

GPAM and DPAM: IPPs' optimal route to market and how it affects revenue certainty



Executive Summary

The Electricity Market Reform currently under way in the UK, with its incipient new subsidy scheme, is expected to change the renewable energy investment landscape. A key issue which has not been adequately addressed yet is that of a route to market for independent renewable power producers. Under the current Renewables Obligation scheme, these generators have financed and earned revenue from their assets through Power Purchasing Agreements (PPAs) with utilities. With the soon to be introduced CfD FiT, it is expected that independent producers will continue to depend on PPAs to finance their projects. However the terms of these agreements have been deteriorating and the CfD structure is not expected to address the underlying issues. Consequently, there is concern among investors that if terms do not improve, or an alternative route to market established, independent power producers might be squeezed out of the UK market. That would be a particularly negative development since independent power producers are an integral part of the renewable energy ecosystem and usually serve as a channel for attracting financial investors interested in pure renewable energy exposure. This research piece reviews one the alternative route to market proposals, the Green Power Auction Market (GPAM) and sets forth a modification developed by the PCCP research team, the Discount Power Auction Market (DPAM) which improves its viability among various stakeholders.

The UK's Electricity Market Reform (EMR)

In November 2012, the UK government introduced a bill in parliament proposing a range of measures to promote low carbon power generation between now and 2020, as part of its Electricity Market Reform package. The finalisation of the bill details is on-going and is slated to achieve Royal Assent late 2013, thereby becoming legislated.

The current bill addresses a number of key issues such as new low carbon generation subsidy scheme (the CfD – Contract for Difference), a capacity market and emissions performance standards, with the aim of attracting £110 billion of investment into the electricity sector by 2020.

The Contract for Difference Feed-in-Tariff (CfD FiT)

The CfD FiT works by stabilising revenues for generators at a fixed price level known as the 'strike price'. Generators will receive revenue from selling their electricity into the market as usual. When the market reference price is below the strike price however, they will also

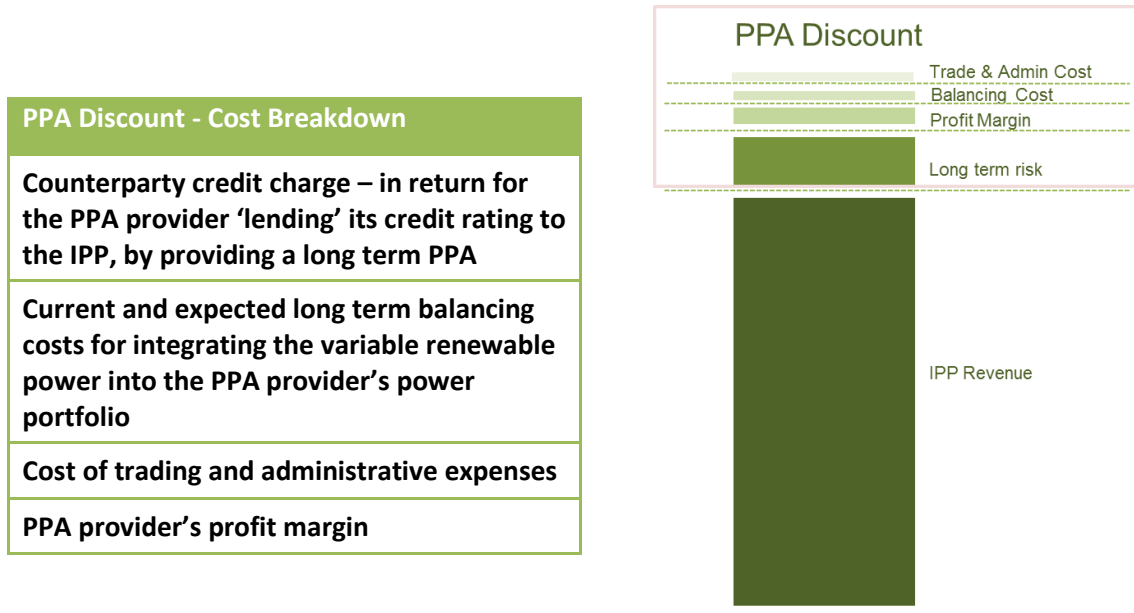
receive a top-up payment from the CfD counterparty (which will be a government owned entity) for the additional amount up to the strike price. Conversely if the reference is above the strike price, the generator must pay back the difference.

The Route to Market Issue

Independent power generators (IPPs) of low carbon power rely on Power Purchase Agreements (PPAs) with large utilities to secure a stable revenue stream and finance their project. PPAs are agreements in which a supplier purchases energy from a generator on a long term contract. Contract terms are usually tailored for each project and might involve fixed or floating prices.

