



DEMAND Methods
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Social practices, energy demand and time use data: *methodological lessons & challenges*

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DEMAND'S Starting Point

WHAT IS ENERGY USED FOR?

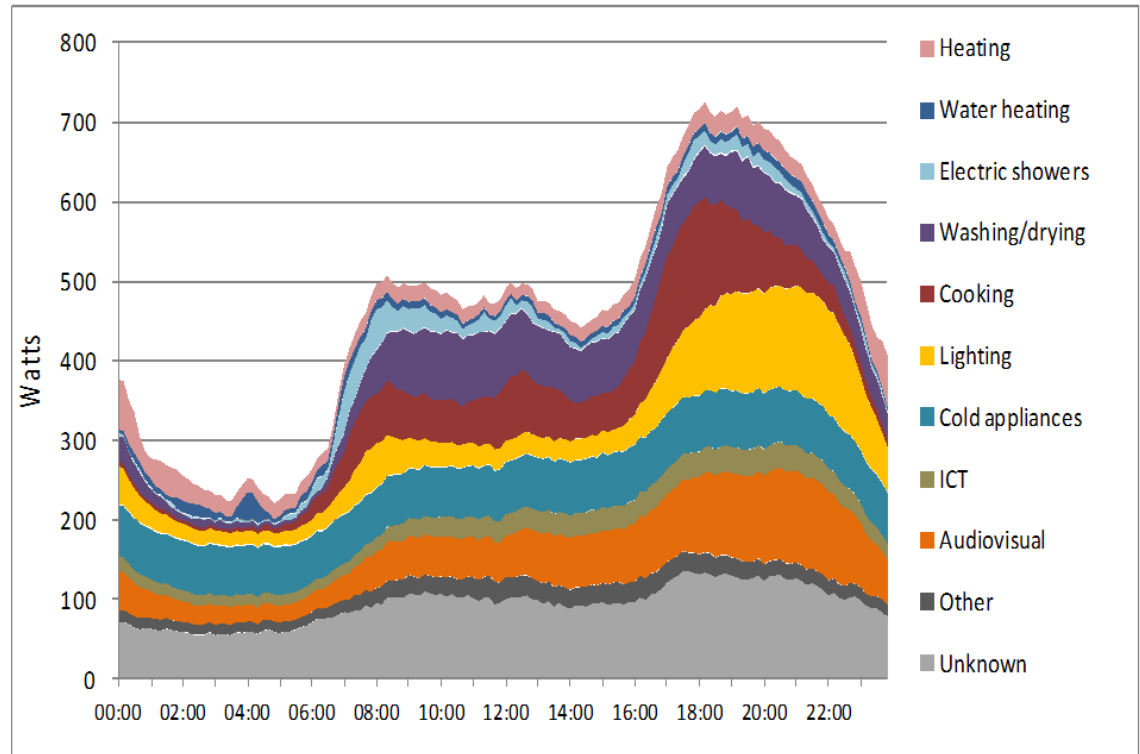
- Energy 'demands' are emergent from co-evolving infrastructures and *what people do* (social practices)
- **Wrong** sorts of questions:
 - *Who uses the most energy and when?*
 - *Which social groups do/don't adopt efficient technologies*
- **Right** sorts of questions:
 - *What are people doing – when, where and for how long?*
 - *Which bundles of practices contribute to peaks (& troughs)*
 - *Which kinds of people do similar social practices?*
 - *Which bundles of practices are currently energy intensive?*



The Challenge

WHERE IS THE DATA TO UNDERSTAND *WHAT ENERGY IS USED FOR?*

- This is an appliance level view & tells us very little about:
 - what people do
 - variation over time and people
 - temporal and causal relationships across domains
 - the evolution of these activities over time

