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Flexibility and Net Zero (FANZ) Statistical Report: Electricity consumption during peak periods

Data Research Unit
November 2026

Report structure

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2. Diurnal (half-hourly) consumption profiles and daily peak-time electricity consumption
3. Annual (monthly) electricity consumption profiles
4. Weekly electricity consumption profiles
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About this research

About this report and the Flexibility and Net Zero survey

Ofgem's Flexibility and Net Zero (FANZ) tracker survey is designed to measure and monitor domestic energy consumers' engagement with flexibility and low carbon products and services in Great Britain.

For the first time in Ofgem, survey responses were linked to historical half-hourly consumption data for a subsample of participants with smart meters. This publication reports on analysis of this subsample's electricity consumption from the first wave of the survey, conducted in June 2025. The findings of this report contribute to the evidence base relating to consumer-led flexibility and will help inform future policy and regulation.

What this report covers

The report uses FANZ survey data linked to electricity data from smart meters to provide descriptive analysis of various sub-groups of GB households to investigate electricity consumption:

By sub-groups of the population:

- Households with various technologies, particularly low carbon technologies (LCTs)
- Consumers with indicators of potential vulnerability

With consideration to three frames of peak:

- Daily peak hours (4-7pm)
- Seasonal peak (during cold/winter months)
- Weekly peak (weekdays v weekends)

Note: *The Technical Annex provides detailed information regarding the data, approach and methods utilised for the analysis presented in this report.*

Summary of key findings

1. Households with indicators of vulnerability have daily electricity consumption that does not differ substantially from the baseline average, while their load profiles also exhibit a broadly similar shape to the sample baseline (all households without low carbon technologies in their home).

2. Households with Low Carbon Technologies (LCTs) exhibit substantialy higher consumption during overnight off-peak times than the average household for off-peak periods. For both electric vehicle (EV) and Heat Pump (HP) users, this is accompanied by higher consumption during peak hours.

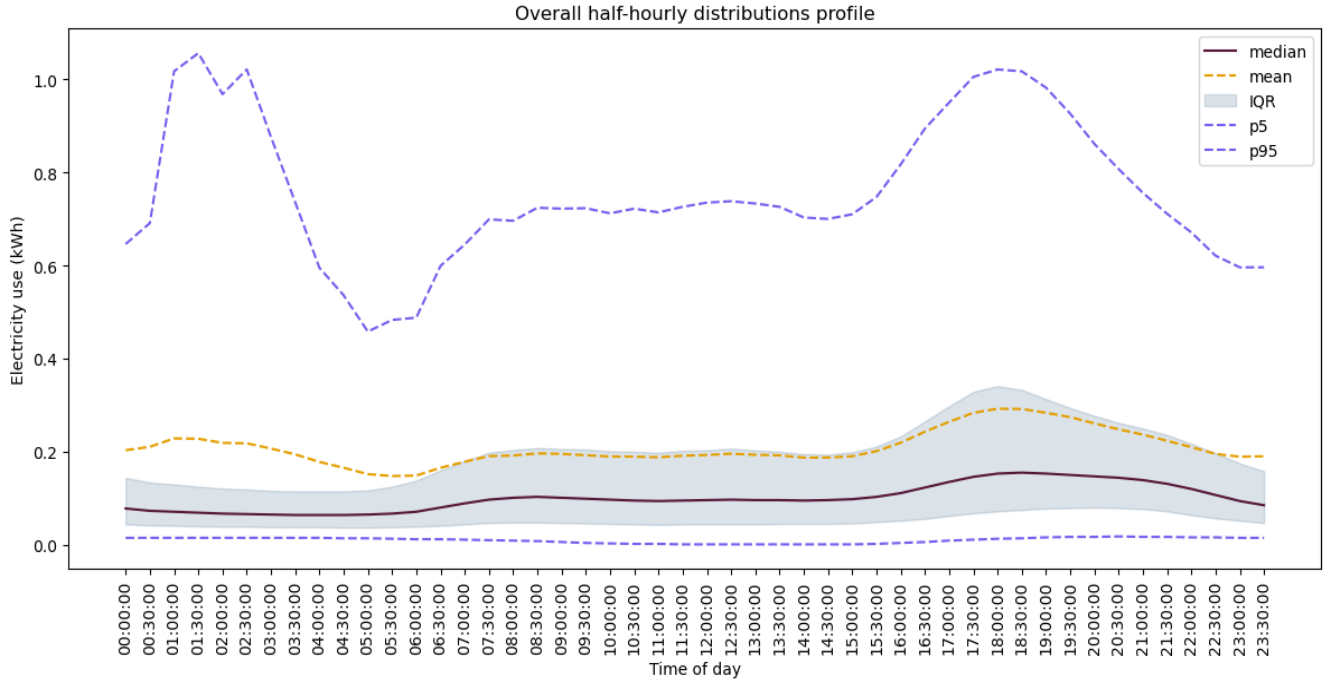
3. As expected, households with heat pumps show the most pronounced uplift in electricity usage in winter.

4. The profile of electricity consumption across the week for households with low carbon technologies as well as vulnerable groups is broadly similar to the sample baseline, with slightly higher consumption at weekends for all groups.

Diurnal (half-hourly) consumption profiles: How electricity consumption varies across the day

The mean daily consumption profile across the whole sample shows a conventional consumption pattern

Electricity consumption is highest during peak hours (4-7pm is used for this report) for most households, with a pronounced early morning peak for the 95th percentile indicating that these households are likely to be low carbon technology users.



IQR: Interquartile range, between 25th and 75th percentiles
P5: 5th percentile
P95: 95th percentile

