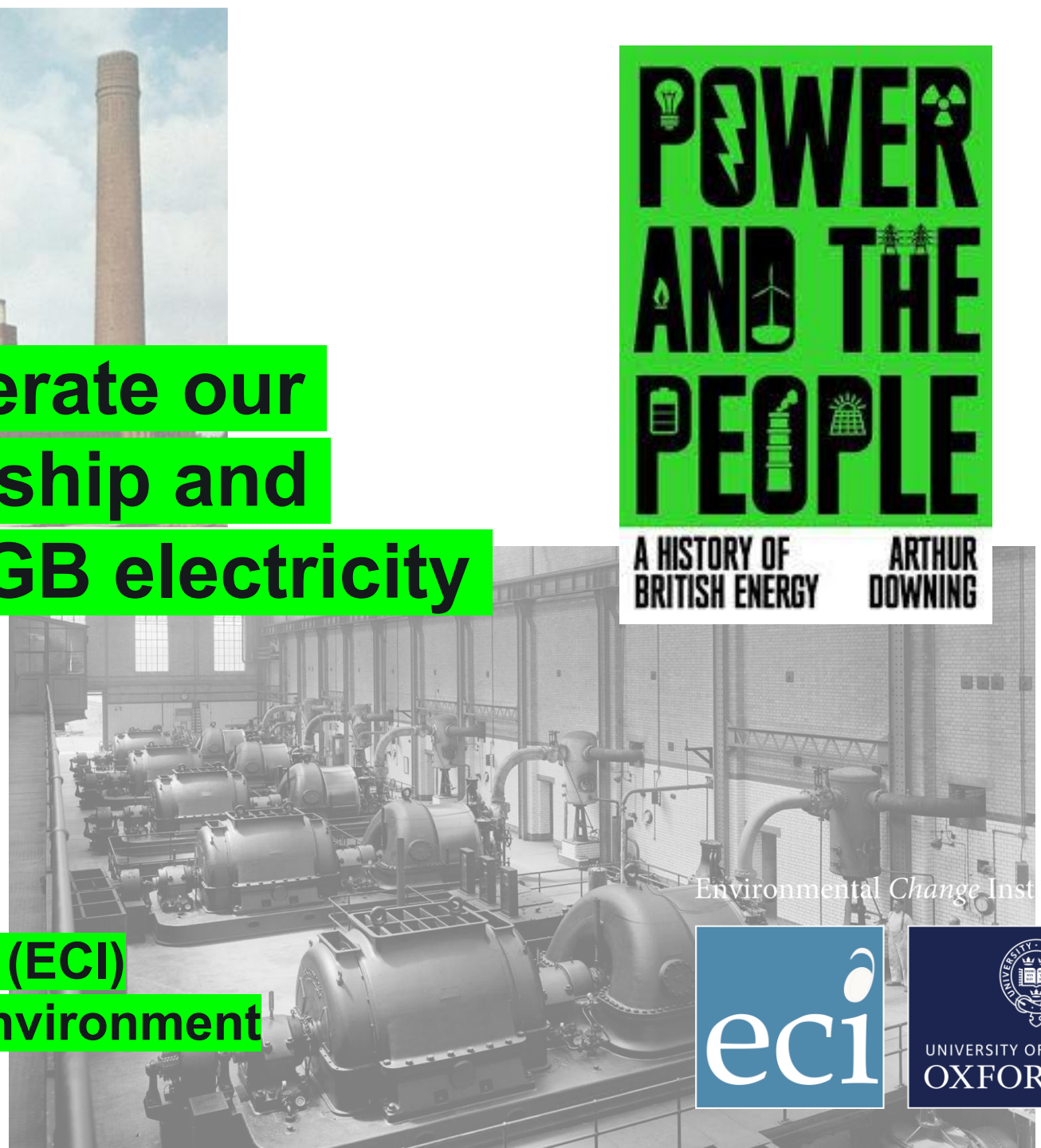
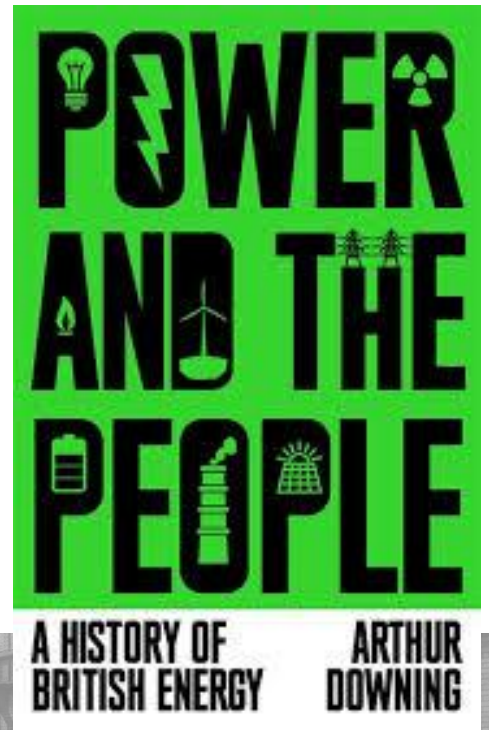




Should the state generate our power? Public ownership and public control in the GB electricity system



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Future Leaders Fellow
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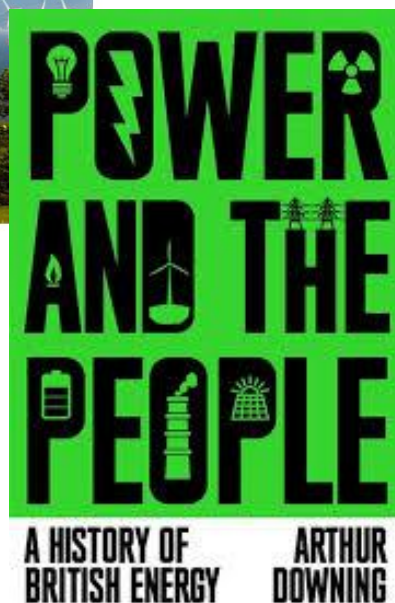
ENERGY

Great British Energy—should the state generate our power?

A publicly owned company could help fix the UK's crumbling market, squash bills and compete with the USA and Europe

By Donal Brown

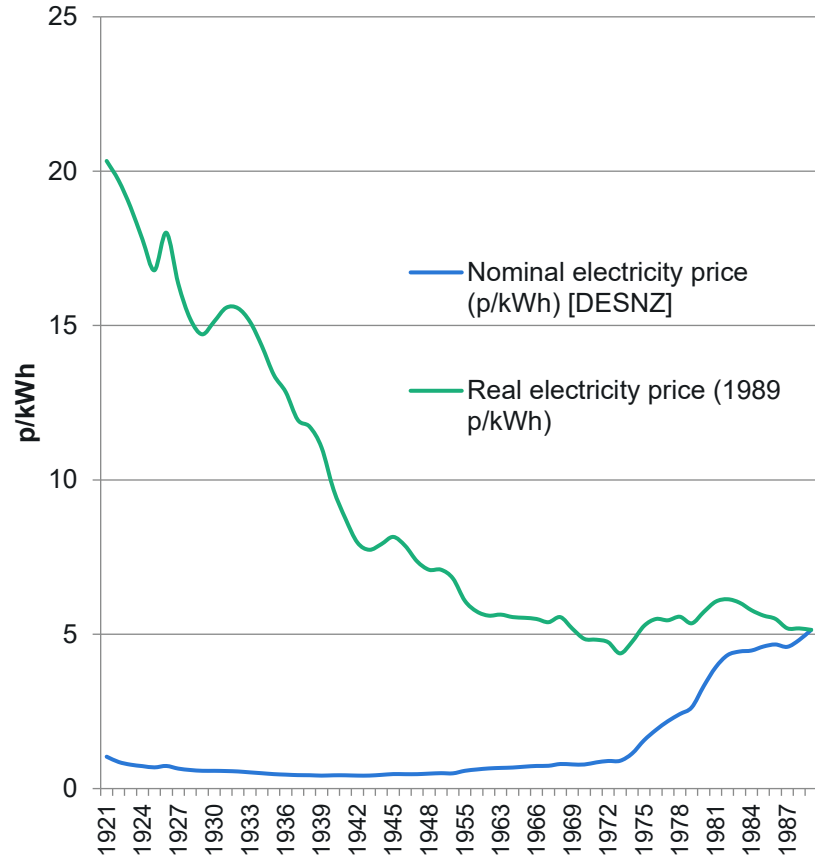
April 06, 2023



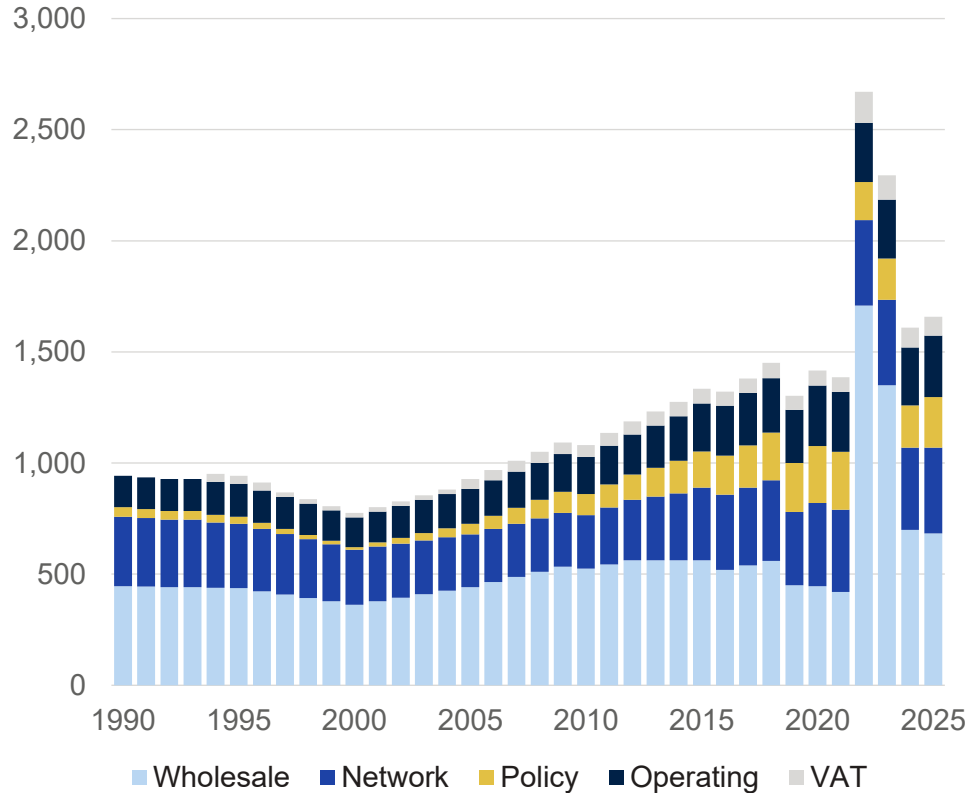
Key themes of the talk

1. The UK has seen a structural increase in electricity prices since privatization, which are unlikely to fall under Clean Power 2030
2. These high prices represent an existential threat to the net zero project as are a gift to its political opponents
3. Very limited detailed work has been done on the costs and benefits of a public power system
4. We model three scenarios:
 1. Sc1: Status quo privately financed
 2. Sc2: Public control (derisked private)
 3. Sc3: Full public ownership
5. We find the Sc3 the full public variant has significantly lower costs of electricity
6. However, adopting conventional macroeconomic assumptions suggests this would increase gilt yields
7. We find the savings are still substantial even when accounting for increases in debt service payments
8. Nonetheless moving to a public sector net wealth or European style accounting treatment of public corporations would mean this productive investment didn't count towards the national debt

Affordability: the real dual-fuel bill has risen 76% since 1990



Decomposition of average real UK household dual-fuel bill, 1990–2025 (£, 2025 prices)



