Revenue Stacking and Salami Slicing

Large-scale long-duration and flexible plants of most types (both generation and storage) rely on stacks of diverse revenue streams to be profitable. This sticking plaster approach to the challengers of the energy transition means that each issue is turned into a contract / revenue stream, one at a time, as it is discovered and quantified. The largest and most remunerative ones (e.g. EFR) are contracted first, because those are the most urgent and greatest need.

Because these needs are addressed individually and with short term contracts, they are delivered by short-lived and small-scale solutions (e.g. batteries, synchronous condensers). Long-lived & large-scale solutions that address many such challenges, and especially those which tackle the root cause of the problems, cannot be financed under short term salami-sliced contracts: they need an entire revenue stack.

This salami slicing, sticking-plaster approach means that narrowly focused, less capable and harder-to-managed plants are built to cream off the most remunerative parts of the revenue stack. This renders the remainder of that stack less profitable, as the plants that are capable of delivering the remainder need to amortise their costs over the remaining contracts, thereby inflating the costs of those contracts. This means that the total cost to the market of all contracts increases: the easy-to-let contracts include the amortisation of the plants that can deliver them, and the harder-to-let contracts include the amortisation of the plants that can deliver not just those but the easier contracts too. The result is that the market has to bear the costs of unnecessary investment in inflexible and less-capable plants.

Moreover, as they bid for one slice at a time, they cannot rely on winning other slices – or, when these contracts (which usually have short durations, less than 2 years) come up for renewal / re-bid, to win them again, so they must over-price their amortisation in each contract. And this inflates the total market costs still further.

To minimise the overall system cost and maximise its security of supply, and to do these over the short, medium and long terms, a better approach is to address the causes of the problems, principally the need for clean (i.e. low or preferably zero emissions) inertial generation and load. Contracts for these should be let for a suitable time. They should then be contracted to deliver whatever other services they can deliver cost-effectively to the system, thereby giving them their entire revenue stack without any increase in price, without any overt or covert subsidy. It is only after this is complete that shortfalls should be evaluated and let in narrow, shorter duration contracts.

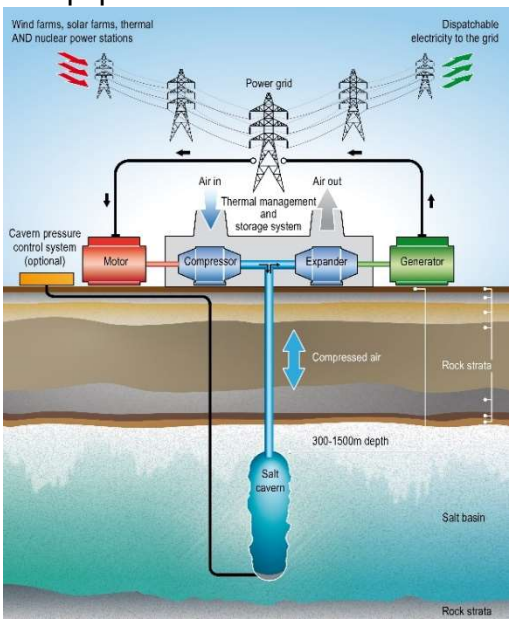
Failing to minimise overall system cost in this way will not remove the business case for large scale long duration renewables, because the need will remain. The main effect of such failure is to increase its cost to the system.

Grid-scale electricity storage
using an innovative form of
Compressed Air Energy Storage

About Storelectric

Storelectric (www.storelectric.com) is developing transmission and distribution grid-scale energy storage, all built with today's standard equipment.

- Innovative adiabatic Compressed Air Energy Storage (TES CAES). Our 500MW, multi-GWh installations will have zero/low emissions, operate at 68-70% round trip efficiency, levelised cost significantly below that of gas-fired peaking plants, and use existing, off-the-shelf equipment. It simplifies the Huntorf plant, operating since 1978. A hybrid will provide reserve grid power.
- Their CCGT CAES technology converts and gives new economic life to gas-fired power stations, halving emissions and adding storage revenues, thereby re-lifing stranded assets. It simplifies the McIntosh plant, operating since 1992. A hybrid is significantly more efficient.



Both technologies can offer black start and similar services. They will operate at scales of 20MW to multi-GW and durations from 4 hours to multi-day. With the potential to store the entire continent's energy requirements for over a week, potential globally is greater still. In the future, Storelectric will further develop these technologies, and other geologies for CAES, all of which will greatly improve storage cost, duration, efficiency and global potential. They address the entire energy trilemma: the world's most cost-effective and widely implementable large-scale energy storage technology, turning locally generated renewable energy into dispatchable electricity, thereby …
enabling renewables to power grids cheaply, efficiently, reliably and resiliently.

About the Author

Mark Howitt is Chief Technical Officer, a founding director of Storelectric. He is also a United Nations expert advisor in energy transition technologies, economics, regulation & politics – invitation here.

A graduate in Physics with Electronics, he has 12 years' management and innovation consultancy experience world-wide. In a rail multinational, Mark transformed processes and developed 3 profitable and successful businesses: in commercialising a non-destructive technology he had innovated, in logistics (innovating services) and in equipment overhaul. In electronics manufacturing, he developed and introduced to the markets 5 product ranges and helped 2 businesses expand into new markets.