CHEAPER AND GREENER

How renewable energy can deliver low-cost power to Irish homes and businesses

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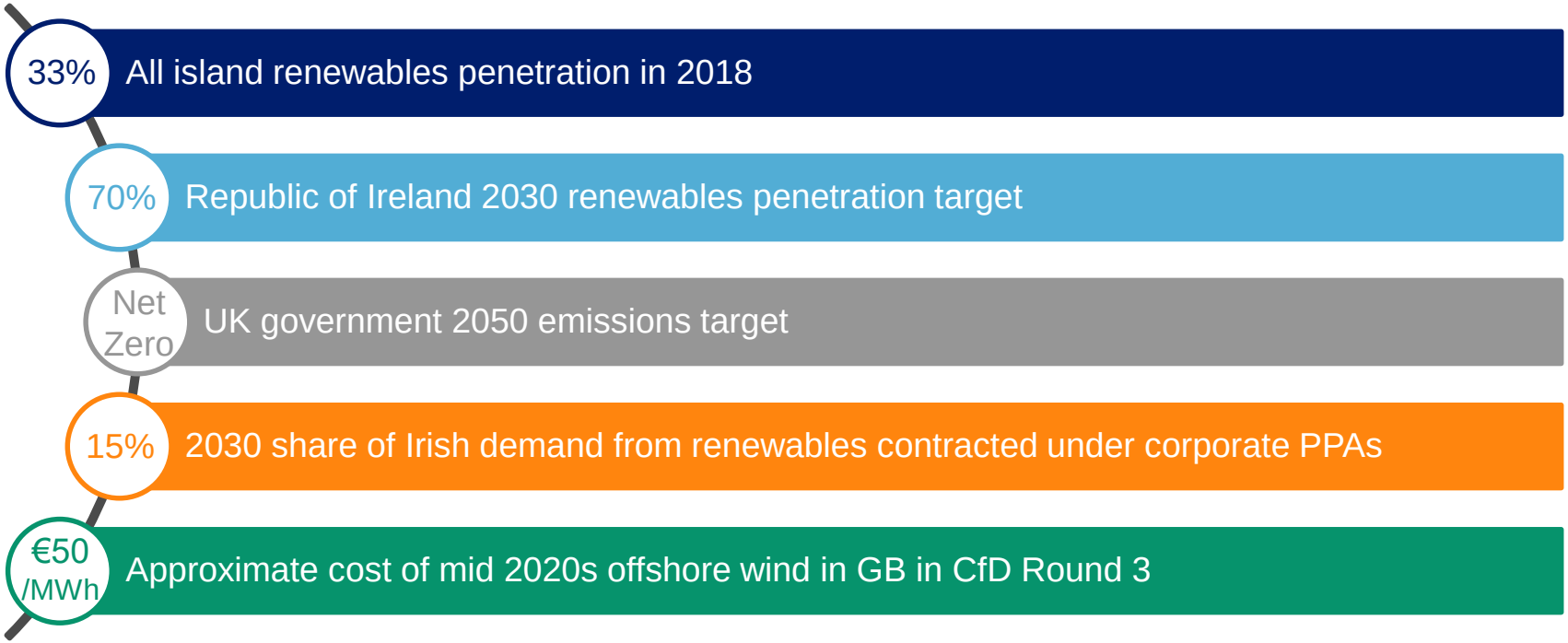
WHERE ARE WE AND WHERE ARE WE GOING?

