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UK Approach to Settlement

Overview

- Metering arrangements in the UK
  - Overview of current arrangements
- UK Settlement System
  - Use of profiles
  - Existing treatment of dynamic time of use tariffs
- Future developments
  - Role out of advanced / smart meters
  - Drivers for change
- Challenges

Metering in the UK

- Metering separated from distribution businesses in 2000
- Suppliers responsible for providing customers with meters
  - Customers have right to provide their own meter, with agreement of supplier
- DNOs have licence obligation to provide metering services for all meters in their area, if requested by the relevant supplier

Overview of Metering in the UK (2)

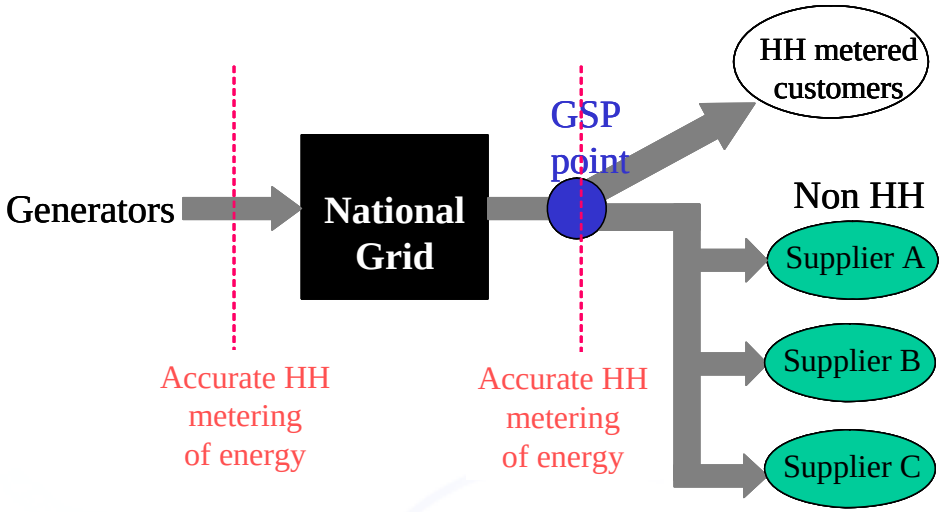
Maximum demand > 100kW

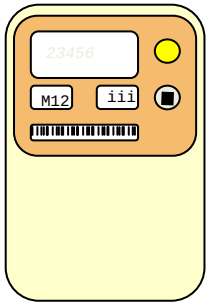
- Half-hourly metering
- Automatic meter reading
  - e.g. Radio, GSM, PLC
- Settlement
  - actual consumption pattern

Maximum demand < 100kW

- Non half-hourly metering
- Manual meter reading
  - At least once every 2 years
- Settlement
  - According to a deemed profile
  - 8 profiles available
    - 1 & 2: domestic
    - 3 & 4: small non-domestic
    - 5 to 8: larger non-domestic<100kW

