



The Role of End-Use in Integrated Urban Energy and Water System Dynamics

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The global trend of urbanisation is concentrating an increasing demand for services in cities, augmenting the global demand for resources such as freshwater and energy. At the same time, those resources are posing limits due to their availability or because their use is made prohibitive because of environmental pressures through e.g. global warming. Whereas planning for the provision of water and energy systems in cities has historically generally been separate, in the face of the present environmental challenges with important and intensifying socio-economic impacts, and because of their important interlinkages, both need to be integrated. The work presented introduces a combined urban energy/water model developed using system dynamics as a method, with an explicit and partially endogenous representation of the end-use demand. The model is used to illustrate how energy-related policies can affect the water sector and vice versa, the implications for planning of both systems which follow from that, and the important role demand side management plays. Data requirements are examined and the utility of the model to decisionmakers is discussed. The context of this work is the United Kingdom and London in particular, but changes to the model are suggested in order for it to apply to cities in other countries as well.