It’s a Lottery: how Ofgem’s price cap fails Economy 7 customers

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Executive Summary

While the government's Energy Price Guarantee has provided price certainty for most customers, there remain several million often low-income households for whom the position is a lottery. These are the households on Economy 7 or other similar multi-rate tariffs originally designed for use with electric storage heating.

On these tariffs the idea is that customers pay a slightly higher day time rate than customers on a standard tariff but then get cheaper electricity at night.

For a long time, this group of customers has been neglected by regulators and policy makers. Earlier this year Sustainability First and Glen Dimplex highlighted to Ofgem concerns that:

- these **customers are systematically over-paying through the price cap (by around £100 pa)** because Ofgem's model does not reward them for using more energy at night when wholesale prices are lower;
- and that **there is scope for suppliers to game the system because of the freedom they have to set relative night and day rates** within the cap.

However, Economy 7 does not appear in Ofgem's latest Programme of Work for the price cap on which it is currently consulting. In our view it needs to be included as a priority issue.

The introduction of the Energy Price Guarantee has made the picture more complicated but it is now clear that **the way many suppliers make use of the flexibility in how they set relative day and night rates is creating a lottery across suppliers, regions and payment methods**.

For customers who charge their storage heaters and hot-water at night the Economy 7 tariffs (or other similar tariffs such as Economy 10 or Total Heat Total Control) are almost certainly the best option – and there are some very good value deals available for these customers. But there are large numbers of households – around 1.5 million – who are on an Economy 7 tariff but who do not have storage heating, and who could now be paying hundreds of pounds a year more than they would on a standard single rate tariff.

In the current crisis **there needs to be much clearer advice to Economy 7 customers** about checking whether it is still the right tariff for them and about how their tariff works – in particular how the balance between their night-time and day-time usage impacts their bill (and when those rates apply).

While it is hard to find information on suppliers' tariffs across the country, checking the Economy 7 direct debit rate for an address in Eastern region reveals a range running from Shell Energy whose night rate is 20p/kWh through to EDF which offers a night rate of 7p/kWh (or under 1p/kWh for PAYG from January!). The day rates are then the other way round (at 41p/kWh for Shell Energy, 54p/kWh for EDF direct debit and 57p/kWh for EDF PAYG). Compared to the standard single rate tariff of 35p/kWh (or 34p/kWh PAYG) some of these day rates seem excessive.

For most customers on a standard single rate tariff the price cap and Energy Price Guarantee mean that they are paying the same unit price whoever their supplier is. **For Economy 7 customers this is not the case – and neither BEIS nor Ofgem seem to be aware of the scale of the disparity.** The fact that there are such variations in the Economy 7 tariffs reinforces the concern that the flexibility suppliers are allowed within the price cap leaves the arrangements open to abuse.

Aside from the real and immediate impacts on a key group of customers (typically young renters or older low-income households), there are also strategic reasons why BEIS and Ofgem should be

looking more closely at this issue. While smart electric storage heating will always be a niche solution it has an important future role to play in the decarbonisation of heat for small well-insulated domestic properties, such as flats, that are not suitable for heat pumps. BEIS have also acknowledged the role storage heaters can play as a flexible source of heat in their recent consultation on Delivering a Smart and Secure Electricity System. But to play that role effectively there have to be suitable tariffs.

Moreover, there is a clear consensus that to deliver the smart, flexible energy system needed as we rely more on renewables, much more use will have to be made of time of use tariffs going forward. Ofgem should be looking to use Economy 7 and similar multi-rate tariffs as a testing ground for how it will oversee a much more complex market – seeing it as a bridge to the future, including to encourage overnight EV charging – and not a relic of the past.

Ofgem must not ignore the interests of the several million customers on Economy 7. While everyone in the industry talks about ensuring "no-one left behind" – this is a group of customers who are just that.

We are asking Ofgem and BEIS to look urgently at how the price cap and Energy Price Guarantee are working for these customers, building on the findings in this report. We also want to see a wider review of the lessons that can be learned from Economy 7 for future smart, flexible energy markets, including the wider reforms needed to ensure smart storage heating can play its part in addressing the huge challenge of de-carbonising heat.

Mindful of the stresses that households are facing this winter and that those with electric heating are often particularly vulnerable, it is vital that Ofgem, BEIS, suppliers and consumer groups do all they can to help Economy 7 customers navigate their way through the tariff lottery.

What is Economy 7 and why it matters today

Most electricity consumers today are on a standard p/kWh tariff, 24 hours per day, regardless of what time of day or night they use their electricity.

By contrast, Economy 7 is a tariff which gives 7 hours of lower priced electricity at night, with a day rate that is then higher than the standard day rate. It was designed for use with electric storage heaters (which heat up overnight and release heat in the day) although it is clear that many customers remain on an Economy 7 tariff who no longer have this sort of heating system (because it has been replaced with gas or direct-acting electric heating).

There are special meters for Economy 7 that have two registers to record day and night usage (and switch the heating circuit on/off at the appropriate times). As well as Economy 7 there are other meter / tariff variants such as Economy 10 and Total Heat Total Control which are also designed specifically for use with storage heaters, each offering benefits to different profiles of energy use, including, for example, providing for an additional boost during the afternoon.

