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- CONFIDENTIAL -

Preliminary

West of England Combined Authority

Chelson Meadow PPA structuring report

31st March 2023

Contents

Glossary

Term	Definition
1. Baseload	Base load is the minimum level of electricity demand required over a period of 24 hours for a corporate consumer. It is calculated to determine the baseload tradeable blocks within an electricity supply contract.
2. Baseload settlement	Settlement where electricity is balanced and shaped by a supplier/third-party entity as per the agreed volume of consumer in a given period of time. Fee for balancing and shaping is to be borne by an consumer.
3. Back to back PPA contracts	A term used to describe two linked PPA contracts required under the physical PPA structure, one with the electricity generator and another with the electricity supplier.
4. Basis risk	Risk associated with the variation in price difference between wholesale market and PPA price and the volume-weighted settlement mechanism of the PPA reconciliation
5. Cannibalisation	The effect of Increasing penetration of zero marginal cost variable renewable technologies cause the decline of wholesale electricity prices due to the merit-order effect.
6. Contract-for-difference	A mechanism where payments are paid to/paid by either of the contractual parties for positive or negative variations from a predetermined price for solar/wind power
7. Delta	A term to express the difference between two calculated amounts
8. Future Wholesale curve	A representation of the indicative future price of electricity on wholesale market
9. In the money	When market prices are above the PPA price, the generator pays the corporate. Therefore corporate is 'in the money'
10. Monthly baseload	Minimum amount of demand over 24hrs in a month. Such type of contracts are settled on forecast monthly production (P50) against prevailing hourly prices
11. Out of money	When market prices are below PPA price, the Corporate pays the Generator. Therefore the Corporate is 'out of the money'
12. Pay-as- Produced PPA	A contract structure where PPA volume is settled against actual, intermittent generation
13. Pay-as- forecast PPA	A contract structure where PPA volume is settled against forecasted production based on a probabilistic calculation agreed by both parties (usually the P50)
14. Profile risk	Risk associated with the variation in production of electricity. Due to the intermittent nature of renewable energy, production may vary depending on the availability of sunlight for solar assets and wind for wind projects

Glossary (cont'd)

Term	Definition
15. Sleeving fee	A fee charged by a supplier for managing the shaping and balancing risks of generating assets on behalf of an electricity consumer within the supply agreement
16. Stepped pricing	Price which remains constant at a particular level but increases or decreases once the threshold is crossed at each step
17. Solar capture price	The weighted average spot price at which the asset produces.

Acronyms

Term	
1. BAU	Business as usual
2. CAPEX	Capital expenses
3. CfD	Contract-for-difference
4. COD	Commercial operation date
5. CPI	Consumer Price Index
6. CPPA	Corporate power purchase agreement
7. DA	Day Ahead
8. EPC	Engineering procurement & construction
9. GO	Guarantee of Origin
10. HH	Half Hourly
11. HoT	Head of terms
12. LCOE	Levelized cost of electricity
13. NPV	Net Present Value
14. OPEX	Operating expenses
15. PaP	Pay-as- produced
16. REC	Renewable Energy Certificates
17. REGO	Renewable Energy Guarantee of origin
18. SBTi	Science base target initiatives
19. vPPA	Virtual power purchase agreement
20. UMS	Unmetered supply
21. VPPA	Virtual Power Purchase agreement

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Background & Scope

Background and Scope

Background

In 2022, Plymouth Energy Community (PEC) approached the South West Local Net Zero Hub with a project which is considered a good fit to progress the Hub's discussions and work on PPA innovation and implementation models for communities.

Chelson Meadow is a potential 13MW capacity solar farm with an expected annual output of c.13.1GWh that secured planning permission in June 2022.

The project has investment links to Plymouth City Council (PCC) – PCC and PEC would own 50% each of the Chelson Meadow Community Solar (CMCS) Joint Venture - and the authority wants to explore whether they can purchase power generated from this solar farm through a virtual Power Purchase Agreement (vPPA) to cover part of the Council's annual electricity consumption and contribute to the Council's journey towards decarbonisation.

Objectives of this document / workstream

EY has been engaged by West of England Combined Authority to provide commercial advisory support for the development of a vPPA for Chelson Meadow Solar Farm between the potential owner of the asset (CMCS) and the consumer (Plymouth City Council). EY's support on the project covered the following workstreams:

1. Commercial advisory support to PCC to establish a business case for a vPPA (virtual PPA)
2. Analysis of the most appropriate vPPA hedging mechanism for PCC and Plymouth Energy Community Renewables (PEC)
3. Proposed commercial structure for the Chelson Meadow project
4. Supporting PEC and PCC to set an appropriate PPA strike price
5. Review of commercial clauses in the existing draft vPPA Heads of Terms

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Executive Summary

Executive summary - Introduction

Introduction to Renewable Power Purchase Agreements

A Renewable Power Purchase Agreement is a contract for the supply and purchase of electricity between a renewable electricity generator and an electricity consumer. Under a PPA, an electricity consumer agrees to purchase renewable electricity directly from an electricity generator, for a pre-agreed price, volume and minimum duration.

Current benefits of Renewable PPAs to consumers:

Environmental benefits, which include a consumer's support for renewable electricity and the importance of the consumer's commitment in allowing this project to deliver. Consumers can demonstrate clear "additionality" for new renewable generation, through a direct and verifiable relationship to a specific renewable energy project and associated Guarantees of Origin for reporting purposes.

Commercial benefits, potential cost *savings* (for both the power and the REGOs) and reduced exposure to power and REGO price *volatility* based on current wholesale market structure. Other commercial benefits include long-term electricity price certainty and REGO price protection compared to alternative REGO procurement options e.g. via a green tariff or over-the-counter REGO purchasing.

For this analysis we have also considered relevant community benefits, which relate to CMCS' and PCC's wider collaboration in Chelson Meadow and how the project can benefit the wider Plymouth community. These benefits relate to the anticipated Biodiversity Net Gain from CMCS, land rental income from CMCS to PCC and a reduction in PCC's carbon emissions.

Executive summary – Contract structures

PPA contracts can take two forms:

A Physical/sleeved PPA contract is a bilateral multiyear contract which involves physical delivery of power through the energy consumer's electricity supply contract. The power producer/generator signs an agreement with the energy consumer for the supply of contracted volume. In accordance with this structure, the energy consumer also signs a back-to-back retail supply agreement for sleeved power to reflect the terms in the renewable PPA agreement with the generator.

A virtual PPA contract is a fixed-for-floating swap, commonly referred to as a financial contract for difference. In this arrangement, a contract for the settlement of floating wholesale market power price against an agreed fixed PPA price is made between the power generator and the consumer. The physical electricity is subsequently fed into the grid and sold at prevailing wholesale market price. The generator and the consumer then settle the difference between the market price and the contractual price. This type of PPA is similar to a financial derivative, hence there is no requirement to involve the energy consumer's electricity supplier.

In both structures the contracting parties would need to agree the following key parameters:

the pricing mechanism, usually a fixed price linked or not linked with inflation, but other structures such as a floating price with a discount to market exist (more information on pricing structures in page 25)

the contract tenor, the duration of the PPA contract signed between the two parties is usually determined by the asset's financing flexibility and debt repayment horizon, but also the consumer's risk appetite and normal duration of contracting

The electricity delivery and settlement, usually a Pay-as-Produced structure is preferred by the electricity generator, but other options are available including a Pay-as-Forecast structure and a Baseload structure (more information on electricity delivery and settlement options in page 26)

Executive summary - PCC consumption profile

PCC's current electricity consumption

A review of PCC's annual metered consumption shows total demand at c.12-15GWh per annum. This total excludes unmetered electricity, which is anticipated at about 7GWh per annum. Thus, PCC's total consumption is expected to be between 19-22GWh per annum.

Chelson Meadow generation is c. 60% of PCC's current consumption

The analysis shows that Chelson Meadow will cover roughly 56-67% of PCC's total annual consumption, assuming a flat daily consumption of ~35MWh for PCC metered consumption.

PCC's current electricity procurement contracting structure will need to adapt with the arrival of a PPA

PCC's electricity procurement is currently managed through an aggregated portfolio of several public entities, split into baskets based on preferred hedging strategies and framework agreements.

The implementation of the PPA contract would require PCC to change its current electricity purchasing structure, as CMCS and PCC will need to reconcile the PPA contract either under a Day-Ahead reconciliation mechanism or a 12-month rolling wholesale market fix on a monthly or quarterly basis respectively. The current supply contract is not structured to accommodate these mechanisms fully.

The PPA contract would effectively provide PCC with a long-term hedge during the agreed tenor with CMCS.

The expected annual PPA volume is 13GWh, which leaves 6.4GWh to be managed outside of the PPA contract. In baseload blocks the split is 2.2MW current total, of which 1.5MW will be directed towards the PPA (either settled on Day-Ahead or the 12-month wholesale market fix contract which would basically be hedges of seasonal winter and summer contracts each year) and 0.7MW would be flexibly hedged by PCC (or PCC's advisor through wholesale market contracts).

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Executive summary - Virtual PPA reconciliation mechanism

This report has briefly introduced the choice around the PPA's reconciliation mechanisms at different points throughout the analysis. Alongside the commercial and legal structures of the contract, the reconciliation mechanism is one of the most important elements of the PPA structure under consideration; and contracting parties would need to fully understand the complexities of such a mechanism.

As described earlier in the Exec summary, a virtual PPA is a fixed-for-floating swap, commonly referred to as a financial contract for difference.

The buyer and the seller put a contract in place for the virtual purchase (i.e. settlement) of power at a predetermined set price.

The physical generated electricity is subsequently fed into the grid and sold at the prevailing market price. The generator and the consumer then reconcile the difference between the contractual price and the market price.

These contracts are normally resolved monthly for all hours or intervals in that month, and the direction of the financial settlement depends on whether there is a net positive or net negative price difference. If the market price is higher than the PPA price, the generator pays the difference to the consumer. However, if the market price is lower than the PPA price, the consumer pays the difference to the generator.

To minimise basis risk, the settlement of the derivative contract between the generator and the consumer will ideally happen against the same index that the consumer is buying its physical power. The most commonly used index in the UK vPPA contracts is the UK hourly N2EX Day-Ahead.

The contracted parties could also explore settlement on the same wholesale market contract (instead of the UK N2EX Day-Ahead) under a simultaneous hedging agreement to minimise power price volatility on the P&L.

The project explored both options, namely the "**Day-Ahead reconciliation mechanism**" and a rolling "**12-month wholesale market fix**" across the lifetime of the PPA tenor. We present the benefits and risks of each reconciliation mechanism in the next few pages.

Alongside these two options, we also briefly re-introduce the Physical (sleeved) PPA structure in order to compare settlement risks related to basis and renewable intermittency misalignment and provide a full picture on the parties' optionality to contract based on market standards.

PCC's and CMCS' "open-book" discussions provide an opportunity for both parties to reduce settlement volatility under a virtual PPA agreement, however the agreement would need to equally balance the risks carried by each party – as well as considering the benefits against a Business-as-usual scenario.

Executive summary – Electricity settlement mechanisms

Virtual PPA settlement mechanisms

a) Rolling 12-month wholesale market fix

On the Rolling 12-month wholesale market fix, the generator would sell the physical power to an electricity utility / trader with a solar capture discount applied. The consumer would buy power (either through wholesale electricity contracts on a flexible supply agreement or fixed price, fixed term), but they would have to consider additional charges for baseload delivery and the residual load fixing.

Risk points: Solar capture discount (£10-20/MWh), Residual load fixing (Yearly)

b) Day Ahead settlement

On a Day-Ahead (DA) settlement, the developer will leave the asset's total production to the Day-Ahead index and the consumer will do the same for the consumption committed under the PPA contract. There are no associated shaping costs (balancing costs are usually captured in the PPA price) from the generator's side,

That said there is still a basis risk as the contract will be settled on the volume-weighted average price (WAP) of the *generation* shape, while the consumer will pay their supplier based on their volume-weighted average price of their *consumption* shape.

Risk points: Basis risk, shape risk

Physical PPA considerations

A Physical PPA structure does not require a reconciliation mechanism between the two parties

A physical PPA route would remove the settlement requirement from a 12-month wholesale market fix and DA mechanism, as the developer will sell PaP to the consumer's electricity supplier. The electricity supplier will then balance and shape the intermittent volume (for a fee) and provide baseload to the consumer through their supply agreement. This route includes some risks from evolving balancing and shaping fees in the consumer's portfolio, as the consumer will only be able to fix these costs for a maximum of 5 years (typically 2-3 years alongside the supply agreement renewals). These costs currently stand between £15-20/MWh.

Risk points: Volatile, uncertain balancing and shaping risks, back-to-back developer/supplier/consumer contracts, sleeving PPA complexities

Executive summary – Electricity settlement mechanisms

Both Day-Ahead and 12-month market fix structures can be accommodated in PCC's electricity contract where PCC either:

- Has a supply contract where PCC is fully flexible to hedge its volumes through wholesale market contracts. This structure will serve a 12-month wholesale market fix contract settlement mechanism for the PPA volume and a flexible purchasing of the remaining volume. It will give PCC full flexibility on how to manage this as well as freedom to agree the "lock" days with CMCS to limit arbitrage.
- i.e. PCC has an annual fixed price-fixed term supply contract for the PPA volume, where the "lock" day will be agreed with CMCS to limit the spread between CMCS' achieved rate and PCC's hedged position for that year. This option will not necessarily require an independent advisor to manage the wholesale market element (although timing of fixing is important i.e. more risks to fix within winter than summer) and PCC will need to ensure there is full visibility of the commodity and non-commodity split.

Executive summary – NPV scenarios

The analysis produced 13 different wholesale market central pricing scenarios and 12 subsequent wholesale market high and low scenarios to test several sensitivities against Chelson Meadow's financial model and the benefit/cost of each structure against PCC's Business-as-usual scenario. For transparency, the BAU scenario assumes that each year PCC would have purchased electricity in the wholesale market on the rates provided by EY's central, low and high wholesale market prices in each scenario plus an assumed value of REGO certificates to compare like-for-like with the PPA structure.

PPA prices of £100/MWh, £105/MWh, and £110/MWh with discount rates of 6% and 3.5%, PPA tenors of 12 years and 20 years, and PPA start dates from Q2, Q3, and Q4 2024 are assumed in thirteen distinct scenarios. Except one, all scenarios are run based on a pay-as-produced structure. A scenario with PPA price of £105/MWh & PPA tenor of 12 years has also been run based on a baseload structure. It is pertinent to note that Baseload PPAs are subject to balancing and shaping fees which cannot be fixed for more than 2-3 years and such fees are expected to rise going forward.

While all scenarios for EY Central scenario with PPA prices of £100/MWh and £105/MWh for 12 years lead to positive NPV, all £110/MWh scenarios result in negative NPV. Also PPA prices of £105/MWh for 20 years result in negative Net Present Value (NPV) .

Two more scenarios producing neutral NPV under 12 and 20 years have been modelled to provide PEC and PCC with the point of indifference for each structure against the BAU scenario. The zero NPV price is £107.3/MWh and £97.3/MWh for 12 years and 20 years respectively.

Please note that the NPV scenarios presented in this report are based on EY's wholesale market forecasts created at present. These wholesale market forecasts are derived from a combination of microeconomic and geopolitical factors affecting near-term electricity contracts and macroeconomic factors related to the supply/demand shape in the UK electricity market in the period 2023-2050.

Detailed information on the NPV scenarios and rationale can be found in Section 5. EY's price modelling methodology and price scenarios for the curves used in the report can be found in the Appendix.

Executive summary – Recommendations

Terms	Market standard	Chelson Meadow	EY recommendation
Tenor	10-15 years	20 years	The proposed 20-year PPA tenor is 5-10 years above the market standard tenor in corporate offsite PPA deals concluded and seen by EY in 2021-2023. The extended tenor poses a risk to PCC due to lack of visibility on the performance of wholesale market prices in the next 20 years. This risk is more important when we consider the discussions on changes to the wholesale market operation including the Review of the Electricity Market Arrangements (REMA).
Price (CPI Indexed) (Jan 2023 terms)	£70-80/MWh	Assumed £110/MWh	The asset's proposed fixed-indexed price is £30-40/MWh higher than recent corporate offsite PPA deals concluded and seen by EY in 2021-2023. These prices reflect slightly larger offsite PPAs with an average output of 30-50GWh, hence we need to factor in that lower capacity assets will benefit less from economies of scale. Comparing prices against the tenor, developers give price incentives to consumers when consumers choose a longer tenor for the PPA contracts. Hence, we would expect the £70-80/MWh market standard range to be lower if we were to match market standard PPAs with Chelson Meadow's tenor.
Contract structure	Virtual	Virtual	Aligned with market standards. Virtual PPAs now dominate Physical PPAs for corporate offtakers.
Commercial Operations Date (COD)	Q2- 2024 to Q1-2025	July 2024 to September 2024	Aligned with market standard in terms of asset availability currently in the market. Based on the current wholesale market structure, the later the COD the lower the price consumers would pay, meaning that a project starting operations in 2025 would provide lower pricing , but potentially lower savings.
Reconciliation mechanism	Day-Ahead	12-month wholesale fix	Both reconciliation mechanisms can accommodate Chelson Meadow's offsite PPA. The Day-Ahead reconciliation mechanism is market standard, however this is because parties do not usually negotiate on "open book" terms. Both parties will need to ensure that the 12-month fix can happen on the same day each contractual year to minimise the delta between each party's achieved fix price. The 12-month wholesale fix will reduce monthly cashflow volatility compared to the Day-Ahead mechanism, meaning that it can keep PCC closer to its current purchasing arrangements.
Supply contract mechanism	Fixed-price, Fixed-term	Flexible supply agreement	PCC will need to change its purchasing strategy irrespective of the agreed reconciliation mechanism. A Day-Ahead reconciliation mechanism will require less contract management from PCC's side, however the Day-Ahead reconciliation and P&L volatility will need to be monitored more closely on a monthly basis throughout the lifetime of the project.
Other benefits	Commercial & Environmental benefits	Commercial, Community & Environmental benefits	Chelson Meadow can provide additional community and profit incentives. These incentives will need to be quantified, to determine how they weigh against other terms where Chelson Meadow is less competitive. We recommend additional work to be done on this point to ensure project viability. Both parties will need to be aware and ensure no cross subsidisation occurs from PEC/PCC relationship on project financing and PPA pricing. In addition to the above, the Chelson Meadow PPA can provide PCC price protection against volatile pricing in the renewables certification (REGO) market and assist towards the decarbonisation of PCC's electricity consumption (Please find more details on page 57)