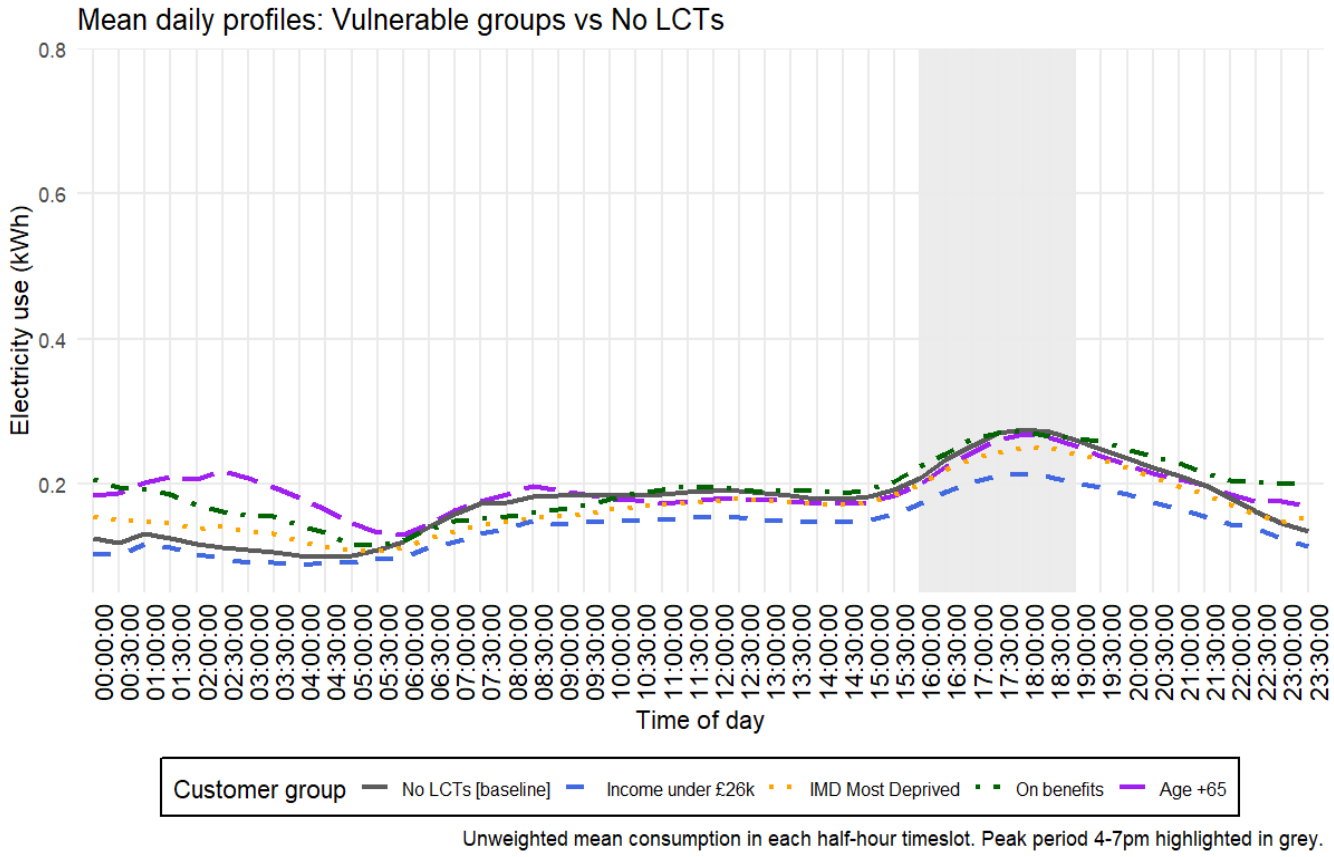
Across the whole sample, the mean daily electricity consumption profile shows a conventional pattern, with electricity consumption highest during the peak hours of 4-7pm.

Mean consumption is consistently higher than median for the full sample and subgroups. This is commonly the case in residential electricity data and indicates a right-skewed distribution.

This is consistent with very high consumption readings for the 95th percentile (P95) of users, many of whom are likely to have low carbon technologies such as electric vehicles and heat pumps. Only the 5th percentile (P5, low consumption) show an almost flat profile throughout the day.

Consumption profiles across vulnerable groups retain a typical profile shape with larger shares of consumption during peak hours

The conventional daily consumption profile shape is represented here by the baseline 'No LCTs' group. In general, it is observed that the potentially vulnerable groups represented on this chart have broadly similar consumption profiles to the baseline.



The '**No LCT' baseline** subgroup show a conventional daily load profile. Their electricity consumption is typically low overnight, rising to a morning peak before 9am. It then stabilises in the afternoon, rising again to its peak in the early evening (4pm-7pm), before tapering off again at night.

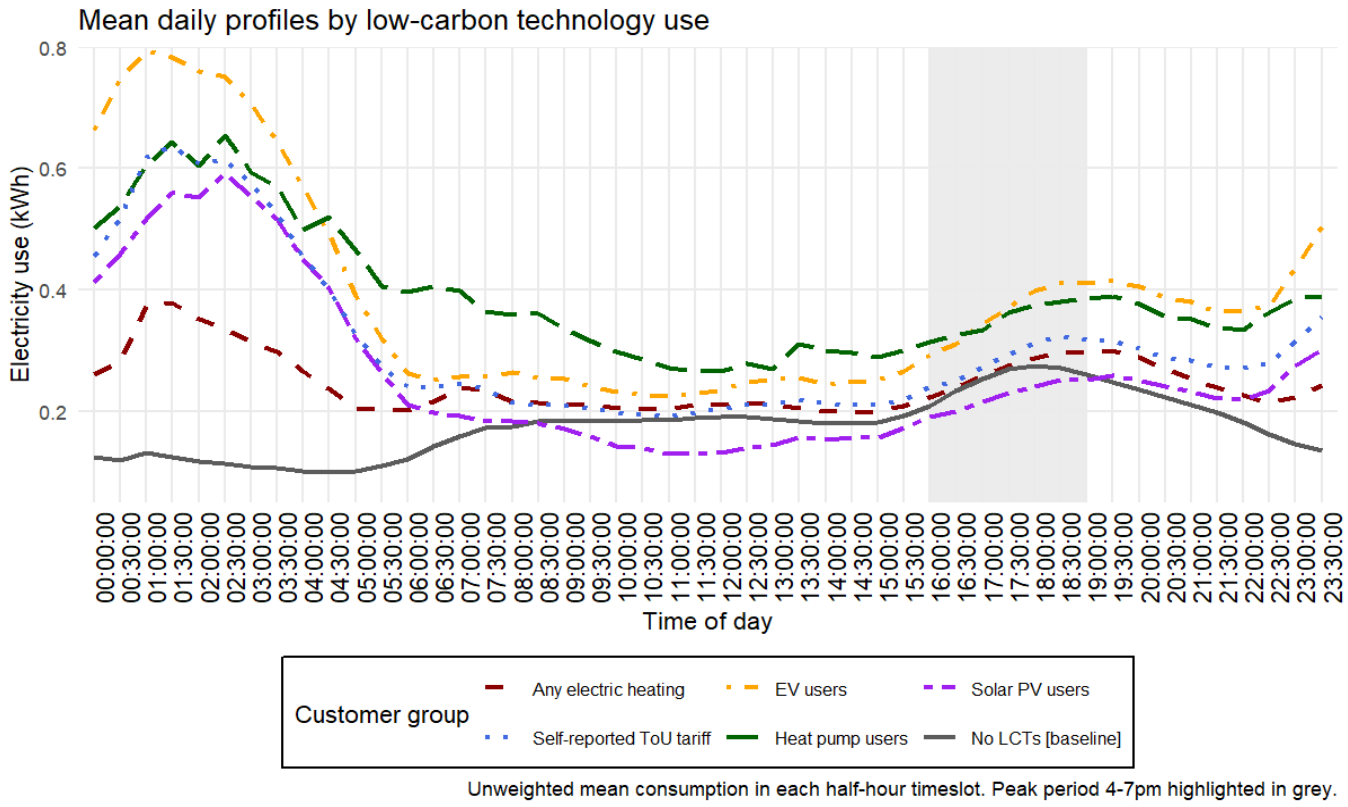
The vulnerable groups in this analysis exhibit a broadly similar daily consumption pattern to the baseline load profile, with some marginal differences:

- Consumers on low incomes use less electricity overall throughout the day compared to the 'No LCT' baseline.
- Households receiving benefits and aged 65+ have slightly higher consumption in overnight off-peak hours.

