

Top 10 with...

Interview with our infrastructure experts on **energy storage**

October 2022

Key facts for energy storage:

2021

business established

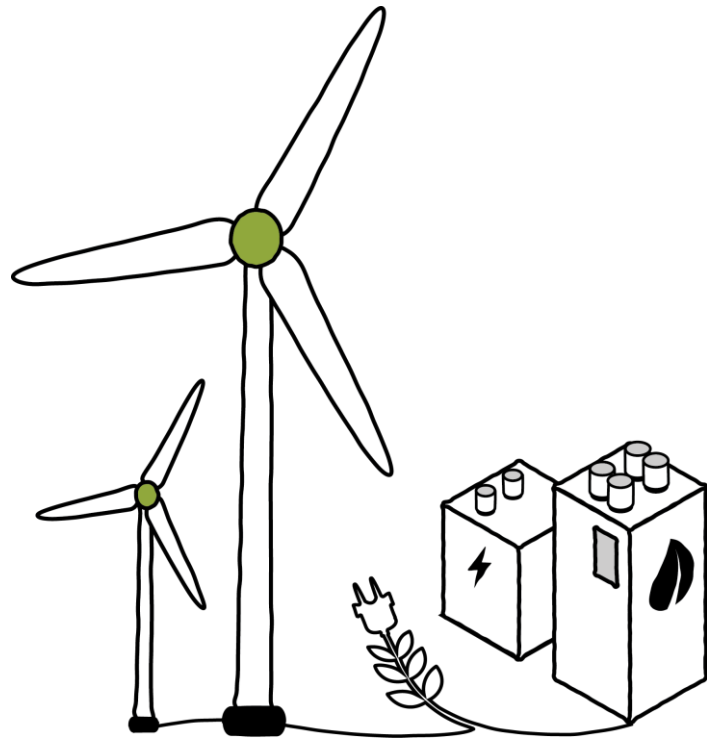
4

GW experience
combined*

50+

years of technical
expertise combined*

* Team expertise prior to
UBS Asset Management



Time is ripe

Energy storage has the potential to help reduce the carbon footprint and is proving to be a timely solution in the transition from thermal-power generation to sustainably sourced energy.

George Manahilov, Ken-Ichi Hino and Alex Leung discuss why we're talking energy storage now, the added value for investors, and what's next to come in this relatively new but well under way asset class.

Our experts



George Manahilov
Co-Head of Energy Storage



Ken-Ichi Hino
Portfolio Manager, Energy Storage

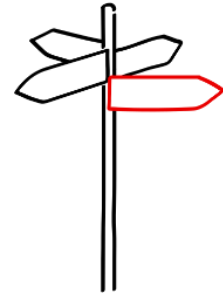


Alex Leung
Infrastructure Analyst, Research & Strategy

The energy storage deployment is expected to grow more than 100 times over the next 30 years¹ and to represent a market worth more than USD 100 billion².

1

Energy storage is currently a hot topic and one for the long run. How did we get there?



George Manahilov:

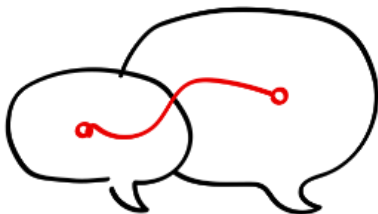
The relevance of energy storage is directly tied to the current global effort to decarbonize. Decarbonizing the electric grid is considered one of the key first steps toward decarbonizing the broader economy. In order to achieve this, renewables need to grow more than 10 times from current deployment levels over the next 10-20 years.

However, because they are intermittent resources (meaning solar produces when sun shines, wind farms when wind blows), we need energy storage to shift renewable energy to times when renewables are not generating, thus making energy storage a key component of grid decarbonization.

The fast growth of the electric vehicle sector has rapidly expanded the global battery manufacturing capacity, driving down battery costs and making the use of energy storage on the electric grid cost-competitive for the first time. We anticipate the energy storage deployment to grow more than 100 times over the next 30 years¹ and to represent a market worth more than USD 100 billion².

2

What is the relationship between renewable energy and energy storage?



Ken-Ichi Hino:

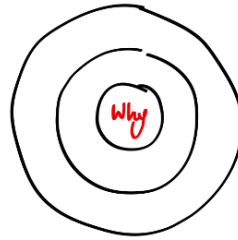
Deploying energy storage on the grid is critical to enabling the continued growth of renewables such as wind and solar, and their continued deployment increases energy storage value. Energy storage can act as demand when renewable generation is high, which creates room for additional renewable generation and can reduce curtailment of renewable energy. Times with higher levels of renewable generation are correlated with times of lower-cost energy, reducing charging costs for energy storage. In this manner, deployment of renewables and energy storage work in a virtuous cycle with symbiotic effects.

3

Could you explain what makes energy storage a critical grid infrastructure?

George Manahilov:

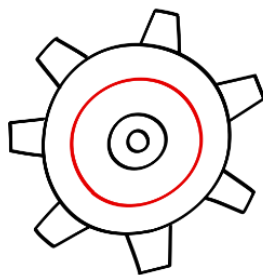
Batteries are dispatchable and this ability to control when they generate helps ensure energy stored in them is used at the right times. In addition, batteries are fast-responding, bi-directional resources (they can charge and discharge), which makes them an ideal source of key grid firming services that ensure the grid operates reliably.