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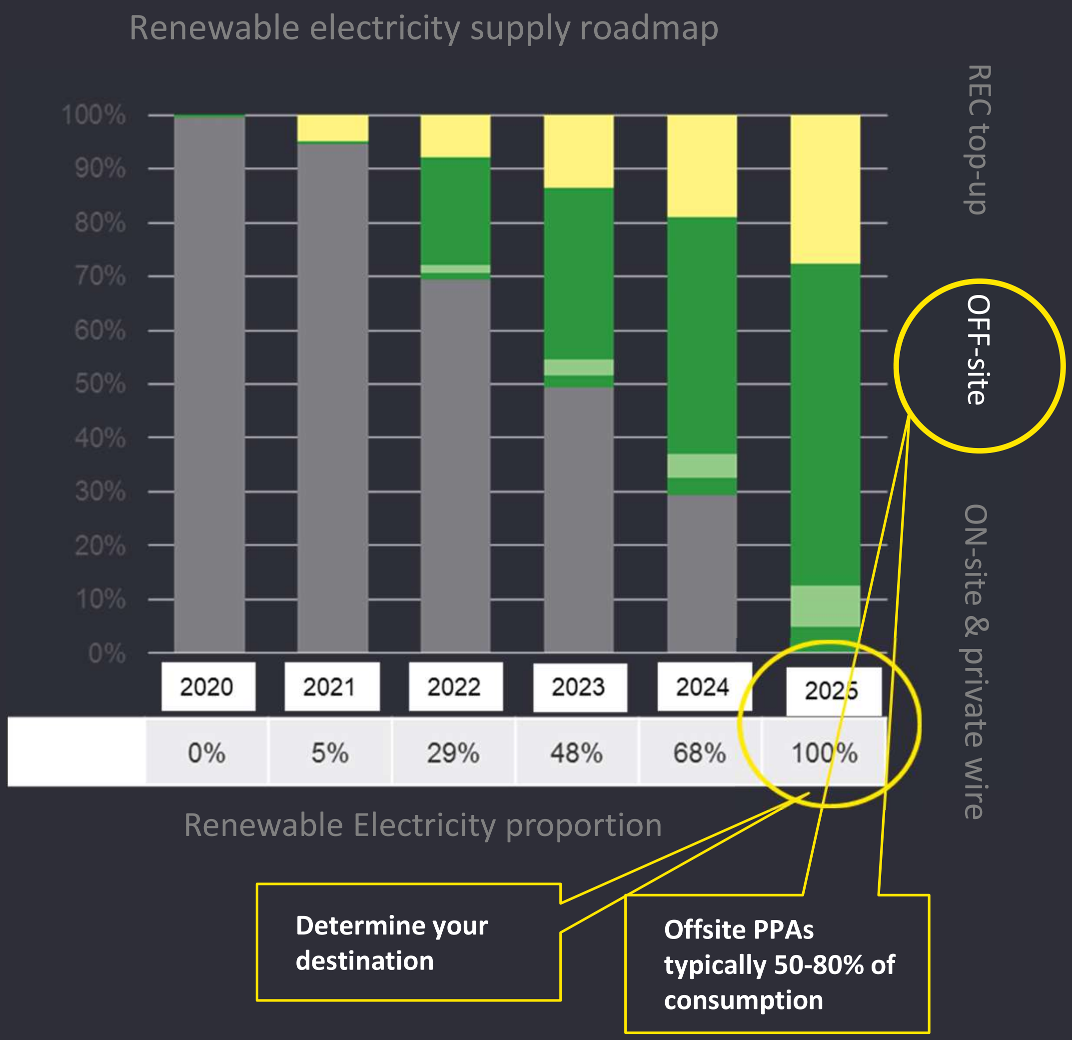
PPA familiarisation workshop

Renewable electricity purchasing options and benefits

Offsite PPAs typically provide the majority volume of a consumer seeking to move to renewable energy

Consumers tend to set their destination first, establishing a renewables goal

A portfolio of options are typically needed to achieve stated targets



Option	Description	Benefits
Reducing energy use	► Energy efficiency measures implemented across sites which assist in reducing overall energy usage ► Examples include LED lighting, building management systems, innovative 'smart' solutions to monitor/control energy usage	Financial (orange) Carbon (green) Brand (green)
Onsite generation	► Undertaking to build and operate renewable energy generation onsite ► Typically only very small scale (<10%) is achievable	Financial (orange) Carbon (orange) Brand (green)
Offsite PPAs	► Purchase of green power directly from third party generators through a sleeved or virtual agreement. ► Clear 'additionality' reputation benefits and potential to achieve large-scale savings.	Financial (green) Carbon (green) Brand (green)
Tariffs or certificates	► Either the purchase of green certificates (including GOs and RECs) or a 'green' tariff from existing utility. Flexible, short-term. ► Typically used to top-up PPAs to 100% but an extra operating expense.	Financial (red) Carbon (orange) Brand (orange)
Carbon offsetting	► Compensation of carbon emissions through funding an equivalent saving elsewhere ► Often used by multinationals who have operations generating different levels of carbon emissions, e.g. via heat or travel	Financial (red) Carbon (green) Brand (orange)

Renewable PPA Overview – What is a renewable PPA?

Renewable PPAs demonstrate multiple benefits and offer a direct relationship with a new build renewables project

Renewable Power Purchase Agreements (PPAs) are essentially contracts for purchase and supply of renewable electricity.

There are three key elements of a typical renewable PPA structure:

1. **An electricity consumer/supplier who agrees to purchase renewable electricity directly from an electricity generator, for a pre-agreed price, volume and minimum duration**
2. **The purchased electricity can be credibly attributed to the output of that generator**
3. **The consumer's/supplier's promise to pay for this electricity contributes materially to the financing of the construction and operation of the generator**

Benefits of Renewable PPAs to consumers:

1. **Can demonstrate clear 'additionality' for new renewables generation being added to the grid**
2. **Direct and verifiable relationship to a specific renewable energy project and associated Guarantees of Origin for reporting purposes**
3. **Potential cost savings and reduced exposure to power price volatility**
4. **Entering into renewable PPAs is good for the local/ global environment as it contributes to the decarbonisation of the energy system**

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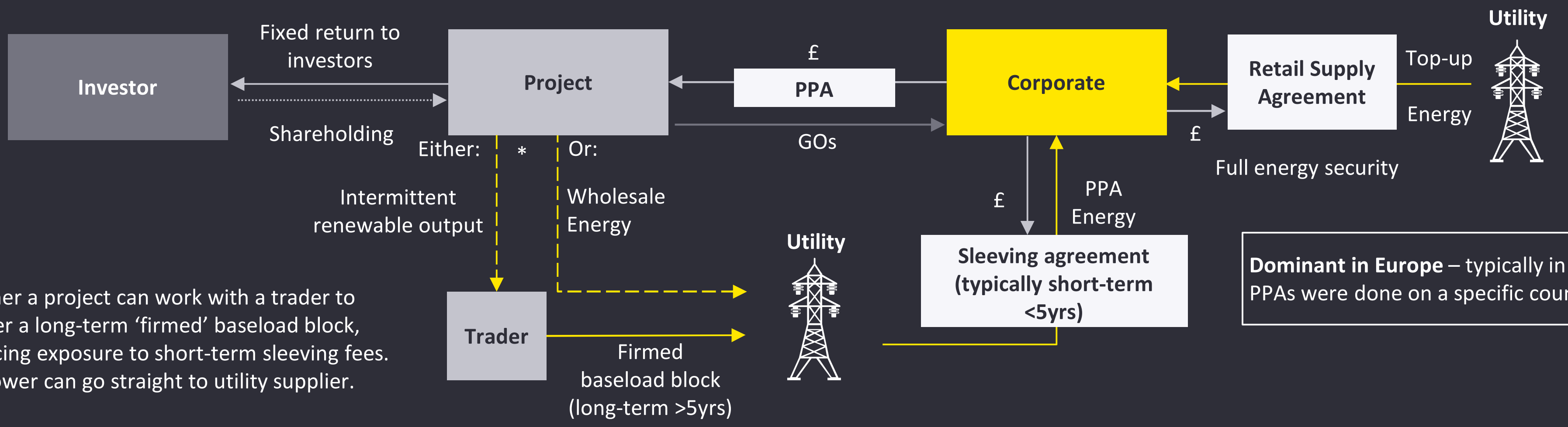
Renewable PPA Overview - Sleeved/physical PPA

Sleeved PPAs offer a straight forward accounting treatment and were the dominant form of renewable PPA in the past

Sleeved PPA structure

Purchasing directly from a renewable project: some contractual complexity but simple accounting treatment



* Either a project can work with a trader to deliver a long-term 'firmed' baseload block, reducing exposure to short-term sleeving fees. Or power can go straight to utility supplier.

Dominant in Europe – typically in the past PPAs were done on a specific country basis.

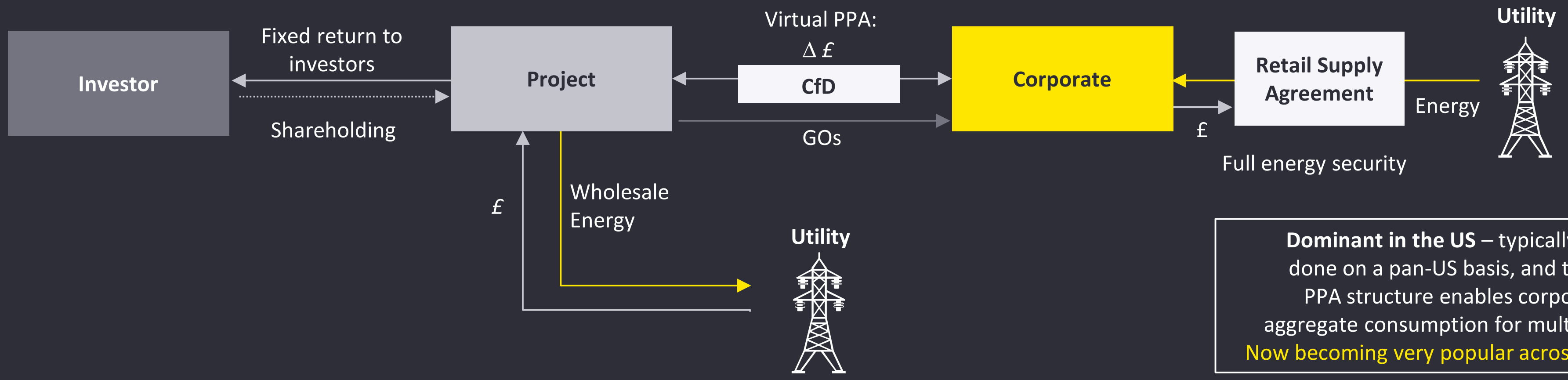
- Physical PPAs are bilateral multiyear contract which involve the physical delivery of electricity. A Power producer/generator signs an agreement with a consumer for the supply of contracted volume.
- In accordance with this structure, consumers also sign a back-to-back retail supply agreement for sleeved power
- There are additional trader/supplier charges to the consumer for balancing and shaping of the intermittent renewable power
- The retail supply agreement can be signed for 2-3 years with the chosen supplier. consumer has the flexibility to change supplier every 2-3 years, but has to be able to sleeve the PPA in any supply agreement for the duration of the PPA contract

Renewable PPA Overview - Virtual PPA

Virtual PPAs offer a much simpler structure, which is quicker to execute, and is becoming the dominant structure in the UK & Europe

Virtual PPA structure

Continuing with existing supply arrangements, the VPPA is a financial derivative – a "Contract for Difference". Legally simpler, there may be some settlement risk and accounting complexity involved



Dominant in the US – typically PPAs are done on a pan-US basis, and the Virtual PPA structure enables corporates to aggregate consumption for multiple regions. Now becoming very popular across Europe & UK

- A fixed-for-floating swap, commonly referred to as a financial contract for differences.
- In this arrangement, a contract for the purchase of power at a predetermined set price is made between the power generator and the consumer.
- The generated electricity is subsequently feeded into the grid and sold at prevailing market price. The generator and the consumer then reconcile the difference between the contractual price and the market price.
- These contracts are normally resolved monthly for all hours or intervals in that month, and the direction of the financial settlement depends on whether there is a net positive or net negative price difference. If the market price is more than the contractual price, generator pays the difference to the consumer. However, if the market price is lower than the contractual price, consumer pays the differential to the generator.
- These type of PPA are similar to financial derivative

Physical Vs. Virtual PPA comparison

Depending on the corporate's requirement, suitability of the PPA differs. However virtual is generally recommended due to its easier implementation

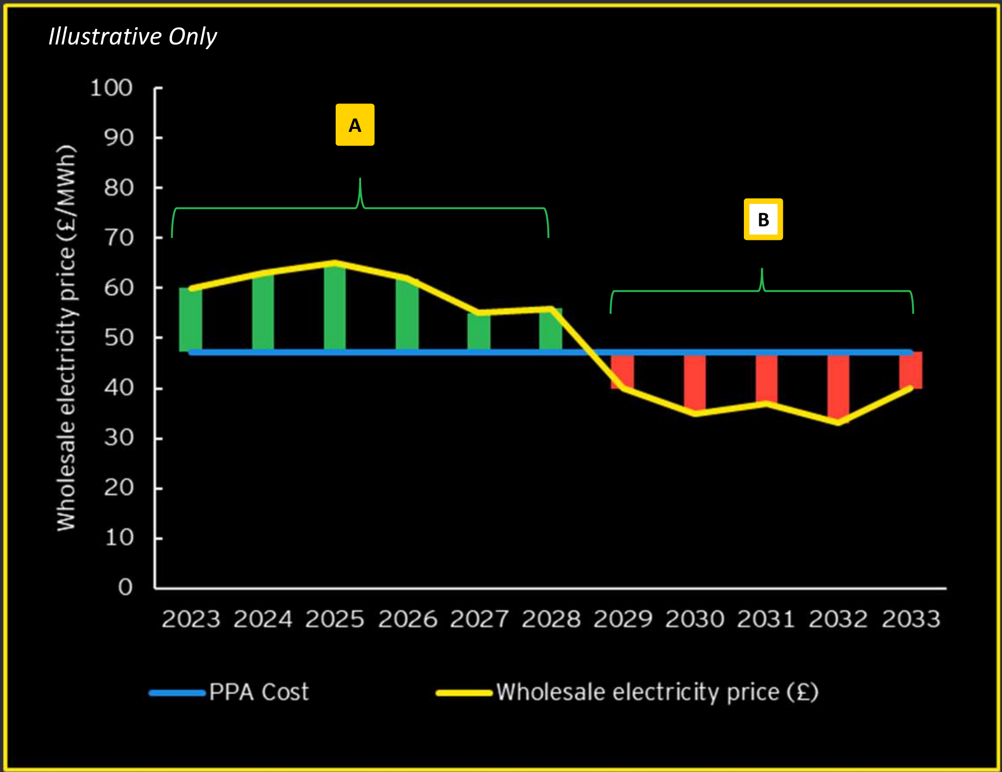
Type of PPA	Upsides/Key benefits	Potential Downsides
Physical PPA	▸ Closer association with generating asset ▸ Buying energy 'directly' from a specific project ▸ Flexible price structure: ▸ Floating (discount-to-market); or ▸ Fixed (index-linked) ▸ More straight forward accounting treatment ▸ Generally not a lease or financial instrument	▸ Potentially more complicated up-front and setup costs can be greater ▸ Two back-to-back PPA contracts ▸ Exposure to sleeving costs ▸ Balanced power depends on actual asset performance ▸ i.e., volume of top-up 'balanced' power influenced by actual project's PPA output
Virtual PPA	▸ Simpler structure, with fewer contracts compared to a sleeved/physical PPA ▸ No balancing responsibility (if have agreed to pass on to the Generator / project owner) ▸ PPA is independent of Retail Supply Agreement renewals ▸ Can cover consumption which is even under landlord billing control	▸ Not perfect price security if Generator's wholesale energy market is different to Corporate's retail energy market, resulting in a mismatch and lack of correlation ▸ Only permits a fixed price structure ▸ Accounting treatment can be more difficult (considered a financial instrument) ▸ Delta cashflows can be volatile on a short-term basis, but mostly net off in the longer term

Illustration of VPPA payment flows

Virtual PPA is a Contract-for-Difference (CfD) financial settlement. Cash flows on the CfD offset higher/lower payments under the retail supply agreement

Virtual PPA Cashflows

The graph is a visual representation of a cashflow profile for a Virtual PPA.



Generator Perspective

- **The total cashflows for the Generator** - (market revenues plus Virtual PPA deltas) in a Virtual PPA structure **remain fixed** and are therefore bankable which allow third party financing for the renewable development.
- A **Over time period 'A'** – the Generator pays the Corporate as market prices are above PPA price and therefore the **Corporate is 'in the money'**
- **Over time period 'B'** - the Corporate pays the Generator as market prices are below PPA price and therefore the **Corporate is 'out of the money'**

B

Corporate Perspective

- **'Delta' cashflows for the Corporate** - These **PPA losses or gains will generally offset a similar opposite saving or cost from where the Corporate is purchasing power** (in its retail supply agreement) – as long as the reference 'settlement market' index is the same. E.g. day ahead average market price is used to calculate the CfD payments and that same floating market is where the corporate is buying power.
- **Large payments from the Generator to the Corporate** in scenario 'A' will offset where the Corporate is paying ***higher*** **retail supply prices** for its consumption.
- A **Large payments from the Corporate to the Generator** in scenario 'B' will offset where the Corporate is paying ***lower*** **retail supply prices** for its consumption.

B

The settlement of the derivative contract between the generator and the consumer will ideally happen against the same index to minimise basis risk.
The most commonly used contract in the UK vPPA contracts being the UK N2EX Day-Ahead.
The contracted parties could also explore settlement on the same wholesale market contract instead of the UK N2EX Day-Ahead under a simultaneous hedging agreement to minimise power price volatility on the P&L. More work is needed to explore the balance between benefits and risks on this approach.

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Physical and Virtual offsite PPAs: Demystifying the structures

A virtual PPA structure has similar characteristics to a physical structure in terms of duration, pricing, additionality & sustainability claims, however differs on price settlement, electricity supplier involvement and accounting treatments

Physical PPA

Electricity delivery

"Direct" delivery of power through the electricity supply contract

Contract structure

Two PPA contracts, one with the generator and one (back-to-back) with the electricity supplier

Balancing and shaping

For Pay-as-Produced structures, volume is usually balanced and shaped to baseload by the electricity supplier or an aggregator

Accounting treatment

Simple accounting treatment, as volume is sleeved directly in the supply agreement, and so is seen as an executory contract

Virtual PPA

Electricity delivery

Standard supplier electricity delivery, but on Day-Ahead purchasing, while the vPPA "sits" on top of the supply agreement as a financial instrument.

Contract structure

One PPA contract with the generator

Balancing and shaping

No balancing responsibility (if passed on to the Generator / project owner), but some basis / profile risk consideration from intermittency against settlement prices

Accounting treatment

More complex accounting treatment is needed, as vPPA acts as a derivative financial instrument

Shared characteristics

Additionality from new-to-ground projects

Additionality implies the buyer's investment is credited with creating new, clean sources of energy. Both Physical and Virtual PPA structures can equally been leveraged by renewable generators to receive financing support from institutions and enable project construction.