Note: For the rest of this report, the 'No LCT' subgroup will also be referred to as the baseline group.

Consumption profiles across groups of LCTs owners exhibit significantly different behaviours relative to the typical shape

All low carbon technology (LCT) user groups exhibit significantly higher consumption during the overnight off-peak periods compared to the baseline. With the exception of Solar PV users, this is accompanied by higher consumption at peak.



Unweighted mean consumption in each half-hour timeslot. Peak period 4-7pm highlighted in grey.

While all LCT user profiles share a distinctive overnight peak (indicating use of multiple LCTs for many households), each also exhibits some specific features:

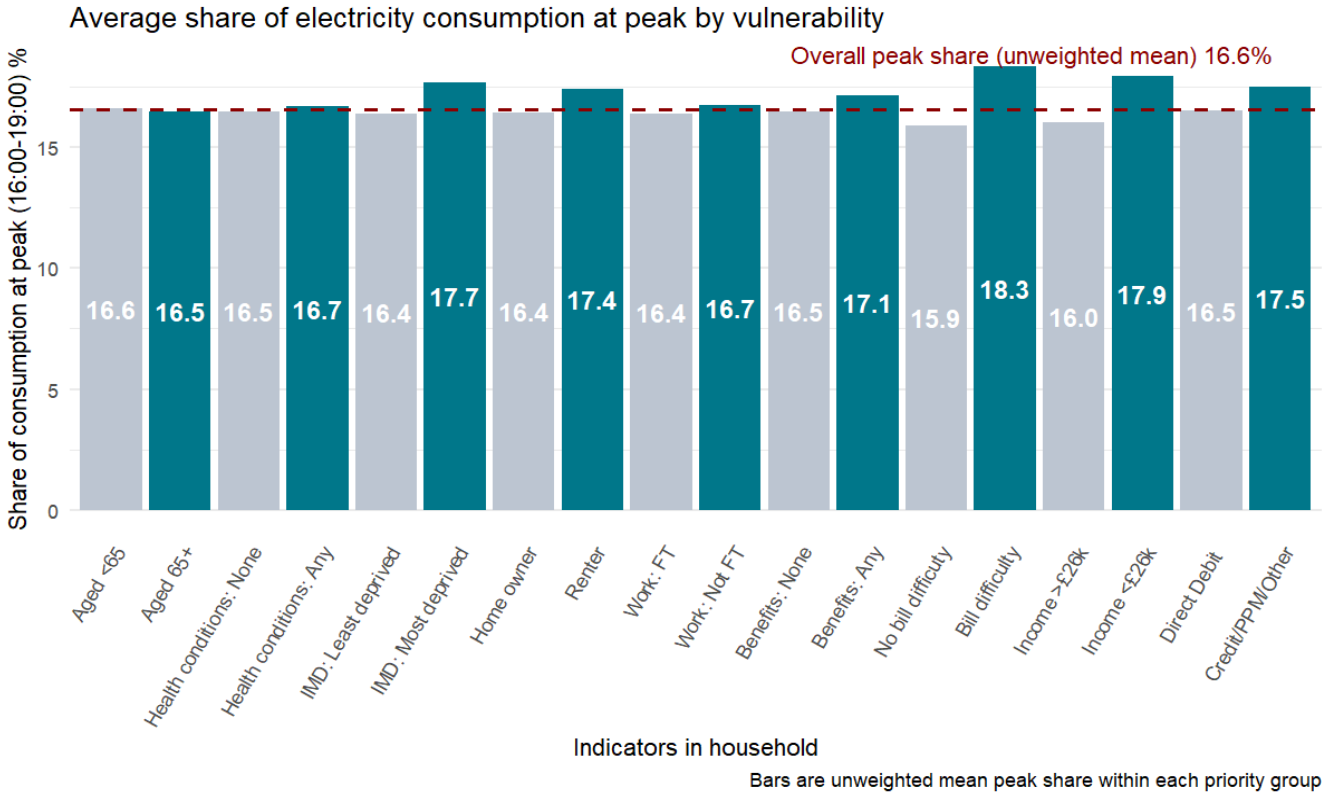
- Households with solar panels show a familiar 'duck curve', with low electricity import (grid consumption) occurring during daylight hours, a modest evening peak after 7pm, and relatively high consumption overnight.
- Households with all other LCTs have higher consumption throughout the day.
- The load profiles of those with electric vehicles (EV) have the highest consumption overnight indicating off-peak charging.

Note that some households will own more than one LCT which will be reflected in their daily profile. Sample sizes are low for some LCTs – see technical annex.

Daily peak-time electricity consumption

Peak consumption as a share of daily total: Peak share % is similar across vulnerability groups, and slightly higher than the average for some groups

Peak share is slightly higher for consumers in typically vulnerable groups, particularly those with bill difficulties and those with household incomes below £26k.



