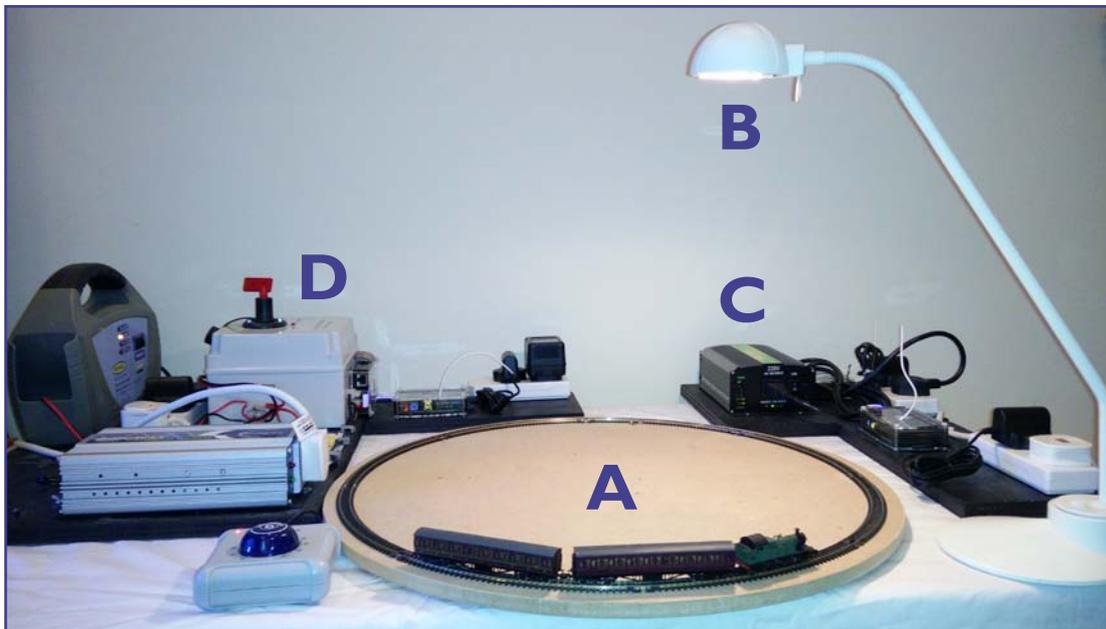


## EXSTORM Project

Swanbarton Limited conducted a feasibility study to assess business models for electricity storage, with grant support from Innovate UK. **EXSTORM** (EXploiting STORAge through an open Market) follows a previous Swanbarton project that demonstrated that Community Energy Markets (CEM), which incorporated electricity storage, had significant economic benefits for all local participants. As part of **EXSTORM** a desktop scale CEM was created to assess how real time peer-to-peer (p2p) markets work with different kinds of trading heuristics and energy prices set mutually between households or small businesses. (Patents pending)

### Free p2p markets allows anyone to benefit from locally generated renewable energy



The desktop model above consists of four units:

- A** A train set to represent household A's energy usage.
- B** A desk lamp to represent household B's energy usage.
- C** A grid tie inverter connected to a 250 W<sub>peak</sub> solar PV panel.
- D** A battery controller managing the charging and discharging of lead acid batteries according to market conditions and converts between AC and DC current.

Each unit is controlled by a raspberry pi (RPi) that monitors its own generation and/or consumption of energy. With this information and trading heuristic software the RPi's autonomously communicate with one another, in real time, to determine an agreeable trading price.

This desktop scale demonstrator visualises **EXSTORM**'s main work: a full scale detailed simulation of market operation. **EXSTORM** has demonstrated that real time peer-to-peer free markets offer excellent response of local price to local energy abundance, and thence may enable excellent demand response to price. Furthermore, when combined with market-acting local energy storage, the liquidity of local price enables new opportunities for managing peak energy flows at the interconnect between low voltage feeders and the distribution network.

For more information on Community Energy Markets visit [www.communityenergymarkets.com](http://www.communityenergymarkets.com)

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