+76%

real increase in a typical household's heat and electricity bill since 1990

4% → 14%

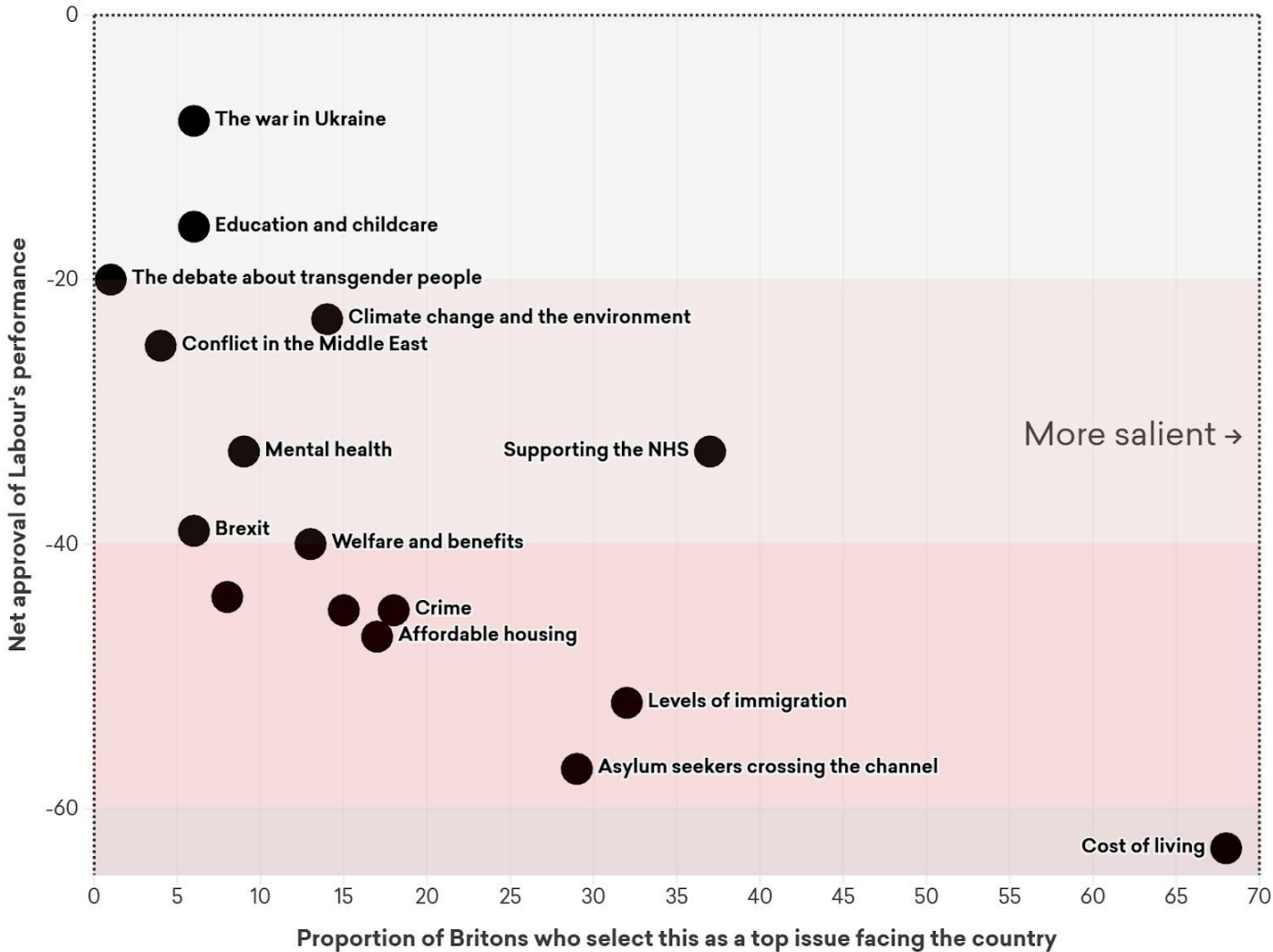
policy costs as a share of the bill (1990–2025): a 430% increase, recovered through regressive levies rather than taxation

Affordability as measured here: absolute and relative cost, exposure to volatility (the 2022 wholesale spike), and — as the components show — who bears the cost of decarbonisation.

Figures 3 & 5 in Brown & Pauker. Sources: DESNZ (2026a); Ofgem (2025, 2026).

Labour's approval is lowest on issues that matter most to the public

How well or badly would you say the current Government is doing on each of the following issues?

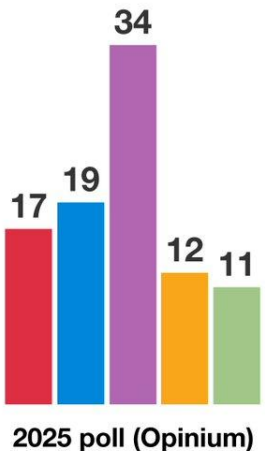
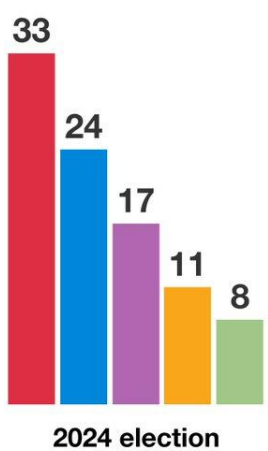


STATS
CITIES

Voting intention amongst Brits on less than £20k

YouGov exit poll, July 2024 / Subsamples from Opinium poll, 26-28 March 2025

● Lab ● Con ● Ref ● LD ● Grn



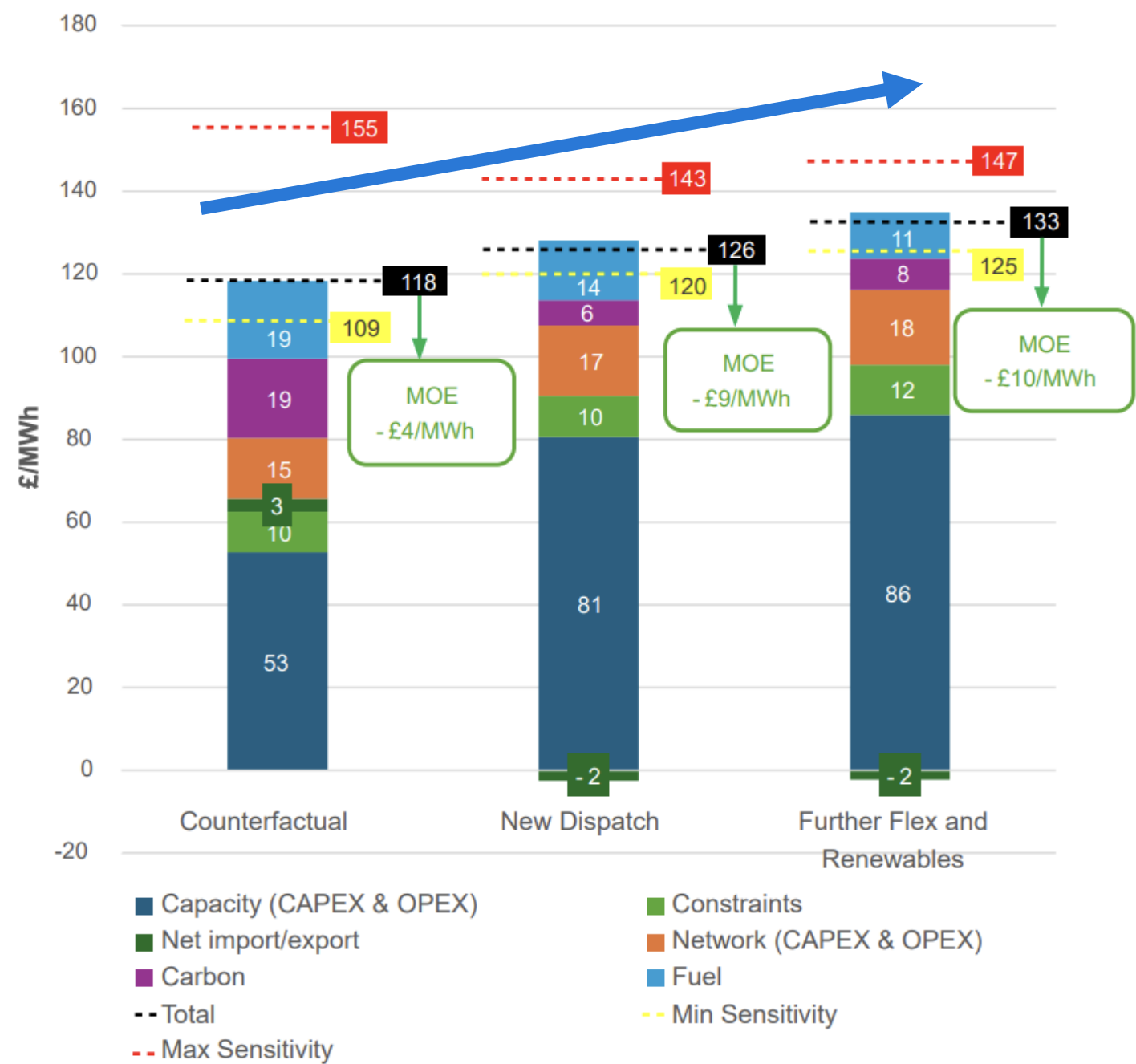
“The Telegraph
Nigel Farage is right:
net zero is the new Brexit”

Pollsters claim that the British public ‘overwhelmingly supports’ radical policies to tackle climate change. Are they sure?



Clean Power 2030

“Clean Power 2030 ... can be delivered **without increasing costs** for consumers, without compromising security of supply and while bringing local economic and job opportunities.”
NESO 2024



Summary of issues in GB market design

3. Constraint costs

Generators self dispatch their power onto the system, ignoring grid constraints and driving up balancing costs.

4. Unrealised Demand Side Flexibility

Energy suppliers face low/uncertain rewards for DSF, while consumers are expected to shift behavior to provide system stability. Leading to an undersupply of DSF.

1. Inframarginal rents

Low carbon generators receive high wholesale price + RO / CM subsidies.

2. Balancing rents

Gas power plants continue to set wholesale prices and extract inflated profits to balance the system, despite providing <5% of generation.

