The Radio Teleswitch
An historical perspective on the roll-out of domestic load control
GEC Central Heating PLUS from only £650

‘Central’ heating
Glorious even background warmth from NightStor electric storage heaters that can be installed so simply, run on ‘low-price’ electricity and are absolutely clean and safe.

‘Selective’ heating
Quick extra heat from GEC heaters that can be automatically timed and thermostatically controlled to cut fuel waste.

‘Protected’ heating
SupaWrap roof insulation keeps heat inside and can save up to 20% on fuel bills.
G.E.C. CENTRAL HEATING - PLUS FROM ONLY £65

gives you more for your money than ordinary central heating

1. 'CENTRAL' HEATING
   Glorious even background warmth from NIGHTSTOR electric storage heaters that can be installed so simply, run on 'low-price' electricity and are absolutely clean and safe.

2. 'SELECTIVE' HEATING
   Quick extra heat from exciting up-to-date G.E.C. heaters that can actually be automatically timed and thermostatically controlled to cut fuel waste

3. 'PROTECTED' HEATING
   Fibreglass 'Supawrap' roof insulation keeps heat inside (can save up to 20% on fuel bills).
This talk

• Introduction to the radio teleswitch
• Hope and disappointment
• Barriers, and what has (and hasn’t) changed
• Final thoughts
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“Opt-out” i.e. mostly inherited

Retail competition, but mainly legacy product

Biggest programs in states with low/no retail competition

See [Direct Load Control of Residential Air Conditioners in Texas (The Brattle Group)](https://www.eia.gov/todayinenergy/detail.php?id=6250#tabs_RenewablesMaps-4) and [https://www.eia.gov/todayinenergy/detail.php?id=6250#tabs_RenewablesMaps-4](https://www.eia.gov/todayinenergy/detail.php?id=6250#tabs_RenewablesMaps-4)
System introduced

Queen’s Award for Technological Achievement

‘prospects for innovative tariff and load control developments [were] a major source of favourable comment’

Electricity Act 1989 (privatization)

‘Significantly under-utilised’

Retail competition

Less than 0.5m RTS contracts

Smart meters
Half-hourly settlement

Lack of long-term contracts

Amount of data

Lack of geographical targeting

One-way comms, no knowledge of meter and contract arrangements

Lack of geographical targeting

Vertical disintegration, misaligned incentives
Episode IV
A NEW HOPE
Half-hourly settlement

Amount of data

One-way comms, no knowledge of meter and contract arrangements

Lack of long-term contracts

Lack of geographical targeting

Vertical disintegration, misaligned incentives
Domestic Fixed Price Energy June 2016 customers (ScottishPower Area):

Definitions and Recommended Applications

These descriptions cover general principles. Actual prices charged vary according to time, depending on choice of payment method, and are fixed separately.

Domestic
This tariff has a Daily Standing Charge which applies regardless of usage and a single kWh rate for all electricity used. The Domestic tariff is intended for customers who make use of electricity for general domestic purposes only. It is also suitable for most customers who use electric heating (e.g. non-storage based systems).

White Meter No. 1 (WM1)
This tariff has a Daily Standing Charge which applies regardless of usage and two different kWh rates, for day and night. The day rate is applied to all electricity used during Day and Night time periods respectively. "Night" is defined as any period of 8.5 hours at ScottishPower's discretion between 22.00 and 06.30 GMT, but in practice should be one of the following:
- 23.05 to 07.00 GMT (winter)
- 23.45 to 08.15 local time
- Same clock time all year
- 00.00 to 08.15 local time at the choice of ScottishPower during any other time. The Day kWh rate is significantly higher. The Night kWh rate is, however, significantly lower. WM1 is only suitable for customers who make significant use of electricity 24/7. About 35% of the electricity used by continuously operating appliances such as freezers is automatically taken at night. Early morning use of lighting, heating and cooking is also likely to occur at the Night rate, and other appliances such as washing machines and dishwashers can be deliberately operated at night to take advantage of the low price.

ComfortPlus White Meter with Weathercall Option
The ComfortPlus White Meter with Weathercall Option has a lower fixed cost compared to the domestic white meter option.

Convenience				ComfortPlus				White Meter

• Day means at all other times.
• The Controlled Circuit (CC) has a day and night rate.
• CC used to control central heating by switching on and off space heating. The controller operates in one of two ways: by customer choice as described in the user guide.

ComfortPlus White Meter with Weathercall
The ComfortPlus White Meter with Weathercall option has a lower fixed cost compared to the domestic white meter option.

Convenience				ComfortPlus				White Meter

• Day means at all other times.
• The Controlled Circuit (CC) has a day and night rate.
• The controller operates in one of two ways: by customer choice as described in the user guide.

ComfortPlus White Meter with Weathercall Option
The Controlled Circuit is energised for periods having an aggregate daily duration between 6 and 14 hours chosen by ScottishPower on the basis of forecast weather.

ComfortPlus White Meter with Weathercall
The ComfortPlus White Meter with Weathercall option has a lower fixed cost compared to the domestic white meter option.

Convenience				ComfortPlus				White Meter

• Day means at all other times.
• The Controlled Circuit (CC) has a day and night rate.
• The controller operates in one of two ways: by customer choice as described in the user guide.
Final thoughts

• We are at time of high hope for residential demand response enabled by smart devices

• Similar hopes around the radio teleswitch were undermined by technical and (mainly) market structure barriers

• These structural barriers still largely exist, and complemented by additional challenge of uptake of DR and ‘DR-able’ technologies

• Transactive energy is a promising way forward, giving insight into value of actions to all actors and potentially empowering customers – but work needed to understand this potential.
Thank you!

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