Renewables credibility

Both structures are fully aligned with renewable pledges including RE100 and SBTi targets and are backed by the issuance and delivery of Energy Attribute Certificates

Electricity flows

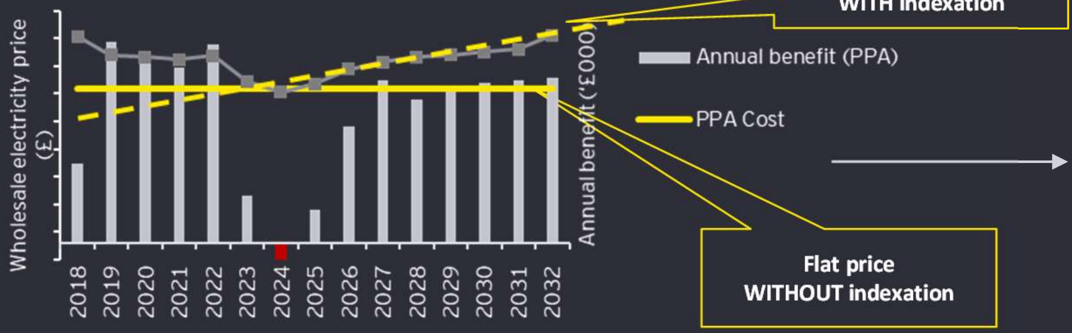
Both structures will have physical power flowing to the electricity network

Options for PPA pricing: fixed, floating or hybrid, but fixed dominates

Fixed price structures are the norm but other options exist. Terms between 5-20 years, with the norm being 10-15 years

Wholesale electricity price (£/MWh in real terms)

1. Fixed (with or without CPI/RPI indexation)



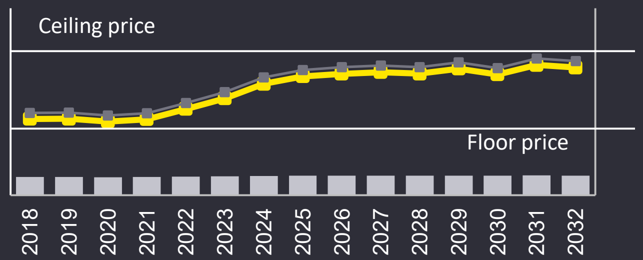
Fixed price structure considerations

- ✓ Price security/certainty with significant potential cost savings (assuming wholesale power prices rise in real terms)
- ✓ Most appealing structure to developers
- ✗ PPA can become 'out of the money' if markets fall below fixed PPA price

Commercial note

- ✓ Stepped pricing (different fixed prices over different years) is also possible. We are observing prices coming *down* in steps to reflect the backwardating wholesale price expectations

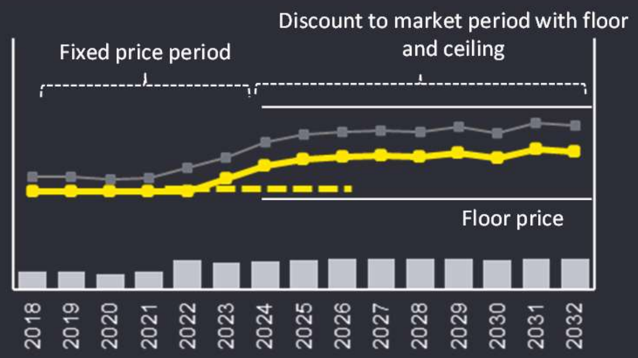
2. 'Floating' (Discount to market) with a cap and a floor



Floating structure considerations

- ✓ Energy costs will track the market, likely in line with competitors
- ✓ Annual savings likely to remain fairly similar year-to-year
- ✗ Corporate is exposed to volatile wholesale market prices
- ✗ Overall savings generally lower over the life of the project compared to fixed price savings

3. Hybrid structure



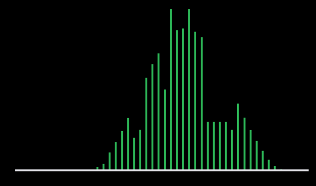
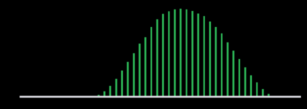
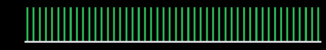
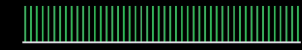
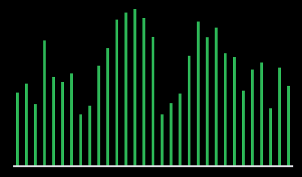
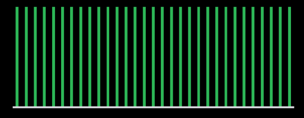
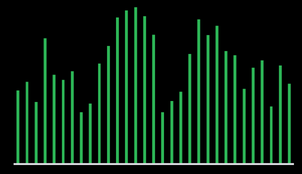
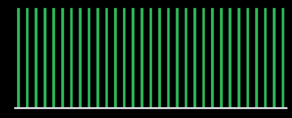
Hybrid structure considerations

- ✓ Provides price certainty in the short term whilst not committing corporate to a fixed position in the long term
- ✗ Corporate is exposed to volatile wholesale market prices after the fixed price period
- ✗ More complex, so potentially more difficult to negotiate/agree and manage over time

[1] Forecast represents the average of independent energy market forecasters' projections

Electricity delivery and settlement options

Hourly pay-as-produced structures are the norm but other options exist. Baseload has the least risk but charges a significant premium

	Hourly Pay-As-Produced	**Hourly Pay-As-Forecast**	**Daily Average Pay-As-Produced**	**Monthly Baseload**
Explanation	Settled on actual hourly production against prevailing hourly price	Settled based on forecast hourly production (P50) against prevailing hourly price	Settled based on actual daily production, against arithmetic average of hourly prices in the same day, so effectively like a daily baseload	Settled on forecast monthly production (P50) against prevailing hourly prices
Hourly example				
Monthly example				
Pros	• All developers likely to bid • Lowest price	• Reduces within-day profile risk • 'Notional' hourly volume pushes volume risk onto developer • Reduces future solar and wind cannibalisation risk	• Reduces within-day profile risk • Reduces future solar and wind cannibalisation risk	• Fixed 'notional' volume set by month pushes volume risk onto developer • Also further reduces profile and cannibalisation risk for consumer
Cons	• Potential for exposure to low settlement markets in future if increasing solar / wind on the grid • Volume risk from natural variability	• Not all developers likely to bid • Premium will be added to price	• Not all developers likely to bid • Premium will be added to price • Volume risk from natural variability	• Not all developers likely to bid • Further premium will be added to price

Less cannibalisation and profile risk, but greater price of PPA →

Comparing Pay-as-produced and Baseload PPA pricing structures - Pros & Cons explained in detail

Electricity production from renewable solar and wind assets is intermittent, meaning that production varies during seasons, months, days, hours and minutes. When entering into a PPA contract, the generator and the consumer agree on who will be bearing the risk of the intermittency of the asset. Two different risks related to the intermittency of a renewable asset and for which CMCS and PCC would need to agree on is the balancing and shaping risks of the renewable asset.

Hourly Pay as Produced

Balancing and shaping risks are not priced separately in this contract structure and electricity is settled against actual production of the asset on an hourly basis. The developer usually embed the cost of balancing the asset within the PPA price, while the shaping risk falls towards the off-taker through the settlement mechanism. Developers prefer this structure given it is more simple and they are not required to carry additional intermittency risk.

Hourly Pay as forecast

In this structure the buyer is obligated to pay for the entire amount forecasted by the developer.
Actual production may differ from the forecasted volume (P50) due to the intermittent nature of renewable energy, hence we expect developers to add a premium for taking extra risk on the renewable generation shape.

Daily Average Pay as produced

In this structure, settlement happens on the average of hourly prices in the same day thus it reduces the risk associated with the solar/wind profile and actual production each hour. Monthly volatility remains, as the settlement only differentiate from a pay-as-produced structure on the average of the volume and settlement pricing.

Monthly baseload

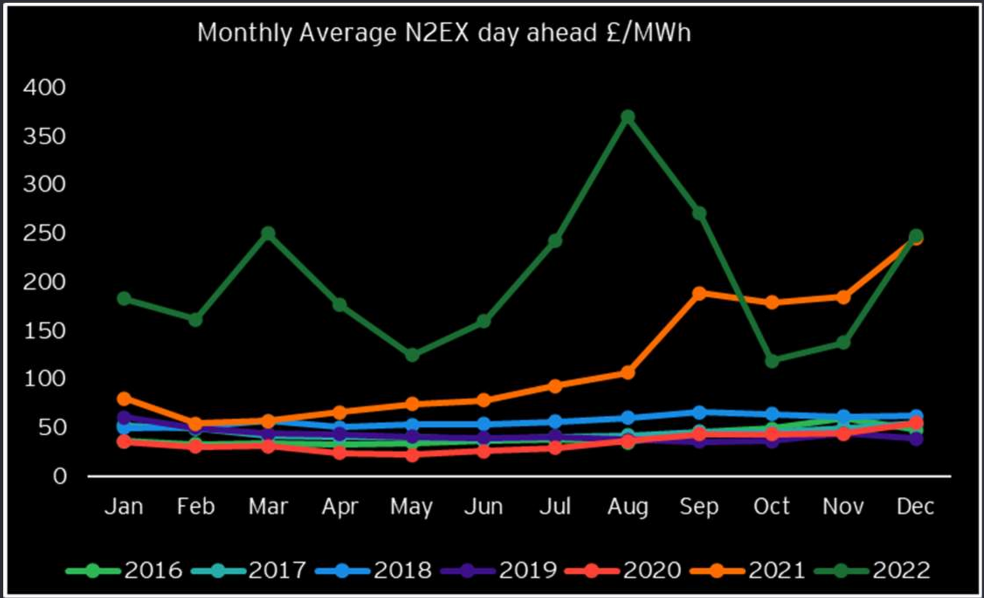
Settlement happens on a forecasted production on a monthly basis which reduces the profile risk for the consumer. However this type of contract structure include balancing and shaping fees for the consumer payable either directly to the developer, the consumer's supplier or a third party trader responsible to balance and shape the intermittent generation.

Less cannibalisation and profile risk, but greater price of PPA

PPA as a price hedge

Fixed price PPA provides a hedge against movements in electricity prices, which have become increasingly volatile.

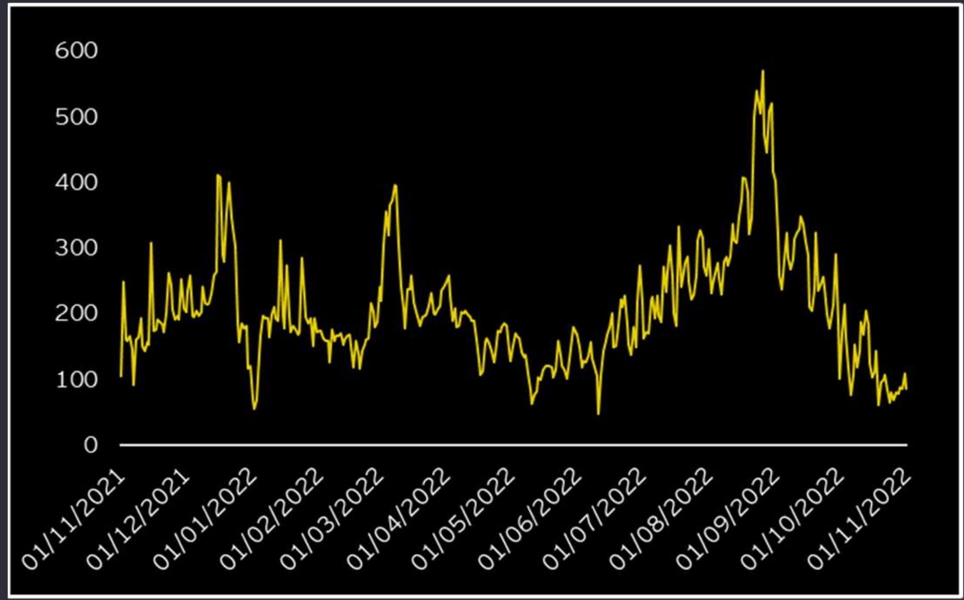
Protecting against long-term energy commodity price volatility…



Sources: www.nordpoolgroup.com

- There's been significant recent volatility in UK markets:
- Driven by gas and carbon prices and intermittent renewables
- Extreme spikes e.g. 'Beast from the East' in March 2018
- From a four year high in Sep 2018, prices fell to summer 2019 and sharp falls in March 2020 with lack of demand due to COVID
- Prices have since rebounded to record highs in 2021 and 2022
- Elevated prices have started easing beginning Aug 2022 because of falling risk from geopolitical reasons

…and shorter term too

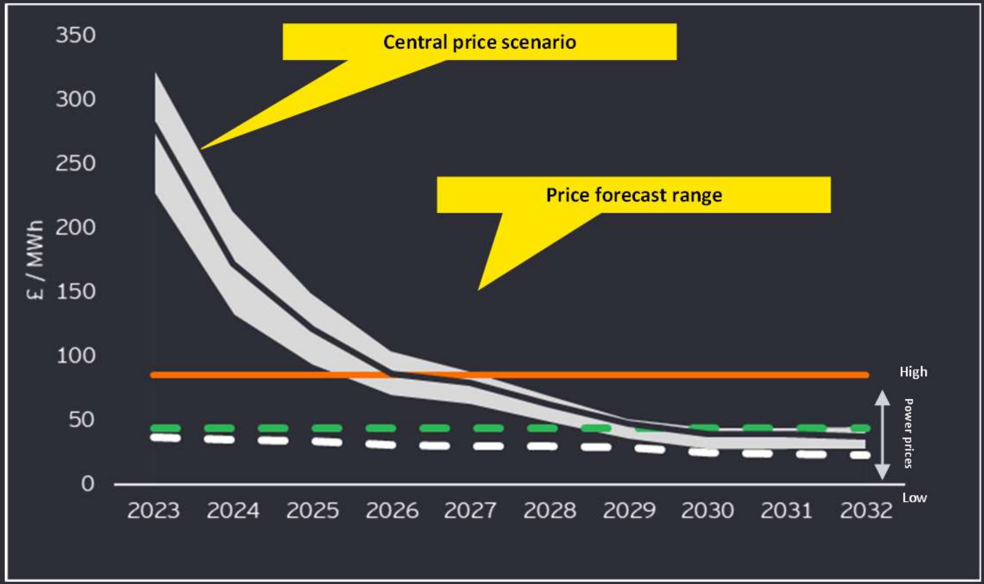


- In 2022, Russia-Ukraine war sends GB power prices soaring to all time high
- Rises and greater recent volatility in 2021 thought partially due to economic recovery and tight gas supplies
- Higher carbon prices generally also leading to increased power prices
- Long-term PPAs provide price security on operating costs

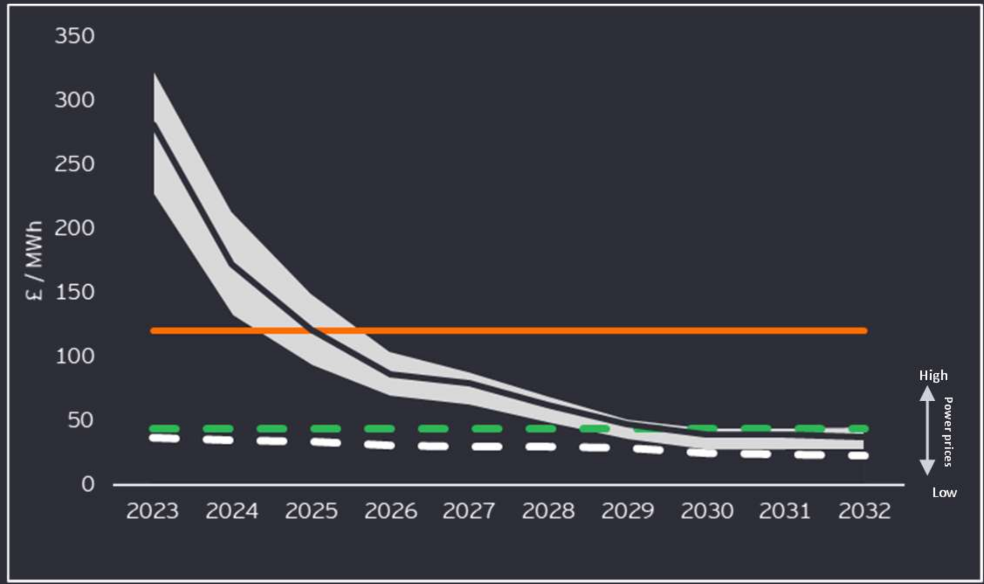
PPA price setting

Near-term market forecasts (2023-2025) are putting upward pressure on PPA pricing. Corporate savings currently heavily front loaded, with the market converging with PPA strike price in the midterm (2026-2030).

LCOE vs PPA price comparison – Solar (2023-2032)



LCOE vs PCC PPA price comparison – Solar (2023-2032)



LCOE (Woodmac) — LCOE (BEIS) — PPA Price — Power price central — Power price range (low to high)

- Solar PPA prices currently stand £30-40/MWh above the upper range of the levelized cost of electricity ranges, with margin being realised from increased volatility in wholesale market prices, rising inflation and risks related with the pre-development and construction phases.
- The recent CfD Allocation Round 4 set a benchmark on current PPA prices, indicating the levels generators are willing to contract for their assets.
- PPA prices can provide significant upfront cash savings owing to a rise in short / medium term prices (i.e. partially driven by tightness in gas supplies, geopolitical concerns and higher carbon pricing)
- The size of an asset, the location and development stage will determine how developers price their assets in the corporate PPA market. Pricing under a LCOE+ structure will allow PEC and PCC to determine the PPA price purely based on the asset's unique characteristics.

[1] PPA prices based on the CfD auction price adjusted for inflation and credit risk
[2] Power prices are blended average of forecasts
Reference:- EY curves

Renewable Energy (REGO) certificates processing

Overview of the existing framework of the Renewable Energy Guarantees of Origin (REGO)

REGO certificates provide certification that energy being supplied has been generated from a renewable source. The Office for Gas and Electricity markets (Ofgem) issue one REGO certificate per megawatt hour (MWh) of eligible renewable output to generators of renewable electricity. REGOs are predominantly used for suppliers' Fuel Mix Disclosure (FMD). Suppliers use REGOs to prove to the final customer that a given share of energy was produced from renewable sources. The certificates are also used by electricity consumers entering a physical or virtual PPA agreement for environmental reporting purposes. The diagram below shows the processing journey of a REGO certificate from the asset's REGO application to Ofgem to accreditation and REGO issuance.