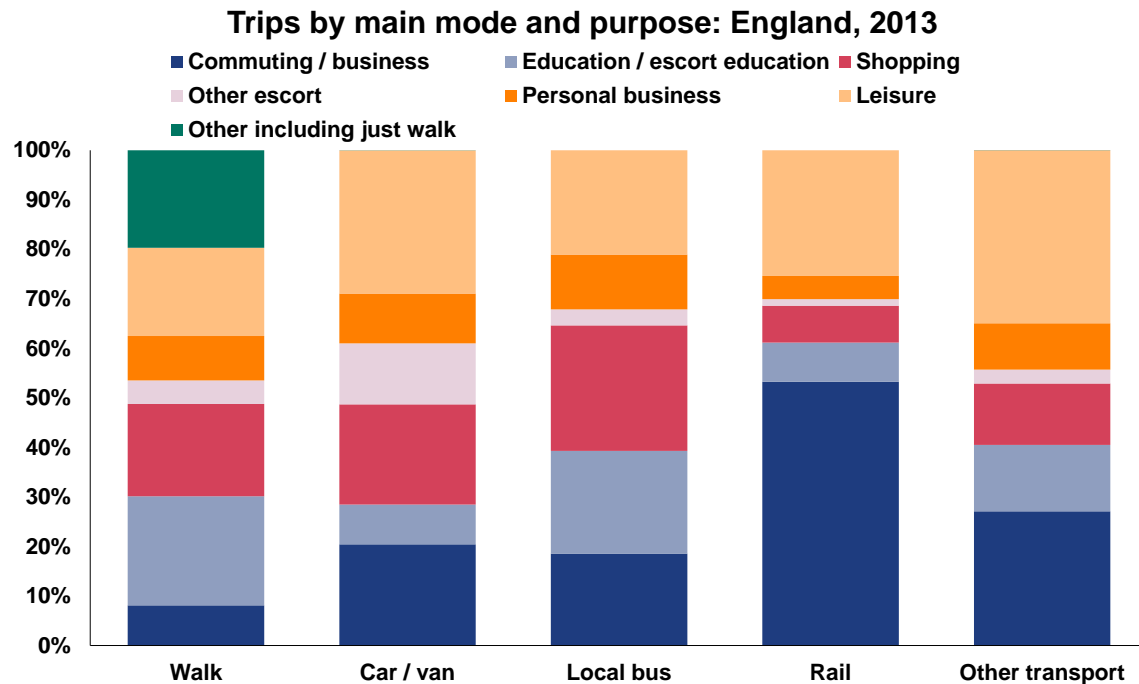


Graph 7a: HES average 24-hour electricity use profile for owner-occupied homes, England 2010-11

The Challenge

WHERE IS THE DATA TO UNDERSTAND *WHAT ENERGY IS USED FOR?*

- This is journey purpose level view & tells us very little about:
 - What leads to the trip?
 - Where does mobility come in the sequence of other activities?



Why do we need to know more?

If we want to tackle ‘peaks’ – two inter-linked approaches’:

- Demand Reduction
 - Just reducing it per se
- Demand Response
 - Shifting it somewhere else in time (or space and time)

This raises the crucial question:

- **What can shift and where can it shift to?**

In DEMAND terms:

- **What** are people doing, **when** and **where**?
- In what **sequence**?
- How **synchronised**?
- With what **variation**?
- How has this changed over **time**?
- What **flexibility**?
- What does this imply for **shifting**?

Time Use Data

- Representative activity diaries
- Two days by household (Week, Week-End)
- 10 minutes steps primary and secondary activities
- Waves every 10 years
- Individual + household level information
- Link across different energy 'domains' (household and mobility)
- International standardisation (MTUS)

