Department of Energy & Climate Change

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The Backstop PPA Proposal

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Status of this document

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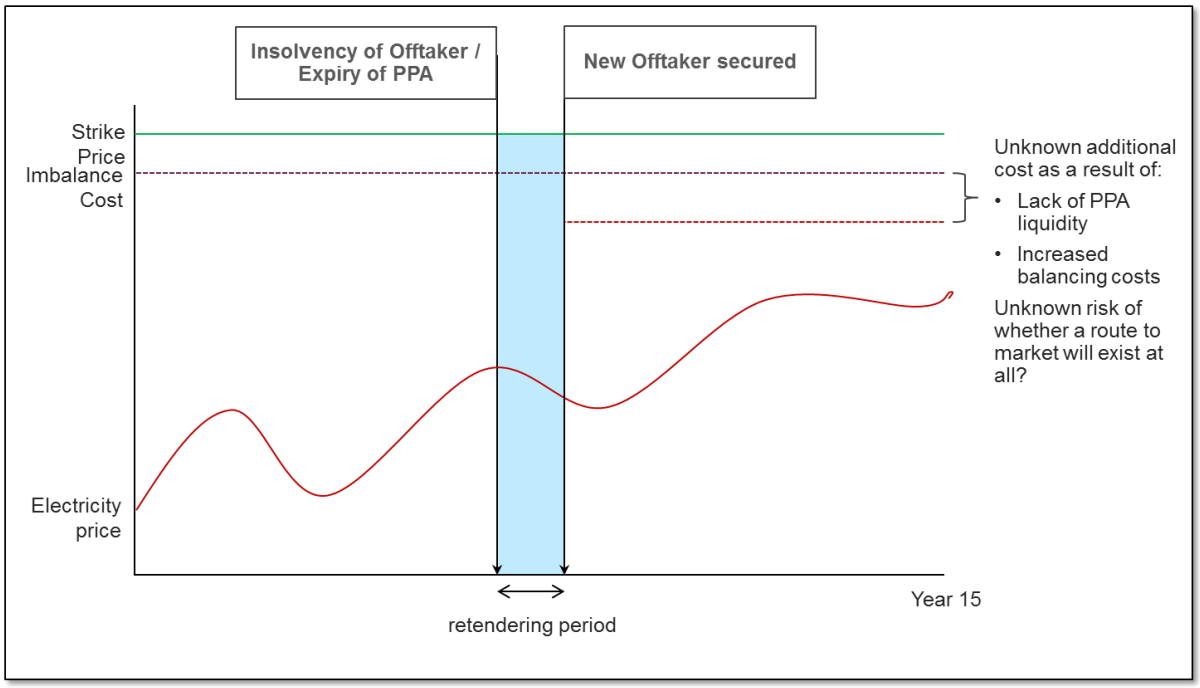
1. OVERVIEW OF THE BACKSTOP PPA PROPOSAL

1.1. The "Route-to-Market Issue"

A policy objective for Government is to ensure that independent renewable energy project developers have a financeable "route-to-market" under the proposed Contract for Differences ("**CfD**") Feed in Tariff regime. Based on the evidence from industry gathered through DECC's Call for Evidence published in May 2012[1], one perceived issue is that owing to uncertainty around long term liquidity and imbalance exposure, lenders will continue to require generators to have long-term Power Purchase Agreements (PPAs) matching / exceeding debt tenor that guarantees offtake and fixes (or caps) imbalance costs[2]. This dynamic is set out in Figure 1 below.

Figure 1: Unbankable "merchant" imbalance risk on offtaker insolvency / PPA expiry



This dynamic is likely to restrict the available bankable counterparties to a small number of offtakers with strong credit ratings and an enduring presence in the energy market raising the following key questions / concerns:

- **PPA Market Capacity** – To what extent will this limited pool of offtakers be willing and able to offer bankable long term PPAs to the volumes of additional generation anticipated under EMR?

[1] DECC, A call for evidence on barriers to securing long-term contracts for independent renewable generation investment, May 2012

[2] In February 2013, DECC commissioned Baringa Partners to assesses the issues facing independent renewable generators in securing commercially viable Power Purchase Agreements ("PPAs") and how that might evolve in the future with a move to Contract for Differences ("CfDs"). This document should be read in conjunction with our report on these issues which is being published in parallel with this document and is titled "Power Purchase Agreements for independent renewable generators – an assessment of existing and future market liquidity, July 2013".

- **Imbalance pricing** – Is it cost effective for consumers to require offtakers to fix (or cap) imbalance costs for a project over 15 years?

- **Extent of competition** - With such a small number of offtakers able to offer bankable PPAs, will there be sufficiently competitive conditions in the PPA market to drive cost reflective pricing?

1.2. The Backstop PPA Proposal

Whilst a range of solutions could be envisaged to the issues identified, this proposal (the "**Backstop PPA Proposal**") uses an offtaker of last resort to provide a backstop route-to-market and a minimum revenue stream in the event that, after the start of the CfD, a generator cannot secure a PPA on terms that allows it to meet its debt service obligations (either because of high imbalance costs or a lack of competition in the PPA market). Table 1 below sets out this proposal in more detail.

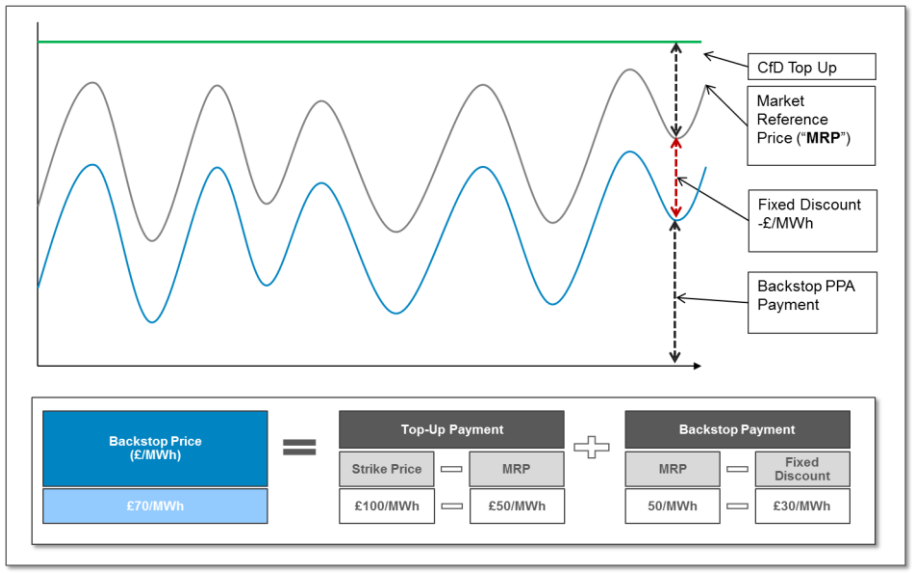
Table 1: A summary of the proposal

Stage	Explanation
Obligation on suppliers to offer a Backstop PPA	▶ Place an obligation on certain suppliers (each, a "**Backstop Offtaker**") to offer to enter into (or bid to provide) a power purchase agreement (a "**Backstop PPA**") on specified terms with any eligible generator under certain circumstances (for example, when directed to do so by Ofgem or a Competent Authority[3]). ▶ Any entity offering Backstop PPAs will have to have a minimum credit rating or to the extent that it does not, will be required to provide a Parent Company Guarantee (PCG) or Letter of Credit (LC) in support of its obligations under the Backstop PPA from an institution that does.
Backstop PPA pricing aimed at protecting debt but not equity	▶ The Backstop PPA would provide a guaranteed route-to-market for each eligible generator at a price set at a fixed (£/MWh[4]) discount (the "**Fixed Discount**") to the Market Reference Price ("**MRP**") in the relevant generator's CfD. ▶ This Fixed Discount would be set at a level significantly greater than the discounts expected to materialise in the market over the course of the generator's CfD. The Backstop PPA would effectively provide a 'floor price' for a generator, capping the risk that a generator would be exposed to if it has to re-contract for PPAs after the start of its CfD (for example, following expiry of an initial short-term PPA, or in the event of a PPA provider defaulting).

[3] Administration of the Backstop PPA arrangements would not necessarily need to be carried out by Ofgem. As such, all references to Ofgem throughout this paper should be taken to include any other "competent authority".

[4] We note that, as highlighted in Section 1.6.3 below, pricing the Backstop PPA by reference to a fixed £/MWh discount does potentially create market distortions where this sort of pricing is unavailable in the open market (i.e. PPA pricing continues to be based upon a percentage discount to the wholesale electricity price). The magnitude of this potential distortion, especially during periods of high electricity prices, will need to be properly assessed against the need to provide the extent of revenue certainty provided by a fixed £/MWh discount.

Figure 2: Pricing structure under the Backstop PPA



- This would provide a *minimum* level of revenue for the generator (expected revenues would likely be significantly higher through the normal PPA market), which could be used to give comfort to lenders if generators choose to contract PPAs on a shorter term basis or with less credit-worthy counterparties.
- As such, this option will be designed to be unattractive for equity under normal market conditions and should therefore only be triggered by the project as a last resort where it cannot secure a PPA or alternative route to market that leaves the project in a better position than under the backstop arrangements.

Any profit or loss accruing to Backstop Offtakers "levelised" across all suppliers

- Quarterly, semi-annually or annually, Ofgem would then carry out a "levelisation" process in which the aggregate profit or loss accruing across all Backstop Offtakers who are party to Backstop PPAs is spread equally across all suppliers[5]. Levelisation would therefore in effect socialise any profit or loss.
- The details of the levelisation process depend in part on the allocation mechanism (see Section 2.5 below).
  - ✓ If allocation is undertaken through a competitive process, levelisation would simply apply to the sums 'bid' by successful Backstop PPA providers.
  - ✓ If allocation is undertaken through an administrative process, the calculation of a supplier's payment or liability into the levelisation "pot" will be based off an assessment by Ofgem or some other

[5] Note, this is likely to require additional powers in the Energy Bill.

	competent authority of the estimated profit or loss accruing to the Backstop Offtaker under the Backstop PPAs

1.3. Key design questions

The key design questions arising out of the summary provided in Section 1.2 above centre around there broad areas – namely:

- What are the terms of the Backstop PPA (i.e. level of the Fixed Discount and allocation of risk)?
- What is the nature of a generator's entitlement to a Backstop PPA (i.e. legal status of the right, eligibility criteria for access to the protection)?
- What is the nature of a supplier's obligation to provide a Backstop PPA (i.e. allocation of Backstop PPAs amongst suppliers and the mechanism of levelisation) and should other market participants be entitled to voluntarily provide Backstop PPAs?

Table 2 below sets out the key design questions and principles that arise in each of these three areas which will need to be explored more fully in the next phase of development. We note, however, that this paper is primarily concerned with the institutional / counterparty framework and therefore explores only the third area (i.e. the nature of the obligation) in detail in Section 2 below.