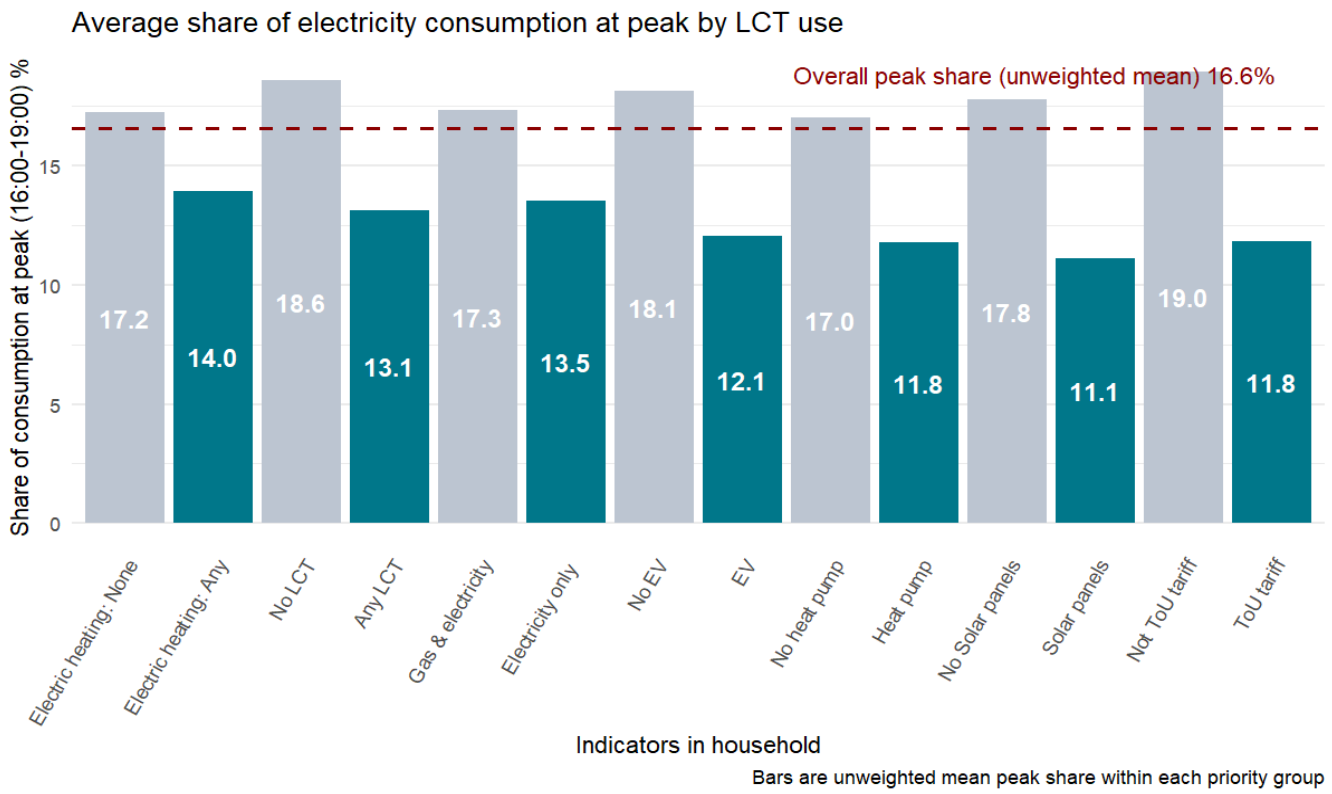
On average, households in this analysis use 16.6% of their daily electricity consumption during peak hours (4-7pm).

Peak consumption as a share of daily total is highest for consumers in bill difficulty and for those on incomes below £26k, with shares sitting at 18.3% and 17.9%, respectively. Households in the most deprived areas according to the Index of Multiple Deprivation (IMD) also have a slightly higher than average peak share (17.7%), as do those who don't pay by direct debit (17.5%) and Renters (17.4%).

The peak share of other vulnerable groups is very similar to the baseline.

Peak consumption as a share of daily total: Consumers with LCTs typically have lower peak share than those without

In general, LCT ownership appears to be a very good predictor of lower shares of peak consumption.



On average, households in this analysis use 16.6% of their daily electricity consumption during peak hours (4-7pm).

Across households with LCTs, peak consumption as a share (%) of the daily total is consistently lower than the average, with an overall peak share of 13.1% for all LCT users.

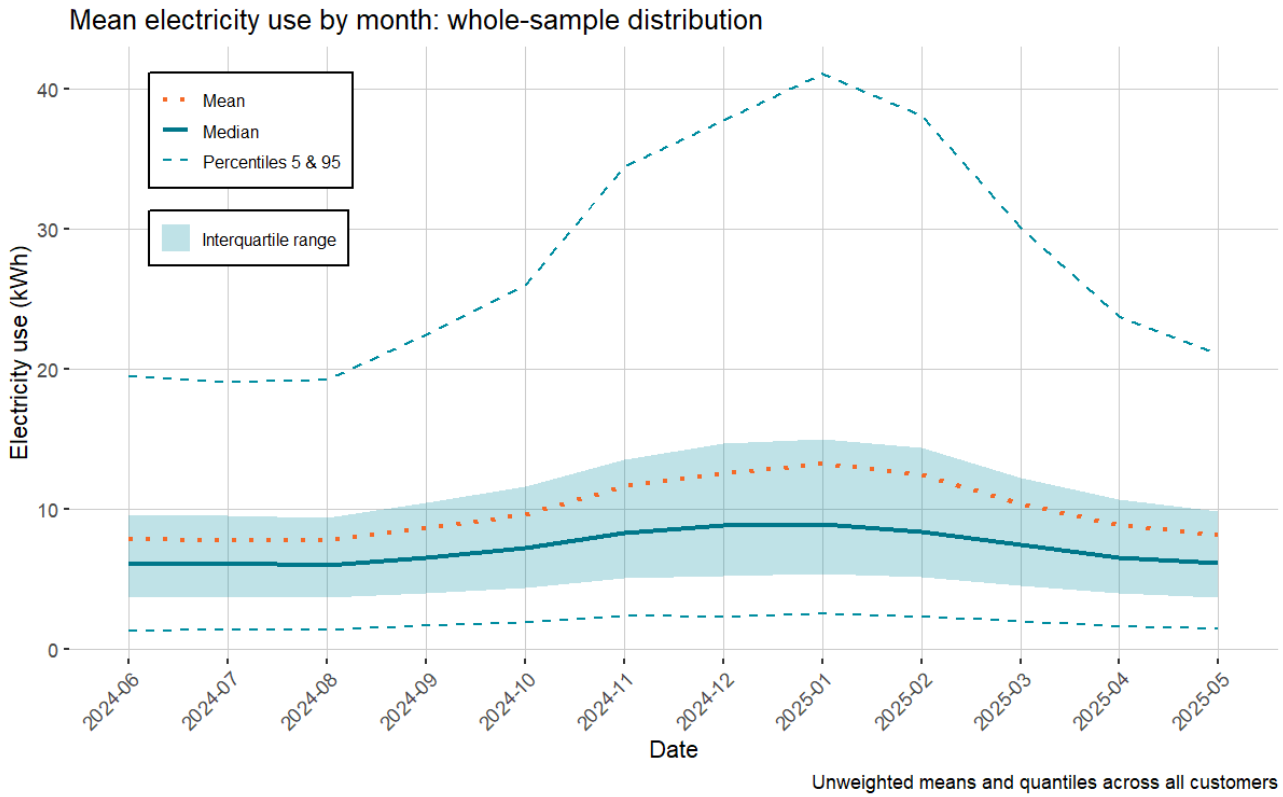
Note that despite the lower peak share, LCT users have substantially higher total daily consumption of 14.5 kWh, compared to a whole sample average of 9.9 kWh.

