Ocean grazer solutions

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Although there are plenty of green energy products, congestion on electric grids means that much of this green energy is going to waste and causing energy prices to plummet. Matt Brundrett interviewed Frits Bliek of Ocean Grazer to discuss the potential of energy storage to combat energy supply and demand issues.

On 13 May 2023 energy prices became negative all across Europe for the first time, due to a tremendous oversupply of wind and solar power. There is no offshoot for the power; we need to leave that energy somewhere.

Hourly price fluctuations in energy supply and demand reflect the changes in over and under supply. Profit can be maximised by trading on the day-ahead and intraday energy markets, and even more value can be gained by trading on the balancing markets. You need deep and long-lasting storage installations that can handle these fluctuations. To maximise profit, a storage system needs to be able to handle 1,500 – 10,000 cycles per year, depending on the revenue model and local market conditions.

Therefore, you need deep energy storage to shift the energy over multiple hours. You need to go beyond the current barriers (typical storage systems available now have a storage depth of one to four hours) to depths that can shift eight or 12 hours. That is where the Ocean Grazer ocean battery has a lot of value. The technology is based on mature pumped hydro storage technology that can provide over a million cycles, meaning you can frequently dispatch a system without ageing the technology and effectively use any price fluctuation.

There is the potential for a large part to be constructed by local people, for example, building the reservoirs out of concrete, creating local jobs and benefitting local businesses and resources. Sharing that profit is quite a smart solution to handle these challenges.

We considered their projects, a large industrial installation combined with solar plants. Depending on the location, you could also have cogeneration with a wind farm. If you add up those profiles, you can reach for an upper level of local generation by adding a battery. This has two advantages: The installation operator gets almost 100% renewable energy, and you can also fix the energy prices.

Over the last few years, we have learned that price fluctuations can have a huge impact on our economy and the profitability of companies. By combining storage with local generation, companies can become more independent from the energy market. Although there is usually a great connection available, in most cases, what we also see in some cases is that it"s tough to get a good connection. In those cases, if you combine the local generation with storage assets, you will get more than what you would get if you just operated the renewable generation assets and connected them to the grid.

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The system"s scalability mainly comes from the reservoirs underground. You can add more reservoirs under the seabed, meaning you can keep expanding those capacities after installation. We think it"s a very important capability because the market will look quite different 20 years from now. In financial terms, this means there is an increasing drive to have more capacity to profit from fluctuations and keep the system stable.

The most promising combination so far has been with hydrogen production. The electrolyser presents huge opportunities to produce green energy. It"s also very attractive for certain industrial installations to combine an electrolyser with local generation from wind and solar. If you combine them properly with an Ocean Battery system, you can increase the amount of locally generated green hydrogen significantly.

Electrolysers must run a utilisation factor between 70% and 90% to maintain efficiency. When powering your own energy storage systems, you just can"t guarantee that without energy storage. With energy storage in mind, you can start building projects with a plan, taking the storage facility into account and, in combination with the local generation and implementing ocean batteries. We see that as a pathway to bringing green energy to the European Union and balancing energy supply and demand.

Ocean Grazer B.V. develops energy storage solutions, such as the Ocean Battery, for the offshore renewable energy sector. It is a Dutch start-up and a spinoff from the University of Groningen.

The planned global production of offshore wind, for the year 2050, exceeds 1150 gigawatts. Soon, weather conditions will dictate the timing of renewable energy production, causing large fluctuations.

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