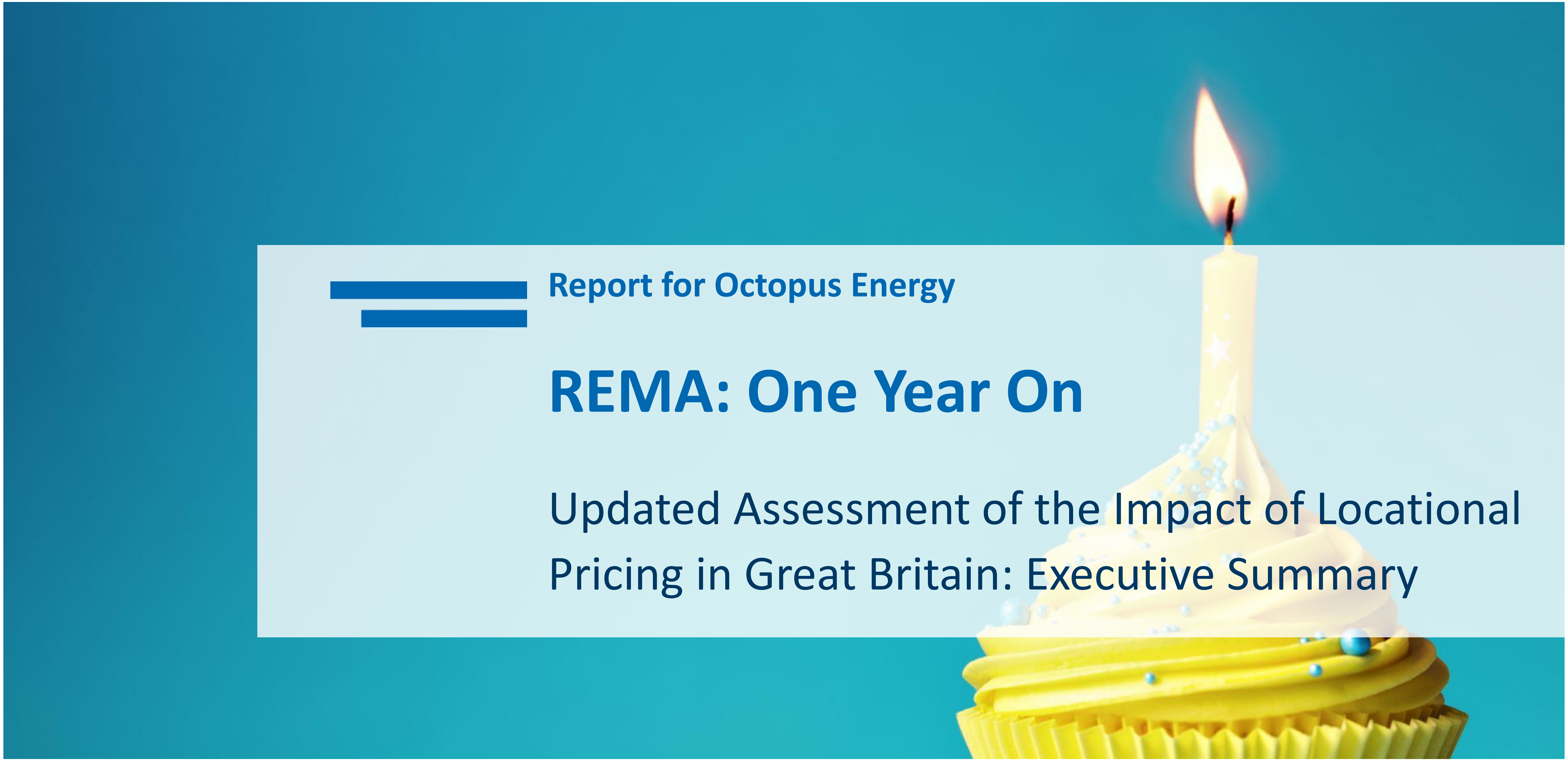

Report for Octopus Energy

REMA: One Year On

Updated Assessment of the Impact of Locational Pricing in Great Britain: Executive Summary

FTI CONSULTING

FINAL

10 July 2026

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Octopus has asked FTI Consulting to update our 2025 assessment of the benefits of locational pricing in GB: as of 2026 zonal design is still highly beneficial and nodal design even more so

Introduction and context

- Central to the Review of Electricity Market Arrangements ("REMA") debate in Great Britain ("GB") was whether GB should retain a single national wholesale electricity price or move to a locational wholesale pricing design (which is commonplace in many liberalised electricity markets).
- On 10 July 2025, the Government announced that it would not proceed with zonal pricing and in favour of Reformed National Pricing ("RNP"). Nearly a year on, however, limited, progress on RNP has been made.
- While RNP is being designed and implemented, household energy bills and concerns around GB industry's international competitiveness due to high energy costs continue to face significant political scrutiny.

Scope of work

- As part of the REMA debate, Octopus Energy engaged FTI Consulting in 2025 to assess the benefits of zonal pricing in GB.[1] Octopus Energy has asked FTI Consulting to refresh our previous locational pricing analysis using the latest available information and projections to understand whether it remains relevant as a potential (and timely) lever for reducing consumer bills. In this report we examine the following questions:

Is zonal pricing still beneficial for GB in light of latest information and given the current status of RNP?

Could nodal pricing offer even better outcomes for GB than zonal?

- In light of the consumer bill affordability debate and ongoing geopolitical instability, we have also been asked to explore whether Net Zero can help to mitigate gas price shocks.

