

Digital Meeting Etiquette

- Welcome to the Issue 119 Workgroup– We'll start shortly
- We encourage attendees to **use video**, where bandwidth allows, especially if talking
 - There is a setting on Teams to “Turn off incoming video” if you are having persistent connection issues
- **Mute when not speaking**
 - Minimise background noise to maintain focus
 - Use Teams chat if you cannot get through
- Stay on topic: Keep contributions relevant to the agenda
- Respect all perspectives: Foster a collaborative and inclusive environment
- This session will be recorded for the notes taking purposes. The recording will not be shared outside Elexon

3 June 2026

Issue 119 Workgroup

Meeting 4



Welcome to the Issue 119 Workgroup

What we'll cover today...



Agenda

- Welcome and Introductions

Discussion items

- Wrap up recommendations
- Red-lined changes to BSCP128

Closing items

- AOB
- Meeting Close

01

Wrap up recommendations

OVO – Dan King

BSC Issue 119 - Workgroup #4

Wrap up recommendations

3rd June 2026

Together, we have the power to make
energy work for people and planet

Exec Summary

What we're asking the workgroup to agree today:

1. Update the LV NHH profiling within the LAF model
2. Add a backtesting control step to the Elexon LLF audit
3. Run the LAF model seasonally (Summer + Winter)

All three are already provisioned in BSC/BSCP128 - no Code changes required.

Adoption in time for the 1 August 2026 methodology submission delivers improvements for the 1 April 2027 LLF update.

Why this workgroup was set up

PURPOSE

Total network losses (LLF + GCF) are rising

Investigate the rising trend in electricity distribution losses, which is driving inaccurate Settlement worth tens of millions of pounds annually and creating an under-recovery of costs for domestic suppliers.

Industry participants don't currently have sufficient understanding of why losses are rising or confidence that Settlement Errors will be detected and resolved, and this risk becomes more acute under MHHS where the shortened reconciliation timetable leaves less room for error.

PLAN

Bring parties together to review the landscape and propose improvements

Review BSC processes, increase data sharing/transparency, and strengthen Exelon's oversight of LLF/GCF anomalies. The group will explore three main areas:

- 1. LLF methodology:** Review for improvements and transparency (considering embedded generation, behind-the-meter consumption, and exporting GSPs).
- 2. Existing controls:** Assess controls against identified failure points.
- 3. GCF methodology:** Evaluate if it remains equitable for mutualizing Settlement Error (including M10 revisions) and if increased transparency (Category 3 Public document) is sufficient.

Note Issue 119 scope change: #3, GCF methodology, is being addressed through BSC Issue #120

Issue 119 has brought together BSC parties to review losses: Exelon, DNOs, Domestic & Commercial Suppliers

What have we learned?

LOSS FUNDAMENTALS

Why losses may be expected to rise...

EVIDENCED - Technical (physical loss from power flow) : Low-carbon technologies (EVs, heat pumps) drive higher utilisation of the LV network. Because **losses scale with the square of power flow**, demand increases have an exaggerated impact on losses.

NOT YET EVIDENCED - Non-technical (i.e. theft, errors in unmetered supplies, settlement errors) : ENA's analysis suggests non-technical losses could be material, but the workgroup has not investigated independently. Having agreed that non-technical losses should be included in generic LLFs, theft is not considered to be the primary purpose of this Issue group.

Workgroup findings:

Improved cross-industry understanding of technical reasons for losses and that DNOs do not separately model technical vs non-technical losses for Generic LLF classes. However, we note that a trend of increased losses is not observed equally in all GSPs (see Appendix). We haven't investigated why this is the case or what this could tell us.



Industry participants are expecting distribution losses to increase with increased load and congestion on the network.

What have we learned?

ELEXON AUDIT

Elexon noted errors are rare and most submissions are compliant.

- Internal software checks calculations against a tolerance
- Consistency with Market Domain Data (MDD)
- Three-decimal precision verification
- Site-specific data validation
- SQL queries to detect mismatches or year-on-year deviations
- 20% tolerance threshold on year-on-year LLF changes

Loss Adjustment Factor 'LAF' MODEL

Most DNOs use a centrally developed LAF model to assess and set LLFs

The workgroup was given an overview of how the LAF model works, namely by ingesting historic data (either metered or settled) for a given part of the network and then calculating annual losses at different network voltage classes (EHV, EHV>HV, HV, HV>LV and LV).

There is no concept of technical vs non technical losses within the LAF model.

For generic losses, the annual volumes are profiled out to 48sp x 365 days to create generic Seasonal time of day (STOD) losses.

Learned about some of the pitfalls eg. example of a new housing development with solar where the annual import and export volumes net out will be invisible to the LAF model.

Elexon audit process has broad acceptance criteria. LAF model is used by most DNOs and has some weaknesses.

Where do we believe there are issues? **EVIDENCED & RESOLVED**

EVIDENCED & PARTIALLY RESOLVED

GCF allowance in the Domestic Price Cap

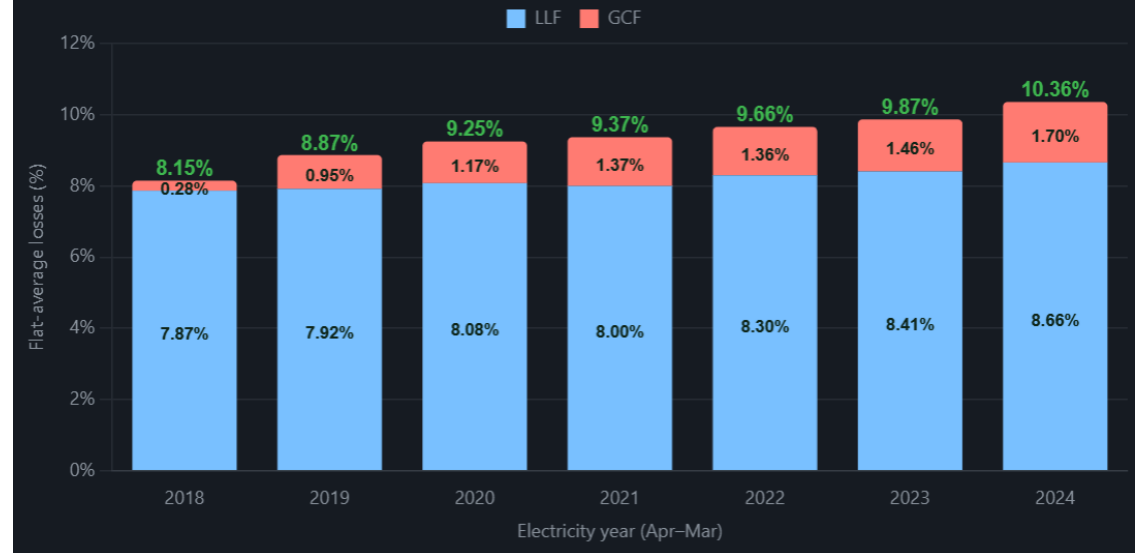
Workgroup recognised that annual average GCF has deviated from ~0% (1.00) when the Domestic Price cap was introduced to >1.5% in subsequent years as total distribution losses have increased with LLFs lagging behind.

Ofgem now include GCF as a term within the domestic price cap costs methodology.

Price Cap methodology calculates and applies GCF to costs on a flat average basis across all settlement periods and so under-estimates the cost of high peak and high winter GCF.

1 · Annual flat-average losses · full elec years

Apr–Mar electricity years. Stacked LLF + GCF. The Domestic Price Cap was introduced 1 Jan 2019, during elec year 2018.



Where do we believe there are issues? **EVIDENCED**

EVIDENCED

Peak GCF (SP 33–38) is structurally high

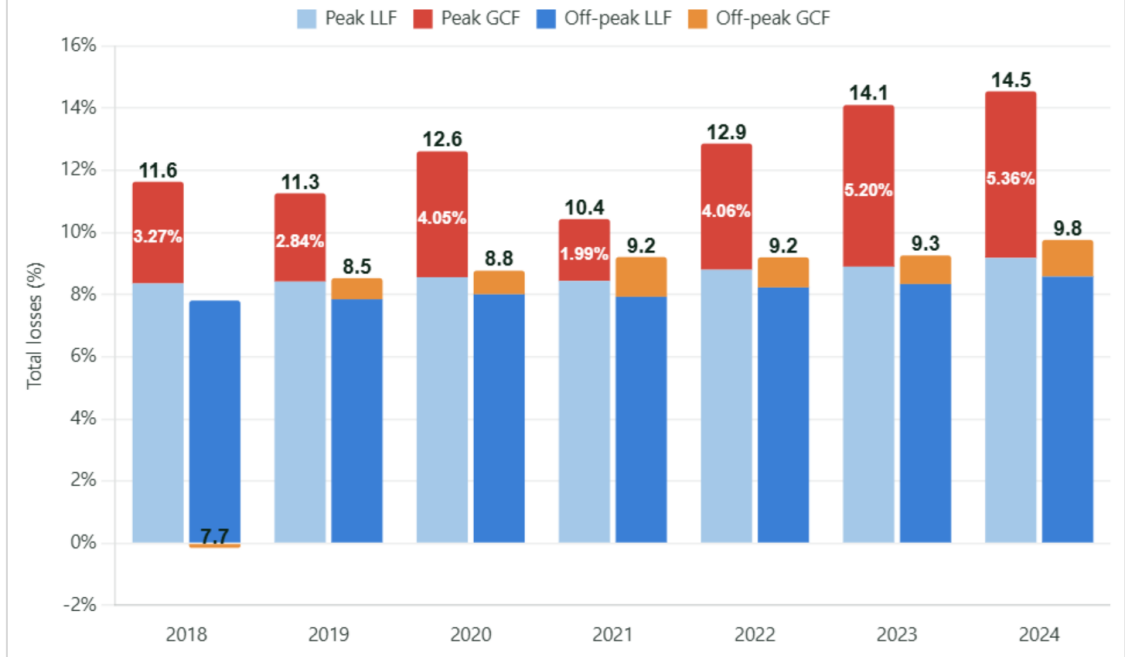
Persistent peak gcf is evidence that seasonal time of day (STOD) LLFs are not being set appropriately. The chart on the right shows Exelon flat average national GCF values split by consumption year and Peak vs Off-peak settlement periods (33-38).

Peak distribution losses (LLF+GCF) consistently exceed 11% and are rising faster than total losses. This is consistent with the concept of “network congestion” increasing losses. It is also evident that the “Peak LLFs” are not increasing on a lagged basis to account for true losses as BSCP128 suggests it should.

We believe this is because of the LV NHH profiling methodology within the LAF model.

Appendix slides evidence this issue persists in every GSP.

Peak (SP 33–38, left) vs Off-peak (right)



PROPOSED SOLUTIONS: LV NHH Profiling + Audit improvements

1. Review the LV NHH profiling coefficients within the LAF model. Exelon + DNO + Issue 119 representatives
2. Exelon to expand the scope of audit to include a specific control test on Peak (sp 33-38) LLFs to confirm BSCP 3.1.4 and 3.1.8 are met. Control could be developed independently or in consultation with Issue 119 workgroup representatives.

We note that both of the above solutions are already provisioned within the BSC and BSCP128 - no change required. We therefore recommend that these recommendations are adopted immediately to ensure accurate LLFs are approved for 1-Apr-2027

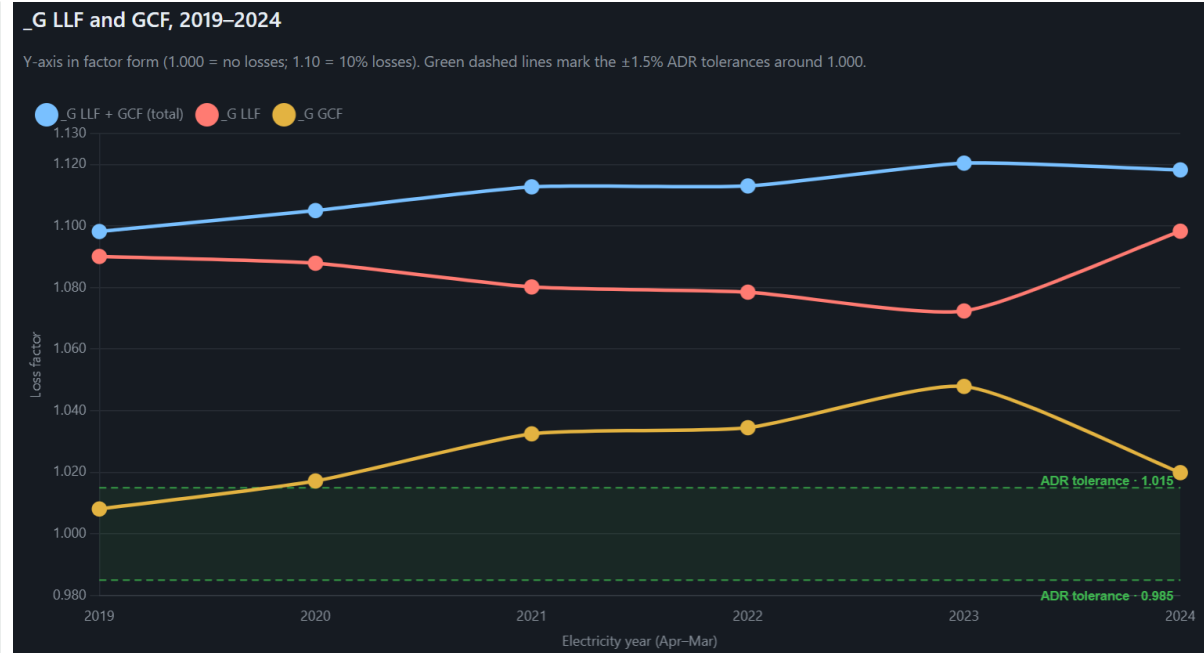
Where do we believe there are issues? **EVIDENCED**

EVIDENCED

LLF updates are sometimes worsening GCF losses

We have seen cases of annual LLF updates creating a worse GCF position.