Grid Edge Policy's previous report "An Electric Heat Pathway: Looking Beyond Heat Pumps" sponsored by SSEN (an electricity distribution network) provides a comprehensive review of the use of electric storage heaters, their benefits and the barriers to their adoption including the role of Economy 7 and other tariffs. Key findings from that report on the prevalence of Economy 7 were that:

- **A small but significant number of homes have storage heating today**. Based on the England and Scotland Housing surveys for 2017-18 around 1.4 million households had electric storage heating, with a higher prevalence in Scotland than England;
- **Electric heating is strongly associated with fuel poverty**. At that time a household in an electrically heated home (either storage heating or direct-acting) was twice as likely to be in fuel poverty as someone in a gas heated home. This reflects the fact that they are more likely to be on low income and living in an energy inefficient property - as well as the relative costs of electricity versus gas.
- **Many more households are on an Economy 7 or similar tariff than currently have electric storage heating.** At that time the CMA and Ofgem both found that around **4 million households** were on some form of "restricted meter" (of which 3.5 million were on Economy 7) and based on DUKES data for 2019 19% of domestic electricity consumption was on Profile Class 2 (ie some form of multi-rate tariff).

With the rollout of smart meters, the number of households on Economy 7 or similar tariffs but without storage heating is likely to have fallen and, following the CMA Retail Market Review, households with restricted meters can insist on being put onto a standard tariff if that is more suitable for them. **Up to date basic data on the number of households on an Economy 7 or similar tariff is not publicly available (although suppliers will have that information).** Elexon have confirmed from their records that there are still around 3.5 million meters classed as Profile Class 2 (which is a multi-rate meter) although not all of these will be on an Economy 7 tariff. On that basis it seems reasonable to assume that a few years on from the publication of the Electric Heat Pathway report there will still be around 3 million households who are using Economy 7 or similar tariffs, of whom around half are using electric storage heating**. At around 10% of households, this is not a "niche" that can simply be ignored.**

The Energy Consumer Archetypes[1] that Ofgem produces to help them in considering distributional issues do not explicitly identify Economy 7 customers. However, the archetypes that are identified as being off gas grid and more likely to use electric heating (G11, H12 and H13) are all classified as "disengaged" and are either young couples / singles often in private rented accommodation and on close to average incomes – or elderly / disabled customers on low or very low income. This reinforces the importance of ensuring that these customers are being treated fairly.

The Ofgem Price Cap and the Energy Price Guarantee

The Default Tariff Cap (or 'price cap') has been in place since January 2019, and Ofgem is responsible for regularly reviewing the level at which it is set. It ensures an energy supplier can recoup its efficient costs, whilst making sure customers do not pay a higher amount for their energy than they should. While the price cap is usually presented in terms of the amount that a typical dual fuel customer will pay each year, the cap does this by setting (separately for gas and electricity) a maximum suppliers can charge per unit of energy and a maximum daily standing charge[2]. The rates vary slightly by region and by payment method. The price cap applies to customers who are on a default or standard variable tariff (as opposed to eg a 2 year fixed price deal). It now covers 26 million households (around 90% of the market).

Because the Ofgem price cap is designed to reflect suppliers' costs it has been rising sharply over the past year or so as gas prices (and hence also electricity prices) have increased. Originally the price cap was being reset every 6 months but given the pace of change in prices it is now being reset every quarter.

In response to this energy and cost of living crisis, this autumn the Government introduced the Energy Price Guarantee whereby they subsidise the cost of energy to bring the bill for a typical dual fuel customer down to £2500 pa until April 2023 and £3000 pa thereafter. This is achieved by the Government providing a subsidy to suppliers on the unit rate of energy which reflects the difference between the Ofgem price cap and the Energy Price Guarantee.

The Energy Price Guarantee applies to all customers and is in addition to other targeted help to low-income households. For customers who are not covered by the Ofgem price cap the Energy Price Guarantee still applies and they receive the same discount / subsidy (17p/kWh for Oct-Dec 2022) on whatever their current tariff is.

Economy 7 customers

Although they get much less profile than standard tariffs, Economy 7 and other multi-rate tariffs are also covered by Ofgem's Default Tariff Cap.

The way that the price-cap works for Economy 7 is that Ofgem sets the daily standing charge and the *average* p/kWh. For Economy 7 the supplier's *average* unit price is calculated by weighting their night and day rates in the ratio 42 (night):58 (day). Provided their weighted average price is at or below the cap, suppliers are free to set the relative day and night rates as they wish.

[1] https://www.ofgem.gov.uk/sites/default/files/docs/2020/05/ofgem_energy_consumer_archetypes_-_final_report_0.pdf

[2] Formally they set the annual charge for a customer with zero usage and for a customer with median usage – but this is essentially the same as setting the standing charge and unit rate.

For more complex meter variants (eg with three time periods) suppliers are required to use "historic consumption data or, in the absence of historic data, a reasonable estimate of the average consumption split". This again seems to be based on a single national weighting..

As with standard rate tariffs, the (weighted average) Economy 7 rates that Ofgem sets under the price cap vary slightly by region and by payment method. For October-December 2022 the (weighted average) Economy 7 rates are typically 2p to 3p lower than standard rates so that a customer using more than 42% of their energy at night would generally be better off on Economy 7[3].

With the introduction of the government's Energy Price Guarantee (EPG) the level of the charges that customers face is reduced compared to the prevailing price-cap level. For Economy 7 (or other multi-rate tariffs) unit rates are calculated as a fixed p/kWh discount on the weighted average Ofgem tariff cap rate. This discount was 17p/kWh for Oct-Dec 2022, rising to 31.8p/kWh in January 2023 to offset the increase in the Ofgem cap.

