

Storage Business Models: Lessons for Electricity from Cloud Data, Frozen Food and Natural Gas

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Executive summary

Electrical energy storage (EES), along with interconnection and flexibility in demand, is among the innovations that can support the transition to a non-fossil fuel energy system based on renewables. EES has a multiproduct nature and may offer different revenue streams to those that operate or own the facility. The size of their value depends on different factors such as the place where the facility is located, the type of service/benefit, the type of technology, the market and regulatory context, etc. Even though there are powerful forces promoting EES, there are factors limiting its deployment such as regulatory, market and technological barriers and the lack of appropriate business models (BMs).

This study explores well-established non-electric storage markets – for cloud data, frozen food and natural gas - to identify some key lessons applicable to EES operated by electricity distribution companies. A look at different non-electric storage markets and specific case studies that represent each of the three storage markets, provides valuable insights on the way in which the different components of their business models are interacting and capturing value for both customers and firms. We have classified EES as an emerging market (introduction stage) which is being introduced in a few jurisdictions, but usually limited to trials. Cloud storage is in the second stage (growth stage) and its adoption is increasing dramatically among both business and final consumers. This study places frozen food storage between the growth and the third – maturity - stage. This is a well-established market that will continue expanding due to the high demand for frozen food. Gas storage is in the maturity stage. It is a well-established market with many competitors (including liquefied natural gas (LNG) imports). The selection of non-electric markets that are at different stages of their respective life cycles allows us to capture the different operating approaches across their BMs components. The BMs' discussion across the different markets is based on the method proposed by Johnson et al. (2008). These authors identify a set of interconnected components: the customer value proposition (CVP), the revenue formula, key resources and key processes.

In general, we observe the existence of well-developed business models (BMs) in growing and mature storage markets. Successful BMs provide a value proposition to customers and can generate profits for storage firms. All storage products are also sensitive to regulation, but the degree of sensitivity varies by storage type (gas and EES are the most sensitive ones). Finding the optimal configuration of ownership of storage facilities is an important part of BMs. Restricting this arbitrarily may not be beneficial for the development of EES. There has been a lot of innovation in storage BMs, especially in the use of technology and in contracting (market and bilateral), which should be facilitated in EES. The Internet of Things and digitalisation could play an important role in the widespread use and accessibility of EES products.

Keywords: electrical energy storage, gas storage, frozen food storage, cloud storage, business models.

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