Key findings from our analysis[1]

FES25 HT

Impacts relative to national pricing	Is zonal still attractive? ✓			Is nodal better? ✓		
	£ billion	£ billion	£ / HH[3]	£ billion	£ billion	£ / HH[3]
	NPV 2030-50	Annualised	Annualised	NPV 2030-50	Annualised	Annualised
Consumer:						
Operational benefits	54.8	3.7	39.2	72.7	4.9	51.8
Transmission savings	22.0	1.5	16.0	30.2	2.1	22.0
Siting benefits[2]	10-20	0.7-1.4	20-40	10-20	0.7-1.4	20-40
Societal operational benefits:	24.2	1.6	-	30.7	2.1	-

Other highlights:

- Largest operational benefits arise in the zone across Northern England & Wales (Zonal: £33.7 billion, Nodal: £38.9 billion, NPV 2030-50)[2]
- 'Phantom exports' to France under national pricing cost GB consumers £18.7 billion (NPV, 2030-50)
- Implementation timeline: 2-3 years

Notes: (1) As with any modelling, our results are inevitably a function of the input assumptions we use. We have sought to transparently document these, with full details in Section 6 of the Main Report. (2) The Department for Energy Security and Net Zero ("DESNZ"), estimates the siting benefits from the Strategic Spatial Energy Plan ("SSEP") at £10-20 billion on an NPV basis (2030-50) or "gradually accumulate post-2030, reaching a £20-40 saving on the typical annual dual fuel household bill by 2040" (Source: Reformed National Pricing ("RNP"), DESNZ, April 2026 (link), p. 17). (3) HH = Household

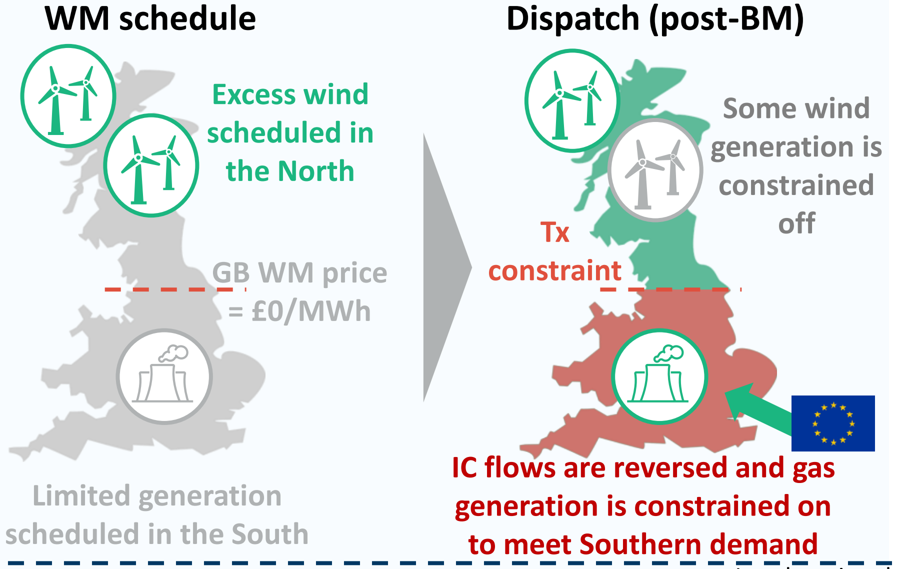
Locational pricing delivers primarily operational benefits, thus complementing any siting levers pursued in parallel. We are not aware of any credible alternative to achieve this

Locational pricing delivers operational benefits, even if siting is unchanged

National

Under national, excess wind generation is often (self-)scheduled in the North, with limited generation in the South. Storage behaviour can exacerbate this.[1]

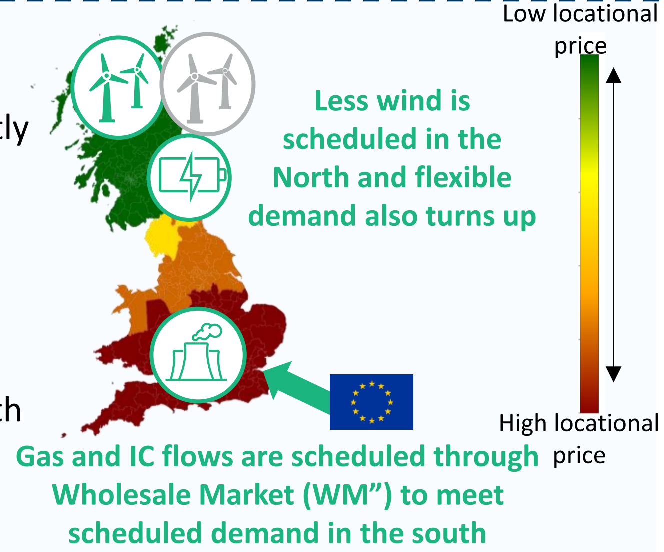
This dispatch is not physically feasible, so NESO has to redispatch assets at significant cost to consumers.



Locational

Under locational pricing, congestion is reflected directly in the wholesale prices. Locational pricing signals incentivise a schedule that aligns better with physical reality and reduces or eliminates redispatch costs.[2]

Two-way assets play a key role: for example, flexible demand in the North helps absorb excess wind generation, whilst gas and interconnectors in the South are scheduled directly through the Wholesale market ("WM").



Based on the illustrative (and highly stylised) example on the left, the key benefits of locational pricing are:

1. Wholesale electricity prices **reflect actual value of electricity at a given time and place**. Consumers in locations rich in renewable resources, can benefit from comparatively lower wholesale prices.
2. The **market design aligns to the realities of the physical system** (i.e. constrained transmission network), whereas the current approach of network build seeks to make the physical system better approximate the current market. **Locational pricing reduces the economic case for transmission build:** some may be uneconomic.
3. Flexible two-way assets are, by design, acting in line with the system needs: there is **no need to apply policy 'patches'** to fix issues such as repetitive re-trading ("RRT").[3]
4. GB's renewable output is used to meet domestic demand and European demand when this is physically consistent with the limits of the GB transmission grid and the prevailing economic signals. Unlike under national pricing, GB's renewable output is not sold to Europe and subsequently re-dispatched due to internal congestion (referred to as **'phantom exports'**).
5. Additional siting benefits (not evaluated in this report) emerge due to locational pricing: large energy intensive electricity demand would – for economic reasons – receive stronger incentives to site in areas of excess renewable generation to access cheaper electricity. This would mitigate the need for policy makers to find alternative incentives for such siting and reduce the economic case for increased transmission build (see slide 8).