However, what this means is that while standard rate customers have their prices fixed through to next April (and then again for the following year at a higher rate), Economy 7 customers can see their prices vary on a quarterly basis if the Ofgem Economy 7 cap changes by more (or less) than the standard rate cap. As highlighted by MoneySavingExpert[4], Economy 7 customers are seeing a substantial increase in their bills from January as a result of this effect. There is also scope for suppliers to change their relative day and night prices as part of this quarterly update which can have a big impact on individual customers depending on their usage pattern.

The BEIS website provides very little information in relation to Economy 7 but simply reinforces the message around flexibility:

"*Note that for customers on multi-register tariffs such as Economy 7, suppliers have flexibility to apply slightly different discounts to the individual rates within the tariff, helping to balance-out the reduction of more expensive day rates with cheaper night-time electricity rates. Each supplier will approach this differently*".

Economy 7 customers over-paying in the Price Cap

The way that the price cap limits are set is complex but from a review of the models that Ofgem publishes it seems clear that **Ofgem is *over-stating* the total costs associated with Economy 7 tariffs as it makes no allowance for the fact that with more of their usage at night time these customers should be benefitting from lower wholesale electricity prices at night**. While the model does take account of this different pattern of usage in its calculation of *network* costs[5], it does not do so for *wholesale energy costs* which are by far the largest component. While this simplifying assumption may have been reasonable when the tariff cap was first introduced, the materiality of the impact for Economy 7 customers means that it now urgently needs to be reviewed

[3] Although this difference on its own may not be sufficient to justify installing storage heating over direct-acting heating and – as set out below – does not fully reflect the savings that Economy 7 customers deliver to the system.

[4] https://www.moneysavingexpert.com/news/2022/12/economy-7-price-rises-form-january/

[5] Although it should be noted that many flexibility providers consider that current network charges do not adequately reflect the benefits to the system of shifting demand to off-peak times.

It is hard to determine the precise impact of the Economy 7 night-time disbenefit without access to detailed wholesale energy price information that Ofgem can access (but that is proprietary and not publicly available). However, based on indicative information from the Octopus Energy website we have estimated that Economy 7 customers are over-paying in the Price Cap by around £100 pa (see Annex)[6]. In our view this is sufficiently material – in particular for lower income households - to justify Ofgem doing further work. Having raised the issue with them earlier this autumn, **we are disappointed that Economy 7 does not appear in the Ofgem Programme of Work on the Price Cap on which they are currently consulting.** We understand the cost aspect may be picked up as part of the proposed work on wholesale costs. However, **we maintain that Economy 7 (including the wider aspects flagged below) should be explicitly identified as a priority area in the Programme of Work.**

More fundamentally, Ofgem should explicitly consider the impacts on Economy 7 customers of any wider changes that it is making to the price cap. The increase in tariffs that Economy 7 customers are (on average) seeing in January is a fall-out from the significant changes that Ofgem has made to the wholesale cost element of the price cap – moving to quarterly updating and the inclusion of "backwardation". Because the Ofgem model takes account of the higher winter usage by Economy 7 customers (but not the higher night time usage) the "transitional adjustment" is higher for Economy 7 than standard rate customers. Although Ofgem consulted extensively on these changes to the wholesale methodology, nowhere did it consider the specific impacts on Economy 7 customers. Indeed, in its Distributional impacts assessment[7] where it looked at the impact on the various Ofgem Consumer Archetypes it explicitly excluded from its analysis the Archetypes that are on electric heating.

The scope for gaming Economy 7 in the Price Cap

The second concern that we raised with Ofgem was around the flexibility allowed to suppliers to set relative night and day rates (subject to the weighted average being in line with the cap). This leaves the door open to possible gaming by suppliers. While this approach for Economy 7 is set out in the licence framework which Government put in place, we argued that Ofgem should monitor what suppliers are doing and collect better data on the *actual* balance of day and night usage.

Since the introduction of the EPG there seems to have been a significant widening of the differentials between night and day rates (which at the start of the year appeared to have narrowed according to Glen Dimplex). This is helpful for households with night storage heaters but means that customers on Economy 7 but without storage heaters could now be much worse off than they would be with a standard single rate tariff.

On top of this, in the next section of this report, we present **new evidence which shows how some suppliers appear to be exploiting the flexibility they have on setting day and night rates** – and

[6] And, as described above, the EPG is calculated as a fixed p/kWh discount on the Ofgem tariff cap rate. Hence if customers are over-paying by £100 pa under the Ofgem price cap they will over-pay by £100 pa under the Energy Price Guarantee.

[7] https://www.ofgem.gov.uk/cy/publications/price-cap-changes-wholesale-methodology-distributional-impacts

which also challenges the idea that Ofgem is regulating these prices in any meaningful way. This provides a further reason for Ofgem to include Economy 7 in its Programme of Work.

From a BEIS standpoint, it is also clearly important for them to understand the impacts of the government's EPG on Economy 7 customers and the impact of the flexibility that suppliers have. Building this understanding is also key as BEIS look to evolve the EPG from April 2023. In his recent statement the Chancellor referenced capping the benefits of the EPG so that it did not apply to high usage. While this would make sense generally, customers using Economy 7 for storage heating need to be treated differently as they have higher than average levels of electricity usage (because they are using electricity rather than gas for their heating / hot water). One option could be a larger allowance for Economy 7 users – whether applied to the day-rate, night-rate or both. The key requirement is that BEIS actively consider the implications of any changes for this key group of several million customers, who are largely overlooked.

While not the focus of this paper, there are also some small businesses that historically had storage heating and are on Economy 7 (Profile Class 4) which BEIS should be mindful of in reviewing the Energy Bill Relief scheme and which Ofgem should look to understand better as part of its work on microbusiness customers.

