DBCCA Response to UK Electricity Market Reform (EMR) Consultation

March 8, 2011

[redacted]
Global Head of Climate Change Investment Research

DBCCA research available online:
http://www.dbcca.com/research

NOTE: Document responds to the Feed-in-Tariff section of the EMR consultation, specifically addressing Question 3.

DB Climate Change Advisors' research has highlighted the fact that investors look for TLC in renewable energy policy frameworks:

- **Transparency** – How easy is it to navigate through the policy structure and understand and execute?
- **Longevity** – Does the policy match the investment horizon and create a stable environment for public policy support?
- **Certainty** – Does the policy deliver measurable revenues to support a reasonable rate of return?

Key Takeaways

By maximizing TLC, policy makers can lower the costs of capital required to finance renewable energy projects and therefore lower policy costs, attract sustainable capital flows, and drive market transformation. DBCCA has used TLC criteria to develop a renewable energy policy screening tool.[1] Based on its global survey of clean energy and climate policies, DBCCA has found that advanced feed-in tariffs most clearly embody the low-risk policy characteristics required for renewable energy scale up.

There are currently over 50 national feed-in tariff policies in place around the world, each with its unique design characteristics and risk profiles. TLC analysis can also be used to differentiate feed-in tariff policies according to their specific design characteristics.

As outlined in the December, 2010 DECC Consultation Document, *Electricity Market Reform*, a key feed-in tariff design decision point for the UK will be how to structure the FIT payment. The three options under consideration are the premium feed-in tariff, the fixed feed-in tariff, and the feed-in tariff with a contract for difference (CFD). It is important to note that the evaluations of these different policy types contained in these comments are high-level, and bankability of these structures will ultimately depend on their actual design and practical implementation.

As identified in previous TLC analyses, we feel that it is clear that the fixed price FIT is the lowest risk design option – it conforms most clearly to TLC criteria and would afford the lowest cost of capital; all price risk is removed, generators have maximum revenue certainty, and the long tenures are "bankable," providing maximum capital structure flexibility.

DBCCA agrees with the assessment that the premium FIT conforms least to the TLC criteria of the three options. Although the initial rate can be set to reflect generation costs, the variability of market prices over time undermines revenue *certainty* and raises the cost of capital since there is both electricity market price and volume risk uncertainty, which increases the odds of suboptimal policy outcomes. The fact that the premium rate floats on top of the market price also removes its ability of the FIT to serve as a long-term, fixed-price hedge and effectively leaves the potential cost ceiling unlimited. As a result, the FIT would exacerbate, rather than mitigate, the ratepayer impact of rising electricity prices. In our view, these factors create risks to policy *longevity*.

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[1] DB Climate Change Advisors. (2009). *Paying for renewable energy: TLC at the right price - Achieving scale through efficient policy design.* New York, NY: The Deutsche Bank Group.

We are less clear about the comparisons between the fixed price FIT and the CFD model because of uncertainties surrounding the proposed CFD structure. In finance, a CFD is a contract between two parties - a buyer and a seller. The buyer agrees to pay the seller for the difference between the current value of an asset or commodity (e.g. electricity) and an agreed price ("the strike price") when the market price is below the strike price. When the value of the electricity rises above the strike price, the seller pays the buyer.

The incentive payment in the Consultation Document is different from a standard CFD in that the payment to the seller appears to be decoupled from the "strike price." It is expected that generators will sell power at the market price and receive an additional "top up payment." The "top up" payment is calculated as the difference between the long-term contracted tariff rate (analogous to the strike price) and an "average market price," instead of the difference between the long-term contracted price and the *actual* market price.

As a result (as shown in Figure 8 on p. 53 of the consultation document) the total amount received by the generator could be either below the long-term contracted tariff rate or above the long-term contracted tariff rate.

If the average price has been accurately calculated, then the total payment to the generator should theoretically equal the long-term contracted tariff. The fact that the ultimate rate could be either below or above the long-term contracted tariff rate decreases investor certainty.

Another uncertainty is the circumstance under which the seller might be required to pay the buyer. Under a standard CFD, this would occur when the market price is higher than the strike price. Under the proposed CFD, it is unclear whether the generator would pay the buyer if the value of its total revenue (i.e. top-up payment + market price) rises above the long-term contracted tariff rate, or if the market price alone rises above the long-term contracted tariff rate. This distinction would have important implications for the "efficiency signals ... under current market arrangements" which the CFD structure would seek to preserve.