Solar PV users have the lowest peak share, sitting at 11.1%, with heat pump users having a peak share of 11.8%.

Annual and seasonal consumption profiles: How electricity consumption varies across the year

Across the whole sample, annual electricity consumption shows a conventional seasonal pattern

Electricity consumption peaks in winter, with more pronounced seasonal patterns among the highest consuming customers.



Interquartile range: 25th to 75th percentiles

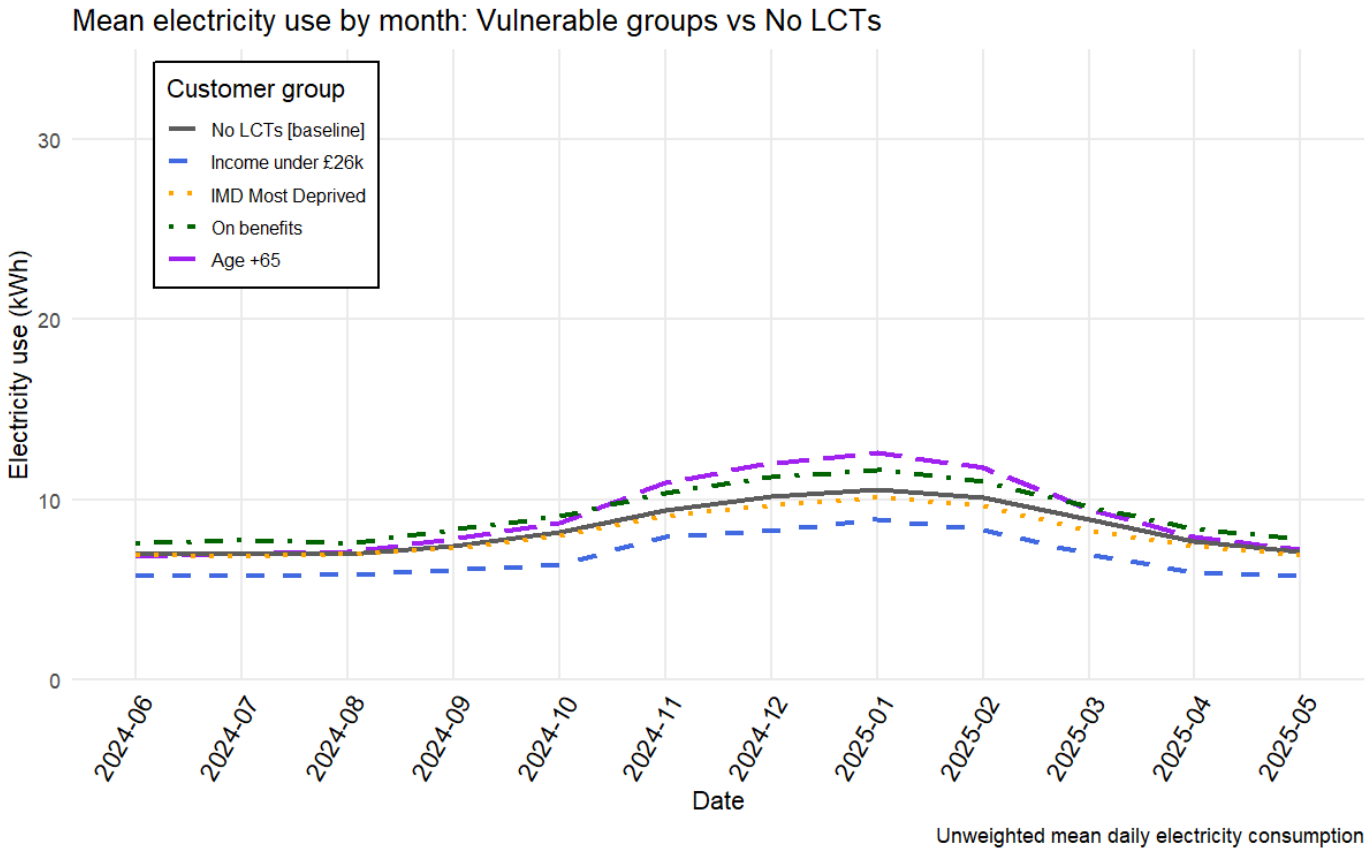
Electricity consumption is highest in winter, with both mean and quantiles peaking in January 2025: unweighted mean daily use is 13.2kWh, with the 75th percentile consuming 15.0kWh and the 95th percentile 41.0kWh for January.

Mean consumption is consistently higher than median for the full sample and subgroups. This is commonly the case in residential electricity data and indicates a right-skewed distribution.

This is consistent with very high consumption readings for the 95th percentile of users, many of whom are likely to have low carbon technologies such as heat pumps and electric vehicles.

Annual consumption profiles across typically vulnerable groups follow similar patterns to the baseline.

A typical consumption profile is represented by the baseline ‘No LCTs’ group. Households receiving benefits and households with members aged 65+ have higher consumption throughout the year, while low-income households have the lowest consumption.

