



NEW STREAM
RENEWABLES

New Stream Insight : Nuclear Power Generation in the UK

Where are we and where are we going?



Commentary from
Paul Sanders
Head of Generation at New Stream.

NEW STREAM'S VIEW

"Our view is that PPAs can't typically be standardised and put on an auction platform. Or if they are, then there is a risk of either undervaluing the renewable price or ending up with a PPA structure that doesn't work for the company or individual."



Nuclear generation will be a significant factor in short, medium and long term power prices.



Flexibility will be key.



Power demand may double by 2050.

To its supporters, Nuclear is a crucial step to meeting Britain's net-zero emissions goals, providing reliable low-carbon power and creating thousands of jobs. To its critics, it's an outdated, risky technology that will push up energy bills and blight the landscape. But whatever your position Nuclear generation will be a significant factor in short, medium and long term power prices in the UK and across much of Europe.

Flexibility will be key. Someone like EDF would argue that wind has higher costs in terms of this flexibility requirement and says it is confident Sizewell and Hinkley could actually reduce consumer bills but when you look at £92.50 per megawatt-hour (the Hinkley award) for its power its more than double the price awarded to recent offshore wind projects.

The government position is that power demand may double by 2050 and due to the intermittent nature of renewables up to 38% of that demand may need to be met by "dispatchable" gas with carbon capture or base load nuclear generation.

Britain's Nuclear Projects

Project Name	Size (GW)	Partners	Status	Comments
Hinkley Point C	3.2	EDF, CGN	Under construction	Still targeting generating in 2027 at a cost of £25 billion pounds. Construction financed by EDF. Government guaranteed price for power sold from plant.
Sizewell C	3.2	EDF, CGN	Waiting for planning permission	Reactor design based on Hinkley plant. EDF looking for ways to fund it without shouldering all the risk. It's seeking to combine government and private funding. Aims for planning application early 2020. Construction due to start 2021. Electricity flows from 2031.
Bradwell	2.3	CGN	Early technical stages	Seeking government approval for a Chinese reactor design. Could be politically sensitive.
Wylfa	2.9	Hitachi	Abandoned in September	Hitachi pulled out of project after putting it on hold in 2019. Was due to start generating in mid-2020s.
Oldbury	2.9	Hitachi	Abandoned in January	The project is in very early development stages. Site identified but no applications had been made for regulatory approvals.
Moorside	3	Toshiba	Abandoned in 2018	Decision to halt project came after failed attempts by Toshiba to sell its stake. No financing agreement was in place with the government. Was due to start operating in 2024.

About Sizewell C

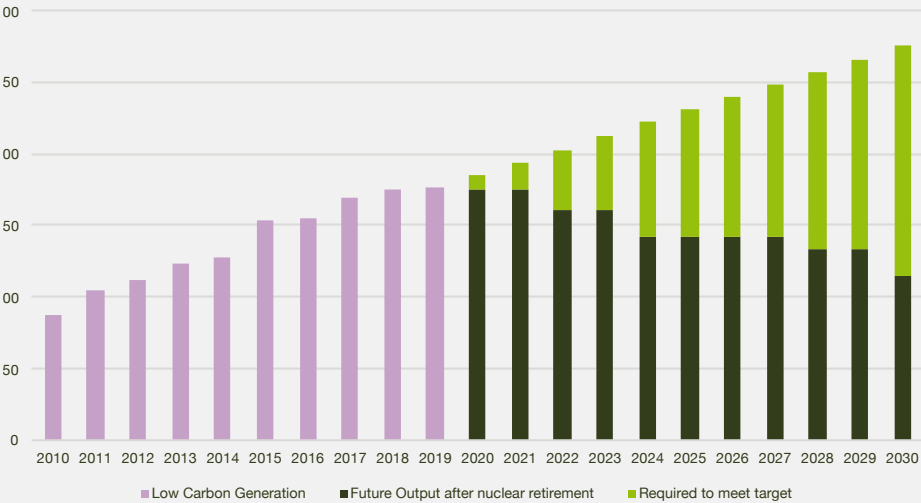
Much has been written about the Hinkley point project but the twin-reactor plant in Suffolk also proposed by EDF could generate 3.2 gigawatts of electricity which would be enough to provide 7 per cent of Britain’s needs. It would be a sister station to Hinkley Point C, which EDF is building with the Chinese state group CGN in Somerset, and which the government said in 2016 should be the “first of a wave of new nuclear plants”.

However, of five projects that were proposed to follow Hinkley, three have been abandoned by Toshiba, while CGN’s hopes of building its own reactor in Essex are looking more unlikely. This could mean that the Sizewell C plant will be the test case for future nuclear generation in the UK.

