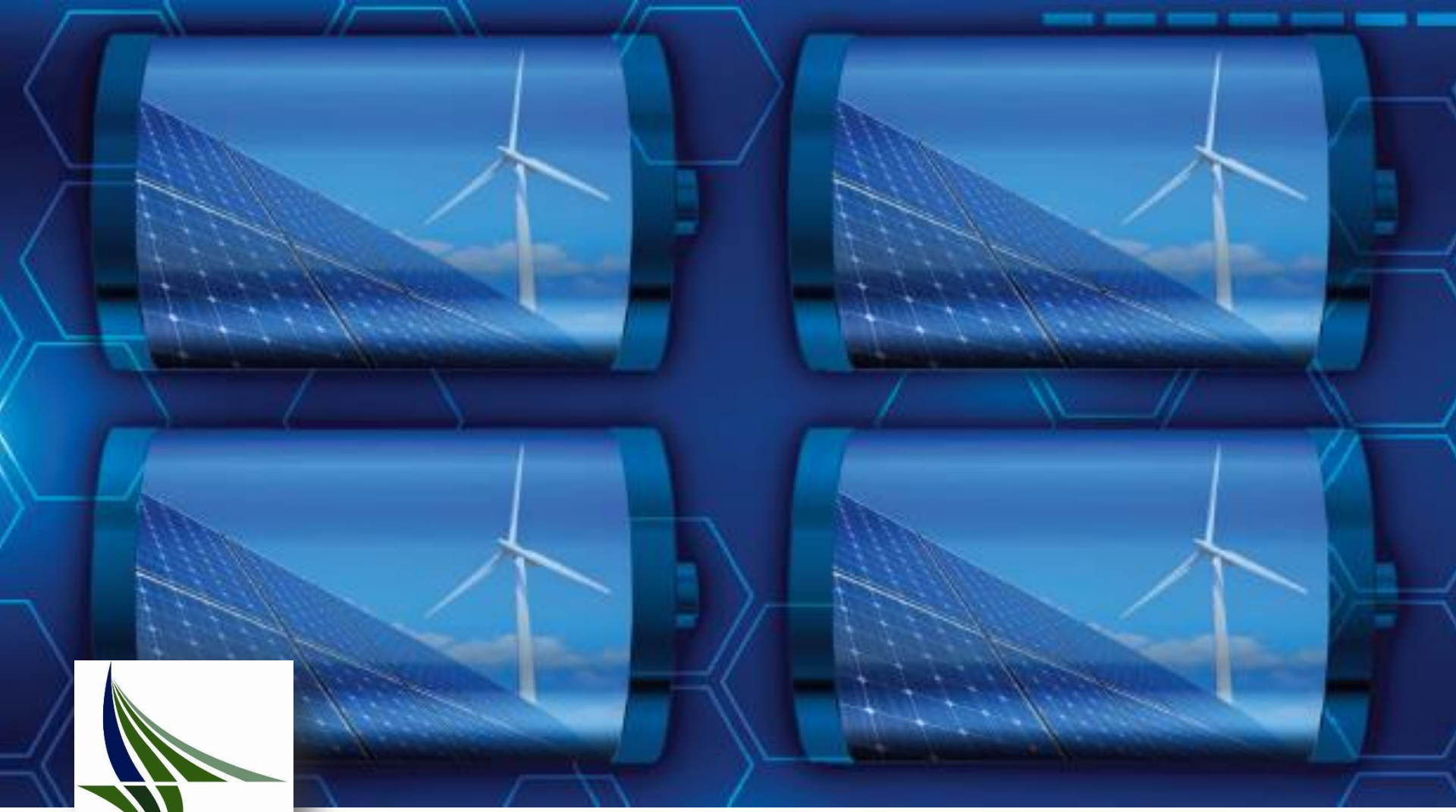

GEODE Position Paper – Energy Storage

Functions of Electricity Storage for the Grid

Jonathan Hallinder
2016-07-06

Energy Storage – Role in the Energy System

- Storage is part of flexibility
  - Store excess electricity to periods with lack of electricity
- Ensuring security of supply and power quality
- Will be integrated at all levels of the electricity grid including distribution and customer level
- Replacing conventional transport fuels with electricity stored in batteries or low carbon fuels
- Helping customers to optimize self-consumption (e.g. PV)

What are the benefits of storage for DSOs?

DSOs can use storage to:

- Handle increasing share of intermittent RES to medium an low voltage grids
- Avoid or postpone costs for electricity network reinforcement
- Reduce power demand during peak hours
- Improve power quality in the grid
- Manage interruptions in electricity supply → improve security of supply
- Tool to handle flexibility

Conclusions

- Decentralised storage will play an important role from a market and grid perspective
- DSOs should be **allowed to use, own and operate storage**, to fulfil core activities and for the security of supply. There should be:
  - No restrictions on market actors on what they use storage for
  - No restriction on who should own or operate storage
- DSOs should be able to access commercial storage to fulfil their network requirements and to facilitate Demand Response activities, through contract with owner
- Storage is a tool for DSOs in order to manage flexibility, therefore DSOs should be allowed to buy flexibility services from storage facilities

Conclusions

- If storage is necessary to operate the grid, **the same regulatory framework should be provided for all system operators** (DSO and TSO)
- The regulatory framework must allow all the technical options, e.g. storage can provide services to the market and to the networks (DSO and TSO)
- It should be possible to finance storage through grid fees when it is an economic alternative to traditional grid investments

Conclusions

- The grid tariffs should be more cost reflective and allow fair cost allocation. More capacity based grid tariffs
- General barriers towards deployment:
  - **Technologica**l: New technologies
  - **Market issues**: No market signals to incentivize building of storage Lack of innovation in the Power Exchange Market
  - **Economic**: Low electricity price, high investment costs → weak business case
  - **Strategic**: Lack of regulation to bridge market and political, including a development of capacity based tariffs
- It is important to support more R&D in storage solutions that include interaction between the different energy carriers

Recommendations

A regulatory framework must be developed where DSOs **are allowed to use, own and operate storage** connected to the distribution grid in order to fulfill their core activities and to guarantee the security and quality of supply in their area of responsibility

• • •

A regulatory framework addressing the barriers currently preventing the integration of storage into market and grid has to be developed

• • •

The same regulatory framework should be provided for all system operators (DSO and TSO), if storage as a network asset is necessary to operate the grid