

# Market Code launch

Presentation of international experience on market reforms and models

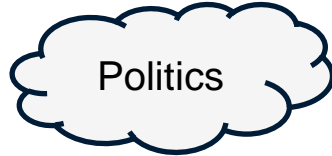


**NECOM**  
NATIONAL  
ENERGY CRISIS  
COMMITTEE

# A market reform is a process and not a project

.... And it needs countries to be agile - support common market reform as well as individual strategies

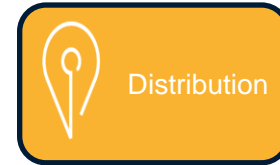
National market reform (what is it?)



System Operator



Market Operator



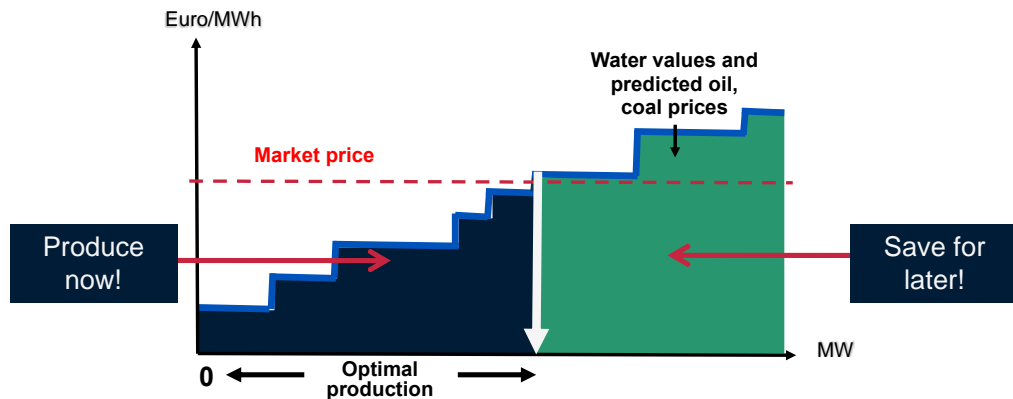
Bilateral trading (unregulated...)



# In a competitive wholesale market – What are we trying to achieve?

At a high level it is easy...

## To Produce or not to Produce



## Market Principle



Price



The fuel value is the opportunity cost of producing now compared with producing in the future?

# There is always a balance to be found....

...between competitive market with few limitations and a constrained real-time operation of the power system

## The economist wants:

- Liquid markets
- Large trading area with no/few physical constraints
- Standardised products
- Large number of competing buyers and sellers
- No differentiation between the different buyers and sellers



## The engineers wants:

- Market representation of the underlying physical power system
- Representative trading areas with physical constraints
- Customized products for the physical needs
- Deep knowledge of the sellers and buyers capabilities