This suggests we should strengthen the Elexon LLF Audit process to take account of outturned GCF and whether the LLF update is expected to improve / worsen the position.



PROPOSED SOLUTIONS: Audit improvements

1. Add in a control step to the LLF audit to confirm that, when backcast against prior year data, the proposed LLF updates move the level of expected GCF towards zero. Any LLF updates that when backcast are expected to move the “Annual Demand Ratio (ADR)” outside of tolerance must be accompanied with an explanation from the DNO.

This solution is already provisioned within the BSC and BSCP128 - no change required. We therefore recommend immediate adoption.

Where do we believe there are issues?

EVIDENCED

EVIDENCED

Seasonal losses are not being captured in Generic LLFs

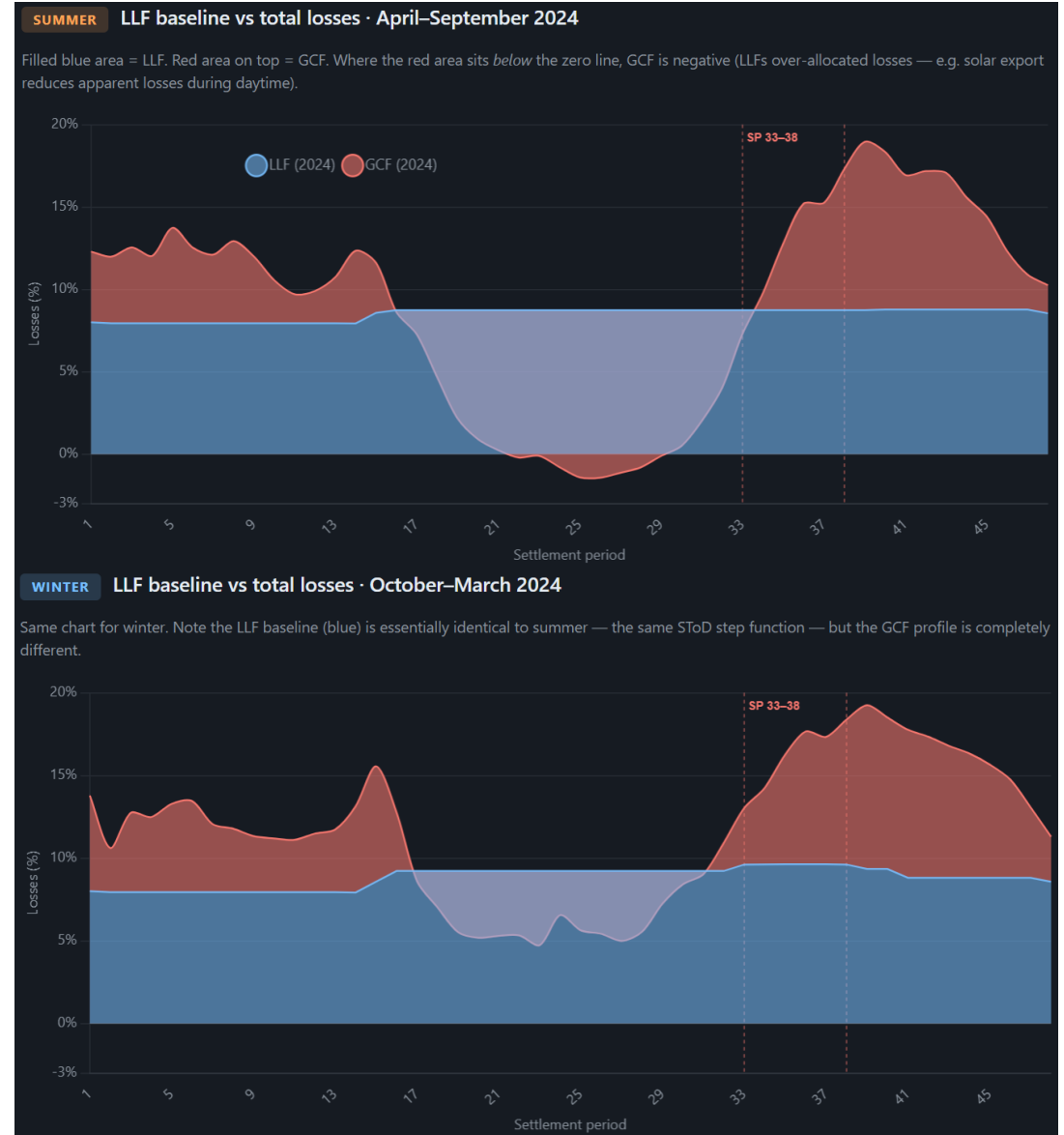
The charts on the right hand side (Summer-24 on top, Winter-24 below) show how flat average total distribution losses compare by season. In summer, distribution losses see on average a deep solar dip which can actually result in negative distribution losses. Winter losses see less of this solar dip.

STOD LLFs are not updating to reflect this behaviour, and for settlement accuracy and BSCP128 compliance we believe they should.

The workgroup has also explored the potential impact of the LAF model being an annual model considering net energy flows, resulting in some network load being ‘invisible’ in the model, “loss-netting”. An example discussed previously was a new housing estate with embedded generation being invisible to the LAF calculations.

PROPOSED SOLUTIONS: x2 LAF models (1 per season)

1. **Preferred:** The LAF model (excel workbook) should be calculated twice, one covering summer volumes (Apr-Sep), and another covering winter volumes (Oct-Mar). This would go some way to mitigating the issue of loss-netting.
2. **Alternative:** Review of LV NHH profiling in the LAF model may partially improve this issue.



Where do we believe there are issues?

We recommend these areas of concern are noted by the workgroup, but with no further investigation at this stage.

NOT YET EVIDENCED

Will MHHS Load Shapes make things better? Half Hourly, maybe, but maybe not

It is unclear whether MHHS will improve or worsen the overall picture.

Workgroup agreement is that daily GCF is likely to be improved. However, HHly GCF may get worse due to structural LSS site selection not equating to non-HHly users.

Proposal: Review impact post MHHS migrations

SUSPECTED BUT IMPACT NOT YET EVIDENCED

GSP Group take reconciliation

There are no controls to ensure the sum of LAF model inputs = GSP Group Take

We believe the fact that LLFs do not update on a lagged basis to reflect the full impact of historic GCF is strong evidence that not all GSP Group Take is being considered in the calculation of losses.

Proposal: A new control performed by Elexon to ensure all Group Take is being captured in LLF updates (all LAF models) would be beneficial.

KNOWN BUT IMPACT NOT YET EVIDENCED

Loss netting hides true gross flows

LAF model uses annual net volumes per voltage level. Co-located import/export flows in different geographies or Seasons cancel in the model but generate real I²R losses on the network.

The workgroup hasn't undertaken specific analysis on the issues this creates.

Proposal: Seasonal LAF models (1 x Summer, 1 x Winter) adopted + review of LV NHH profiling.

KNOWN BUT IMPACT NOT YET EVIDENCED

DNO incentives misaligned

Suppliers carry the GCF cost; DNOs do not have a direct accuracy incentive on LLFs.

Proposal: Out of scope for this workgroup - flagged for industry consideration

Three NEW practical recommendations for the April 2027 LLF update

These are being recommended in addition to the recommendations proposed in Workgroup #3 (Mar-26)

1 Audit and update LV NHH profiling

One-off check on the "NHH profiling" tab of every DNO's LAF model. Verify LV shape source captures peak (not "uncorrected" DUOS billing data).

2 Extra Audit step : Mandatory backtesting

Add a backtesting step to the LLF approval process: newly calculated LLFs tested against D0276 outturn - GCF should converge to zero, not grow.

3 Seasonal LAF models - x2 Excel models instead of 1 annual

Mandate separate Summer and Winter LAF model runs separately. Winter peak GCF (Nov-Feb SP 33-38) is +6.5 %pt vs +2.7 %pt full winter — seasonality is not captured today.

Recommendations for further review for the April 2028 LLF update

These are being recommended in addition to the recommendations proposed in Workgroup #3 (Mar-26)

4 Separate import/export LLFs

Change Principle 6 — generic export LLFs should be calculated separately from import. Current equality risks under-allocation as export volumes grow.

5 Review STOD design

Test whether the existing 5-STOD framework captures the peak hump now widening into SP 39-42. Consider seasonal/granular STOD variants.

6 Review MHHS impacts

Post MHHS migrations identify whether structural LSS site selection results in any systemic half-hourly settlement accuracy trends.

PRACTICAL SOLUTIONS FOR WORKGROUP AGREEMENT

Recap - What we're asking the workgroup to agree today:

1. Update the LV NHH profiling within the LAF model
2. Add a backtesting control step to the Elexon LLF audit
3. Run the LAF model seasonally (Summer + Winter)

Why this is important:

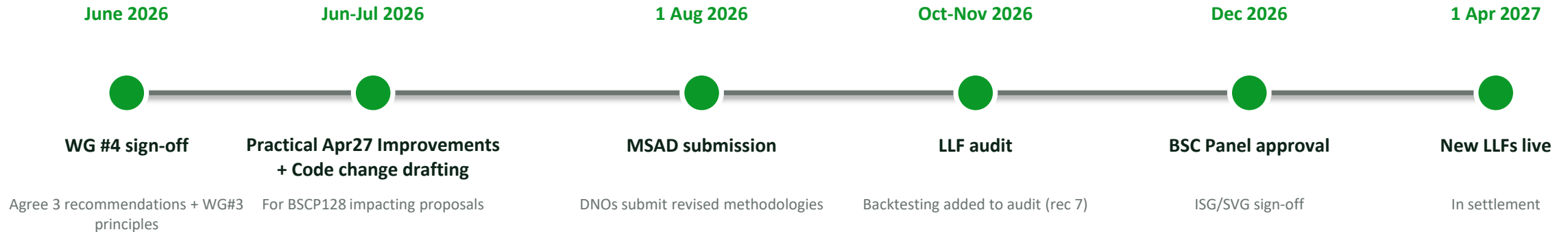
1. **Settlement accuracy** - Improved settlement accuracy across all market segments will improve the accuracy of both cost allocation and future cost signals (eg. higher peak LLFs), ultimately improving market efficiency.
2. **Cost accuracy** - More accurate LLFs directly improves the accuracy of the price cap cost methodology and provides transparency to the wider market on the costs of electricity supply.

Good for The System, good for The Market

WE ARE SEEKING FOR THE WORKGROUP TO AGREE TO THESE RECOMMENDATIONS

NEXT STEPS

Path to landing changes for the April 2027 LLF update



Asks of the workgroup today

Endorse the recommendations: *1. LV NHH review, 2. Audit controls, 3. Seasonal LAFs*

Or capture specific objections and proposed amendments in the minutes.

Agree backtesting approach

Propose members help develop D0276 audit backtesting methodology by Sep 2026.

Identify workgroup members who can support delivery

Write up comprehensive outcomes of Issue 119 and vote for approval

Formal vote on the principle updates as the foundation for all other changes.

APPENDIX: GSP Loss decomposition

Total distribution losses (LLF + GCF) — one slide per GSP

Reference deck · 2018–2024 elec years

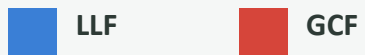
Each GSP slide shows two views of total distribution losses

LEFT CHART · FULL YEAR

LLF + GCF stacked, one bar per year

Blue = LLF (technical losses, calculated by the DNO and approved annually).
Red = GCF (residual unallocated losses — the BSC Issue 119 problem).
Total = bar height.

Look for: rising stack height (worsening total losses), and the relative share of LLF vs GCF (is the LLF model keeping pace?).



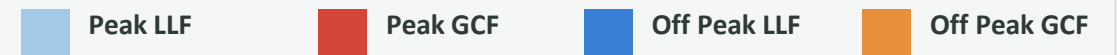
RIGHT CHART · PEAK vs OFF-PEAK

Same data split into peak and off-peak

Two bars per year.
LEFT bar of each pair = peak (SP 33–38, 16:00–19:00).
RIGHT bar = off-peak (all other SPs).

Each bar is again LLF + GCF stacked.

Look for: the peak bar towering above off-peak, and whether the GCF (red) component shrinks at peak after LLF updates.

