

European electricity markets: lessons from Britain

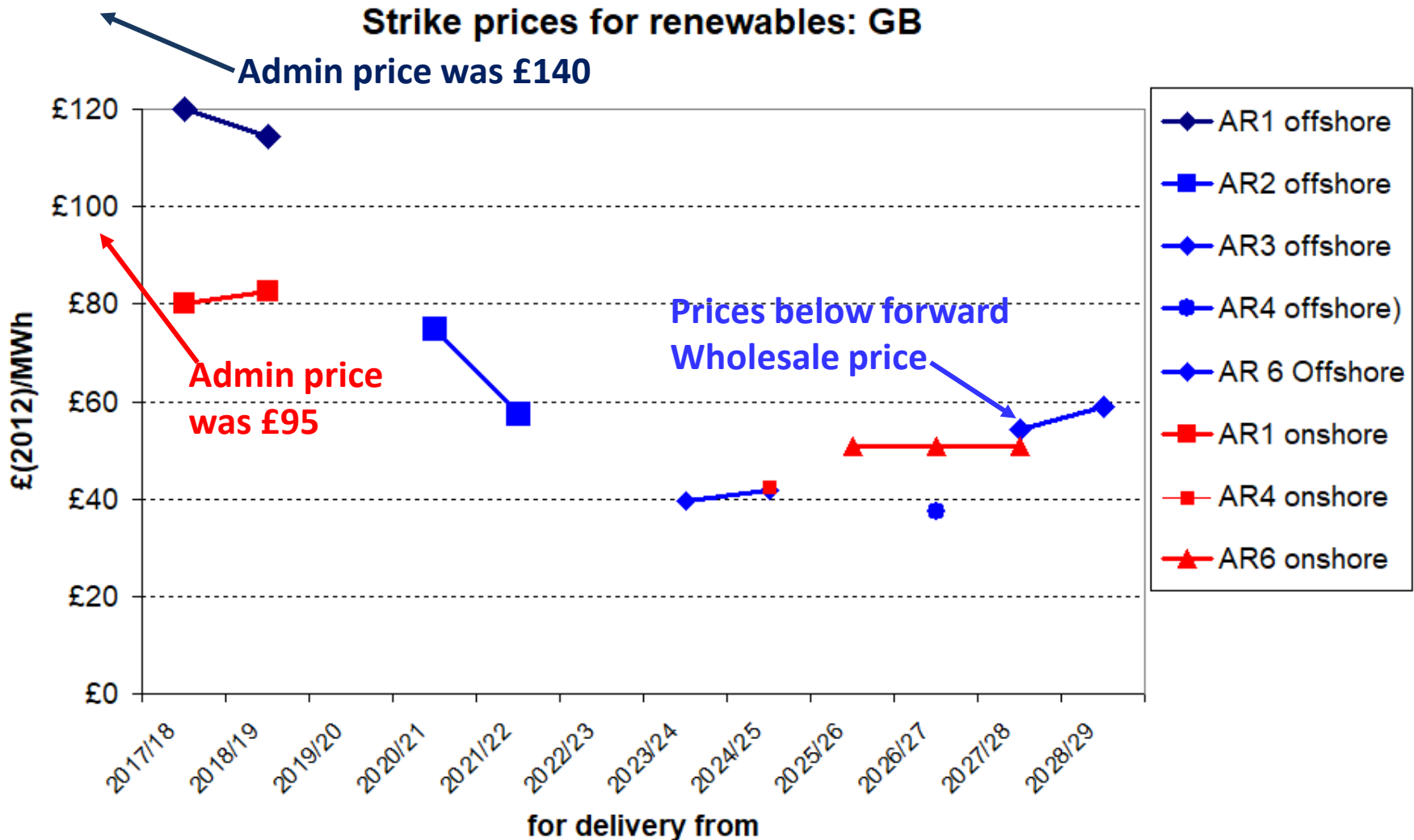
David Newbery, *EPRG,*
University of Cambridge