The power market concept needs to take this in account in all market timeframes

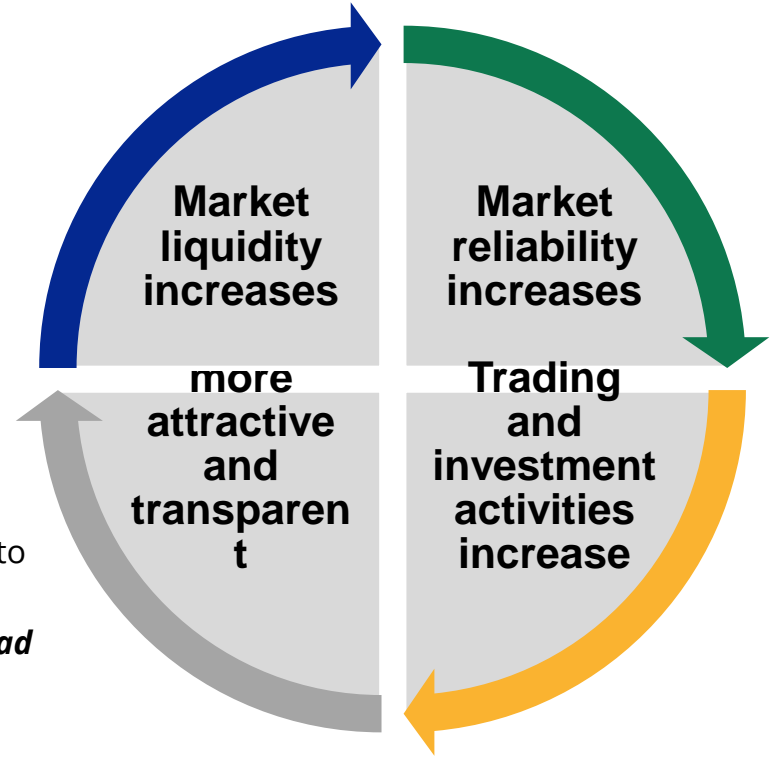
# A Market Driven by Planning

- The electricity market is driven by planning where the total assets and commitments must be balanced for every hour.
  - A buyer needs to estimate how much energy needed to meet customer demand for the next delivery day and the price to pay for this electricity volume.
  - The seller as the owner of power plants needs to decide how much he can deliver and at what price.
  - This has to be done based on the current market and electricity situation with a view to the company's short- and long-term strategy.

# The stepwise market implementation

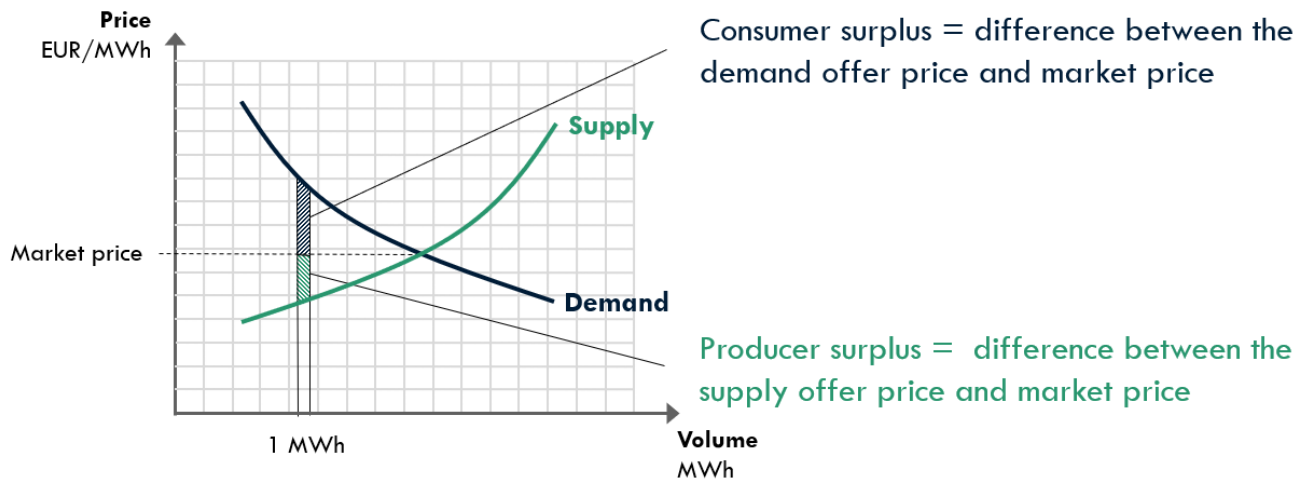
## Main targets:

1. Economic-driven price signals
2. Regain trust in the system
3. Support the energy transition and the technology disruption
  - moving towards **unbundled, cost-reflective tariffs** to better reflect electricity services
  - .. while increasing **security of supply** and **reduce load shedding**



# Maximizing social economic welfare

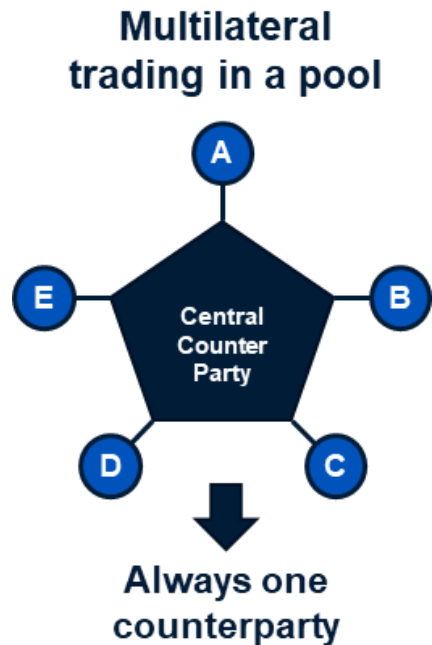
The area between the buy and sell curves represent the total economic surplus of buyers and sellers for each hour.