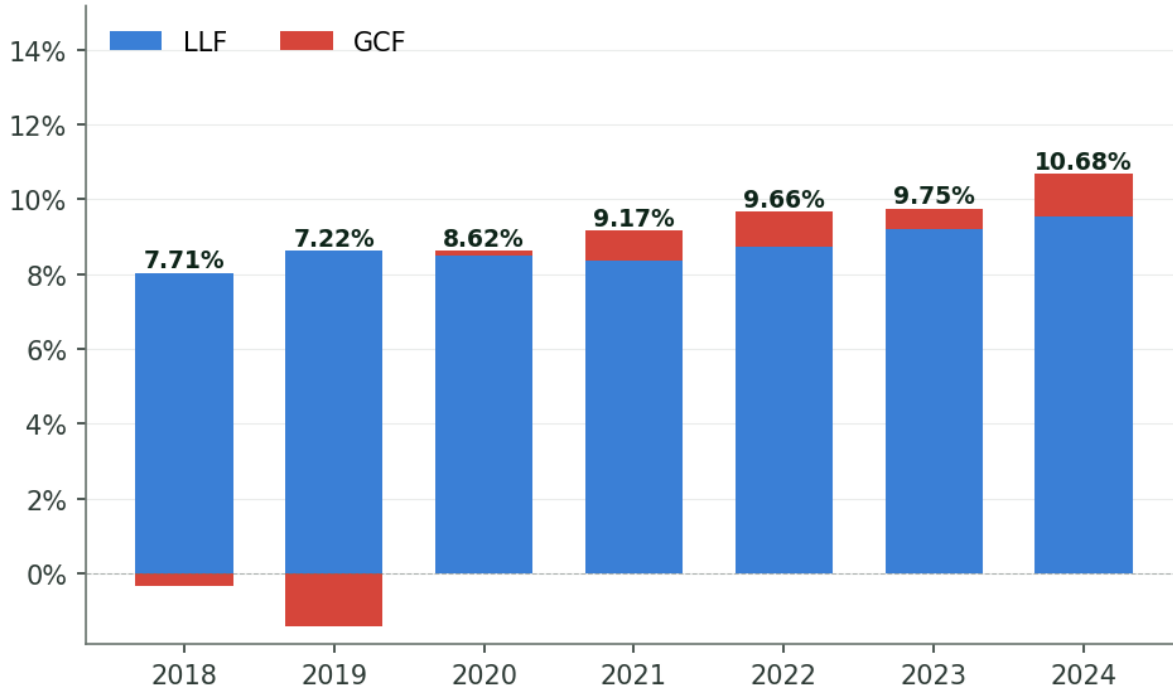


Y-axes are fixed across all 14 GSPs so charts are directly comparable.

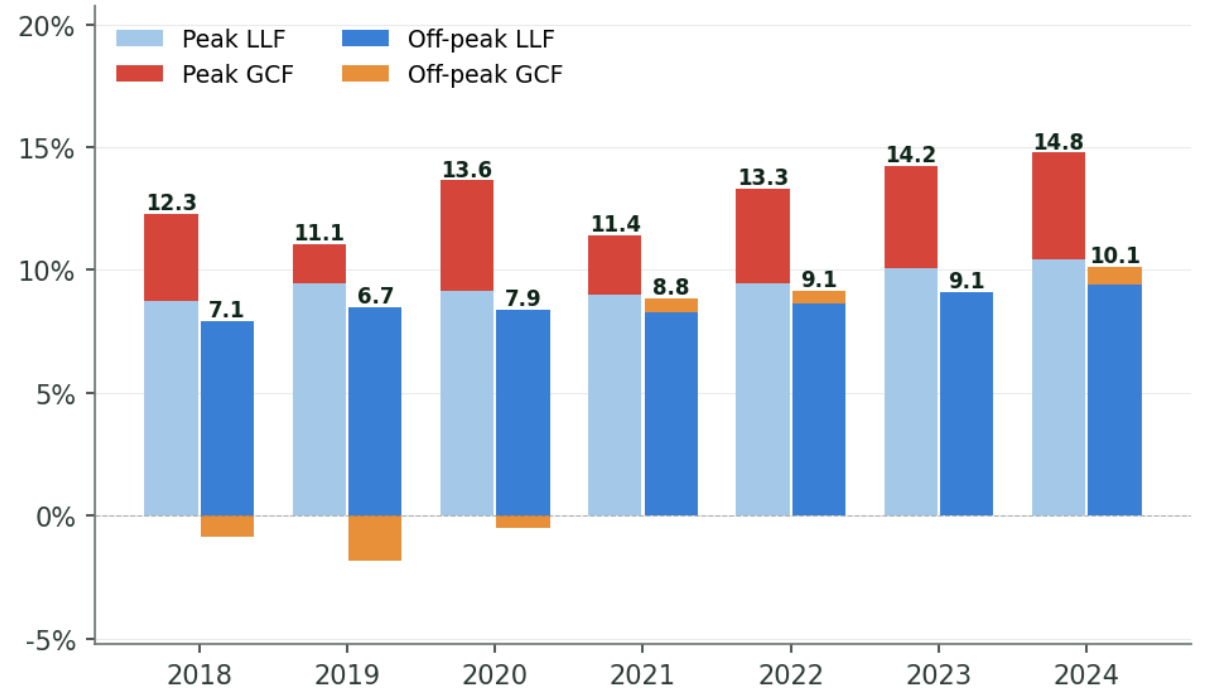
A Eastern

7.71%	10.68%	+2.97	14.77%	10.11%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



B East Midlands

6.12%

2018 total

8.62%

2024 total

+2.50

Δ

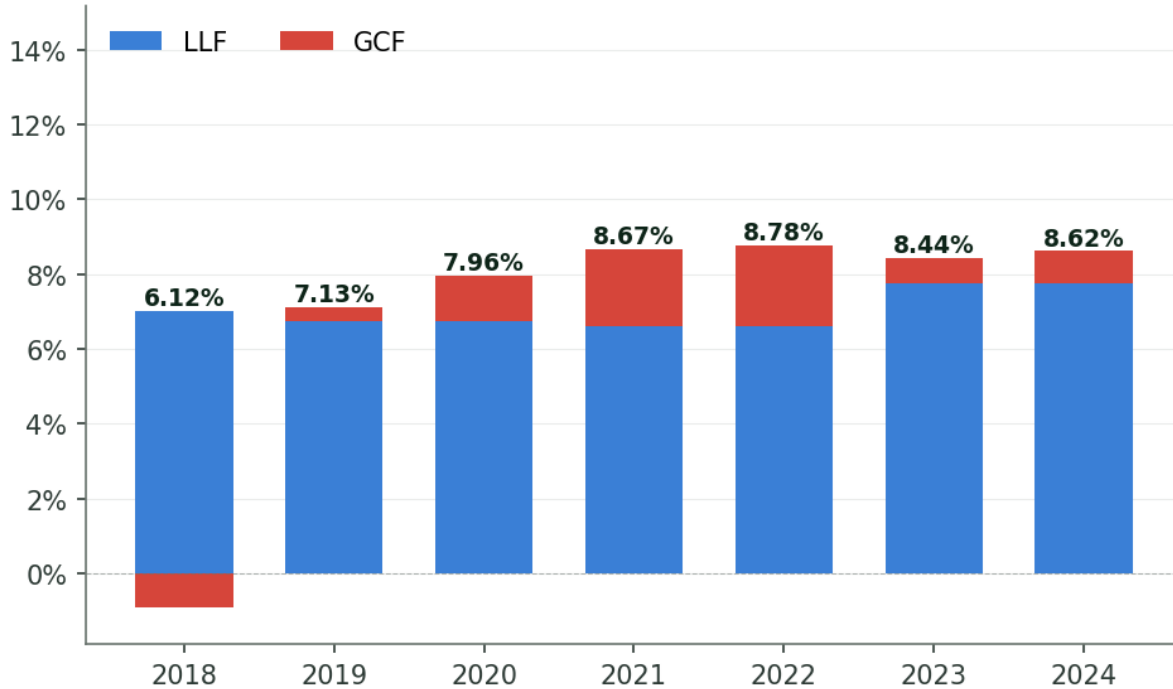
13.65%

2024 peak

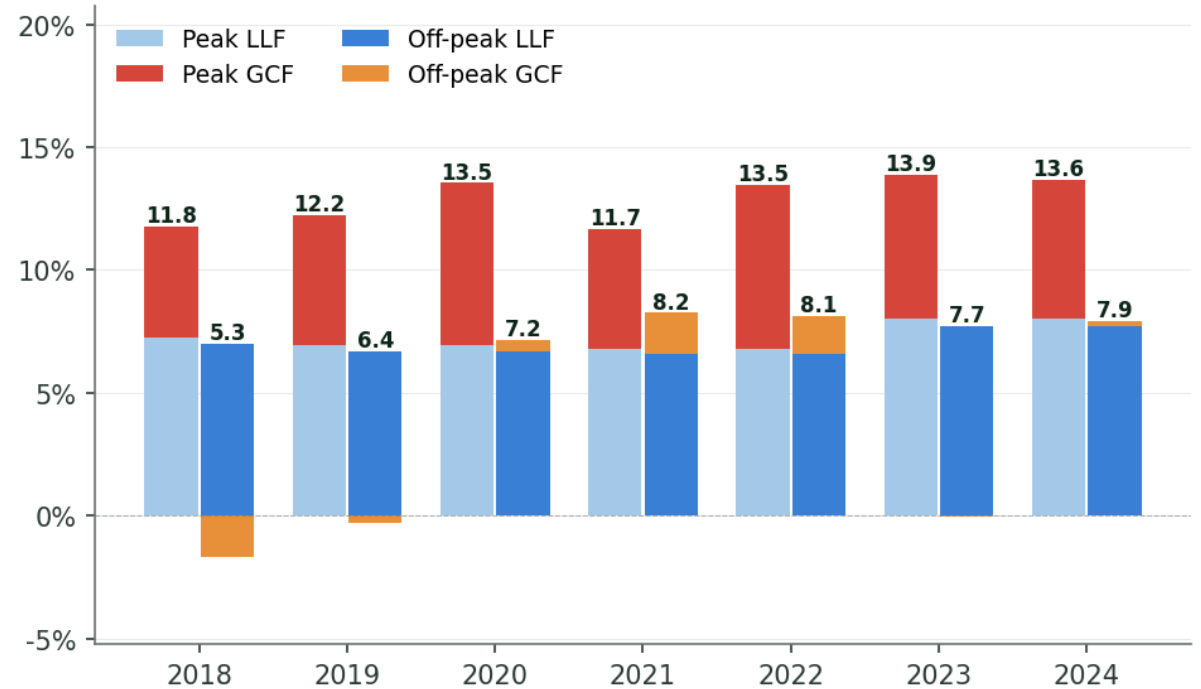
7.90%

2024 off-pk

Full year · LLF + GCF stacked



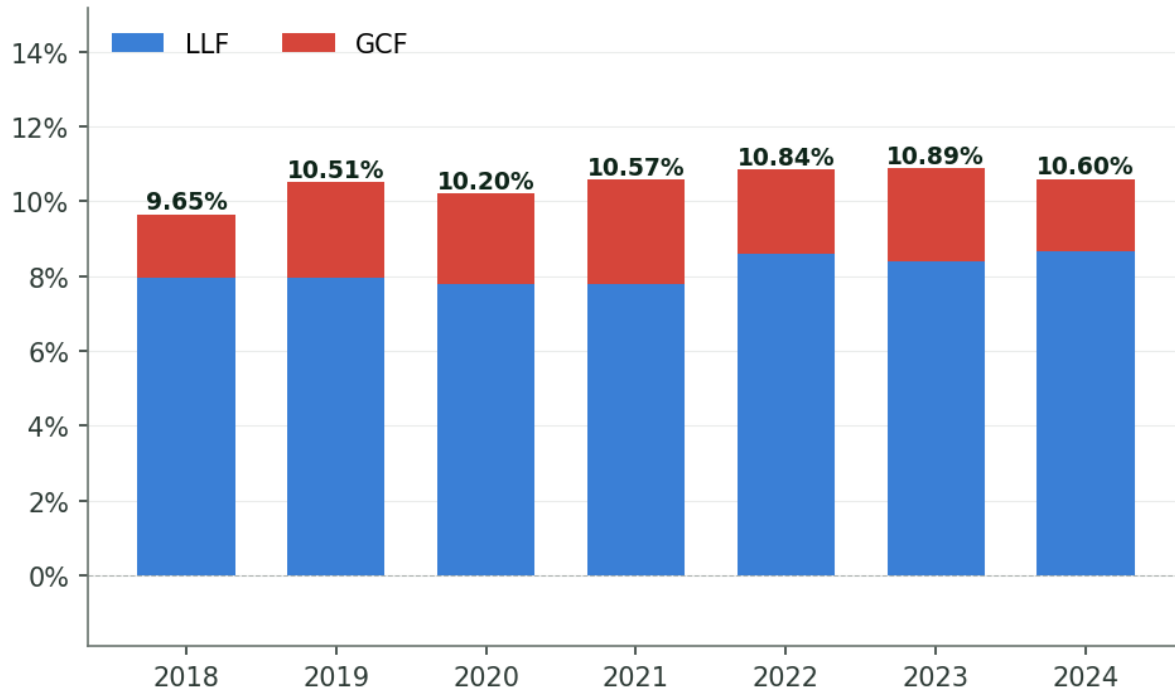
Peak (SP 33-38, left) vs Off-peak (right)



