

The economics of electricity storage

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Electricity storage systems can be assessed and compared in economic terms in much the same way as can other more familiar electricity sources. The key difference is that these more familiar sources, turbines and gensets for example, work by converting some primary energy source: coal, oil, uranium, sunlight, wind etc. into electricity, while the energy source for a storage system is also electricity, i.e. electricity generated at some earlier time: off-peak power from the mains, or renewable energy generated when say, the sun shines or the wind blows.

Hence, the fundamental basis for evaluating whether an electricity storage system is viable in strictly economic terms in its own right (and in comparison with other electricity sources having the same required electricity output characteristics) is the extent to which electricity can be profitably arbitrated, i.e. purchased at low cost (during off-peak times) and then sold when electricity prices are higher. A further distinction can be drawn between storage systems able to supply power without noticeable interruption (within milliseconds of the loss of the main source), and those that take many seconds or minutes to do so from standby.

The paper will compare the full costs (capital and operating) of a range of storage technologies and other plant available for the supply of peak and/or seamless power, and determine their niche, if any, in Australia's electricity power supply networks.

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