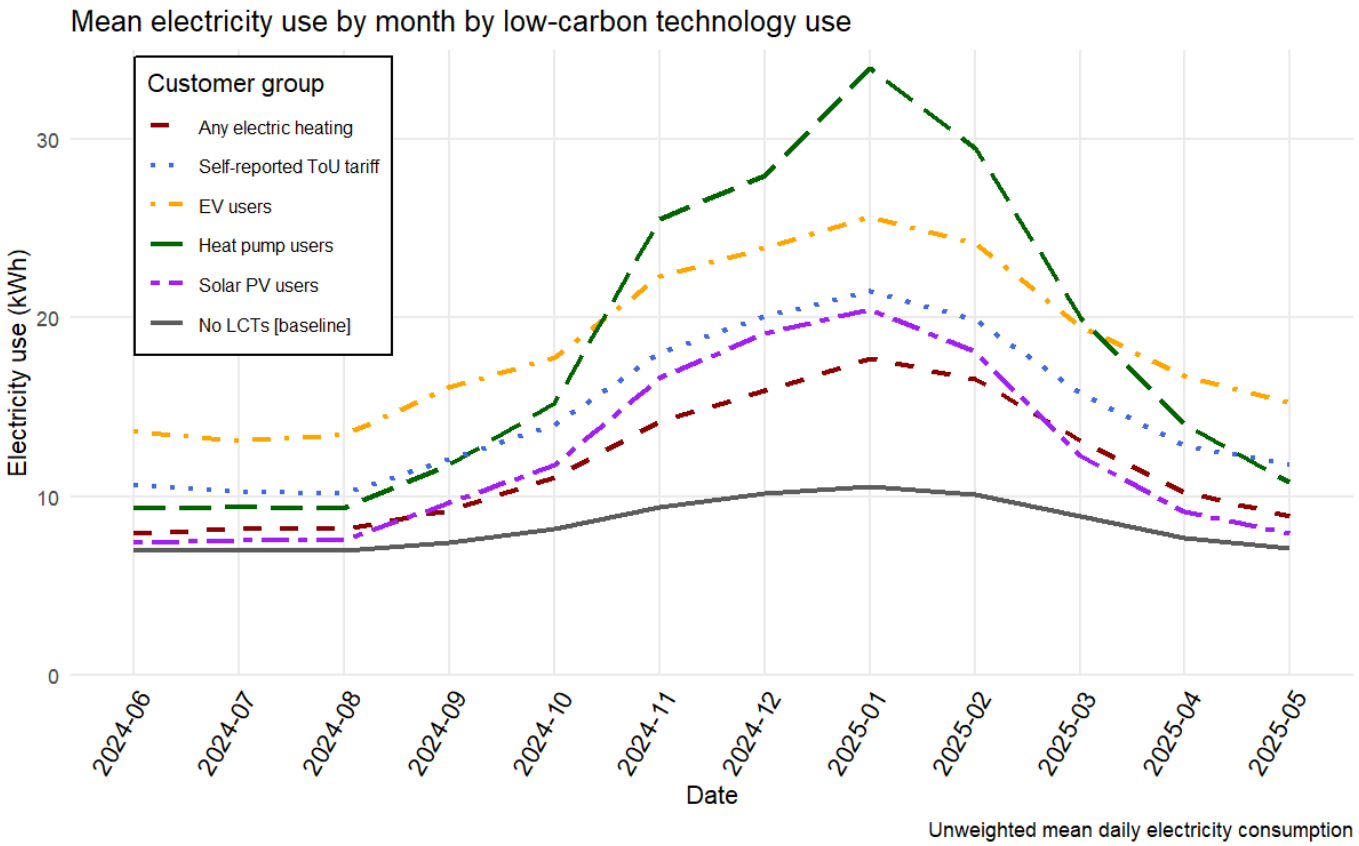


All the groups with indicators of potential vulnerability show similar seasonal patterns of consumption displaying higher consumption in colder winter months, with consumers aged 65+ having a slightly more pronounced winter peak.

Households receiving benefits and those aged 65+ have the highest mean consumption throughout the year while low-income households (< £26k) have the lowest average consumption.

Consumption across LCT owner groups exhibit significantly different behaviours compared to the average household

Typical consumption profile is represented by the ‘No LCTs’ baseline group. There is a strong winter peak exhibited by households with heat pumps.



Heat pump users exhibit a strong and sustained winter uplift, peaking in January 2025 with consumption 86.0% higher than the annual mean figure and 263.7% higher than lowest use in June 2024.

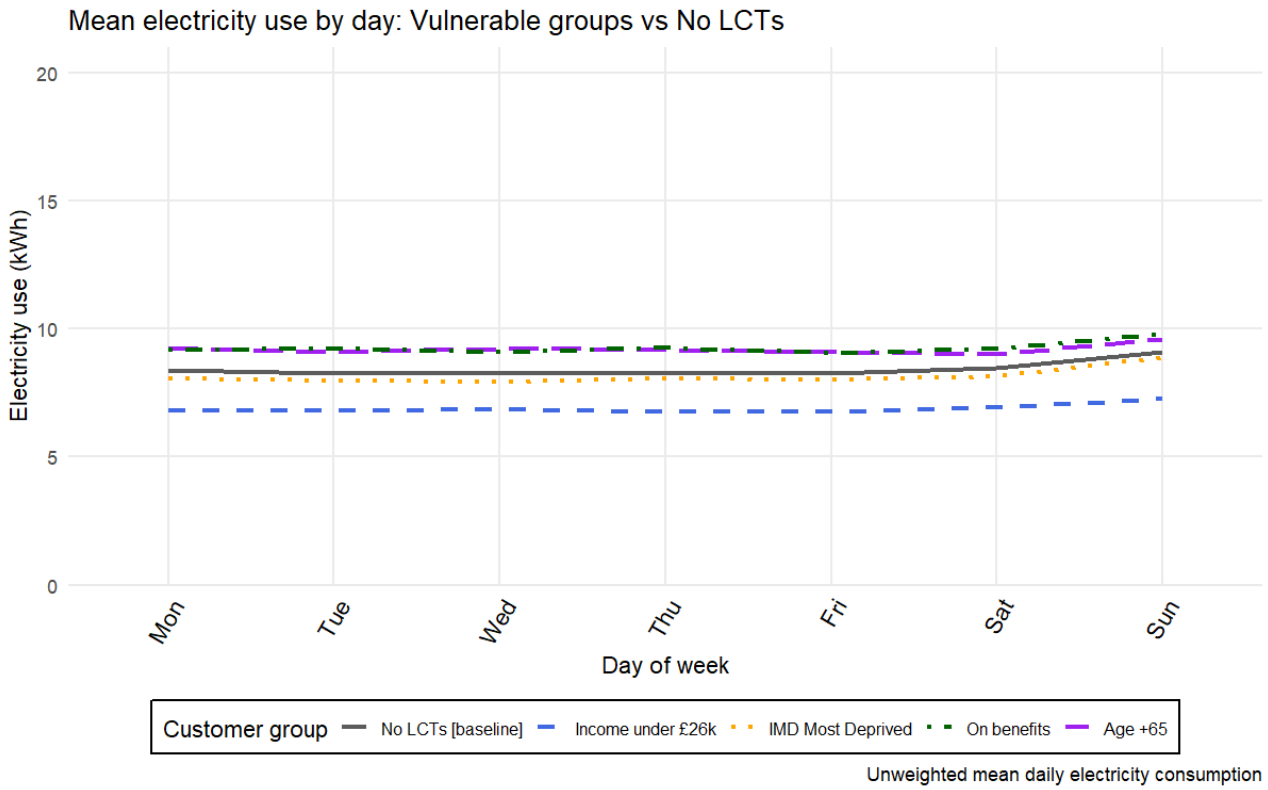
By contrast, the 'baseline' group with no LCT usage only uses 26.1% more electricity than its annual mean during the peak month (January 2025), and the combined sample of all LCT users also peaks in January 2025 at 44.9% above its annual mean.

Note that most baseline households will use gas central heating.

Weekly consumption profiles: How electricity consumption varies across the week

Households with indicators of vulnerability show a similar pattern of use to the average across the week and weekend

Households on low income and in IMD Most Deprived groups use less electricity than the average throughout the week



Across the whole sample used for this report, consumers used an average (unweighted mean) of 9.8 kWh of electricity per day on **weekdays** and 10.3 kWh per day on **weekends**. Sunday is typically the highest-consumption day of the week.