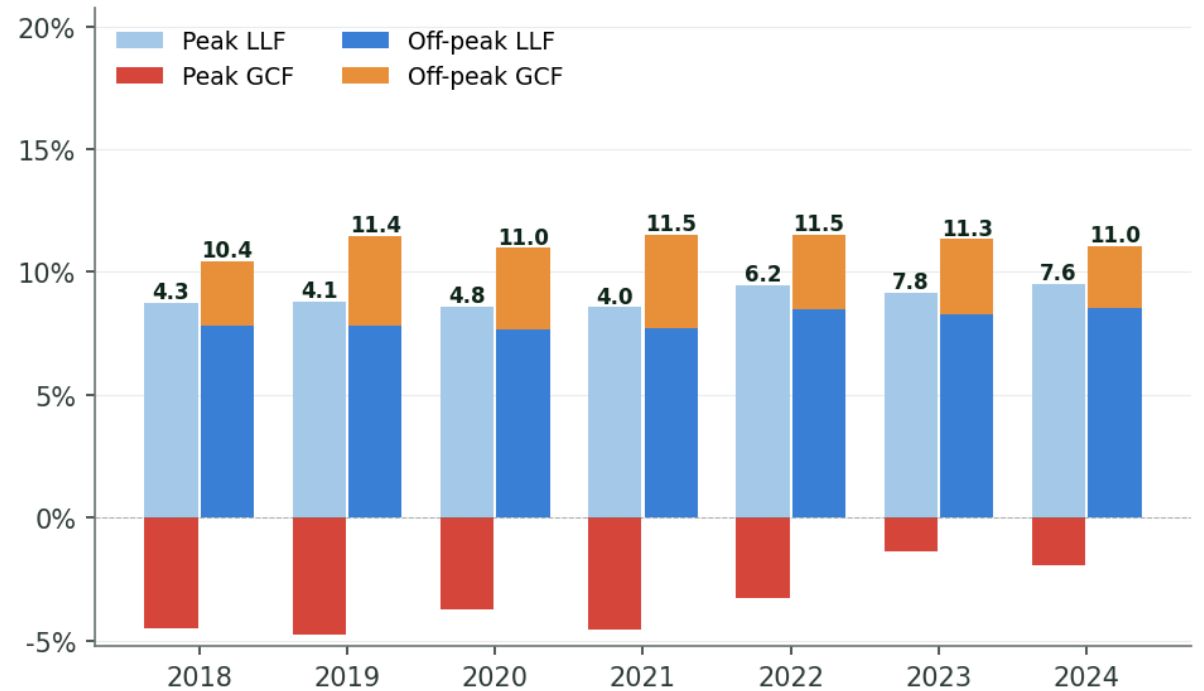
C London

9.65%	10.60%	+0.95	7.57%	11.03%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



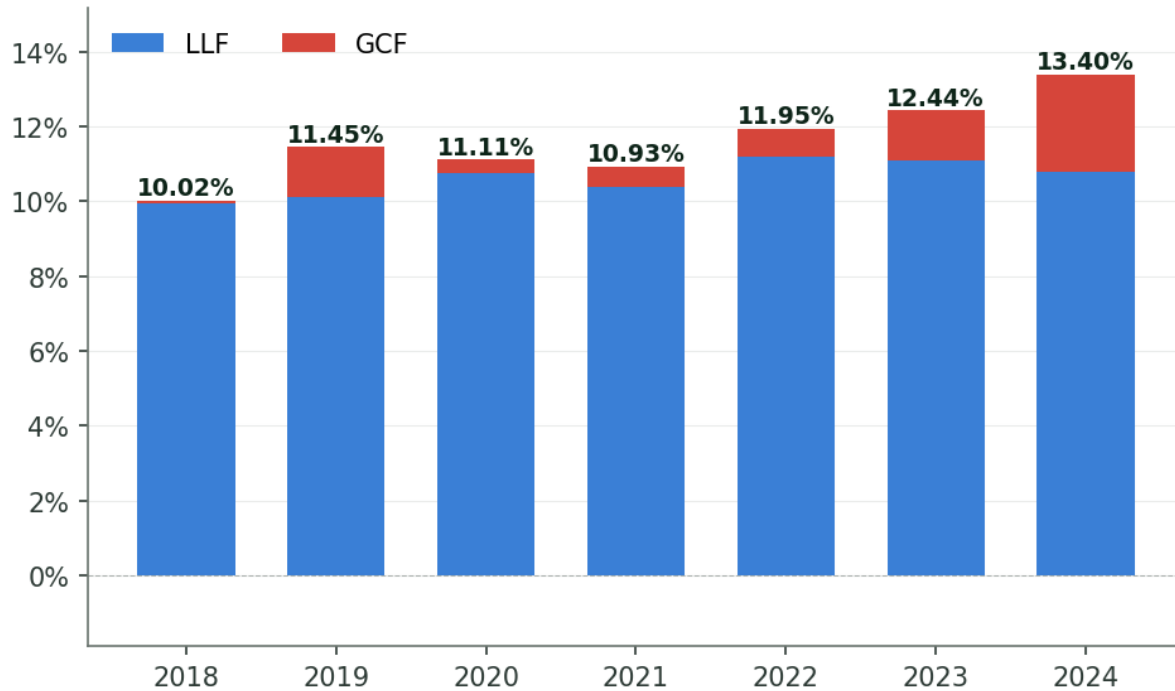
Peak (SP 33-38, left) vs Off-peak (right)



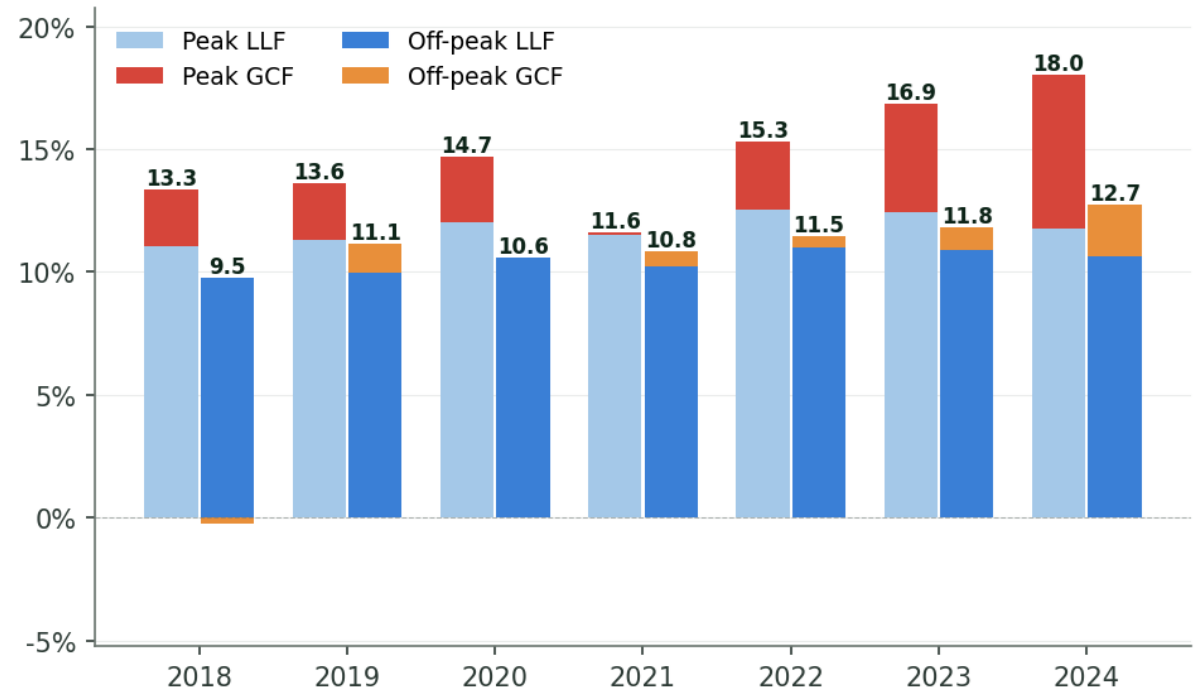
D N Wales & Mersey

10.02%	13.40%	+3.38	18.05%	12.73%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



