MULTISCALE MODELLING TO MAXIMISE DOMESTIC ELECTRICITY DEMAND MANAGEMENT

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The influence of connected load on the operation and performance of electrical power systems has been recognised for a long time. There is potential to exploit the characteristics of load to improve the performance of future electricity networks through the application of energy demand transformations. However, this will require increased levels of load model detail which includes the temporal variations in load characteristics, particularly at the low voltage (LV) level. In this talk we will present the work program of DESIMAX, a collaborative research project looking at wide-scale implementation of demand side management (DSM) within electricity networks. To fully understand the implications of extended use of DSM, it is important to develop multi-scale models that will be able to capture, predict and demonstrate the response of the power system at time scales ranging from sub-second intervals to periods of years. A multi-sector modelling framework is proposed that includes the physical (electrical) system, the end-user behaviour, the economic and environmental models, as well as the set of digital interventions required in order to assist wider and easier implementation of DSM. The proposed modelling framework, which focuses on the residential and small commercial energy sectors, allows for a holistic approach to DSM integration and is capable of assessing the implications and effects of devised DSM schemes across the entire electricity system.