



Brief Comments on Contracts for Differences for Renewable Integration

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What is CfD?

- CfDs (Contract for difference) are derivative instruments to hedge against the price movement of the underlying asset.
- Contract is to settle the difference between a strike price and a reference price,
- Design of CfDs may require the asset to be made available in the market or delivered through the market, or it could even be a financial contract without any reference to any asset.
- As such delivery doesn't happen through the CfD contract.
- In Power Markets, CfDs have been used to hedge transmission congestion risks (Nordpool).
- UK introduced CfDs to promote investment in renewables in the year 2011.
- The period of the contract could be the life of the asset; generally it is to cover the period of debt (10/15/20 years).

Need for CfDs

- High capital cost of Renewable projects.
- Investors need visibility of revenue.
- High renewable has a cannibalizing effect, as such there is a need to protect revenues.
- A PPAs are good long-term options, however, these have the following limitations:
 - Volume risk: The off-take quantity depends upon the off-taker's decisions to meet its demand.
 - Payment Risk: PPAs are exposed to the payment default risk depending upon the credit rating of the off-taker.
 - Nontransferable and Long-term commitment by the off-taker and exiting the PPA is not easy.
- Derivative markets may not provide such hedges for longer durations. Developed countries have seen such hedges for up to three years. In Indian commodity markets electricity derivatives are yet to be introduced and even for other commodities contracts are currently available only up to three months.
- CfDs provide flexibility as well as these could be for a long duration, superior to both PPAs and Electricity Derivative market instruments.
- CfDs help in the integration of RE sources through the market.

CfDs are financial contracts: question of regulatory jurisdiction

- CfDs derive its value from the reference price of an underlying asset therefore these are by nature derivative contracts.
- Electricity is a Notified commodity under section 13 of the SCRA 1956.
- There is no delivery involved through this contract and therefore CfDs are not Non-Transferable Specific Delivery contract.
- As such, CfDs for renewable electricity can be transacted on a platform approved by SEBI (Commodity Exchanges) or on Power Exchanges regulated by CERC after consent from SEBI.
- Section 13 of SCRA 1956 restricts any type of contract, other than those transacted by a Commodity Exchange, therefore bilateral CfD contracts on renewable electricity are not permitted; however, Government can grant exemption.
- However, SCRA doesn't apply to Government or RBI or a Corporation constituted by the Government for the purpose (viz. SECI).

Basic structure of CfDs (1/2)

- Underlying: A renewable asset:
 - Could be differentiated by technology.
- Parties to the contract:
 - Renewable asset owner (seller of CfDs).
 - Entity guaranteeing the settlement of difference (buyer), which could be:
 - A government organization; or
 - Entity responsible to meet renewable obligation; or
 - Socialized to all grid-connected entities.
- Settlement price (strike price): price as agreed between parties, typically derived through an auction, if renewable assets are differentiated by technology there would be separate auctions.
- Reference Price: Price in the power market (typically day ahead market).
 - In case of settlement longer than the time block than averaging process would entail some basis risk.

Basic structure of CfDs (2/2)

- Settlement Period:
 - Each Time block: No basis risk.
 - Monthly: Better for settlement however creates basis risk depending upon averaging method for settlement.
 - Yearly: too long settlement period.
- Settlement quantum:
 - Based on the installed capacity: no incentive to generate electricity.
 - Based on energy delivered: arbitrage with other market segments possible (buying in another segment to meet delivery obligation), settlement linked with metering.
 - Based on the quantity scheduled: easier settlement, risk of arbitrage remains.
 - No linkage with capacity or delivery: Financial in nature, may defeat renewable integration objective.

What are design choices (1/2)

- Technology-specific or Technology agnostic.
- Settlement duration:
 - Time block wise: who different it would be from FIT mechanism
 - Weekly/ Monthly/ quarterly/ yearly
- Strike price floor and cap: CfD to adjust payments only outside the corridor.
- No support if prices are below a threshold, say negative prices: when prices are too low, the system doesn't need more supplies, system requires that plants should not generating electricity during such periods.
- Capping CfD support.
- Claw back: Claw-back means recovery of the amount from the RE generator if the reference price is more than the strike price:
 - Full claw back
 - Partial claw back

What are design choices (2/2)

- Providing exit to the sellers from the CfD contract.
- Dynamic strike price:
 - Adjusted based on inflation etc
 - Resetting strike prices periodically through an auction for all assets
- Maximizing system value viz a viz project value:
 - Adjusting support for plants based on system requirements (locational or time of production)
- Counterparty to the contract:
 - A Government organisation
 - Participants
 - Socialising amongst all grid-connected entities viz charge it along with transmission charges similar to Competitive Transition Charges (CTC) in the US
- Allowing CfDs with a mandate to participate in the Power Exchanges for sell of electricity or other avenues could also be explored by the investor.

