Aurora Keynote:

What's next for offshore wind?

Ashutosh Padelkar

Associate GB Power & Renewables, Aurora

AURORA

Renewables Summit

London 2023

The deliverability of GB's offshore wind ambition is in question with cost and policy uncertainty, and declining subsidy support

AURORA

Input costs	↑ 16%	Increase in average turbine price for Siemens turbines between Q2 '22 to Q1 '23
% Cost of capital	↑ 4.25 p.p.	Increase in interest rates since Jan 2022 has driven up financing costs
? Policy uncertainty	↑ 24+	Alternatives to the current market design proposed in REMA[1]
£ Ringfenced support	✕	Offshore wind no longer has a dedicated budget
Strike prices	↓ 74%	Decline in strike prices for offshore wind since FIDER[3] (2014)

How can the market overcome these challenges to deliver 50GW offshore wind by 2030?

1) Review of Electricity Market Arrangements; 2) CfD Allocation Round 5; 3) Final Investment Decision Enabling for Renewables

Sources: Aurora Energy Research, Siemens Gamesa Q1 2023 report, Bank of England, DESNZ

Aurora has analysed three routes beyond the CfD that could enable the delivery of offshore wind projects

AURORA

X Deep-dives

A Hybrid financing

- Combining CfDs with PPAs could increase IRRs by 1.5 p.p.
- Hybrid financing also unlocks other revenue streams like CM or ancillary services

B H_2 Co-location

- The green hydrogen business model could be crucial for sites with limited grid access
- Sites in North Scotland could achieve an LCOH of £4.7/kgH_2 due to high load factors

C Reform of Govt support

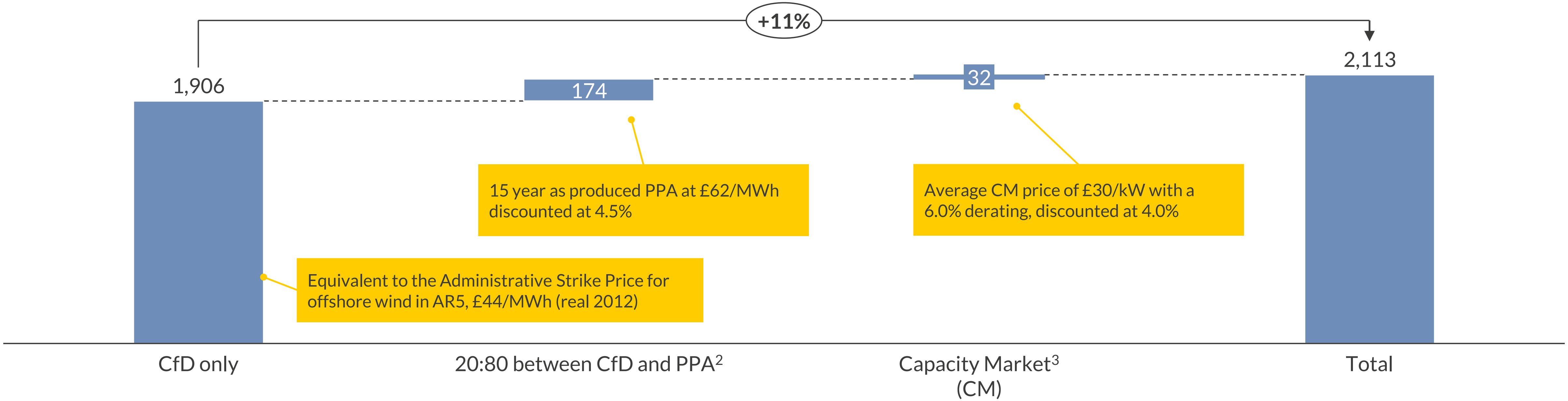
- Moving to revenue cap and floor could increase IRRs by 1.5 p.p. and accelerate investment
- Government-guaranteed minimum revenue would retain investor confidence

Sources: Aurora Energy Research

Splitting the project capacity into multiple revenue streams has become increasingly lucrative as the CfDs have become increasingly competitive

