Energy storage

Energy security in a renewable powered world

Overview

- Energy security and PV
- Using storage with PV
- Research using modelling
- What does the future hold?

Current grid balancing



PV increase in UK

- PV deployment was 2.7 GW at end of 2013
- 2.1 GW under or awaiting construction
- Aiming for 11 12 GW by 2020

The situation in Germany

Germany had 36GW solar at end of 2013

- Along with wind, can cover >50% of total electricity demand
- In 2013, began offering subsidies for lithium-ion battery + PV systems
- At least 4000 systems installed so far

Technology available

Lead-acid batteries most readily available technology but not well suited:

- Low lifespan
- Low depth of discharge Lithium-ion batteries more well suited but costs are currently a barrier. Capacitors/supercapacitors.

Model results



Overall performance



Future technology



Looking into the future

UK levels of PV generation are not high enough yet to affect broader network. But batteries pair well with PV's day-night cycle.

Larger uptake of PV could change the direction of energy policy, if costs drop.

Thank you for listening. Any questions?