Notes: (1) Repetitive Re-trading (RRT) by electricity storage in transmission constraint periods, Ofgem, June 2026 (link), How the Current GB Wholesale Market Design Fails to Make Best Use of Flexible Assets: the Curious Case of Batteries Flip-Flopping in the BM, FTI Consulting, December 2024 (link). (2) Under zonal pricing, inter-zonal redispatch is alleviated, but redispatch costs remain within zones. Under nodal, all redispatch costs are eliminated. (3) As of June 2026, NESO has shortlisted several potential 'patches', none of which fully resolve the issue. See: Constraints Collaboration Project (CCP) Webinar, NESO, Jun 2026 (link).

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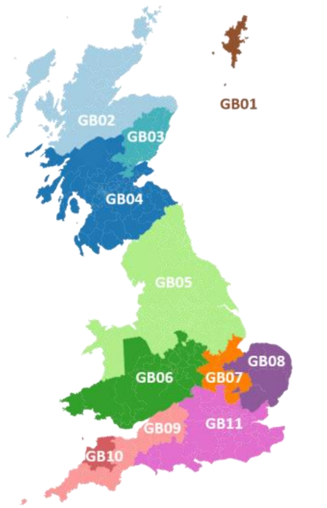
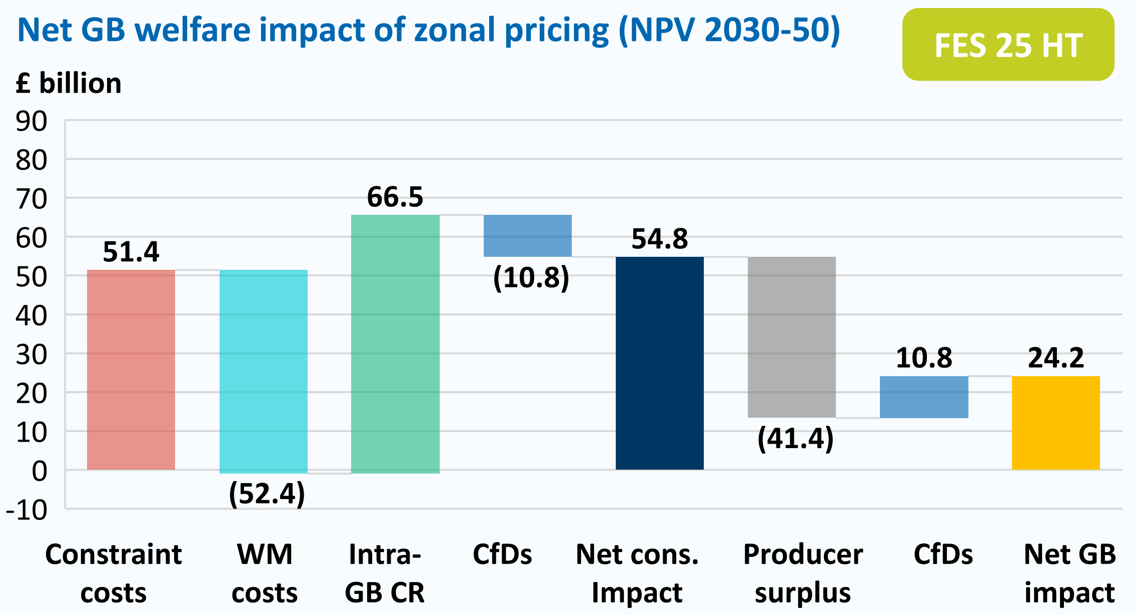
Our latest analysis finds, again, that zonal pricing delivers consumer benefits of **c. £55 billion (PV, 2030-2050)** and **c. £24 billion societal benefits** from an increase in operational efficiency

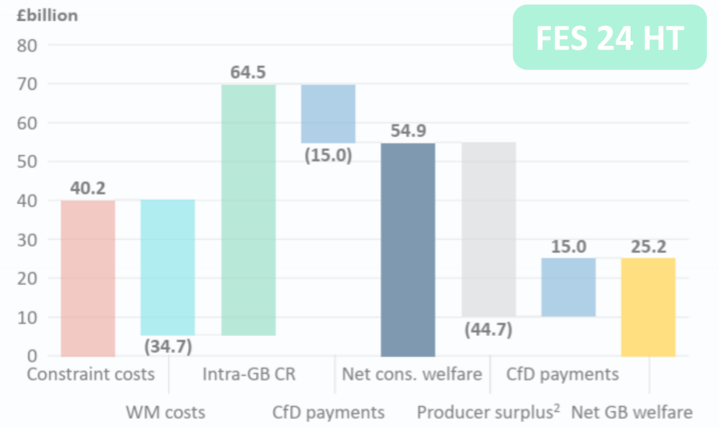
GB price zone map



Net GB welfare impact of zonal pricing (NPV 2030-50)



Net GB welfare impact of zonal pricing (NPV 2030-50)



Our assessment of zonal pricing, published in February 2025 (under FES 24 HT) estimated £55 billion (PV, 2030-2050) GB consumer benefits.