Economy 7 under the Energy Price Guarantee – a hidden lottery

A lack of transparency

It is extremely difficult to find out what suppliers' tariffs are for Economy 7 (and impossible for other multi-rate tariffs). Only EDF publishes a full schedule on their website[8] that summarises the EPG Economy 7 tariffs by region and payment method – and a separate schedule for other multi-rate tariffs. Octopus Energy also provide an overview by region for Economy 7. For other suppliers there is typically a look up tool where you have to enter your postcode or address. In some cases this does not provide the information as either the supplier says it is not taking on new customers or it works out from the address that you are not on an Economy 7 meter and hence won't give a tariff for it. This is also the case with price comparison sites. Clearly for most customers what they want to know is what the Economy 7 tariff is for them and hence the tool is convenient (and EDF's sheets, inevitably being detailed, are not necessarily so helpful). However**, there is real value in terms of market transparency in the summary sheets of the EPG rates. This should be a regulatory requirement.**

More generally there is very little information about Economy 7 tariffs on Ofgem's website. The BEIS website shows the Energy Price Guarantee rates for standard tariffs by region but not for Economy 7. This "blind spot" needs to be addressed.

A lottery by supplier

In the absence of a consolidated dataset, Table 1 below has been pulled together by searching for direct debit Economy 7 tariffs on individual supplier websites for a single address in the Eastern region. In the interests of simplicity, the daily standing charge is not included as suppliers have no flexibility as to how this is set and hence, for a given region, the same standing charge applies across

8 https://www.edfenergy.com/sites/default/files/government_energy_price_guarantee_prices._standard_variable_deemed_and_welcome._credit_meters.pdf

all suppliers. The table highlights the huge variation that exists between suppliers in terms of how they choose to set their relative day and night rates.

Table 1: Summary of supplier Economy 7unit rates in Eastern region under the EPG (direct debit and Oct-Dec 2022 unless otherwise stated)

	Day Rate (p/kWh)	Night rate (p/kWh)
Shell Energy	40.70	19.90
Octopus Energy	44.35	14.89
British Gas	44.38	14.85
E.ON	44.46	14.74
Scottish Power	46.69	11.65
Utilita	46.90	11.34
EDF (from Jan 23)	54.47	7.00
EDF PAYG (from Jan 23)	57.40	0.94

The idea that if you happen to be with EDF in the Eastern region on an Economy 7 PAYG meter you could be paying under 1p/kWh for your night rate seems astonishing – and a real bargain provided you are able to avoid the penal day rates of over 57p/kWh. This tariff would be brilliant for someone with night storage heaters, a hot water tank and extremely limited day time usage. It could be a disaster for someone with gas heating and a more conventional usage pattern[9] who would be £400 pa better off on the standard day rate of 34.1p.

We have not had the information or resource to look systematically across regions, but the huge variation in supplier night-rates in a single region is evidence of a real concern. The idea that with a "regulated tariff" the night rate on direct debit in Eastern region can vary between 7p/kWh and nearly 20p/kWh makes a mockery of the concept – it is not a regulated tariff, rather a lottery depending on which supplier you are with.

The best Economy 7 tariff in terms of the balance of day and night rates will vary by customer - depending on their mix of day and night usage. However, **switching for Economy 7 customers has always been a challenge and in the current market it is nigh on impossible. This makes it all the more important that Ofgem ensures customers are not facing higher prices than they should.**

A lottery by region and payment method

While the analysis above focuses only on the Eastern region, a review of the EDF schedule - summarised below - shows that **there is a huge variation in the relative day-night prices *across* regions.** While concerns have been raised around other elements of the regional variation (eg in standing charges) this variation in Economy 7 rates does not reflect differences in the Ofgem cap level by region (where there are some small variations). Rather, it reflects differences in how EDF has chosen to set its unit rates to comply with the cap. EDF are our focus here because they are the only supplier to be transparent and publish this data – although they do also appear to have some of the more extreme tariff differentials.

Again, we have not shown the standing charge as there is no flexibility for suppliers in how they set this.

[9] Assumed to be 20% night time usage and 3200kWh pa

Table 2: EDF Economy 7 unit prices under the Energy Price Guarantee (p/kWh) from Jan 23

	Direct Debit		Cash/ cheque		PAYG	
	Day rate	Night rate	Day rate	Night rate	Day rate	Night rate
E Midlands	51.92	5.88	57.03	7.13	49.59	7.13
Eastern	54.47	7.00	59.35	8.81	57.39	0.94
London	50.60	14.56	56.64	14.89	52.10	10.44
Midlands	48.48	13.09	53.41	14.73	51.07	7.50
North East	45.49	12.60	49.62	15.11	47.63	7.67
N Scotland	45.98	14.20	48.29	19.34	46.30	11.78
N Wales	51.75	13.81	57.35	14.82	53.93	8.72
North West	46.98	13.71	51.51	15.82	48.8	9.21
South East	54.97	6.79	60.24	8.10	54.28	5.74
S Scotland	46.65	15.51	51.38	17.40	49.33	9.78
S Wales	49.18	12.35	54.09	14.02	51.64	6.93
South West	49.38	11.22	54.16	13.01	53.3	3.80
Southern	48.55	13.76	53.18	15.85	51.13	8.16
Yorkshire	46.08	14.42	51.21	15.69	49.18	8.15

Table 3 below shows the same EDF tariff information but presented as the ratio of night to day rates across the country. If you are in Eastern or E. Midlands, then the night rate is less than 15% of the day rate. If you are in the North of Scotland the night rate is 25-40% of the day rate – depending on your payment method.