Table 2: Key design questions and issues

Component	Key questions / issues
Terms of the Backstop PPA	
How should the Fixed Discount be calibrated?	▶ The Fixed Discount will need to be calibrated at a level that is significantly greater than discounts expected to be available in the market, while also providing sufficient revenues (between CfD top-up payments and energy sales under the Backstop PPA) to ensure that debt is comfortable that it will get fully repaid (assuming normal operational performance). ▶ There are different approaches to calibrating the Fixed Discount. One approach could be based on aiming to provide a certain level of revenue buffer (i.e. debt service cover ratio) to projects with typical levels of gearing to ensure that lenders can be comfortable that: ✓ a generator under the backstop arrangements can service debt principle and interest payments at all times, even in years of poor wind or operational performance; and ✓ equity investors are still sufficiently incentivised to prevent them walking away from the project. ▶ Once the level of this minimum cover ratio has been determined, actually setting this Fixed Discount will then require DECC to model a typical generator for each technology type (making assumptions around capacity

	factor, wind variability, capex costs, typical leverage levels and debt pricing), and set the discount at the level that ensures that in each six monthly period of the loan repayment period the Debt Service Cover Ratio ("**DSCR**") or Loan Life Cover Ratio ("**LLCR**") exceeds the relevant target ratio. ▶ An alternative approach would be to set the Fixed Discount at a level that would protect the generator against extreme scenarios for imbalance risk, which is a key factor that could lead a generator to turn to the Backstop Offtaker. This would require DECC to model different scenarios for imbalance risk, and determine which scenario is an appropriate scenario to provide protection against.
What should be an appropriate risk allocation under the Backstop PPA?	▶ A key driver will be ensuring that the allocation of risk under the Backstop PPA will give banks comfort that the generator will always receive a minimum revenue. ▶ Key requirements here will be that the Backstop PPA ensures: ✓ that the generator is not exposed to imbalance risk over and above the obligation to forecast availability; and ✓ sufficient credit support to protect the generator from the insolvency of the Backstop Offtaker. ▶ However, a challenge will be balancing the demands of banks and the need to ensure that the allocation of risk under the Backstop PPA aligns as closely as possible with that available in the open market. This is to avoid distorting the PPA market by providing protections under the backstop arrangements that are unavailable in the open market.
Nature of the generator's right to a Backstop PPA	
Where is the generator's right to a Backstop PPA enshrined?	▶ What should be the nature of a generator's right to a Backstop PPA and in what instrument should it be enshrined? For example, the right could be: ✓ set out in statute; ✓ enshrined in the CfD; or ✓ included in the generator's licence. ▶ A key tension in this regard may be between the increased confidence generators and lenders might take from a contractual right to a Backstop PPA, and the need to ensure that the CfD counterparty is not under an obligation to provide physical offtake (which it will not be in a position to do from a legal and operational perspective) or exposed to liabilities that it cannot manage. It is also questionable whether a contractual right to a Backstop PPA within a CfD would in fact provide greater confidence to generators or lenders, given the lack of involvement of the CfD

	counterparty in the backstop arrangements and the 'pay-when-paid' nature of CfDs. ▶ It is worth noting that generator's rights under other schemes, such as the small scale FIT, are set out in regulations alone, and have proved to be bankable, and that change in law clauses within the CfD would be likely to capture a statutory right to a Backstop PPA.
Are there any fetters on eligibility?	▶ Should the right to a Backstop PPA be unfettered – i.e. a generator can opt into the arrangement at any time? ▶ Or should there be some eligibility requirements? For example, to access a Backstop PPA a generator could be required to prove: ✓ that they have contracted for a minimum tenor at the outset; and/or ✓ that they cannot get a PPA in the market at a discount to the MRP that is less than the Fixed Discount available under the Backstop PPA; and /or ✓ that their previous PPA had not been terminated due to contractual breach by the generator. ▶ Another key question is what obligation should be placed (if any) on the generators to re-test the open market once it is in the backstop arrangements?
For how long will a Backstop PPA be available to <u>new</u> CfD plant?	▶ Should the option of a Backstop PPA be a temporary solution while the PPA market develops and Ofgem's liquidity reforms take effect or should it be an enduring solution? ▶ At what point and under what circumstances would the backstop be removed for future plant? ▶ How might the Backstop PPA evolve in a world of competitive CfD allocation?
Nature of the supplier's obligation to enter into a Backstop PPA	
Who should be Backstop Offtakers?	▶ What size of supply business should be obligated to offer Backstop PPAs? ▶ Should smaller suppliers or other market participants (e.g. aggregators / other PPA providers that are not suppliers) be able to 'opt in' to be voluntary Backstop Offtakers (subject to meeting minimum credit requirements)?
How are generators allocated to Backstop	▶ Should generators be able to choose a Backstop Offtaker who must be obliged to accept them, or should there be an allocation process managed by Ofgem to spread volumes across all suppliers?

Offtakers?	▶ Should there be a form of 'tendering' to be a Backstop Offtaker, e.g. on the basis of bid administration or imbalance fees? ▶ If generators do not have control over the identity of the Backstop Offtaker, how can lenders be given sufficient comfort that the project will not be impacted by an insolvency event involving a Backstop Offtaker? (for example by minimum credit rating or collateral obligations in the Backstop PPA itself.)
Who will be subject to levelisation and how will this work?	▶ Over what group of suppliers should the profit or loss be socialised (i.e. all suppliers or above a de minimus threshold measured by number of customers or volume)? ▶ How will the value and costs accruing to Backstop Offtakers under Backstop PPA be assessed for the purposes of levelising profits or losses across the all suppliers subject to levelisation? ▶ How will the levelisation process ensure that Backstop Offtakers are still sufficiently incentivised to minimise imbalance cost?

1.4. Anticipated benefits of the Backstop PPA Proposal

This section looks at what the anticipated benefits might be for consumers if the Backstop PPA Proposal, appropriately designed, was implemented.

1.4.1. Improved PPA market competition

One of the most significant barriers experienced by new entrants looking to offer long term PPAs in the GB market is building confidence amongst the lending community both in terms of their long term credibility and creditworthiness. As a starting point lenders currently require a counterparty offering long-term PPAs (or a parent providing a guarantee) to have a minimum credit rating of BBB- or above. In addition, lenders will also consider capitalization, long term experience in energy markets, strategic position and credibility. This has the effect of creating a natural preference for large VIU offtakers on the basis that not only do they have large balance sheets and a relatively stable supply base, they are also seen as being strategically invested in the GB market in a way that makes it very difficult for them to walk away from long term contracts and liabilities.

In this way, by providing a 'floor price' which caps long-term imbalance and liquidity risk, the Backstop PPA should make lenders comfortable with equity choosing to contract:

- with less "creditworthy" new entrant aggregators or smaller suppliers; and/or
- for shorter periods to get more competitive pricing on the cost of balancing its output; and/or
- on a variable imbalance cost basis with an option to exit if imbalance costs are such that the price paid is lower than the generator would receive under a Backstop PPA.

In essence, the Backstop PPA Proposal would therefore look to create a softer relationship between debt tenor and PPA tenor, leaving equity with greater flexibility as to the contracting structure and

counterparty which best suits its appetite for risk (*and not its lenders). This should in turn remove the principle barrier to entry for new entrant offtakers (i.e. proving the "creditworthiness" described above), thereby deepening the liquidity of the PPA market in GB over time. This should drive savings for consumers by driving more competitive pricing of route-to-market services for generators funded under CfDs and could support government and Ofgem's wider objectives to increase wholesale market liquidity.

1.4.2. Spreading / dissipating energy risk

In the present market, the PPA market is constrained by the balance sheet capacities of a small number of bankable offtakers willing and able to underwrite key market risks under a 15 year offtake agreement. With a move to a CfD, generators will no longer require a minimum price floor in a PPA, which significantly changes the level of risk that will need to be assumed by an offtaker under a PPA. This in turn might improve the balance sheet treatment of these contracts by credit rating agencies and accounting firms, thereby releasing balance sheet capacity of incumbents to offer more long term PPAs.

However, the approach of credit rating agencies is still yet to be clarified. We understand that a key determinant will be the perceived magnitude of the risk being assumed by a PPA provider under a long term 15 year route-to-market arrangement – in particular:

- Is a floating payment obligation actually a fixed payment obligation if there is no underlying liquidity in the wholesale electricity market?
- What is the extent of the imbalance risk and what is the size of the discount on the electricity price the offtaker is receiving in return (i.e. level of imbalance risk / return)[6]?

In this way, a key benefit of the Backstop PPA Proposal is that it should break the reliance on a number of balance sheet constrained VIUs by bringing more liquidity into the PPA market through allowing banks to finance against "less creditworthy offtakers" as well as allowing equity to price long term imbalance risk without affecting bankability. This could potentially dissipate the allocation of residual energy risk under the CfD framework and therefore increase the volumes of finance that can be raised for investment in GB renewables.

1.4.3. Appropriate allocation of imbalance risk reducing system costs

A number of the proposed solutions to the route-to-market problem for independents have focused on entirely removing imbalance risk for generators. One of the key design features of the Backstop PPA Proposal is that, while it caps long-term imbalance risk, equity is still exposed to imbalance costs up to this point. As such, the Backstop PPA Proposal retains the economic incentives on generators to locate, design and operate their projects in such a way that reduces the likely imbalance cost for any offtaker contracting with that plant.

As to whether this is appropriate essentially boils down to whether there are any behaviors of generators that the regulatory structure should be incentivizing to make sure that the generators are "good" or "bad" balancers. This is a question that Mott MacDonald have looked at more closely at for DECC, however potential differentiators in this regard could include:

[6] We note that formal advice on this issue is required.

- Locating your plant in a location where the resource is predictable (i.e. wind speeds, solar radiance) and more certain from a forecasting perspective;
- Locating your plant in a location which is uncorrelated with other generators to leverage the "diversity" benefits of reducing aggregate forecast error when considered over a portfolio of uncorrelated intermittent generators;
- Designing a configuration and purchasing plant and control systems that are more controllable and reliable; and
- Providing more accurate forecasting of asset availability and investing in communications equipment, infrastructure and information flows that enable the offtaker to better forecast the Generator's output.

The benefits to consumers over the long term of retaining these incentives on equity investors are hard to quantify, as they necessarily involve assumptions around then extent to which the generator (as opposed to just the offtaker) can materially affect its own imbalance costs. However it is worth noting that in other European markets, like Germany, where historically generators have been largely insulated from imbalance risk through the Fixed FIT and central dispatch of all renewables by the TSOs, there has been an increasing move to encourage generators to more actively participate in the marketing of their output in an effort to reduce growing system costs. This is being incentivised through a new "Direct Marketing" regime which effectively provides generators with a premium on their subsidy level if they opt to directly trade their output in the wholesale electricity market and manage the resultant imbalance risk. This has driven rapid growth in "direct marketers" (who offer a route-to-market service to generators in return for a slice of the additional revenues) along with interesting commercial and technical innovations, like 'virtual power plants' and direct control of wind farm output by offtakers to reduce imbalance costs.

1.4.4. More effective CfD competition

By increasing the diversity of PPA counterparties and contracting strategies, the Backstop PPA Proposal should allow independents and VIUs developing projects to compete on a level playing field when CfD allocation transitions to competitive auctions. Without greater diversity in the PPA market, there is the risk that an independent generator would be competing for a CfD with the project development arms of the very same utilities that will need to provide that independent project with long term offtake. This could make it difficult for independents to compete meaningfully. By providing the Backstop PPA and reducing reliance on a smaller number of VIUs, independents should be able to provide more meaningful competition by allowing them to bid with contracting structures that do not necessarily have to involve one of the large VIUs.

1.4.5. Regulatory consistency and simplicity of implementation

This Backstop PPA Proposal has the distinct advantage of using existing market participants to carry out a role that they perform in the market today. Moreover, it leaves much of the existing market arrangements largely untouched and avoids placing obligations on market participants that are not consistent with their existing role in the regulatory arrangements. Table 3 below sets out these benefits out in more detail.