Renewable IPPs, under the CfD regime, will need to secure PPAs which provide them with a guaranteed price, indexed to the reference price of the CfD, minus a discount. The discount, as broken down in Figure 1, is in effect a payment to the PPA provider to compensate it for the various costs and associated risks it absorbs in the process of buying and selling the produced/purchased power.

Figure 1: PPA Discount Cost Breakdown



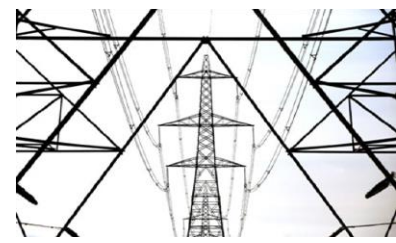
Source: PCCP Analysis

In addition to the costs and risk premium implied, PPA providers will add on an unknown profit margin for undertaking these activities.

As opposed to IPPs, Vertically Integrated Utilities (VIUs - which act as the usual PPA providers) have the ability to pass some of these costs to consumers. In addition, since the PPA discount combines its provider’s costs and profit margins, and given that there are a limited number of PPA providers (implying low level of competition), discounts can be significant and/or inefficiently priced. This is particularly important given that these prices are locked in for the tenor of a PPA (usually 15 years).

There is already some evidence that this can happen: UK PPA discounts (estimated between 10-20% of the wholesale power cost) are significantly higher when compared to other European countries and current estimates of UK balancing costs (ranging between 1-4%).

There is a real risk that if PPA terms are not improved, or some other route to market mechanism established, the returns for IPPs will be lower than those assumed when setting the subsidy level. This clearly impacts their ability to attract capital from investors versus VIUs, and could lead to their withdrawal from the market.



IPPs have a valuable contribution to make in attracting development and construction capital to the renewables build out, particularly as they provide financial investors with access to pure exposure, something recognised by the UK government, as stated in DECC's 2012 report¹:

"The large vertically-integrated energy companies and other existing participants in the market are making significant investments in the UK's electricity sector and will continue to play an important role over the coming years. These companies cannot, however, deliver all the investment that is needed to meet the Government's objectives. It is critical, therefore, that the market is open to the widest possible range of investors and that the market framework supports different business models.

As well as attracting investment, low barriers to entry in the market drive competition, innovation and diversity; it is therefore in consumers' interest to achieve a broad investment base, including from new entrants and independent developers."

The GPAM Proposition

A proposal which has gained significant traction in providing a possible solution to the route to market issue is the Green Power Auction Market (GPAM) proposition put forward by the RES Group and Mainstream

Renewables, and endorsed by a number of leading renewable IPPs.

The GPAM proposition is based on the existing renewable energy NFPA¹ auction model. These are six month rolling auctions administered by NFPA where renewable energy generators sell their output to suppliers. In effect these auctions are an alternative to long term PPAs, providing renewable energy generators with short term, rolling, six month PPAs, the price of which is determined through the auctioning process. Overall experience with these auctions has been deemed positive and some 714MW were cleared in the latest round.

The main elements of the GPAM proposition are as follows:

- A rolling auction that allows IPPs to sell a specified amount of renewable generated power to potential buyers. Currently 6 months is being contemplated for the length of time between each auction
- Those buyers then provide a short term (potentially 6 month) PPA
- The auction result then dictates the renewables power price for a given period of time
- A generator auctions the output of his entire site for the auction period. As with current PPAs, balancing risk, administrative and trading costs are

¹ For more information on the NFPA please visit <http://www.nfpa.co.uk/about.html>

transferred to the purchaser (the short term PPA provider). The key difference is that the PPA terms are determined through an auction process, rather than a bilateral negotiation

The enabling element of the proposition is that the market reference price of the CfD will not be the spot (or exchange) power price, but the auction clearing price. As a result, the CfD top up or top down will be determined by the difference between the strike and renewable energy auction prices. According to RESⁱⁱ this mechanism provides a clear and financeable route to market for independent generators.

Another key characteristic of the GPAM proposition is that in the event that the auction does not clear due to inadequate demand from suppliers, there would be a buyer of last resort, which could be the CfD counterparty or the auction administrator. Although the auction clearing price could theoretically go to zero, in reality there is strong incentive for power traders to bid the price up to near spot electricity prices and take advantage of the arbitrage between the two. In fact, GPAM could indirectly provide consumers with savings due to this government-owned buyer of last resort providing the short term PPAs, thereby reducing cost of financing to IPPs, which can be reflected over time in lower strike prices.

DPAM: PCCP's suggested GPAM Enhancement

We support the UK government's aim of preserving the presence of independent renewable power generators and believe that the GPAM proposition sets out a viable route to market solution.

Simultaneously, we would like to suggest a nuance which we believe significantly enhances the proposition's offering. Our modification, the Discount Price Auction Mechanism (DPAM), provides the same price certainty to IPPs, minimises costs to consumers, introduces transparency to PPA costs and potentially attracts new market participants.