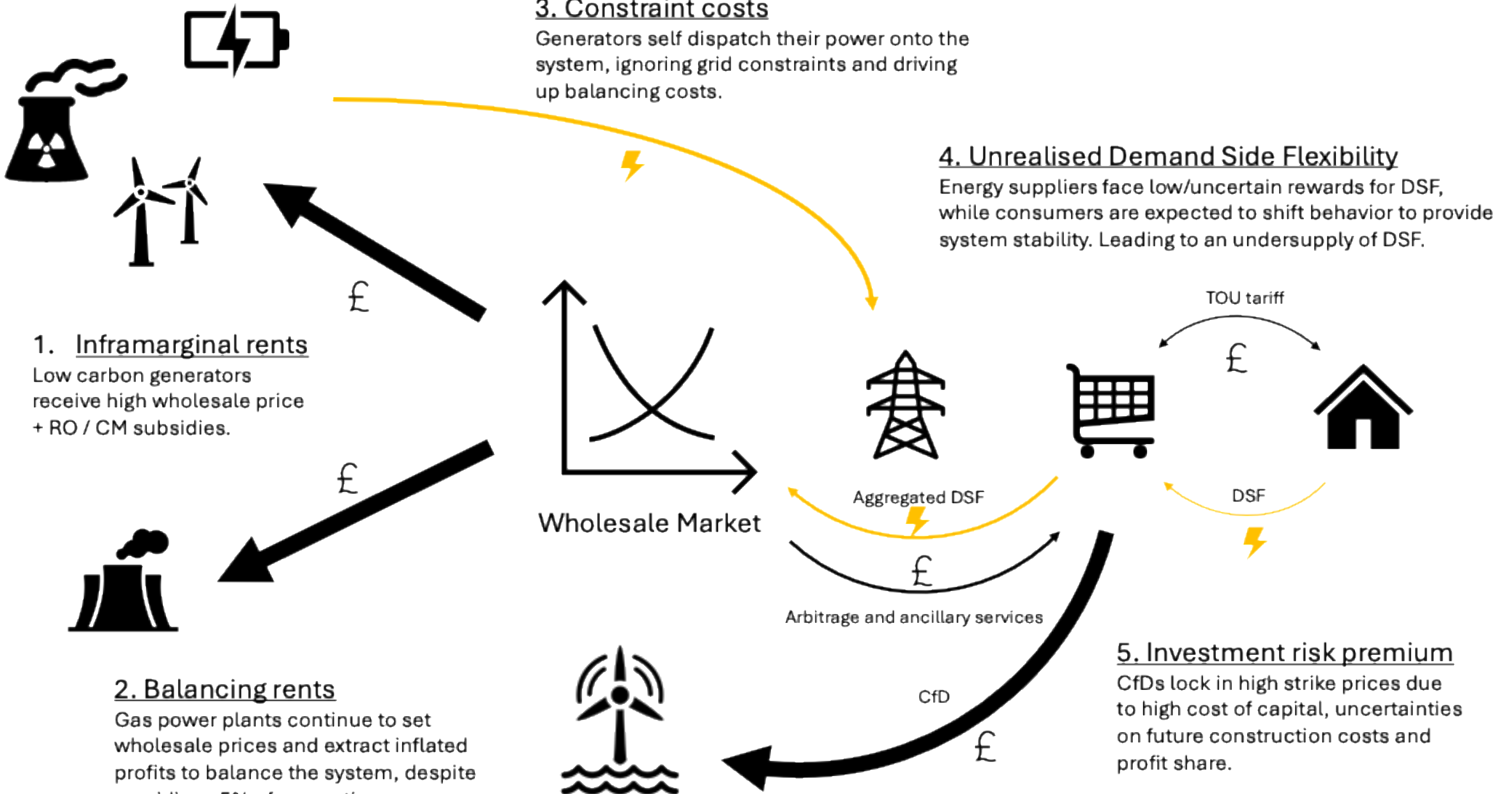


Wholesale Market

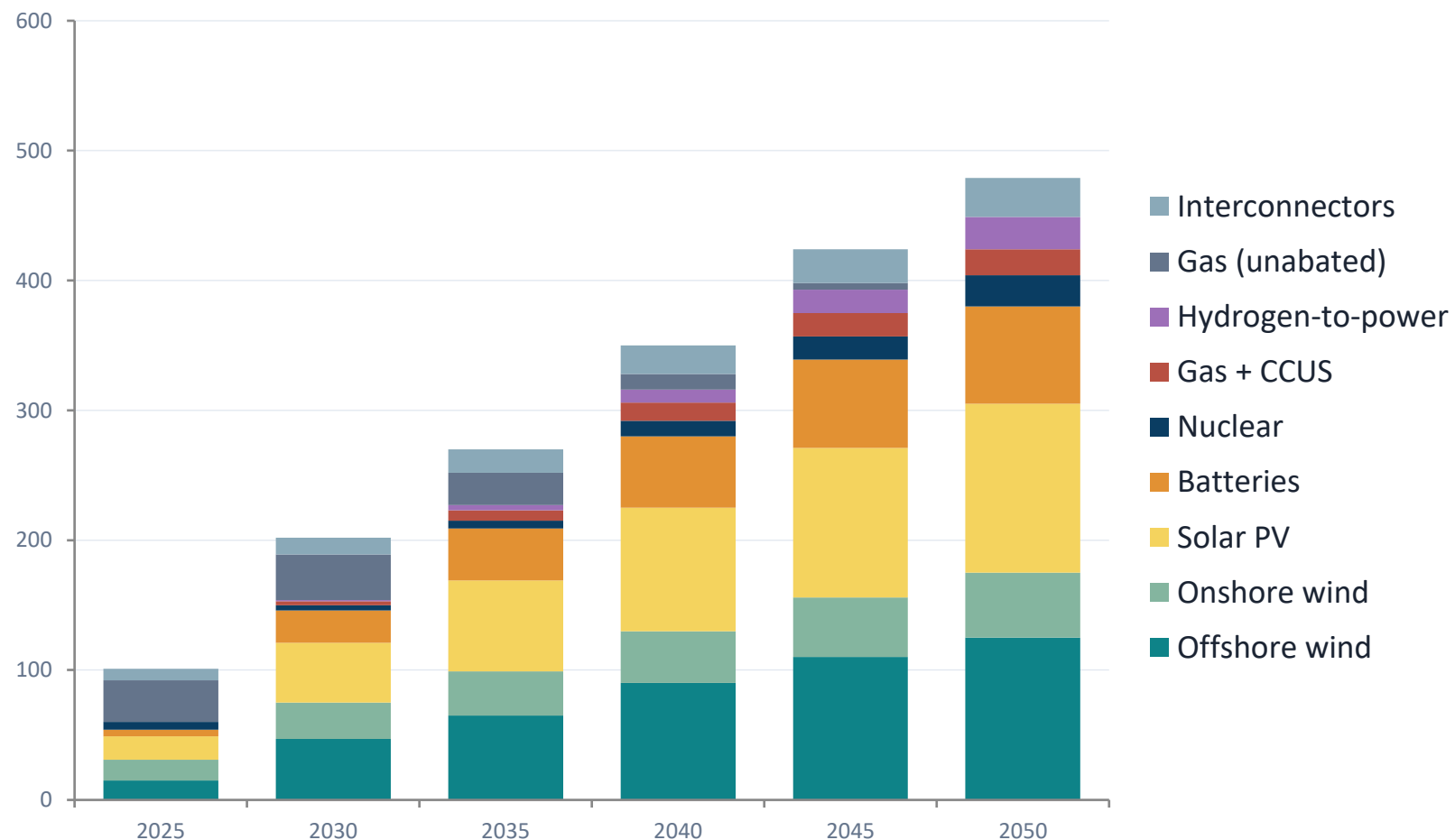
Aggregated DSF
Arbitrage and ancillary services

5. Investment risk premium

CfDs lock in high strike prices due to high cost of capital, uncertainties on future construction costs and profit share.



Beyond 2030: another 170 GW added on the path to net zero



~£700bn

Total investment 2025–2050

£40bn/yr to 2030, then £26bn/yr to 2050

+125 GW

of new capacity 2030–2050

690 TWh

demand by 2050 — 2.4× today

0 GW

unabated gas by 2050

Modelling the impact of Public Ownership & Public Control on the GB Power System

Team

Donal Brown – Oxford

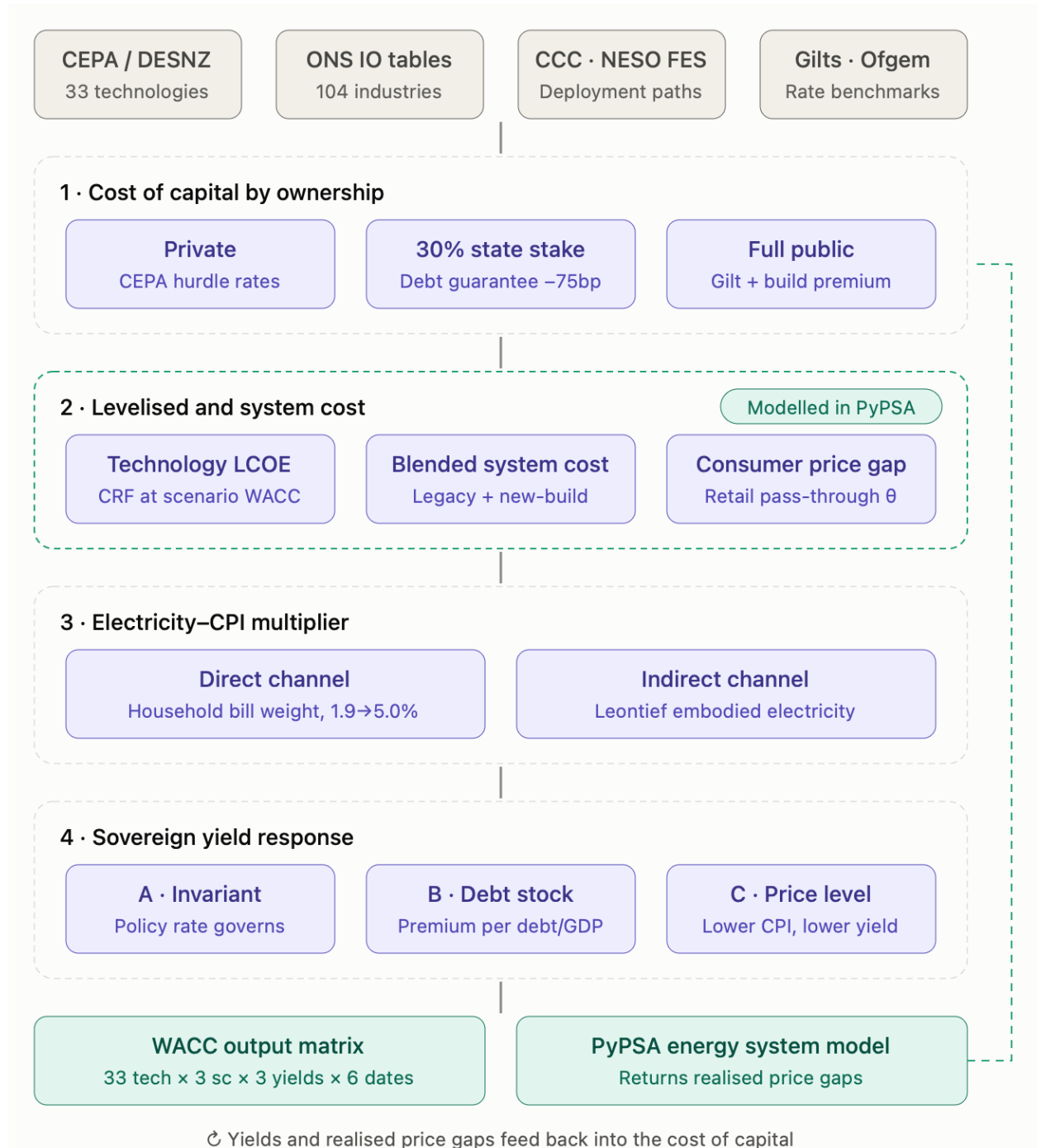
Andrew Lyden – Univ. Edinburgh

Cassandra Etter-Wenzel – Oxford

Patricia Pino – UCL

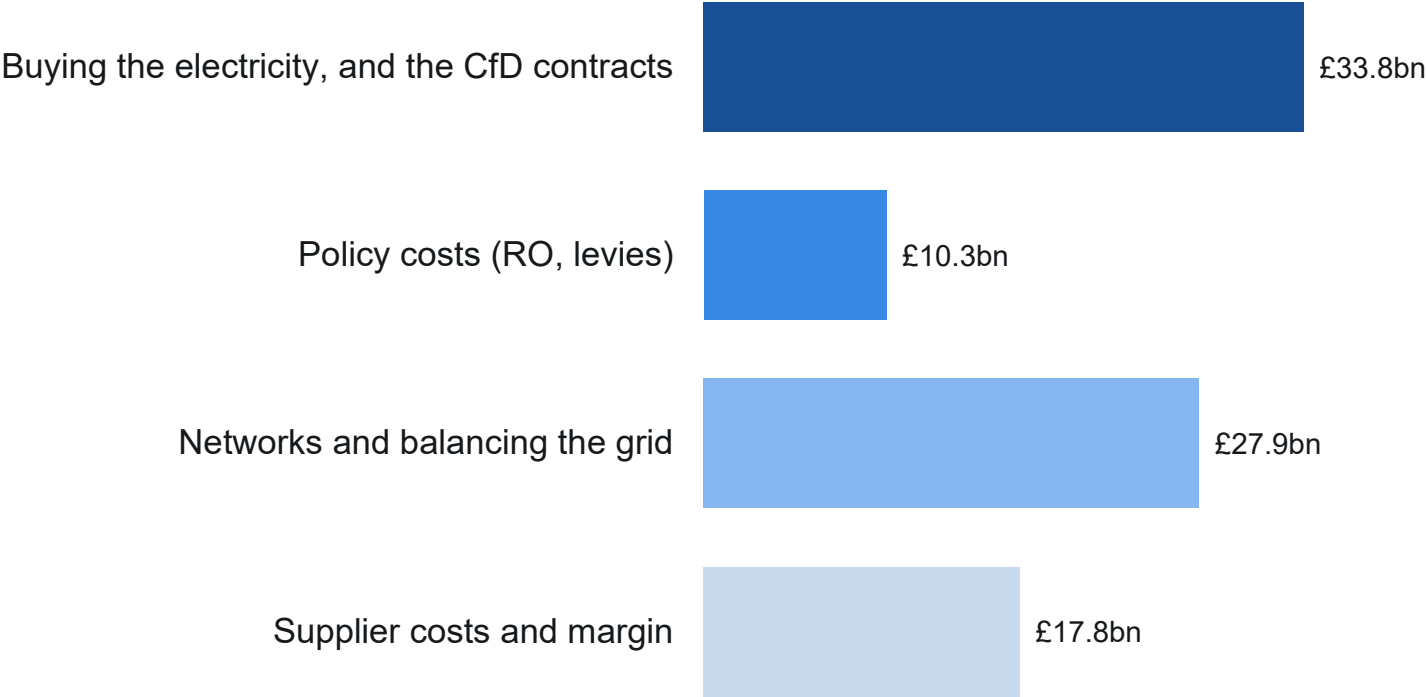
Luke Hatton – Imperial College

Chris Hayes – Common Wealth



Generation ownership can reach about half of the £89.9bn bill: the electricity and the contracts that pay for the power stations