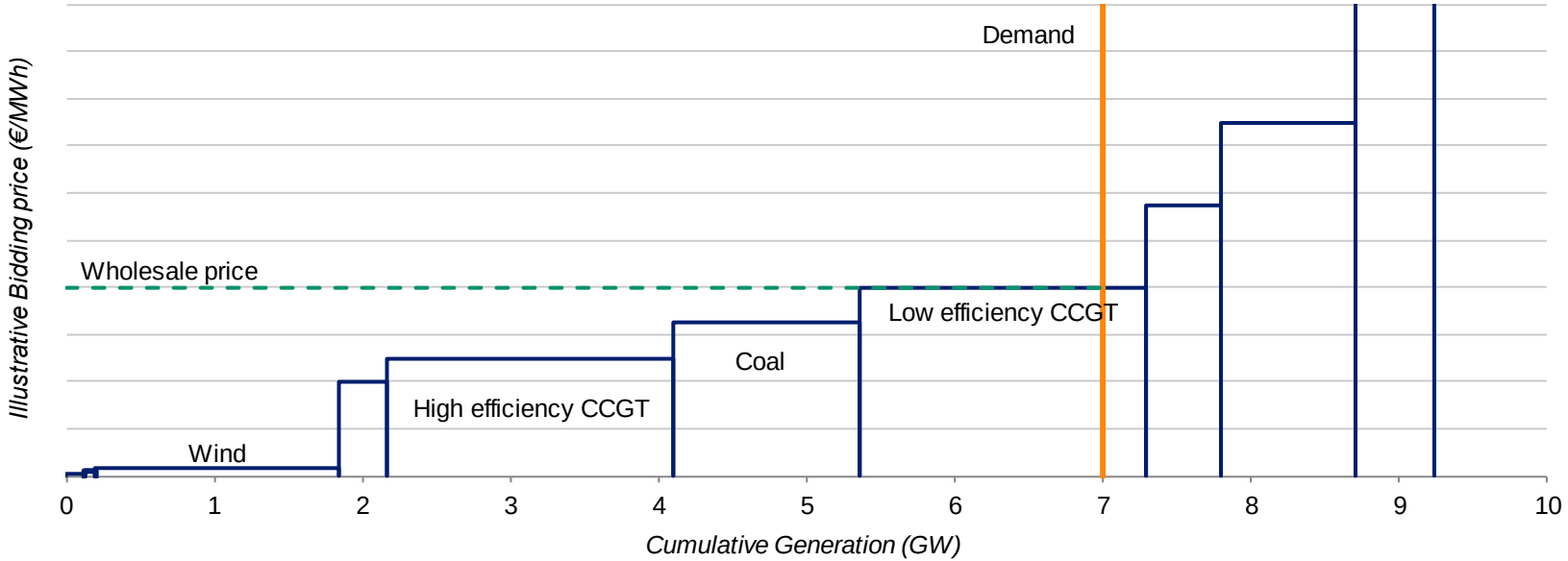
Climate ambition across the Republic of Ireland and the UK has become increasingly aggressive in 2019



WHAT BENEFITS MIGHT ADDITIONAL RENEWABLES BRING?

Given the types of technologies likely to feature, wholesale electricity prices might be expected to fall if additional renewables are built

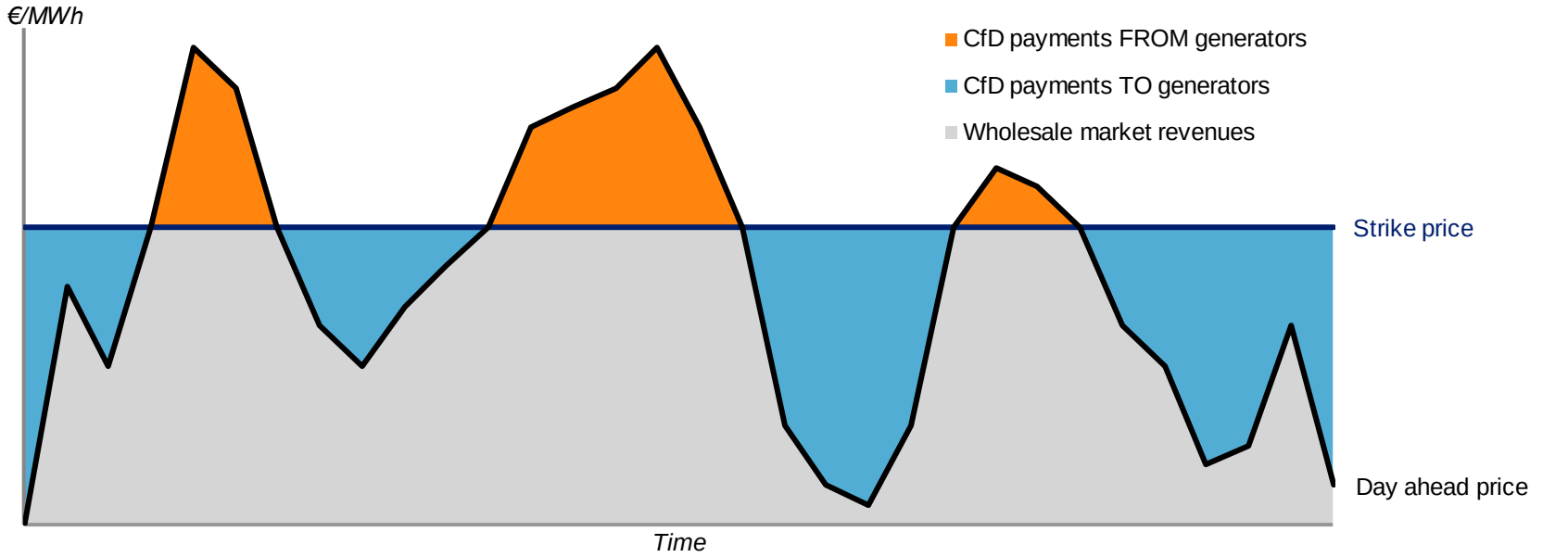
Illustrative marginal cost curve for the SEM (MW, €/MWh)