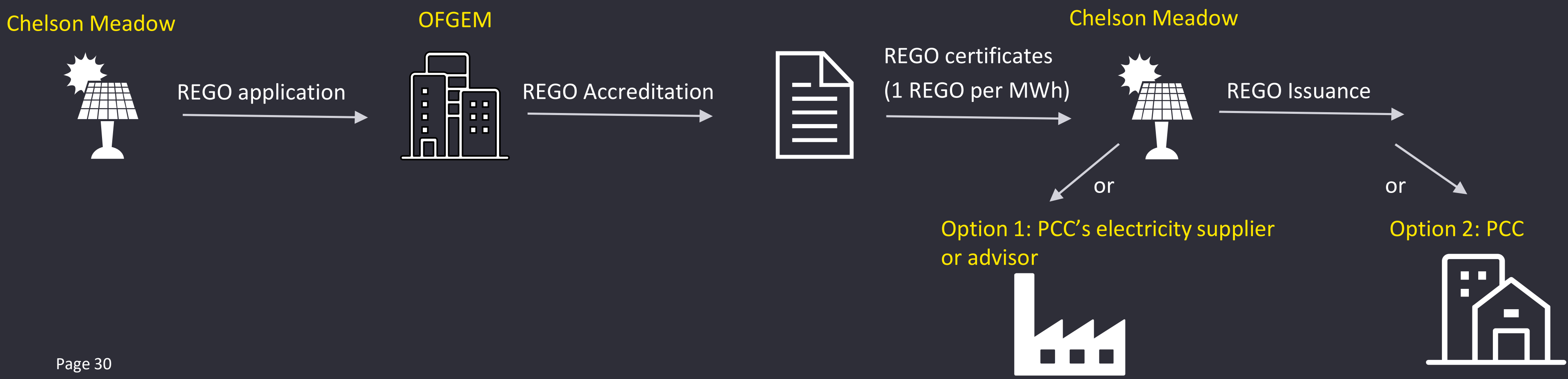
The REGO journey

CMCS will open a REGO account with Ofgem's Renewables and CHP Register, where the asset will submit an application to receive accreditation under the REGO scheme. Once accreditation is granted, the asset will need to submit generation data to Ofgem through the registry and Ofgem will issue one REGO per MWh towards Chelson Meadow based on generation data submission. Equally PCC will need to open a REGO account under the same registry to receive and cancel the REGO certificates on the council's behalf. Alternatively, PCC can choose to transfer the certificates to its electricity supplier – however in that case the electricity supplier will only tag PCC's ownership on the certificates and use them primarily for their Fuel Mix Disclosure (FMD). The latter is usually an option used in physical PPA contracts.

Chelson Meadow and PCC will then have two options for REGO transfer and cancellation through the PPA contract. PCC can choose to either delegate the cancellation of the certificates to its electricity supplier or advisor of electricity purchasing or choose to receive and cancel the REGO certificates in-house.

Under both structures, Chelson Meadow will transfer the REGO certificates to PCC's registered account (either option 1 or 2).

Option 1 gives the REGO cancellation admin to the electricity supplier or advisor and is likely to carry a service charge, whereas Option 2 will require PCC to allocate internal resources for the REGO cancellation process. The process is not complicated and usually only takes place at the end of each REGO compliance period (compliance periods run from April to March each year).

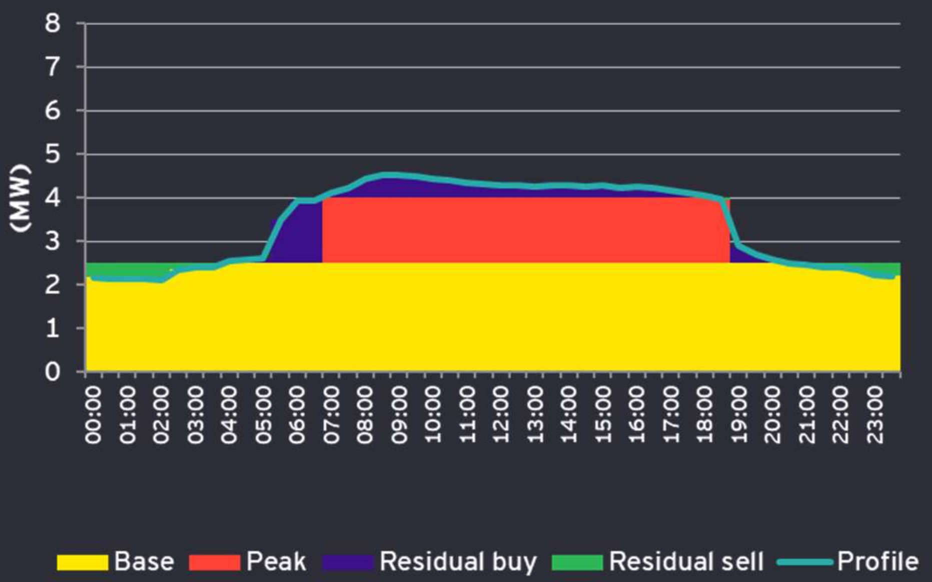


4

PCC consumption profile & supply contract review

Consumption profiles and supply contract frameworks

Chart 1: Daily consumption profile



Electricity consumption in flexible electricity supply contracts is split in Tradeable and non-tradeable volumes.

Electricity suppliers analyse a client's consumption and provide a tradeable shape and non-tradeable (residual) load. The tradeable volume is split in baseload and peakload blocks.

A typical consumption profile is shown in graph X on the left – this consumption pattern shows the demand of a typical corporate buyer such as a supermarket chain or a large estate agency.

We highlight that PCC's consumption is likely to vary from this standard pattern, due to a likely increase in consumption from street lighting and various seasonal variations.

Suppliers typically offer clients two options for their tradeable volumes:

Access to the wholesale electricity market (Wholesale market purchasing) through a dedicated energy customer desks which provide the ability to fix seasonal, quarterly, monthly

DA wholesale contracts or fixing against published market indices (Day-Ahead purchasing) (e.g the N2EX Day-Ahead index or EPEX Day-Ahead index).

The non-tradeable volume is usually managed via different product offerings from suppliers. Each option is designed to allocate different levels of risk from the supplier to the client, related to the predictability of costs and the actual residual volume. Suppliers usually offer the following three options:

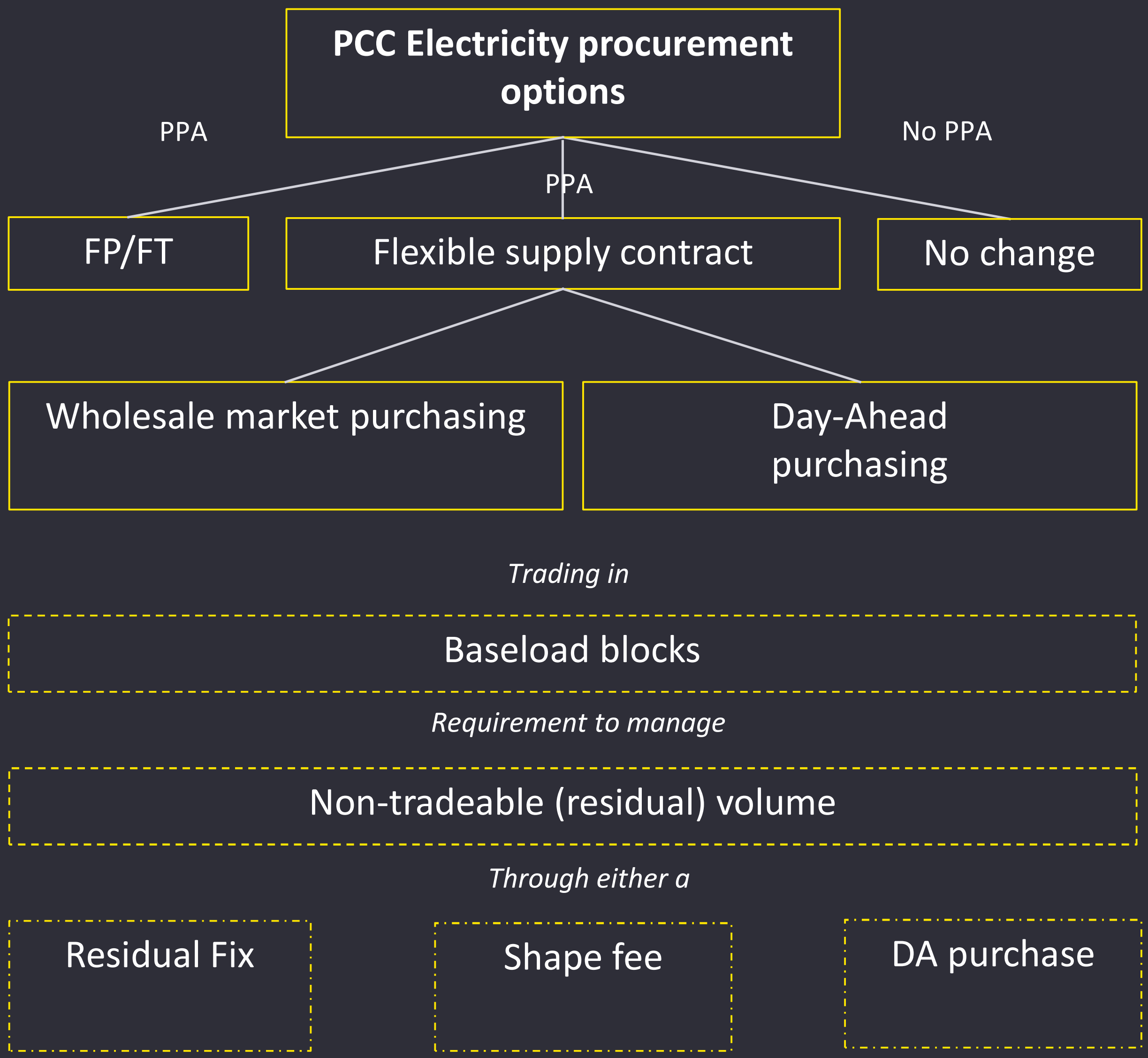
Residual fix at contract anniversary: the supplier will aggregate the non-tradeable volume of the client's annual requirements, using historical data and provide a fix price that provide budget certainty for the year-ahead

Shape fee: A fixed price per MWh for the total non-tradeable volume across the duration of the supply contract. The difference with the residual fix is the timing of fixing i.e annually vs one-off fix at the start of the contract.

Purchase on Day-Ahead index: The non-tradeable volume is not locked in advance, but instead remain floating and tracks a spot market price on the UK Day-Ahead market.

Higher predictability of the consumption profile can lead to better structuring of a client's electricity profile to tradeable and non-tradeable blocks. Better structuring can also allow the client to hedge more effectively the consumption profile and minimise the non-tradeable volume and hence the residual load

PCC supply contract management options



The decision tree on the left provides PCC's options on electricity procurement with and without a PPA.

Depending on the PPA's financial settlement mechanism –a 12-month fix structure or a Day-Ahead index– PCC can choose to either have a Fixed-Price, Fixed-term (FP/FT) structure or a Flexible supply contract.

A FP/FT contract is likely to minimise the need for active management from PCC, however PCC will need to ensure visibility of the commodity and non-commodity rates to ensure settlement of the PPA contract is correct. The FP/FT contract only works under a 12 month fix PPA contract, but defers from a flexible supply agreement on procurement flexibility.

A flexible supply contract can give PCC the ability to choose from wholesale market purchasing or Day-Ahead purchasing.

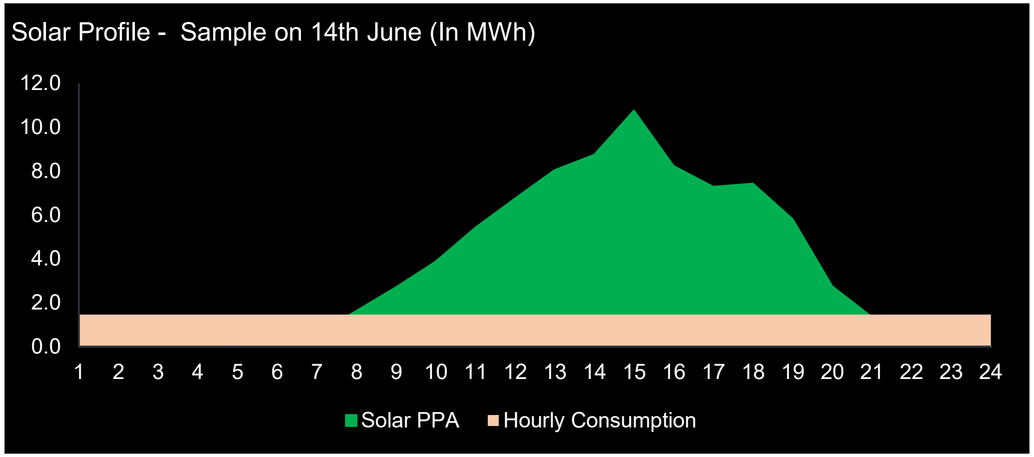
A 12-month fix PPA contract settlement could only be applicable under the wholesale market purchasing,, while Day-Ahead purchasing will serve better under a Day-Ahead settlement mechanism.

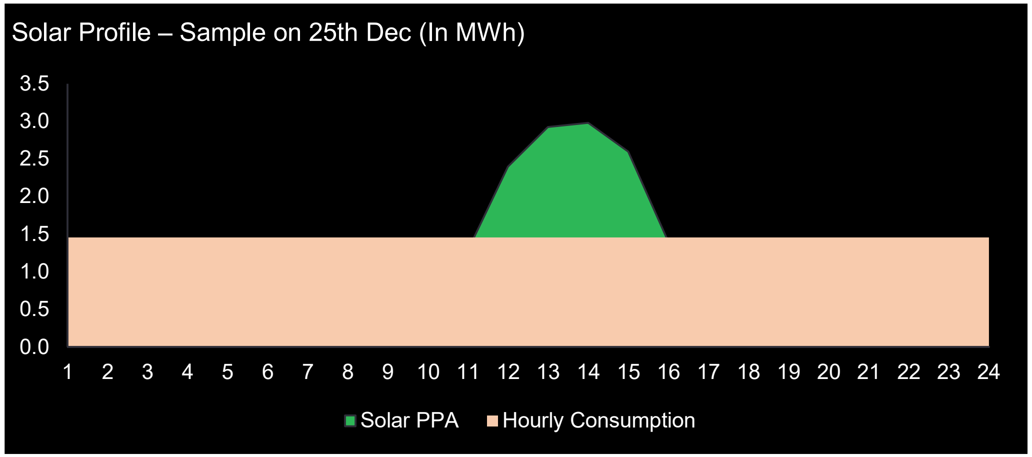
In both instances, PCC will be buying baseload blocks and the supply contract will also have a non-tradeable volume that will need to be managed separately

Consumption Profile

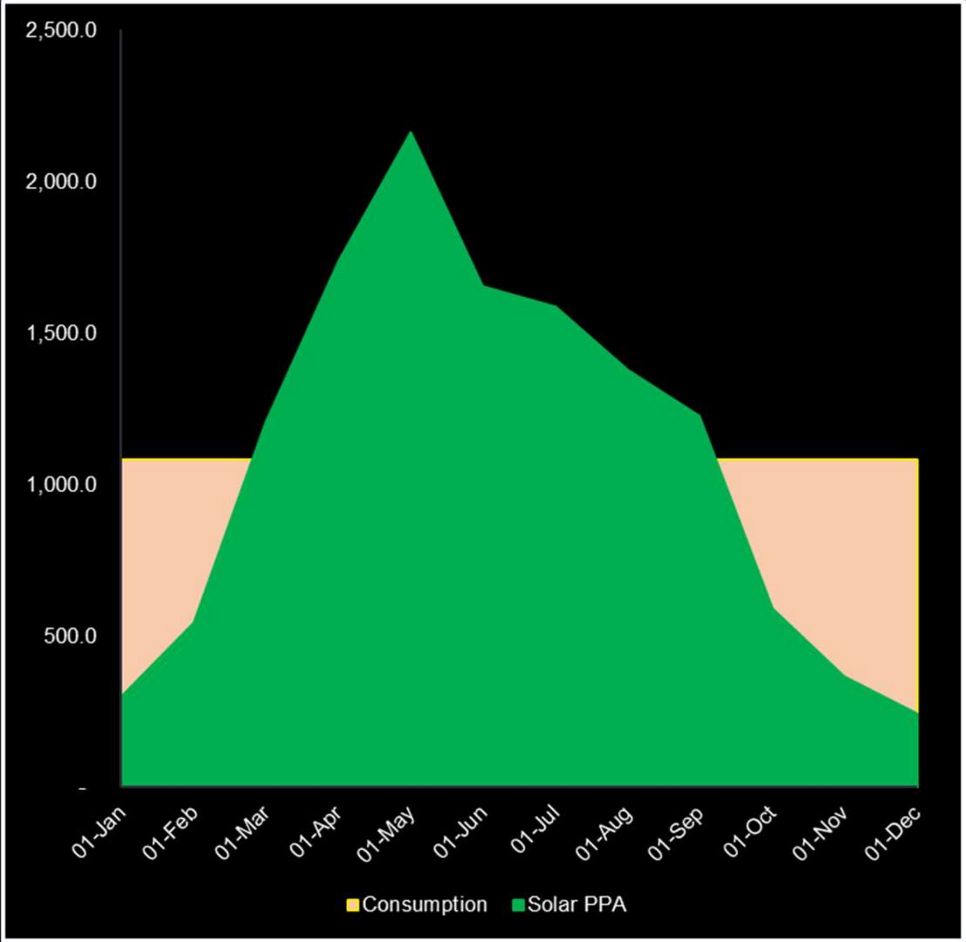
Consumption profile is plotted against a standard solar generation profile to analyze how much PCC is over hedged

Indicative daily consumption/generation profile





Indicative monthly consumption/generation profile



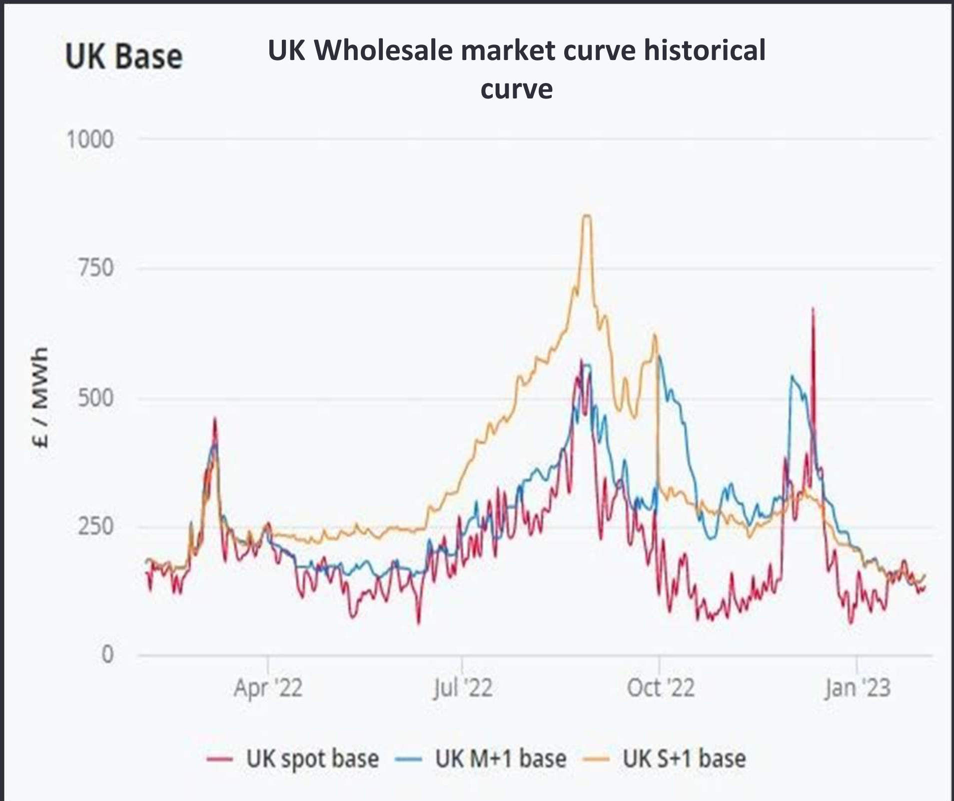
- The analysis assumes a flat daily consumption of ~35MWh for PCC, however we anticipate that consumption will vary during the day.
- The total annual generation from Solar asset is circa 13GWh.
- Based on the two profiles and during 12pm to 3pm we expect the asset to generate above PCC's baseload consumption across the year. During the winter period and on days with less sunlight, the asset might match or be lower than PCC's consumption