E West Midlands

7.53%

2018 total

9.41%

2024 total

+1.88

Δ

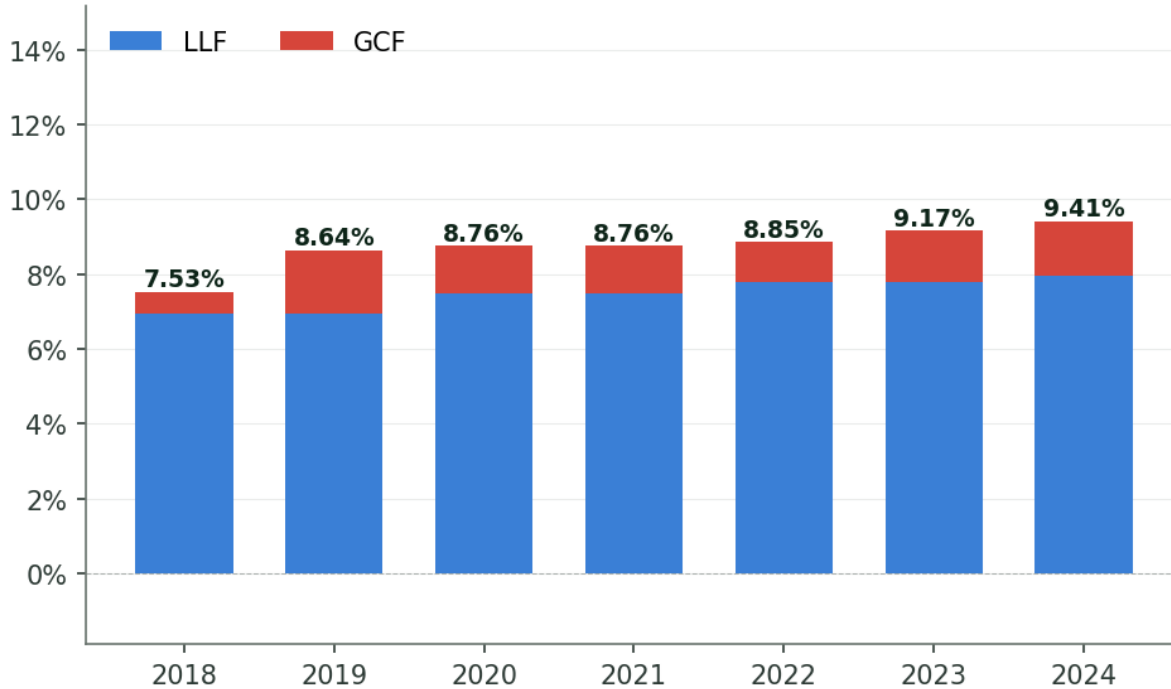
13.15%

2024 peak

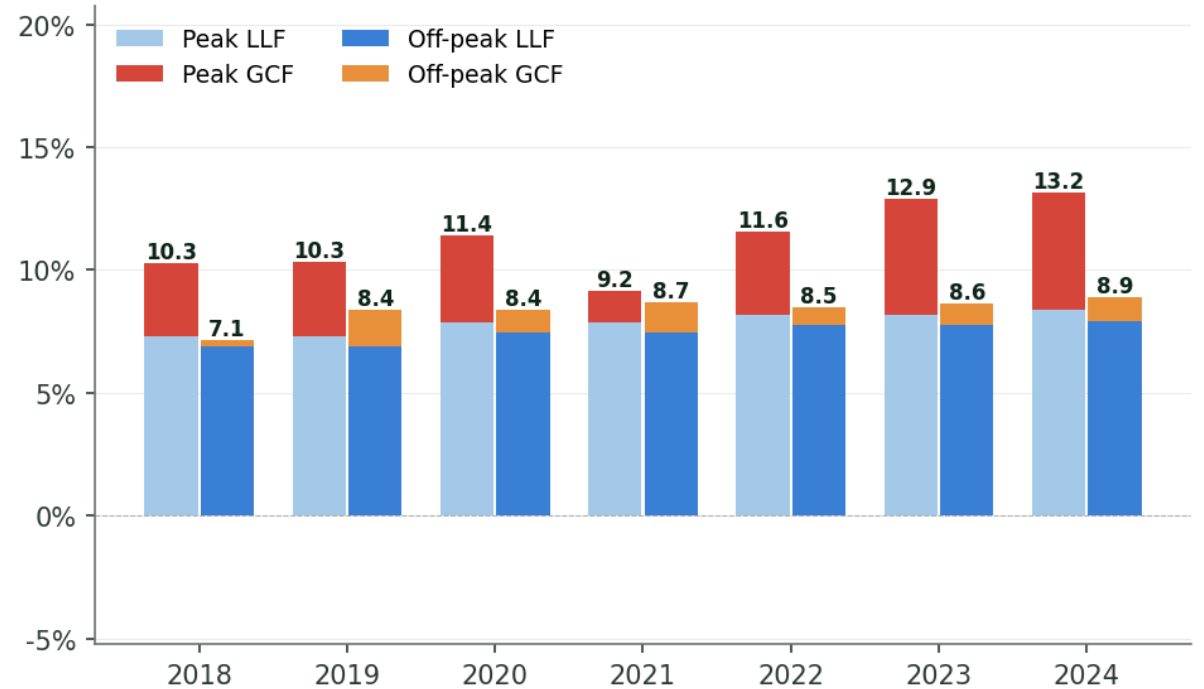
8.89%

2024 off-pk

Full year · LLF + GCF stacked



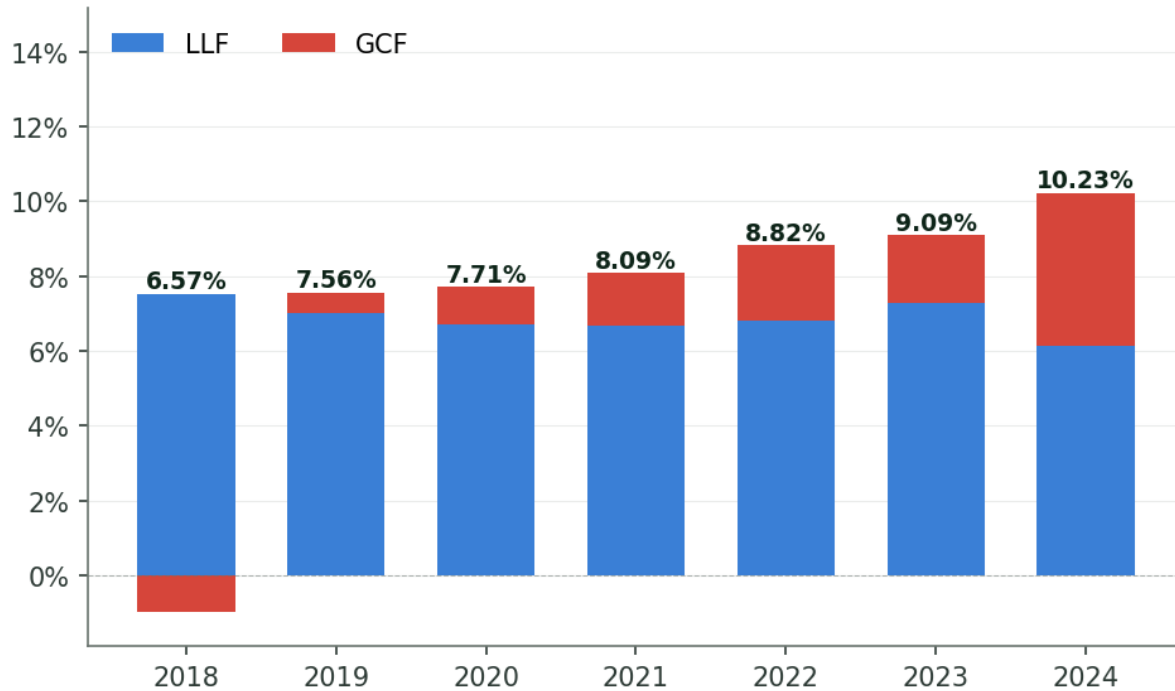
Peak (SP 33-38, left) vs Off-peak (right)



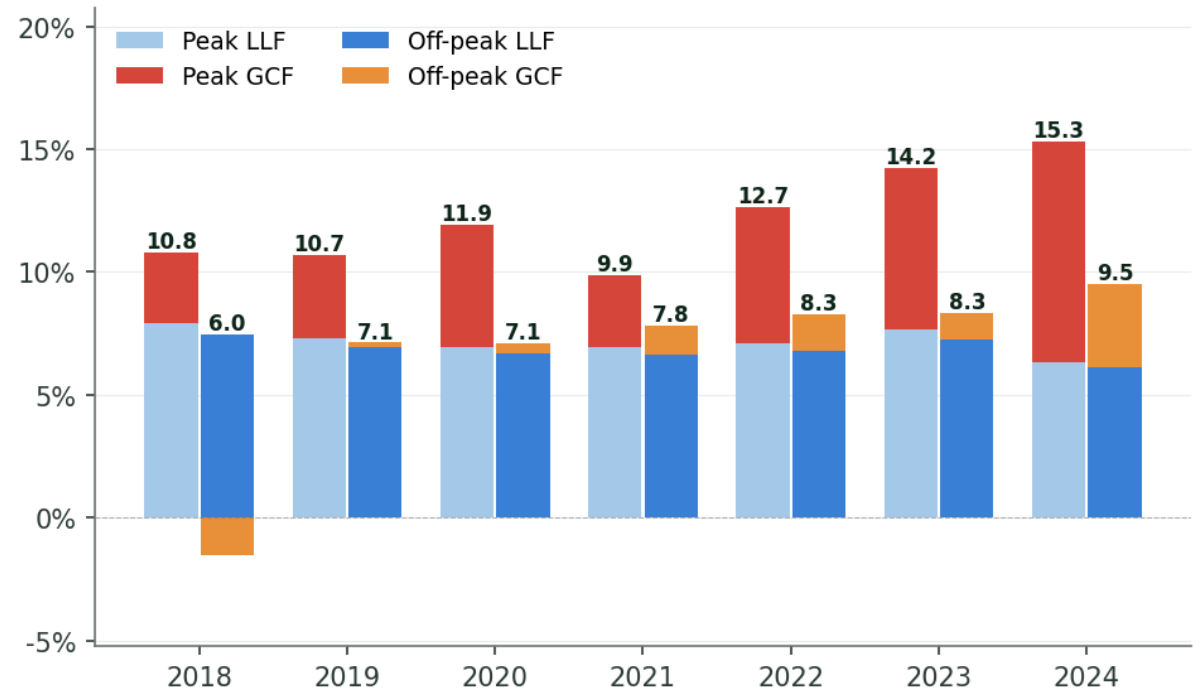
F Northern

6.57%	10.23%	+3.66	15.32%	9.51%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