Table 3: EDF Ratio of Night to Day rates (as a %) by region and payment method (from Jan 23)

	Direct debit	Cash/cheque	PAYG
E. Midlands	11	13	14
Eastern	13	15	2
London	29	26	20
Midlands	27	28	15
N East	28	30	16
N Scotland	31	40	25
N Wales	27	26	16
North west	29	31	19
South east	12	13	11
S Scotland	33	34	20
S Wales	25	26	13
South west	23	24	7
Southern	28	30	16
Yorkshire	31	31	17

And although the information is harder to extract for other suppliers, a review of a selection of tariffs shows that a number of other suppliers also have a relatively higher night rate in N. Scotland. Only Utilita and Scottish Power seem to be playing with a straight bat and setting their tariffs on a consistent basis across all distribution regions. Among the others the highest that we have found is the E.ON PAYG rate where in N. Scotland the night rate is 60% of the day rate.

The variation by payment methods adds a further element to the lottery. As shown in Table 3 above, for EDF the night-day tariff ratio for PAYG is lower than for other payment methods across all regions (apart from E. Midlands). However the E.ON example above shows this is not the case across all suppliers. It is not clear why there should be a particular variation by payment method, unless again this reflects different levels of penetration of storage heating and hence different consumption splits.

It's suppliers who stand to benefit from this flexibility

So what determines the relative day and night rates? Given that suppliers have flexibility to set their rates it seems likely that they will do so in order to benefit their bottom line, based on what they know about the actual balance of day and night time usage of their customers in a particular region.

There are, in effect, an unlimited number of day-night tariff combinations that comply with the price cap using the Ofgem 42 (night): 58 (day) weighting, as illustrated in Table 4 below. Each of these tariff combinations gives a weighted average rate of 32p/kWh. The Table then also shows how the *actual* average unit price will vary for these tariff combinations depending on the *actual* mix of day and night usage in a particular region.

This actual balance of day and night usage will depend in large part on the prevalence of storage heating which will tend to be much higher in off gas grid areas, for example. It will also vary over the course of the year (ie depending whether or not the storage heating is being used).

Table 4: Illustrative example of the effect of varying relative day and night rates (p/kWh)

Day rate	Night rate	Weighted average unit rate for different proportions of day time usage		
		58% (Ofgem)	70%	45%
51.55	5	32.00	37.59	25.95
47.93	10	32.00	36.55	27.07
44.31	15	32.00	35.52	28.19
40.69	20	32.00	34.48	29.31
37.07	25	32.00	33.45	30.43
33.45	30	32.00	32.41	31.55
32.00	32	32.00	32.00	32.00

Ofgem's 2019 Open Letter on Revising TDCV values[10] included a regional breakdown of the Economy 7 night – day consumption split. This shows that there are significant differences across regions. In particular, in 2019 N. Scotland and S. West had the highest proportion of night time usage at 51% while Eastern was relatively low at 37% (with E. Midlands the lowest at 32%). The letter also sets out how the most prevalent meter type (Economy 7, Economy 10, DTS etc) varies by region.

In a region with a low penetration of night storage heaters the actual balance of usage is likely to be more heavily weighted to day time than the Ofgem assumption. In this case, as shown in the table, suppliers can gain by reducing their night rates and increasing their day rates (while keeping the weighted average in line with the Ofgem formula).

[10] https://www.ofgem.gov.uk/publications/review-typical-domestic-consumption-values-2019

By contrast, in a region with higher-than-average penetration of night storage heaters - and hence a night-day usage balance weighted more to night time, the actual revenue that suppliers earn will be less than the average allowed under the price cap (assuming they keep to having night rates lower than day rates!). However, in this case, as the table shows, the incentives on suppliers are to narrow the gap between night and day rates. The fact that night rates appear relatively higher in N. Scotland is therefore no surprise given that there is a higher penetration of storage heater customers there and hence there is a commercial incentive on suppliers to keep the night rates high.

Of course, there are limits to how far suppliers can push this – and not all suppliers appear to be playing this game to the same extent - but **Ofgem should be alert to the incentives that exist and should monitor what suppliers are doing**.

If suppliers play it straight and use the same day-night tariff ratios across the country then their gains and losses should balance out. However, if they tune the tariff ratio by region, as most seem to do, they have an opportunity to profit overall.

Ofgem also needs to ensure that the 42 (night): 58 (day) weighting that it uses is kept up-to-date[11]. If customers on Economy 7 who do not have storage heaters increasingly move off onto standard single rate tariffs, then the consumption balance of remaining customers will be weighted more to night time usage. This risks leaving suppliers under-compensated (and with increased incentives to exploit the flexibility they have).

A conclusion of the Sustainability First PIAG project (on smart meter data for a public interest purpose[12]) was that Ofgem needs better data on patterns of energy consumption if it is to avoid "flying blind" into the energy transition, faced with suppliers who do have that information. Economy 7 is a prime example of where Ofgem needs better demand side data to monitor the market effectively.

To avoid the risk of gaming by suppliers Ofgem should either require them to use a common day-night tariff ratio across all regions or change the licence requirements to require suppliers to use their own night-day usage weightings for each region (and to be transparent about what these are).

In principle, Ofgem could go further and actually set out what it considers an appropriate night-day tariff ratio to be. However as noted above, there is a flaw in Ofgem's price cap model in that it does not currently take account of the lower wholesale energy cost for Economy 7 customers who use more electricity at night. As a result, using the implied tariffs from this model would lead to a night rate that was too high and a day rate that was too low. If this flaw were addressed then Ofgem could perhaps be more prescriptive.