EDF analysis suggests the Sizewell C nuclear plant could cost each household about £10.50 a year on their energy bills and only time will tell if that represents good value for the consumer.



UK Electricity Generation from Low Carbon Sources



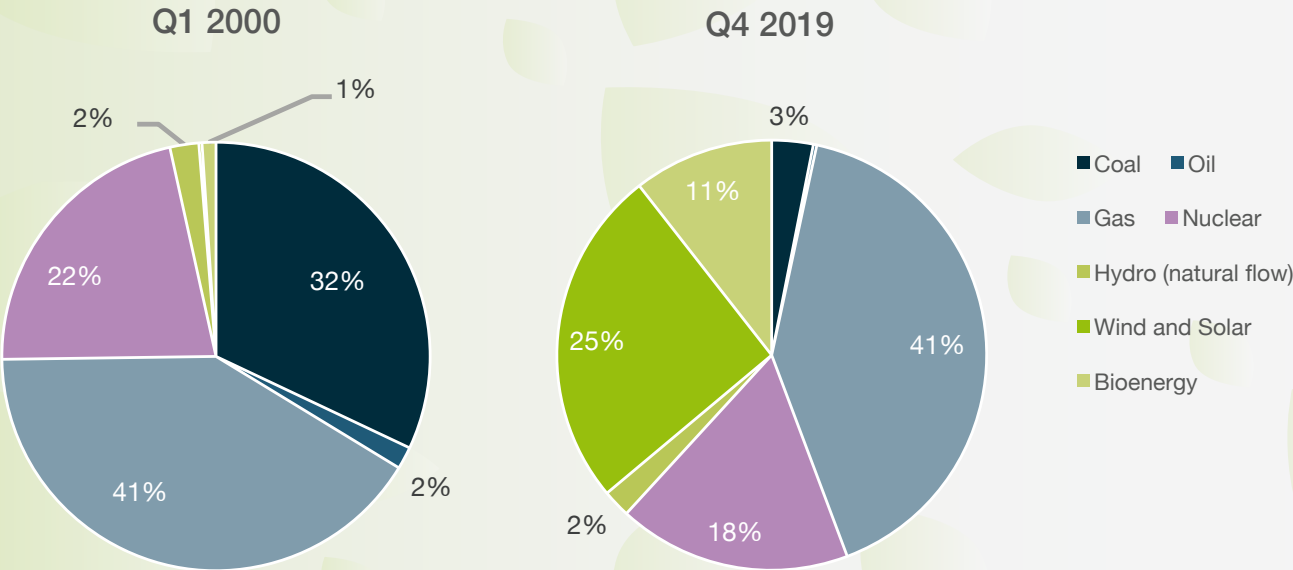
NEW STREAM POSITION

“We work closely with developers and funders to provide an optimal PPA structure for the project duration on individual assets or for entire portfolios.”

- For context, the 3GW Hinkley C new nuclear plant being built in Somerset will generate around 20TWh once completed around 2027. The world’s largest offshore windfarm, the 1.2GW Hornsea One scheme off the Yorkshire coast, will generate around 5TWh each year.
- Given scheduled nuclear retirements and rising demand expected due to increased electrification of transport and heating low-carbon generation would need to increase by 15TWh each year until 2030 in order to meet the benchmark of 100g CO2/kWh.
- The nominal 100gCO2/kWh target for 2030 was set in the context of the UK’s less ambitious goal of cutting emissions to 80% below 1990 levels by 2050. Now that the aim is to cut emissions to net-zero by 2050 we have to assume that the 100gCO2/kWh indicator is likely to be the bare minimum.
- 54% of UK electricity generation in 2019 came from low-carbon sources, including 37% from renewables and 20% from wind.



UK Electricity Generation by Fuel Mix



Nuclear impact on UK Power Pricing and PPAs

- 6 French nuclear plants have major 10 year overhauls that need to be undertaken in 2020.
- Covid lockdowns delayed maintenance schedules with knock on impacts across the fleet.
- Availability issues appear to be steadily rising.
- UK nuclear plant have their own availability issues.
- As plants in France and the UK get older increased safety regulations mean outages are more often sudden and extended.

What this means for PPA pricing ?

We certainly see fundamental reasons why there should be a market priced risk premium for potential shocks as we enter winter. There is clearly issues in France with their nuclear generation that could have wider implications across European energy markets including the UK.

If we get some cold weather in addition to this then that could reverse interconnector flows as we saw in Winter 2016.