Energy storage's contributions to grid reliability can be seen most clearly in California, where it is expected that energy storage will provide the vast majority of the additional Resource Adequacy (capacity) required over the next four to five years to meet reserve levels and ensure a reliable grid.

4

How can energy storage fit in investors' portfolios?

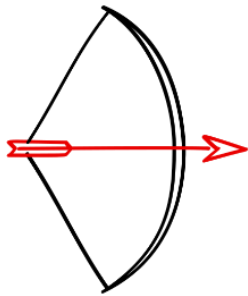


Ken-Ichi Hino:

Energy storage on the electric grid is still in the early stages of its maturation and we believe it will follow a growth pattern similar to those experienced by wind and solar before it. Because elements of the business model have not fully formed yet and economics for energy storage in certain markets are highly attractive, energy storage can offer higher near-term potential returns than traditional infrastructure and can be used to help boost portfolio level returns if investors take the right approach to entering the market. As the sector matures, capital costs and returns will compress. While there are significant benefits available, projects need to optimize across multiple variables such as finding the right storage locations, efficiently designing and commercializing projects, deploying effective revenue generation approaches, and more.

5

What future developments should we expect to see within this sector in the coming years?



Alex Leung:

We expect that many elements of wind and solar maturation will be replicated in the story of how energy storage matures. Some of them include more efficient commercial structures and increasing familiarity and acceptance by capital markets compressing capital costs. But also lower-cost and more efficient downstream or adjacent services such as operations and maintenance and insurance.

6

What should investors be mindful of when approaching energy storage and what advice would you give to new investors in this space?



Alex Leung:

Energy storage requires deep market, technical and operational expertise. Because this asset class benefits from the high volatility of commodities prices, investors must be familiar with drivers of beneficial commodity price dynamics. Not every market is created equal and while storage makes sense in some markets, it does not yet make sense in all markets, so market research and analysis are an important premise.

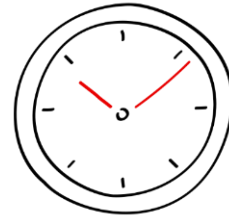
California and Texas are good examples of markets where storage currently makes sense due to their size and high concentration of renewables. Other up-and-coming markets include New York and New England, since both regions have aggressive renewable energy targets. Last but not least, project implementation and execution are key to unlocking the value of storage, as well as an understanding of analytics and commodity markets.

7

Is now the right time to invest in energy storage?

Ken-Ichi Hino:

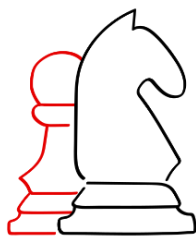
We have just hit the tipping point of when energy storage is economic in select markets, and we believe the trends that caused us to reach this tipping point (increasing market value and lower costs) won't slow down. Critically, energy storage benefits from other rapidly growing sectors – renewable energy and electric vehicles – which indicates that we are at the beginning of the growth, rather than seeing a one-time blip.



However, as the market grows, it will mature, which will reduce returns available to future projects. In our view, there is likely a limited window for capturing returns above those available to assets such as wind and solar projects.

8

How is energy storage coping with the current macroeconomic environment?

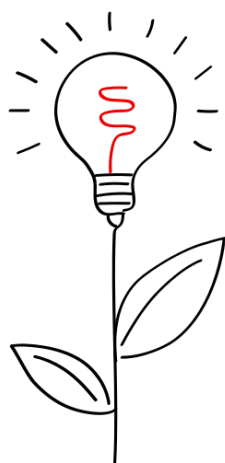


Alex Leung:

The main impact on storage economics is in the cost of batteries, which is mitigated to some degree by the rapid growth of global manufacturing capacity in batteries. Energy storage is also attractive in an inflationary environment due to its higher potential returns, as long as it retains upside exposure. As witnessed this year, the current inflationary environment is actually adding to the energy price volatility. This is because high prices are set by expensive gas plants, while the marginal cost of renewables remain low. As a result we have these peaks and troughs in power prices that are positive for energy storage, especially those more exposed to market prices.

9

What's the role of ESG within the sector?



Alex Leung:

As discussed by George earlier, energy storage plays a critical role in decarbonizing the electric grid, and therefore the broader economy, primarily by complementing renewable energy sources and providing carbon-free dispatchable energy. Energy storage has been classified as an activity contributing to climate mitigation in the EU Sustainable Finance Disclosure Regulation Taxonomy³. By storing energy when renewable energy production is high, and providing that energy back to the grid when renewables are offline, energy storage can reduce the grid's carbon emissions. So, energy storage can be a big contributor towards mitigating global warming, climate change and decarbonization, which are part and parcel of ESG.

10

What's the expertise and added value of the UBS Asset Management energy storage team?



George Manahilov:


The UBS energy storage team has more than 50 combined years' experience in renewable and alternative energy investing, technology development, project development and operations sectors.

Our team's complimentary set of skills, ensures the expertise needed in all of the areas required to execute on a stand-alone storage investment strategy including: technical expertise, development experience, capital formation and deployment in renewables and storage, operational expertise and power market knowledge.

¹ Source: International Energy Agency ("IEA"), Net Zero by 2050 - A Roadmap for the Global Energy Sector, May 2021

² Source: National Renewable Energy Laboratory, 2020

³ EU Taxonomy Compass | European Commission (europa.eu)

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