EPRG-PwC Winter Seminar

13th December 2024

- Success – CfD auctions
 - Could be improved
- 2030 Offshore wind target implausible
 - ⇒ Rebalance to onshore wind and **PV?**
- **NESO useful step to address Transmission needs**
 - Needs massive **shakeup of planning and bureaucracy**
- **Curtailment** accelerating issue
 - Even if transmission constraints removed
- **Interconnectors** reduce curtailment
 - But need efficient dispatch: **zonal pricing**
 - Allows low cost **wind to benefit consumers**

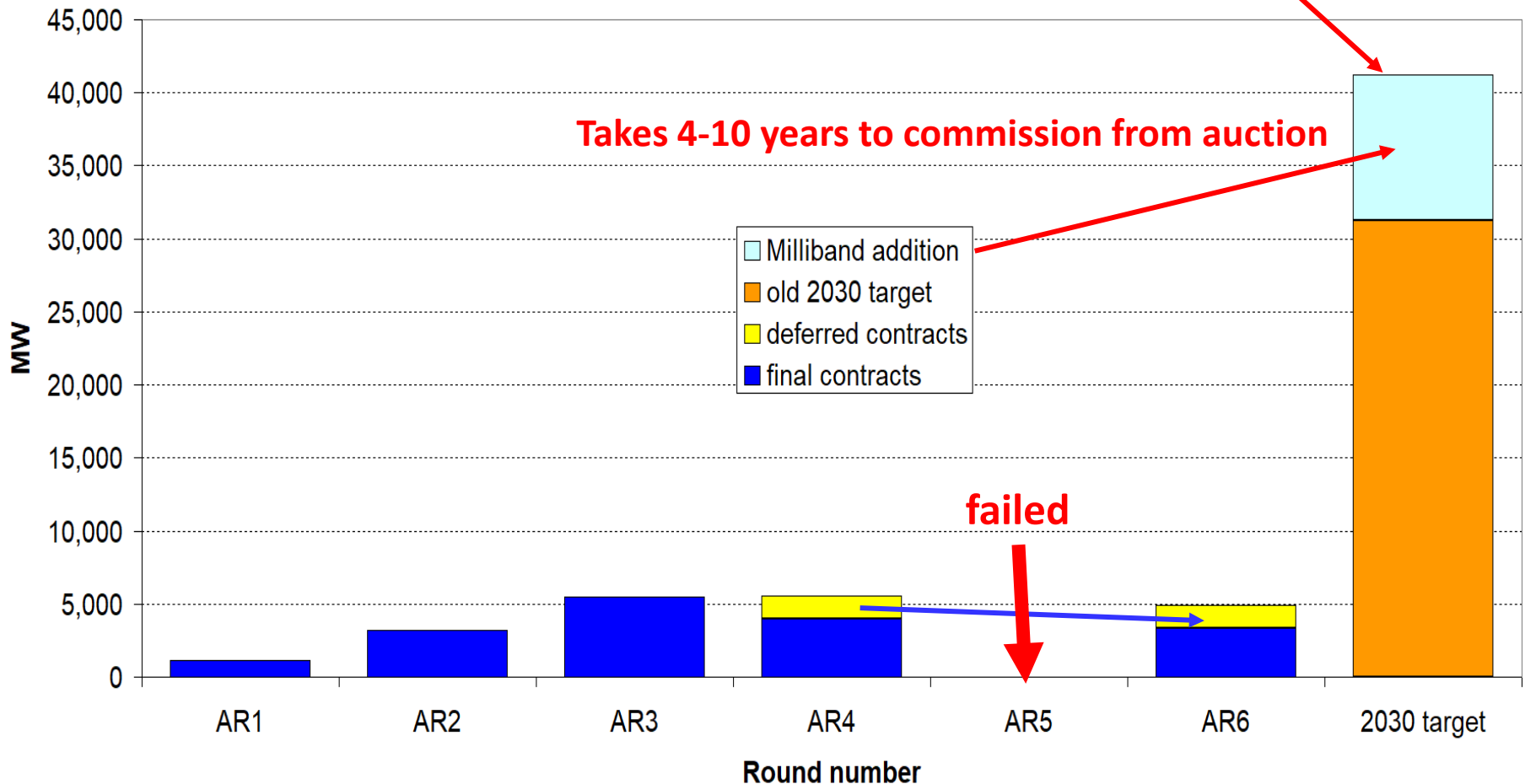
Earlier auction price falls reversed



Source: <https://www.gov.uk/government/publications/contracts-for-difference-cfd-allocation-round-6-results>

The new 2030 offshore wind target is infeasible

Offshore wind auction rounds



Source: <https://www.gov.uk/government/publications/contracts-for-difference-cfd-allocation-round-6-results>



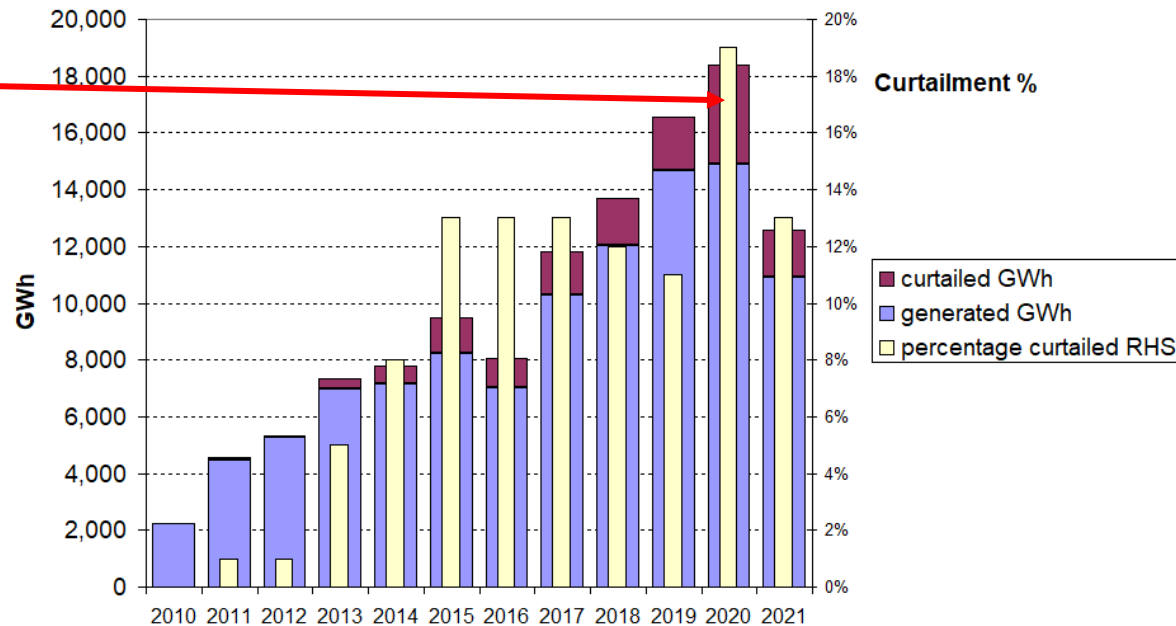
How credible are the 2030 targets?