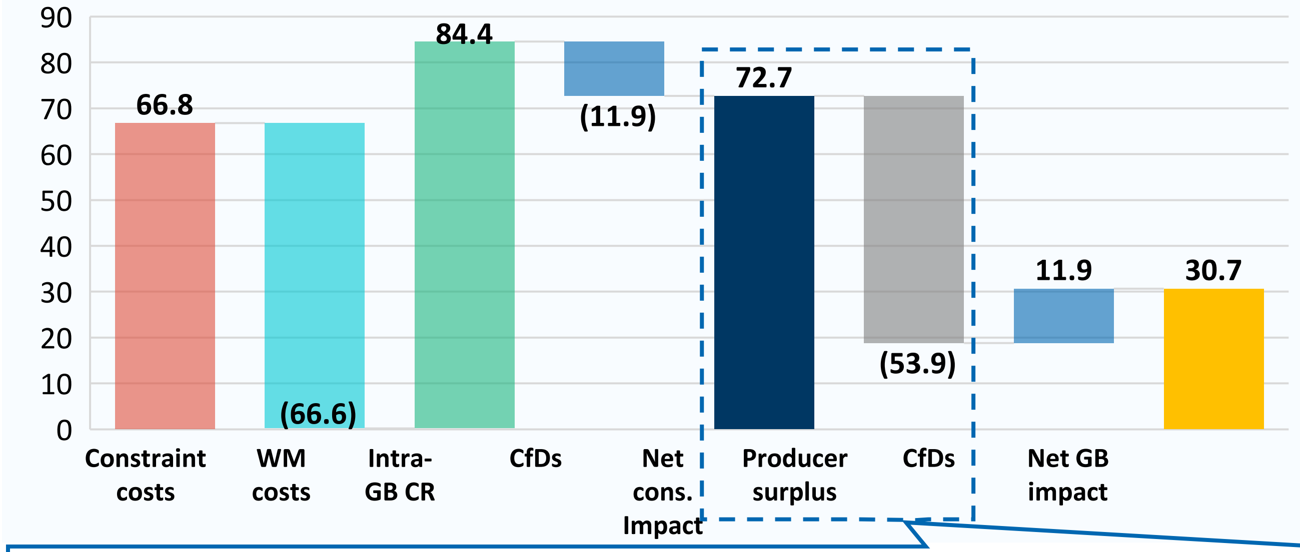
- Our previous analysis in 2025, in the lead-up to the REMA decision, found that zonal pricing could deliver c. £55 billion (PV, 2030-2050) in consumer benefits under the FES 24 Holistic Transition ("HT") scenario assuming perfect central planning, or up to £74 billion with unpredictable shocks inhibiting delivery of the central plan.[2]
- We have updated our analysis under the FES 25 HT scenario and continue to find that GB consumers are the main beneficiaries of locational pricing, with aggregate **consumer benefits of £54.8 billion**, relative to national pricing (NPV, 2030-50).
- This corresponds to a c. **£40 annualised benefit per household** (operational benefit only).[3] There would also be additional benefits relating to improved siting (£20-40 per household, based on DESNZ's estimate of SSEP benefits) and transmission savings (up to £16 per household).[1]
- These benefits are mainly driven by a **reduction in constraint costs** and the **creation of intra-GB congestion rents**, which more than offset the changes in wholesale prices.
- Producers are to a significant extent shielded by an assumed grandfathered Contract for Difference ("CfD") design that includes top-ups for all CfD generators calculated relative to the zonal WM price. But overall producer surplus remains reduced.
- The **£24.2 billion net societal benefit of zonal pricing[4]** remains high and positive.

*Notes: (1) See slide 3. (2) Impact of a Potential Market Design in GB, FTI Consulting, 24 February 2025 (link). (3) Household benefit calculated for average household consumer: annualised benefit per household = annual aggregate consumer benefits (£ billion) / Total GB demand (MWh) * Demand per household (MWh), with all demand data from FES 25 HT. We then annualise across the modelling period. We assume that household demand is the same across GB. (4) This comprises the impacts on constraint costs, WM costs, intra-GB congestion rents and producer surplus. CfDs represents a transfer between stakeholders and therefore does not enter the SEW figure.*

Nodal pricing is, as expected, even more beneficial than zonal, generating **£73 billion** in consumer benefits relative to national pricing (and £23 billion if Net Zero is not reached).

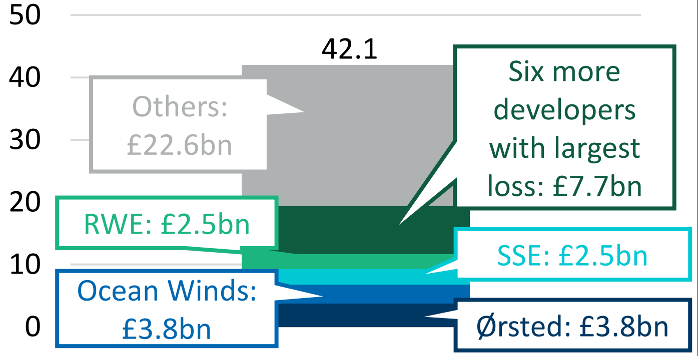
Net GB welfare impact of nodal pricing (NPV 2030-50)

FES 25 HT



- Many producers receive materially less payments from consumers under locational pricing. Under the status quo, generators would retain £42 billion of additional producer surplus, relative to nodal.
- Almost half of this, £19 billion, is reduced consumer payments to just ten developers. Even just delaying nodal by two years would increase net producer surplus for these ten developers by £4.4 billion (NPV, 2030-31).

Additional retained producer surplus under national (£ billion, NPV 2030-50)[3]



Nodal pricing continues to have the highest benefits of the market designs examined under FES 25 HT (i.e. relative to national and zonal)

- Our analysis in 2025 focused solely on zonal pricing, due to developments in the REMA debate. Our previous (2023) assessment for Ofgem found the consumer and societal benefits of nodal pricing to be £50.8 billion and £24.0 billion, and £30.7 billion and £15.3 billion for zonal pricing (NPV, 2025-40, real 2022).[2]
- In the latest analysis we estimate that under FES 25 HT, nodal pricing has consumer benefits of **£72.7 billion** relative to national pricing (NPV, 2030-50). This corresponds to a £52 annualised benefit per household (operational benefits only). There would also be additional benefits relating to improved siting (£20-40 per household, based on DESNZ's estimate of SSEP benefits) and transmission savings (up to £22 per household).[1]