WHAT WILL THIS COST?

2-way contracts for difference (CfDs) will be key to achieving these targets and currently look like they will represent a net cost

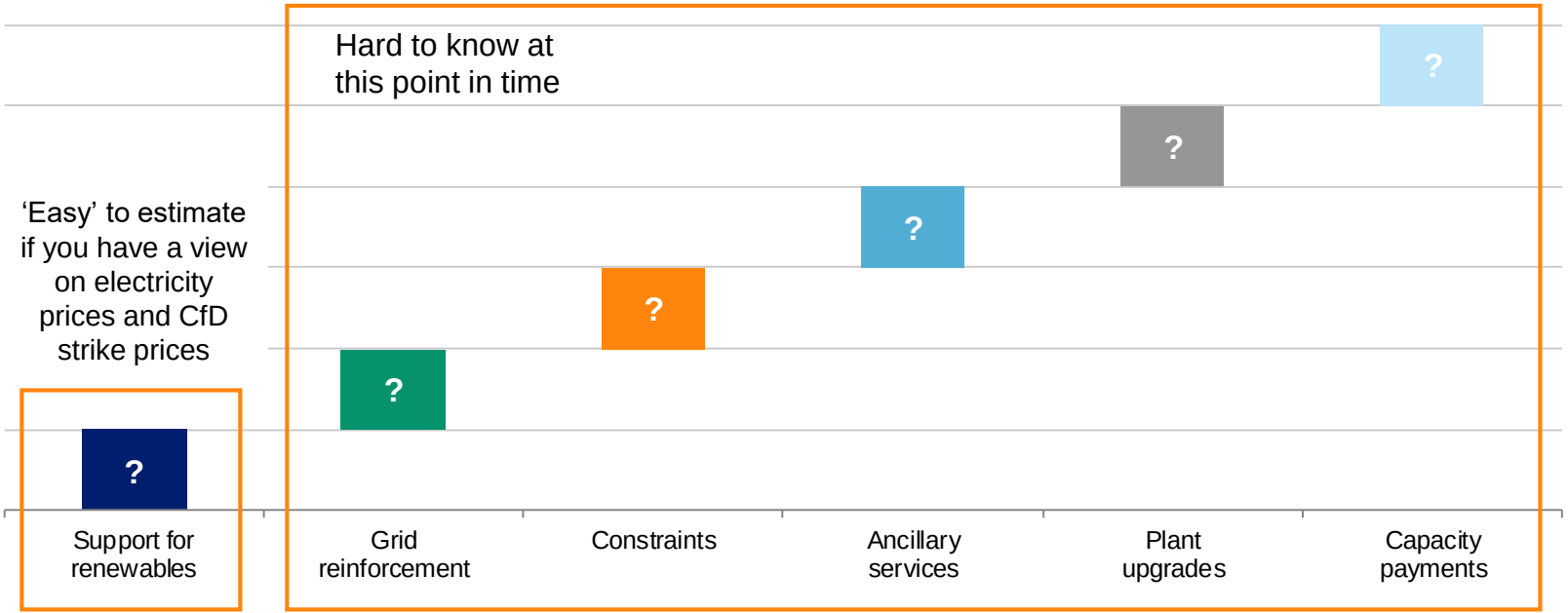
Structure of a 2-way CfD (€/MWh)



WHAT WILL THIS COST?