G North West

9.33%

2018 total

11.82%

2024 total

+2.49

Δ

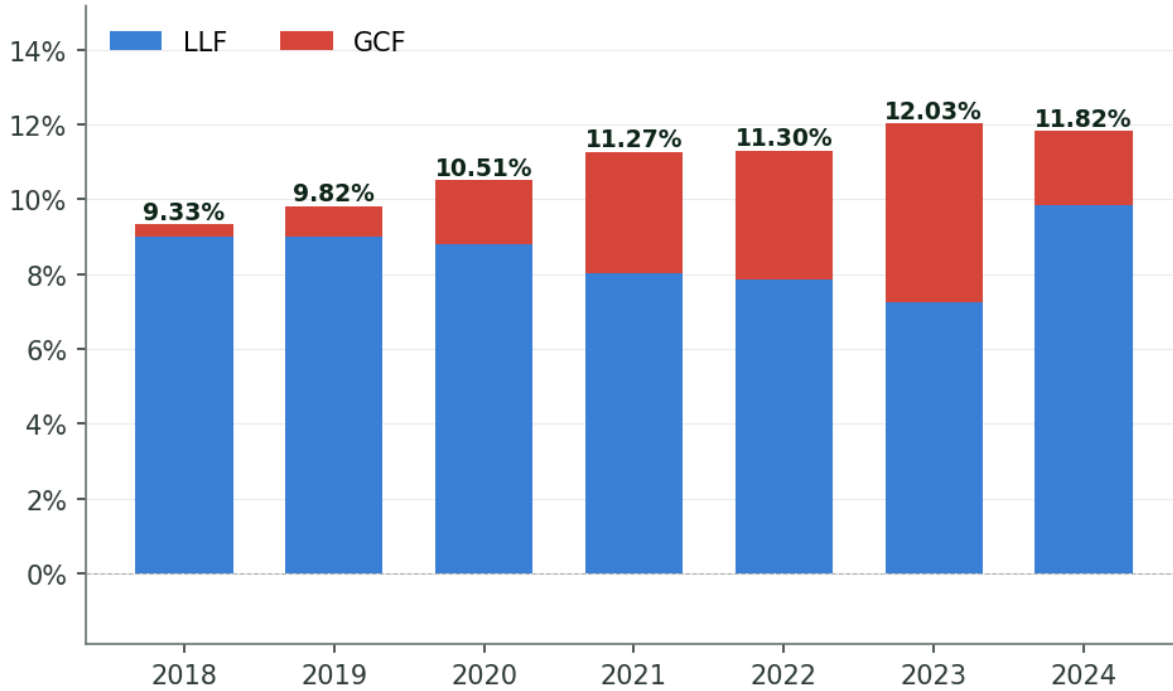
16.83%

2024 peak

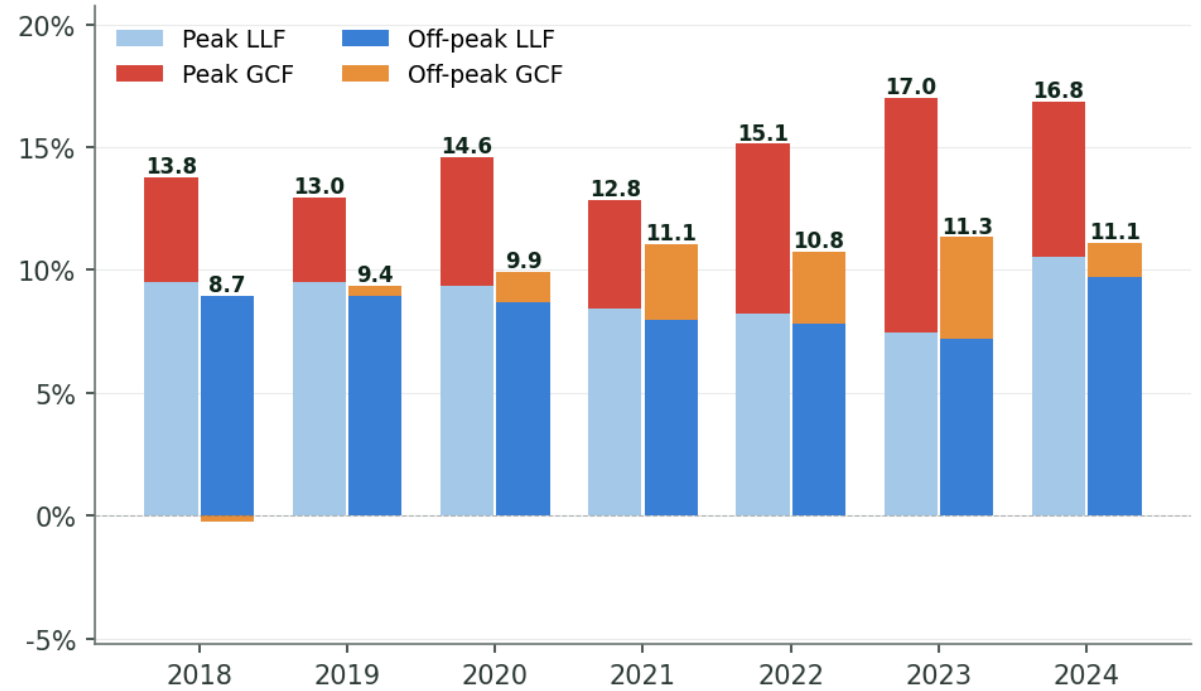
11.10%

2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



H Southern

6.93%

2018 total

8.53%

2024 total

+1.60

Δ

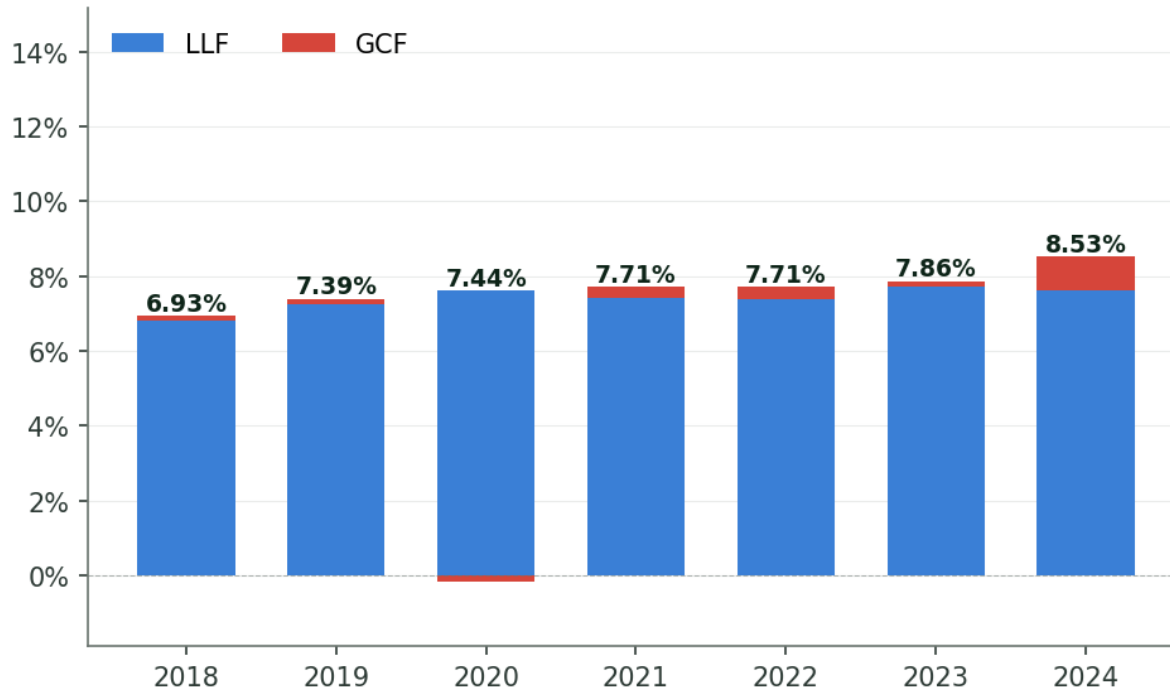
11.48%

2024 peak

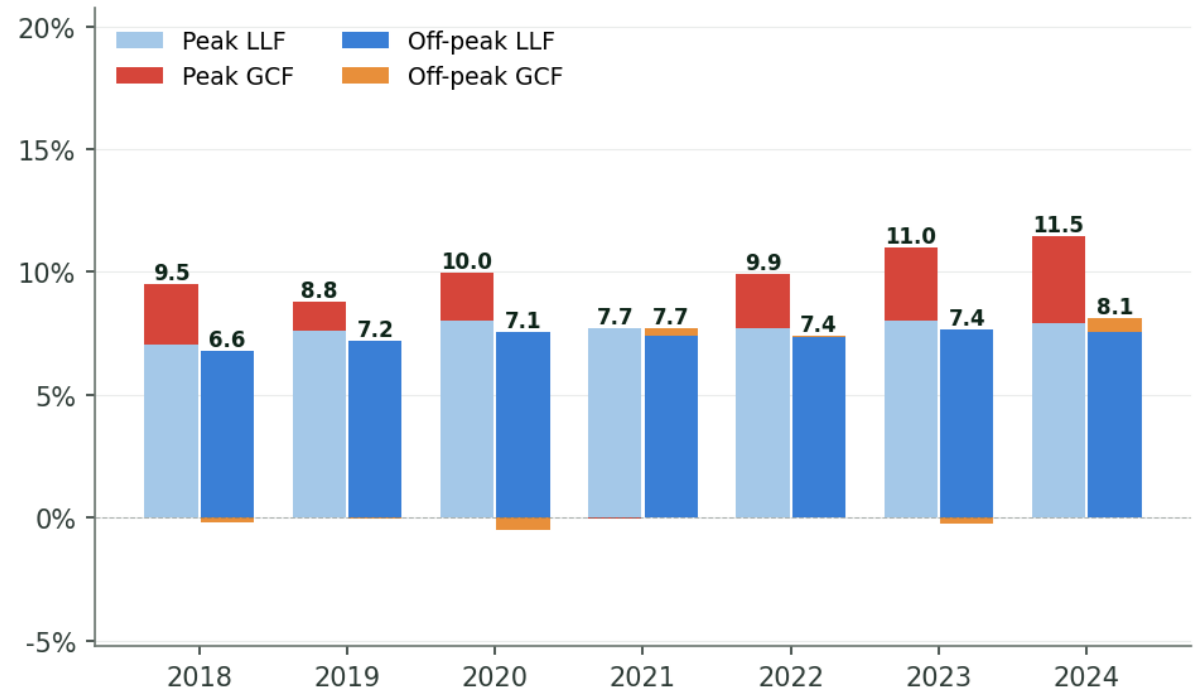
8.10%

2024 off-pk

Full year · LLF + GCF stacked



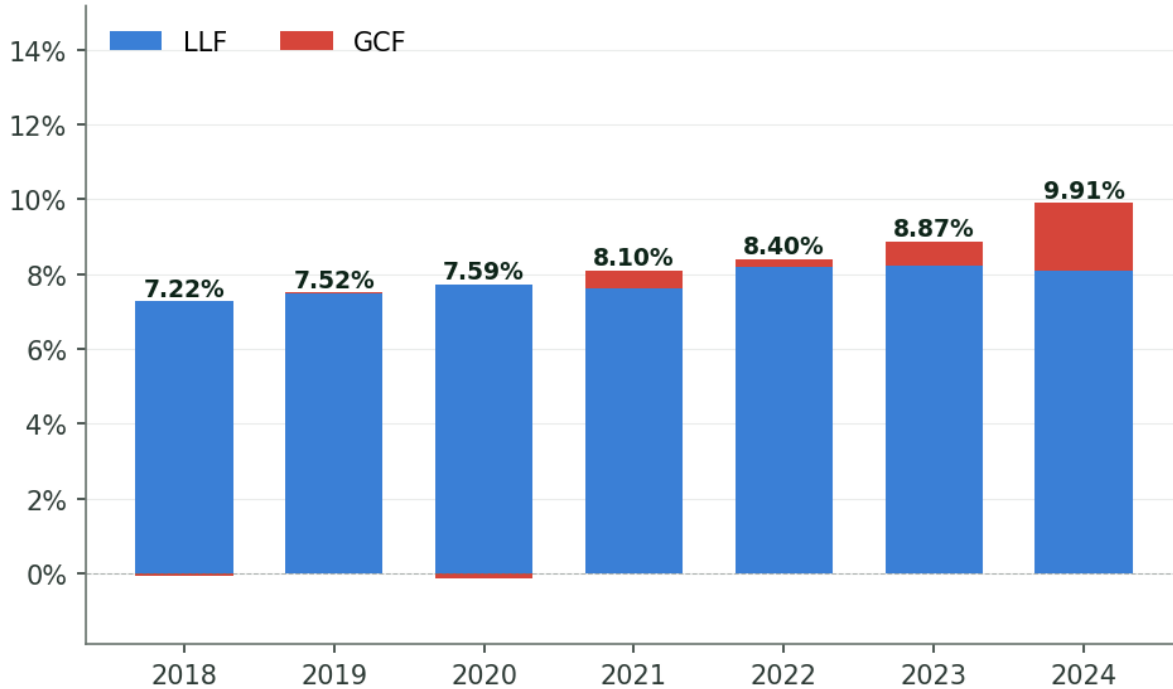
Peak (SP 33-38, left) vs Off-peak (right)



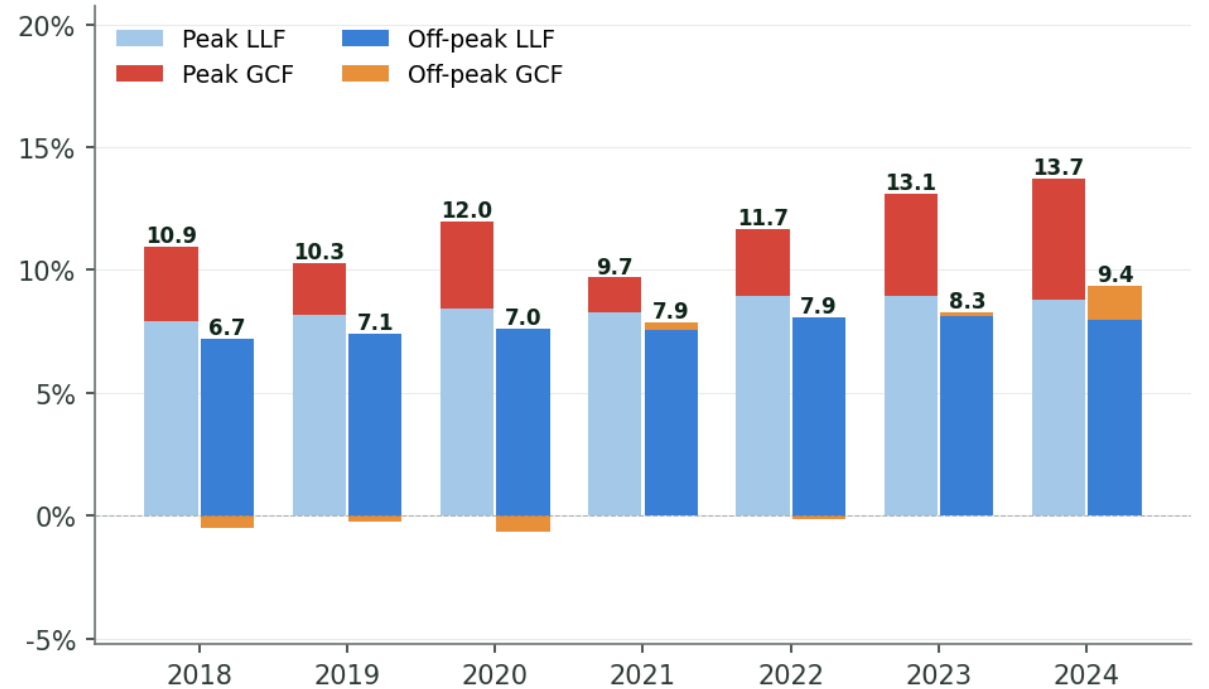
J South East

7.22%	9.91%	+2.69	13.73%	9.37%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



K South Wales

6.22%

2018 total

5.61%

2024 total

-0.61

Δ

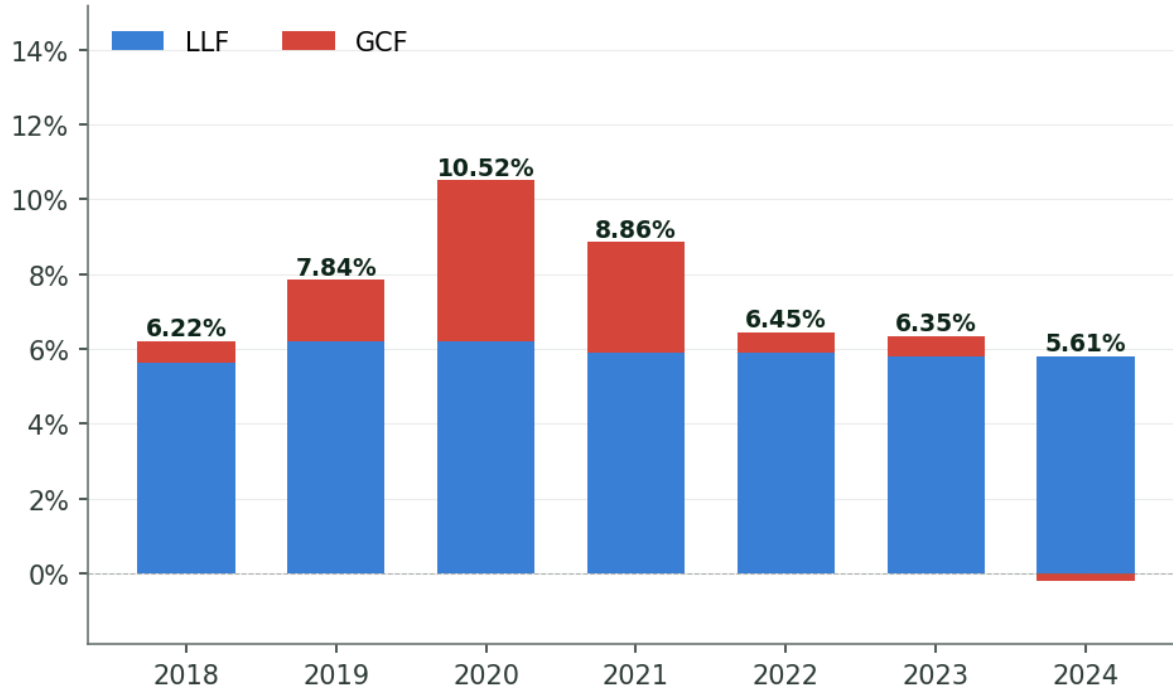
9.93%

2024 peak

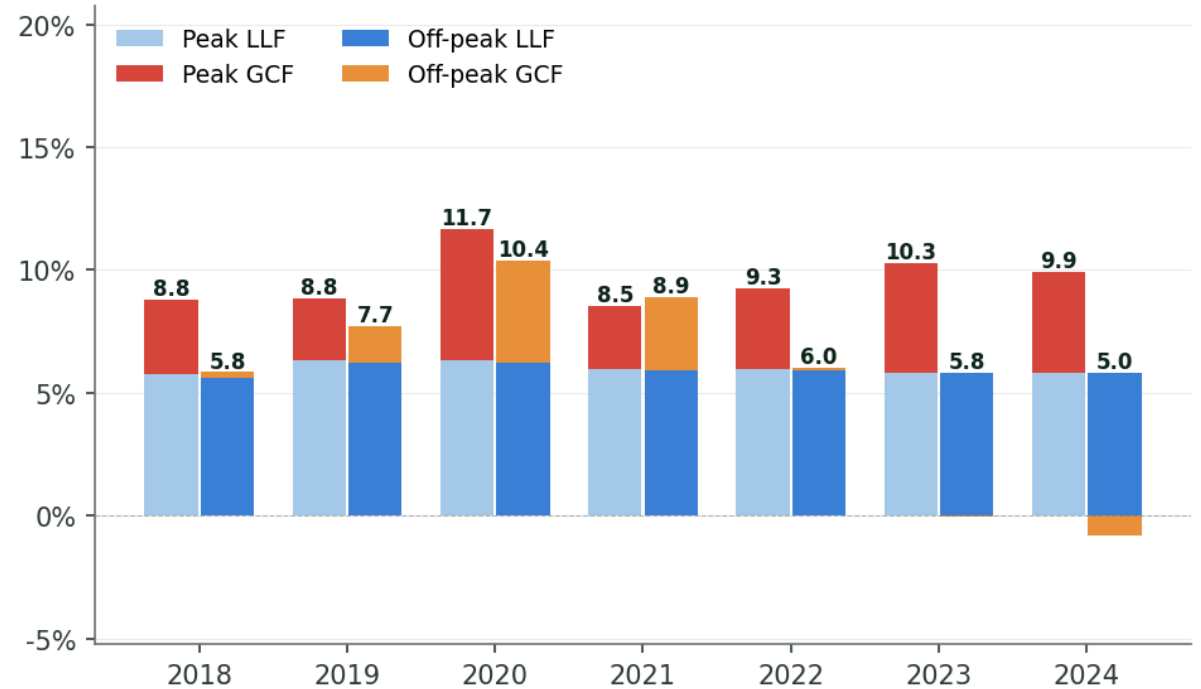
4.99%

2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)