UK Settlement System



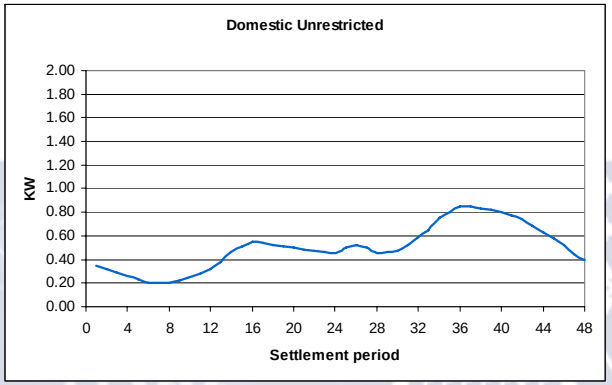


Annual Consumption

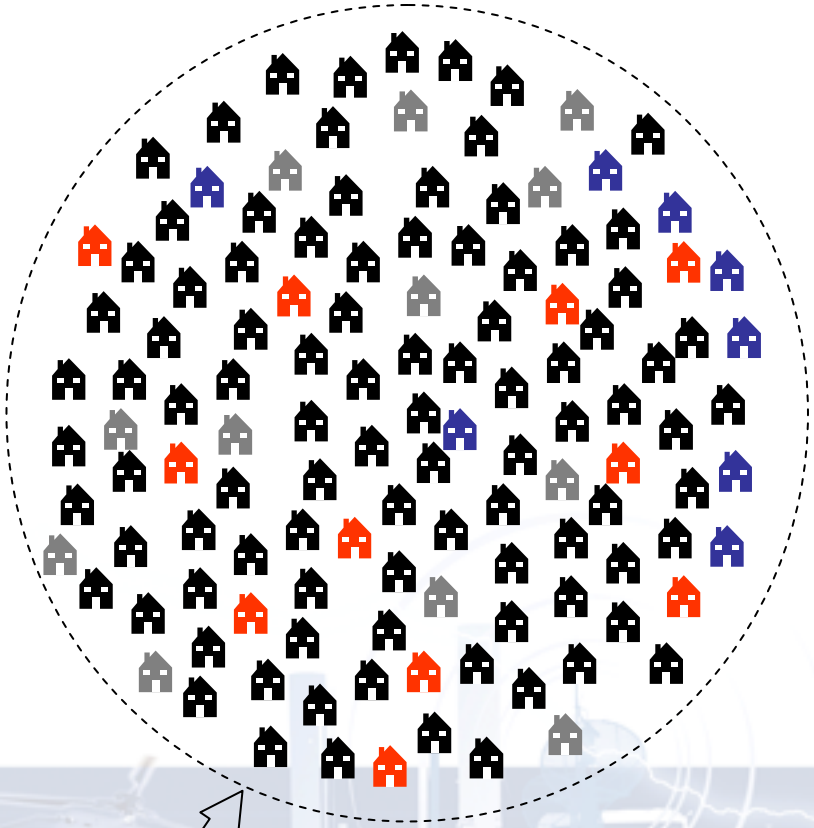
17,520 Half-hourly values

profiles

GSP Error = GSP metered energy - HH metered energy - NHH energy estimated using profiles

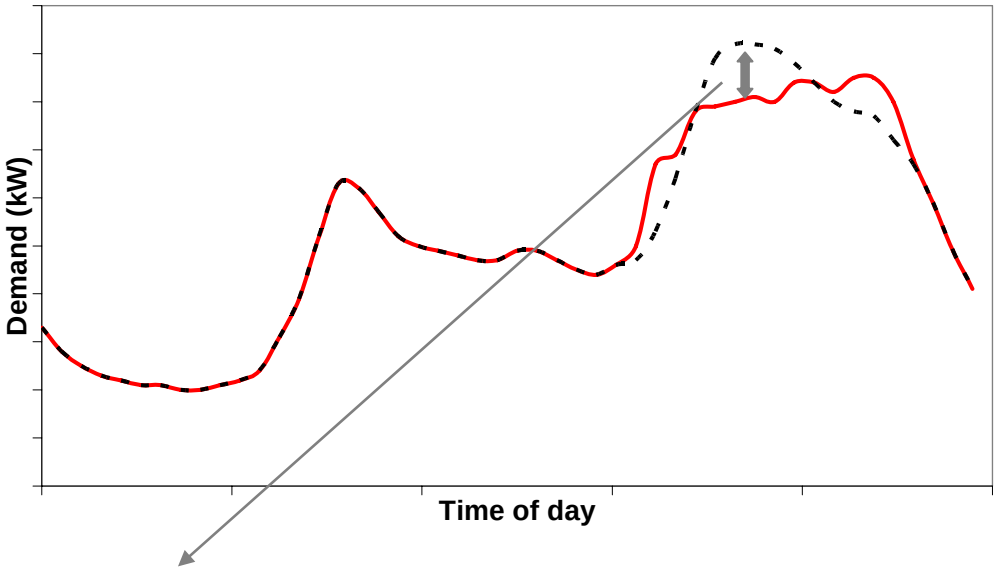


UK Settlement System (2)