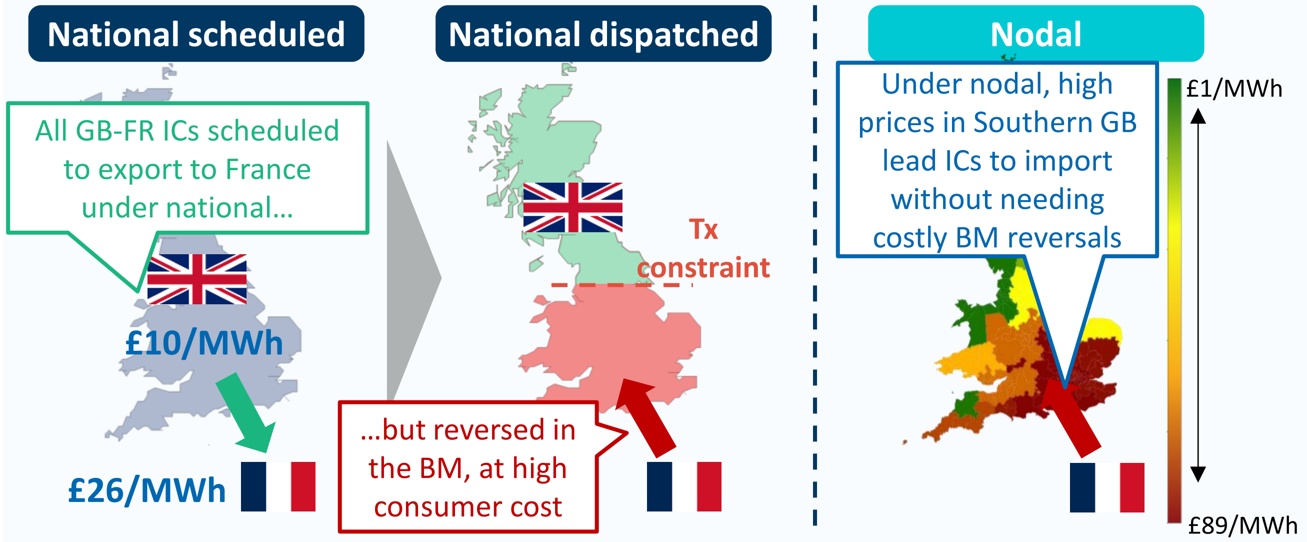
Nodal pricing helps reduce consumer bills (and increase societal welfare) even in a scenario where GB does not achieve its Net Zero ambitions

- Under the FES25 Falling Behind ("FB") scenario, nodal pricing delivers £23.3 billion of consumer benefits (NPV, 2030-50), corresponding to an £18 annualised benefit per household.[3]
- This indicates that locational pricing is a 'no regrets' policy even if we do not meet our Net Zero targets, and adds to our previous findings that locational pricing is as well a safety net with respect to transmission delays, nuclear delays and shocks to offshore wind build-out.[4]

*Notes: (1) See slide 3. (2) Assessment of locational wholesale electricity market design options in GB, FTI Consulting, October 2023 (link). (3) Household benefit calculated for average household consumer: annualised benefit per household = annual aggregate consumer benefits (£ billion) / Total GB demand (MWh) * Demand per household (MWh), with all demand data from FES 25 HT. We then annualise across the modelling period. We assume that household demand is the same across GB. (4) Reduction in net producer surplus aggregated across all transmission-connected offshore wind, onshore wind, run-of-river hydro and pumped storage assets – both operational and under development. These technologies cover 88% of the total loss in net producer surplus.*

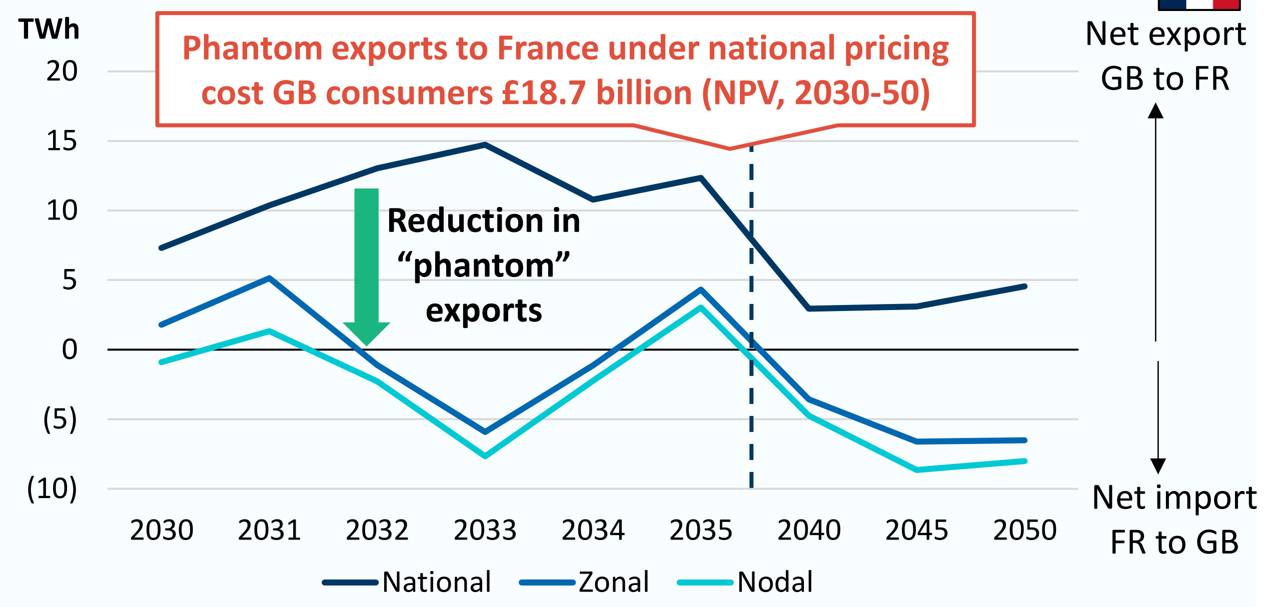
‘Phantom exports’ to France are expected to cost GB consumers £19 billion (NPV, 2030-50). These are 85% mitigated under zonal pricing and eliminated under nodal pricing

Illustration: French IC “phantom exports” – 9am, 29th January 2045



- Under national pricing, low GB wholesale prices often lead ICs to schedule to export from GB to Europe, but these exports often cannot be physically delivered due to intra-GB transmission constraints (referred to as ‘phantom exports’), requiring ICs to be reversed in the Balancing Mechanism (“BM”).
- A recent example of this occurred during the heatwave on evening of 23rd June, when scheduled exports contributed to system constraints, requiring NESO (and hence consumers) to pay c. £3 million to reduce exports in the BM.[1]
- ‘Phantom exports’ benefit European consumers because they lower their WM prices. However, this comes at the expense of GB consumers as they lead to higher GB WM prices and require costly NESO balancing actions to resolve.
- The issue is significantly mitigated under zonal pricing and does not occur under nodal pricing, as exports are only scheduled when they can be physically delivered.