Hitting 2030 targets will involve significant costs…renewables will likely need some support, the grid will need reinforcing, etc.

Examples of costs associated with increasing renewables penetration to 70% by 2030



‘CONSUMER VALUE’

Our assessment of ‘Consumer Value’ trades off the benefits of lower wholesale electricity prices against the costs of providing support to renewables generators

Wholesale Price Saving

40x20 Pathway

- **All-island** RES capacity fixed at 2020 levels

70x30 Pathway

- RES capacity increases so **all-island** RES-E penetration reaches 70% by 2030

- New thermal / battery plant built so ‘lights stay on’ in both pathways
- Common fuel and carbon assumptions (IWEA / National Grid)
- Common interconnector assumptions (IWEA)
- Common demand assumptions (derived from EirGrid)

Present value of the difference in wholesale cost of satisfying electricity demand between 2025 and 2040

Stabilisation Cost

Payments TO Generators

- Model hourly dispatch in the SEM → hourly wholesale electricity prices
- Compare hourly wholesale prices with an assumed CfD strike price
- Sum up all periods when payments are made TO / FROM generators

Payments FROM Generators

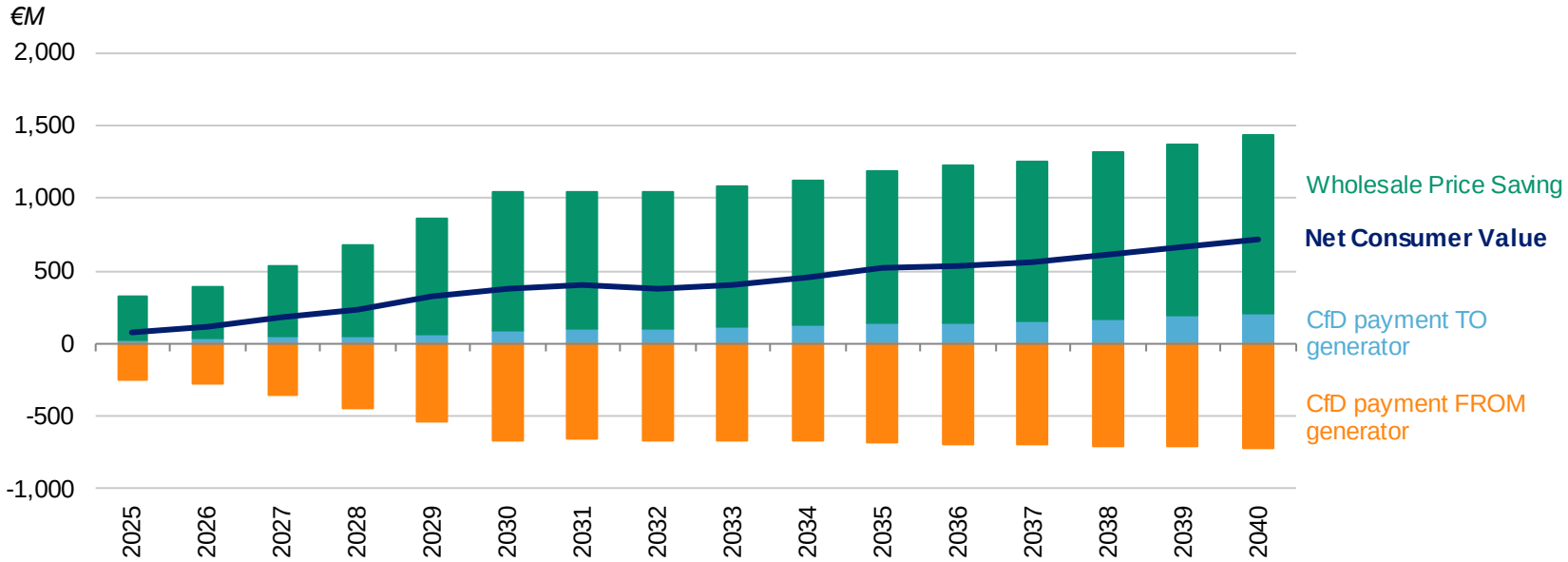
Present value of the net cost of supporting renewables assessed between 2025 and 2040

‘CONSUMER VALUE’

From 2025 onwards, annual Wholesale Price Savings outweigh net Stabilisation Costs