While customers are confused with significant winners and losers

This variation in rates across suppliers, payment methods and regions has massive implications for customers and whether it is worth their while being on an Economy 7 tariff – and the risk that customers could end up paying significantly more for their energy than they need to.

Moreover, the balance of night-day rates seems to have shifted very significantly over the past year meaning that customers for whom Economy 7 was previously a reasonable option could now be much worse off than if they were on a standard tariff. Conversely customers with storage heaters

[11] Following the 2019 TDCV review referenced above Ofgem decided to keep the 42:58 split based on 2017 data as the change at that point was only small.
[12] https://www.smartenergydatapiag.org.uk/

and high night time usage can have suddenly found themselves much better off on Economy 7 – but with the risk that relative prices could change again.

With very little help or advice available to Economy 7 customers through formal channels customers are turning to self-help groups like the MoneySavingExpert online forum.

Case study evidence on the impacts

In this thread titled "Big changes for E7 as part of EPG" there is discussion of the impacts of the change in relative prices with the introduction of the EPG:

"*Yes, something significant has changed somewhere and I find myself scratching my head again. There are much bigger regional differences than before. In some region PAYG rates are lower than DD…*

It almost seems too good to be true for me. At these rates my October bills will be 20%ish LESS than they would have been at April rates".

In this thread – by contrast - **someone who lives in a flat with direct electric heating is on Economy 7 with EDF and has worked out that with the new rates they would be £500 per year better off if they could move to a standard tariff (as only 17% of their usage is at night).** They want to know if this is possible.

Someone else notes that the new rate works for them as they have storage heaters and a hot water tank and use around 80% of their electricity at night. And the discussion continues:

"That new E7 night rate is an absolute steal for anyone with storage heaters.".

"Are you in the South East region? Wow indeed, why do the SE get such cheap E7 off-peak DD rates, I wish that was the case for the SW."

These are relatively savvy users. However, most customers on an Economy 7 or similar tariff have a fairly poor understanding of how their tariff works as reflected in the Citizens Advice "False Economy" report (Sept 2018) on legacy time of use tariffs (which built on their earlier report "From Devotees to Disengaged" (2012)). This found that the primary issues faced by Legacy Time of Use (LToU) customers were inadequate information provision and difficulty in switching suppliers**. In a survey of 500 LToU customers, around a quarter were unsure of the hours when the cheaper off-peak rates were available. Given the very significant differences between day and night rates currently for some suppliers this is a real concern.**

The report recommends that energy suppliers regularly inform their customers about the hours for which the peak and off-peak rates apply, and what these rates are. They should also provide guidance on how a ToU tariff may or may not fit the customer's lifestyle.

While suppliers may not have full visibility of the current heating system used, they can tell quite a lot from patterns of usage and they have a responsibility under Ofgem's treating customers fairly requirements (SLC 0 and also eg under Licence Condition 31F) to ensure that customers can make informed tariff and consumption choices. **Ofgem should proactively monitor and enforce these requirements.**

Ofgem should also make it clear that customers can move freely between Economy 7 and standard rates, for example if the Economy 7 rates are not appropriate for their pattern of usage – and they should still be covered by the Default Tariff Cap. It is also important that customers can move freely onto Economy 7 if they install new storage heating, for example.

While there is a clear responsibility here for suppliers there is also a role for consumer organisations who have traditionally advised customers on the benefits of switching supplier and can help ensure that customers are on an appropriate tariff for their needs (and that they understand when these tariffs apply). **Helping these consumer organisations understand how dramatically Economy 7 tariffs can vary is a reason why the transparency, which is currently lacking, is so important.**

Why Economy 7 matters for the future

With the imperative to de-carbonise heat and the growing emphasis on system flexibility, smart storage heaters and hot water could and should form a part of the landscape going forward. It is also critical to ensuring "no-one is left behind" in the transition to net zero, given the demographics of those with storage heaters today.

Getting things right for today's storage heating consumers is essential to protect some of the most vulnerable in society, who already face some of the highest charges for their energy and are often least able to participate in the market. But getting things right for storage heater customers is also vital in paving the way for an alternative form of electric heating that helps fill an important, and not insignificant, space in the heat-de-carbonisation landscape.

During the recent Public Accounts Committee (PAC) Inquiry into the Regulation of Energy Suppliers[13], the PAC asked Ofgem how they will encourage customers to use energy when costs are low. In its evidence to the Inquiry Ofgem said that it may need to consider how the price cap is structured in the light of net zero, for example to encourage EV customers to charge their vehicles when the wind is blowing and demand is low.

But for storage heaters this is already a 'here-and-now' matter and Ofgem should look at this question now in the context of electric storage heating and learn the lessons for its oversight of the future market.

In September 2018, Citizens Advice concluded in their report on legacy time of use tariffs that if the long-standing problems of these tariffs were not fixed at that point, then new time of use customers would experience the same frustrations in the future, stating that 'suppliers and regulators need to act now'. 18-months on, research for the Electric Heat Pathway report referenced above found that this remained a 'critical gap' in terms of policy and regulatory consideration. Reviewing progress for this latest report it is clear that still nothing has changed.

One of the other messages from the Electric Heat Pathway report is that smart storage heating has a valuable role to play in heat decarbonisation in small, well insulated properties where either space limitations preclude the installation of a heat pump or the up-front costs mean that it is not cost justified where the heat load is very limited. The recent BEIS consultation on Delivering a Smart and Secure Electricity System identified storage heaters as one of the electric heating appliances with the greatest flexibility potential which should therefore be covered by the proposed "smart mandate".

