THE ELECTRICITY STORAGE NETWORK

Connecting Energy Storage

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The Electricity Storage Network

UK's industry body for the promotion of electrical energy storage.

Current members include

- Electricity storage manufacturers
- Suppliers
- Developers
- Users
- Electricity network operators
- Consultants
- Academic institutions
- Research organisations

Formed in 2008

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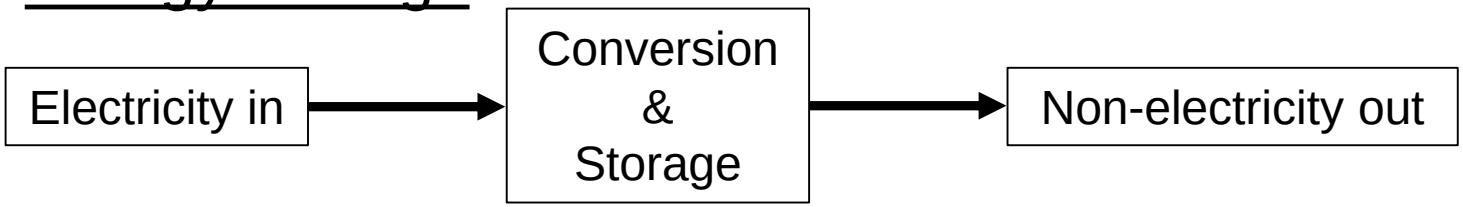
Energy vs Electricity Storage

Energy Storage covers a broad range of technologies

Electricity Storage is a specific sub-set of Energy Storage
Also a broad range of technologies

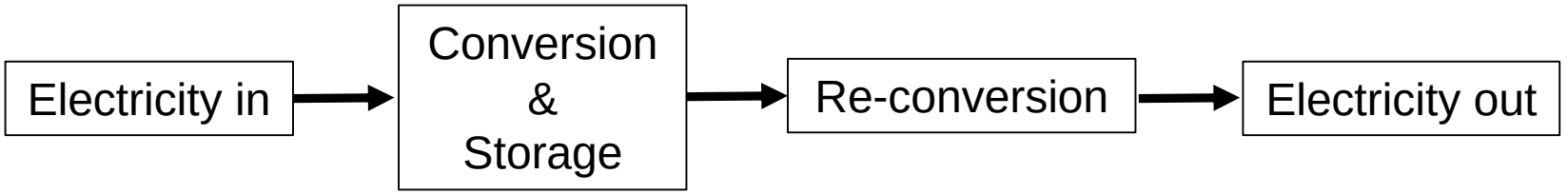
Energy Storage

Controllable demand only



Electricity Storage

Controllable demand and export



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Definitions

Definitions are needed to modify codes and treatment

Each nation developing their own definitions for both Energy Storage and Electricity Storage.

A single Energy Storage definition is not enough.

Our definition for Electricity Storage:

"**Electricity Storage**" in the electricity system is the conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy.

"**Electricity Storage Facility**" in the electricity system means a facility where Electricity Storage occurs.

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Treatment

Since Energy Storage is demand, it can be connected as demand. Can provide frequency response by turning demand on and off, but can not export electricity.

Electricity Storage is both demand and export.

- On DN this leads to duplication in the connection process
- How will it be treated on TN?
- Connection charges – one or two regimes?
- Use of System charges
- Management of import and export
- Metering
- Settlement
- Faults (forced to disconnect, when can help?)
- Constrained networks

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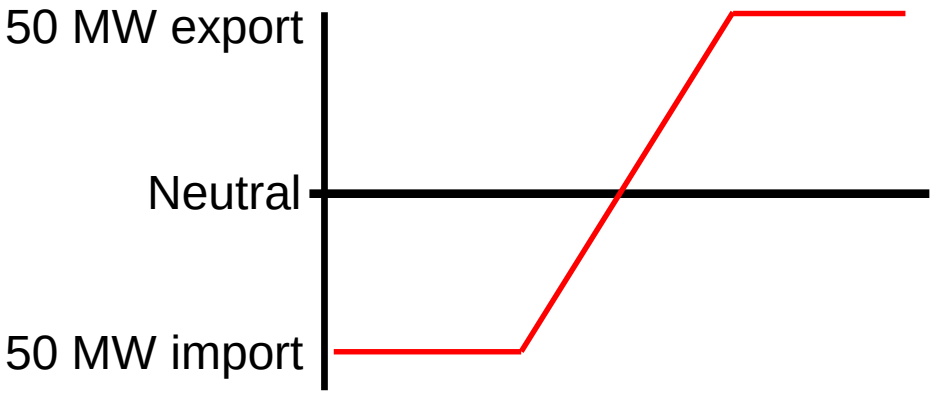
Issues

A demand site has a maximum demand

An Electricity Storage site has a maximum demand and a maximum export:

50 MW electricity storage:



- 100 MW “resource”
- How quickly can it “swing”?
- How much “shape” can it give?
- Mandatory services?
- Hold back capacity for flexibility
- Minimum time to charge/discharge?
- Rapidity of response
- Multiple services simultaneously
- Who controls?
- How is it controlled?

