limited to inspection and maintenance activities

Is there work for local people and companies?

We strive to employ people from the region and source locally wherever possible. We are always looking for new working relationships in the industry and welcome you to get in touch.

VPI, as the owner of the battery storage facility, will not usually employ workers directly, this will be undertaken by our supply partners and contractors (and their subcontractors).

What economic benefits can a battery storage system bring to the local community??

The projects are organized in project companies that pay business taxes in the local communities. The municipalities benefit in particular when electricity prices are highly volatile - a battery storage system is therefore a kind of insurance against uncertainty in electricity costs.

Local landowners benefit through lease or purchase agreements for the required land.

Decommissioning

When a battery storage facility reaches the end of its life, the project can either be extended through reinvestment or permanently decommissioned and the area returned to its original state. Decommissioning a battery storage facility is likely to involve the following:

1. Dismantling and removal of the battery storage infrastructure and deconstruction of associated infrastructure

2. Recycling of construction materials and battery cells

3. Site remediation

The battery storage operator is responsible for decommissioning the storage facility. The requirements for decommissioning - such as the restoration of the site - are set out in the contracts with the landowners and in the planning approvals.

Recycling: Many of the building materials are already recycled as far as possible. The recycling of batteries is also possible and is currently being tested in pilot projects - with the aim of recycling over 99% of the materials. We expect that when our projects are decommissioned, the circular economy will be established, and our batteries will be recycled.

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