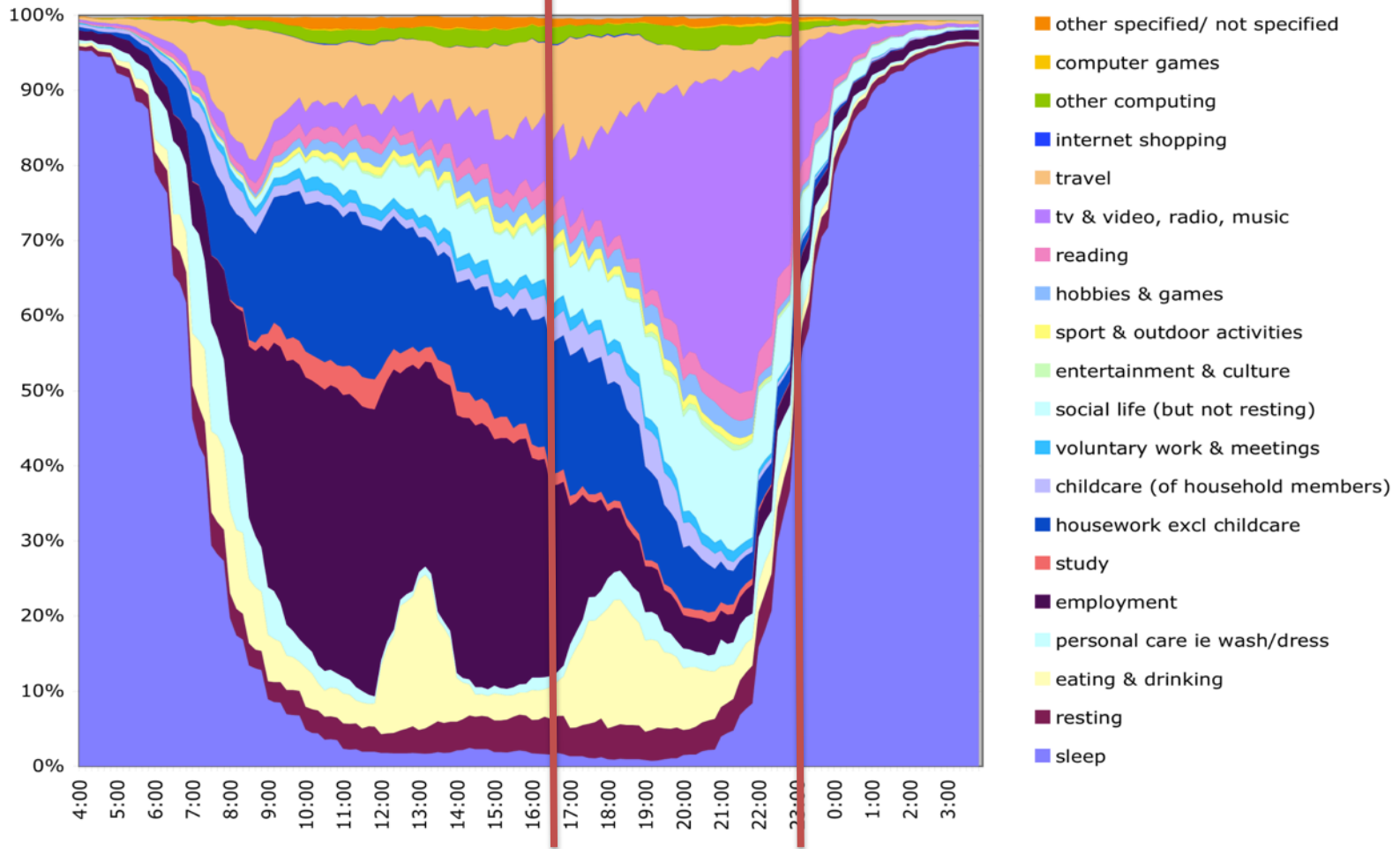


Time Use Data

MTUS UK time use surveys

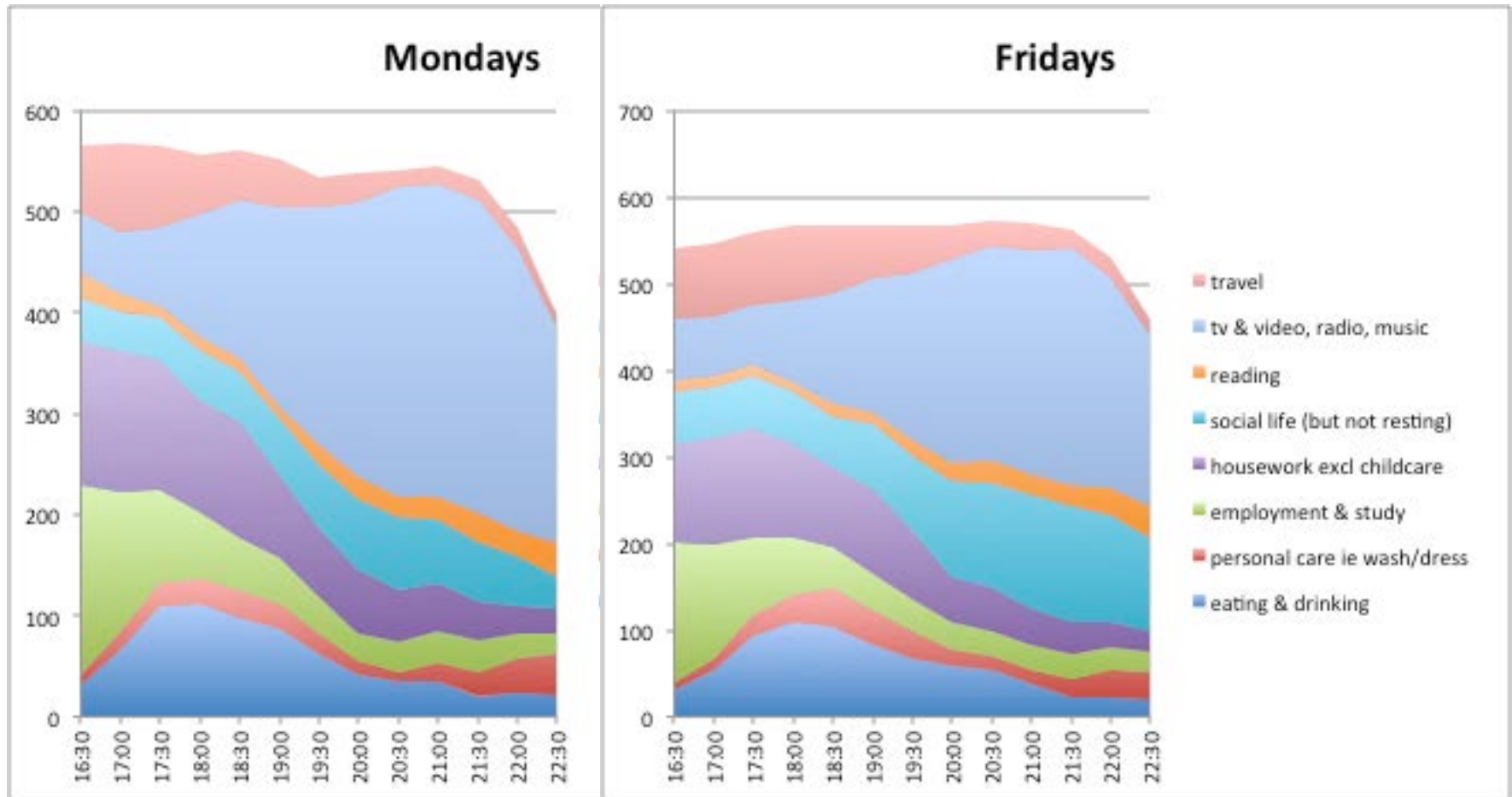
Survey	Sample	Sample size	Time interval	Notes
1974	All 5+ in representative household sample	2,598	30 minutes	7 diary days, primary & secondary activities (73 codes), location known
1983	Representative sample 14+	1,350	15 minutes	7 diary days, primary & secondary activities (188 codes), location known
1987	Representative sample 14+	1,586	15 minutes	7 diary days, primary & secondary activities (190 codes), location known
1995	Representative sample 16+	1,962	15 minutes	1 diary day, primary activities only (31 codes), location unknown
2000	All 8+ in representative household sample	8,688	10 minutes	7 diary days (weekday & weekend), primary & secondary activities (265 codes), location known
2005	Representative sample 16+	4,854	10 minutes	1 diary day, primary & secondary activities (30 codes), location known

So what constitutes peak?