Optimising the seller and buyer surplus (while taking into account potential limitations in both orders and the transmission infrastructure) results in the maximum overall economic welfare.

## Benefits of trading in an organised market

- The market is a tool to enable flow of electricity in the economically best direction (from low price towards high price)
- Trading through a market makes the world simpler for utilities
- Your only concern is: What are my marginal cost for generation and willingness to pay for demand?
- Let the market figure out the optimal use of resources.
- You as market member are not involved in the cross-border agreements/arrangements – you are given access to a bigger market and liquidity through the pool.
- The power pools is the Central Counter Party
- The Central Counter Party removes your counterparty risk.
- Social economic welfare maximization
- Optimal utilization of assets





# How to meet the new market requirements

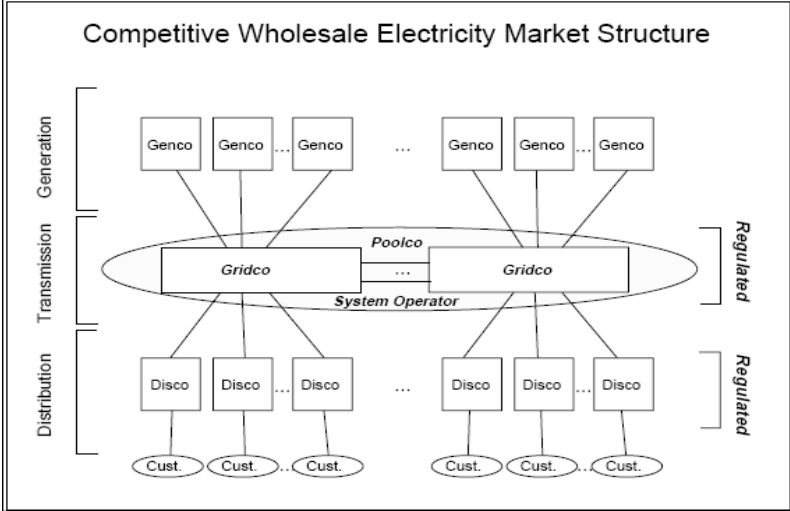
... But this is not the only path...

Characteristics	Monopoly	Single Buyer	Wholesale Competition	Retail Competition
<b>Definition</b>	<b>Monopoly at all levels</b>	<b>Competition in Generation</b>	<b>Competition in Generation</b>	<b>Competition in Generation</b>
<b>Competing Generators</b>	No	Yes	Yes	Yes
<b>Choice for retailers</b>	No	No	Yes	Yes
<b>Choice for consumers</b>	No	No	No	Yes

Increasing trend from monopoly towards fully competitive markets presents new requirements



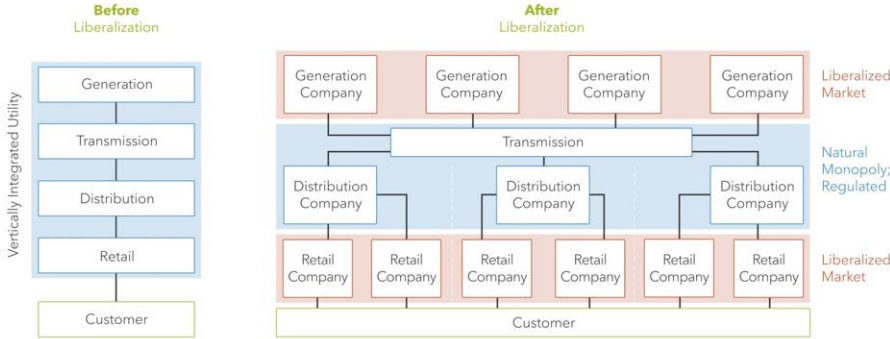
# Generic best practice on Market Structure



