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Title	Environmental whole-system optimisation and control
Abstract	<p>Current Energy policy is designed to combat issues of climate change, security of supply and rising energy costs, and includes the implementation of improved energy efficiency and renewable/sustainable energy generation capacity within the work-place and the home. A number of existing technology platforms are designed to result in reduced CO2 emissions and energy costs, either via improved energy efficiency or supplementary renewable energy generation. However there is one major aspect of the efficiency and emission equation which has not been addressed. This is the area of whole-system optimisation and control of different technologies within an integrated whole, and the consideration of how 'human factors' such as occupancy characteristics affect system performance. This EngDoc will research which 'whole system' solutions offer maximum benefits at lowest cost by:</p> <ol style="list-style-type: none"> 1. Reviewing, evaluating and benchmarking existing technologies and techniques for whole-building design and specification. 2. Developing mathematical models of system and sub-system elements to enable predictive whole-system optimisation for varying technical, environmental and human scenarios. 3. Post-occupancy evaluation via diagnostic data monitoring for a range of real 'home-integrated' systems to facilitate validation of our modelled 'virtual environments'. 4. Depending on the outcomes of 1-3 above, the development of specific optimised system components, such as improved heat pump or solar thermal control algorithms.

