Framing the Problem:

How flexible is (household) demand and why do we need to shift it?

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UK: Household Energy Context

DYNAMICS OF ENERGY, MOBILITY AND DEMAND



UK: Household Electricity Context



UK: Household Electricity Context



DYNAMICS OF ENERGY, MOBILITY AND DEMAND



UK: Household Electricity Context



Source: University of Southampton 'Community Based Initiatives in Energy Saving' project (n = 180)





UK: Household Gas Context



Source: University of Southampton 'DANCER' project (n = 8, Dec 2012 - Feb 2013)



UK: The timing of (domestic) energy use







UK: Evolving Demand – Change is normal

To put it simply, most families in 1970 lived in homes that would be cold by modern standards in winter – as cool as 12°C on average (see Table 6o, Appendix 1). There may have been ice on the insides of the windows, and nearly everyone accepted the need to wear thick clothes at home in winter.

Few homes had central heating, and many families used coal for heating. Added to this, few families owned the household appliances everyone takes for granted today.

Source: DECC, 2013 (UK Housing Factfile)





UK: Evolving Demand – Change is normal

Chart 4: Electricity consumption by household domestic appliance, by broad type, UK, 1970 to 2011



DYNAMICS OF ENERGY, MOBILITY AND DEMAND

Source: DECC, ECUK Table 3.10

1970s

Typical energy using products in the home 30 years ago (Box 1)



Owen. 2006. The rise of the machines—a review of energy using products in the home from the 1970s to today., Energy Saving Trust, London.



2000s

Typical energy using products in the home today (Box 2)

Televisions /ideo players DVD player/recorder Portable music players Mobile phones Hairdryers Hair irons Electric toothbrushes Wireless telephone/answering machine Slave portable phone handsets Electric kettle smoothie maker Magimix Ice-cream maker Digital radio Mini hi-fi systems Washing machine Tumble dryer Dishwasher PlayStation/games console Cappuccino make Digital clock/radios Electric lawnmower Strimmer Microwave Electric oven Electric hob Extractor fan Large fridge/freezer Drinks cooler Portable fan /acuum cleane PC computer Monitor Printer Scanner/fax **Digital camera** Set-top box Electric shave Steam iron uicer lome security system Broadband connection Halogen bulb light fittings Personal care products Power tools Electric blanket



UK: Evolving Demand – Examples

- Laundry 1974-2005
- Eating at home 1974-2005
- ICT use 1983-2005
- Data: Multinational Time Use Survey 1970-2005, UK only, 18+



UK: Evolving Demand – Laundry



Tuesday



Data: % of reported laundry being done at given time

Source: Multinational Time Use Survey Dataset (UK, 1974-2005, all 18+)



07:00 08:30 08:30 11:30 14:30 14:30 14:30 14:30 19:00 19:00 20:30 22:30 01:00 01:00 02:30

1.40% 1.20% 1.00%

0.80%

0.60%

0.40%

0.20% 0.00%

05:30

04:00



1974

2005



UK: Evolving Demand – Meals at home



UK: Evolving Demand – Computing/Internet



Things to remember:

- Demand 'peaks' can be:
 - Bad difficult to meet & to manage resources/infrastructures
 - Good economies of scale (e.g. public transport, [district heat?])
- What people do changes over time
 - For all sorts of reasons
 - The current 'state' is (probably) not stable
 - How can we leverage that?
- And as we will now see...
 - People can be flexible
 - But they have constraints

The status quo cannot be assumed