New Stream Summary PPA Recommendation :

New Stream is still working with clients to put in place short term PPA fixes of 6 to 12 months capturing some of the value in increased pricing for the front winter contract. The underlying power market is still showing fundamental reasons to be positive about potential further price increases so we are working with PPA clients to ensure we have flexibility to re-contract on a forward looking basis if the market continues to rise.

As always every client has slightly different requirements so we work with them on a bespoke basis to find the best PPA solution.

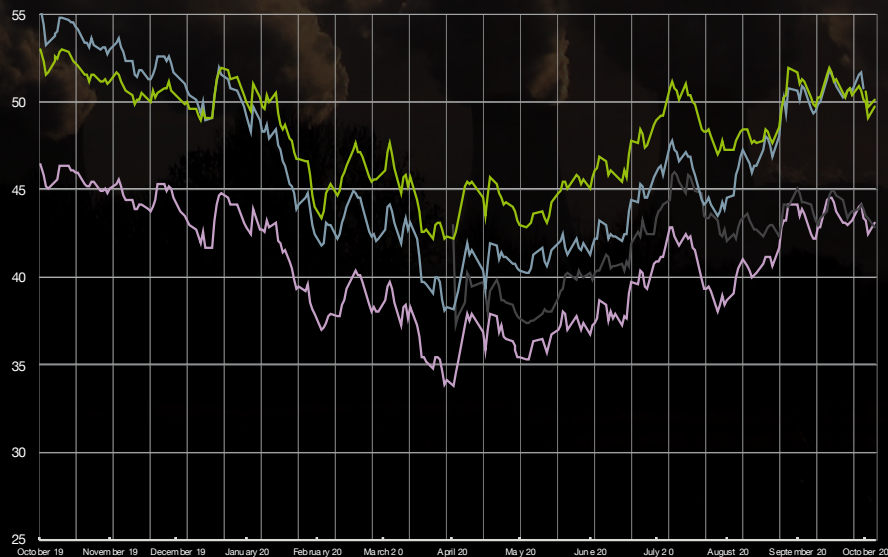
 **Jamie Banks -**
PPA Manager
at New Stream:

“The situation with French nuclear generation as we enter winter is really interesting in terms of PPA strategy.”

“Back in April EDF shocked the market in by slashing its output guidance by more than 20% to 300 TWh. For context France’s 60GW nuclear fleet underpins much of European power markets. These plants alone have historically generated around 15% of the Europe’s total requirement and now that the UK is connected to that market via power interconnectors this will likely impact prices here.”

UK Power Chart : Off the Lows

NS UK Power ahead



Green Certs

REGO

Demand for CP19 certificates slowly increasing however we are seeing a number of buyers coming into the market for CP20. Buyers are very generation technology specific with pricing for non-bio certificates ranging from £0.35-0.45.

ROC

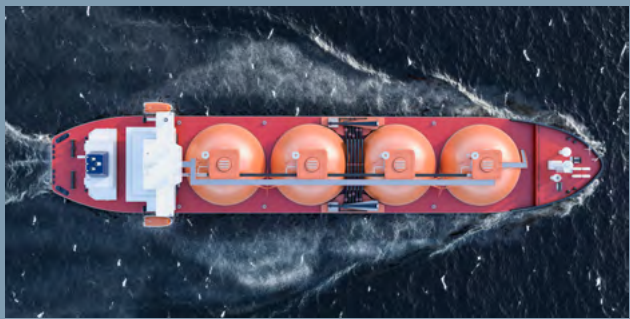
Given the uncertainty over supply volumes and as such the impact on ROC demand together with continued falls in the forecast recycle value , prices have continued to weaken. Forecast for ROC recycle is not at around the £2.50/ROC level.

Green Gas Certificates

Very active market with buying interest from UK, Europe and now US corporates. The entry to the market by US corporates reflects their desire to back off their gas demand in the UK and Ireland for data centre behind the meter power generation.

Considerable premiums being offered for certificates derived from waste and crop with carbon capture.

In other news :



Spot LNG prices strengthened last month on the back of ongoing liquefaction repair work in Australia. Supply issues were compounded after a hurricane Laura swept through the US, halting output from two major LNG plants.

As we have flagged recently production problems have slowed LNG cargos into the UK and have been supportive to NBP and power pricing.



Government consults on biogas levy, favours flat rate per meter. The Green Gas Support Scheme is due to launch in Autumn 2021. It will be funded by the Green Gas Levy, which will pay biogas producers over a 15-year period.



National Grid and Dutch transmission system operator Tennet are working on plans for a multipoint interconnector that would connect offshore wind farms to both countries.



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Since 2008 we have been involved in over 3GW of PPA power sales and route to market trading for a wide range of clients including institutional funds, private estates and local authorities.