PV of total gross margins for an offshore wind asset in the North Sea[1] entering in 2030

£/kW (real 2022)



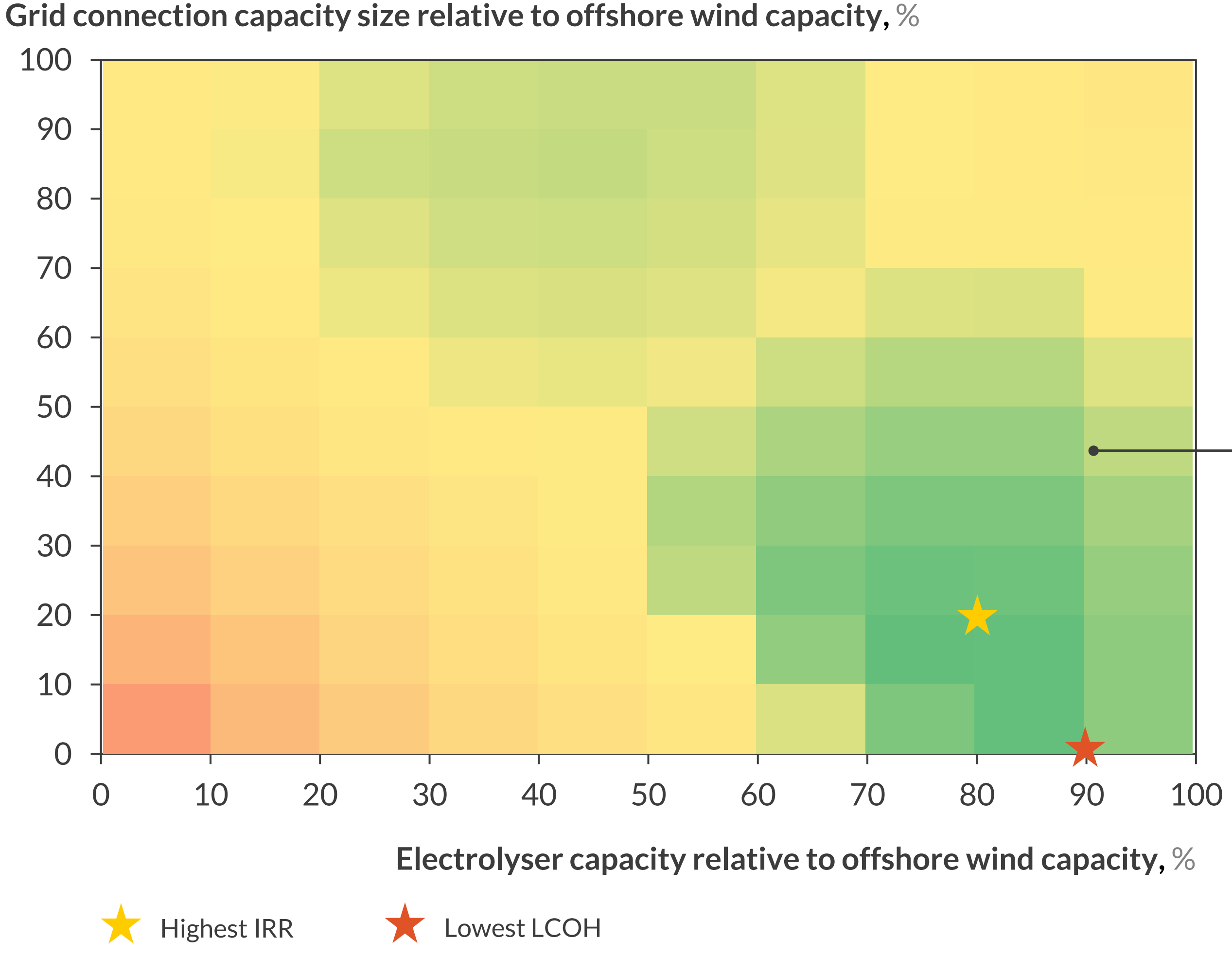
Unlevered project IRR %, pre-tax (real 2022)