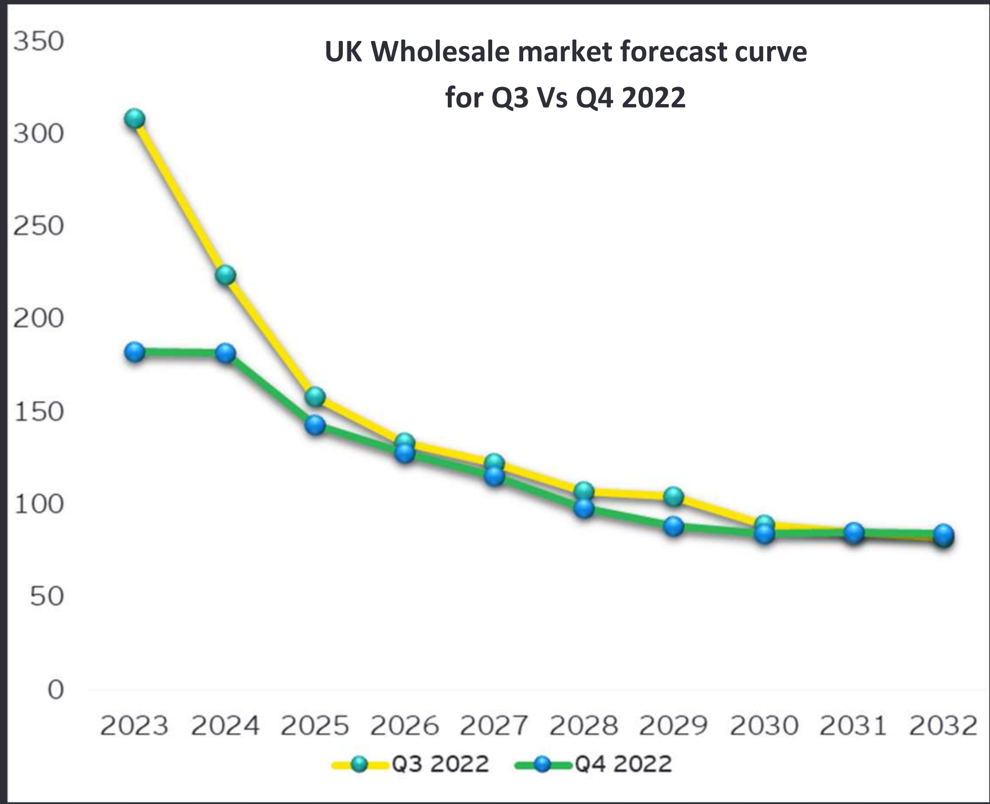
5

Wholesale power prices & NPV estimates

UK Wholesale market historical and forecast curves

UK wholesale market has seen significant volatility over the past 2 years due to supply / demand issues. The unprecedented volatility results in uncertainty in long term price forecasts. Percentage change between Q3 2022 vs Q4 2022 forecasts is up to 41% for 2023





- UK's electricity originates mainly from three sources – gas, renewables and nuclear. The share of these fuels is determined by a number of factors including their price (influenced by fuel costs, global markets and economic indicators), weather (intermittency and plant availability) and political direction (the support that each technology will receive to serve a country's strategy i.e. renewable targets, economic targets, security of supply).
- Geopolitical uncertainty and a tight gas system have contributed to an increase in risk premium related to supply and demand imbalances. These factors alongside an increase in economic activity saw UK wholesale electricity curves rise to all-time highs in summer 2022. Prices have since softened, but remain elevated for the period 2023-2026.
- The comparison of the wholesale electricity contracts and PPA prices in this report results to savings being realised at the beginning of a PPA contract due to the backwardated shape of the curve.
- Also during 2022, it can be seen that the Month-Ahead and Season-Ahead markets have traded significantly above the Day-Ahead spot price. Utility providers factored in a large risk premium for buyers to get forward price certainty.

Current PPA market vs Chelson Meadow's NPV estimates

Market summary

The corporate PPA market has increased considerably in size over the last few years and due to the typically longer-term nature of the contracts, PPA prices only partially mirror wholesale market pricing levels. PPA prices currently sit comfortably below the wholesale market curve. Fixed nominal PPA prices (for pay-as-produced structure) range from £80-85/MWh for a 10-12 year contract, while CPI indexed contracts start from £70-80/MWh for a solar project. These are the indicative figures from recent bids that we have conducted in the last two months.

If we compare these numbers with the current wholesale electricity curve to future price for e.g. 2028, there is a spread of roughly £40/MWh against the fixed nominal PPA scenario. Hence significant early savings are expected from long-term PPAs of 10-12 years. Uncertainty in the market peaked in late 2022 due to spiking gas prices, but since the start of 2023 there has been more stability in future wholesale market price curves which have been softening. Increasing renewable power onto the grid may still lead to some volatility of market prices and so a large number of corporates are interested in contracts for 10-12 years to get long term price certainty, green benefits and positive NPV.

Chelson Meadow's NPV summary

The NPV analysis compared the projected PPA prices presented in this section against Business-as-usual scenarios, using EY's wholesale electricity market curves in Q4-22. The resulting NPV figures provide the discounted difference between the projected PPA prices and EY's wholesale electricity market curves for the duration of the tenor and for the expected output of the asset in each scenario after adjusting for inflation.

PPA prices of £100/MWh, £105/MWh, and £110/MWh with discount rates of 6% and 3.5%, PPA tenors of 12 years and 20 years, and PPA start dates from Q2, Q3, and Q4 2024 are assumed in thirteen distinct scenarios. Except one, all scenarios are run based on a pay-as-produced structure. A scenario with PPA price of £105/MWh & PPA tenor of 12 years has been run based on a baseload structure. It is pertinent to note that Baseload PPAs are subject to balancing and shaping fees which cannot be fixed for more than 2-3 years and such fees are expected to rise going forward.

While PPA prices of £105 for 20 years result in negative net present value (NPV) for EY Central scenario, all scenarios with PPA prices of £100/MWh and £105/MWh for 12 years lead to positive NPV. Besides that, all £110/MWh scenarios result in negative NPV.

The analysis also provides a PPA price at which the NPV becomes zero, which can be a mutually agreeable threshold for the buyer and seller if additional PPA benefits, such as community benefits, are left out. Based on the EY Central scenario, PPA prices of £97.3 for a 20-year term and £107.3 for a 12-year term result in zero NPV. The NPVs for the various scenarios that were taken into account in this exercise are closely tied to current wholesale market forecasts (which have been calculated by EY's Economic Advisory team). Therefore, the actual savings and NPV may change significantly over time and are entirely dependent on the prevailing and forecast wholesale market prices.

Note: it is worth flagging that there are other 3rd Party wholesale power price forecasts, which are higher than EY's forecast scenarios and also one that is lower than EY's forecast scenarios.

NPV Scenarios for PCC – Central wholesale curve

For scenarios 1-3b we assume a virtual PPA structure, Pay-as-produced with two different discount rates at 6% and 3.5% to reflect market standard rates and a “green book” rate respectively. Scenario 4 reflects a sleeved baseload PPA arrangement.

Scenarios	PPA Price (PaP 1-7/Baseload 4) (GBP/MWh)	Discount rate	PPA Tenor	NPV - Central (GBP millions)	PPA start date[2]	NPV £/MWh
1	100	6%	12 years	0.74	Q2 2024	4.75
1a	100	3.5%	12 years	0.62	Q2 2024	4
2	105	6%	12 years	0.23	Q2 2024	1.5
2a	105	3.5%	12 years	0.02	Q2 2024	0.14
2b	105	6%	20 years	(1.07)	Q2 2024	(4.12)
3	110	6%	12 years	(0.27)	Q2 2024	(1.75)
3a	110	3.5%	12 years	(0.58)	Q2 2024	(3.71)
3b	110	6%	20 years	(1.77)	Q2 2024	(6.79)
4	120[1]	6%	12 years	(0.81)	Q2 2024	(5.2)

[1]Scenario 4: We assumed a PPA price of £105/MWh and £15/MWh balancing and shaping fees fixed for 2 years. Balancing and shaping fees are then inflated with CPI. Please note that these fees are usually subject to negotiation between the consumer and the electricity supplier every 2-3 years, meaning that the figure can vary across the lifetime of the PPA.

[2]Assuming Q1 January-March, Q2 April – June, Q3 July – September and Q4 October - December

NPV Scenarios for PCC – Central wholesale curve

Additional NPV modelling provided for zero NPV PPA rate (Scenarios 5 and 5a under 12 and 20 years respectively)
Additional NPV modelling provided for a Q3-24 and Q4-24 PPA COD (Scenarios 6 and 7 respectively)

Scenarios	PPA Price (PaP 1-7/Baseload 4) (GBP/MWh)	Discount rate	PPA Tenor	NPV - Central (GBP millions)	PPA start date[2]	NPV £/MWh
5	107.3	6%	12 years	(0.0)	Q2 2024	(0.0)
5a	97.3	6%	20 years	(0.0)	Q2 2024	(0.0)
6	110	6%	20 years	(2.01)	Q3 2024	(7.73)
7	110	6%	20 years	(2.26)	Q4 2024	(8.68)

[2]Assuming Q1 January-March, Q2 April – June, Q3 July – September and Q4 October - December

NPV Scenarios for PCC – High and Low wholesale curves

For scenarios 1-3b we assume a virtual PPA structure, Pay-as-produced with a 6% discount rate. Scenario 4 reflects a sleeved baseload PPA arrangement.

Scenarios	PPA Price (PaP 1-7/Baseload 4) (GBP/MWh)	Discount rate	Tenor[2]	PaP/Wholesale curve	NPV – (GBP millions)	NPV £/MWh
1	100	6%	12 years	High	5.08	32.55
1	100	6%	12 years	Low	(3.08)	(19.74)
2	105	6%	12 years	High	4.57	29.30
2	105	6%	12 years	Low	(3.59)	(22.99)
2b	105	6%	20 years	High	4.22	16.22
2b	105	6%	20 years	Low	(5.89)	(22.65)
3	110	6%	12 years	High	4.06	26.05
3	110	6%	12 years	Low	(4.09)	(26.24)
3b	110	6%	20 years	High	3.52	13.55
3b	110	6%	20 years	Low	(6.58)	(25.32)
4	120[1]	6%	12 years	High	3.73	23.90
4	120[1]	6%	12 years	Low	(4.8)	(30.81)

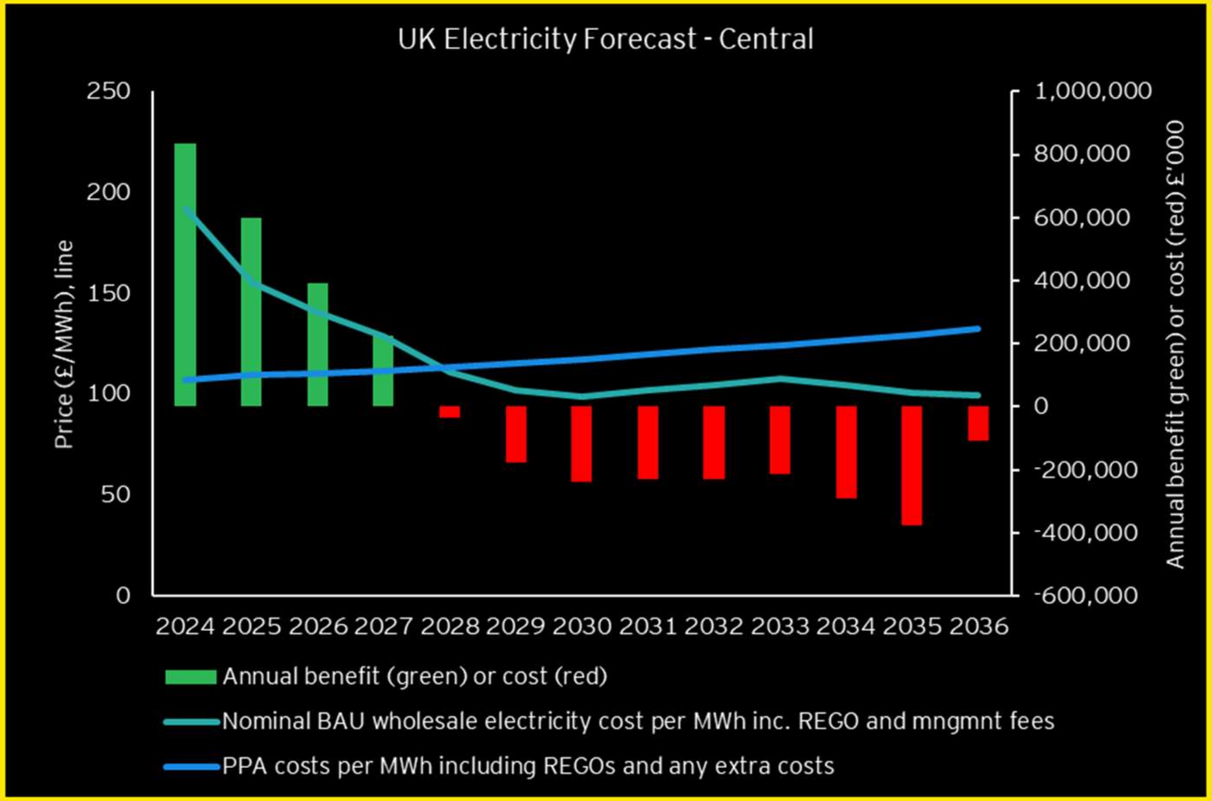
[1]Scenario 4: We assumed a PPA price of £105/MWh and £15/MWh balancing and shaping fees fixed for 2 years. Balancing and shaping fees are then inflated with CPI. Please note that these fees are usually subject to negotiation between the consumer and the electricity supplier every 2-3 years, meaning that the figure can vary across the lifetime of the PPA.

[2]Assumed start date Q2-24

EY

NPV Estimate – PPA Scenario 1 - Central

PPA price of £100/MWh with 6% discount rate - results in estimated NPV of c.£0.74m across 12 years (NPV/MWh = £4.75/MWh)



PPA price = £100 CPI linked
13 GWh/yr
12 yrs

Results

Estimated BAU Wholesale Spend: **£18.52 m** Across 12 years

Estimated PPA Spend: **£18.37 m** Across 12 years

Estimated Undiscounted Savings: **£0.15 m** Across 12 years

Based on the assumptions in this section, a NPV of £0.74 m is estimated for PPA Scenario 1

Note PPA modelled to **start in Q2 2024** and last for 12 years

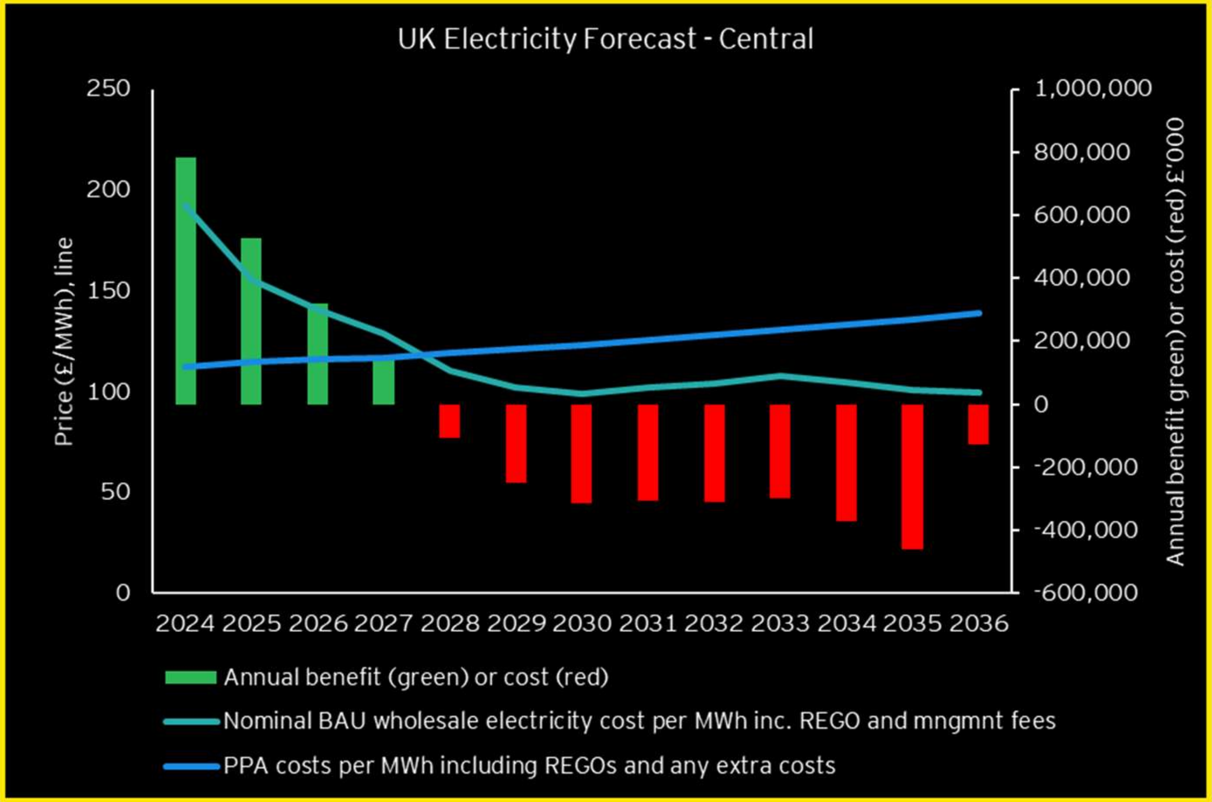
Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs..