Another key potential difference between the fixed and the CFD FIT structures is their transparency. The fixed price structure is easy for a broad range of capital providers to assess and may potentially "democratize" electricity production by easing entry barriers to smaller distributed producers. The CFD structure is less transparent and may serve as a barrier to entry for some capital providers, which could decrease the pool of potential investors and of competitive capital, providing institutional support for incumbent electricity providers. The Consultation Document characterized the need to attract a broader range of capital providers beyond the utilities as "essential."

A related issue is how and when the CFD payment is "trued up" – the timing and frequency of the revenue stream to the generator could introduce greater or lesser degrees of transparency to the system, especially if revenue is decoupled from a fixed "strike price" as appears to be contemplated.

Another issue that should to be clarified is what other features the CFD may contain, if any. The document refers to the FIT models in the Netherlands and the offshore wind incentive in Denmark. Each of these models contains their own specific designs which would further impact the comparative evaluation of a CFD with a fixed price. The Netherlands' FIT, for example, requires that the generator receive no FIT incentive if the market price falls *below* a certain price.[2] If a similar feature were integrated into UK policy, this would create additional uncertainty. The Danish offshore wind procurement, meanwhile, uses competitive bidding to set the long-term contracted tariff and then uses a CFD to fill the gap between the market price and the price as bid. Integrating such a system into UK policy would have its own set of implications.

The CFD structure will have to be clarified further before it can be adequately evaluated from a risk perspective. In the meantime, an important question for policy makers to consider would be the cost of risk vs. balancing costs. It would be useful to quantify the potential incremental cost of balancing electricity under different fixed price and CFD scenarios against the cost of capital differential between fixed price structures and wholesale market models.

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[2] Corfee, K., Rickerson, W., Karcher, M., Grace, R., Burgers, J., Faasen, C., et al. (2010). *Feed-in tariff designs for California: Implications for project finance, Competitive Renewable Energy Zones, and data requirements*. Sacramento, CA: California Energy Commission.

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DBCCA Response to UK Electricity Market Reform (EMR) Consultation: FIT CAPS

March 9, 2011

[redacted]

Global Head of Climate Change Investment Research

NOTE: Document addresses the concept of Caps of Feed-in-Tariffs and is applicable to questions 3-11 of the EMR consultation document.

Adjustments and Limitations

Consultation questions 3-11 of the EMR document address FiTs, exploring issues such as FiT model structure; the impact of FiTs on low-carbon generators; the impact of the proposed FiT models on availability of finance for low-carbon generators; and subsequently the advantages and disadvantages of each FiT model. DBCCA addresses the pro's and con's of FiT models in a separate submission to the consultation. This response looks at the concept of caps of FiTs in relation to the EMR.

When developing either a feed-in tariff (FIT) or other renewable policy mechanism, it is important for investors to understand how the policy is linked to broader climate and energy targets and how progress towards those targets is governed. From an investor perspective, the transparency of these frameworks is paramount. At the same time, we realize that transparency may need to be balanced with some degree of policy flexibility in order to ensure the longevity and durability of the feed-in tariff and to strike a fair cost/benefit balance.

Key issues include:

- whether or not market growth is limited, —e.g. is there an explicit volume or budget cap to fund the policy? and
- the different mechanisms with which policy makers adjust the policies in response to changes in market fundamentals.

In cases where the FIT is being utilized to achieve a broad policy objective (e.g. market transformation), formal policy targets may not be binding and may instead set a minimum floor which can be surpassed without consequence.

In many cases, targets connote some form of limitation, constraint or ceiling (rather than a floor). The simple characterization of renewable energy markets as "capped" or "uncapped," however, is misleading. Different jurisdictions have adopted an increasingly varied range of approaches to managing progress towards targets which requires more detailed characterization. Instead of discussing caps, this paper employs the concept of triggers, adjustments and reviews in order to more precisely characterize the Transparency, Longevity, and Certainty (TLC) implications of different renewable energy volume management strategies:

- **Triggers** are defined as market growth thresholds that initiate some type of policy adjustment
- **Adjustments** refer to the changes that can occur when trigger points are reached

It is important to note that this paper assumes that some governance framework for adjusting the policy is in place. It is possible, of course, for policies to be subject to unexpected adjustments or amendments, and such approaches can significantly undermine investor confidence in the market.

