Project Title:	'A new approach to assessing the value of demand side management and storage in reducing costs for electricity system operation and investment.'
Principle Investigator:	Professor Duck (University of Manchester)
Project duration:	13/11/06 – 16/09/07
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The UK is committed to responding to the climate change challenge and the energy sector, and in particular electricity, is expected to make a significant contribution to achieving this goal. Wind power, both on and offshore is presently the principal commercially available and scalable renewable energy technology and it is expected to deliver the majority of the required growth in renewable energy. However, the amount of electricity generated by wind is highly variable and therefore difficult to predict. One of the key challenges of this development is to ensure cost effective integration of these resources in the operation and development of the UK systems without compromising supply security

One of the key features of the present electricity system is that the balance between demand and supply must be maintained at all times. Given that the demand cannot, at present, be controlled, the balance must be maintained from the generation side. In order to supply demand that varies daily and seasonally, generation capacity must be able to meet maximum (peak) demand. In addition there needs to be enough capacity available to deal with any unpredicted demand increases. The unpredictability of wind power makes it difficult to maintain the equilibrium between demand and generation.

This increases the need for the use of technologies which help manage and control the level of demand, known as Demand Side Management. Demand Side Management, or DSM, works by shifting demand from peak to off-peak periods in order to reduce its variability. The use of DSM or storage techniques could help increase the efficiency of energy production and reduce need for network capacity. Currently the potential benefits of using DSM and storage technologies for such applications in the context of the UK electricity system haven't been properly explored. There is also a lack of rigorous methodology and tools for assessing the impact DSM and storage could have, which this project aims to address.

This project investigated a new approach to assessing the benefits DSM could have to the UK. In this context, the proposed project will investigate a new approach to valuing DSM for alternative future development scenarios of the UK system. The methodology used was based on a radically new approach mixing modern financial modelling coupled with sophisticated mathematical and computational techniques

This investigation developed a novel mathematical framework aimed at valuing applications of DSM in increasing the utilisation and improving the efficiency of the operation of future UK electricity system. The project also showed that it is possible to save around 30% of the generation cost to warm a typical household in winter using DSM.