Table 3: Minimising implementation costs and risks

Component	Explanation
Minimising set up costs	▶ The Backstop PPA Proposal uses suppliers (and potentially other market participants, e.g. aggregators) to provide a guaranteed route-to-market, as they are active in the PPA market today and therefore already have the infrastructure and expertise to provide this service. ▶ This should avoid the need to create a new body, or give other entities (i.e. National Grid, the CfD counterparty) the relevant powers, capacity, trading infrastructure and resources to fulfill a role that is (in a well-functioning market) very unlikely to be used.
Minimal disruption to EMR	▶ The Backstop PPA Proposal leaves the design of the CfD untouched.[7] This should reduce the need for further complexity in the drafting of this instrument that could threaten the deliverability of EMR within the required time scales. ▶ Moreover, this proposal does not involve the CfD counterparty offering Backstop PPAs which would create issues both in terms of: ✓ Capacity – the CfD counterparty is designed to offer a derivative contract and manage payments, it is not designed to offer physical offtake; ✓ Credit – financier's credit analysis of the CfD counterparty will rest on confidence in its ability to match the levy payments from suppliers with its anticipated payments under CfD contracts that it has signed with generators. Any proposal that changes the reference price or channels uncertain imbalance risk through the CFD counterparty could "pollute" this credit analysis thereby threatening the viability of EMR as a whole. The Backstop PPA Proposal avoids this by using suppliers and a separate levelisation process to fund payments. ✓ Accounting treatment – the accounting status of the CfD counterparty is dependent on it performing a limited role in terms of collecting payments from suppliers and passing them on to generators (or vice versa). Taking on trading activities could change this accounting treatment, and jeopardize the body's not-for-profit status.

1.5. An assessment of the key risks for consumers

This section looks at what the anticipated risks for consumers if the Backstop PPA Proposal was implemented – both in terms of design risks and implementation risks.

[7] Subject to the discussions in respect of whether the right to the Backstop PPA is contained – see discussion in Table 2 of Section 1.4

1.5.1. Imbalance / offtake risk transfer to consumers

Risk

The Backstop PPA Proposal involves a transfer of imbalance and liquidity risk away from generators and onto consumers. More specifically, consumers are underwriting the risk that imbalance / market access costs rise to such an extent that PPA discounts against the market reference price (MRP) in the open market exceed the Fixed Discount under the Backstop PPA.

Materiality / Mitigants

The extent of this risk transfer will largely depend on two elements of the design of the proposal that have yet to be determined, namely: (a) the level of protection provided by the Backstop PPA (i.e. the level of the Fixed Discount); and (b) the eligibility criteria (if any) for entry into the mechanism in the first place. Indeed, once the these key design components have been determined, a key aspect of any impact assessment will be to look at the probability of imbalance cost rising to such a level that route-to-market services cannot be provided by offtakers at a cost that is less than the level of the Fixed Discount under the Backstop PPA.

In advance of this analysis, however, it is worth noting that while the Backstop PPA Proposal would (if invoked) transfer imbalance risk to consumers, it is arguable that in most cases consumers would probably have shouldered an increased imbalance cost in any event (i.e. with or without the Backstop PPA Proposal). This is rationalised as follows:

- If we assume that in the absence of the Backstop PPA, a large proportion of new CfD plant would have to contract out long term imbalance costs under a 15 year PPA with a big six supplier (the cost of which would have been factored into strike prices);
- If imbalance costs in the long term turn out to be higher than the level originally priced into the discount in the PPA, the supplier would be out of the money.
- However, notwithstanding that the supplier has theoretically absorbed this risk; suppliers would seek, depending on the extent of retail competition, to pass through these costs to consumers through retail electricity prices.
- As such, consumers are likely, over the long term, to be paying for that increased imbalance cost whether it is formally underwritten by a Backstop PPA (and socialised through levelisation) or not.
- The only exception to this is if:
  - ✓ an increase in imbalance cost causes a big supplier who has underwritten imbalance cost for 15 years to go insolvent or to repudiate the contract (i.e. they can't pass it on to consumers as the retail market is too competitive);
  - ✓ in which case the project would be exposed to that increased cost (as it would have to re-contract at a higher discount) and equity and lenders would have to take a haircut on returns which they could not pass onto consumers;

However, the wider impact on consumers of a big supplier going bust or walking away from contractual commitments could be very considerable, and could outweigh / swamp the beneficial impact of the haircut on returns to generation projects taken by equity and lenders.

1.5.2. Incentivising excessive risk taking by equity

Risk

Equity takes excessive risk in their contracting strategy that increases the likelihood of the backstop arrangements being needed and therefore increases the potential risk to consumers.

Materiality / mitigants

While this is a key concern, it should be noted at the outset that the underlying rationale behind the Backstop PPA Proposal is to allow equity more flexibility in terms of the level of exposure that it takes to long term imbalance risk by protecting lenders from the consequences of contracting with less credit worthy counterparties or for shorter tenors. As such, allowing equity to price greater imbalance risk should be viewed as a positive outcome if the objectives of the proposals (i.e. increased PPA competition) are to be realised.

The key qualification here is to ensure that the level of protection provided by the Backstop PPA is sufficiently unattractive to equity that it is appropriately incentivised to not take excessive risk without facing the full consequences of any down side (i.e. it is taking risk on its own account not the account of consumers). It should be noted, however, that discussions with industry indicate that lenders are unlikely to give equity a completely free hand on contracting strategy notwithstanding the availability of the Backstop PPA. Indeed, the larger the Fixed Discount under the Backstop PPA (i.e. the lower the cash buffer left in the project to pay debt), the more likely lenders are to provide an effective check on equities' inclination to maximise returns (rather than risk mitigation) by exercising greater control over the nature of the offtake arrangements through the covenants package in the loan documentation.

Indeed, a similar dynamic will come into play at the other end of the spectrum where the Fixed Discount is set at a level that leaves a greater cash buffer in the project. This might be driven by the need to give lenders greater comfort that: (a) the project will withstand poor wind / resource years or periods of poor operational performance; and (b) in the event that the project enters the backstop arrangements, equity is still sufficiently incentivised to keep operating the plant to maximise output (rather than just walking away).

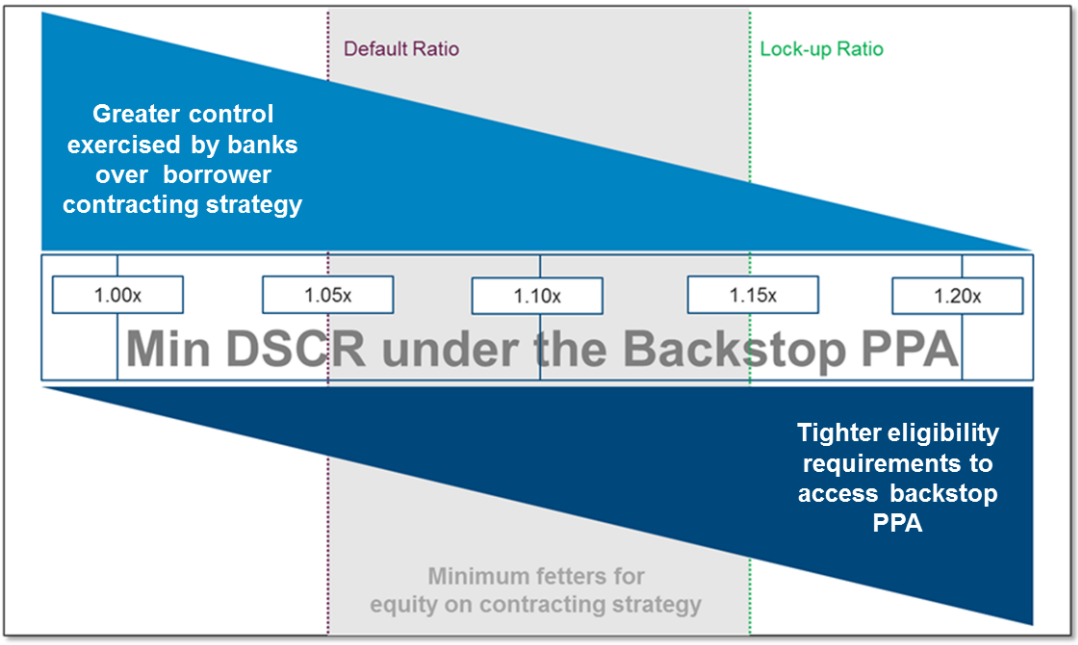
However, in this scenario, DECC will probably need to exercise more influence over the contracting strategies of projects by insisting on minimum tenors for original PPAs and sufficient evidence at the time a generator is looking to enter the backstop arrangements that it cannot secure a viable PPA in the open market (i.e. fettering the right to the Backstop PPA with eligibility requirements).

In view of these two dynamics, the key challenge in setting the level of the Fixed Discount will therefore be choosing a level that:

- reduces the risk that equity is not exposed to the full downside of its own actions thereby requiring additional fetters to be placed on the circumstances in which it can avail itself of the protections of the backstop arrangements;
- while at the same time avoiding such an aggressive Fixed Discount that lenders essentially demand the same contracting strategy as today thereby neutralising the key objective of the proposal – increasing liquidity in the PPA market.

This tension is set out in Figure 3 below.

Figure 3: Relationship between level of protection and fetters on equity[8]



1.5.3. Distorting incentives on generators to contract in the PPA market

Risk

This proposal could distort the incentives on generators to contract in the PPA market by making it more attractive to enter the backstop arrangements.

Materiality / Mitigants

The circumstances in which a generator might voluntarily opt into and/or remain within the backstop arrangements, notwithstanding the fact that it can achieve greater value capture in the open market, are where the risk allocation under the Backstop PPA provides a greater level of protection in relation to specific risks. For example, more robust credit support or greater protection from imbalance risk / negative price risk. Another example is where the open market continues to, at least partially, price imbalance by reference to a fixed *percentage* discount on the wholesale electricity price whereas the Backstop PPA (as set out in this proposal) is priced based on a fixed *£/MWh* discount. In this way, the Backstop PPA might potentially be offering a level of revenue certainty (and protection from basis risk) that is otherwise unavailable in the market.

As such, one of the key challenges facing the design of the backstop arrangements is to ensure that the terms and conditions of the Backstop PPA that are available to generators reflect as much as possible the outer limit (in term of risk allocation) of what constitutes a bankable PPA in the open market.

However, one potential problem is how the arrangements deal with a change in risk allocation over time. For example, if on Year 1 a generator finances his project against a Backstop PPA that protects

[8] Ratio levels are indicative only and for the purposes of illustration

it from negative price risk, but on year 10 the PPA market moves so this protection is no longer available:

- Should the generator still be able to avail itself of the Backstop PPA on the original terms (i.e. the risk allocation in the Backstop PPA is grandfathered from the date of FID); or
- Should the generator be exposed to changes in the PPA market in terms of the market standard approach to the allocation of certain risks?

The latter is likely to be viewed highly unfavourably by financiers as they will want to have visibility from day one what their likely revenues / risk allocation will be under the backstop arrangements. Conversely, the former risks a potential distortion in the PPA market such that a generator might prefer the backstop arrangements as it insulates it from key risks that is no longer available in the open market. If generators will not take risk on a shift in PPA terms over time, then the one way of protecting against this risk may be to set more stringent eligibility criteria that requires the generator to actually prove that the pricing received in the PPA market genuinely exceeds the level of the Fixed Discount (even with the shift in terms).

1.5.4. Distorting incentives on suppliers to offer PPAs

Risk

Using suppliers as Backstop Offtakers could potentially distort the availability of PPAs by incentivising them to withdraw liquidity from the PPA market to pick up power "on the cheap" under the backstop arrangements.

Materiality / Mitigants

First and foremost, if the backstop arrangements have the impact that they are intended to have (i.e. increase competition in the PPA market), then the likelihood of this risk materialising should be relatively low. Indeed, if this did occur then by definition the intervention would have failed in its primary objective (however, we do note that greater competition in the PPA market would be expected to take time to develop).

However, even in a world of limited competition in the PPA market, allowing non-suppliers (i.e. aggregators and other PPA providers who are not suppliers) to offer backstop services should materially mitigate this particular risk. Moreover, the levelisation process should provide incentives on suppliers not to pursue this strategy given that:

- Firstly, under the backstop arrangements, any profit the supplier as Backstop Offtaker makes by providing a route-to-market at a cost lower than the Fixed Discount under the Backstop PPA will be smeared across all suppliers. As such, there will always be significant incentives on any given supplier to offer a PPA in the open market at a discount marginally better than the Fixed Discount under the backstop arrangements and retain all the profit between that discount and the real cost of imbalance / trading.
- Secondly, depending on the allocation mechanism, the levelisation process will likely be viewed by suppliers as very unattractive as it could expose them to not insignificant regulatory risk relating to any difference between their actual profit and loss and their deemed profit or loss as determined by Ofgem (if a regulated approach to allocation was adopted, see Section 2.5).