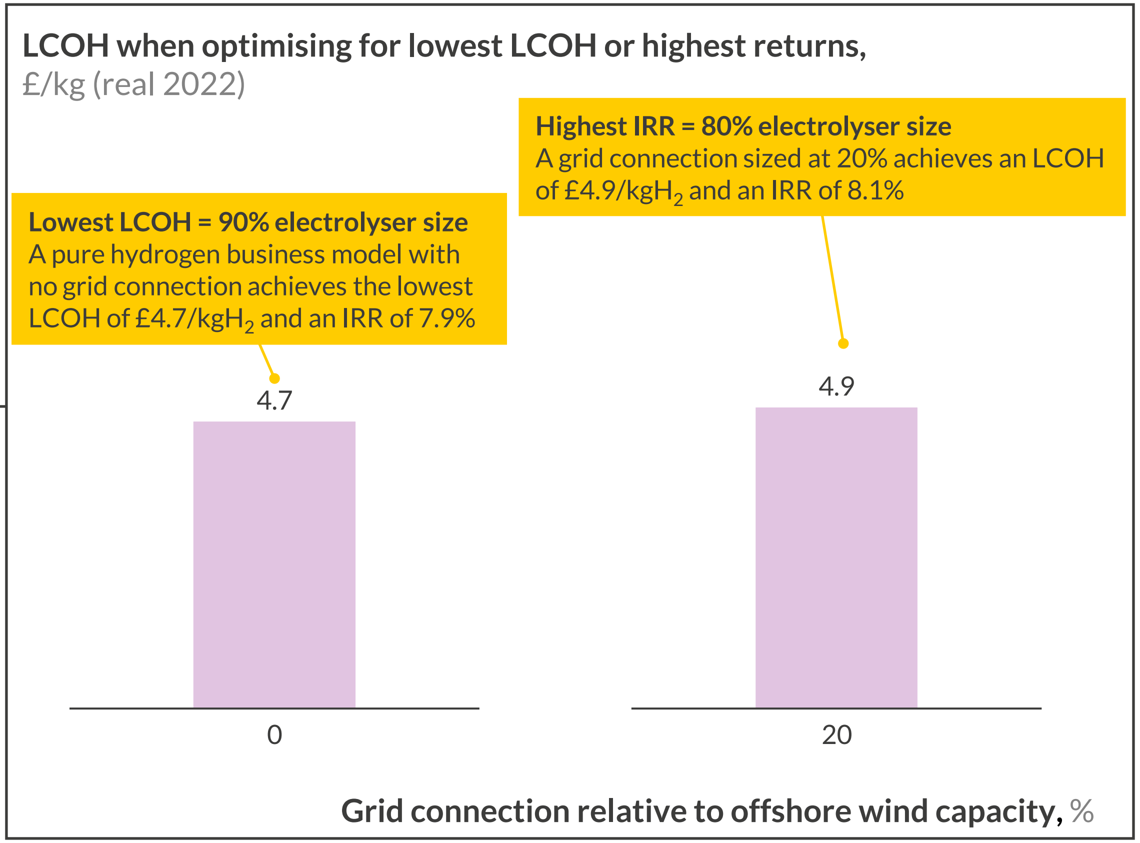
1) Transmission connection, assumed load factor of 52.1%; 2)Increase in NPV when the project capacity is split 80:20 between the PPA and CfD; 3) The capacity reserved for PPAs is eligible for a CM contract

Sources: Aurora Energy Research

The green hydrogen business model can enable grid-constrained projects to build a business case supported by Government subsidies

Offshore wind-electrolyser colocation[1] assuming hydrogen offtake at £4.6/kgH_2 and project financing cost of 8%,
IRR %, pre-tax (real 2022)