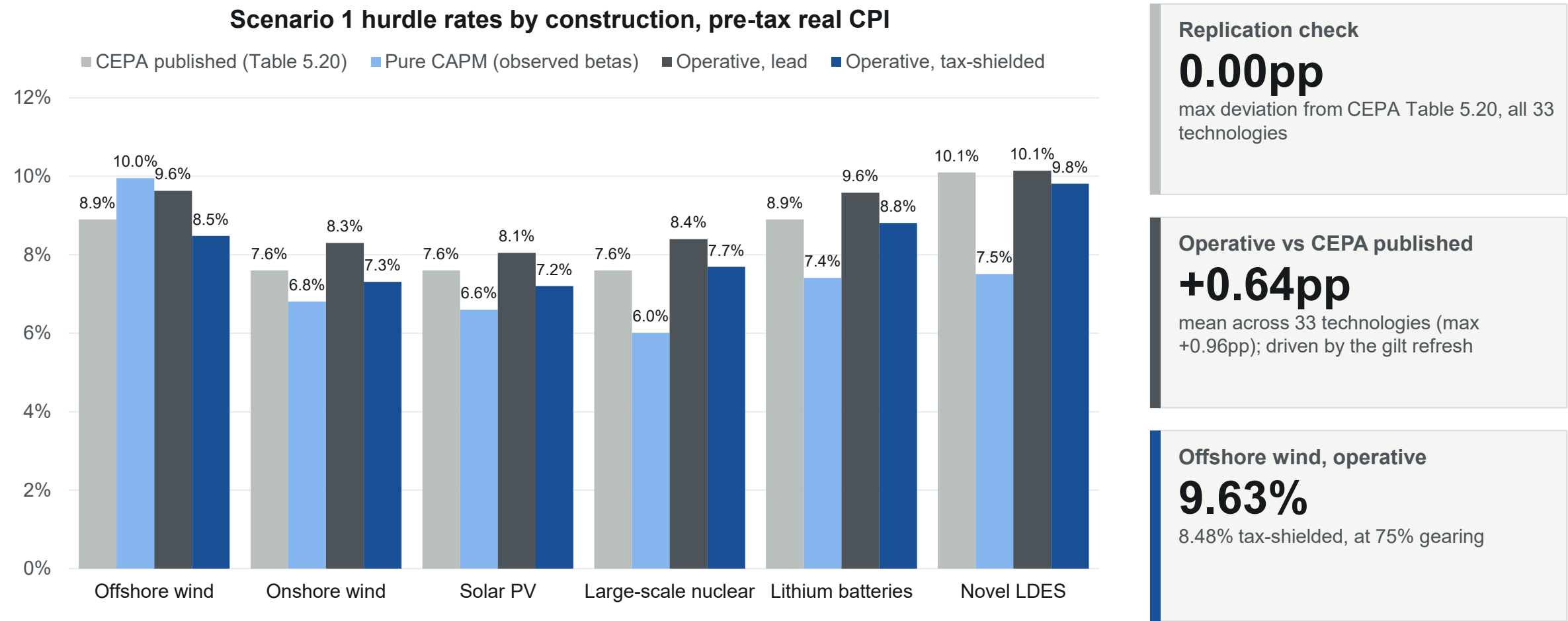
What GB pays for electricity in 2030 under private ownership, £bn a year



Bill part	Can ownership change it?
Electricity and CfDs	Yes: this is where ownership acts
Policy costs	Partly: the RO, if the old plant is bought
Networks and balancing	Partly: constraint payments. Wires: possible, not modelled
Supplier costs	Not here. Public supply: possible, out of scope

Total £89.9bn a year across GB (ex VAT), £1,070 a household (inc VAT). Ofgem price-cap categories.

The model reproduces CEPA's published hurdle rates exactly, then refreshes them to today's market

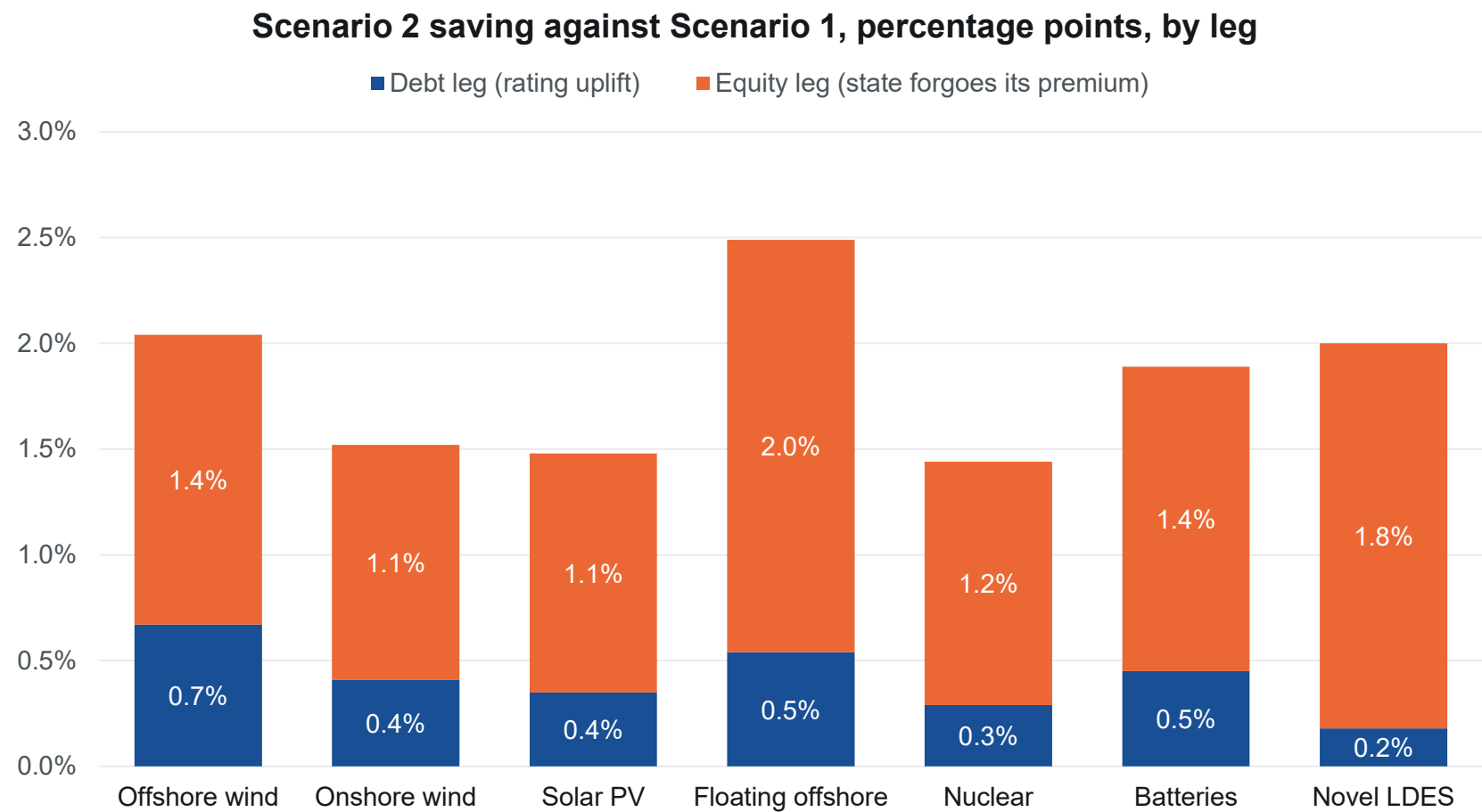


GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

Three ways the state could own the power stations, each a bigger step than the last

	Sc2 Public control	Sc3a Public ownership	Sc3b Public ownership + nationalisation
New power stations (built from 2025)	State takes a 30% stake in each one debt is de-risked	State builds and owns all of them	State builds and owns all of them
Existing power stations	Stay private	Stay private	State buys them for £72bn
How the state's plant is paid	Through the auctions, at a lower strike price	At cost, over the life of the plant	At cost; the market price is replaced by a tariff
Who runs the system	The market, as now	The market, as now	One operator schedules every plant

A 30% state stake and a two-notch credit enhancement cut financing costs by 1.4 to 2.5 points



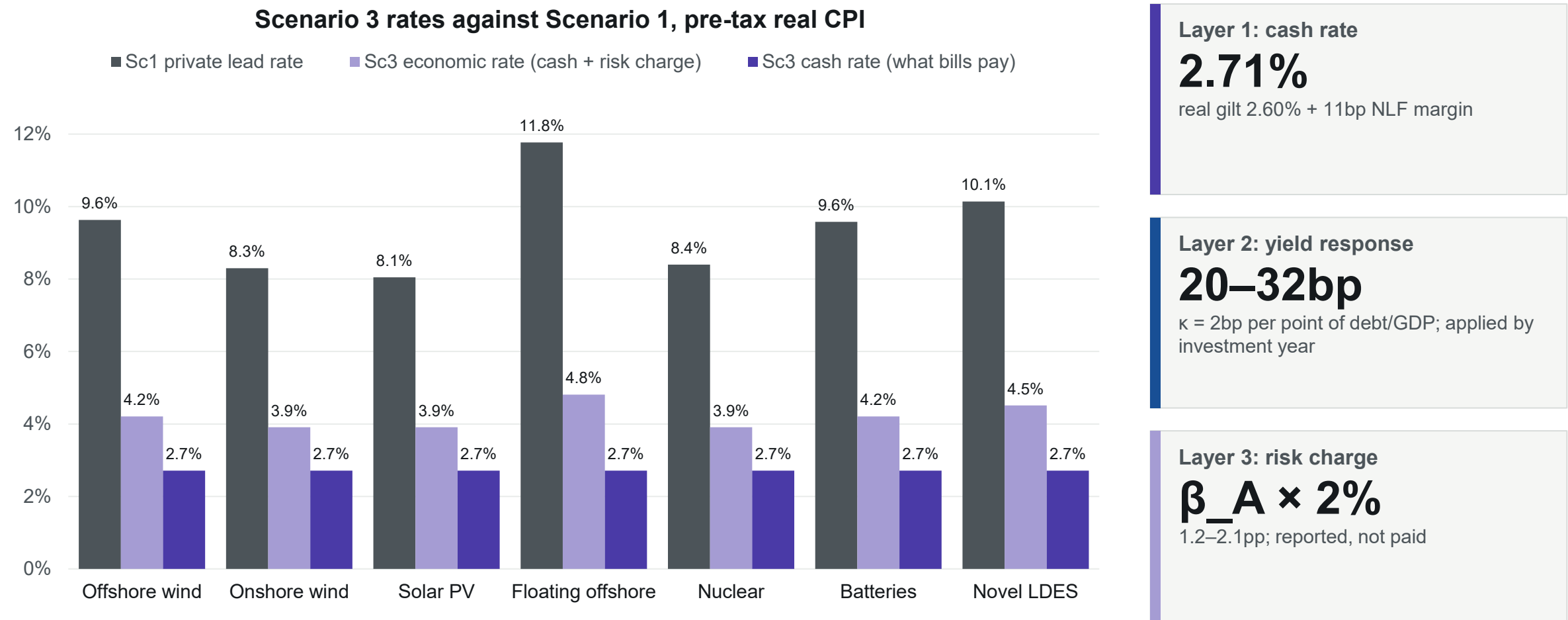
Credit enhancement
2 notches
range 1–3 (EIB PBCE, Moody's); floor rf + 45bp

