

ENERGY STORAGE: THE INVESTORS' PERSPECTIVE

Energy storage is part of the D3 resource, D3 being Demand Management, Demand Response and Distributed Generation. D3, including storage, remains a massive energy resource that is often cheaper and cleaner than building new supply capacity. How to put in place policies, regulations and markets that enable the exploitation of the D3 resource is the new challenge for governments and energy professionals everywhere.

We are all familiar with the refrain, “we need more electricity storage”, it is like other statements that have become truisms such as “energy prices will always go up” but in the case of storage case it is true. As we add more intermittent renewable generation such as wind and solar, and more “must run”, generation such as nuclear and energy from waste, and as our infrastructure ages we do need more storage and many studies have identified the issue and provided estimates of the market and the economic benefits.

From an investor point of view, storage like anything else, needs a business case and that is where part of the problem lies.

Storage can produce benefits such as; reduced capex on generation, reduced capex on transmission and distribution, and higher efficiency through improved utilisation of fossil fuel plants as well as reducing volatility for traders. Storage can balance the intermittent nature of renewable and shape the output of fixed output plants such as nuclear to match the demand profile. Part of the implementation issue is that benefits from storage may occur in different parts of the system and the regulatory regime, and this applies in most markets, does not recognise all of the benefits or provide a way of capturing them all. A sensible regime would value all of the benefits from storage or any other D3 resource.

In Germany we have seen negative pricing of electricity at times of high renewable generation. If storage developers can access regimes where prices fluctuate from negative to positive, with the right technology with the right cost base, then clearly there is the making of a business case. In rapidly developing countries, where the supply capacity is insufficient to meet demand, storage can help strengthen grid resilience at a lower capex than building new plant.

In the UK there has been a considerable effort to include incentives for D3 in the EMR, efforts that were supported by Ministers, but for whatever reasons the current version of the EMR legislation does not adequately recognise the size of the D3 resource or provide suitable mechanisms. This is a major failure of UK energy policy, one of many over the last decade.

As well as grid scale technologies there is a large potential market for some integrated, embedded storage technologies, especially in industrial processes where there is waste heat and cooling demands. Large energy users with heat and cooling needs could use storage to arbitrage the market and level demand.

From an investors perspective storage technologies are an equity investment for two reasons; lack of long-term contracts and technology maturity. Unless a developer can get some form of contract from the grid or another suitable counterparty that provides some certainty on income, such as a medium term STOR contract from National Grid there is no chance of raising project debt. Another big issue with storage from the investor's point of view is that it is, and this applies to all technologies, not mature and the technologies are still under development. Also from the investors point of view the fact that there are many different technologies addressing different applications (speed of response, scale, duration etc) may be confusing – there is definitely an education task needed there.

The fact that the technologies are under development brings us to government support. Emerging energy technologies, notably renewables and CCS, have benefited and continue to benefit from considerable technology development support as well as operational support, in particular renewable

get a subsidy plus protection against being unavailable at peak. Storage deserves some equivalent regime. In the USA there was support for storage from the stimulus package but unfortunately the outcome has not been uniformly positive. Beacon Power received a Federal loan guarantee before filing for bankruptcy in 2011. The assets, including 20MW frequency response plant, were subsequently purchased by Rockland Capital. Other companies such as A123, a battery developer which is also now having problems, received \$390m support from stimulus funds. These problems do illustrate the difficulties of government supporting new technology development.

Various storage technologies have of course attracted investment from VCs and angels, including Matrix client Highview Power Storage. One of the issues in the whole new energy space, which definitely applies to storage, is that it is a very different world to IT and software development. Developing new energy technologies takes a long time, the energy industry is inherently conservative (partly for good reasons), sales cycles are slow, the amount of proof needed that the technology works is high, and then even when proven deploying the technology at scale requires a significant amount of capital and a different type of capital from VC money. Several VCs who moved into new energy and clean tech did not really understand the energy business. Technology development in the energy business is a hard and slow process and investors need to understand that. There is a real argument for strategic investors or partners such as large power companies or large industrial corporates, if technology developers can get them. As well as providing a natural market and testing ground they can help get through the process of real world technology development. The problems of strategic partners of course include the normal ones of the relative power between small entrepreneurial technology developers and large corporates, as well as major differences in culture and objectives.

To sum up:

- Storage is a vital part of the energy scene looking forward
- It has many benefits in different parts of the system
- Storage needs a regulatory regime that creates a market where those benefits are valued
- Storage is an equity play because it is developing technology and generally does not have long term contracts associated with it
- As a critical emerging technology there is a need for some kind of financial support regime in line with those for renewables and CCS
- Ultimately deployment of storage will be by big corporates and utilities and so storage technology developers need to partner with these kinds of players at the right stage in their development.

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