1.5.5. Impact on suppliers capacity to enter into PPAs

Risk

The obligation to offer Backstop PPAs will reduce the capacity of a supplier to enter into PPAs in the open market.

Materiality / Mitigants

The materiality of this risk will very much depend on the balance sheet treatment by the credit rating agencies of the backstop arrangements. It is arguable that the obligation to offer Backstop PPAs might not have a material impact on the balance sheets of existing suppliers and their capacity to enter into PPAs given that:

- firstly, the obligation to offer Backstop PPAs is a contingent obligation with a well-functioning market, a low probability of occurring; and
- secondly, for this risk to materialise, credit rating agencies would have to view an obligation to enter into a Backstop PPA as a fixed liability that is imputed onto the supplier's balance sheet. However levelisation should socialise any profit or loss across all suppliers and therefore in of its self is not a contractual obligation but rather more akin to the CfD levy.

Having said that, a Backstop PPA would nevertheless give rise to a liability, the treatment of which by both accounting firms and credit rating agencies will need to be explored more fully, with formal advice sought by DECC on the accounting treatment and business impacts of the obligation on suppliers to enter into Backstop PPAs (combined with periodic levelisation). We do note, however, that the extent of this impact might be mitigated by reducing the tenor of each Backstop PPA (without affect the generators *right* to a Backstop PPA for the remaining term of its CfD*)*. For example, in a scenario where Backstop PPAs are periodically retendered after a period of time (see Section 2.5.2 below), this could limit the tenor of any particular Backstop PPA thereby reducing the extent of any consolidated liabilities that may be imputed onto the balance sheet of the Backstop PPA provider.

1.5.6. Distorting capital structures

Risk

Setting the Fixed Discount under the Backstop PPA will increase the debt capacity of projects that would, in the absence of this mechanism, have achieved lower gearing.

Materiality / Mitigants

A core objective of the Backstop PPA proposal is to allow lenders to lend against contracting structures (i.e. tenor & counterparty) that, without the availability of the Backstop PPA, would not have been bankable. However, different contracting structures will come with different levels of risk, and therefore have an impact on projects' gearing levels.

The impact of the Backstop PPA mechanism on gearing will depend on a number of variables, in particular:

- the difference between the Fixed Discount and the discount on long-term PPAs in the market;

- the difference between the discounts on long- and short-term PPAs in the market; and
- the weighting that lenders assign to revenues 'above the line' (i.e. above the level of revenues from the Backstop PPA).

In general, the closer the Fixed Discount is to the level of long-term PPA discounts in the market, the greater the risk of projects obtaining higher gearing through a shorter-term contracting strategy. Therefore, key to mitigating this risk will be setting the Fixed Discount at an appropriate level in relation to discounts available in the market. We note that it is difficult at this stage to assess in any great detail the nature and materiality of this risk, as this will require a better understanding of the way in which banks decide to size debt against the Backstop PPA mechanism.

1.5.7. Moral hazard by providing a backstop for poorly performing generators

Risk

There is a potential moral hazard of providing protection to a generator that enters the Backstop PPA arrangements due to termination of their original PPA caused by its own default (e.g. poor operational performance, failure to notify suppliers of unscheduled outages etc.). Further, a generator that is in the backstop arrangements must be appropriately incentivised to properly cooperate with the backstop PPA provider to enable that offtaker to appropriately manage that generator's physical position.

Materiality / Mitigants

This is a material concern. However it could potentially be mitigated as follows:

- Firstly, an eligibility requirement might be placed on generators such that they could not enter the backstop arrangements if the reason that their original PPA was terminated was their own default.
- Secondly, in much the same way as a normal PPA sets out the requirements on generators (i.e. notification / scheduling of outages, forecast of capacity, information and SCADA integration), the Backstop PPA could mirror these provisions. In order to incentivise the generator to comply with these obligations to the standard of a reasonably prudent operator (as would expected under a standard PPA), the following protections could be built into the backstop arrangements,
  - ✓ The generator could be exposed to a penalty structure that exposes it to the consequences of its breach (i.e. in a scenario where the capacity forecasts provided were incorrect it could be penalised based upon the imbalance charges incurred by the offtaker in the period of the generator's default); and / or
  - ✓ Alternatively, in the event that the generator repeatedly breached the Backstop PPA, its existing Backstop PPA and its right to a new one could be terminated / removed entirely.

Removing the protection of the Backstop PPA entirely would be a draconian remedy and would need to be restricted to examples of repeated and material breach (with appropriate remedy periods) of provisions that are entirely within the control of the generator. Indeed care would be needed to ensure that any obligations and related incentives did not expose the generator to unbankable risks. The other consideration would be the extent to which Ofgem (or any other competent authority) would be in a position to determine whether a breach (either of the original PPA, that led to termination, or of the

Backstop PPA) had indeed occurred. This could put any administrator in a difficult position where breach was dependent on circumstances or commercial / legal interpretation.

2. NATURE OF THE SUPPLIER OBLIGATION

2.1. Introduction

As already set out in Table 1 above, the proposed counterparty model essentially involves placing an obligation on suppliers to enter into (or bid to enter into) Backstop PPAs with eligible generators, with any profit or loss that accrues to a supplier under the Backstop PPA shared, or "levelised", across other large suppliers. This Section 2 looks at the policy options and challenges around the structure and nature of this obligation on suppliers to provide and fund the backstop arrangements and how the bankability of this counterparty structure might be ensured. In view of this, Table 4 below sets out the key questions that will be addressed in this section.

Table 4: Counterparty questions

Principle	Question	Section
Ensuring bankability	▶ How can the counterparty model and Backstop PPA be structured to ensure bankability?	*Section 2.2*
Obligation / right to contract	▶ Who is obliged to offer Backstop PPAs and should other market participants be allowed to opt into the scheme?	*Section 2.3*
Obligation to fund	▶ Who should be obliged to fund the backstop arrangements through levelisation payments?	*Section 2.4*
Allocation of contracts	▶ How should Backstop PPAs be allocated amongst available Backstop Offtakers?	*Section 2.5*
Levelisation calculation	▶ How should levelisation payments be calculated in a way that accurately reflects the cost of providing the Backstop PPA but minimises costs to consumers?	

2.2. Ensuring bankability of the counterparty model

A key objective of the design of the counterparty model for the backstop arrangements must be to ensure that generators (and their lenders) are comfortable with the credit quality of the entity that will stand behind the Backstop PPA. As explained in Section 1.2 above (and developed further in the rest of this Section 2 below), the model proposed in this paper uses suppliers as offtakers of last resort by obliging them to contract with eligible generators[9]. If that offtaker of last resort is one of the large VIUs that provide bankable long term offtake in the PPA market today, then lenders are likely to be content with that credit exposure. However, as explained in Sections 2.3 to 2.5 below, it will be difficult to provide any guarantees that the Backstop PPA will be with any particular entity given the need to allocate these contracts in such a way does not overly burden any one supplier and ensures that the entity selected is the one capable of providing a route-to-market service at the lowest overall cost to consumers.

[9] As set out below, however, other market participants able to offer offtake services would also be able to participate in the backstop arrangements.

As such, in order to ensure the bankability of a counterparty model under which the generator and its lenders will not necessarily have control and certainty as to the identity of the entity with which it will contract, the following structural protections will need to be built in to ensure consistency of credit quality across Backstop PPAs and Offtakers:

- **Create an enduring right** – ensure that the Generator's right to Backstop PPA will endure any insolvency of the original Backstop Offtaker (or any scenario where the generator exits the backstop arrangements but then wishes to re-enter them at a later date);
- **Certain and seamless transition** – ensure that the transition arrangements in the event of the insolvency of the original Backstop Offtaker are as seamless as is possible and provide certainty as to the period which will be required for the generator to be able to re-contract with another Backstop Offtaker;
- **Robust credit support in the Backstop PPA** – require all Backstop Offtakers without a minimum credit rating to provide a PCG or LC with an institution that does, guaranteeing:
  - ✓ all amounts due but unpaid under the Backstop PPA at the time of the original Backstop Offtaker insolvency or Backstop PPA termination (e.g. non-payment, credit support failure); and
  - ✓ all losses incurred by the generator in the transitional period between the original Backstop Offtaker insolvency and the commencement of contract with a new Backstop offtaker (i.e. lost revenue, termination costs etc.).
- **Socialise cost of credit enhancement** - The additional cost of providing this minimum credit support would then be included in the levelisation process (or in the fee bid by a supplier in the tender process) and socialised across all suppliers.

This should provide more flexibility in the design of the Backstop PPA allocation framework described in Sections 2.3 to 2.5 below.

2.3. Obligation / right to contract

A key initial question is who should be required or have the right to enter into a Backstop PPA. One option would be to follow the approach taken with the small scale FiT and only place an *obligation* to offer a Backstop PPA on suppliers over a certain size ("**Mandatory Backstop Offtakers**"). For the small scale FiT this is set at a threshold of 250,000 customers.

For those suppliers that are below that level, or any other entity with the financial and technical competence (i.e. aggregators or financial institutions), there could be an option to *opt into* the mechanism (each, a "**Voluntary Backstop Offtaker**"). This could have the advantage of not focusing all Backstop PPAs on a smaller number of obligated suppliers and could provide greater value for money where the Backstop PPA service was tendered (see Section 2.5.2 below). As explained in Section 2.2 above, the bankability of this voluntary offtake model (i.e. where the identity (and therefore creditworthiness) of Backstop Offtakers is not defined in advance) will be contingent on ensuring consistent credit quality through the minimum credit support level specified in the Backstop PPA itself.

2.4. Obligation to fund

Section 2.3 above discussed which entities should be obliged (or have the right) to actually contract with generators under Backstop PPAs. In turn, a decision will need to be made as to who should be subject to the obligation to fund the backstop arrangements. As already explained in section 2.1 above, it is proposed that the backstop arrangement could be funded through a levelisation process which would in effect socialise any profit or loss that accrues under Backstop PPAs across suppliers.

Ideally, levelisation would include all suppliers to avoid discriminatory effects and distortions in the retail market. Indeed, this would certainly align with the approach taken under the CfD levy. However, there may be arguments that could be raised to exclude suppliers below a certain threshold on the following basis:

- Firstly, while smaller suppliers are subject to the CfD levy, it might be arguable that these payments are relatively forecastable given the obligation is linked to market prices. Levelisation exposure, on the other hand, would be most likely driven by greater than anticipated imbalance costs which are more uncertain and therefore more difficult to accommodate for a smaller supply businesses (both in terms of the cash flow impact and the ability to pass it on their customer base).

- Secondly, on the basis that smaller supply businesses do not participate in the PPA market given their balance sheets, it may be more appropriate to include only those suppliers who might potentially be contributing to the problem in PPA liquidity in the first place.

2.5. Allocation of contracts and levelisation calculation

This section looks to explore the different design choices with respect to two interrelated questions:

- Firstly, how Backstop PPAs can be allocated amongst available Backstop Offtakers?

- Secondly, how should each Backstop Offtaker's profit or loss under the Backstop PPAs to which it is a party be calculated and levelised across other suppliers subject to levelisation?

These two questions are dealt with together as there is a close link between the manner in which Backstop PPAs are allocated and levelisation payments calculated. Broadly speaking, there are two potential policy packages that are set out in Table 5 below and explored in detail in Sections 2.5.1 and 2.5.2 below.