Annual Wholesale Price Savings, Stabilisation Cost and net Consumer Value assuming a CfD strike price of €60/MWh

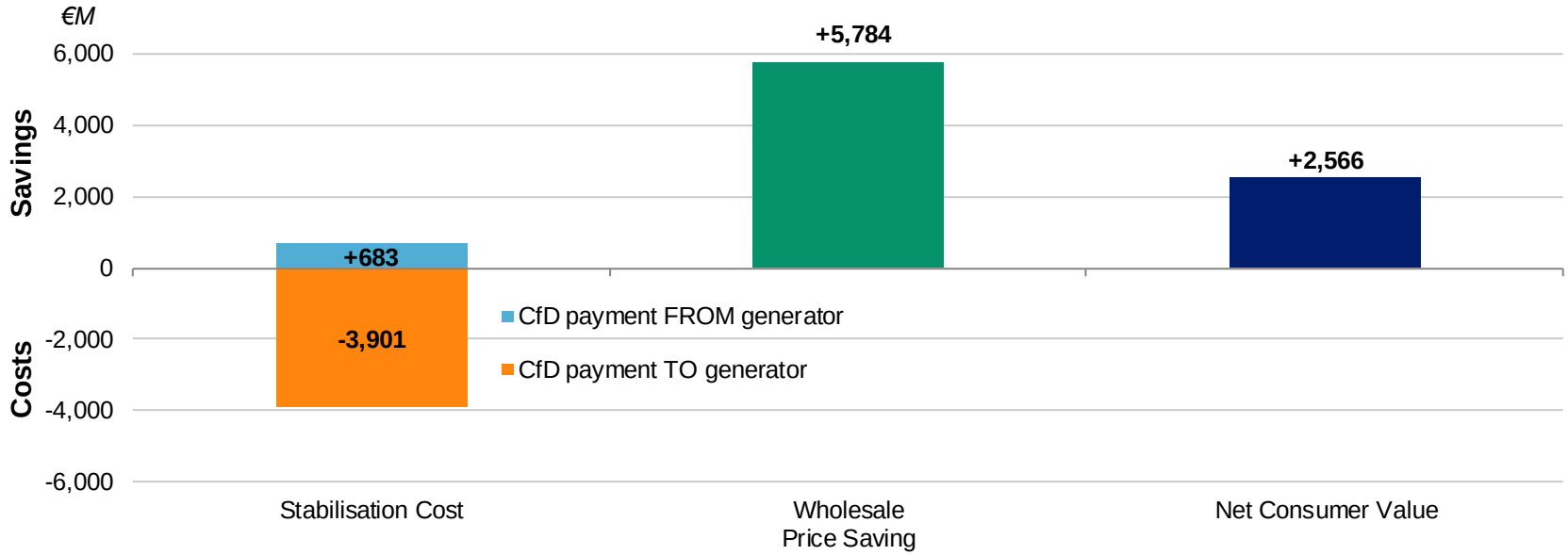
(€M, real 2017 money)



‘CONSUMER VALUE’

If CfDs were struck at €60/MWh for all renewables capacity built after 2020, net ‘Consumer Value’ across the SEM would be ~€2.5B in the period 2025-40

Assessment of cumulative net Consumer Value assuming CfD strike prices are €60/MWh (€M, real 2017 money)