South Western

7.11%

2018 total

8.83%

2024 total

+1.72

Δ

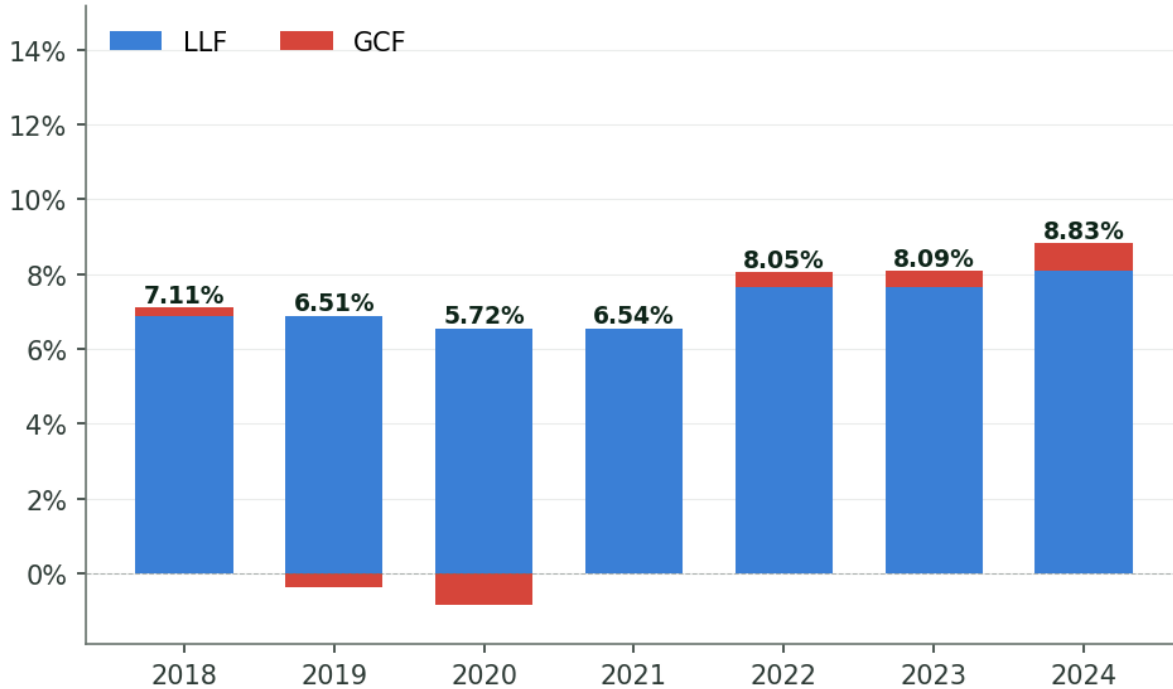
14.99%

2024 peak

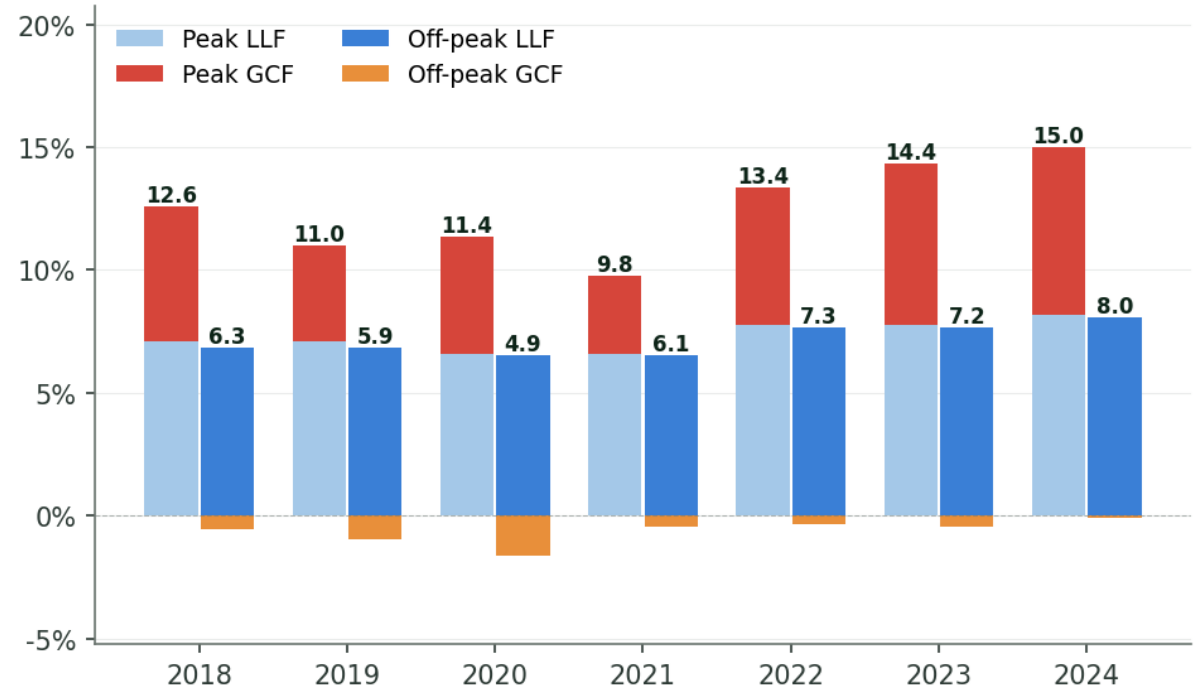
7.95%

2024 off-pk

Full year · LLF + GCF stacked



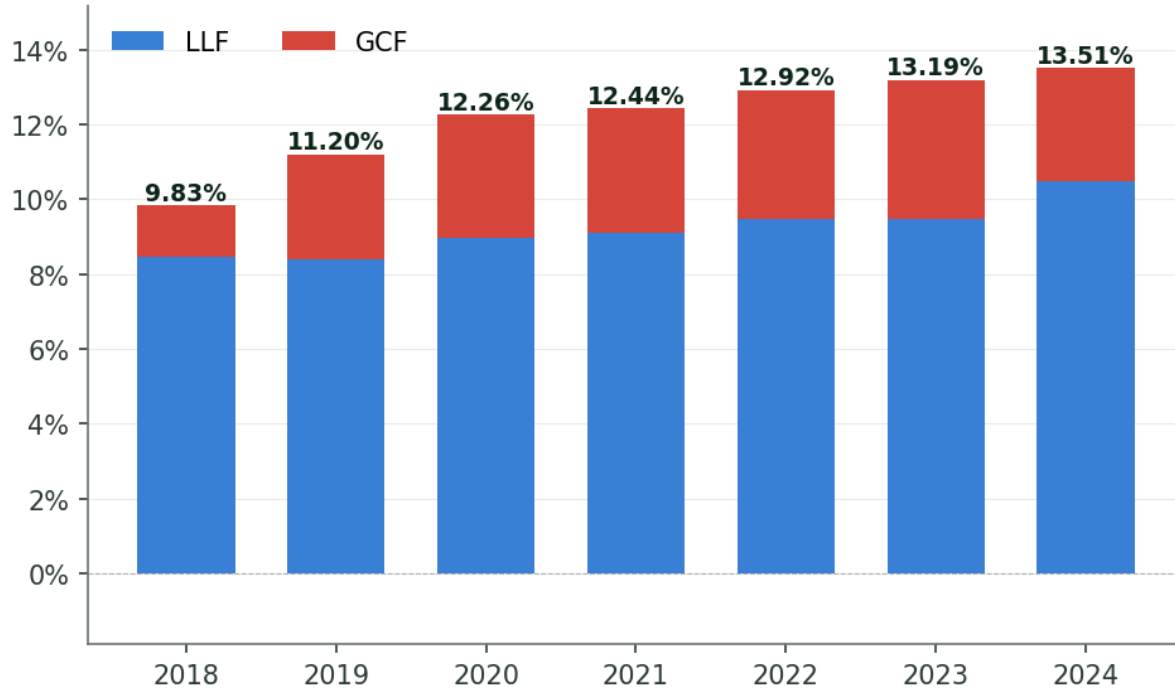
Peak (SP 33-38, left) vs Off-peak (right)



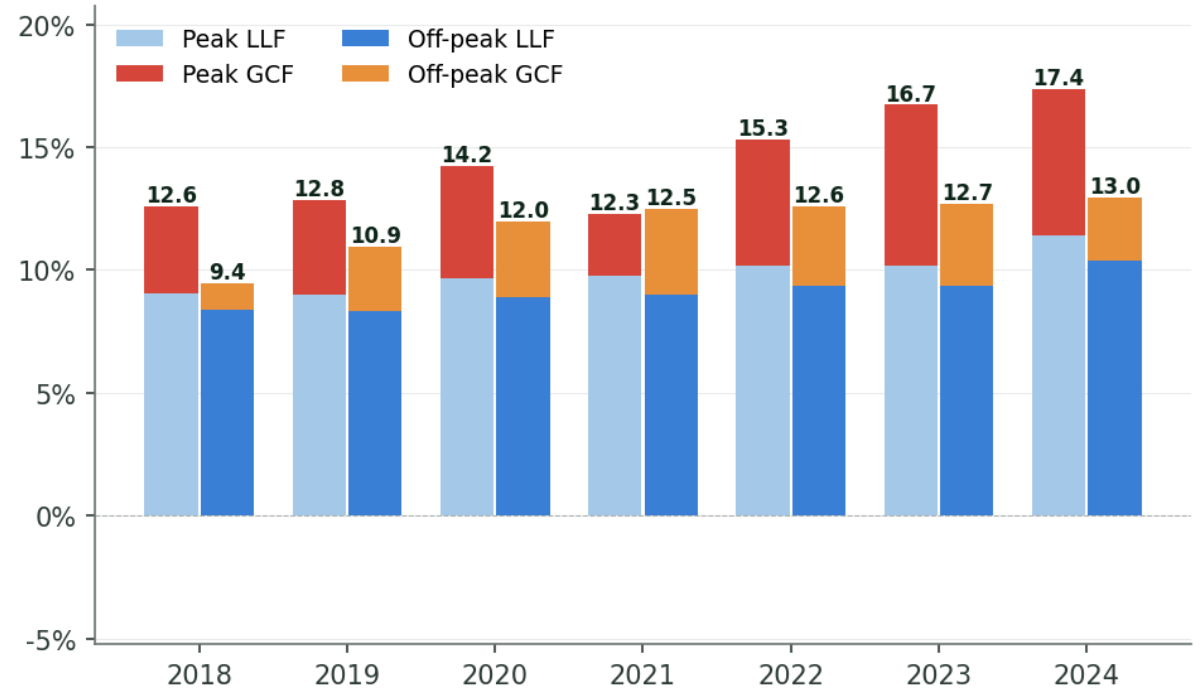
M Yorkshire

9.83%	13.51%	+3.68	17.35%	12.97%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)