Table 5: Design choices for Backstop PPA allocation and levelisation

Option	Allocation	Levelisation
Regulated	▶ Backstop PPAs are allocated amongst available Backstop Offtakers based on a set of pre-defined rules or principles (i.e. rule based / administered allocation).	▶ Levelisation payments would be calculated based upon an assessment / estimate by Ofgem of the profit or loss incurred by Backstop Offtakers party to Backstop PPAs.

Competitive	▶ Prospective Backstop Offtakers bid a £/MWh fee (the "**Management Fee**") required to purchase and manage a generator's output under the terms of the Backstop PPA.	▶ Levelisation payments would be calculated by sharing the total Management Fees charged by Backstop Offtakers across all suppliers subject to levelisation.

2.5.1. Regulated approach

A. Allocation

An administered mechanism would effectively allocate Backstop PPAs across available Backstop Offtakers based upon a clear set of rules or principles which would be overseen and administered by Ofgem (or some other administering body). Broadly speaking, this allocation process should, to the extent possible, ensure that generators entering the backstop arrangements are allocated across available Backstop Offtakers in such a way that balances the following four competing objectives:

- **Simplicity & speed** – is as simple and as seamless as possible;
- **Even distribution** – does not place an undue burden on any one available Backstop Offtaker (i.e. increase concentration risk);
- **Optimises system benefits** - to the extent possible, optimizes the system benefits of placing a Backstop PPA with an available Backstop Offtaker who is able to provide that service at the lowest overall cost to consumers - i.e. by realising more benefits (e.g. embedded benefits) or reducing its cost base (e.g. reduced imbalance with a better "fit" within a supplier's portfolio); and
- **Risk of challenge** - does not require Ofgem or another administering body to exercise undue discretion that could be open to challenge.

Some options in this regard are set out in Table 6 below.

Table 6: Rule based allocation

Option	Explanation	Appraisal
Generator choice	▶ Generators that qualify for a Backstop PPA are free to choose which of the Mandated & Voluntary Backstop Offtakers they would like to contract with. ▶ This is how the offtake under the small scale FiT is allocated today.	▶ Has the significant advantage in that it is simple and certain for the generator and avoids the exercise of discretion on the benefit of Ofgem. ▶ However it has the disadvantages of ✓ potentially resulting in a "concentration risk" on one available Backstop Offtaker with generators shopping around for the best credit; and ✓ Generators may not choose the offtaker who is 'optimal' in terms of

		fitting with their portfolio.
Capped Obligation	▶ As above, but Ofgem could specify a 'cap' for each Mandated Backstop Offtaker in terms of the volume of capacity that it was required to contract with. This could be set by reference to size of the project revenues relative to the size of their supply business. ▶ This could be an absolute cap or a more "layered" approach in which each supplier is allocated an interim cap, which once full, eliminated that supplier from the list of Mandated Backstop Offtaker until such time as all others have filled their interim caps (at which point the process would be repeated with all interim caps reset)	▶ Again, this approach would have the advantage of: ✓ being simple and certain for generators; ✓ minimal discretion required from Ofgem; and ✓ mitigates the concentration risk ▶ However it could still result in an asymmetric distribution depending on the granularity of the cap and, as above, it does not necessarily result in the lowest cost to consumers as it does not allocate Backstop PPAs in an optimal manner from a system perspective.
Admin-istered	▶ Ofgem to specify an offtaker based upon some set of agreed principles. ▶ These principles could account for the need to balance the requirement to: ✓ evenly allocate projects across available Backstop Offtakers; and ✓ ensure a better fit between generators and offtakers (e.g. if there were criteria around the offtaker's portfolio in comparison with the generator).	▶ This would have the advantage of ensuring the need to spread the burden of offering backstop arrangements across all available Backstop Offtakers as well as leveraging system benefits. ▶ However, its three distinct disadvantages are: ✓ it would probably involve Ofgem exercising a degree of discretion, which could be open to legal challenge; ✓ it is less transparent and certain for generators as to who the offtaker will be; and ✓ it could be more time consuming in terms of the period from eligibility to enter the backstop arrangements and contracting with a Backstop Offtaker.

B. Levelisation

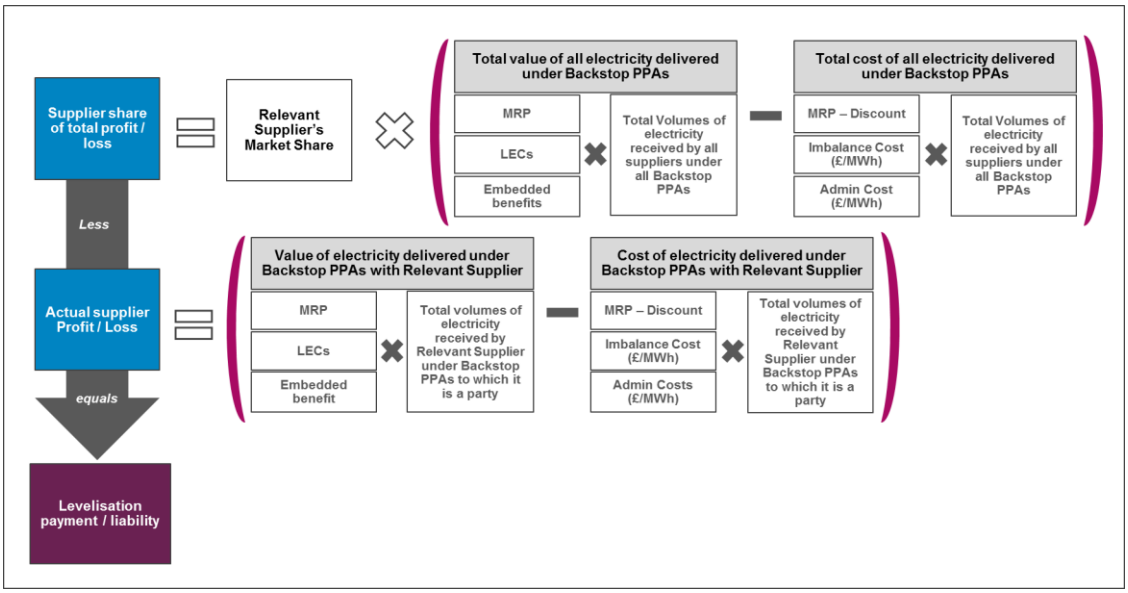
A regulated approach to levelisation would look to assess or estimate the profit or loss accruing to each Backstop Offtaker under the Backstop PPAs to which it is a party and then smear that across all suppliers through levelisation payment. The extent to which any relevant supplier would be liable for a payment into the "levelisation pot" or due a reimbursement from the "levelisation pot" is set out in Table 7 below.

Table 7: Determining payments / reimbursements from the "levelisation pot"

Option	Circumstances
Payment to the relevant supplier from the "levelisation pot"	▶ A supplier's estimated loss under the Backstop PPAs to which it is a party *is greater* than its share of the total loss (when socialised across all suppliers subject to levelisation); or ▶ A supplier's estimated profit under the Backstop PPAs to which it is a party *is less* than its share of the total profit (when socialised across all suppliers subject to levelisation).
Payment from the relevant supplier into the "levelisation pot"	▶ A supplier's estimated loss under the Backstop PPAs to which it is a party *is less* than its share of the total loss (when socialised across all supplier subject to levelisation). ▶ A supplier's actual profit under the Backstop PPAs to which it is a party *is greater* than its share of the total profit (when socialised across all suppliers subject to levelisation).

This calculation in set out in more detail in Figure 4 below.

Figure 4: Conceptual, regulated levelisation payment/liability calculation



As such, regulated levelisation would require Ofgem to assess the following:

- **Assessment of Value** - What is the value of the electricity and other benefits accruing to each Backstop Offtaker under the Backstop PPA?
- **Assessment of Cost** - What are the costs incurred by each Backstop Offtaker in relation to complying with its obligations under a Backstop PPA?

Calculating assumed value received by Backstop Offtakers

As set out in Figure 4 above, the value accruing to a Backstop Offtaker under a Backstop PPA can be broadly broken down into the value of the electricity itself, the Levy Exemption Certificates (LECs) and the embedded benefits. Table 8 highlights a number of considerations with respect to the challenges that Ofgem would face in appropriately quantifying the value that accrues to a Backstop Offtaker under these arrangements

Table 8: Challenges facing Ofgem in assessing value accrued under Backstop PPAs

Benefit	Assessment of value to Backstop Offtaker
Electricity	▶ The simplest approach here would be to use the Market Reference Price under the CfD. However, this may or may not represent the value received by the Backstop Offtaker in respect of that offtake. ▶ For example, under an intermittent CfD, using the day-ahead index might ignore the fact that the Backstop Offtaker has in fact traded the output in the forward and/or intraday markets such that it has extracted more value than it is being credited with for the sake of levelisation. ▶ While this may be a desirable outcome as it incentivises the Backstop Offtaker to trade the output according to market drivers, it is worth acknowledging that

	Backstop Offtakers may receive additional revenue here that is not smeared across other suppliers.
LECs	▶ The simplest approach here would be to use the prevailing Climate Change Levy (CCL) rate. ▶ However, suppliers may argue that this exposes them unduly to LEC market risk to the extent that oversupply or structural limitations in the LEC market mean that they are not trading at that rate.
Embedded Benefits	▶ Valuing embedded benefits is likely to be the most challenging component of the "value stack" to assess (and will only be relevant to Backstop Offtakers who are actually suppliers). ▶ This is because the extent of the embedded benefits that accrue will depend on the nature of the Backstop Offtaker's portfolio. For example, if a Backstop Offtaker who is a supplier does not have customers at a Grid Supply Point ("GSP"), behind which an embedded generator that it has contracted with is located, then it will not be able to benefit from reduced TNUoS, BSUoS etc. ▶ As such: ✓ either Ofgem sets a flat rate for embedded benefits but then the allocation of Backstop PPAs takes into account the differential in value of embedded benefits to different potential Backstop Offtakers, or ✓ the levelisation framework will need to take into account the fact that the value of embedded benefits will need to be entity specific.
Accrued Interest	▶ To the extent that a profit accrues to a Backstop Offtaker under the Backstop PPAs to which it is a party, the levelisation process will need to capture the accrued interest (at a specified rate) of that accrued profit prior to levelisation (e.g. (3% p.a./4)*(levelisation payment due)

Calculating assumed costs incurred by Backstop Offtakers

The Backstop Offtaker would incur a number of costs in managing a generator's output under a Backstop PPA. These are set out in Table 9 below.

Table 9: Costs to a Backstop Offtaker of carrying out obligations under a Backstop PPA

Option	Circumstances
Imbalance Costs	▶ The cost of managing the forecast error between the day-ahead stage and physical delivery (for intermittent CfDs).
Trading Costs	▶ The cost of accessing the market in terms of trading infrastructure (i.e. computers, traders), exchange fees and posting of collateral.

Finance Costs	▶ The costs of providing any credit support to the generator to protect against its own insolvency (as described in Section 2.2 above).
Administrative Costs	▶ Costs of registering the generator's meter with Elexon. ▶ Costs of forecasting the output, both in terms of equipment and personnel. ▶ Operational costs associated with managing output of the plant (i.e. responding to SO instructions).
Cost of Carry	▶ To the extent that a loss accrues to a Backstop Offtaker under the Backstop PPAs to which it is a party, the levelisation process will need to capture the cost of carrying that loss prior to levelisation (i.e. once a quarter, semi-annual etc.)

While an assessment or estimate of costs incurred by the Backstop Offtaker in relation to trading, administrative and finance costs might be expected to be a relatively simple process, estimating allowed imbalance costs is likely to be the most challenging for Ofgem. As such, this is the aspect of the Backstop PPA cost assessment that is explored in detail here.

The objective would be to set allowed imbalance costs at a level that appropriately incentivised the Backstop Offtaker to manage the imbalance exposure efficiently, but did not over estimate that cost such that Backstop Offtakers (a) are incentivised to withdraw liquidity from the normal PPA market as they can make more money in the backstop arrangements or (b) leaves a Backstop Offtaker who is also a supplier in a materially better or worse position relative to other suppliers after levelisation.