State equity stake
 $\sigma = 30\%$, $\varphi = 0$
state forgoes its share of $\beta_E \times \text{MRP}$

If $\varphi = 1$ (pari passu)
0.18–0.67pp
saving falls to the debt leg alone

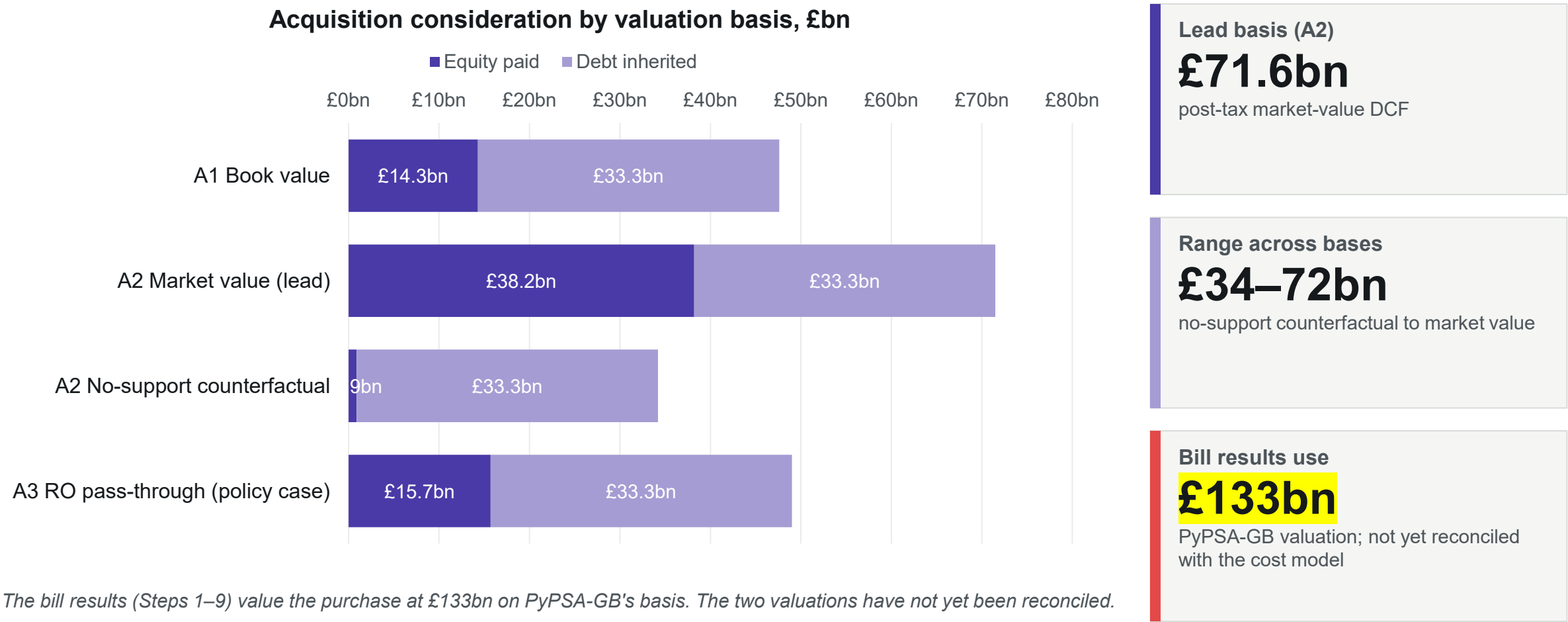
GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

The state finances at 2.71%; charging for the risk it holds still leaves a 3 to 5 point saving



GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

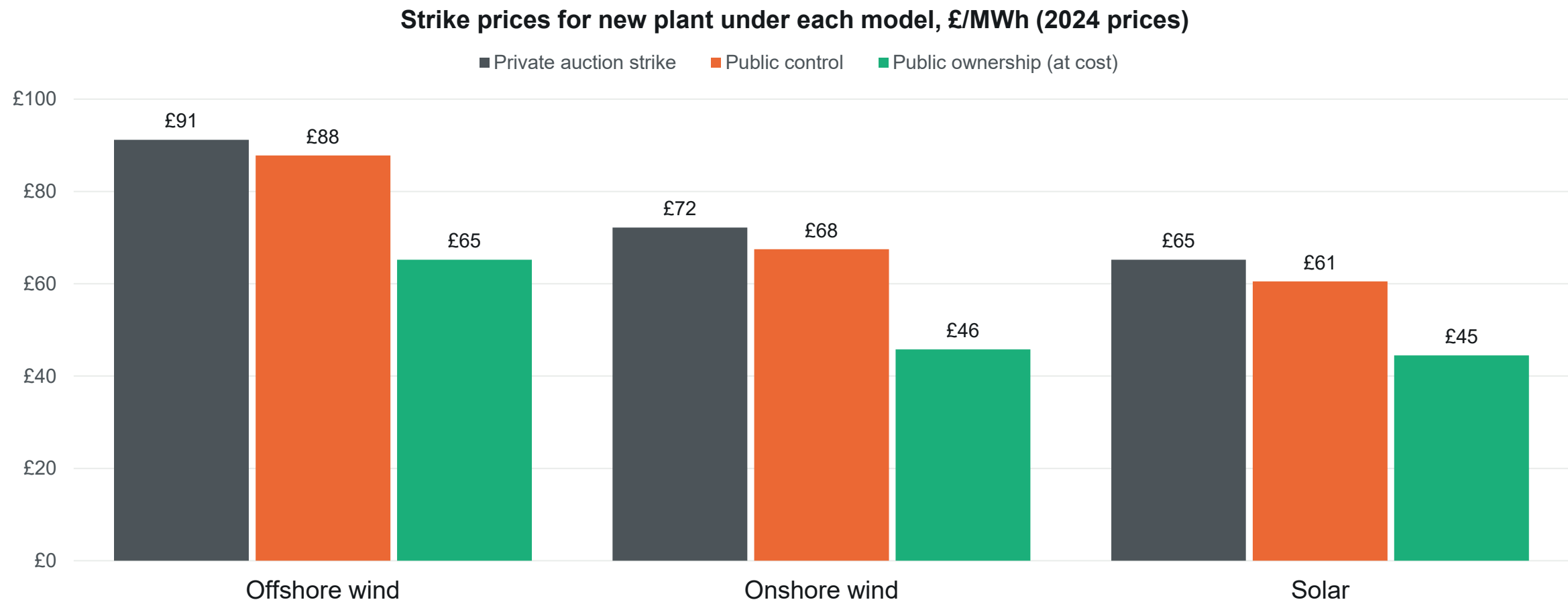
The cost model values the existing fleet at £71.6bn on its lead market-value basis



The bill results (Steps 1–9) value the purchase at £133bn on PyPSA-GB's basis. The two valuations have not yet been reconciled.

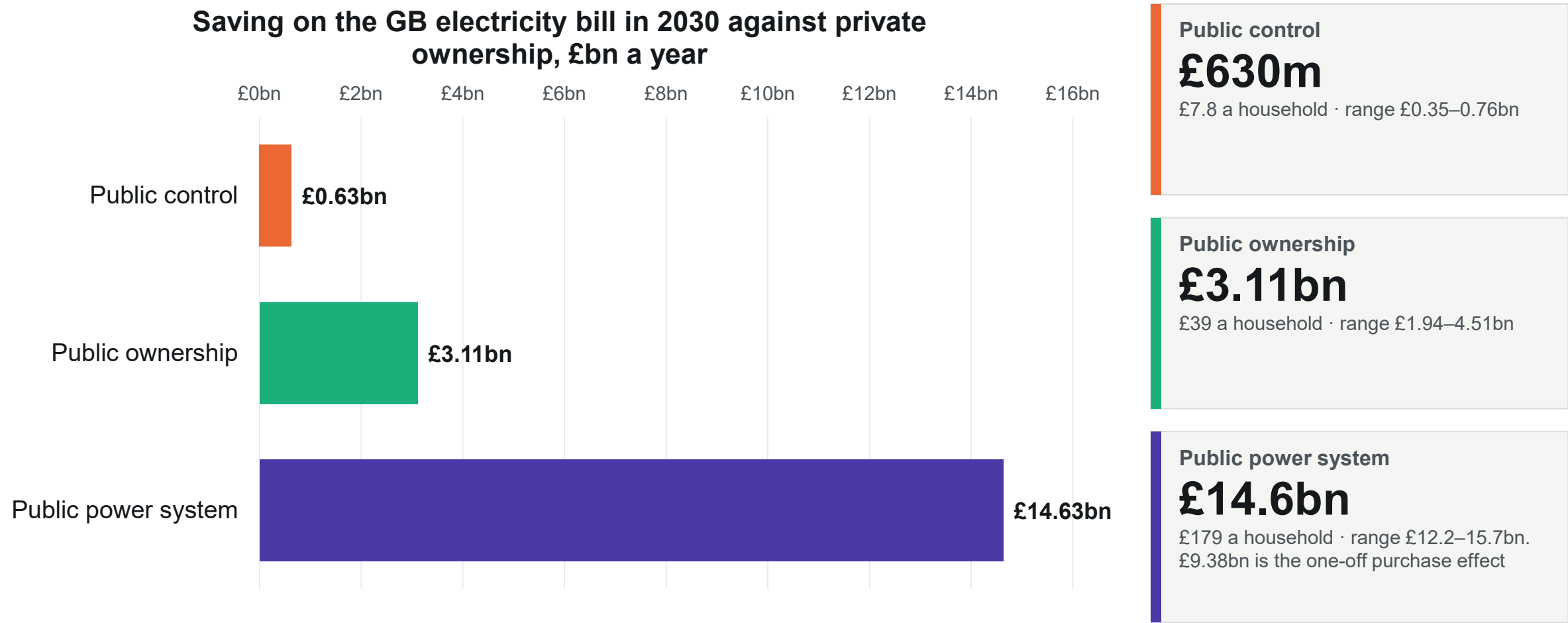
GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

Cheaper state capital means lower strike prices: offshore wind falls from £91 to £65/MWh at cost