How would CfDs interact with other schemes

- CfDs and BESS
 - As investment in renewable would get derisked through CfD, less incentive to invest in BESS
 - Will it mean supporting both CfD as well as BESS, putting an additional burden
- Renewable Purchase Obligation (or Renewable Generation Obligation)
 - CfDs be supported through RPO/ RGO
 - UK introduced CfDs in place of RO
 - How will it differ from RECs, which is not a preferred choice since buyers like to purchase renewable energy rather than a certificate

Who should fund deficits in CfD program and how to use surpluses

- Government Organization

- Pros

- To meet policy objectives
 - Provides certainty to such a long-term scheme
 - Socialisation over a larger economy rather than a sector

- Cons

- Market distortion
 - Need for budgetary support

- Participants

- Pros

- Lesser distortion in the market
 - No need for budgetary support

- Cons

- Discoms (and some State governments) are under financial stress and may not be able to arrange funds,
 - Achieving policy objectives would be market-dependent
 - Direct impact on consumer prices

What could be perverse incentives to the participants

- The possibility of any perverse incentives would depend upon the design of the scheme.
- In case the floor is not set (up to which CfD payments would be allowed), there would be an incentive to continue generation, even when it is not required.
- Is it possible to on one hand use CfD to stabilize revenues during low prices, and such low-priced power is used in BESS which again might be getting some capital support.
- Issue of the value of the assets for the system vs. maximizing value for the investors e.g generation in high wind zones maximises investors' value vs. low wind zones where the system requires investment.

Changes required in the Power Market Design

- Volume in the DAM/ RTM, may be restrictive to bring new capacity through this scheme:
 - An increase in volumes in DAM/ RTM would stabilize prices and help the integration of the renewables.
 - Reducing fragmentation of the volume and bringing all possible volumes to one segment.
- Issue of reference price:
 - Three exchanges may provide different prices and which needs to be taken as a reference would become a question.
- Coupling of exchanges and their integration with SCED/ SCUC would serve both of the above purposes.
- Review to introduce negative prices and timing for this change.

Some Examples of Payback and Clawback

Time-block wise

- Strike Price decided: INR 3.5 per unit

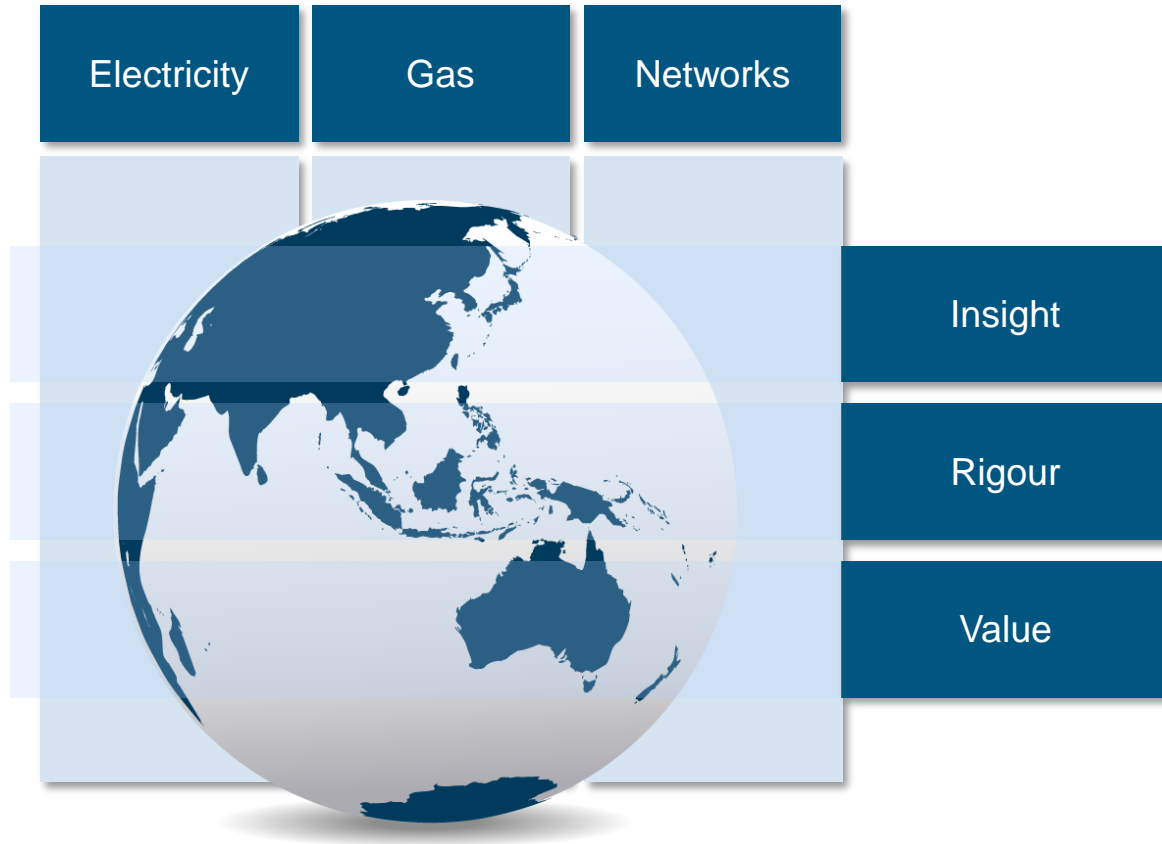
TB	Strike Price	Reference Price	CfD Payout (-)/ Payin (+)
1	3.5	2	-1.5
2	3.5	2.5	-1
3	3.5	2.5	-1
4	3.5	3	-0.5
5	3.5	3	-0.5
6	3.5	4	0.5
7	3.5	5	1.5
8	3.5	5	1.5
9	3.5	6	2.5
10	3.5	6	2.5

Monthly

- Strike Price decided: INR 3.5 per unit

Days	Strike Price	Reference Price	CfD Payout (-)/ Payin (+)
1	3.5	2	
2	3.5	2.5	
3	3.5	2.5	
4	3.5	3	
5	3.5	3	
6	3.5	4	
7	3.5	5	
8	3.5	5	
9	3.5	6	
10	3.5	6	
Average	3.5	3.9	0.4

End



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