In view of this, one approach would be to use historic data in relation to each asset that enters the backstop arrangements to estimate the likely imbalance cost incurred by the Backstop Offtaker in any given period. This would require an assumption to be made about the manner in which the Backstop Offtaker is likely to trade the output. For intermittent generators, the Backstop PPA will most probably be indexed to the day-ahead market price (to eliminate basis risk for the generator). As such, it would seem reasonable to assume that the Backstop Offtaker would look to sell 100 per cent of a plant's forecast output at the day-ahead stage but then look to minimise its imbalance volumes going to gate closure by trading out any change in the assets forecast output in the period between day-ahead and gate closure in the intra-day market. Obviously, the Backstop Offtaker will always be exposed to the cash out price in relation to any difference between the actual out-turn generation levels in the delivery period differ and final contracted position submitted an hour before at gate closure.

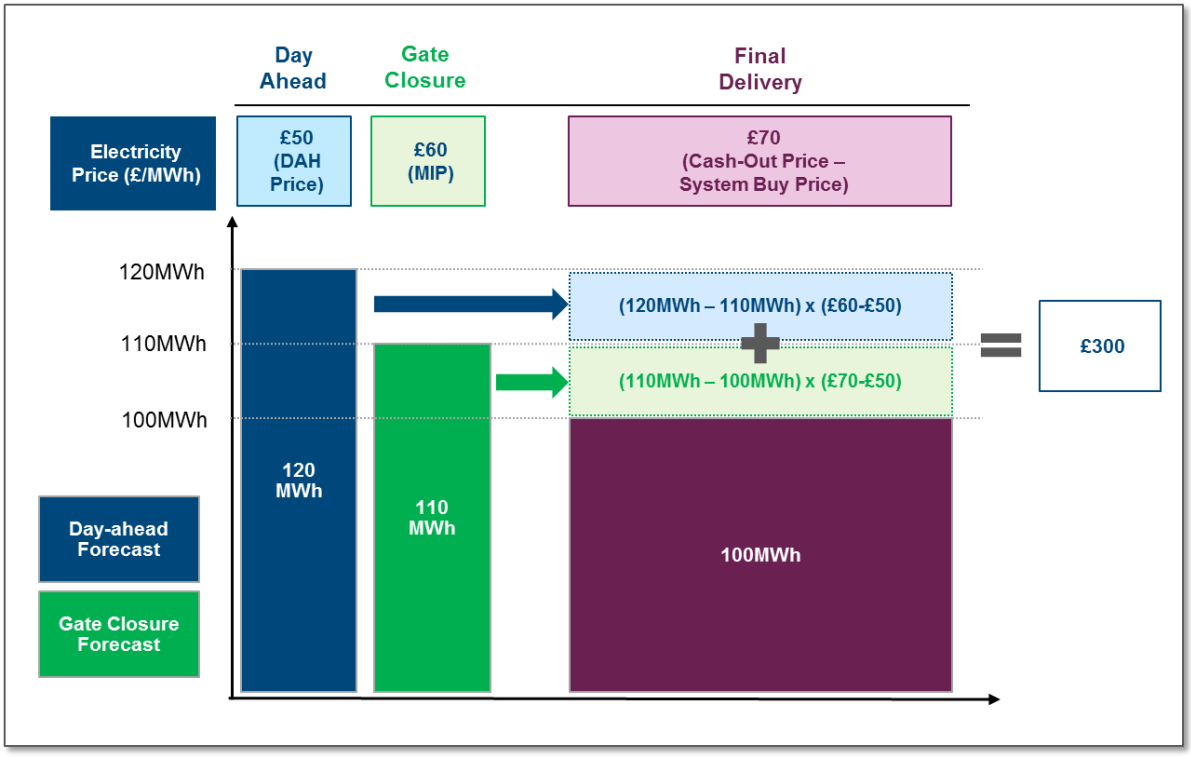
On the basis of this assumed trading strategy, the Backstop Offtaker's total imbalance cost in any given settlement period can be quantified as follows:

- the difference between the day-ahead forecast and the forecast at gate closure (the "**Intra-day Imbalance Volume**") *multiplied by* the price differential between the day-ahead price and the price in the intra-day market (Market Index Price or MIP) that the Backstop offtaker was able to trade out any Intra-day Imbalance Volumes; *plus*

- the difference between the intra-day forecast (i.e. the final contracted position in relation to that asset) and actual metered output (the "**Post GC Imbalance Volume**") *multiplied by* the price differential between the day-ahead (DAH) price and the cash out price.

This calculation is shown schematically in Figure 5 below.

Figure 5: Calculating imbalance costs between day-ahead and physical delivery



It is important to note that the methodology above makes a number of assumptions which may or may not reflect the reality in terms of the way in which the Backstop Offtaker forecasted and traded the power it receives under a Backstop PPA (and these are set out in are detailed in Table 11 below). This may lead to an over or under compensation in terms of allowed imbalance costs for the purposes of levelisation. Please see Annex 1 for a detailed discussion of some of these issues and challenges with assessing imbalance cost using historical data.

Table 11: Assumptions and limitations of estimating imbalance cost

Option	Circumstances
Trading Strategy	▶ The methodology above assumes that a Backstop Offtaker will trade all of its forecast output in the day-ahead market and then manage its imbalance position between day-ahead and gate closure in the intra-day market. ▶ However, depending on the relative distribution of difference between the cash out price and the market price, suppliers may not actually trade the output in that manner as they may prefer to be exposed to: ✓ the System Buy Price (i.e. go into gate closure having sold more than the forecast output); or ✓ the System Sell Price (i.e. go into gate closure having sold less than the

	forecast output). ▶ Not accounting for this may over compensate a supplier for their actual cost (which may be acceptable on the basis that it incentivises appropriate trading strategies), or it would require Ofgem to make ongoing changes to its assumptions on how a supplier might trade the power given the distribution of cash-out prices.
Estimating forecast error	▶ Estimating imbalance in the manner set out in Figure 5 above requires Ofgem to be able to accurately determine a Backstop Offtaker's forecast volumes in relation to a particular asset at both the day-ahead stage and the intra-day stage in each half hourly settlement period. ▶ However, Ofgem will not be able to rely on any information provided by the suppliers themselves (as this could expose the system to gaming). As such, Ofgem would need to use some form of third party estimates of asset level forecasts with suppliers incentivised to forecast more accurately than the third party. ▶ While National Grid already forecasts wind output at an asset level at day-ahead stage, we note that this capability would probably need to be expanded to cover all distribution-connected plant as well as to deal with gate closure forecasting (although see Annex 1 for more details on how this might be done on a cost effective basis).
Intra-day Liquidity	▶ The methodology above assumes that the Backstop Offtaker is able to trade out any intra-day imbalance exposure at the Market Index Price ("MIP"). ▶ Suppliers may argue that quantifying imbalance assuming that it can access this price in the spot markets exposes them to basis risk. This is because: ✓ The MIP is derived from a basket of trades completed over the 20 hours leading up to gate closure and therefore does not represent a "market price" in the same way as, for example, the day-ahead auction price. ✓ Moreover, the intra-day market is relatively thinly traded and therefore MIP is likely to be a more volatile and less transparent index, increasing basis risk for the Backstop Offtaker. ▶ To address this, Ofgem would either have to: ✓ Develop a liquidity adjustment to account for the fact that backstop Offtakers are unlikely to be trading exactly at MIP; or ✓ Ignore intra-day markets entirely and calculate imbalance cost on the basis of the difference between the day-ahead forecast and delivered volumes; however, this risks over-compensating the suppliers.
Portfolio benefits	▶ The methodology above calculates imbalance cost at an asset level. However, imbalance costs can be proportionately reduced when the asset is

	considered as part of the wider portfolio. ▶ The extent of this benefit will vary portfolio by portfolio and is likely to be very difficult to quantity on the basis that it will require an assessment of the extent of correlation in forecast error across assets within the same portfolio. ▶ Having said that, the extent of these benefits is likely to be considerably reduced, if not eliminated entirely, if Ofgem moves to a single cash out price following the conclusion of their Electricity Balancing Significant Code Review.

2.5.2. Competitive approach

A. Allocation

This approach would instead look to allocate Backstop PPAs amongst eligible Backstop Offtakers based on competitive process. In summary, the process would work as follows:

- In the event that a generator entered the backstop arrangements, Ofgem would tender the role of Backstop Offtaker for a particular asset for a fixed tenor (e.g. six months, 1 year, 3 years) on the terms of the standard form Backstop PPA;
- Eligible Backstop Offtakers (i.e. both Mandatory and Voluntary) would then bid the cost, or "management fee", that they would require to buy power and manage the trading costs and imbalance costs associated with that output under the terms of the Backstop PPA;
- In bidding this cost, each prospective Backstop Offtaker would assess the extent to which:
  - ✓ the costs (£/MWh) of managing that output under the terms of the Backstop PPA (i.e. as set out in Table 9); *exceeds*
  - ✓ the value the fixed discount under the Backstop PPA (i.e. as set out in Table 8).
- The supplier that bid the lowest management fee would be awarded the contract for that period (indeed, in some scenarios prospective offtakers might bid negative management fees).
- For example:
  - ✓ if the Backstop PPA has a Fixed Discount of £30/MWh and a prospective Backstop Offtaker estimates the embedded benefits and LECs add an additional £3/MWh, the aggregate value of each MWh of output delivered under the Backstop PPA would be £33; and
  - ✓ the Backstop Offtaker estimates the administrative, trading, finance and imbalance costs (including a margin) associated with complying with its obligations under the Backstop PPA at £40/MWh
  - ✓ the prospective Backstop Offtaker would theoretically bid a management fee of £7/MWh or above.

- ✓ To the extent that this was the lowest bid then the Backstop PPA would be awarded to that supplier.

B. Levelisation

Levelisation under a competitive solution would be a far simpler process than under a regulated solution as there would be no need to actually determine the value of costs accruing to each Backstop Offtaker. Instead, levelisation would be applied against the aggregate total of management fees paid to (or by) all Backstop Offtakers. For example:

- A generator enters the backstop arrangements and is awarded to a Supplier A based on bid managements fees of £4/MWh.
- If the generator produces 100 MWh in a given period, then Supplier A would receive £400 from the levelisation pot for performing the backstop service.
- If we assume that there are three additional suppliers in the market (i.e. Supplier B, C and D), each with equal market share, then each supplier (including Supplier A) would be liable to pay £100 into the levelisation pot. Supplier A would therefore receive a net amount of £300 from the levelisation pot.

This is summarised in Table 11 below.

Table 12: Levelisation based on bid "Management Fee"

Option	Market Share	Bid Management Fee	MWh under Backstop PPA	Backstop PPA costs incurred	Levelisation payment / liability
Supplier A	25%	£4/MWh	100	£400	+£300
Supplier B	25%	£5/MWh	0	£0	-£100
Supplier C	25%	£6/MWh	0	£0	-£100
Supplier D	25%	£7/MWh	0	£0	-£100

If Supplier A's actual loss under the Backstop PPA was £3.50/MWh rather than its bid £4/MWh (e.g. because it was able to trade the power in such a way that it received more than the Market Reference Price; or it forecast the output of the plant accurately such that imbalance volumes were reduced), then Supplier A would have reduced its exposure to levelisation by £25 relative to other suppliers.