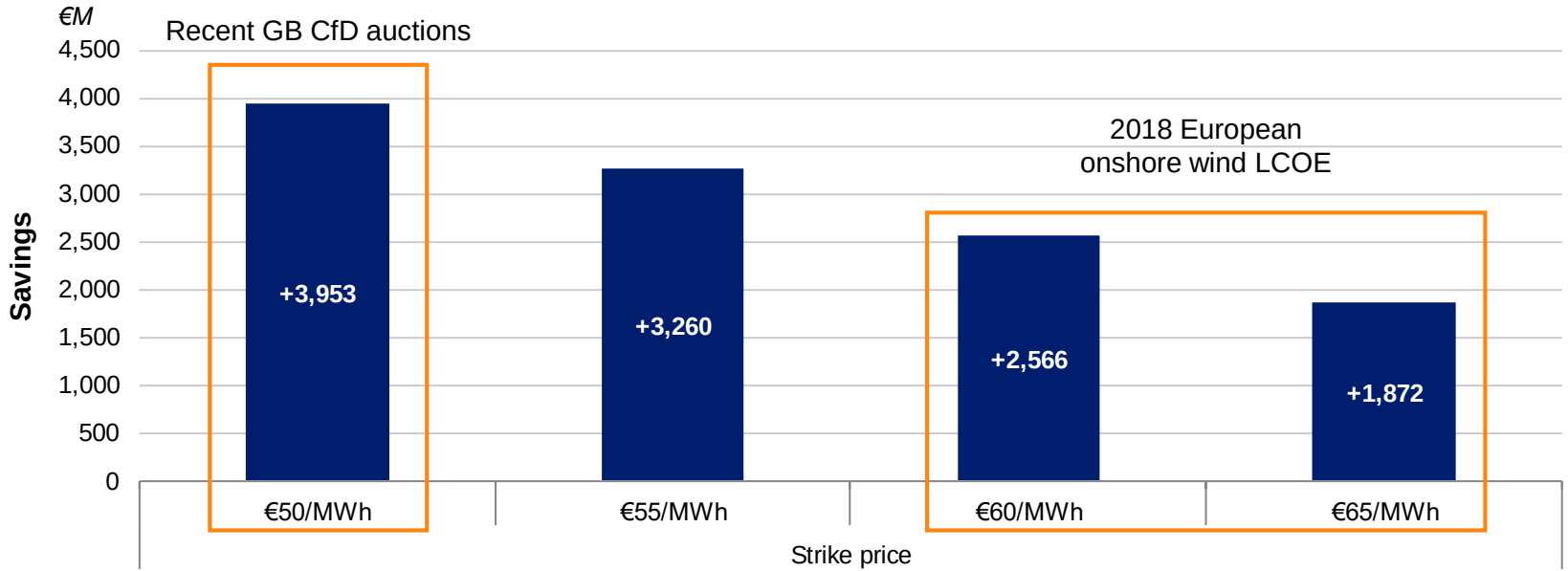


NB: Present value calculations assume a 6% discount rate.

‘CONSUMER VALUE’

At a plausible range of CfD strike prices, consumers across the all-island market stand to ‘benefit’ in the range of €2-4B between 2025 and 2040

Sensitivity of net ‘Consumer Value’ to CfD strike prices (2025-40) (€M, real 2017 money)