- **Offshore wind additions static**
 - At plausible growth rates **50 GW** reached in **2040 not 2030**
 - Instead target raised to **60 GW – average** output **30 GW**
 - Need to accelerate time to final investment decision
 - ⇒ Single agent auctions for seabed + CfD?
 - PV needs 5-fold expansion to meet 50 GW by 2030
 - = **5,000 hectares** (agriculture is **17 million** ha.), **5.5 GW av.** output
 - 2022 built only **0.7 GW PV**, **0.3 GW** on-shore wind
 - **2024 AR6**: **0.5 GW PV**, **1 GW** on-shore wind
 - Grid-scale PV cheapest & fastest option
 - Onshore wind faster than offshore wind
- ⇒ **replace some offshore with PV, on-shore**

The high VRE problem: curtailment

- Variable Renewable Electricity (VRE, i.e. wind and solar PV)
- Peak: average output ratio 2-4:1 (wind); 9:1 (PV)
- 2030-31 peak wind = **160%** average domestic demand
- Transmission constraints already cause **curtailment**
- Marginal curtailment **3-4 times average**
⇒ curtailment rates **rise** with increased VRE

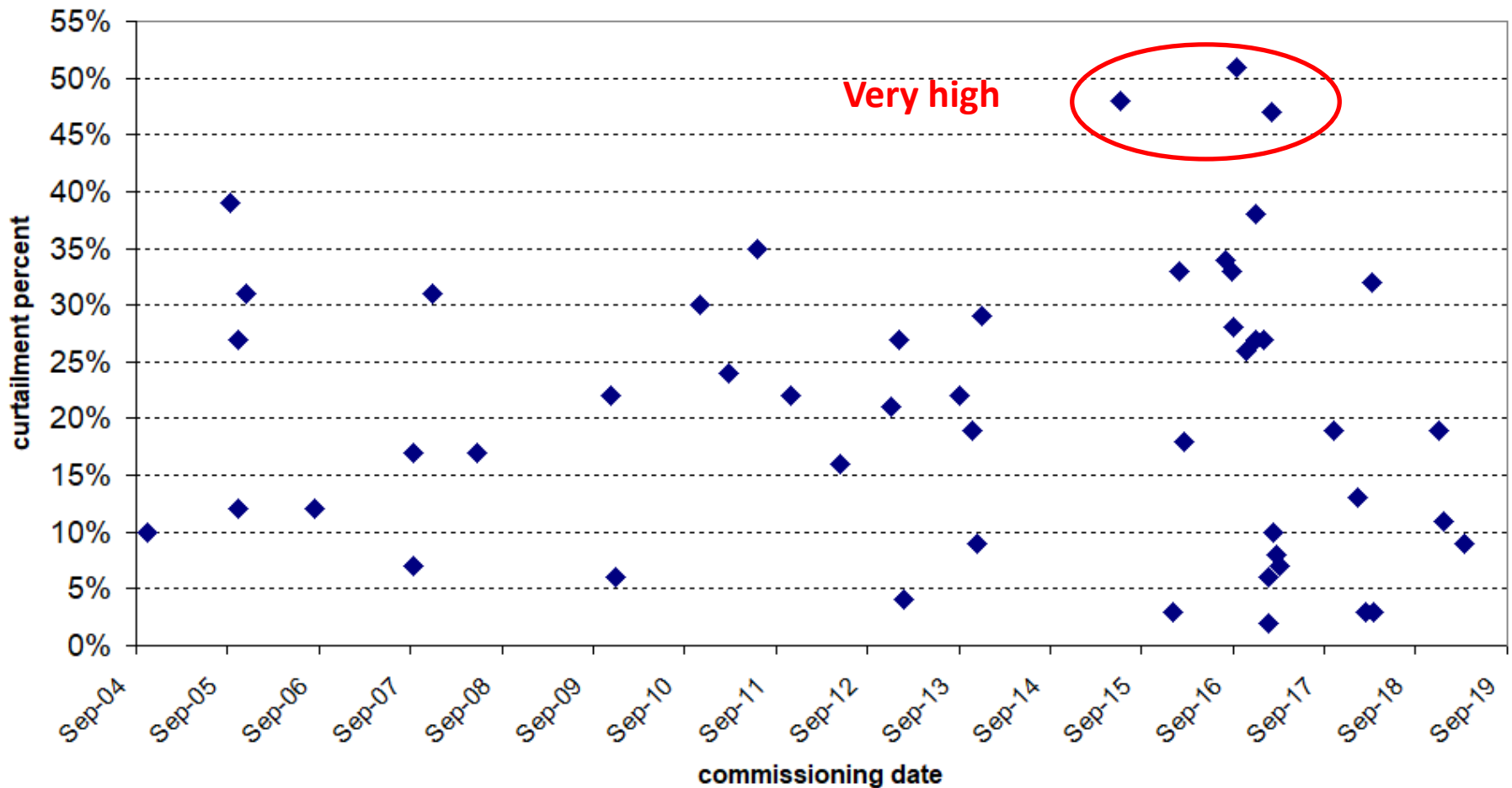
Evolution of wind curtailment in Scotland 2010-2021