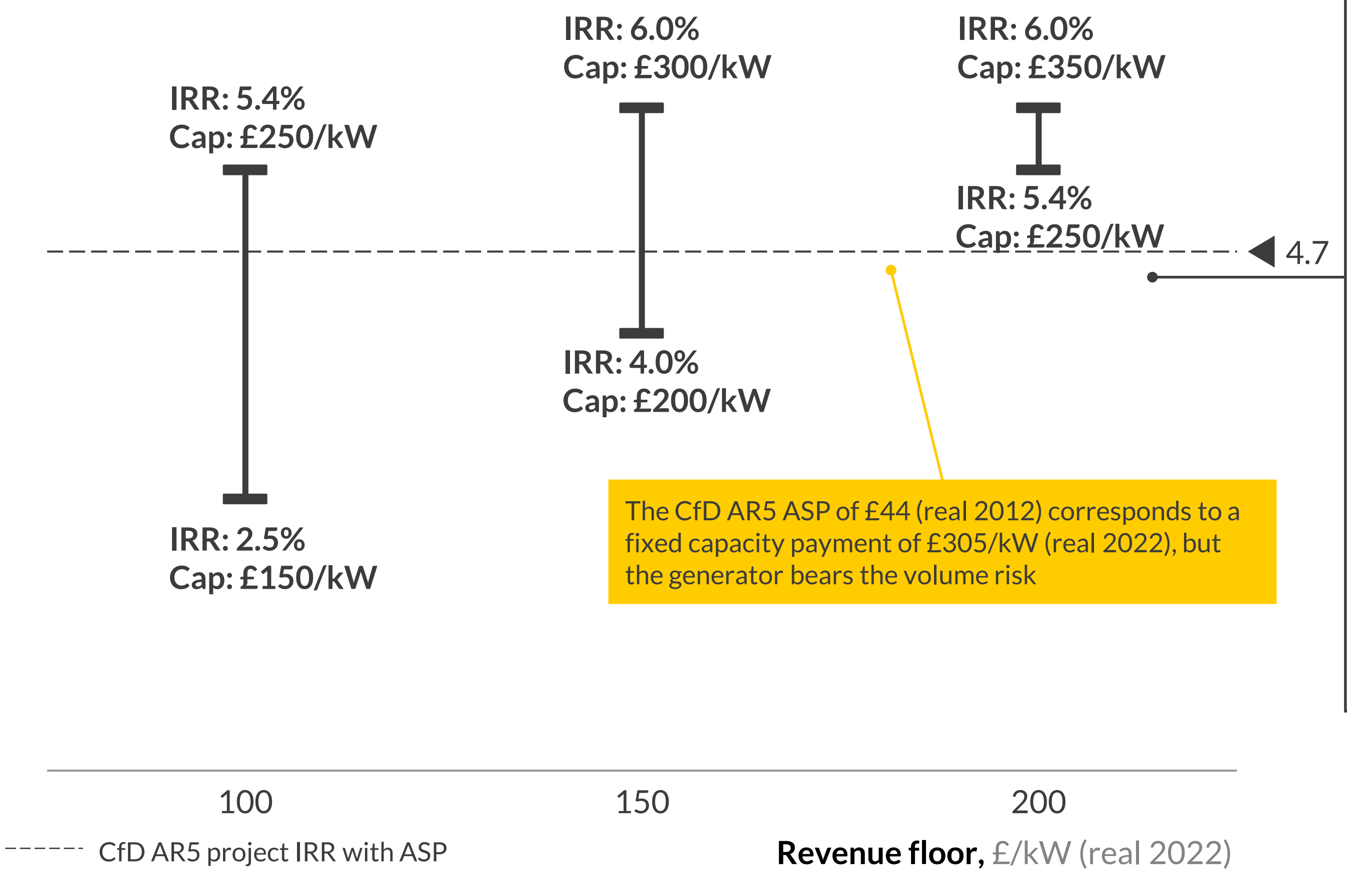
1) Offshore wind project in North Scotland with a load factor of 52.9% with an HVDC link to an onshore electrolyser at the site of hydrogen offtake