Scheduled flows on GB-FR ICs (TWh)



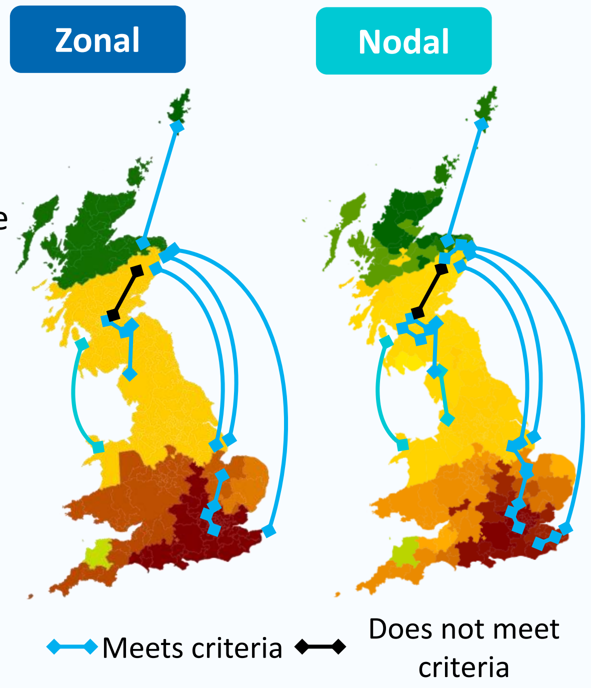
- Phantom exports are most prevalent in France as it is the most interconnected with GB, and all GB-FR ICs are located in the South.[2]
- Under national, ‘phantom exports’ to France cost GB consumers £18.7 billion, through a combination of higher WM costs, higher constraint costs but lower CfD top ups (due to higher WM prices). We have not quantified the additional ‘phantom exports’ to other European countries, but these would increase the total cost to GB consumers.
- French consumers receive £40.4 billion benefits (NPV, 2030-50) from phantom exports, through reduced WM prices in France.[3]
- Phantom exports are 85% mitigated under zonal pricing and eliminated under nodal pricing.

Notes: (1) Interconnector flows, Elexon (link). Interconnector Requirement and Auction Summary Data, NESO (link). (2) Under FES 25 HT, GB-FR IC capacity is 4 GW out of 11.7 GW of total GB IC capacity in 2030, and increases to 7.65 GW out of 21.4 GW in 2050. (3) We do not quantify any costs that French consumers may bare in their local redispatch.

Locational pricing reduces the economic case for transmission (up to £30 billion could be uneconomic) and supports GB’s data centre ambitions through lower electricity costs

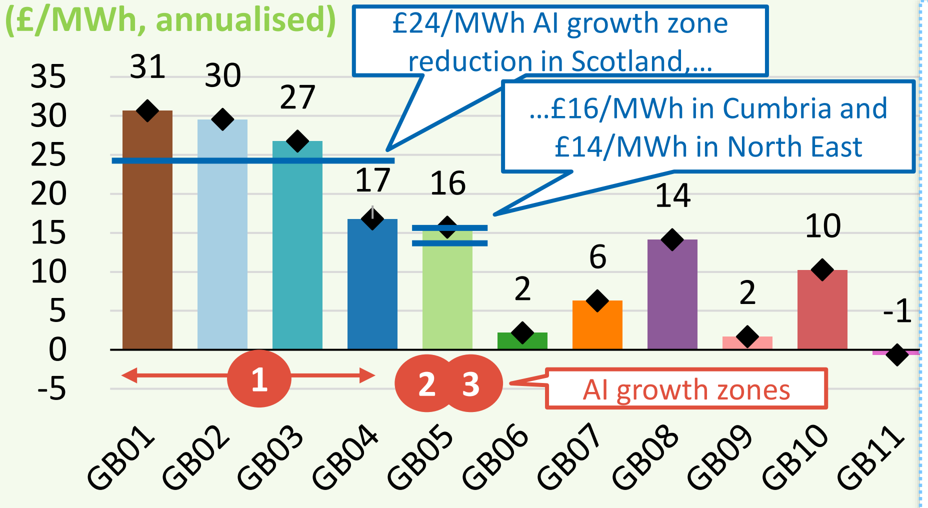
Recommended GB transmission projects for reassessment under LMP

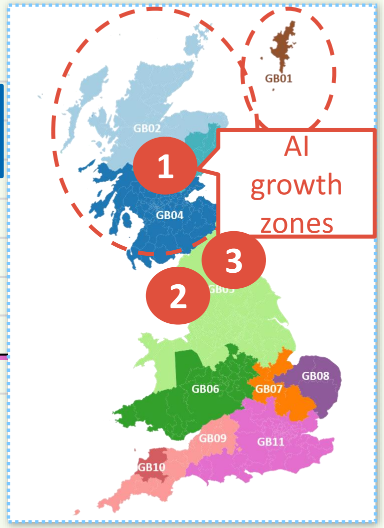
- Locational pricing reduces the economic case for intra-GB transmission investment. This enables the most critical transmission assets to be prioritised, thus reducing costs for customers and alleviating pressure on supply chains.
- In previous analysis,[1] we sought to identify factors that affect the economic benefits of transmission. Our assessment indicated that transmission is **less likely to be economically beneficial** under locational pricing if:
  - The project connects two locations with narrow locational price differentials; or
  - The project is likely to facilitate large volumes of exports from GB to Europe (see previous slide on ‘phantom exports’).
- **Under zonal pricing, 9 out 10 new inter-zonal projects** from Beyond 2030 (**worth £22.0 billion**, NPV 2030-50) meet these criteria and are less likely to be economically beneficial, while **14 out of 15** (**worth £30.2 billion**, NPV 2030-50) new Beyond 2030 projects meet these criteria **under nodal.**[2]



- These projects could be prioritised for reassessment if locational pricing were implemented.