Source: <https://www.ref.org.uk/energy-data>

Scotland transmission constraints already very serious

Curtailment in 2020 by commissioning date of Scottish wind farms

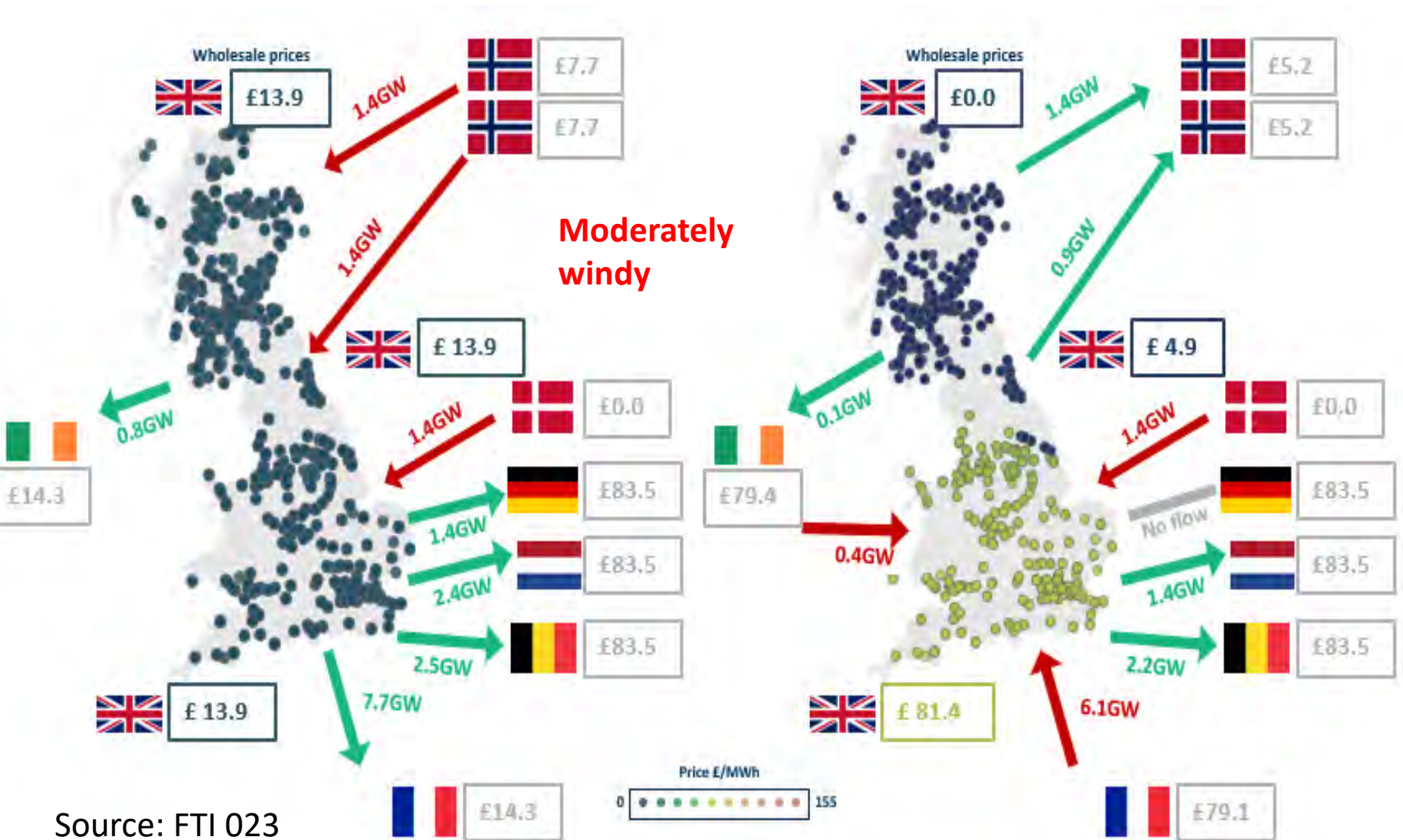




Locational pricing

- FTI report to Ofgem suggests nodal pricing
 - Now ruled out => zonal pricing as second best
- e.g.: surplus Scot wind, high demand S. England
 - Single GB price = £13.7/MWh
 - Imports NO => Scotland, exports to FR, Scot Wind constrained
 - Zonal price: £0/MWh Scotland, £81.4/MWh S England
 - Scot wind => Norway, GB South imports from FR
- Benefits:
 - many zones depoliticises Scotland: England border
 - Interconnectors efficiently used
 - Low wind prices passed to consumers

Single GB price zone vs LMP: impact on interconnectors



Source: FTI 023



Improving VRE delivery

- Key is **assured efficient** delivery
 - ⇒ Announce **future auction** amounts (or £ available)
 - ⇒ **Combine auction** of seabed site with CfD?
 - ⇒ Guide location of onshore, PV to existing grid capacity
- **Curtailment** with compensation **expensive**
 - **Limit** number of **contracted MWh**
 - E.g. 60,000 MWh/MW for offshore wind
 - ⇒ assured future total revenue underwrites finance
- Onshore PV, wind to respond to spot price
 - ⇒ “deemed” CfD based on **forecast** or reference price
 - ⇒ as a financial contract **encourages efficient dispatch**

- Offshore 2030 wind target **infeasible**: more like 2040