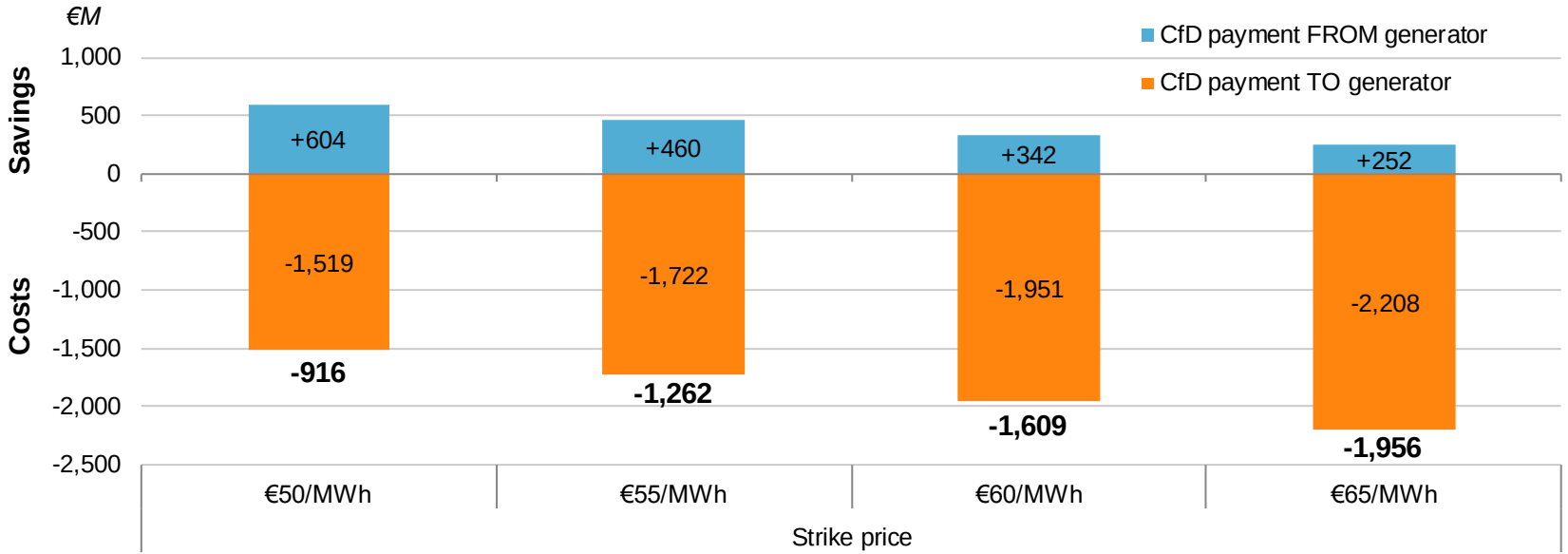


NB: Present value calculations assume a 6% discount rate.
Source for onshore wind LCOE is IRENA.

IMPLICATIONS FOR CORPORATE PPAS

If 15% of all-island demand has to come from generation backed by corporate PPAs, corporate Ireland would be providing funding of c.€1-2B to renewable generators

Sensitivity of CPPA share of 'Stabilisation Cost' to CfD strike prices (2025-40) (€M, real 2017 money)



NB: Present value calculations assume a 6% discount rate.

CLOSING THOUGHTS

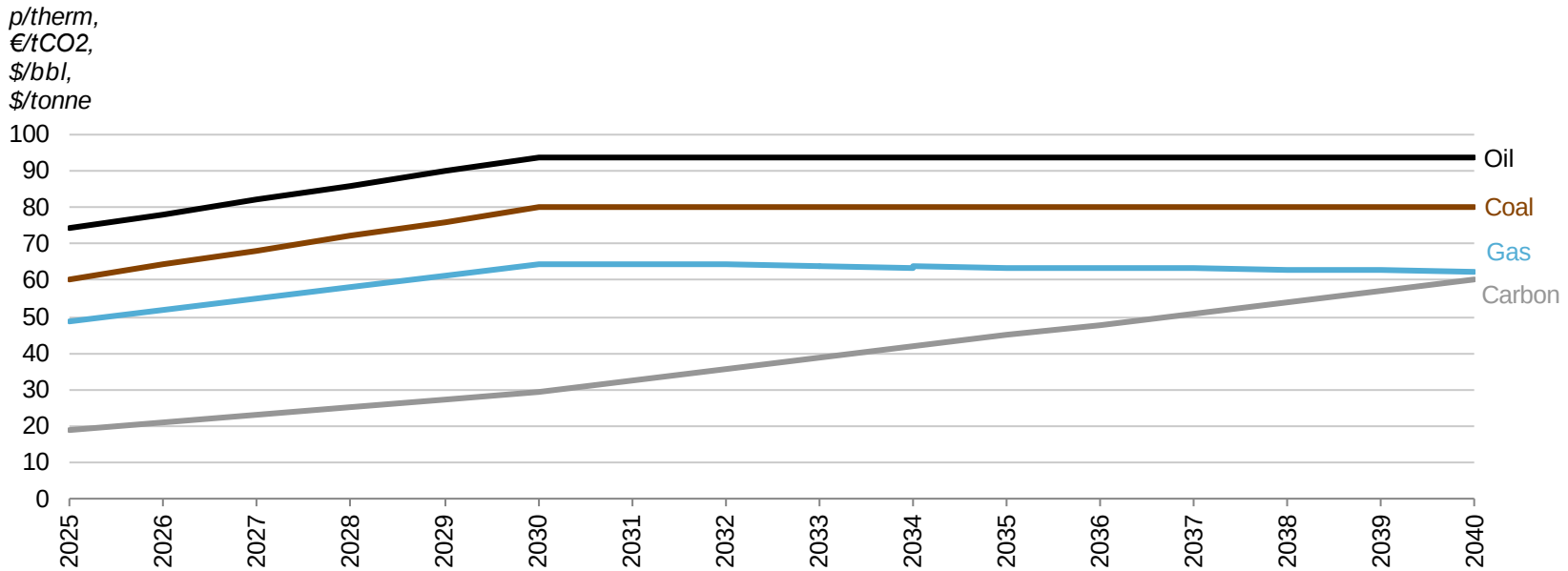
- More wind / solar MW → significantly lower wholesale prices than the non-renewable (thermal) alternative
- Cost of supporting additional RES does not outweigh benefits of lower wholesale prices (at plausible strike prices)
- The ‘consumer value’ estimates presented can be thought of as a ‘budget’ for all of the costs not considered
- Corporates will benefit without getting involved directly → are there suitable incentives for CPPAs?
- The cost of any such incentives is implicitly factored into these ‘consumer value’ estimates