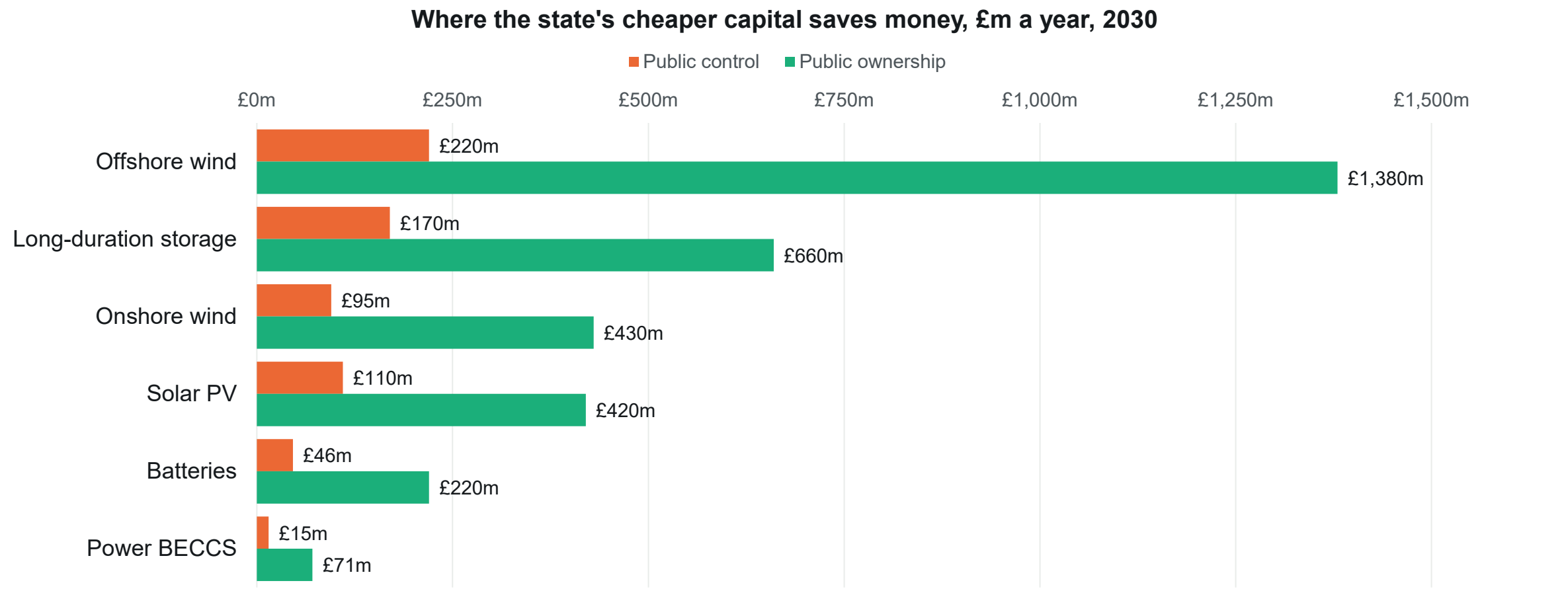


Dispatch-weighted strike prices for contracts awarded from 2025, 2024 prices.

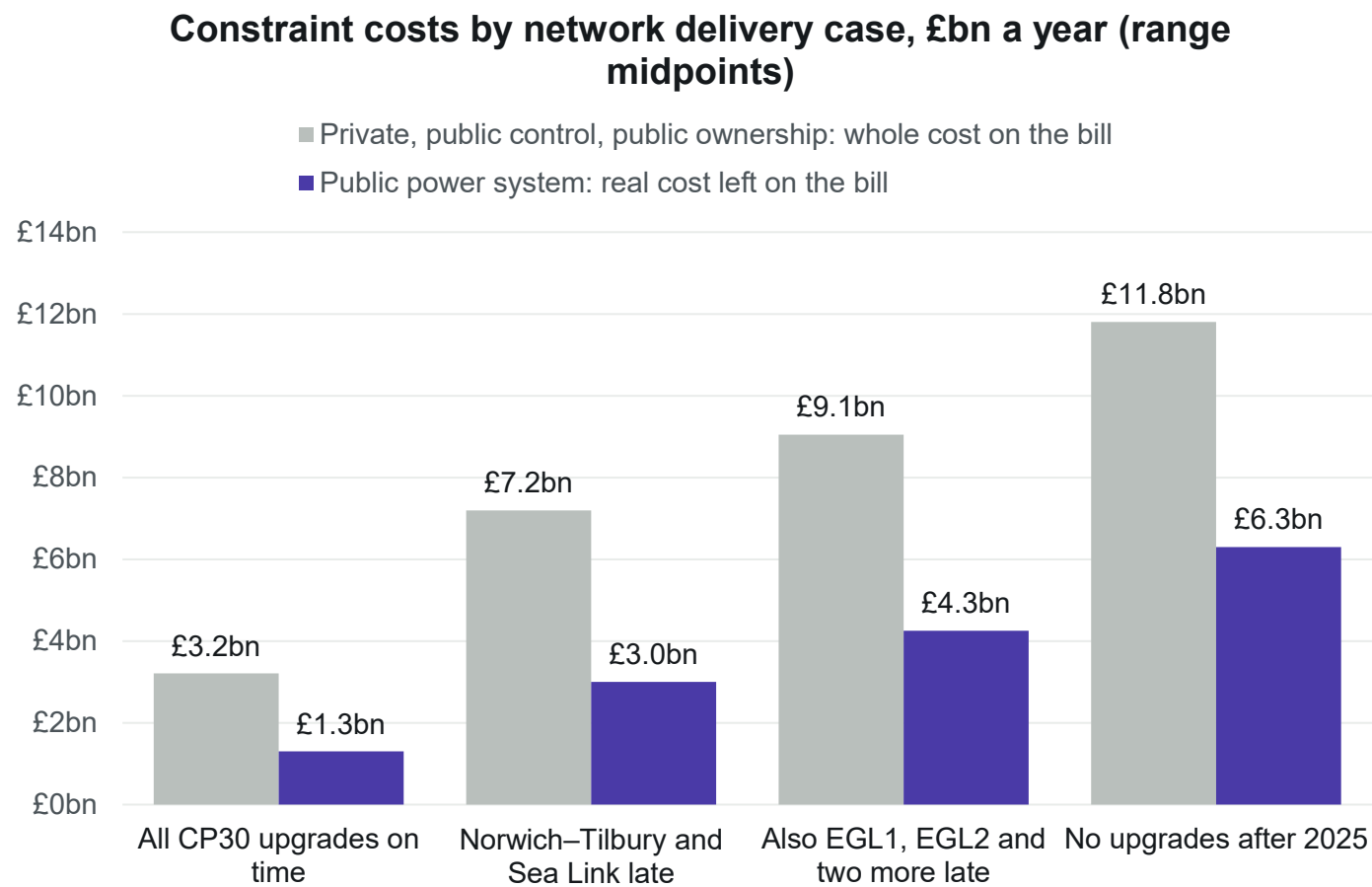
All three cut bills, and the bigger the state's role the bigger the saving



Offshore wind carries most of the financing saving: £1.38bn of £3.21bn under public ownership



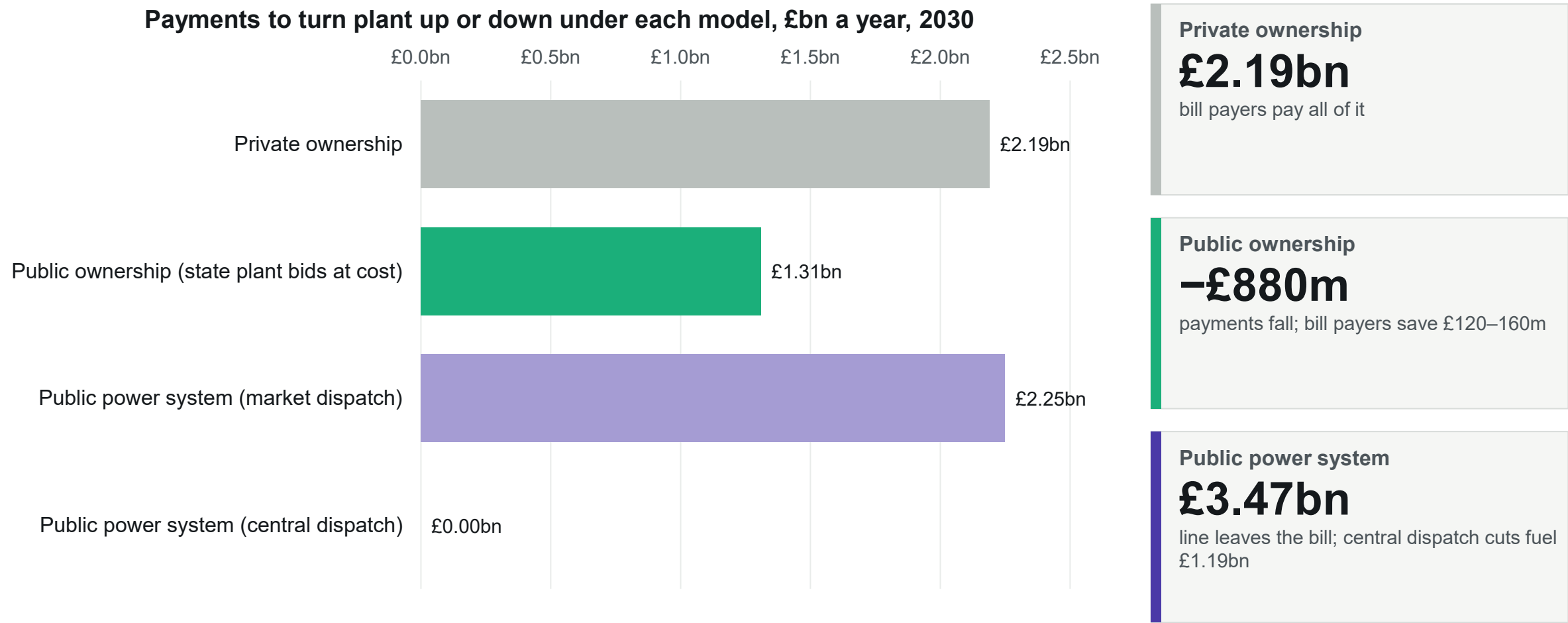
If the grid is late, constraint costs can treble, and only the public power system escapes most of them



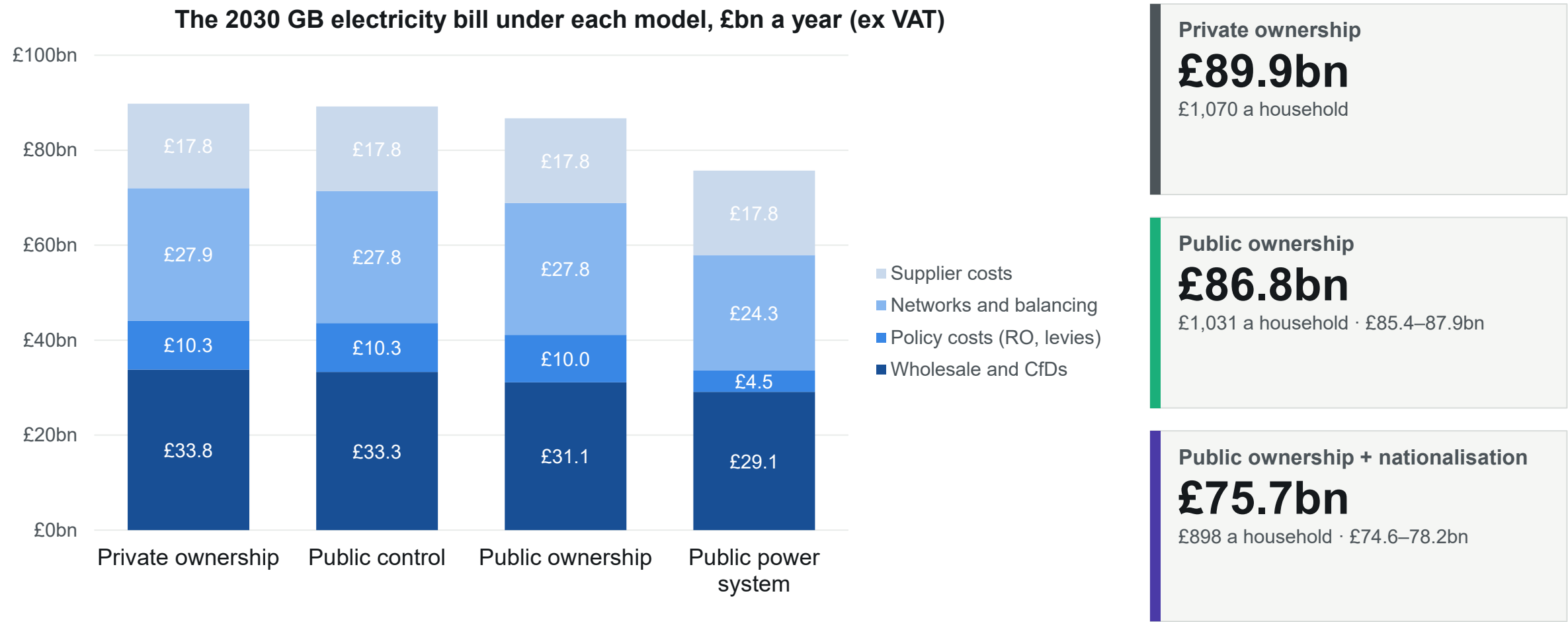
Network case	On the bill: other models	Public power system
All CP30 upgrades on time	£2.84–3.57bn (£34–43/hh)	£0.9–1.7bn (£11–20/hh)
Norwich–Tilbury, Sea Link late	£6.58–7.79bn (£80–95/hh)	£2.2–3.8bn (£27–46/hh)
Also EGL1, EGL2 + two late	£7.8–10.3bn (£95–125/hh)	£3.0–5.5bn (£36–66/hh)
No upgrades after 2025	£10.9–12.7bn (£132–154/hh)	£5.0–7.6bn (£61–92/hh)

NESO thermal-constraint estimates for its network delivery cases (2024 prices).