However, the Electric Heat Pathway report cautioned that direct-acting electric heaters are increasingly being installed in place of storage heating because these are cheaper for landlords - albeit not usually for tenants in terms of running costs. Even for owner occupiers, the lower up-front costs of direct electric heating can be tempting unless there are clear benefits from storage

[13] https://committees.parliament.uk/committee/127/public-accounts-committee/news/174285/pac-ofgem-failures-come-at-considerable-cost-to-energy-billpayers/

heating in terms of lower running costs. **It is vital that customers are properly rewarded for their use of electricity at times when demand on the system is lower or when wholesale prices may be lower due to excess output (e.g. wind at night) – and for the flexibility that they can provide to the system.**

In terms of the price cap, it is also important that there is a level of stability around the night-day tariff differentials so that customers can be confident if they are looking to invest in night storage heaters. There are also wider policy actions that need to be taken around building standards and EPC recommendations to make much clearer the benefits that storage heating has over direct-acting electric heating.

There is much policy focus on how to reward EV drivers for being flexible and charging their vehicles overnight. **The same opportunity is there with smart electric storage heating for those who would benefit most from and are least able to access other means of decarbonised heating**. **It deserves far more focus as part of a clear commitment to "no one left behind".**

Conclusion and summary of asks

As highlighted in previous work by Citizens Advice, Sustainability First and Grid Edge Policy, customers on Economy 7 and similar tariffs have long been over-looked by policy makers, despite often being lower income and at greater risk of fuel poverty. While even basic statistics around numbers of customers on Economy 7 tariffs are not routinely published by Ofgem or BEIS, the most recent figures show 3.5 million customers with multi-rate meters including 1.4 million with electric storage heating. At around 10% of customers this is not a "niche" issue that can be ignored.

While other customers now have some predictability through the Energy Price Guarantee, this is not so for Economy 7 customers. As a result, they face a lottery in terms of the prices they pay depending who their supplier is, their payment method and where they are in the country – and the potential for relative prices to shift significantly over time. As discussed, this is a result of the flexibility that exists in the price cap for suppliers to set the day-night tariff ratio as they wish (subject to the weighted average meeting the price cap).

There has always been an issue with customers on Economy 7 getting poor information about their tariffs and when the different rates apply. Given current very high prices and given the very significant differences between day and night rates in some cases, this is more important than ever.

Based on this updated analysis our specific asks are that:

- In its programme of work for the Price Cap, Ofgem should include a review of the Economy 7 arrangements as a priority element. In particular this should include
    - ensuring that the lower cost of wholesale energy at night is properly taken into account in setting the level of the cap;
    - monitoring how suppliers are exploiting the flexibility that exists in the price cap around relative day-night rates and look at how to ensure customers are not disadvantaged by it;
    - ensuring that where wider changes are being made to the price cap that the impacts on Economy 7 customers are explicitly considered; and
    - clarifying that customers can switch freely between Economy 7 and standard rates and still be protected by the price cap.

- BEIS should ensure that it understands how suppliers can exploit the flexibility under the Energy Price Guarantee and the implications for Economy 7 customers of any future changes to the EPG;
- To provide greater transparency around Economy 7 and other multi-rate tariffs, Ofgem should require all suppliers to publish schedules like EDF's. BEIS and Ofgem should also collate this data and generally should both look to provide more information for customers on Economy 7.
- Advice agencies should use this improved published information to help support customers on Economy 7 tariffs recognising the very significant impacts that being on an inappropriate tariff can have.
- Suppliers should take additional steps to ensure that multi-rate customers are aware of the times when different rates apply and that the tariff remains suitable for the customer's needs – in particular if they change the relative day and night rates.
- Ofgem should monitor supplier compliance with their obligations on information provision and ensuring that Economy 7 tariffs are suitable for a customer's needs (eg SLC 31F) and more generally on treating customers fairly (SLC 0).
- Ofgem and BEIS should look at the wider lessons to be learned from Economy 7 for the development of time of use tariffs more generally, including to encourage over-night charging of EVs.

In essence our overall message is simple - Ofgem and BEIS should give this neglected group of several million customers the focus they deserve.

Annex: Economy 7 customers over-paying in the price cap

The wholesale costs in the price cap do not take account of the fact that for Economy 7 customers with storage heaters, much more of their demand will be at night time when wholesale electricity prices are lower

The current position

Ofgem publishes detailed spreadsheets showing the build-up of the figures that go into setting the price cap and the breakdown of the various cost components (eg including assumptions about different lengths of hedging contracts).

In the latest price cap calculations[14] (published November 2022 and coming into effect from 1 Jan 23) the Annex 2: Wholesale Costs workbook shows the assumed £/MWh at transmission level for single rate and multi-rate meters as:

	Q4 22	Q1 23
Single rate	281.57	331.05
Multi-rate	279.04	344.63

These figures are then adjusted for shaping and other factors and different loss rate factors applied by region.

What is striking from this is that for Q1 23 the energy costs are actually higher for multi-rate tariffs which would seem to be a result of transitioning to quarterly updates and the different seasonal profile for multi-rate. In the various consultations that took place ahead of Ofgem's decision to change the wholesale methodology no reference was made to the differential impacts on Profile Class 2 customers although Table A.1.1 in the Appendix to the Final Decision shows the higher uplift that will be applied to Profile Class 2 (multi-rate) customers.

Thus, while multi-rate customers are facing higher costs as a result of their different seasonal usage pattern, **no account is taken of the higher night time usage which should lead to lower costs for multi-rate.**

Specifically, the wholesale costs worksheet has a tab for demand which has a slightly different summer – winter split for profile classes 1 and 2 but the peak – baseload split that is given (30-70) is not broken out between profile classes.