 - ⇒ Shorten consenting, combine seabed and CfD auction
 - ⇒ Expand interconnectors, ensure properly coupled
 - ⇒ Zonal pricing
 - ⇒ **Replace** with more onshore wind, PV
- Transmission needs acceleration
 - Pro-active build to good VRE sites, offshore landings
 - More skilled local engagement: offer alternative routes
- Curtailment inevitable => **ensure CfDs fit for purpose**

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References

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Fiscal support in 2022-23

EPG: Energy Price Guarantee (all households)

EBRS: Energy Bill Relief Scheme (all businesses)

EBSS: Energy Bill Support Scheme (Direct payment to all households)

£ billion				
	March 2022 forecast	November 2022 forecast	March 2023 forecast	Outturn
Total effect of Government decisions	12.3	67.1	52.2	51.1
<i>of which:</i>				
Energy bills support	6.0	55.2	41.6	39.6
<i>of which:</i>				
EPG		24.8	23.0	20.3
EBRS		18.4	6.7	6.7
EBSS	6.0	12.0	11.9	12.7
Cost of living payments¹	0.0	9.2	9.2	9.2
Council tax rebate	2.9	2.9	2.9	2.9
Other Support Measures	3.4	7.0	4.5	4.5
Windfall taxes	0.0	-7.1	-6.0	-5.1

¹This includes the cost of living package announced in May 2022 that includes the expansion of the EBSS

= 2% of GDP (net)

Source: OBR Forecast Evaluation Report, October 2023, [OBR 2023](#)

Some additional support estimated into following period by NAO.