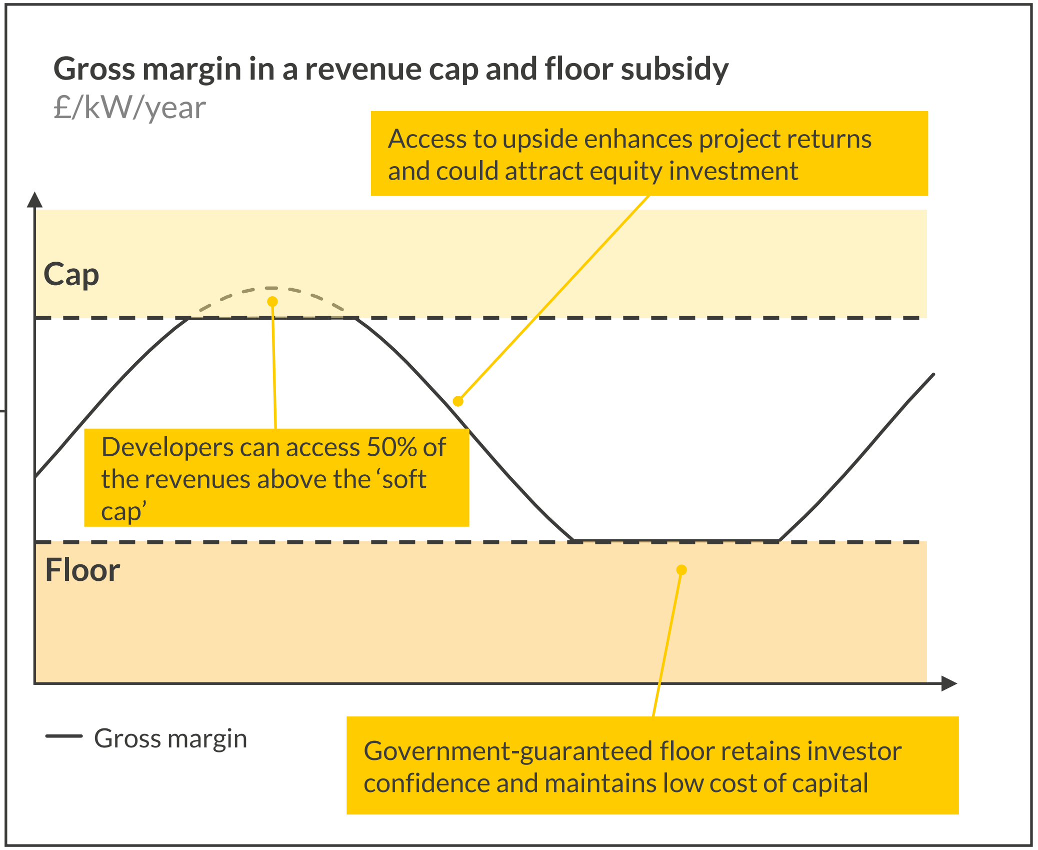
Sources: Aurora Energy Research

Revenue cap and floor offers a win-win solution that could lower the budget impact while offering attractive returns and incentivising investment

AURORA

Offshore wind asset in the North Sea[1] entering in 2030
Project IRR %, pre-tax (real 2022)





1) Transmission connection, assumed load factor of 52.1%

Source: Aurora Energy Research

Key takeaways

AURORA

Offshore wind in GB faces economic headwinds due to uncertainty surrounding policy, costs, and declining subsidy support. Developers can explore three alternatives to the CfD-only business model to mitigate these challenges

Splitting project capacity between a CfD (20%) and PPA + Capacity Market (80%) can increase returns for a representative offshore wind project by 1.5 p.p. (real 2022, unlevered)

H_2

Co-location with subsidy-backed hydrogen electrolysers is an opportunity to diversify into the green hydrogen business model with an LCOH of £4.7/kgH_2 whilst reducing required grid capacity and costs

Moving to a revenue cap and floor mechanism for offshore wind between £150-300/kW over 15 years can maintain investor confidence and increase the returns for a representative project by 1.3 p.p. (real 2022, unlevered)

AURORA

ENERGY RESEARCH