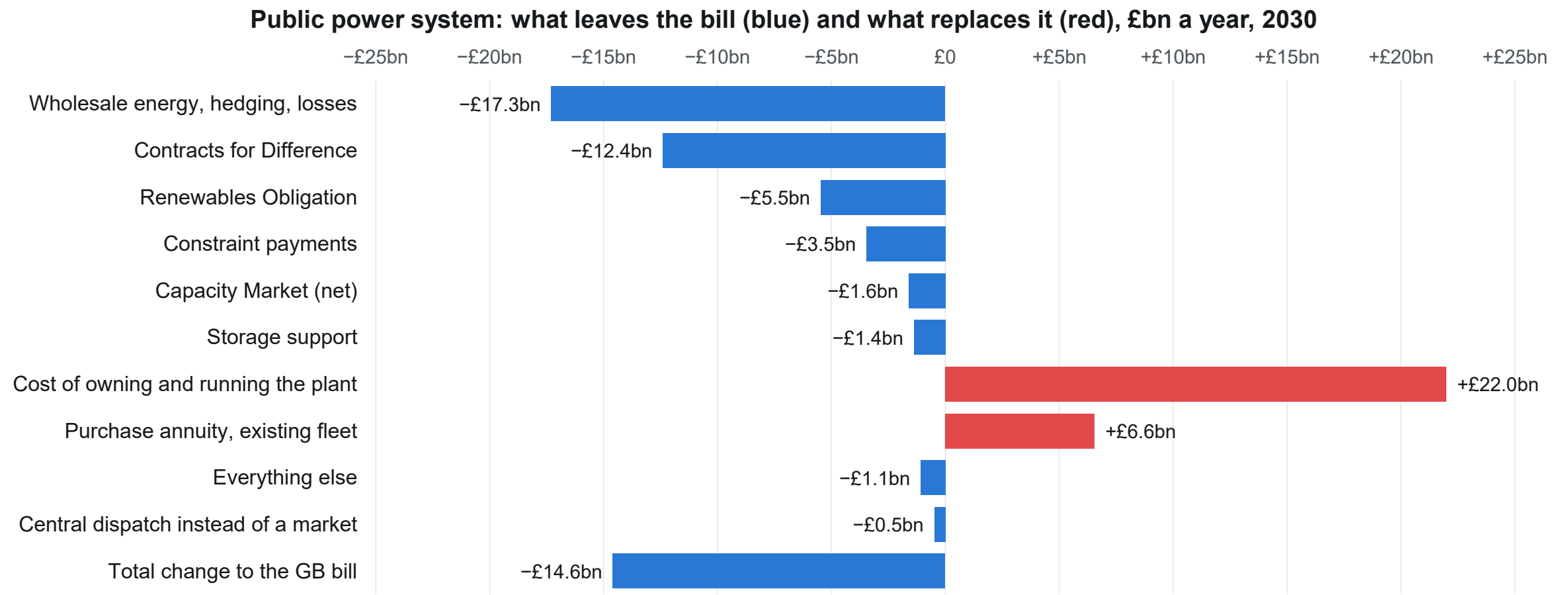
Only central dispatch cuts the real cost of constraints: fuel and carbon fall £1.2bn, a net £490m



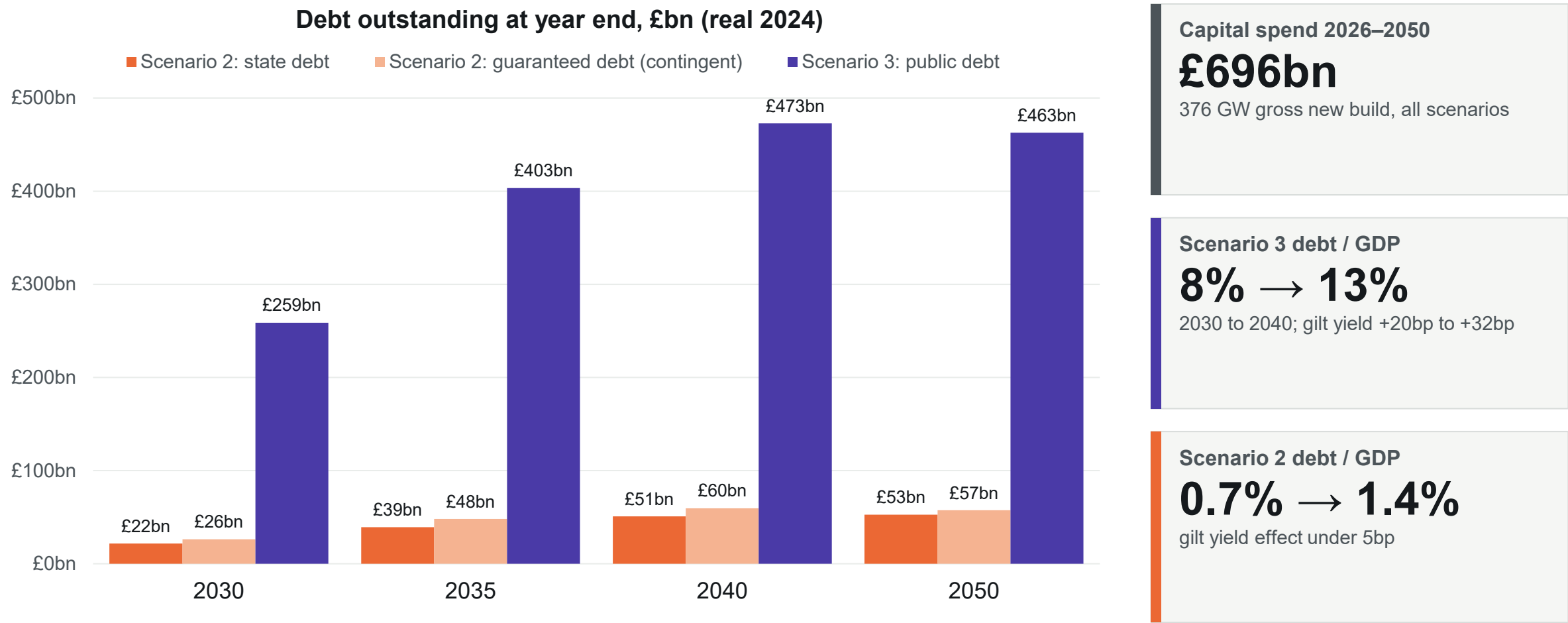
The 2030 bill falls from £89.9bn under private ownership to £75.7bn under the public power system



Market payments of £42bn leave the bill; the cost of owning and running the fleet, £28.6bn, replaces them

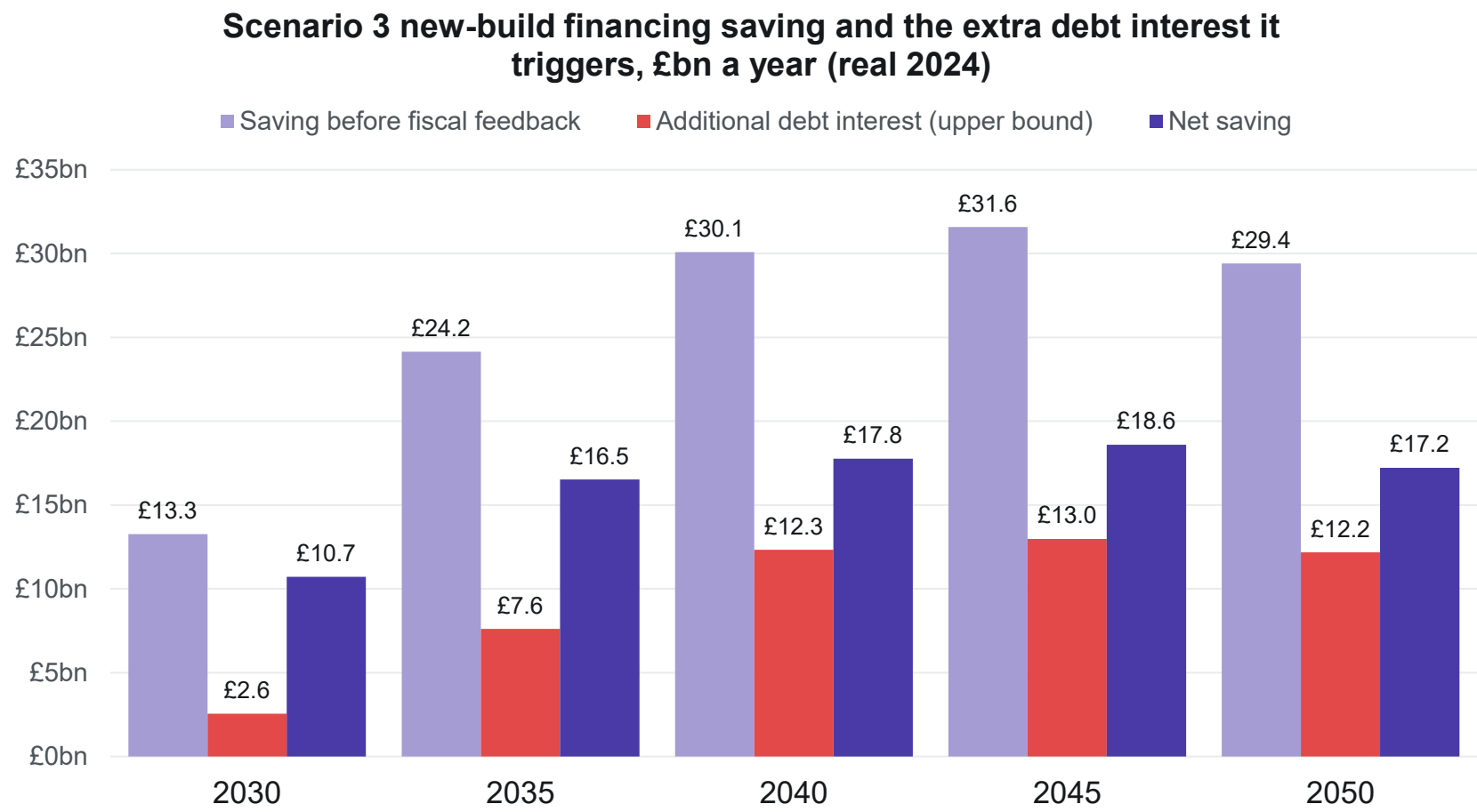


Public ownership borrows £768bn to 2050, mostly for new build; debt peaks near 13% of GDP



GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

Provisional Even at its upper bound, extra debt interest absorbs about a third of the public-ownership saving



Scenario 3, cumulative 2026–50
£376bn net
£591bn gross less £215bn extra interest