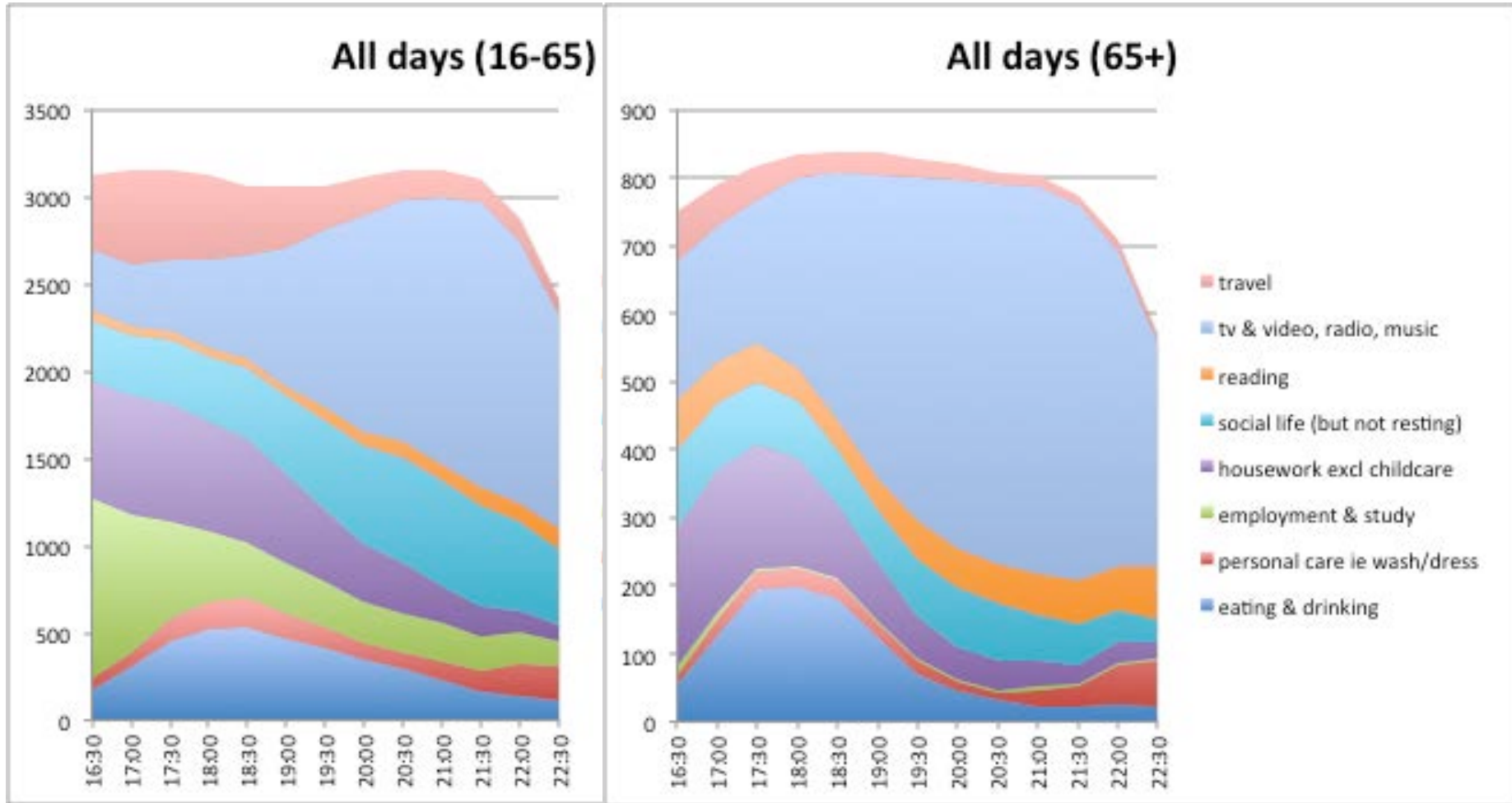
ONS 2005 Time Use Survey Data (UK, weekdays) % of persons reporting

The 'average day' is not that helpful



ONS 2005 Time Use Survey Data (UK) n people in category – half hour summaries

Whose 'peak' is it...?