Source: Hogan, 1998

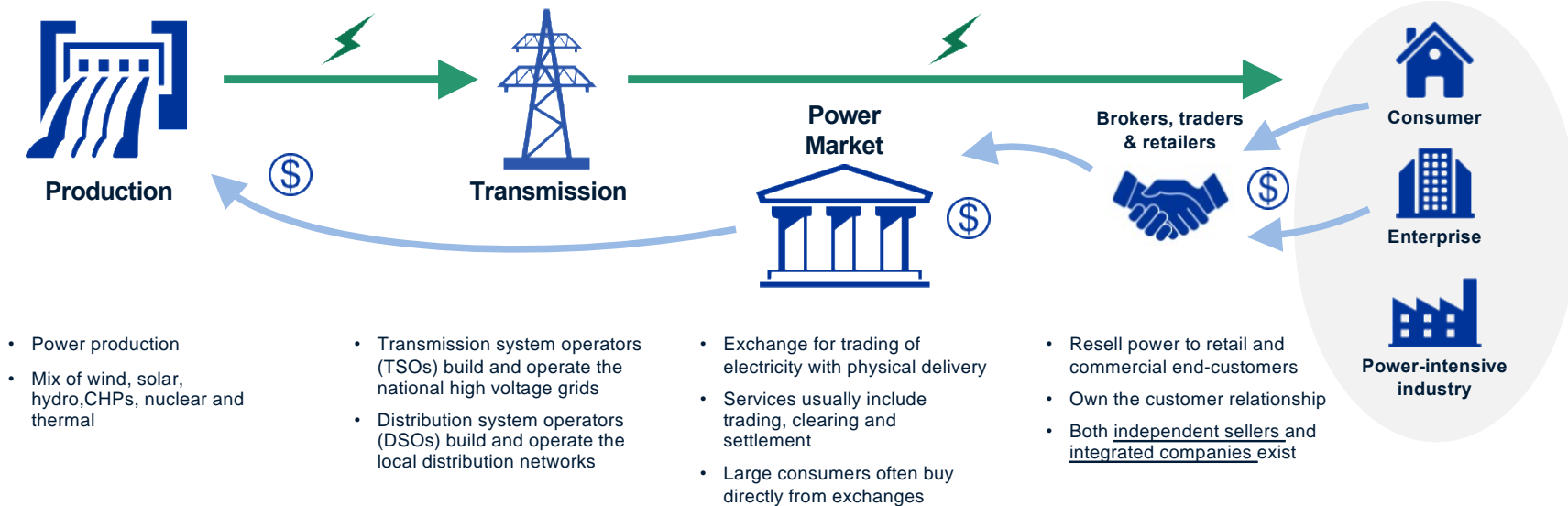
The starting point

## Liberalization of Energy Markets

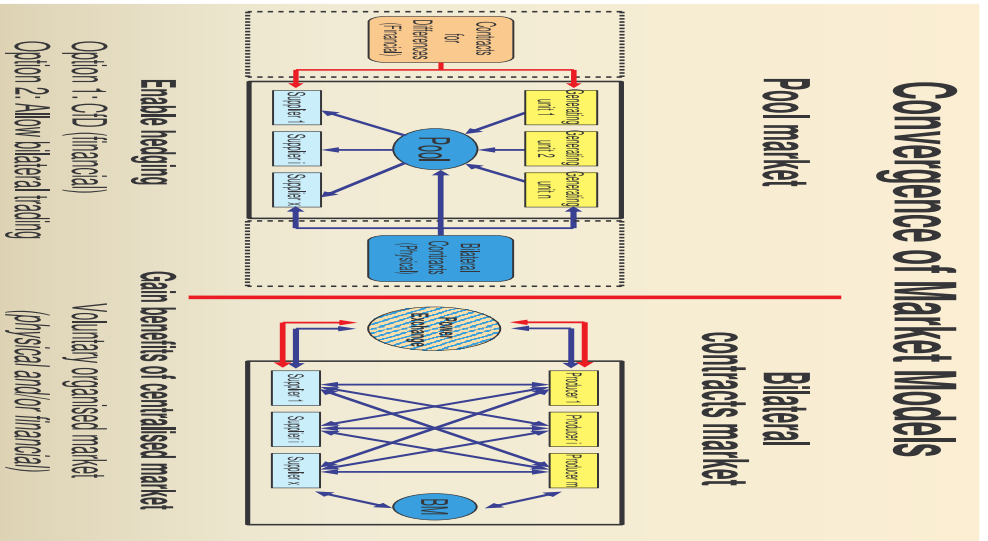


The best practice

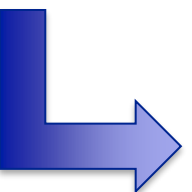
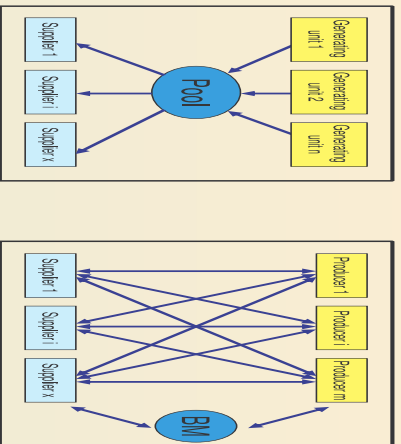
# Overview of the electricity value chain



# Convergence of Market Models




## Pool vs. Bilateral Contracts Market



- Pool**
- Centralized scheduling ⇌ Decentralized scheduling
  - Unit-based ⇌ Company-based
  - Unidirectional exchanges ⇌ Bidirectional trade
  - Integrated balancing ⇌ Separate balancing mechanism

# Historical evolution of market models

# In allocating roles between central bodies and market participants, market designs are often referred to as 'centralised' or 'de-centralised'

	Features associated with 'Centralisation'	Trend 	Features associated with 'De-Centralisation'
Physical	TSO constructs dispatch schedule and issues dispatch instructions to fulfil it	Central dispatch vs self dispatch	Parties self-dispatch, with TSO performing residual dispatch to adjust market positions
	TSO makes unit commitment decisions to turn plant on and off	Central commitment vs self commitment	Parties take their own unit commitment (start/stop) decisions for their units