Triggers

The types of triggers can be characterized as volume-based, cost-based, and time based. These are summarized in the table and their implications from a TLC perspective are discussed in the text that follows.

Triggers

Trigger		TLC Criteria	Metric
Time		●	Specified period of time (e.g. 1 year)
Volume-based	Capacity	◕	MW installed
	Generation	◔	MWh generated and sold
Cost		◔	Budget or ratepayer impact

Source: Meister Consultant Group, DBCCA Analysis, 2011.

TLC Considerations: The type of triggers employed can important implications for policy transparency.

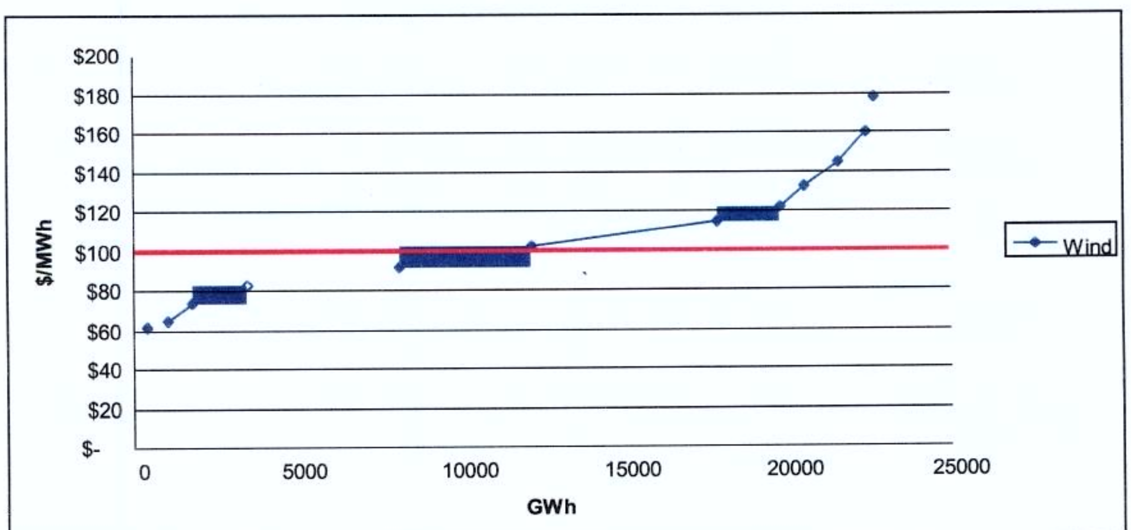
Time-based triggers are the most transparent since they create a stable and known investment horizon.

Capacity-based triggers are less transparent than time-based triggers since it may be difficult to assess how quickly the trigger is being reached. This lack of transparency can be partially alleviated through the use of transparent registry systems that monitor progress.

Generation-based (MWh) and **cost-based** triggers are the least transparent because progress is difficult to assess in real-time, with a full accounting only possible retrospectively.

Adjustments

The different types of adjustments can be broadly defined as demand-side or supply-side strategies. Demand-side strategies limit the total amount of renewable energy that can participate under a policy (e.g. a cap). Supply-based strategies, on the other hand, seek to control volume by limiting supply through price. As can be seen in the wind supply curve below, a certain market response can be expected depending on the price. If the price is set at $100/MWh (red line), then it can be projected that 12,000 GWh of generation will come into the market.



Source: Meister Consultant Group, DBCCA Analysis, 2011.

Broadly speaking, adjustments have implications for policy transparency and longevity, but they typically do not impact reven ue certainty. In other words, we assume that once a generator locks into a given rate, the policy cannot be adjusted to retroact ively amend the contract and decrease the expected revenues. Where this does occur, it can seriously undermine investor confidence.

Demand-side adjustment
The primary type of demand-based adjustment is a **hard cap**. Once the trigger point is reached, the policy is adjusted so that no new generators can participate. Hard caps can be applied to the overall program, or can also be applied annually. The TLC considerations related to hard caps are summarized in the table below:

Hard Caps

TLC Criteria		Discussion
Transparency	◑	Hard caps are transparent to the extent that they are known in advance. The transparency of a hard cap mechanism depends, however, on the rules that govern how generators "get in line" under the cap. As markets approach the cap, transparent queuing rules become critical. Key queuing design considerations include the requirements that must be in place in order to queue (e.g. security deposits, permits and/or site-control), milestones to stay in the queue (e.g. construction starts after a certain time), and how incentives are awarded to those in the queue (e.g. first-come, first-served vs. a lottery)
Longevity	○	Program caps represent a firm limitation on policy longevity. The degree to which longevity is limited depends on whether the caps are annual or overall, and the size of the cap compared to the size of the market.