ONS 2005 Time Use Survey Data (UK, all days) n people in category – half hour summaries

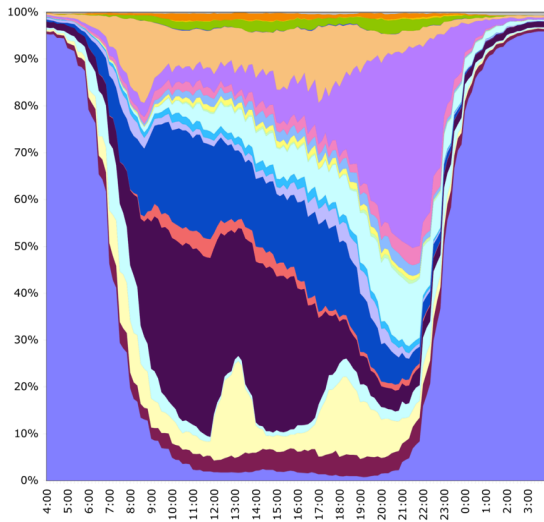
A quantitative approach to practices

- **Practices** as group of activities held together by **meanings** and relying on **competences** and **products** (Shove & Pantzar, 2005)
 - Definition of clearly delimited entities
 - Describing their relation to other practices, needs for energy, and peak demand
 - Tracking alternative practices in the geographical and social space

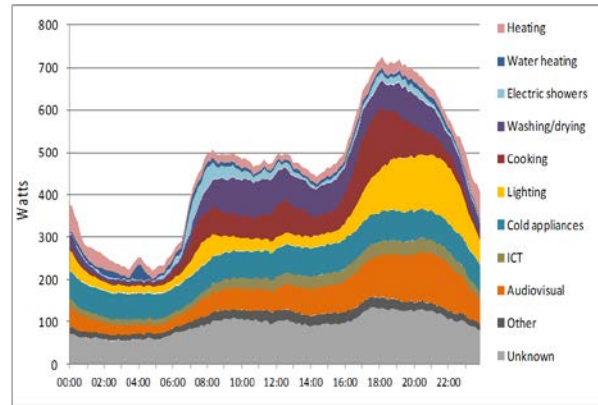


How do we..

Go from this

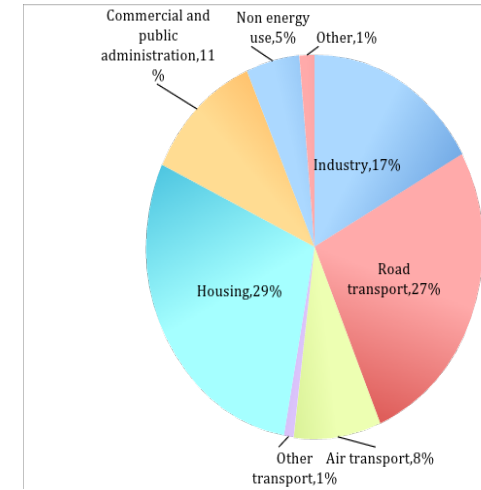


To this



Graph 7a: HES average 24-hour electricity use profile for owner-occupied homes, England 2010-11

To this ?



Proportion of final energy consumption by 'Energy Users', UK 2012 (Source: (Palmer and Cooper 2013),Table 1a)

'Theme 1' questions (& q's for today!)

1. Is sequence analysis a way to detect traces of practices in Tud? What methods can be used?
2. How does TUd allow the link between mobility and domestic energy use to be made?
3. How can we understand time *pressure* and identify those activities responsible for structuring time?
4. How far can the data to be used to detect co-doing as well as co-presence?
5. Can the combination of TUd and GPS data allow analysis of in-home and out-of home activity?
6. When is variation important?
7. Is the data sufficient to detect change over time?
8. How do we assign metrics of energy intensity or energy use to time use data?