The separate losses and demand worksheet has a tab that shows the time of use split that is used in other spreadsheets. It includes time of use factors for TNUOS (eg share of demand 4-7pm is 18.3% for single rate v 13.4% for dual rate) and DUOS but nothing relating to wholesale energy costs.

It is clear from the above that the price cap for Economy 7 customers is being set on the basis of effectively the same wholesale energy costs as for standard tariff customers and they are getting no credit for their higher night time usage when costs are lower.

A relatively simple adjustment would be to have a different peak-baseload split for Economy 7 but ultimately Ofgem need to look in more depth at the wholesale costs in the day / night periods used

[14] https://www.ofgem.gov.uk/publications/default-tariff-cap-level-1-january-2023-31-march-2023

for Economy 7[15]. One way or another the very different demand profile for Economy 7 should be reflected in a different wholesale unit rate.

Historical perspective

Looking back at the original 2018 methodology decision for the price cap[16], at that point that the overall unit rate coming out for Economy 7 customers was lower than for single rate meters (16.2p v 17.4p for standard credit).

At that point Ofgem said: "Note that on a per unit basis, Economy 7 customers pay less than single rate electricity customers. However, Economy 7 customers consume more energy than single rate electricity customers. This means that we state a higher Economy 7 bill at their typical consumption than we do for single rate electricity customers (stated at their lower typical consumption level)."

This relatively small differential can be explained by the time of use adjustments made on network charges and possibly some other charges that were effectively fixed (but not included in the standing charge and hence were lower when spread over the higher average usage for Economy 7 customer).

The model used was based on that adopted by the CMA and it is clear that various simplifying assumptions were made. In particular the Default Tariff Cap: Decision Appendix 4: Wholesale Costs[17] states

Para 2.10 "We use a 70/30 split between baseload and peakload forward electricity contracts in the model used to calculate the energy costs through forward contracts and to update wholesale costs" [ie as noted above the same split is used for single rate and multi rate]

para 2.21 says in relation to shaping costs "For electricity, we base our analysis of the shape of demand on profile class one only (single rate customer, not multi-register customers). As most domestic consumers fall into this category, we consider this is appropriate."

How the world has changed

While there might have been a case for making simplifying assumptions around wholesale costs at the time the price cap was introduced, the world has changed significantly since then. First the level of wholesale electricity costs has risen massively (six-fold in the price cap in the last 3 years) and is what is now driving the rocketing prices. Properly modelling these costs for Economy 7 customers is therefore now vital. Moreover, with increasing use of renewable energy there is much more low marginal cost power on the system and hence when you use energy is becoming as important as how much you use. To not reflect this in the price cap for Economy 7 is unjustifiable.

Given these customers are separately settled (with a separate time of use profile - profile class 2) the actual cost that suppliers face for these customers will reflect their different time of use profile and the price cap should take that on board as well.

[15] This is likely to involve looking at how the EFA (Electricity Forward Agreement) blocks play into supplier procurement in the wholesale markets. These are 4 hour blocks that are the basis of the wholesale market.
[16] https://www.ofgem.gov.uk/publications/default-tariff-cap-decision-overview
[17] https://www.ofgem.gov.uk/publications/default-tariff-cap-decision-overview

How material is this error? – a rough estimate is that Economy 7 customers are currently over-paying by around £100 pa

Properly understanding how material this impact is would require proprietary information on contract prices which Ofgem has access to but is not publicly available. Further work is needed by Ofgem to confirm the scale of this effect but the analysis below looks to provide a ballpark figure to aid prioritisation.

There is limited readily accessible public information on wholesale energy prices by time period but the Octopus Agile tariff description (version of 29/11/22) says that while the wholesale price varies, "..before the energy crisis, it was around 5p/kWh overnight and 9p/kWh at peak, in the current market conditions it is around 22p/kWh overnight and 36p/kWh at peak."

In terms of understanding how the profile of usage varies over the day for Profile Class 1 and Profile Class 2 customers we have used the consumption profile spreadsheet that is provided as an annex to the 2020 TDCV letter[18] (which is effectively the source for the 42 (night) -58 (day) split in the licence).

The spreadsheet profiles are hard to interpret and don't seem to add to 100%. However, looking at the night time share of usage (in settlement periods 1-14) weighted by 5 for weekdays and 2 for weekends gives roughly:

20% of usage at night time for Profile Class 1

40% of usage at night time for Profile Class 2.

These figures seem plausible (eg aligning broadly with the 42 (night) ; 58 (day)split used by Ofgem for Economy 7) and hence are used below.

Applying these splits to the Octopus quoted peak / night wholesale costs gives an average wholesale unit cost of:

33.2p for Profile Class 1

30.4p for Profile Class 2

Looking at the relative differential, we would expect to see Profile Class 2 customers enjoying a 10% lower unit wholesale cost than Profile Class 1.

At current rates this benefit of around 3p/kWh – which is not captured in the current model - would equate to £126 pa for an Economy 7 TDCV of 4200kWh.

On a conservative basis, therefore, it would appear that Economy 7 customers are being overcharged in the price cap by around £100 pa

On this basis, failing to take account of Economy 7 customers' higher night time usage will have been a source of significant detriment to them – in particular in this difficult period - and merits prioritisation by Ofgem given, in particular, that these customers will often be lower income.

[18] https://www.ofgem.gov.uk/publications/decision-typical-domestic-consumption-values-2020