(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
BAU cost	1.87	2.02	1.83	1.67	1.44	1.32	1.29	1.33	1.36	1.40	1.36	1.31	0.32
PPA cost	1.04	1.42	1.44	1.45	1.47	1.50	1.53	1.56	1.59	1.62	1.65	1.68	0.43
Annual Benefit/Cost	0.83	0.60	0.39	0.22	-0.03	-0.17	-0.24	-0.23	-0.23	-0.22	-0.29	-0.38	-0.11

BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs (£100/MWh 2023 real terms, CPI linked)

NPV Estimate – PPA Scenario 2 - Central

PPA price of £105/MWh with 6% discount rate - results in estimated NPV of c.£0.23 m across 12 years (NPV/MWh = £1.5/MWh)



PPA price = £105 CPI linked
13 GWh/yr
12 yrs

Results

Estimated BAU Wholesale Spend
£18.52 m
Across 12 years

Estimated PPA Spend
£19.29 m
Across 12 years

Estimated Undiscounted Savings
-0.76 m
Across 12 years

Based on the assumptions in this section, a NPV of £0.23 m is estimated for PPA Scenario 2

Note PPA modelled to **start in Q2 2024** and last for 12 years

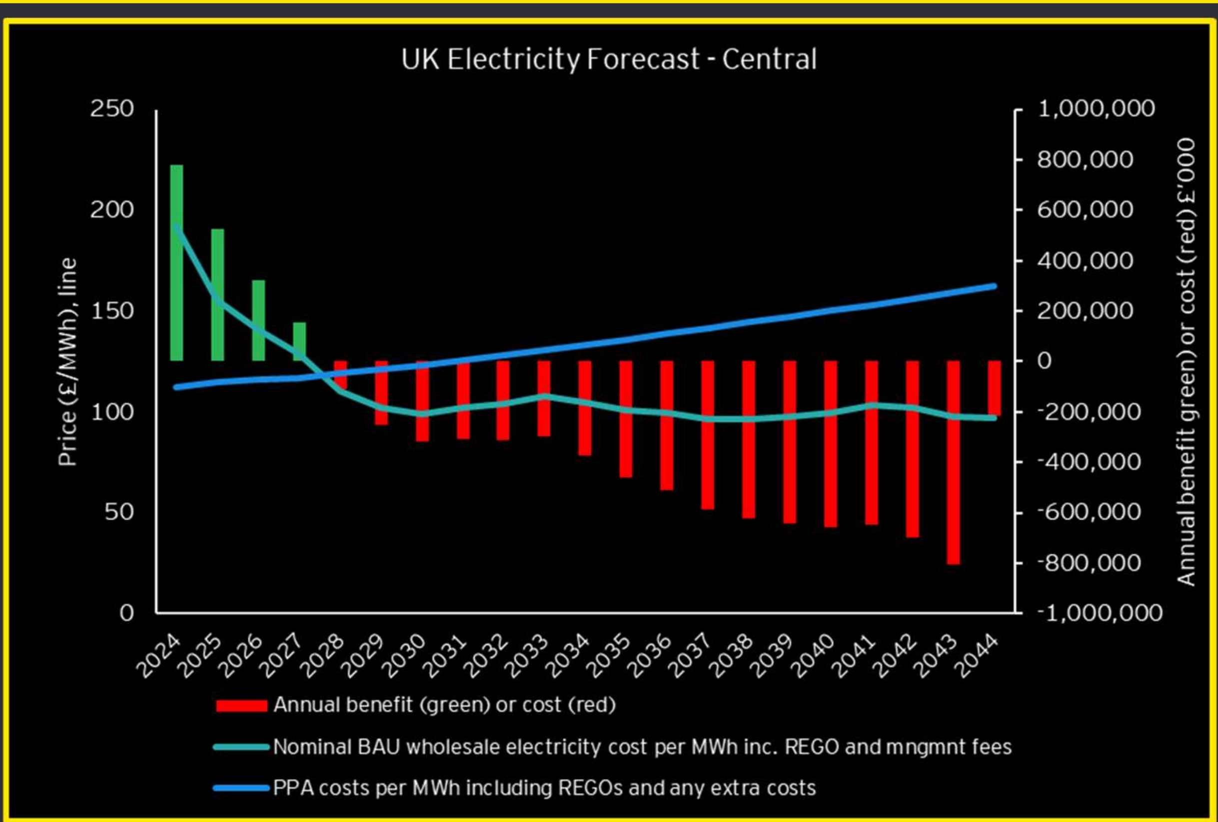
Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs..

(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
BAU cost	**1.87**	**2.02**	**1.83**	**1.67**	**1.44**	**1.32**	**1.29**	**1.33**	**1.36**	**1.40**	**1.36**	**1.31**	**0.32**
PPA cost	**1.09**	**1.49**	**1.51**	**1.52**	**1.55**	**1.57**	**1.60**	**1.63**	**1.67**	**1.70**	**1.73**	**1.77**	**0.45**
Annual Benefit/Cost	**0.78**	**0.53**	**0.32**	**0.15**	**-0.11**	**-0.25**	**-0.32**	**-0.31**	**-0.31**	**-0.30**	**-0.37**	**-0.46**	**-0.13**

BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs (£105/MWh 2023 real terms, CPI linked)

NPV Estimate – PPA Scenario 2b - Central

PPA price of £105/MWh with 6% discount rate - results in estimated NPV of c. -£1.07 m across 20 years (NPV/MWh = -£4.12/MWh)



PPA price = £105 CPI linked
13 GWh/yr
20 yrs

Results

Estimated BAU Wholesale Spend: **£28.83 m** Across 20 years

Estimated PPA Spend: **£34.84 m** Across 20 years

Estimated Undiscounted Savings: **-6.02 m** Across 20 years

Based on the assumptions in this section, a NPV of -£1.07 m is estimated for PPA Scenario 2b

Note PPA modelled to **start in Q2 2024** and last for 20 years

Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs.

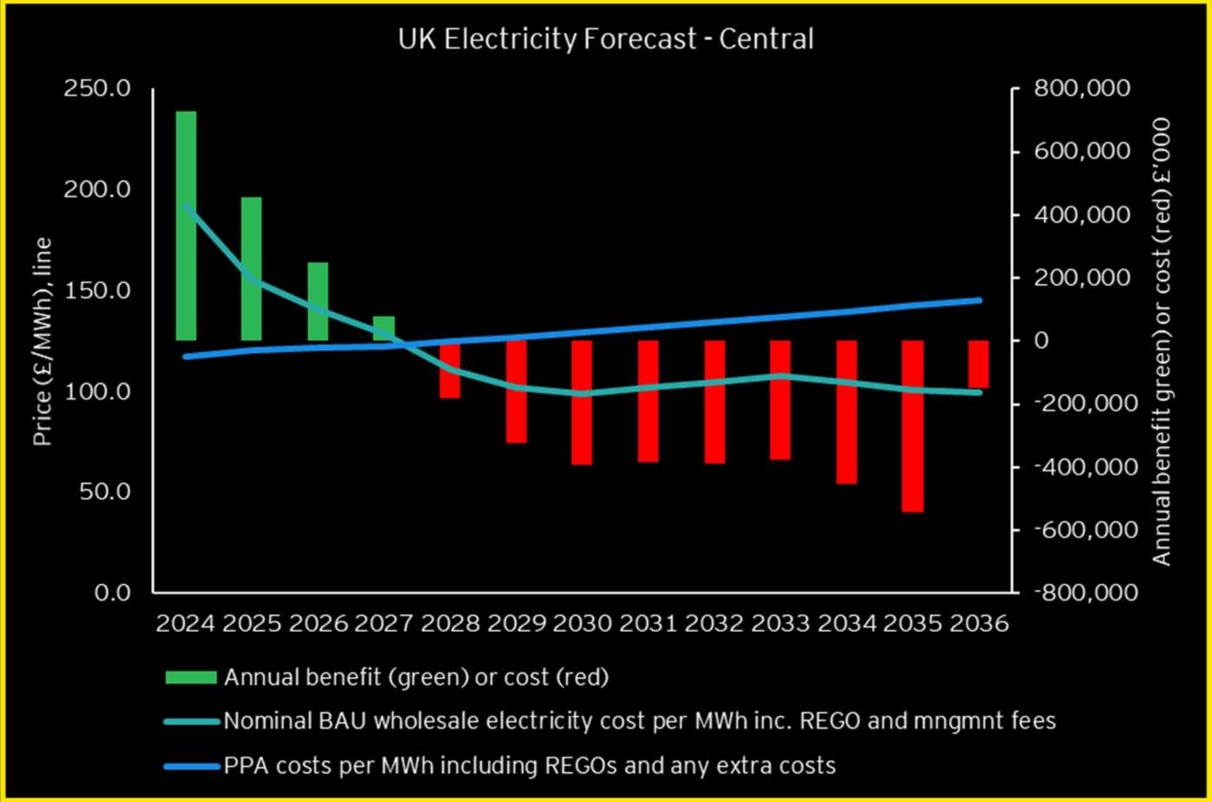
(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
BAU cost	1.87	2.02	1.83	1.67	1.44	1.32	1.29	1.33	1.36	1.40	1.36	1.31	1.29	1.25	1.25	1.27	1.29	1.35	1.33	1.27	0.31
PPA cost	1.09	1.49	1.51	1.52	1.55	1.57	1.60	1.63	1.67	1.70	1.73	1.77	1.80	1.84	1.88	1.91	1.95	1.99	2.03	2.07	0.53
Annual Benefit/Cost	0.78	0.53	0.32	0.15	-0.11	-0.25	-0.32	-0.31	-0.31	-0.30	-0.37	-0.46	-0.51	-0.59	-0.62	-0.64	-0.66	-0.65	-0.70	-0.81	-0.21

BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs (£105/MWh 2023 real terms, CPI linked)

EY

NPV Estimate – PPA Scenario 3 - Central

PPA price of £110/MWh with 6% discount rate - results in estimated NPV of c. -£0.27m across 12 years (NPV/MWh = -1.75/MWh)



PPA price = £110 CPI linked
13 GWh/yr
12 yrs

Results

Estimated BAU Wholesale Spend	Estimated PPA Spend	Estimated Undiscounted Savings
£18.53 m Across 12 years	£20.21 m Across 12 years	- £1.68 m Across 12 years

Based on the assumptions in this section, a NPV of - £0.27m is estimated for PPA Scenario 3

Note PPA modelled to start in Q2 2024 and last for 12 years

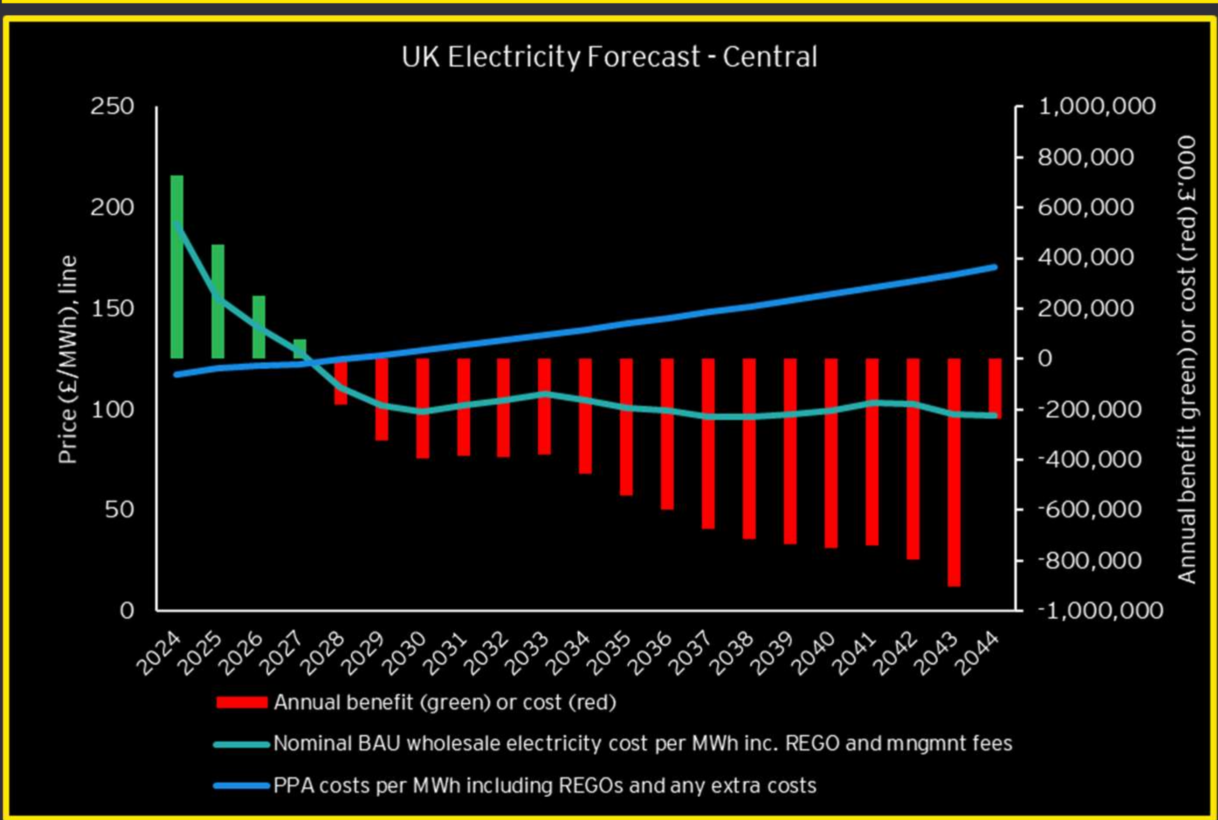
Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs.

(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
BAU cost	1.87	2.02	1.83	1.67	1.44	1.32	1.29	1.33	1.36	1.40	1.36	1.31	0.32
PPA cost	1.15	1.56	1.58	1.59	1.62	1.65	1.68	1.71	1.75	1.78	1.82	1.85	0.47
Annual Benefit/Cost	0.73	0.46	0.25	0.08	-0.18	-0.32	-0.39	-0.38	-0.39	-0.38	-0.45	-0.54	-0.15

BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs (£110/MWh 2023 real terms, CPI linked)

NPV Estimate – PPA Scenario 3b - Central

PPA price of £110/MWh with 6% discount rate - results in estimated NPV of c. -£1.77m across 20 years (NPV/MWh = -6.79/MWh)



PPA price = £110 CPI linked
13 GWh/yr
20 yrs

Results

Estimated BAU Wholesale Spend
£28.83 m
Across 20 years

Estimated PPA Spend
£36.51 m
Across 20 years

Estimated Undiscounted Savings
- £7.68 m
Across 20 years

Based on the assumptions in this section, a NPV of - £1.77m is estimated for PPA Scenario 3b

Note PPA modelled to **start in Q2 2024** and last for 20 years

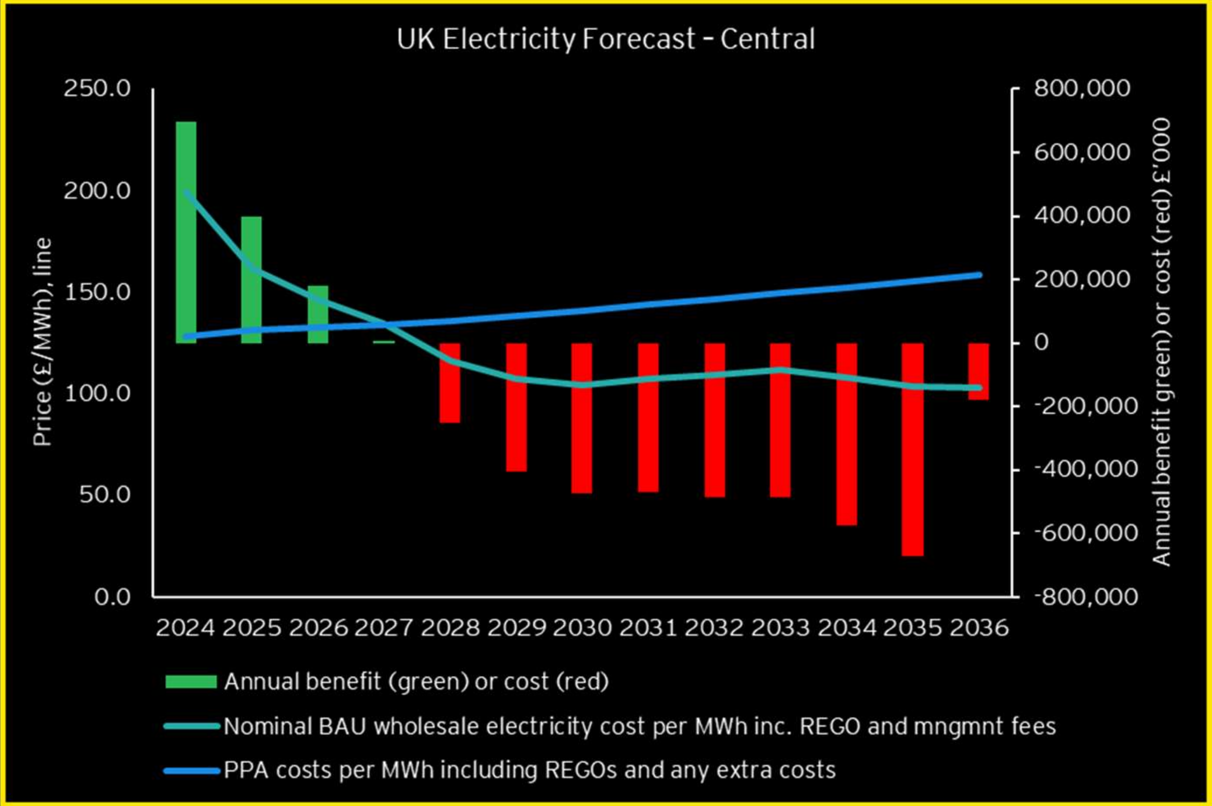
Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs.