This has two effects:

- Firstly, it should provide the right incentives on supplier to manage the output of the generator in the backstop mechanism as efficiently as possible;
- Secondly, it provides significant incentives on all suppliers who are subject to levelisation to participate in the tender. By way of demonstration using the example in Table 12 above:

- ✓ if no supplier had participated other than Supplier A, it might have bid £8/MWh rather than £4/MWh given the lack of competition.
- ✓ This would mean that after levelisation, Supplier A would be left with a profit of £450 (i.e. actual cost of £350 plus its levelisation payments from other suppliers of £600),
- ✓ Whereas each of the other three suppliers would be left with a loss of £200 each.
- ✓ As such, each supplier would be heavily incentivised to participate in order to avoid significant loss of value relative to its competitors.

Having said that, while it is highly unlikely that no eligible supplier would bid to take on a Backstop PPA, the scenario will still need to be catered for in the regulatory arrangements. As such, all Mandatory Backstop Offtakers would probably be required to bid for all Backstop PPAs to ensure that the contract was allocated to someone and the price bid was reflective of actual costs.

2.5.3. Appraisal

Both a regulated and competitive allocation process have some significant advantages and disadvantages, all of which will merit further investigation. However, from the prospective of assessing the general viability of using suppliers as counterparties for the backstop arrangements, while each may have its challenges, we believe neither approach is so problematic as to be unworkable. Table 13 looks to summarise the relative merits of both proposals in more detail.

Table 13: Advantages and disadvantages of regulated vs. competitive PPA allocation and levelisation

Option	Advantages	Disadvantages
Regulated	▶ Rule based allocation can be simple and certain which should increase generator confidence and reduce time for contractual arrangements to be put in place. ▶ This should reduce the level of credit support required to cover the period from original PPA insolvency and entry into the backstop arrangements. ▶ A regulated allocation process could potentially be more enduring as each Backstop PPA can remain with the first Backstop Offtaker for the remaining term of the CfD	▶ Very difficult to accurately reflect the actual value and cost accruing to a Backstop Offtaker under the Backstop PPA without rising over or under compensation ▶ Particularly difficult to assess are the value of embedded benefits and the extent of imbalance cost as these will be entity specific and dependent on parameters that are not easily measured. ▶ Difficulty in ensuring that no one supplier is overly burdened with Backstop PPAs. ▶ Difficult to understand how and

	(unless it needs to be re-allocated on insolvency)[10]. ▶ This could reduce the cost of this approach compared with running a regular competitive process.	why Voluntary Backstop Offtakers would be able to get involved in this process. ▶ Potential need for discretion by Ofgem in allocating contracts or assessing Backstop Offtaker profit or loss.
Competitive	▶ Backstop Offtakers self-select avoiding the need to impose offtake on a reluctant offtaker. This should avoid: ✓ legal issues around whether an imposed contract is legally enforceable; and ✓ the need for Ofgem to exercise any discretion over allocation or cost assessment which reduces the judicial review risk. ▶ Eliminates the need for a complex cost assessment process as Suppliers can assess that internally within their bid "management fee" ▶ Competition between suppliers should allocate a generator with the most suitable supplier in terms of reduced imbalance cost as a result of portfolio benefits and monetizing embedded benefits.	▶ Potentially adds administrative complexity and cost with Ofgem having to run regular tenders. ▶ Potentially increases the time needed to allocate the Backstop PPA when a generators enters the backstop arrangements. ▶ This will in turn increase the level of credit support that will need to be provided under the original PPA to cover the period from PPA insolvency to entry into the Backstop PPA. ▶ There is the gaming risk with suppliers. However, it would seem that this is significantly mitigated (if not largely eliminated) by the design of the levelisation process which should significantly penalise non-participation.

[10] There may be limited scenarios were a change of backstop Offtaker is required – i.e. when a Mandatory Backstop Offtaker falls below the threshold and becomes a Voluntary Backstop Offtaker.

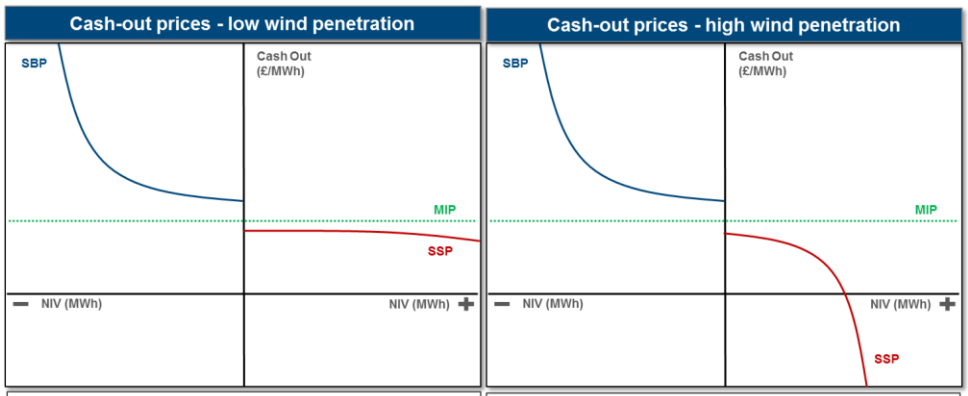
ANNEX 1
ASSUMPTIONS / LIMITATIONS WITH IMBALANCE COST ASSESSMENT

The methodology for estimating imbalance cost at an asset level above makes a number of assumptions which may or may not reflect the reality in terms of the way in which the Backstop Offtaker forecasted and traded the power it receives under a Backstop PPA. These are set out in detail in Table 16 below.

Table 16: Assumptions / Limitations

Option	Circumstances
Trading Strategy	▶ The methodology above assumes that a Backstop Offtaker will trade all of its forecast output in the day-ahead market and then manage its imbalance position between day-ahead and gate closure in the intra-day market. ▶ However, this assumes that the Backstop Offtaker's loss for each MWh of under and over delivery against its contracted position is the same. ▶ In reality, this is not the case as the spread between the System Buy Price and the Market Index Price ("**MIP**") is generally speaking more penal than the spread between the System Sell Price and the MIP. ▶ As such, under these conditions the Backstop Offtaker would most probably adopt a strategy where it contracted for less than its forecast (e.g. 95%) to minimise the probability of being exposed to the System Buy Price. ▶ In the future, however, this approach may not always persist. In a system with high wind penetrations, the System Sell Price could well become more volatile and penal than it is today potentially driving the entirely opposite trading strategy – i.e. selling more than your forecast to reduce exposure to System Sell Price. These two scenarios are set out in Figure 8 below.

Figure 8: change in asymmetry in cash out prices driving trading strategy



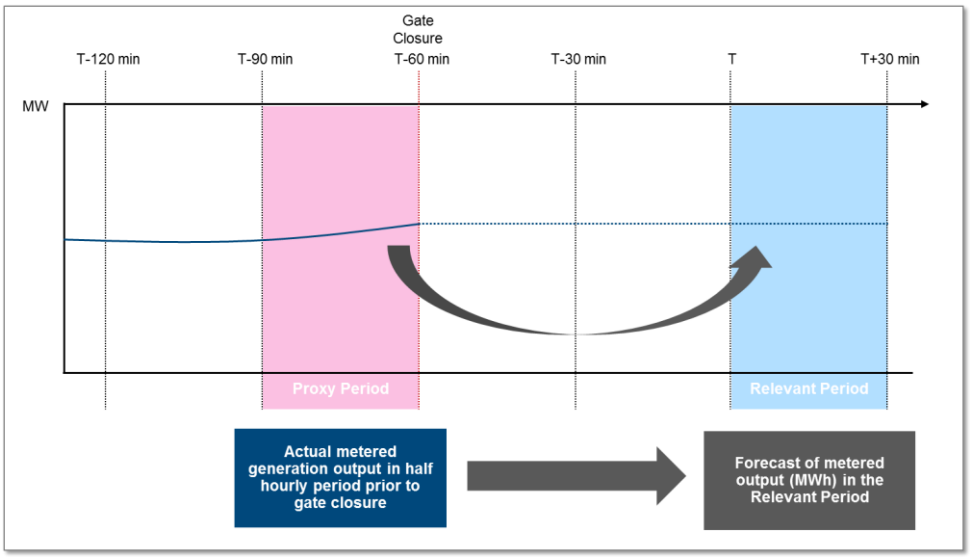
- *Rational Trading strategy would be to go into gate closure **under contracted against your forecast** (i.e. sell 95% of forecast)*
- *This will **reduce likelihood of exposure to the SBP** which is more penal in terms of the spread against MIP*

- Rational trading strategy would be to go into gate closure **over contracted against your forecast** (i.e. sell 110% of contracted)
- This will **reduce likelihood of exposure to the SSP** which is more penal in terms of the spread against MIP (due to increased penetration of wind)

- As such, in calculating a Backstop Offtaker's imbalance cost, Ofgem may need to make certain assumptions on contracting strategy that reflects a rational interpretation of the prevailing distribution of cash out prices.

Estimating forecast error

- Estimating imbalance in the manner set out in Figure 5 above requires Ofgem to be able to accurately determine a Backstop Offtaker's forecast volumes in relation to a particular asset at both the day-ahead stage and the intra-day stage.
- However, at the day-ahead stage, Ofgem will not have any information under the current market arrangements of asset-level forecasted volumes and contracted position.
- At gate closure stage, Ofgem could determine forecast volumes by reference to the Final Physical Notifications ("**FPNs**") submitted by the Backstop Offtaker. However:
  - ✓ Firstly this only applies to plant that have a separate BM Unit (i.e. not exempt / embedded); and
  - ✓ Secondly, as the imbalance charging is calculated at a portfolio level, a Backstop Offtaker would not be sufficiently incentivised to ensure that FPNs are accurate. Indeed, the Backstop Offtaker would be incentivised to make these notifications as *inaccurate* as possible if it was being used to derive its own allowed imbalance costs.
- As such, Ofgem would be required to estimate the forecast volumes of each asset in the backstop arrangements in a way that did not rely on information provided by the Backstop Offtaker itself. One proposal (that would avoid significant up front set up costs and gaming risks) would be as follows:

	✓ In relation to asset level forecasts for a given settlement period at day ahead stage, Ofgem could use the output forecast generated by National Grid as part of its obligation as system operator (see here[11] for a presentation on NG's wind forecasting capability); and ✓ In relation to asset level forecasts for a given settlement period at gate closure, Ofgem could use the actual metered output of the plant in the half hourly settlement period immediately prior to gate closure (i.e. the pink period in Figure 9 below)[12] as a reasonable approximation of the likely output levels in any relevant settlement period one hour later (i.e. the blue period in Figure 9 below).[13] ▶ In this way, a Backstop Offtaker would be incentivised to forecast the output of the generator more accurately than the forecasts used by Ofgem as part of the cost assessment process. **Figure 9: Using metered output at T-1hour as a forecasted output for T - T+30 mins** 
Issues with using Market Index Price (MIP)	▶ The methodology above assumes that the Backstop Offtaker trades at the day-ahead price and the MIP. While this may well be the case for the day ahead market (as this is market is relatively liquid and the price reflects an auction clearing price), suppliers may argue that quantifying imbalance assuming that it can trade out any intra-day imbalance exposure in the spot

[11] http://www.nationalgrid.com/NR/rdonlyres/CBB087D7-94E4-4CC0-A5DA-3ED795CF4D40/45414/Wind_Power_Forecasting.pdf

[12] This will not technically be possible under the current cash out rules as notifications of contracted positions need to be submitted half an hour before gate closure. However, under the current reform proposals, Ofgem are consulting on whether this should be pushed back to gate closure.

[13] We note that is an approach taken by SSE in relation to the FPNs that it submits to National Grid at an asset level.

markets and access the MIP will expose them to basis risk.

- The MIP is derived from a basket of trades completed over the 20 hours leading up to gate closure and therefore does not represent a "market price" in the same way as the day-ahead auction price. Moreover, the intra-day market is relatively thinly traded and therefore MIP is likely to be a more volatile and less transparent index, increasing basis risk for the Backstop Offtaker.

