

What Is Energy Storage and How Is It Relevant in Today's Energy Market?

There's a changing story taking shape in power grids around the world. The mix of how power is generated and distributed is modifying and destabilizing the grid.

Europe leads in moving toward making a cleaner environment a reality. Replacing systems powered by fossil fuels with renewable sources is causing immediate decreases in carbon dioxide emissions, as well as changing the way power is generated and transferred altogether.

David Blood, Market Manager EMEA for Parker Hannifin's Energy Grid Tie Division, likens the established landscape to a giant inverted tree.

"The traditional grid is large power stations. Hundreds of megawatts or gigawatts of huge generating capacity transmitting power over large distances that then gets broken down into lower voltages and lower capacity – spreading out like the branches of the tree until they eventually touch homes, businesses and factories. The idea of large central generation is being challenged by the addition of solar farms and wind turbines. So, there's a move to these distributed generating assets."

In a recent [press release from SEPA](#), the need for awareness of this new frontier was distilled clearly. "The positive impact of solar (or other renewable applications) is magnified when partnered with complementary technologies intelligently blended into a more dynamic and responsive electricity grid."

Energy storage: the last piece in the renewable energy puzzle

The core of these complementary technologies is battery energy storage – the key to making high penetration of renewable energy viable. One of the main reasons is stabilization, which energy storage provides through:

- **Increased reliability**

By saving energy when sources are abundant, storage creates a consistent flow of renewable energy to meet demand needs – even when sources are scarce and demand is high.

- **More efficient operation**

Responsive and effective balancing counters inevitable disturbances.

- **Reduced energy curtailment and waste**

Due to grid overload, constantly generated sources of energy are wasted due to potential congestion or other factors.

What is curtailment and why should it be prevented?

To better illustrate the idea of wasteful curtailment, Blood harkens to an image many in Europe see along freeways: massive windmills stagnant in the distance. He notes that while you might think this is due to equipment issues, it's most often curtailment in action.

“When there’s a huge generation of wind up in northern Germany without a huge consumption there around Frankfurt, but they need the power in the southern area, say Munich. You’ve got to get the power from the north to the south, but the grid isn’t designed to take that much power. So, you’ve got to curtail the generation, which is a shame.”

With energy storage, power generation can be absorbed, collected and used as needed. Utilizing existing sources increases economic value, saving power producers and ultimately, end customers, money.

Energy storage gains for developers

Among the many advantages to energy storage is the sheer practicality of energy storage assets.

- Energy storage systems can be deployed quickly – in seven months (or within one year) as compared to around seven years for even a simple, gas-fired power station.
- 1 MWh of storage can be held in a 40-foot container.
- Storage saves money and facilitates easier, quicker and more financially rewarding projects.
- Storage lessens or eliminates “downtime” through a more efficient grid, resistant to disruptions.

Other advantages are increasing sales and job opportunities in supporting sectors such as manufacturing, engineering, construction, transportation and finance.

The key takeaway is more efficient use of and therefore increase in economic value of energy from clean renewable sources and a better return on many companies’ bottom lines.

What are the challenges and how are they being met?

While the benefits are manifold, the biggest challenge facing the energy storage industry is producing the best, most efficient, highly available and highly functional inverters for energy storage systems, while also reducing the cost.

Most energy storage projects use lithium ion batteries, which is good news because the cost of those batteries has been falling by 10% to 15% and continues to drop. The drop in cost is partly thanks to increased production for use in electric cars and other uses.

“We’re seeing the same pressure for inverters for these projects as well. And there are various ways you reduce cost, like going to higher voltages,” added Blood.

What the future of power generation holds

It is a fundamental fact that the power grid is changing. The standard way of operating is in transition.

The first Parker energy grid tie system went online in 2008, and now has more than 300 MW of equipment deployed. The company has seen this global transformation accelerate in the past decade like never before in its 100-year history – with 40 of those years specifically in electric power conversion and integration.

As Michael O’Boyle stated in a recent [GTM article](#), “Transitioning our electricity sector away from fossil fuels is no longer just an environmental imperative -- it’s an economic one.”

This movement from larger to smaller networks with more renewable sources is making the grid a much more difficult thing to manage. That’s why energy storage is so important – it stabilizes, secures and promotes economic growth rather than threatens it.

Blood points to recent happenings in European power companies as an indicator of what’s to come. “There’s a good chance that the standard way of doing business, of people selling power and people paying for the energy they consume, is going to fail.”

Taking the initiative to be leaders in the field and using energy storage is not only ethically prudent but business smart. As the dust settles on a new age of power generation, being on the right side of the economic boom and the energy race is imperative.

For more information about energy storage and specific applications visit [Parker's Energy Grid Tie Division's Resources Page](#).