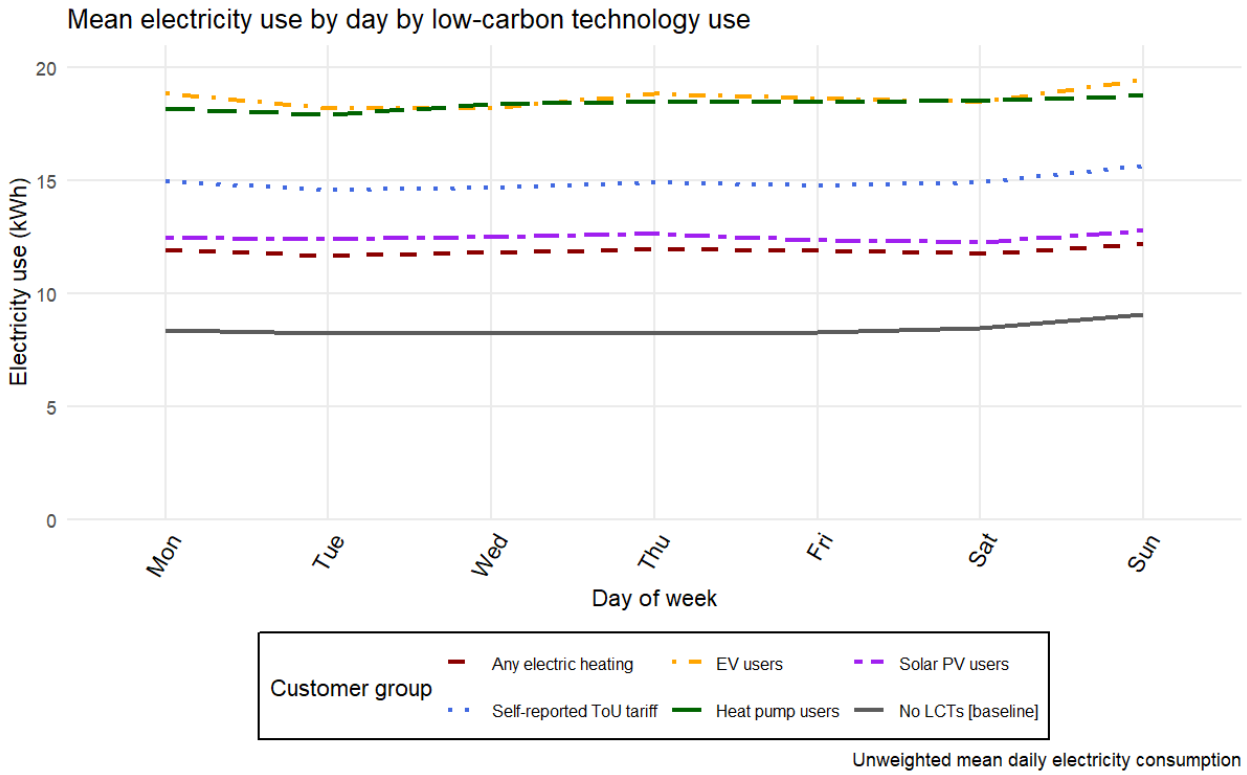
Consumption for low income (<£26k) households is the lowest across the week at 6.8 kWh per day on weekdays and 7.1 kWh per day on weekends.

This is followed by those living in the most deprived areas according to the Index of Multiple Deprivation (IMD), with daily weekday and weekend consumption of 8.0 kWh and 8.5 kWh, respectively.

Households claiming benefits and those aged 65+ have slightly higher consumption than the 'No LCT' baseline but still lower than the whole-sample average.

Regarding technologies, LCT use is associated with higher and more even consumption across weekdays and weekends

As seen in daily and annual profiles, LCT users have substantially higher consumption than the baseline group but with a slightly lower increase in consumption at weekends than non-users.



Across the whole sample used for this report, consumers used an average (unweighted mean) of 9.8 kWh of electricity per day on **weekdays** and 10.3 kWh per day on **weekends**. Sunday is typically the highest-consumption day of the week.

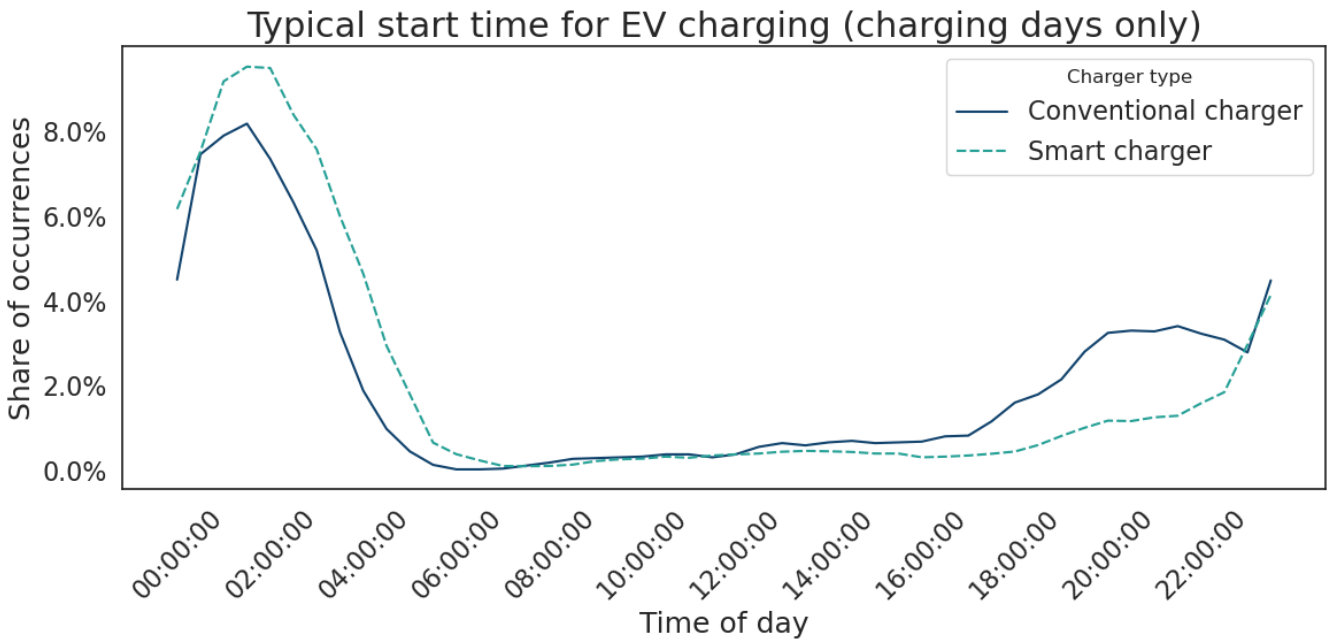
As seen in the monthly charts LCT use is associated with substantially higher electricity consumption than the no-LCT baseline, from a weekday/weekend mean of 11.9/12.0 kWh per day among households with some form of electric heating to 18.2/18.6 kWh per day for heat pump users.