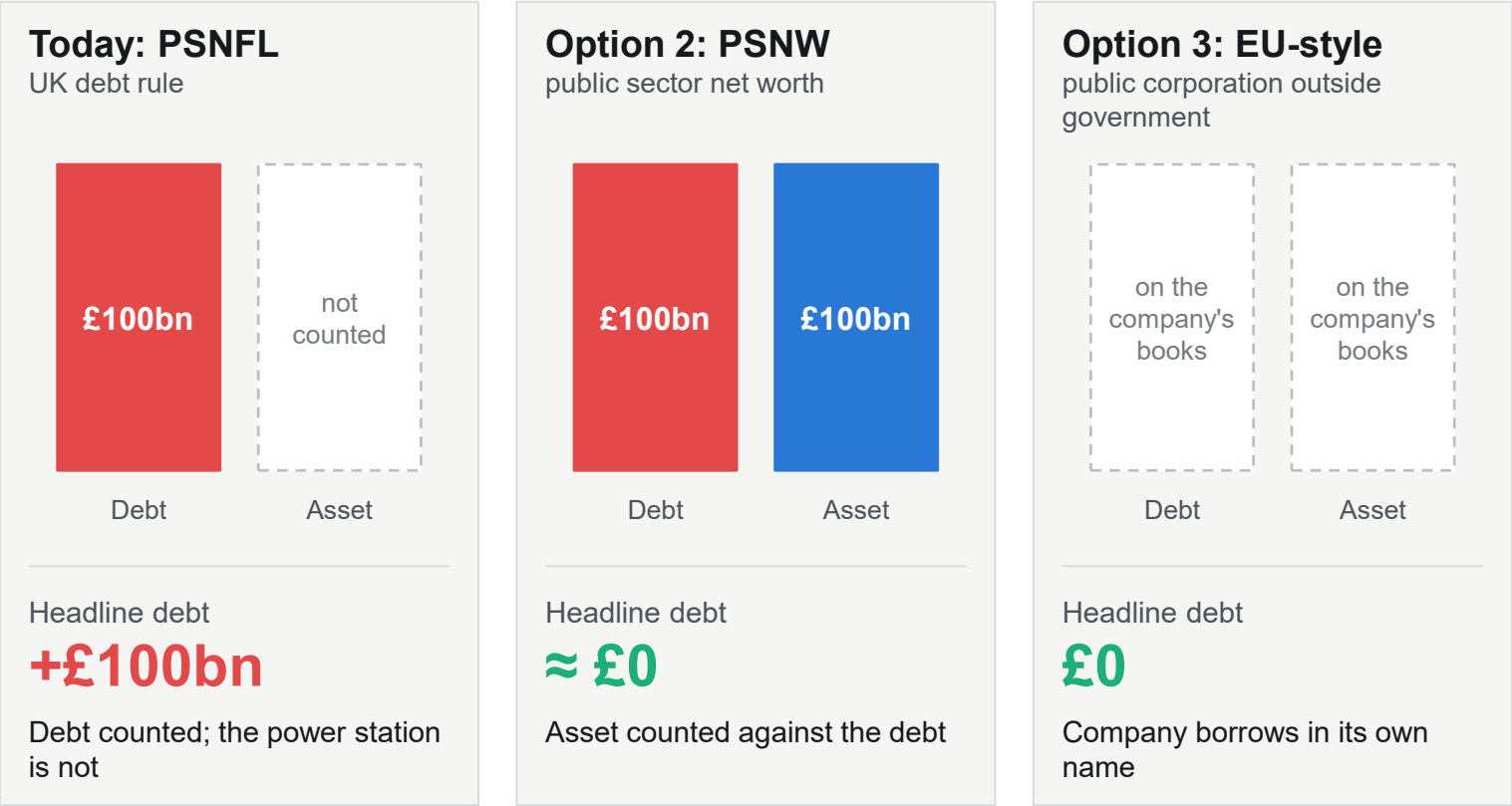
Scenario 3, resource basis
£4–5bn a year
net of extra interest; positive every year

Scenario 2, cumulative 2026–50
£138bn net
£166bn gross less £28bn extra interest

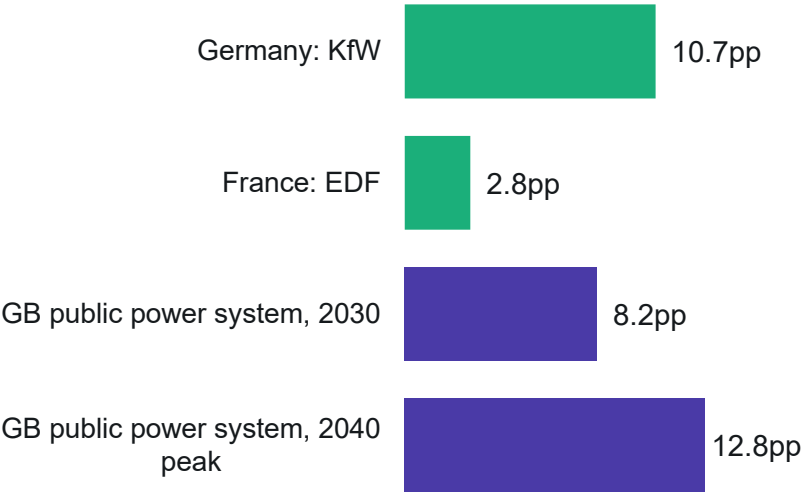
GB Power Model v2-6 (cost-of-capital model), real CPI, valuation date 8 October 2026. CEPA (2025) for DESNZ; DESNZ AR7; methods note §2.

Change how public companies are counted and public power need not add to headline debt, as in France and Germany

How £100bn borrowed to build public power stations is scored



Public company debt and headline debt, pp of GDP



KfW and EDF: what consolidating them would add today (Common Wealth). GB: Scenario 3 public debt counted under PSNFL (GB Power Model v2-6).

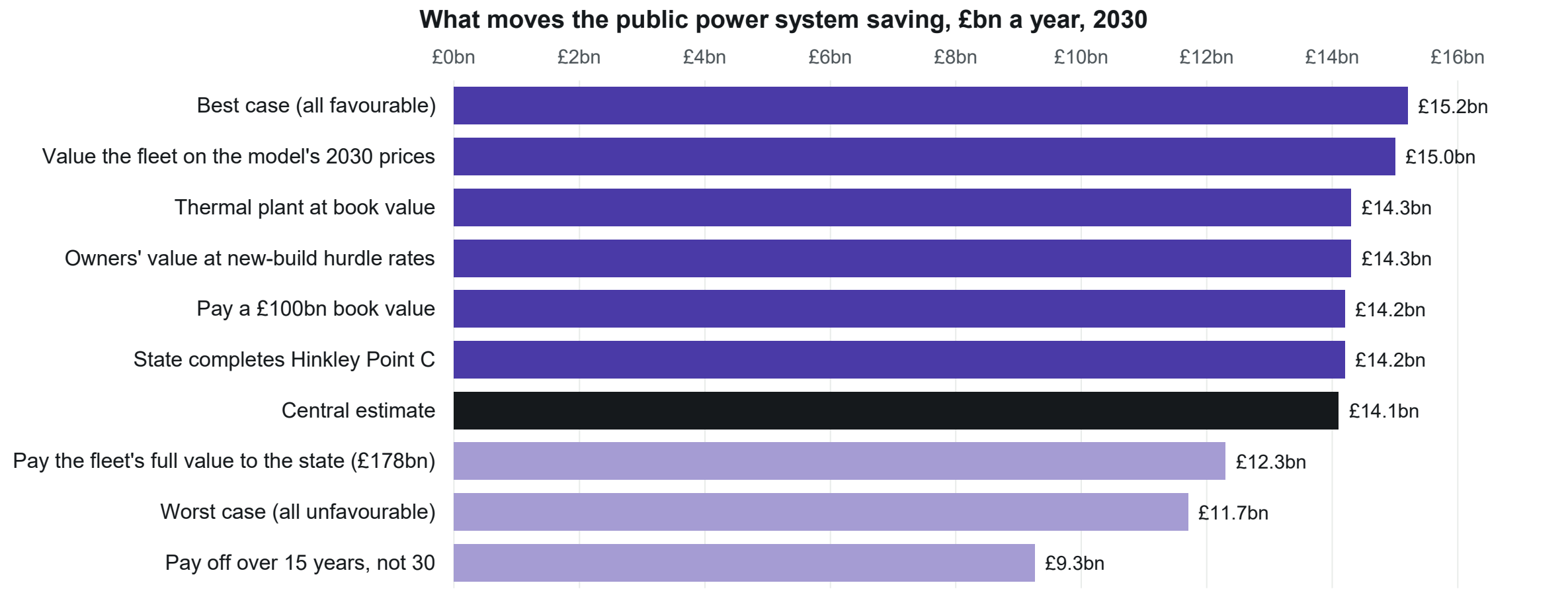
The trade-off: the EU route works only if the company borrows itself, above the gilt rate (EDF: Baa1 vs France Aa3). PSNW keeps Treasury lending at 2.71% and neutral scoring.

Source: Gasperin, National Accounting and Fiscal Rules, Common Wealth, 29 Sept 2026; GB Power Model v2-6. Reclassification changes what counts against the fiscal rule, not the risk: losses the state covers still count against the deficit.

Conclusions

- **Public control & ownership cuts bills, and the saving scales with the state's role.** £630m, £3.11bn and £14.6bn a year in 2030 (£8, £39 and £179 a household) for public control, public ownership and public ownership + nationalisation.
- **A cheaper cost of capital is the mechanism.** The state finances at about 2.75% real against private hurdle rates of 7–10%. For offshore wind, that takes the strike price from £91 to £65/MWh.
- **Public control via financial de-risking has much lower savings.** The private majority still sets the price. The financing saving of 1.4–2.5 points depends on how much of the risk premium the state gives up
- **Only central dispatch cuts the real cost of a congested grid.** Ownership alone changes which plant is turned down, and bill payers keep only £120–160m. Central scheduling saves a net £490m in fuel under conservative assumptions
- **A public power system helps insulate from future gas price and grid risk.** At NESO's £70/MWh wholesale price its saving widens to £16.4bn. If grid upgrades are late, most of a £7–13bn constraint bill becomes the state paying itself.
- **The assumed impact on gilt yields determines the net impact on the national finances.** Conservative Debt: GDP ratio assumptions mean extra debt interest absorbs at most about two fifths of the savings.
- **These estimates do not factor lower inflation or the increase in public assets.** More work is needed to examine potential impacts on the state's borrowing costs, inflation and gilt yields.
- **If we change national accounting conventions Public Power may not add to headline debt,** as in France and Germany, although this might raise the cost of capital slightly

Public power system: the purchase terms move the saving most, especially a 15-year payoff



Key figures: change to the GB bill a year, 2030 (household in brackets)

Figure	Public control	Public ownership	Public power system
Change to the GB bill (range)	–£630m (–£350m to –£760m) · –£7.8	–£3.11bn (–£1.94bn to –£4.51bn) · –£39	–£14.1bn (–£11.7bn to –£15.2bn) · –£173
Central dispatch, further change	—	—	–£490m · –£6.2
State's financing saving on its plant	+£660m	+£3.21bn	in the tariff
CfD line	–£380m · –£4.8	–£2.51bn · –£32	–£12.4bn · –£157
Renewables Obligation	—	—	–£5.47bn · –£66
Purchase annuity, existing fleet	—	—	+£6.56bn · +£81
Constraint payments	—	about £0 (own run)	–£3.46bn · –£42
Wholesale, hedging and losses	—	—	–£17.3bn · –£210
Cost of owning and running the plant	—	—	+£22.0bn · +£272
Storage support	–£130m · –£1.6	–£260m · –£3.1	–£1.38bn · –£17
Context	Private bill £89.9bn (£1,070/hh inc VAT) · Fleet purchase £133bn (renewables and nuclear £101bn, thermal and storage £32bn) · Fleet's lifetime value to the state £178bn · Annuity £6.56bn vs fleet earnings £16.0bn in 2030; earnings fall below the annuity from 2045		