Source: Meister Consultant Group, DBCCA Analysis, 2011.

Supply side – Using price to govern volume

One of the primary types of supply-based adjustments is an **automatic rate adjustment**. Once the trigger point is reached, the rate that is available to generators adjusts either upward or downward. France and Spain, for example, each indexed their feed-in tariff rates in such a way that the rate available actually increased each year, whereas Germany's current adjustment framework is designed to track downward in line with technology cost declines, with grid parity as the underlying target. Our broad view is that rates should generally decrease over time in order to chart a path to grid parity.

Automatic rate adjustments can be structured in a range of different ways. Examples include:

- **Uniform steps**. The rate adjusts by the same amount whenever a trigger point is reached. These steps may not necessarily be based on other market factors.
- **Experience curves**. The rate is set to decline by an amount based on the expected decline in a technology's cost based on projected market volume, e.g. it is often cited that PV panel prices decline by 20% with every doubling of demand based on its experience curve.
- **Decreases pegged to market volume**. The rate declines based on the volume of the market in a prior period, e.g. the previous year. The current German PV adjustment schedule is set up such that the rate decreases by an additional 1% for each 1 GW above 3.5 GW installed in 2011.

Automatic Adjustments

TLC Criteria		Discussion
Transparency	◕	Automatic adjustments generally provide a transparent framework for investors since they are specified in advance. The transparency of adjustments can depend on the frequency with which they occur. Frequent rate adjustments decrease policy transparency. Also, uncertainties in the adjustment formula can decrease transparency.
Longevity	◑	Establishing automatic adjustments is an inexact science, particularly for technologies with dynamic pricing (e.g. PV). With any automatic adjustment, there is the risk that the adjustment will "overshoot" the market and result in prices that are too low to support market development. This can adversely impact policy longevity, depending on whether or not the adjustment mechanisms correct themselves over time.

Source: Meister Consultant Group, DBCCA Analysis, 2011.

The Role of Reviews

Formal policy reviews are included as part of many feed-in tariff policies. The policy review typically results in a binding change to the feed-in tariff policy. In our view, periodic formal review is a necessary part of ensuring that FiTs reflect market conditions and supporting policy longevity. At the same time, reviews can decrease transparency if not carefully structured. Several key des ign considerations include:

Triggers. From an investor perspective, it is good to know ahead of time what triggers the review (see above). In Spain, for example, a review was triggered when the market reached 85% of a 400 MW goal. In Germany, a review occurs every four years (i.e. a time-based trigger) in parallel with automatic annual adjustments. Recent significant drops in PV panel prices led to "out-of-cycle" or unscheduled reviews and adjustments in several countries, notably Germany and France.

Outcomes. The range of possible outcomes should be communicated by policy makers so that the process does not appear to be a "black box" to the market. In Germany, for example, it has been acknowledged in advance that the reviews would focus on the automatic adjustment mechanism for rates. In some other countries, however, it has been unclear whether the outcomes of the review could include rate adjustments, hard caps, both, or other fundamental policy changes.

Frequency. The timing of the reviews can also have important implications for transparency. Overly frequent review cycles can create investor uncertainty and decrease transparency.

Sequencing. In some countries, the reviews have been initiated while the feed-in tariff rates are still available. In other words, the feed-in tariff rate is available until the review is complete. In other countries, however, the feed-in tariff has been halted while the review takes place. From an investor perspective, review processes that progress in parallel with FiT rate availability are preferable to temporary FiT moratoria.

Conclusion

The optimal approach to setting targets and governing progress towards them ultimately depends on the policy objectives and constraints of a given country, as well as the specific technologies supported. From an investor perspective, time-triggered automatic rate adjustments, whose calculation formulae are transparent and methodologically grounded, best deliver transparen cy. When combined with highly transparent, periodic reviews, such adjustments can provide the flexibility required to support policy longevity.

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