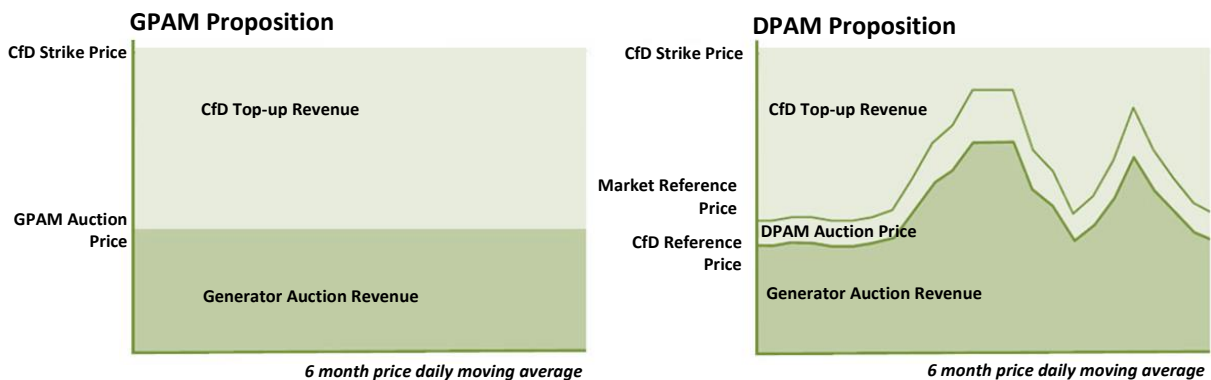
PCCP's proposal is based on the same overall structure as GPAM, i.e. short term rolling auctions. The chief difference however is that instead of bidding to buy the power output of generators at a fixed price, suppliers bid a discounted price: in other words, they bid to provide a six² month PPA, the price of which is defined as the difference between a predefined market price (e.g. the day-ahead market price) and a distinctive discount. The CfD reference price

² The optimum duration for the auction of PPAs is not necessarily six months. This duration is used because of the NFPA experience. A cost benefit analysis would need to be undertaken in order to define the best duration which would involve evaluating the benefits of shorter term price discovery vs. auction transaction costs and market liquidity

would therefore be equal to the difference between the market and the cleared DPAM auction price, as displayed in Figure 2. In effect, DPAM would fragment the PPA cost into its two main constituent parts: cost of energy and cost of balancing and administrative costs. The advantages of this option are:

- instead of fixing the CfD reference price for six months, as the GPAM proposition does, the CfD reference price will still be indexed to the spot (or day ahead) power price, as the government intends, thus minimizing costs to consumers by capturing any spot price fluctuations above the strike
- DPAM auction prices transparently represent the cost of balancing and admin. This would allow government to monitor these costs, adjust future strike prices accordingly and evaluate liquidity of the PPA market
- the cost of balancing, although ultimately born by the consumer (as is currently the case through supplier rate increases) will be managed in a visible manner and by the parties more willing, and able to do so
- transparent and short-term balancing cost pricing could attract a larger group of non-utility, short term PPA providers, who would otherwise be unable to guarantee 15+ year PPAs. This will not only lead to lower PPA costs, but potentially promote innovation by enabling technologies such as demand side management

Figure 2: Comparison of GPAM and DPAM Auction



Source: PCCP Analysis

For independent power generators, GPAM and DPAM offer little difference: they are only required to make their power available at the auction. Auction winners, i.e. suppliers and other participants, would in effect provide short term floating PPAs, with which they are already familiar. Finally, similar to the NFPA auctions, the process could be administered online, where parties with CfDs in place, could be enrolled automatically so as to minimize the transaction costs. The auction administration cost could be covered by the IPPs participating in the auction, which in any case is expected to be low.

Conclusions

As explained in this note, a viable option for solving the route to market issue is to build on the positive experience of the NFPA auctions and set up a mechanism for short term renewable energy auctions. These would in effect substitute short term PPAs for long term ones, with the CfD

counterparty (or the auction administrator) acting as a PPA provider of last resort. Furthermore, in order to create market liquidity it is necessary that the CfD reference price is based on the auction price.

The GPAM proposition put forward by RES Group and Mainstream Renewables suggests that the auction price is fixed for six months. Improving on this option, we presented an alternative auction structure, the DPAM, which proposes alternatively that the CfD reference price is indexed to the spot or day-ahead market price minus a discount, the level of which is determined through the auction process. The advantage of DPAM over GPAM is that it decomposes the PPA costs to its constituent parts (energy, balancing and administrative costs), bringing transparency, minimising the CfD top-up and by extension the consumer cost. At the same time, the revenue and level of complexity for IPPs remains identical under both propositions, providing them with an effective route to market.



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- ii. David Handley, January 2013, Green Power Auction Market: Viable Independent Generation under EMR, available at: <http://www.r-e-a.net/resources/rea-publications>
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