(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044
BAU cost	1.87	2.02	1.83	1.67	1.44	1.32	1.29	1.33	1.36	1.40	1.36	1.31	1.29	1.25	1.25	1.27	1.29	1.35	1.33	1.27	0.31
PPA cost	1.15	1.56	1.58	1.59	1.62	1.65	1.68	1.71	1.75	1.78	1.82	1.85	1.89	1.93	1.97	2.01	2.05	2.09	2.13	2.17	0.55
Annual Benefit/Cost	0.73	0.46	0.25	0.08	-0.18	-0.32	-0.39	-0.38	-0.39	-0.38	-0.45	-0.54	-0.60	-0.67	-0.71	-0.73	-0.75	-0.74	-0.80	-0.90	-0.24

BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs (£110/MWh 2023 real terms, CPI linked)

NPV Estimate – PPA Scenario 4 - Central

PPA price of £105/MWh with 6% discount rate and £15/MWh balancing and shaping fees fixed for 2 years - results in estimated NPV of -£0.81m across 12 years (NPV/MWh = -£5.20/MWh)



PPA price = £120 CPI linked of which
Balancing/shaping = £15/MWh (2yr fixed, CPI after)
13 GWh/yr
12 yrs

Results

Estimated BAU Wholesale Spend	Estimated PPA Spend	Estimated Undiscounted Savings
£19.3 m Across 12 years	£22.0 m Across 12 years	-£2.7 m Across 12 years

Based on the assumptions in this section, a NPV of -£0.81m is estimated for PPA Scenario 4

Note PPA modelled to **start in Q2 2024** and last for 12 years

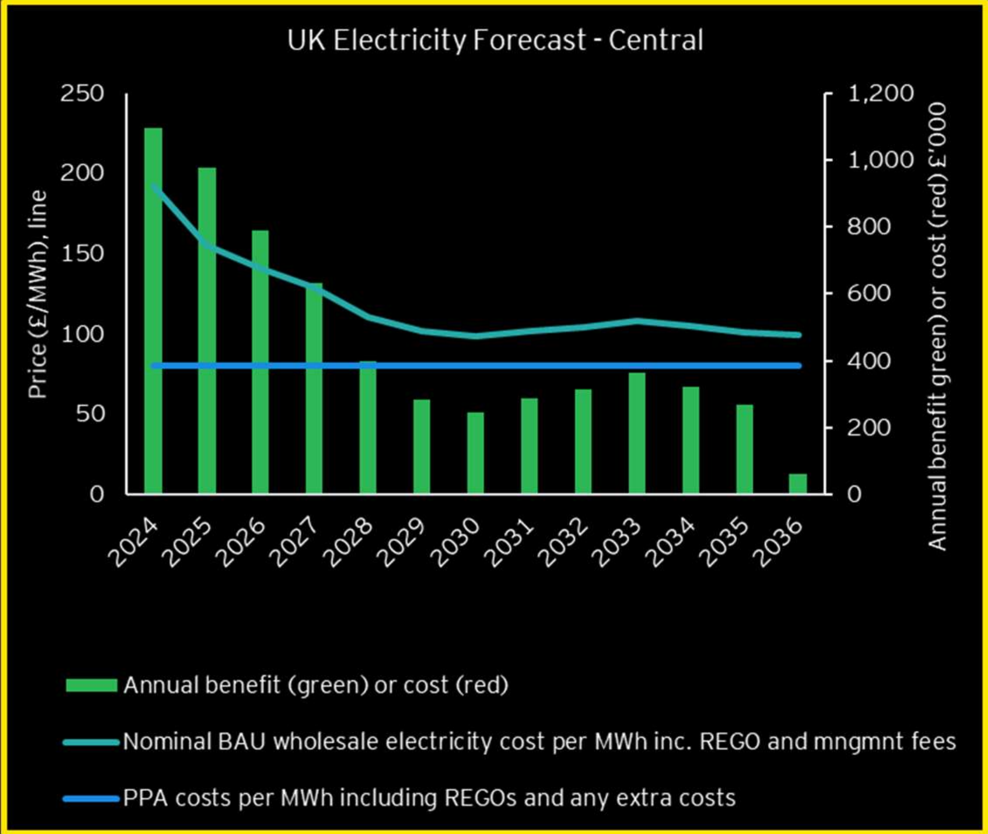
Annual inflation rate modelled as Oxford Economics CPI Forecast for wholesale costs and REGOs.

(£m)	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
BAU cost	1.95	2.10	1.90	1.75	1.51	1.39	1.36	1.40	1.42	1.45	1.41	1.35	0.33
PPA cost	1.25	1.71	1.72	1.74	1.77	1.80	1.83	1.87	1.90	1.94	1.98	2.02	0.52
Annual Benefit/Cost	0.70	0.40	0.18	0.01	-0.25	-0.40	-0.47	-0.47	-0.49	-0.49	-0.57	-0.67	-0.18

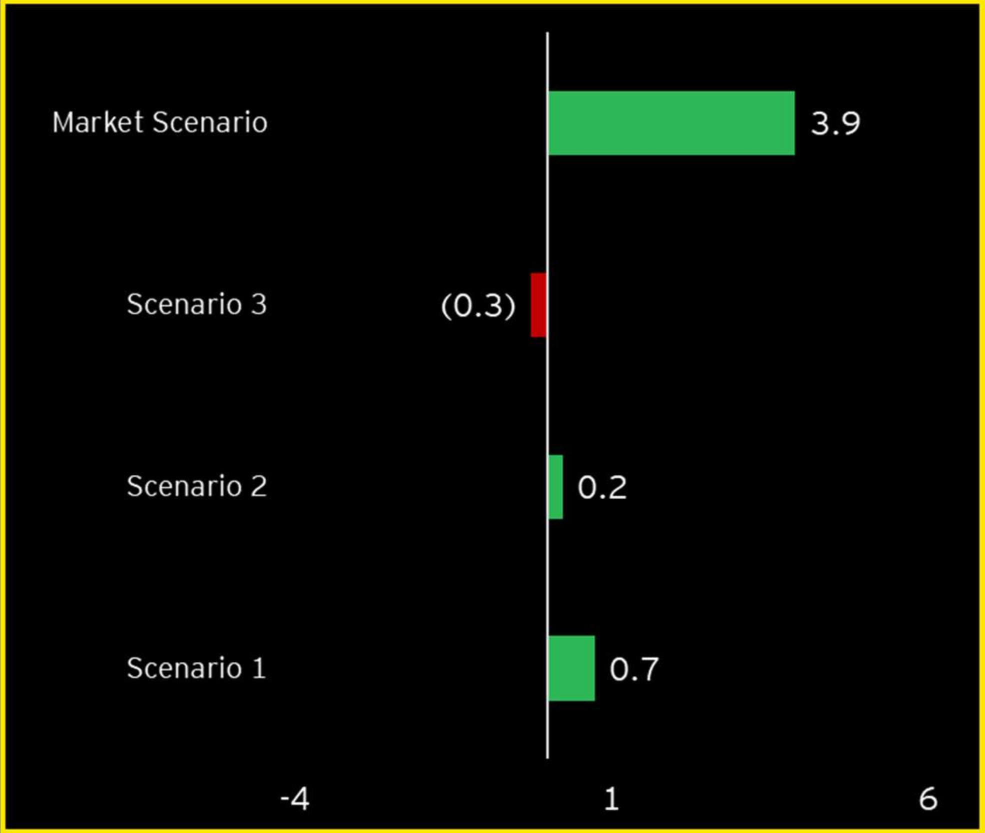
BAU wholesale spend = wholesale estimate plus REGO
PPA cost per MWh including REGOs, balancing and shaping fee (£120/MWh 2023 real terms, CPI linked)

NPV comparison between Chelson Meadow project NPV scenarios and a 'benchmark' market project

Market Scenario: PPA price of £80/MWh flat no CPI-linked



CMCS Scenarios comparison: NPV £ millions



Commentary

The analysis compared Scenarios 1-3 of Chelson Meadow project against the PPA price levels currently available in the market (as of April 2023) . Recent tenders for sites of similar or slightly larger capacity and for 12 years showed PPA prices within the £70-80/MWh range CPI indexed in real 2023 terms and £80-90/MWh flat with no CPI-indexation. When comparing these levels against the proposed levels in Scenarios 1-3, we anticipate a difference in NPV values between the "Market Scenario" and Scenario 1 to be about £3.2m, Scenario 2 £3.7m and Scenario 3 £4.2m.

Additional benefits applying to CMCS project are not factored in here, so the analysis only compares the PPA price (inclusive of REGO certificates) against Scenarios 1,2 and 3 to give contracting parties a purely economic market benchmark view.

6 Reconciliation mechanism

Virtual PPA reconciliation mechanism

This report has briefly introduced the choice around the PPA's reconciliation mechanisms at different points throughout the analysis. Alongside the commercial and legal structures of the contract, the reconciliation mechanism is one of the most important elements of the PPA structure under consideration and contracting parties will need to fully understand the complexities of such a mechanism.

As described in section 3, a virtual PPA is a fixed-for-floating swap, commonly referred to as a financial contract for difference.

The buyer and the seller put a contract in place for the virtual purchase (i.e. settlement) of power at a predetermined set price.

The physical generated electricity is subsequently fed into the grid and sold at the prevailing market price. The generator and the consumer then reconcile the difference between the contractual price and the market price.

These contracts are normally resolved monthly for all hours or intervals in that month, and the direction of the financial settlement depends on whether there is a net positive or net negative price difference. If the market price is higher than the PPA price, the generator pays the difference to the consumer. However, if the market price is lower than the PPA price, the consumer pays the difference to the generator.

To minimise basis risk, the settlement of the derivative contract between the generator and the consumer will ideally happen against the same index that the consumer is buying its physical power. The most commonly used index in the UK vPPA contracts is the UK N2EX Day-Ahead.

The contracted parties could also explore settlement on the same wholesale market contract (instead of the UK N2EX Day-Ahead) under a simultaneous hedging agreement to minimise power price volatility on the P&L.

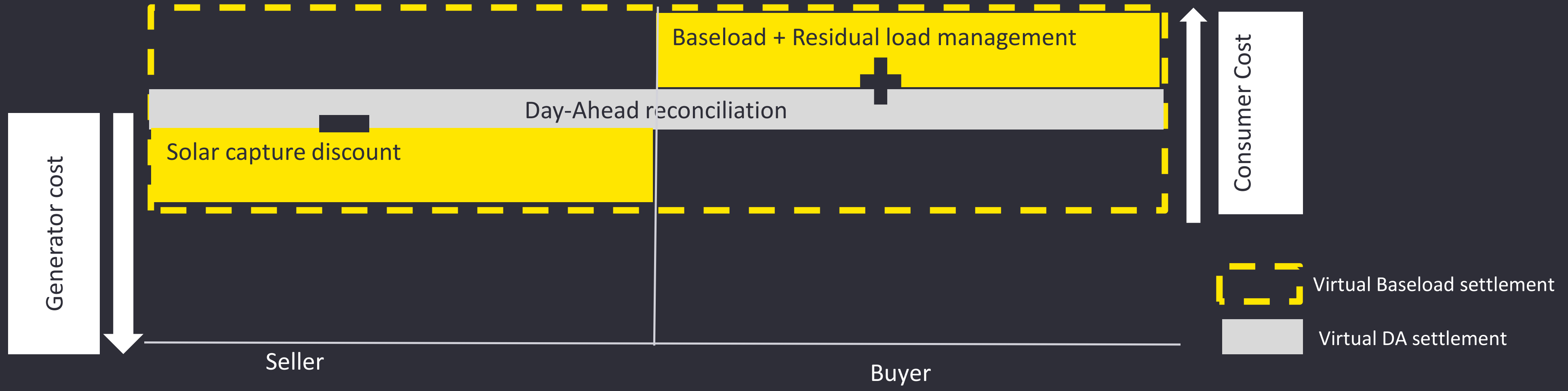
The project explored both options, namely the "**Day-Ahead reconciliation mechanism**" and a rolling "**12-month wholesale market fix**" across the lifetime of the PPA tenor. We present the benefits and risks of each reconciliation mechanism in the next few pages.

Alongside these two options, we also briefly re-introduce the physical PPA structure in order to compare settlement risks related to basis and renewable intermittency misalignment and provide a full picture on the parties' optionality to contract based on market standards.

PCC's and CMCS' "open-book" discussions provide an opportunity for both parties to reduce settlement volatility under a virtual PPA agreement, however the agreement will need to equally balance the risks carried by each party – as well as considering the benefits against a Business-as-usual scenario.

Day-Ahead vs 12-month wholesale market fix

When considering the settlement of the PPA contract either through baseload or DA we need to focus on the risks associated with the volume-weighted average price (WAP) received by the developer and the average monthly price paid to settle the consumer's consumption.



12-month wholesale market fix

On a 12-month wholesale market fix settlement, the generator will sell power to their electricity supplier with a solar capture discount applied. The consumer will buy power (either through wholesale electricity contracts on a flexible supply agreement or fixed price, fixed term), but they will have to consider additional charges for baseload delivery and the residual load fixing.

Risk points: Solar capture discount (£10-20/MWh)

Day-Ahead (DA) reconciliation mechanism settlement

On a Day-Ahead settlement, the developer will leave the asset's total production to the Day-Ahead index and the consumer will do the same for the consumption share committed in the PPA contract. There are no associated shaping costs (balancing costs are usually captured in the PPA price) from the generator's side, while the off taker will not need to create baseload blocks for that part of the portfolio that defaults to the Day-Ahead index.

That said there is still a basis risk as the contract will be settled on the volume-weighted average price (WAP) of the *generation* shape, while the consumer will pay their supplier based on their volume-weighted average price of their *consumption* shape.

Risk points: Basis risk, shape risk

Physical PPA

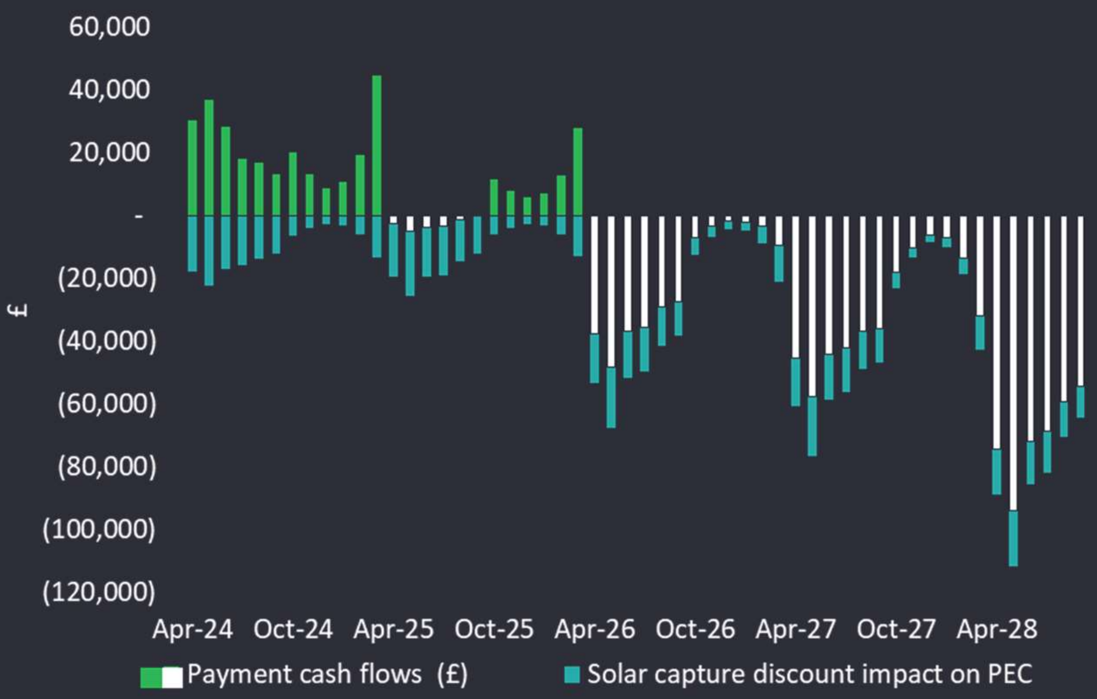
The physical PPA route would remove settlement risks from a baseload and DA mechanism, as the developer will sell PaP to the consumer's electricity supplier. The electricity supplier would then balance and shape the intermittent volume (for a fee) and provide baseload to the consumer through their supply agreement. This route includes some risks from evolving balancing and shaping fees in the consumer's portfolio, as the consumer will only be able to fix these costs for a maximum of 5 years (typically 2-3 years alongside the supply agreement renewals). These costs currently stand between £15-20/MWh.

Risk points: Volatile, uncertain balancing and shaping risks, back-to-back developer/supplier/consumer contracts, sleeving PPA complexities

Day-Ahead reconciliation mechanism

In order to better understand the structure of the Day-Ahead reconciliation mechanism, we have plotted a scenario using monthly Day-Ahead average -prices in the period April-24 to August-28 against a Pay-as-produced, fixed-price (no-CPI) PPA structure with a PPA price at £105/MWh. Chart 2 shows the direction of cash flow payments between PCC and CMCS for the period under consideration.

Chart 2: Illustrative PPA cash flow variation DA reconciliation Apr24-Aug28



Mechanism description

CMCS will receive a solar discounted £/MWh price for the generated volume from the electricity supplier and PCC will pay their electricity supplier the reflective, undiscounted Day-Ahead £/MWh price for the same volume.

The analysis assumed Chelson Meadow's P50 expected annual output and a standard solar yield structure in the UK against PCC's consumption of the same volume on a monthly basis. The analysis took into account a solar discount of 4% against CMCS' achieved price, whereas PCC is expected to pay the full wholesale market Day-Ahead rate.

The two parties will then reconcile on an hourly generation basis against Chelson Meadow's profile to determine the cashflow payment for each month.

Cash flows illustrate cash direction to and from PCC, meaning that positive payments (green) are cashflows from CMCS to PCC and white are vice versa.

The illustration is aligned with NPV calculations in the previous section due to the current electricity price backwardation meaning that we expect PCC to be "in the money" in the first few years of the PPA tenor up to start of Summer 2026.

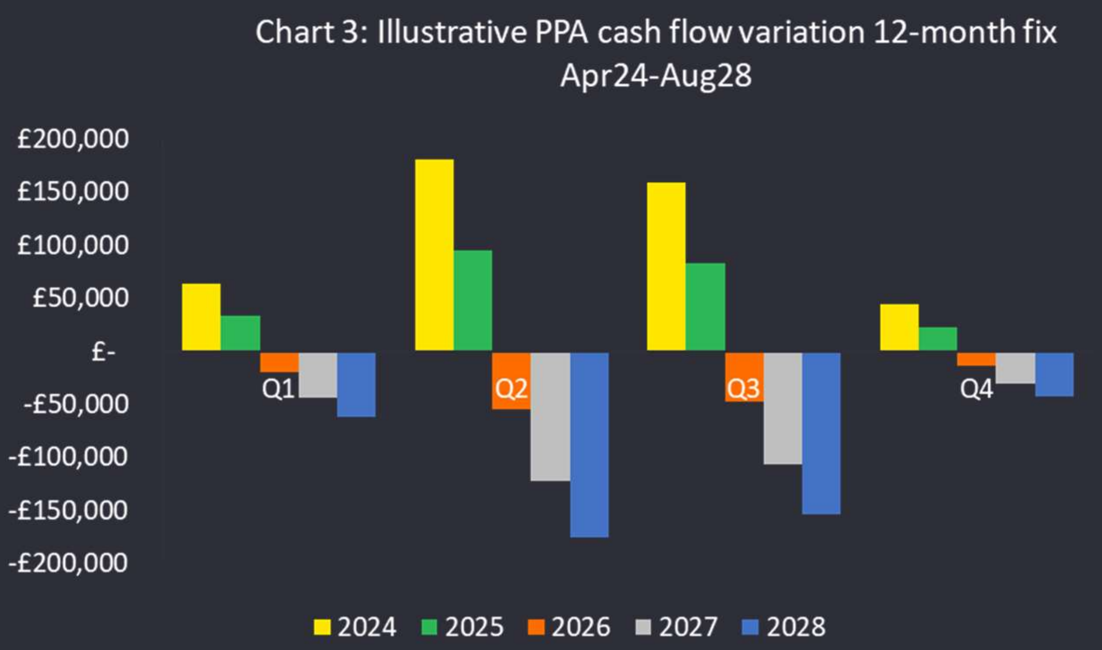
Key takeaways from the analysis

Irrespective of the cash flows direction – which will be determined by PPA performance against prevailing market prices in each given month - the analysis aims to bring to the surface the basis risk within the PPA contract relationship. This basis risk is derived from the difference between the market price CMCS will receive for Chelson Meadow's generation and the price PCC will pay for the same amount of consumption. In this example, we calculated the average delta per month to be £10.6k across the period April-24- July-28. The basis risk will be reduced during the winter period – as less volume is weighted against the asset's generation.