	Nodal pricing within an ISO area !!!	Locational vs non-locational	Zonal or national pricing over a very wide geographical area
Markets	Single marketplace option (for particular time frame)	Single vs multiple market (algorithm)	Multiple competing marketplace options (for particular time frame)
	Designated marketplaces are mandatory or exclusive marketplaces for physical trade	Exclusive vs non-exclusive	Flexibility to choose between different markets (most/all timeframes)
	Gross market (principally to settle positive volumes)	Gross or net market	Net (residual) market (principally to settle delta volumes)
	Designated trading windows with dead zones	Discrete vs continuous trading	Continuous trading opportunities without interruption
	Trades priced at common auction clearing price	Pay-as-clear vs pay-as-bid	Trade by trade specific pricing

Source: AFRY Management Consulting

# Capacity mechanisms – aiming to make participants “whole”

Capacity mechanisms are closely interlinked with the whole market concept:

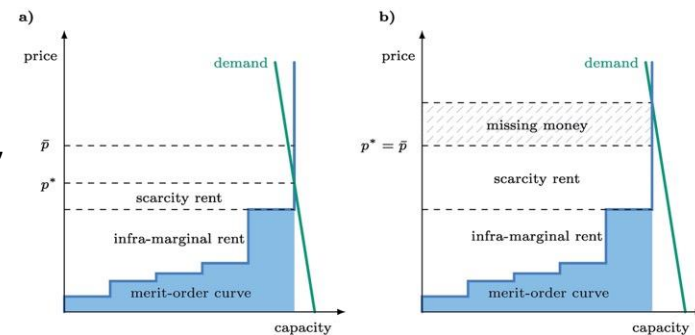
***Are the market design for electricity (physical incl bilaterals, DA, ID and BM) delivering sufficient income for (especially generators)?***