Appendix

MODELLING ASSUMPTIONS

Fuel and carbon prices to 2030 were derived from IWEA's 70x30 report; beyond 2030, gas and carbon come from National Grid; coal and oil are assumed to be flat

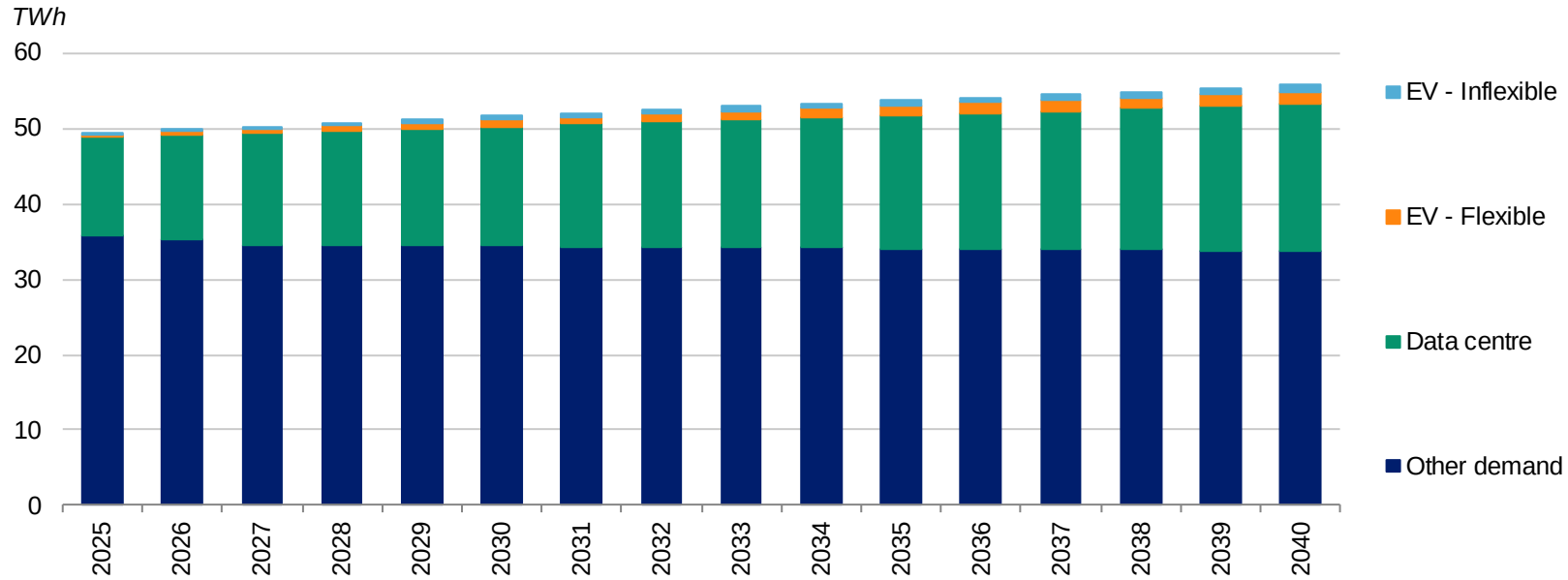
Fuel and carbon price inputs (Gas (NBP) – p/therm, Carbon (EU ETS) – €/tCO2, Oil (Brent) – $/bbl, Coal (ARA CIF) – $/tonne)



MODELLING ASSUMPTIONS

Annual demand was derived from EirGrid projections made in the 2018 Generation Capacity Statement and 2017 Tomorrow's Energy Scenarios

Annual all-island demand projection (TWh)



MODELLING ASSUMPTIONS

Non-renewables capacity is broadly similar in the two pathways; 70x30 has considerably higher wind and solar capacity than 40x20

All-island capacity mix projection in the 70x30 (LHS) and 40x20 (RHS) pathways (GW)