Separate to the above, we calculated the monthly maximum cashflow at £94.1k in May-28. The cashflow variation is based on wholesale forward projections and might not represent actual market prices at the time of reconciliation.

Rolling 12-month wholesale market fix

We have also analysed an alternative reconciliation mechanism for Chelson Meadow and PCC, where the two parties reconcile quarterly on a pay-as-produced basis against each other's hedged 12-month price. We concluded that this option is available due to CMCS' and PCC's open book discussions that allow incentives to reduce Day-Ahead volatility occurring in the Day-Ahead reconciliation mechanism.



Mechanism description*

Under this structure Chelson Meadow and PCC will sell and buy their power on a rolling 12-month fix basis respectively. The parties will then reconcile the PPA strike price against the average of their respective sell/buy achieved rates.

The parties can choose to reconcile on a Pay-as-produced basis or a Pay-as-forecast basis with an annual true up payment to subsequently reconcile actual production against forecast generation.

The pricing elements of the reconciliation – namely the wholesale mid-point price and the PPA strike price - will remain constant for 12-months and parties will settle on the variable quarterly volume to determine the cashflows each quarter.

The best hedge will be achieved if the contracts are aligned - e.g. same start/finish date and same pricing basis. For power not hedged by the PPA, PCC will be able to pay their normal fixed rate.
The parties will need to ensure contractually that the 12-month fix will occur at the same time to reduce price arbitrage for either party and minimise the delta between achieved wholesale rates.

The buy/sell PPAs need not be with the same supplier, but having the same supplier is likely to reduce the spread created from the average reconciliation price between the parties.

Key takeaways from the analysis

Chart 3 shows an illustrative example on how cashflows on the 12-month wholesale market fix can work in the period Apr24-Aug28 based on current wholesale market prices.

The analysis assumed Chelson Meadow's P50 expected annual output against PCC's consumption of the same volume on a quarterly basis. The analysis also factored a 5% solar discount factor, starting in 2024 and rising by 0.75% per annum across the tenor. PCC is expected to pay the full wholesale market price for 2024-2028, as currently traded.

Irrespective of the cash flows direction – which will be determined by PPA performance against prevailing market prices in each given quarter - the analysis aims to bring to the surface the basis risk within the PPA contract relationship and the difference in cashflow volatility between the Day-Ahead mechanism and the 12-month wholesale market fix.

Similar to the Day-Ahead reconciliation, this basis risk is derived from the difference between the market price CMCS will receive for Chelson Meadow's generation and the price PCC will pay for the same amount of consumption. A difference for the 12-month wholesale price fix is that the two parties share the full solar discount cost (i.e. balancing and shaping costs) by averaging the achieved wholesale prices, whereas in the Day-Ahead reconciliation the balancing risk lies with Chelson Meadow and the shaping risk lies with PCC.

In this example, we calculated the average delta per quarter to be £78k across the period April-24- July-28. Separate to the above, we calculated the quarterly maximum cashflow at £182k in Q2-24. The cashflow variation is based on wholesale forward projections and might not represent actual market prices at the time of reconciliation.

*Mechanism example
PCC will enter into a 12-month fixed contract under their supply contract at £150/MWh (wholesale element of their bill).
The generator will also enter into a 12-month fixed price export contract at £143/MWh (factoring the solar capture discount).
Mid-point for reconciliation = £146.5/MWh (Average Market Price) on a quarterly basis.

7

Recommendations

Key PPA Decisions summary

We have summarised the key decision points that CMCS and PCC will need to agree upon for the completion of the Chelson Meadow PPA. The table below shows market standard and alternative options related to the PPA tenor, price, structure, indexation, start and reconciliation mechanism. These are then compared against Chelson Meadow's structure.

Standard	Alternative	Pros & Cons (in terms of costs, risks, time, and sustainability)	Possible choice
Long-term (e.g., 10-15 yrs)	Short-term (e.g., 5-7 yrs)	▶ Long-term PPAs typically needed by developers to pay off on building new projects ▶ This is another really key decision which impacts other terms ▶ Short-term PPAs are possible but tend to be with operational projects ▶ **Long-term: ✓ Costs ✗ Risks – – Time ✓ Sustainability**	**20 years**
Fixed price	Floating price	▶ Fixed price PPAs provide developers with the revenue security to raise project debt ▶ Fixing prices long-term results in market price risk for corporate if market falls below PPA ▶ Floating PPAs rare for corporates as no price security and expected NPV less than fixed ▶ **Fixed price: ✓ Costs ✗ Risks – – Time – – Sustainability**	**Fixed price**
Virtual ('financial') structure	Sleeved ('physical') structure	▶ Both structures equally valid for 'additionality' as both equally enable new projects ▶ Sleeved structure more complex to 'balance' physical volumes of power output vs. demand ▶ Virtual structure more complex in terms of accounting treatment and possible profile risk ▶ **Virtual structure: ✓ Costs -- Risks ✓ Time – – Sustainability**	**Virtual**
Indexation on top	Fixed price	▶ Many corporate PPAs used to be fixed (flat in nominal terms) ▶ Now many developers strongly prefer indexed as opposed to fixed price PPAs – though depends on their financing structure ▶ No-indexation PPAs are available, but initial prices are higher, e.g., + £10-15/MWh ▶ **Indexed price: -- Costs ✗ Risks – – Time – – Sustainability**	**Indexation on top**
Distant-term (PPA start > 2 yrs away)	Near-term (PPA start < 1 yr away)	▶ Not restricting the PPA to start in the near-term enables a wider pool of projects ▶ Distant-term projects could provide lower cost PPAs due to reducing capital costs ▶ Very near-term PPA start could conflict with corporate power hedging already in place ▶ **Distant project: ✓ Costs – – Risks ✗ Time – – Sustainability**	**Near-term (Q3/Q4 2024)**
Day Ahead	Rolling 12-month wholesale market fixed	▶ Rolling 12 months reconciliation required buy/sell PPAs with the same supplier ▶ In standard reconciliation mechanism, basis risk is minimised due to the settlement happening on the same index **Rolling 12-month wholesale market fix project** **✓ Volatility – – Risks ✗ Time purchasing alignment**	**Rolling 12-month wholesale market fix**

Key:
- ✓ = Costs are lower; Risks are lower; Time to start is quicker; Sustainability is 'better'
- ✗ = Costs are higher; Risks are higher; Time to start is longer; Sustainability is 'worse'
- – – = Costs are similar; Risks are similar; Time to start is similar; Sustainability is similar

Recommendations

Following a thorough analysis of the project's main structure and Chelson Meadow's/PCC requirements and key objectives from the PPA, we conclude the report with our recommendations on how the PPA will be fairly balanced for both parties.

From Chelson Meadow's perspective - the recommendations considered the project's financing and CAPEX/OPEX assumptions and any flexibility around a potential cost reduction related to EPC and financing terms communicated by CMCS.

From PCC's perspective - the recommendations considered PCC's current electricity purchasing strategy, objectives from the project both in terms of electricity purchasing and community benefits and finally the market's standard terms on elements related to the tenor, contract structure and indexation.

Terms	Market standard	Chelson Meadow	EY recommendation
Tenor	10-15 years	20 years	The proposed 20-year PPA tenor is 5-10 years above the market standard tenor in corporate offsite PPA deals concluded and seen by EY in 2021-2023. The extended tenor poses a risk due to lack of visibility on the performance of wholesale market prices in the next 20 years. This risk is more important when we consider the discussions on changes to the wholesale market operation including the Review of the Electricity Market Arrangements (REMA).
Price (CPI Indexed) (Jan 2023 terms)	£70-80/MWh	Assumed £110/MWh	The asset's proposed fixed-indexed price is £30-40/MWh higher than recent corporate offsite PPA deals concluded and seen by EY in 2021-2023. These prices reflect slightly larger offsite PPAs with an average output of 30-50GWh, hence we need to factor in that lower capacity assets will benefit less from economies of scale. Comparing prices against the tenor, developers give price incentives to consumers when consumers choose a longer tenor for the PPA contracts. Hence, we would expect the £70-80/MWh market standard range to be lower if we were to match market standard PPAs with Chelson Meadow's tenor.
Contract structure	Virtual	Virtual	Aligned with market standards. Virtual PPAs now dominate Physical PPAs for corporate offtakers.
Commercial Operations Date (COD)	Q2- 2024 to Q1-2025	July 2024 to September 2024	Aligned with market standard in terms of asset availability currently in the market. Based on the current wholesale market structure, the later the COD the lower the price consumers would pay, meaning that a project starting operations in 2025 would provide lower pricing , but potentially lower savings.
Reconciliation mechanism	Day-Ahead	12-month wholesale fix	Both reconciliation mechanisms can accommodate Chelson Meadow's offsite PPA. The Day-Ahead reconciliation mechanism is market standard, however this is because parties do not usually negotiate on "open book" terms. Both parties will need to ensure that the 12-month fix can happen on the same day each contractual year to minimise the delta between each party's achieved fix price. The 12-month wholesale fix will reduce monthly cashflow volatility compared to the Day-Ahead mechanism, meaning that it can keep PCC closer to its current purchasing arrangements.
Supply contract mechanism	Fixed-price, Fixed-term	Flexible supply agreement	PCC will need to change its purchasing strategy irrespective of the agreed reconciliation mechanism. A Day-Ahead reconciliation mechanism will require less contract management from PCC's side, however the Day-Ahead reconciliation and P&L volatility will need to be monitored more closely on a monthly basis throughout the lifetime of the project.
Other benefits	Commercial & Environmental benefits	Commercial, Community & Environmental benefits	Chelson Meadow can provide additional community and profit incentives. These incentives will need to be quantified, to determine how they weigh against other terms where Chelson Meadow is less competitive. We recommend additional work to be done on this point to ensure project viability. Both parties will need to be aware and ensure no cross subsidisation occurs from PEC/PCC relationship on project financing and PPA pricing. In addition to the above, the Chelson Meadow PPA can provide PCC price protection against volatile pricing in the renewables certification (REGO) market and assist towards the decarbonisation of PCC's electricity consumption (Please find more details on page 57)

Other Commercial, environmental and community benefits

Alongside the quantitative criteria taken into consideration on the viability of the Chelson Meadow PPA project for both CMCS and PCC, the parties will need to also determine and analyse the other benefits derived from this agreement. These benefits can be separated in three different categories:

- Environmental benefits, which include the PCC's support on renewable electricity and the importance of the council's investment in allowing this project to deliver
- Other commercial benefits including long-term electricity price certainty and REGO price protection
- Community benefits, which relates to CMCS' and PCC's wider collaboration in Chelson Meadow and how the project can benefit the wider Plymouth community

Environmental benefits

Both physical and virtual PPAs can provide the consumer the required REGO certificates that can be used to claim use of renewable electricity under their environmental reporting guidelines. Both structures are ensuring that the Generator has revenue security, and can then finance and build their project – hence providing clear additionality. PPA structures are both considered as direct procurement of electricity options. To avoid double counting, the corporate must purchase and retire the REGO certificates as described in more detail in Section 3 page 30. Please refer to RE100 technical criteria (Date of publication: December 2022) for further details RE100 Technical criteria and appendices

Other commercial benefits

A PPA can offer price security against volatility wholesale electricity markets, but also price protection against rising REGO prices. The increase in renewable electricity demand in recent years has led to a strong upward trend in REGO certificates' pricing. When entering a PPA, the electricity consumer can fix both the electricity price and the REGO price in one rate (the achieved fixed rate of the PPA) meaning that alongside the wholesale electricity volatility, the consumer also secures exposure on certificates' volatility. The models in this report assumed a REGO price of £5/MWh, however recent reports showed REGO prices rising to £7-9/MWh in Q1-23.

Community benefits

The construction of the solar farm will result in a biodiversity net gain of 26% for the site.

The land rental for solar is forecast to generate an income of approximately £1m over the life of the project.

The project will reduce the Council's current carbon emissions by approximately 60%, with 75% of the current electricity need being met by renewable energy.

The project will protect the Council against energy price increases and volatility over a 20 year period through a Virtual PPA with the solar farm.

The project will future proof the Council against potential policy and legislative change relating to carbon emissions.

8

Appendix

Related to Section 5

Assumptions and inputs for Wholesale power prices & NPV estimates

Modelling assumptions

Shared assumptions across all models

CPI indexation: Oxford Economics CPI forecast
CPI base year: 2023
PPA start for Scenarios 1 to 5a: Q2-2024
PPA start date for Scenario 6: Q3- 2024
PPA start date for Scenario 7: Q4 – 2024
REGOs: £5/MWh
Volume: 13GWh

Scenarios

Scenario 1: PaP £100/MWh, Discount rate: 6%, Tenor: 12 years
Scenario 1a: PaP £100/MWh, Discount rate: 3.5%, Tenor: 12 years
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

Scenario 2: PaP £105/MWh, Discount rate: 6%, Tenor: 12 years
Scenario 2a: PaP £105/MWh, Discount rate: 3.5%, Tenor: 12 years
Scenario 2b: PaP £105/MWh, Discount rate: 6%, Tenor: 20 years
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

Scenario 3: PaP £110/MWh, Discount rate: 6%, Tenor: 12 years
Scenario 3a: PaP £110/MWh, Discount rate: 3.5%, Tenor: 12 years
Scenario 3b: PaP £110/MWh, Discount rate: 6%, Tenor: 20 years
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

Scenario 4: Baseload, £105/MWh PaP & Balancing and shaping fees £15/MWh, Discount rate: 6%
Wholesale curve: EY Q4 Wholesale power curve central

Scenario 5: PaP £107.3/MWh, Discount rate: 6%, tenor 12 years
Scenario 5a: PaP £97.3/MWh, Discount rate: 6%, tenor 20 years
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

Scenario 6: PaP £110/MWh, Discount rate: 6%, tenor 20 years, PPA start date Q3 2024
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

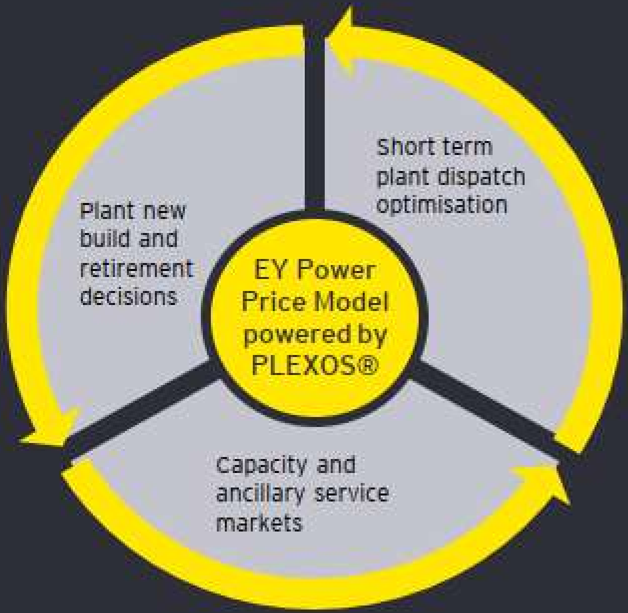
Scenario 7: PaP £110/MWh, Discount rate: 6%, tenor 20 years. PPA start date Q4 2024
Wholesale curve: EY Q4 Solar capture curves (High, Central, Low)

EY

EY's power market modelling

Model inputs:

- **Macroeconomic Drivers:** Oil, gas, coal prices, gross domestic product (GDP)
- **Environmental Drivers:** Emissions (CO_2, SOx, NOx)
- **Energy Transition:** Net zero targets; wind/solar data
- **Demand forecasts:** Energy efficiency, electric vehicles (EVs), heating
- **Policy Drivers:** Capacity market (CM)/ renewable subsidies, interconnector policy etc
- **Commercial drivers:** Hurdle rates, technology costs



Model outputs:

- **Day ahead power prices:** Baseload and peak prices
- **Capture rates:** Capture prices for solar and wind
- **Changing energy mix:** Plant retirements and new build
- **Stochastic analysis:** Sensitivities to climate risk
- **Dispatch decisions:** Load factors/dispatch optimisation
- **Policy impact assessment:** Societal NPV of policy changes

Low, central and high power price scenarios: Key considerations

- Three scenarios are modelled to reflect a range of potential risks to the power market:

Scenario	Narrative	Commodity Prices	Capacity	Demand
High	Short term geo-politics driven stress, higher carbon power system into the long term	Supply squeeze in commodity markets, and gas demand remaining long term for CCS	Higher carbon system, more focus on CCS and Hydrogen	As in Central Scenario
Central	Current expectations, moderate short term stress, and targets broadly met for renewable deployment	Market forwards and independent forecast for commodities and carbon	Broadly aligned to FES CT+ST scenarios	Scale of demand based on CCC Balanced Pathway – with additional demand from Hydrogen
Low	More rapid decarbonization of power system, focus intermittent renewables	Lower commodity and carbon prices driven by renewable roll out	Targets exceeded for renewable build, efficiency improvements for many	As in Central Scenario

CCS: Carbon Capture & Storage
FES: National Grid Future Energy Scenarios

Solar capture prices & modelled PPA prices with 6% discount rate

(including £5/MWh REGO pricing)

Nominal price £/MWh	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
NOMINAL BAU PaP solar capture electricity cost inc. REGOs)	**192**	**155**	**141**	**129**	**111**	**102**	**99**	**102**	**104**	**108**	**105**	**101**	**100**
Scenario 1 PaP PPA cost per MWh including REGOs (£100/MWh 2023 real terms, CPI linked)	**107**	**109**	**110**	**111**	**113**	**115**	**117**	**120**	**122**	**125**	**127**	**130**	**132**
Scenario 2 PaP PPA cost per MWh including REGOs (£105/MWh 2023 real terms, CPI linked)	**112**	**115**	**116**	**117**	**119**	**121**	**123**	**126**	**128**	**131**	**133**	**136**	**139**
Scenario 3 PaP PPA cost per MWh including REGOs (£110/MWh 2023 real terms, CPI linked)	**118**	**120**	**121**	**123**	**125**	**127**	**129**	**132**	**134**	**137**	**140**	**143**	**145**
Scenario 4 Baseload PPA cost per MWh including REGOs and balancing and shaping fees (£120/MWh 2023 real terms, CPI linked)	**128**	**131**	**133**	**134**	**136**	**138**	**141**	**144**	**147**	**149**	**152**	**155**	**128**

Source: EY Economic Advisory

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