To answer this, there are many influences:

- Price limits
- Allowing proper scarcity pricing (avoiding the “missing money” problem\*)
- Legacy costs
- Customers willingness (or ability) to pay

Therefore, there is no generic answer to the question: “Do we need Capacity payments?” – it all comes down to the overall status in the power sector

***However, a big discussion is: How to do this in a manner that is not “state aid” or giving preferential treatment of parts of the sector?***



# A simplified example of the difference

In theory, the cost (and income) should be the same

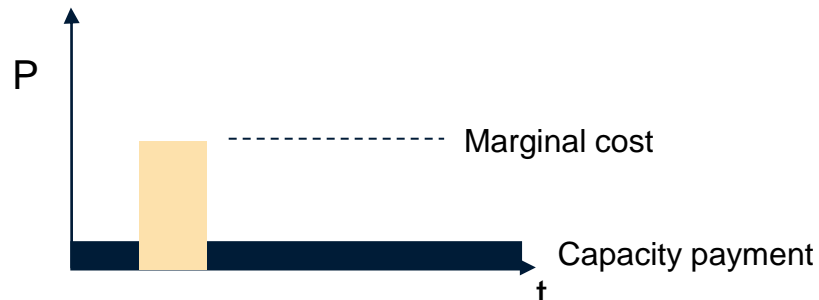
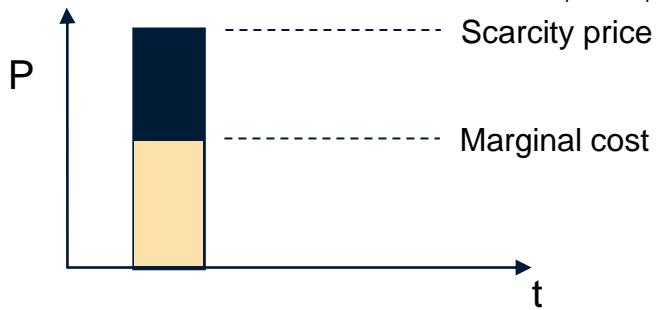
In Germany, 10 years ago a normal gas-fired generating unit would run between 600 and 1000 hours a year.

With increased penetration of VRE in Germany, the gas-fired power plant is now acting as a flexible peaking plant that will only be used 60-100 hours a year;

The income that the gas-fired unit in Germany would need to cover its annual total costs would therefore be 10 times higher than before.

In this circumstance, the market design can solve this in two main ways:

- In an energy-only market with scarcity pricing, you would allow the gas-fired unit to bid a price 10 times higher than before and when it is needed, it will get a sufficient price to cover its costs. The effect of this is that prices will go high in the events when it is needed (and it needs to be allowed to) and this will affect all market participants. However, at the same time, this will give a good price signal for others to try to offer this capacity at a lower price and thereby competition will drive efficiency;
- Another way is to implement a Capacity Remuneration Mechanism where the gas-fired unit will get a separate payment to be available and offer lower prices in the market. This would again make the business case for the gas-unit still fine. However, there are several other drawbacks with this:
  - First is – how shall the price of the capacity mechanism be established?
  - Who shall be eligible for it?
  - How do you control that they really are available when needed?
  - This will distort the market as these units eligible for this, will have a competitive advantage in the market and thereby be chosen before cheaper resources.
  - Last, but not least: It will dampen the prices in the market and make the prices established not reflecting the real cost of the system.



# SPV supporting the transitions in Market reforms – Based on Contract for Difference regime(s)

## What is the measure?

- Replacement of existing Power Purchase Agreements (PPAs) and Universal Service Supply (USS) arrangements with Contracts for Difference (CfD's)
- Implementing RES support while supporting the market
- Might be a solution for potential stranded assets
- Generally - a vehicle for all “non-market based solutions” and also a transitory vehicle
- A well-known tool to manage both transitions as well as longer-lasting support schemes.