Grid Supply Zone

Alternative profile with demand management

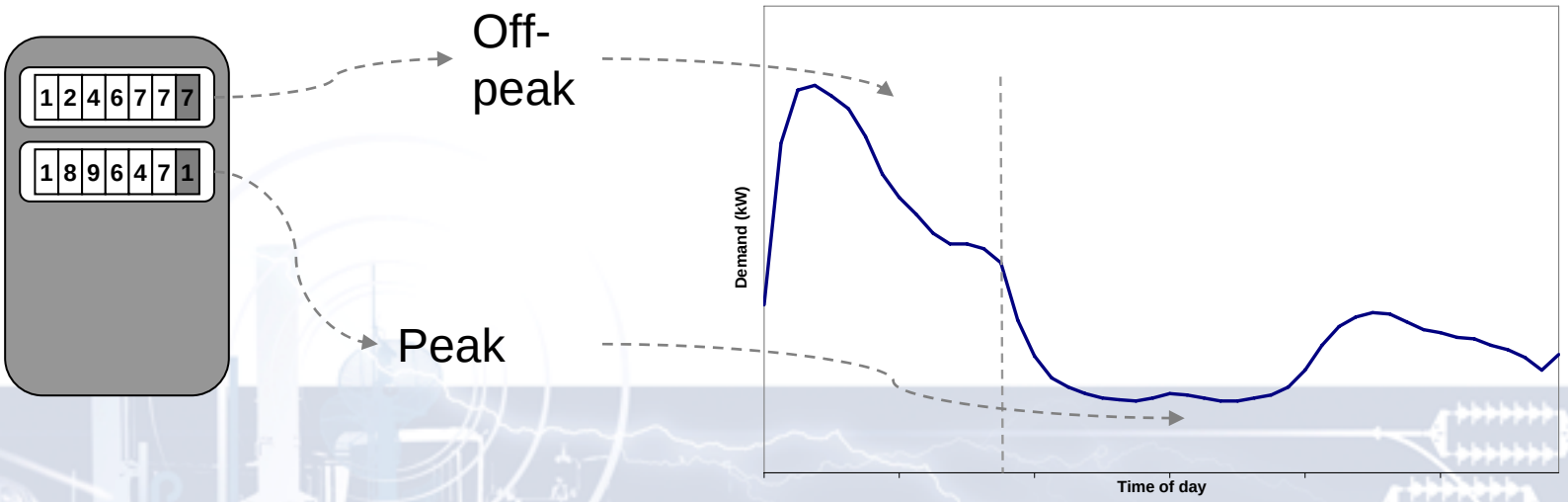


"Error" is shared amongst all suppliers active in the Grid Supply Zone

Customers who actively manage their demand

UK Settlement System - Dynamic tariffs

- Limited scope to handle dynamic time of use tariffs
- Use of multiple registers
    - e.g. households with off-peak tariffs



UK Settlement System - Dynamic tariffs (2)

- Potential for dynamic tariffs
  - Settlement system must know switching times
    - Teleswitch (after 2016?)
    - Clock Intervals
  - Requirement for a unique identifier (Standard Settlement Configuration)
    - For each unique set of register switching times
    - 10,000 available (~700 used to date)
  - Switching ‘rounded’ to nearest half-hour
    - To align with settlement periods
  - Variable duration switched loads
    - Fraction of switched load per day assumed to be fixed (approx)
      - largely independent of duration of switched load
      - does not take account of weather dependent switching

Future Developments

- Smart meters by 2020
  - for all domestic / small non-domestic customers
  - ~25 million households / 2.2 million small businesses

- Advanced meters by 2014
  - for larger (<100kW) non-domestic customers
  - ~ 170,000 businesses

Future Developments (2)

Data collector

Smart metering	Key Features	Advanced metering
?	Half-hourly data	✓
✓	Multiple TOU billing registers	×
✓	Remote disconnect	×
✓	Remote configuration (for credit or prepay)	×
✓	Two-way communications	×

Data collector

Drivers for smart / advanced metering

- Informed consumers
- Accurate billing
- Address credit / pre-payment tariff inequalities
- Energy efficiency & energy savings
- Facilitate microgeneration
- Demand Side Management

Demand flexibility

Demand Flexibility

- Potentially significant contribution in ensuring balance between generation and supply of electricity
  - Reducing peak demand
  - Facilitation of renewable / inflexible generation
- Settlement system
  - Based on ‘average’ load profile of broad customer groups
  - Limited scope for time of use tariffs
  - Difficult to differentiate between customers
    - Particularly in terms of pattern of usage
  - Benefits of demand management ‘spread’ across all suppliers
    - Difficult to ‘capture’ benefits to ensure they are distributed appropriately

Main Challenges

- Limited potential for dynamic time of use tariffs
  - Timing
    - Switching ‘rounded’ to nearest half-hour
  - Profiling of switched loads (e.g. off-peak heating)
    - Not designed to cope with variable switching times
  - Suitable for simple tariff structures only
    - Not able to deal with complex ‘real-time’ pricing
- Cannot capture benefits of flexible demand profile
  - Dynamic demand management
  - Micro-generation
  - Electric vehicles

Way Forward

- Modify current settlement arrangements?

  or

- Move to half-hourly settlements?