Consumer benefits of zonal pricing and cost reductions under AI growth zones (£/MWh, annualised)





- Locational pricing supports GB’s data centre ambitions by incentivising data centres to site close to areas of excess renewable generation. Connecting ‘behind constraints’ would likely reduce connection times and align well with RNP ambitions, while removing the need for AI Growth Zones to incentivise data centres to locate in more remote areas.[3]
- Locational pricing would reduce electricity costs for data-centres. A 500MW data centre located in Scotland could save £117m under zonal pricing and £149m under nodal pricing per year.
- Siting data centres in the North further reduces the need for additional transmission and increase the benefits of locational pricing – previous analysis showed that shifting 1GW data centres to Scotland would reduce the benefits case under zonal pricing of a major transmission line between Scotland and England by 51%.[4]

Notes: (1) Helping Hercules: How to Make Transmission Build-Out to Achieve Net Zero Easier, FTI Consulting, July 2025 (link). (2) We focus on Beyond 2030 as these are the least developed projects (relative to e.g. ASTI projects and those in Clean Power 2030) and exclude intra-zonal projects in the zonal assessment. See slide 48 of Main Report for detailed methodology. (3) Delivering AI Growth Zones’, Department for Science, Innovation and Technology, November 2025 (link). (4) Helping Hercules, FTI Consulting, July 2025 (link).

RNP has fallen short of what was initially promised and, unlike locational pricing, does not address operational benefits. Locational pricing can also augment the SSEP's siting impacts

RNP interventions[1]	On track?	How can RNP interventions be complemented by locational pricing?
Siting and investment levers	✗ The Strategic Spatial Energy Plan ("SSEP") pathway selection and publication dates both delayed relative to REMA announcement.	✓ ▪ Locational market prices have the potential, all else equal, to encourage new generators to site in areas of higher average prices and new demand to site in areas of lower average prices, which reduce future constraint costs and need for transmission investment by better matching local supply and demand. ▪ These visible price signals are complementary to, and can **help to augment the SSEP** in delivering its siting targets, as well as reduce the need for additional siting policies (e.g. the AI Growth Zones Plan).[2] ▪ We do not quantify any benefits arising from different siting decisions under locational pricing compared to national. The operational benefits we report are therefore **additive to – and materially higher** than – the £10-20 billion (PV) benefits reported by DESNZ under the SSEP.[1]
Further bear down on network constraint costs	✗ Multiple transmission projects have recently been delayed, with transmission build taking 12-14 years on average.[2]	✓ ▪ DESNZ cites transmission build and dynamic line rating as the two main levers – these interventions will both be needed in any case and are not affected by market design. ▪ Locational pricing enables more efficient use of flexible assets, which helps to avoid **uneconomic transmission build** and the associated cost to consumers (see slide 8). More granular locational pricing signals would also facilitate multiple potential future reforms, including the development of a CATO regime and co-optimisation of energy and ancillary services.
Improve system operability and efficiency	✗ Balancing and settlement CfI consultation launched behind original schedule.	✓ ▪ NESO recognises that: "*The volume of redispatch projected under national pricing… is likely to be significantly challenging and inefficient, in turn having a direct impact on consumer bills. Reforms to balancing arrangements alone cannot address the underlying cause*".[3] **Locational pricing reduces the need to implement BM reforms** as redispatch costs are smaller (or non-existent, under nodal). These reforms should nonetheless be implemented under national or locational pricing. ▪ Ofgem announced in June 2026 that it is minded to grant cap and floor support to 16 LDES projects in Window 1. Most of these are located behind constraints and hence likely to worsen issues of RRT and constraint costs **unless combined with locational pricing**.[4] NESO estimated the costs of RRT at £136 million in 2024/25, and they are expected to increase in future with more storage deployment.[5]

Our benchmarking against other jurisdictions shows locational pricing could be implemented within 2-3 years in GB

Notes: (1) Reformed National Pricing (RNP), DESNZ, April 2026 (link) (2) Delivering AI Growth Zones, Department for Science, Innovation & Technology, November 2025 (link); (3) RNP Balancing, Settlement, and Dispatch: Slides for BSC Panel, NESO, February 2026 (link) (4) Ofgem stated that the projects are "anticipated to reduce costs by alleviating pressure on transmission and distribution networks and minimising the need for costly investment in new infrastructure or constraint management", albeit it is unclear how Ofgem verified this given that the projects' constraint cost impact was not accounted for in the decision (link). (5) Reformed National Pricing: Balancing, Settlement and Dispatch Call for Input, NESO, February 2026 (link), p.12.

Go-live of locational pricing could be achieved within two to three years by a committed government, given extensive assessment, design and consultation to-date

Implementation timelines for locational pricing

- Experience from other jurisdictions suggests that **design, testing and implementation of a locational market design could be completed within 3-4 years,** as shown in the case studies for the Midcontinent Independent System Operator ("MISO"), California Independent System Operator ("CAISO"), and Alberta Electric System Operator ("AESO") opposite.
- The key element of locational pricing implementation is the **assessment and design** itself (which in GB has arguably already been going for 4 years – though more intensively in H1 2025). Testing and implementation would need to be driven by a committed and determined Government, with preference for pace over perfection, but go-live could be achieved within 2-3 years from 'go' decision.
- Some aspects of design would then **continue to be refined after go-live:** i.e. not all reforms need be prioritised for "Day 1"; some could be progressively introduced once locational pricing has been embedded.
- Given this, if a decision to implement locational pricing is made in Summer 2026, **locational pricing go-live could be achieved by Summer 2029**.