## Why?

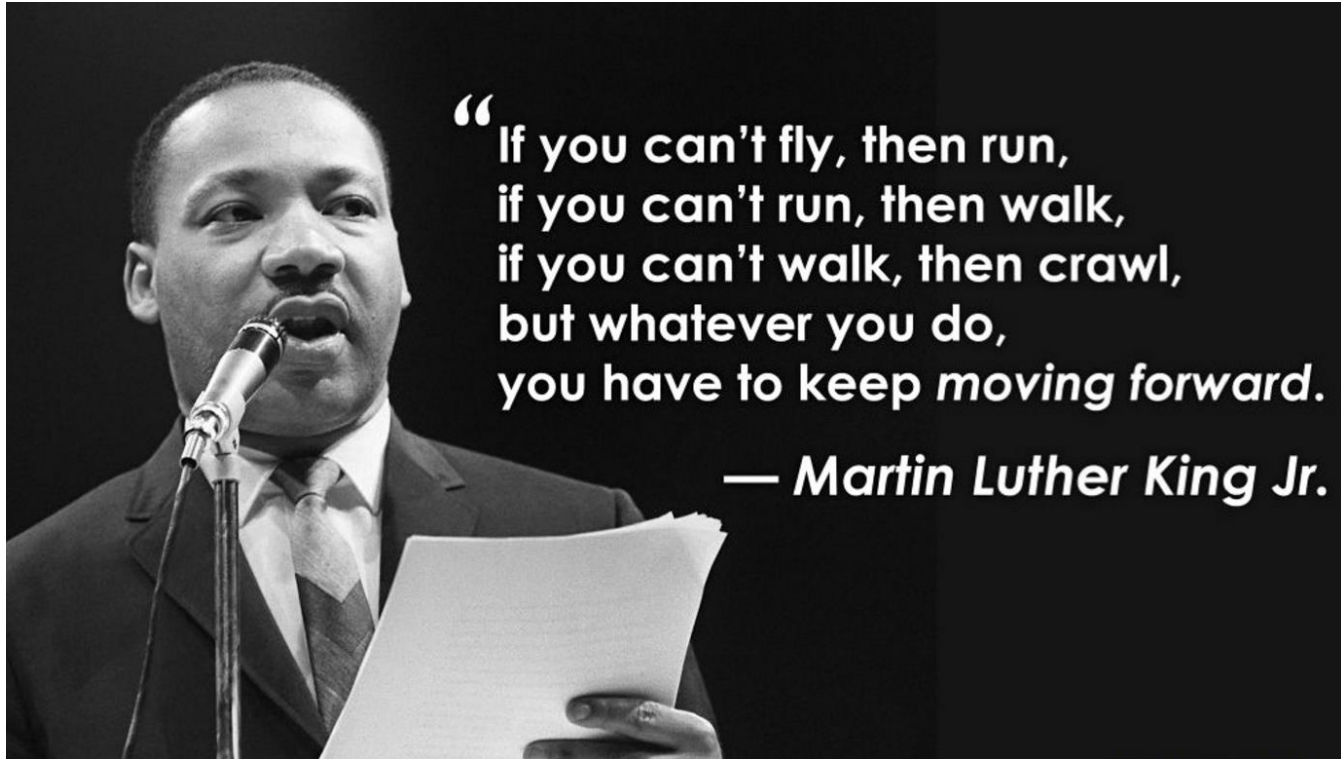
- Protection of end-consumers from overpriced electricity.
- Increased market liquidity.
- Transparency of true underlying price of electricity.
- Reduced exposure to market volatility for the party receiving the CfD than would otherwise be the case.
- No financial detriment caused by switch from PPAs to CfDs.

## Which parties can be affected?

- Market participants previously on a bilateral power purchase agreement (PPA)
- Market participants with a Public Service Obligation for Universal Service Supply (USS)
- All market participants who have independently entered into a private PPA



Words of wisdom: (my favorite market reform quote):



“If you can't fly, then run,  
if you can't run, then walk,  
if you can't walk, then crawl,  
but whatever you do,  
you have to keep *moving forward*.”

— *Martin Luther King Jr.*

THANK YOU  
FOR YOUR ATTENTION!

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