However, although all groups of LCT users had slightly higher mean daily consumption at weekends than weekdays (particularly on Sundays), the week-to-weekend profile is slightly flatter than for the baseline.

Electric vehicle charging behaviours

Case Study: EV users with smart chargers are less likely to start charging between 4pm – 7pm than those with conventional chargers

Those with smart chargers are more likely to start charging overnight than those with conventional chargers, with a more pronounced pattern of conventional chargers being used during peak evening hours.



Suspected charging events were identified by following the Centre for Net Zero's methodology outlined in the paper available here: AI in Charge: Large-Scale Evidence on EV Charging Demand (html)

Although sample sizes were too low to demonstrate statistically significant differences, there are indicative differences between EV users who state they use a smart charger compared to those who state they use conventional chargers:

Households with a smart charger appear to be more likely to begin their charging sessions in the early hours of the morning.

By contrast, those stating use of a conventional charger seem to commence charging in the evening time more often than smart charger users.

Conclusions

Conclusion

This report provides insight into electricity consumption by three timeframes – daily, weekly and annual. The findings allow us to better understand patterns of electricity consumption for various sub-groups (households with indicators of vulnerability and households with low carbon technologies) of the GB population and thus helps inform assessments of the potential impacts of consumer led flexibility.

Vulnerable households have close to average electricity consumption throughout the day and have a similar (slightly higher) share of consumption during peak hours when compared to the average household daily profile. This provides some indication that any negative distributional impacts of flexibility services related to shifting away from daily peak hours might not be substantial.

Households with **low carbon technologies** have higher daily electricity consumption and thus would have a greater positive impact on the grid if they shift some, or more, consumption to off-peak hours. **Electric vehicle (EV)** owners have higher than average consumption overnight indicating that they are already mostly charging during off-peak hours, which appears more pronounced if they have a smart charger.

As expected, households with **heat pumps** have the highest consumption during winter months while they also exhibit high consumption during daily peak hours. Heat pumps therefore provide substantial potential to shift consumption away from peak periods if heat pump users can be incentivised to shift their consumption without compromising on their heating needs.

Further research: Ofgem will use the FANZ dataset to conduct more detailed analyses related to consumer led flexibility, as well as distributional impacts of potential future regulation or policy.

Technical Annex

Technical Notes: on the sample, data processing, and analysis

About the sample
The survey was carried out online by Ipsos using their Knowledge Panel – a random probability panel. A nationally representative sample of 4,385 domestic energy consumers in Great Britain took part in June 2025.

Linking survey data to smart meter data
Where data was available and participants' consent was obtained, a subsample of 1,085 participants' survey responses were linked to up to 13 months' worth of historical half-hourly electricity and gas consumption data. This data linking was required to provide Ofgem with evidence to understand how much flexible energy could be contributed to the system from different consumer groups, based on current uptake of some technologies. More information can be found in the technical report of the FANZ 2025 survey.

Data cleaning
The following steps were applied to the granular electricity consumption data to create a clean data file containing 1 year of data (1st June 2024 to 31st May 2025) for each respondent in this analysis:

- Any reads above the Smart Energy Research Laboratory's proposed threshold of 24 kWh per half-hour were removed, including any 'max reads'.
- Survey participants were removed if they did not meet the following threshold: at least 46 valid electricity reads per day, across at least 30 days per season, for each of the four seasons.
- This left a final sample of 920 households for the analysis in this report.

Notes on this analysis:

- Miscellaneous notes
  - The main metric used in this report is average (unweighted mean) electricity consumption in kilowatt hours (kWh).
  - The analysis in this report compares electricity consumption between various sub-groups of the FANZ sample. Results should *not* be interpreted as generalisable to the GB population.
  - Several subgroups in our analyses have low sample sizes, so all results should be treated as indicative rather than statistically significant. *See the Technical Annex for detail of sample sizes*.
  - The No_LCT group is used as a baseline throughout this report as the consumption profile across days, weeks and years is very similar to the whole sample average.
  - Self-reported ToU tariff and other self-reported variables such as EV Charger Type might be subject to some respondent error.
  - Some households in the sample will have more than one LCT.

- Notes on Annual Heat Pump profiles:
  - Winter consumption uplift found for heat pump users is broadly comparable in magnitude to other recent estimates but with important methodological and data differences
  - For example, Agrawal & Wallom 2026 [html] compare trends in semi-detached homes with and without heat pumps, whereas FANZ data does not record property size or type.
  - 5% of the FANZ sample data is from consumers with heat pumps and 26% from consumers with some form of LCT. Some households will have more than one LCT.

Counts by Category – Vulnerabilities (self-reported)

Label	Description	Unweighted n
Work: FT	Working status: Working full-time	543
Work: Not FT	Working status: Not working full-time	377
IMD: Least deprived	IMD Quintile: High (Least deprived)	740
IMD: Most deprived	IMD Quintile: Low (Most deprived)	180
Health conditions: None	Has no health conditions that limit activities	587
Health conditions: Any	Has a health condition that limits activities	328
Income <£26k	Annual household income below £26,000	191
Income >£26k	Annual household income of £26,000 or more	619
Direct Debit	Pays for electricity by direct debit	851
Credit/PPM/Other	Pays for electricity by standard credit, prepayment meter, or other	69
Benefits: None	Benefit recipient: No	762
Benefits: Any	Benefits recipient: Yes (any)	158
Aged <65	Aged under 65	579
Aged 65+	Aged 65 or over	341
Home owner	Owns their home outright or with a mortgage	762
Renter	Either a social or private property renter	158
No bill difficulty	Not in energy bill difficulty	652
Bill difficulty	In energy bill difficulty	268

Counts by Category – Technologies (self-reported)

Label	Description	Unweighted n
No heat pump	Not a heat pump user	874
Heat pump	Heat pump user	46
No EV	Not a fully electric vehicle (EV) user	791
EV	Fully electric vehicle (EV) user	129
No solar panels	Not a solar panel user	786
Solar panels	Solar panel user	134
No LCT	No low carbon technology (LCT) usage	684
Any LCT	Uses some form of low carbon technology (LCT)	236
Gas & electricity	Has a gas and electricity supply	794
Electricity only	Only has an electricity supply (no gas)	126
Electric heating: None	Not an electric heating user	707
Electric heating: Any	Electric heating user	213
Not ToU tariff	Not a self reported Time of Use (ToU) tariff user	710
ToU tariff	Self reported Time of Use (ToU) tariff user	210