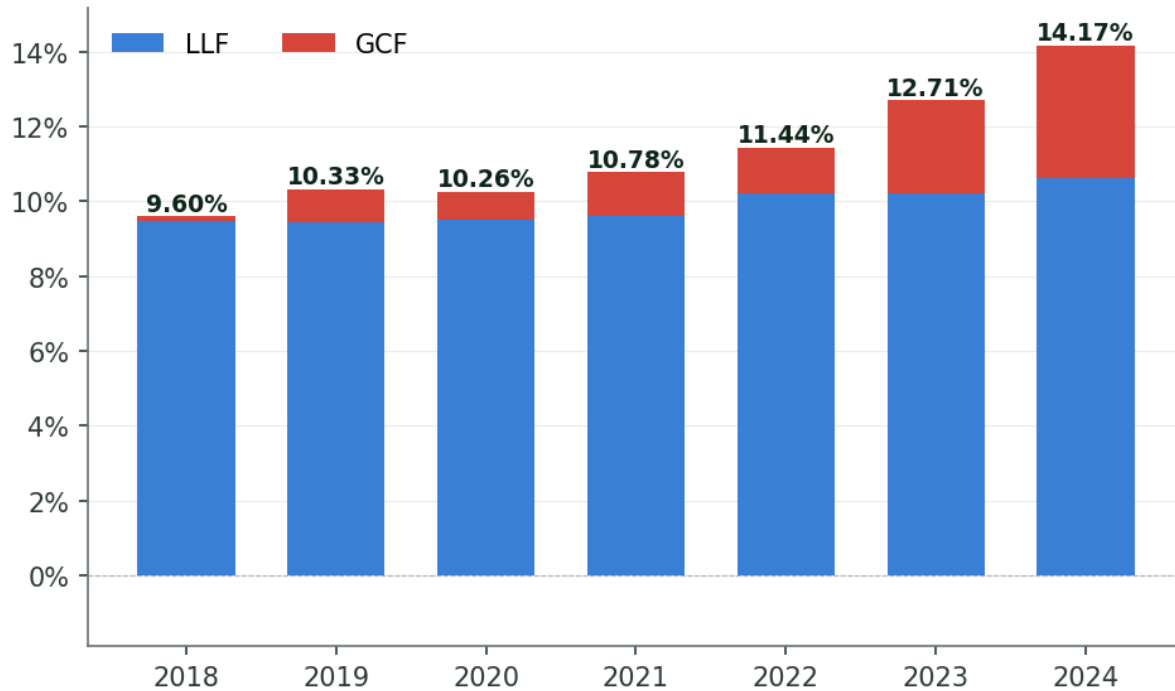




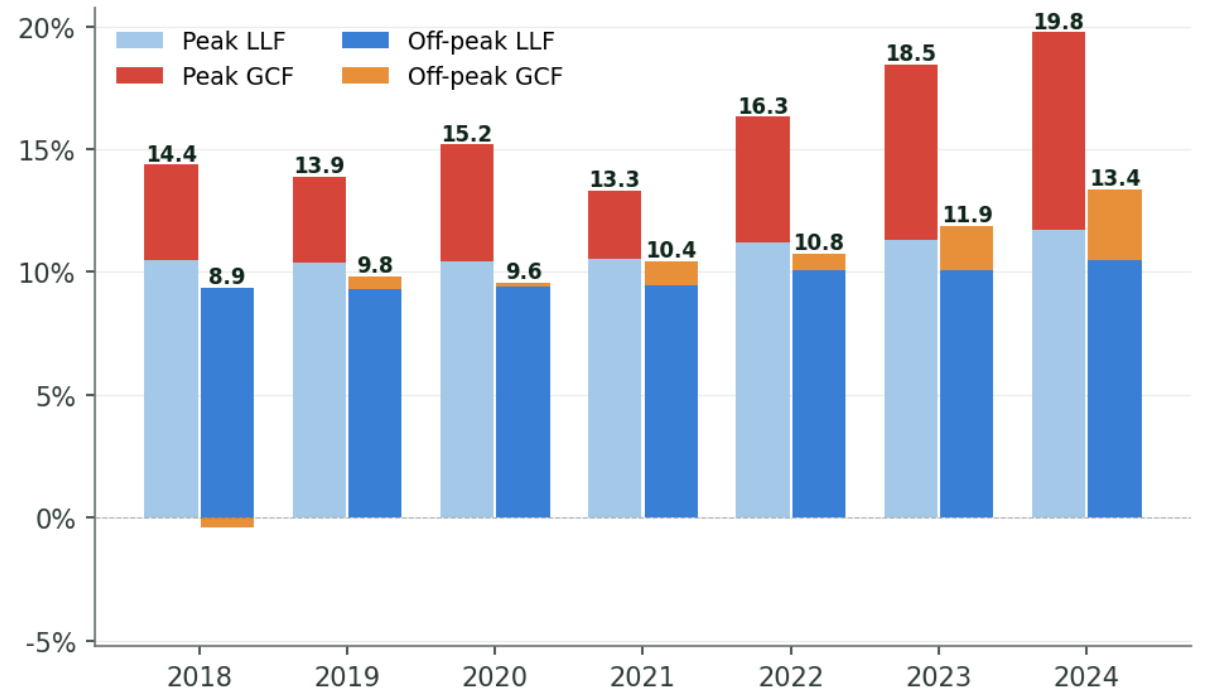
Southern Scotland

9.60%	14.17%	+4.57	19.75%	13.38%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)

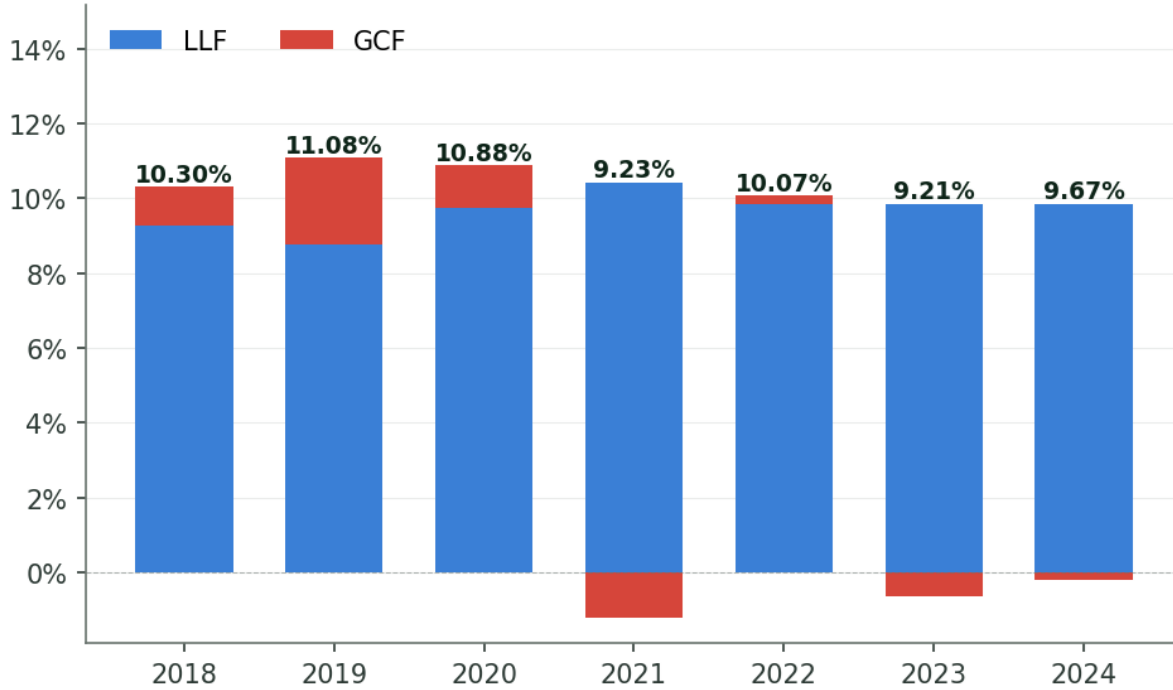




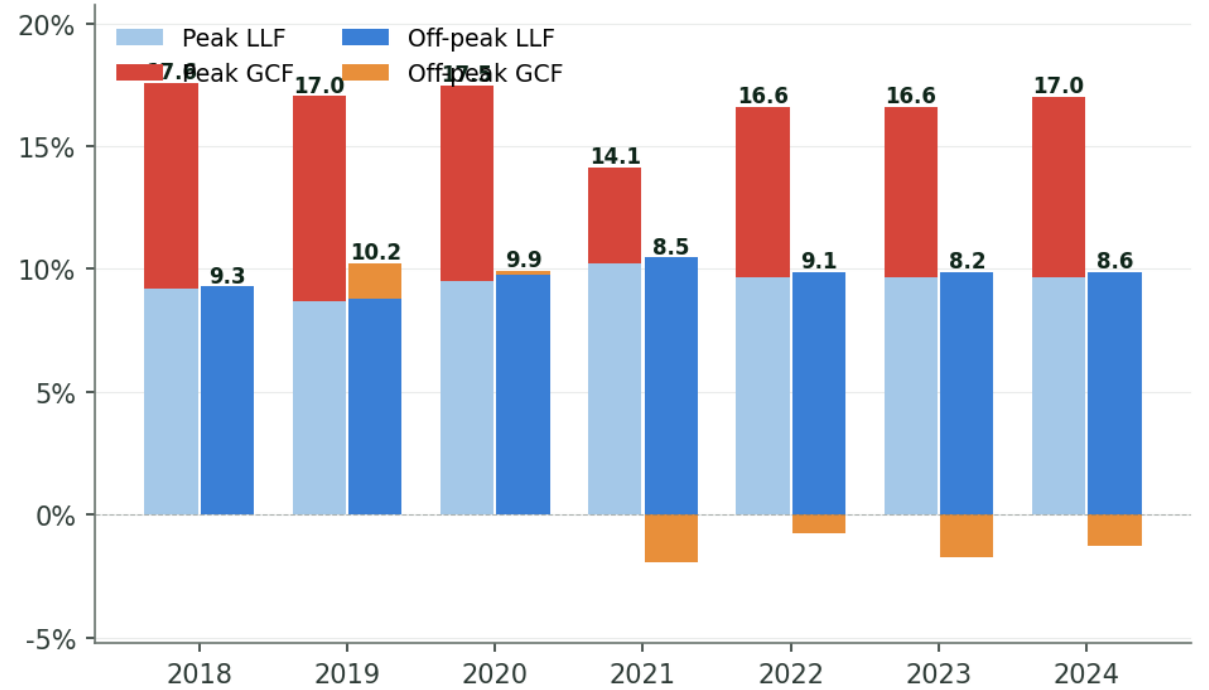
Northern Scotland

10.30%	9.67%	-0.63	17.00%	8.63%
2018 total	2024 total	Δ	2024 peak	2024 off-pk

Full year · LLF + GCF stacked



Peak (SP 33-38, left) vs Off-peak (right)



02

Red-lined changes to BSCP128

Smartest and Elexon

Issue 119, treatment of rising losses

Observations re

- 1) embedded export
- 2) site-specific losses

1) Embedded export line loss factors

BSC treatment of LLFs for embedded export is incorrect, resulting in understatement of losses.

BSC Procedure 128 re Line Loss Factors V13.0, 3.1 LLF Methodology Principles, Principle 6 states:

“Non-EHV Generic LLFs for Import and Export at the same site where the voltage level is the same shall have the same values.”

Principle 6 (equal import and export LLFs) is correct if ...

export from a site is always consumed at the same site, thereby avoiding losses for distribution to that site,
but self-consumption in edge-case settlements do not need to address, as behind the meter netting can apply.

Principle 6 (equal import and export LLFs) is unhelpfully incorrect if ...

any of the export is consumed at another site, incurring losses on the intervening network, especially if consumption and generation are far apart,
in which case the embedded export does not eliminate losses; it may not reduce losses at all; so export should have a lower LLF than import.

We propose that the Issue 119 working group should consider amending Principle 6 as follows:

“Non-EHV Generic LLFs for Export shall be strictly lower values than for Import at the same site where the voltage level is the same.”

Issue 119 could also work with Distributors on a suitable methodology for assigning the lower export LLFs.

2) Site-specific losses

Site-specific calculations seem a reasonable approach for (large) EHV sites and other sites with defined connection arrangements as agreed by the DSO. **This should/must enhance accuracy of loss calculations.**

Where site-specific arrangements apply, the highest level of accuracy should be sought. It is not reasonable to tolerate readily avoidable error within the calculations.

Unfortunately, current site-specific loss calculations are misaligned with the applicable physics, so loss calculations are far less accurate than they could be.

Site import/export power is linearly proportional to current on the distribution network.

Network losses are proportional to the square of current on the distribution network.

} the physics

$\text{Loss} = (\text{LLF} - 1) \times \text{Volume} \rightarrow$ *incurs unnecessary inaccuracy*

← **current calculation**

$\text{Loss} = (\text{LLF}_{\text{new}} - 1) \times \text{Volume} \times \text{Volume} \rightarrow$ *would improve accuracy*

← **proposed revision for consideration**

BSCP128 requires site-specific LLFs are recalculated whenever site volume significantly changes, but this is a limited workaround.

If the LLF_{new} approach were adopted, all losses would be more accurate. Changes in volume would be treated automatically. Only network changes would require LLF recalculation.

Introduction

During [meeting three](#) for Issue 119, an industry expert presented suggestions for [BSCP128: Production, Submission, Audit & Approval of Line Loss Factors](#), including adding clarity and consistency to the Line Loss Factor (LLF) Methodology Principles. Elexon has used the feedback provided to re-draft some of the Methodology Principles. Elexon is seeking feedback on these changes, which will be presented to the BSC Panel as part of the Issue Report and any subsequent Change Proposal (CP).

Changes to BSC128

The changes made to BSCP 128 are:

- Adding Extra High Voltage (EHV) as a defined term to the BSC
- Removing principle 5, i.e.

~~5. Site Specific losses and the total Grid Supply Point Group (GSPG) losses shall be considered in the calculation of Generic LLFs.¹⁸~~

- Amending principle 7, i.e.

As a minimum, Generic LLFs shall be calculated ~~separately for Day and Night~~ using Seasonal Time of Day (SToD).

Changes to BSC128

The changes made to BSCP 128 are:

- Amending principle 9 to ensure the requirement is LDSO using the most recent BSC Year (March – April) when calculating LLFs, i.e.

LDSOs shall utilise Settlement data from a Settlement Run at R3 or greater and from a complete 12-month period, for calculating Generic LLFs. The 12-month period to be used shall be the most recent BSC Year¹⁹ ~~3-years~~ prior to the BSC Year for which the LLFs are being calculated.

Changes to BSC128

The changes made to BSCP 128 are:

- Removing principle 10, i.e.

~~10. Adjustments to calculation or application of LLFs, to take into account historic market wide issues noted in the BSC Auditor's latest Report, can only be made if agreed to be appropriate by the Panel.~~

- Amending principle 12 by making the requirement to calculate 'all generic LLFs' annual, i.e.

12. All Generic LLFs shall be re-calculated ~~at least every 2 years~~annually.

Changes to BSC128

The changes made to BSCP 128 are:

- Capitalising 'Relevant Change' in principle 12.
- Removing the scenario where a Default LLF could be changed mid-year, i.e.,

No changes shall be made to approved Generic LLFs mid year. Annual updates will have an effective from date of 1 April. ~~Where default LLFs have been applied due to an audit failure, these may be replaced with approved LLFs on a prospective basis as determined when the LLFs resubmitted by the LDSO have been approved by the Panel.~~

03

AOB

Any Other Business

Thank you