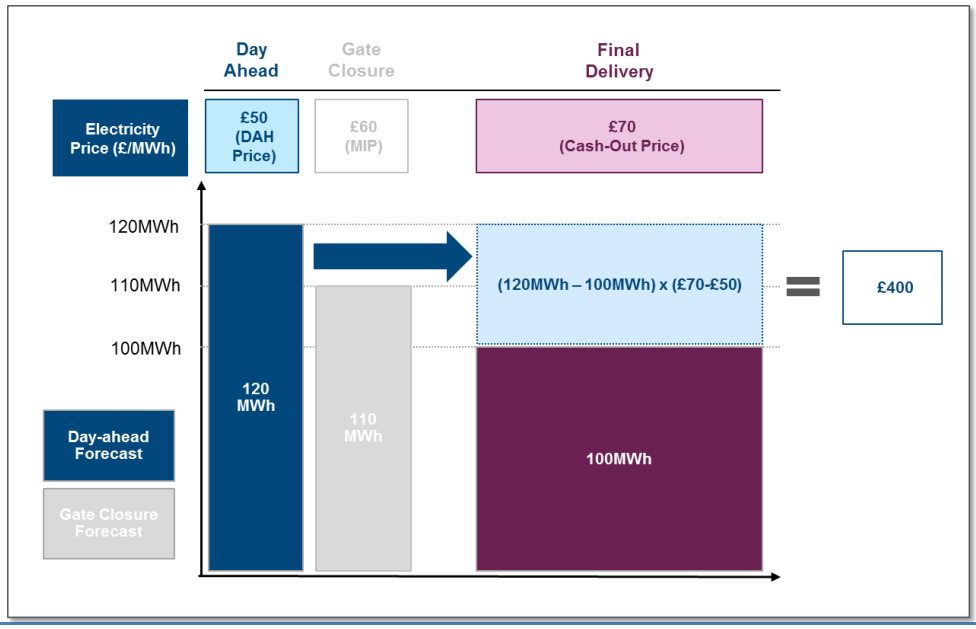
- It may be that DECC take the view that the basis risk is not sufficiently material to warrant further complicating the methodology. Indeed, this may provide further incentives on suppliers to ensure that the backstop arrangements are never used.

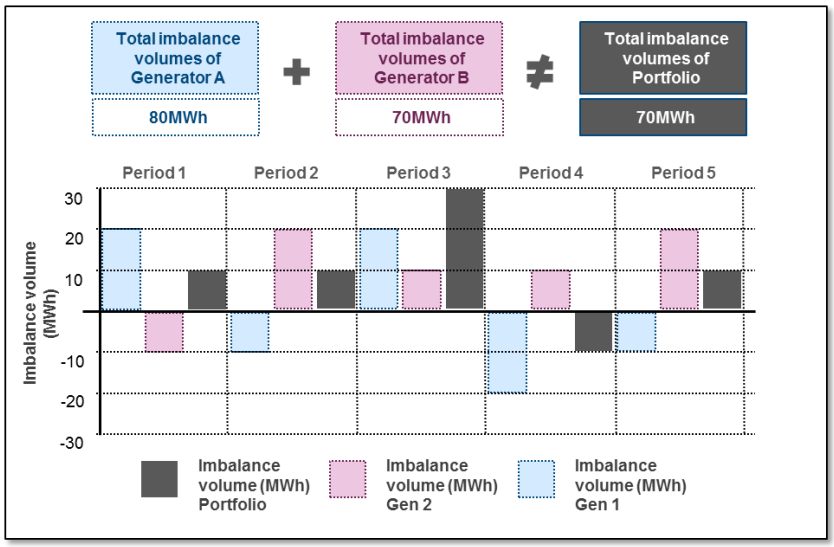
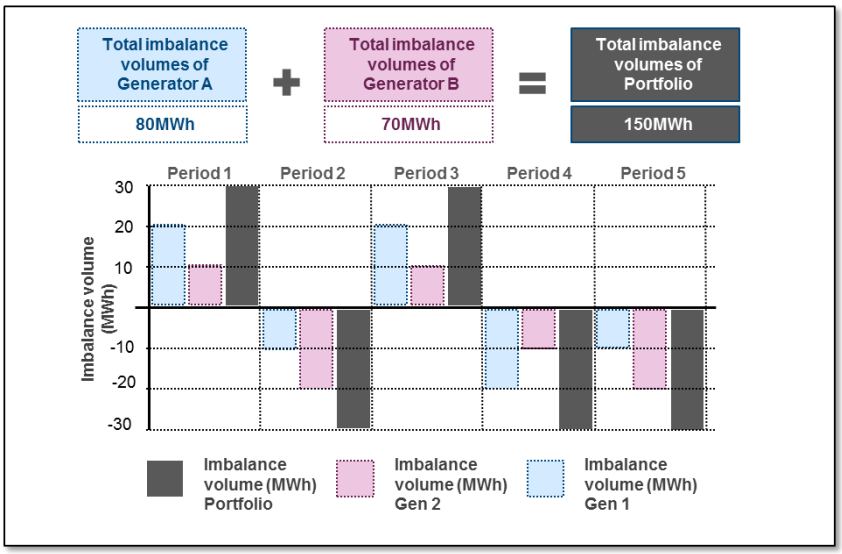
- However, if this issue was to be solved, options could include:

  - ✓ developing a "liquidity adjustment" to the MIP used in the imbalance calculation to account for the fact that the supplier may not have actually been able to access the reported blended price (which is likely to be complex); or

  - ✓ estimating imbalance assuming that the Backstop Offtaker was not able to access the intra-day market at all (i.e. it simply sold 100 per cent. of the output in the day-ahead auction and then took the cash out exposure on the entire differential between the day-ahead forecast and actual delivered volumes (as shown in Figure 10 below). However, this is likely to over-estimate the actual imbalance costs incurred as the DAH price – MIP differential is likely to be less than the DAH price – cash-out price differential (as shown in Figure 10 below which quantified imbalance costs in the relevant period at £400 rather than £300 as set out in Figure 5).

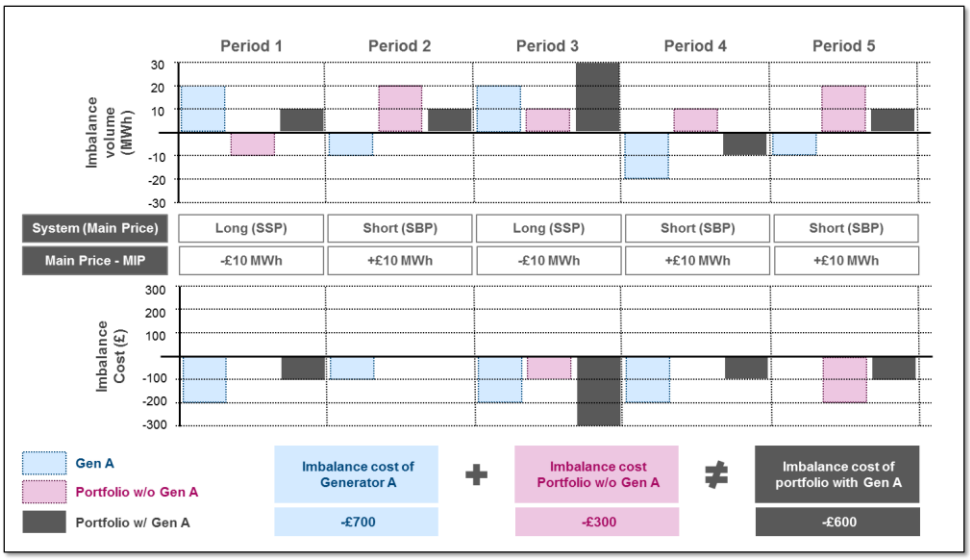
Figure 10: Calculating imbalance cost assuming no intra-day trading



Portfolio Benefits	▶ The methodology above estimates imbalance at an asset level. However, in reality a generator under a Backstop PPA will be added to a Backstop Offtaker's wider portfolio. ▶ If the forecast error in relation to the other assets that form part of a Backstop Offtaker's portfolio are uncorrelated with forecast error for the asset under the Backstop PPA (i.e. other assets are not more likely than not to be out of balance the same direction as the asset in the same period), then there should be a greater reduction in total imbalance volumes across the portfolio than would be expected if you treated each asset separately (i.e. a proportional reduction in imbalance volumes). This is demonstrated diagrammatically in Figures 11 and 12 below. **Figure 11: Un-correlated forecast error – creating portfolio effects**  **Figure 12: Correlated forecast error – creating no portfolio effects** 

- This proportionate reduction in imbalance volumes would manifest as a reduction in imbalance cost as the Backstop Offtaker would have a reduced volumetric exposure to the spread between the market price and cash-out price (I.e. main price) in those circumstances in which it is contributing to system imbalance. This is demonstrated in in Figure 13 below (which uses the same example imbalance volumes as set out in Figure 11 above).

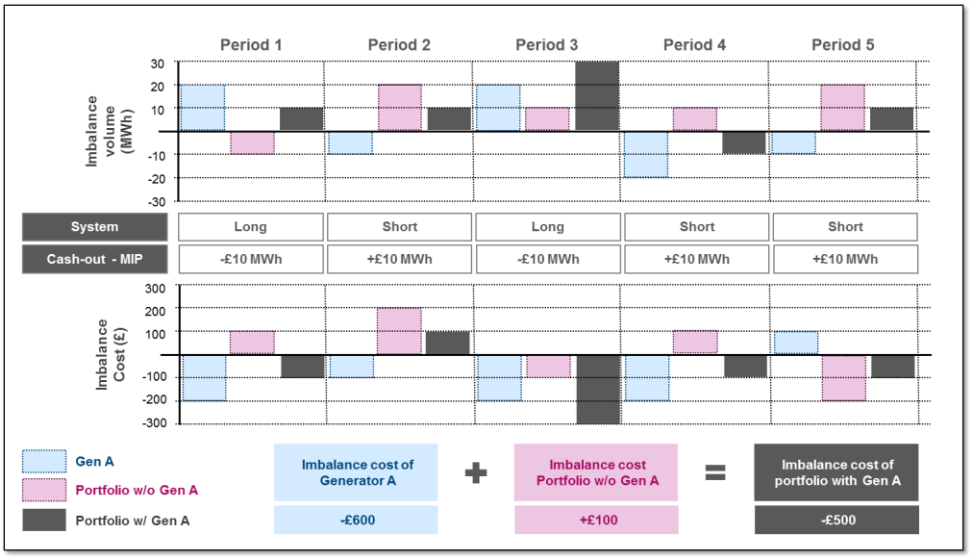
Figure 13: **<u>Non-additive</u> imbalance cost under duel cash out**



- To account for this benefit in the methodology set out in Figure 5 above, Ofgem would need to determine an adjustment to asset level imbalance cost to take account of this benefit. This could potentially be particularly complex for Ofgem give that it would require them to assess the extent of the correlation in forecast error across entire portfolios (which is likely to be infeasible). An alternative approach would be to ignore portfolio benefits (with the risk that Backstop Offtakers would make a profit from providing the service), or use an estimate for average portfolio benefits (which risks under and over-compensating offtakers depending on the actual portfolio benefits realized).

- Having said that, if Ofgem's Electricity Balancing Significant Code Review decides to move to a single cash out price, the extent of the portfolio effect described above should be largely eliminated in relation to post gate closure imbalance volumes. This is because for each MWh of imbalance, a generator might receive a benefit or a cost, depending on whether its imbalance is contributing or not to the overall system imbalance. This is demonstrated in Figure 14 below using the same example set out in Figure 11 above.

Figure 14: Imbalance cost is additive under single cash out



It is worth noting that a move to a single cash out price does not necessarily eliminate all portfolio affects as this will only eliminate the portfolio effects in relation to *post gate closure* imbalance volumes. There still could be marginal portfolio benefits in relation to a reduced exposure to the bid-offer spread in the intra-day markets in relation to *Intra-day Imbalance Volumes.*