Locational pricing implementation timelines from North American jurisdictions

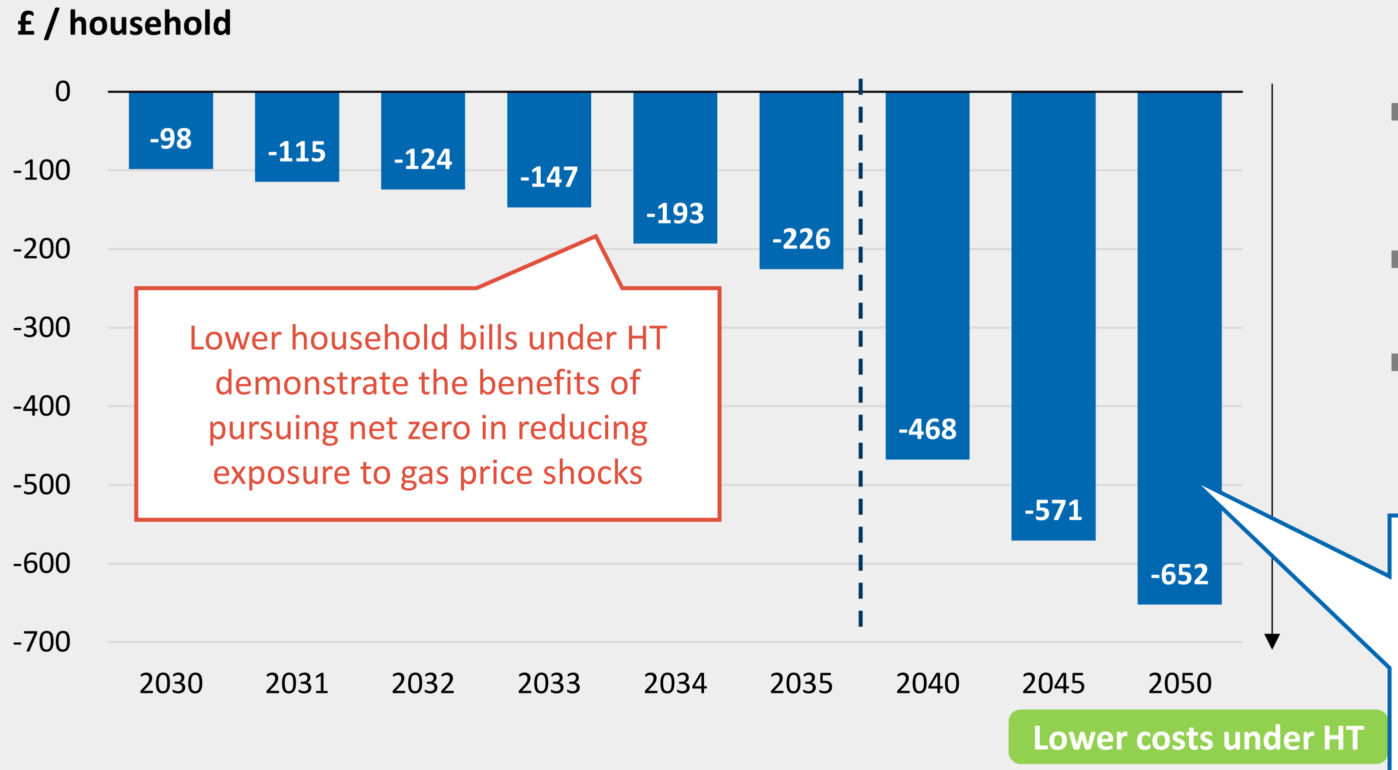
	Assessment	Design	Testing and implementation
MISO	2001-2002	2002-2004	2004-2005
CAISO	2003-2005	2005-2007	2007-2009
AESO	2023-2024	2024-2026	2027-2028
ERCOT	2002-2003	2003-2006	2006-2010
IESO	2016-2017	2017-2019	2019-2025
GB	2022 to 2025 (more intensive in H1 2025)		Could be completed in 2-3 years from 'go' decision

Delayed due to creation of own protocols and use of multiple software vendors (ERCOT) and covid pandemic (Ontario IESO)

Pursuing Net Zero mitigates consumers exposure to future gas price shocks under national pricing, leading to up to £652 / household lower annual dual-fuel bills compared to FB

- Recent years have demonstrated both the volatility of international gas prices and the knock-on impacts for GB consumer bills, firstly through the conflict in Ukraine (2022) and more recently through conflict in Iran (2026).
- In order to assess whether Net Zero can help to mitigate GB consumers' exposure to potential future gas price shocks, we model the variable components of both consumer electricity and consumer gas costs under both the HT and FB scenarios using historical gas prices from 2022.

Decrease in variable electricity and gas components of household bills under FES 25 HT relative to FES 25 FB, both under national pricing (£ / household)



- Across all modelled years, we find that a gas price shock akin to the 2022 shock leads to higher energy household bills in the FB scenario compared to the Net Zero HT scenario.[1] This is because under FB, consumers are more reliant on gas for heating and road transport (see call-out below).
- In contrast, a larger share of heating and road transport demand is electrified in HT. Although there is a small increase in electricity costs relative to FB, this is more than offset by a large reduction in gas costs.
- This demonstrates the effectiveness of Net Zero as a mitigation to reduce GB consumers' exposure to future gas price shocks.
- This is most pronounced by 2050, when all household heating and road transport demand has been electrified under HT such that the variable component of household dual-fuel bills is £652/year lower compared to FB during a gas price shock.

Electrification of road transport and heating demand

	Holistic Transition	Falling Behind
No new petrol / diesel car sales	2030	2040
No new gas boilers	2035	Never

Notes: (1) We assess only the variable electricity and gas components of household energy bills.

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