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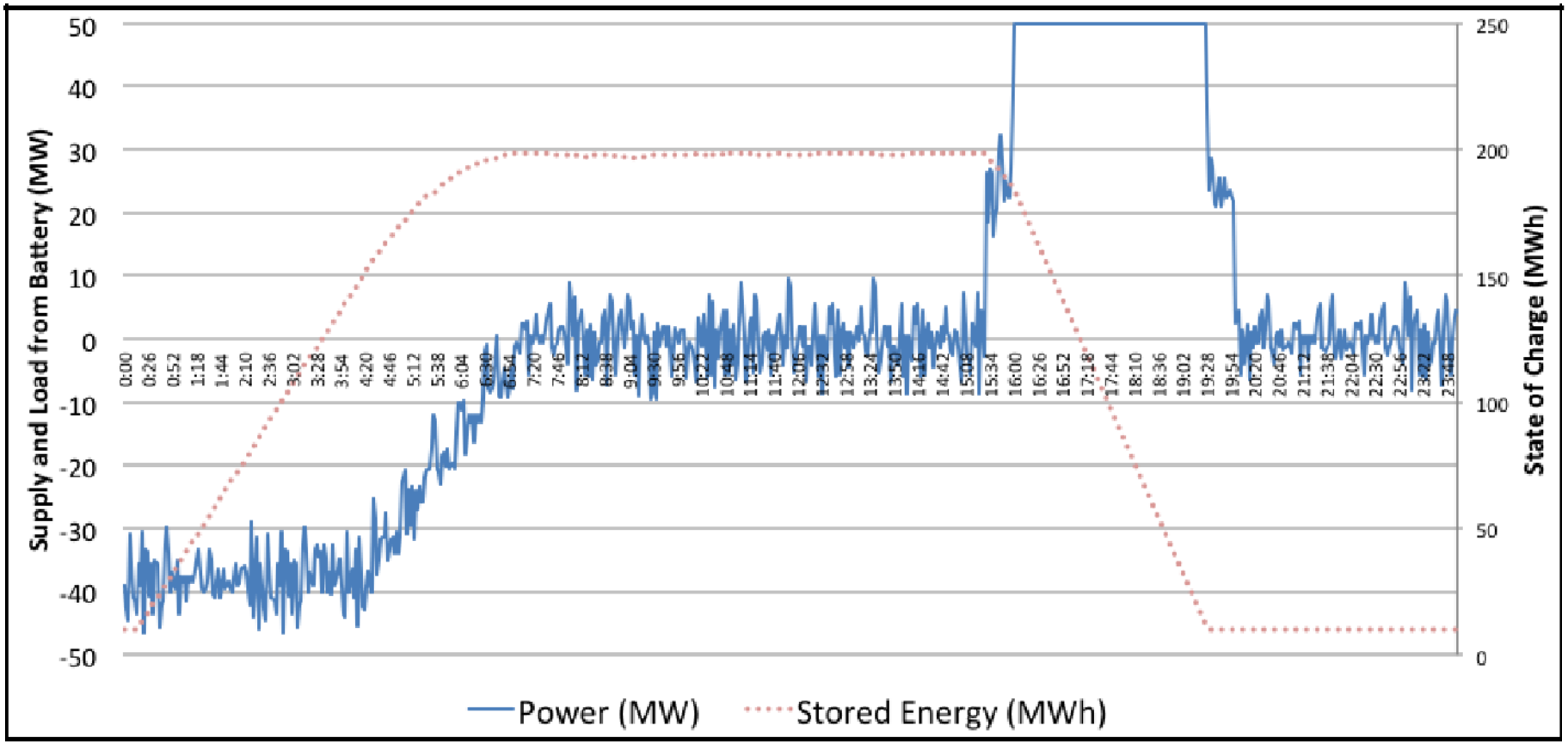
Mode of Operation



As required or always on?

AES
we are the energy

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