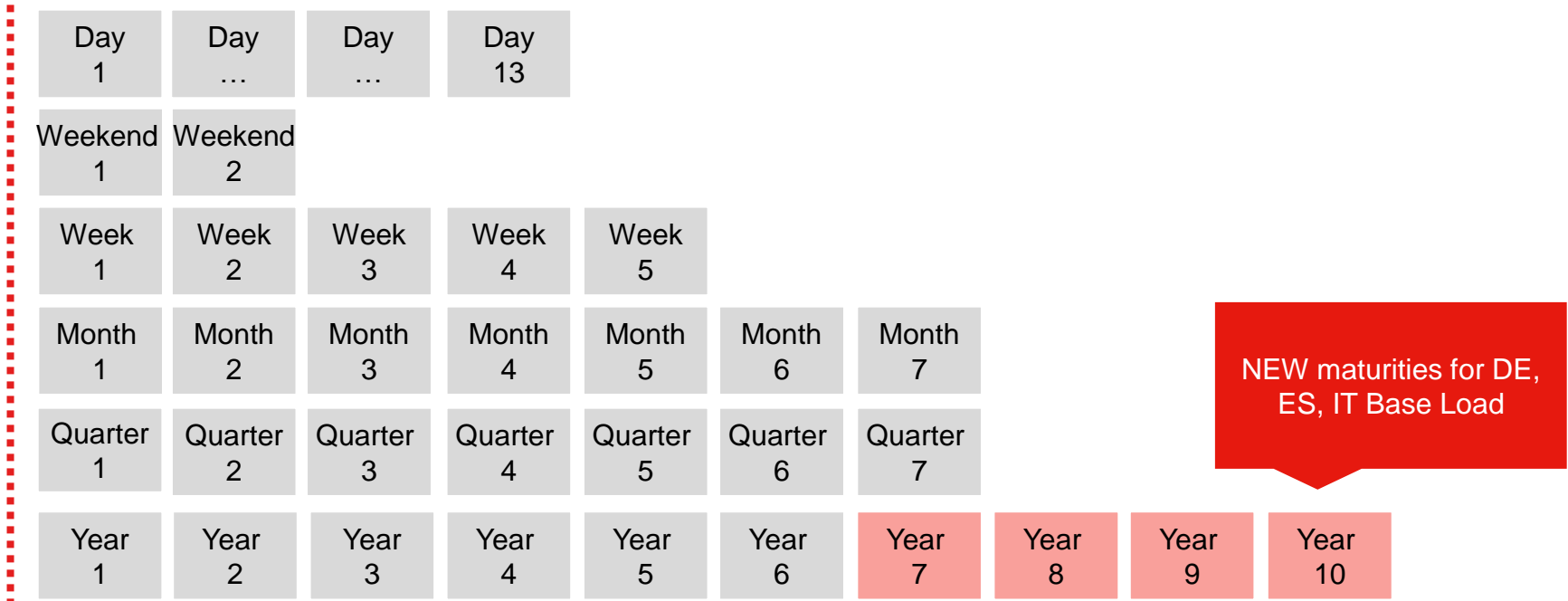


Cal+10 and the future of renewable energy risk management

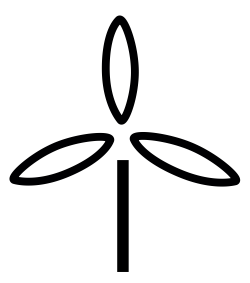
EEX Power Derivatives Markets and Cal+10

- EEX **extended Base Load Yearly Futures to Cal+10** on 27 September 2021 in markets with high potential of PPA activity: **Spain, Germany and Italy**, to facilitate long-term hedging and more PPA development.
- This extends the standard Power product setup of EEX.*
- Each product has as its underlying the Spot index for the respective market (ie. for German power, the day-ahead price for the AMPRION control zone).

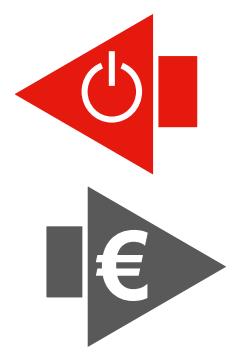


How are EEX Members active in PPAs?

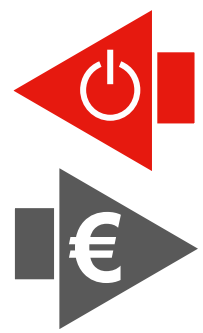
RE Developers sell Power via Long-Term PPAs



EEX Members buy Power via Long-Term PPAs and build RE assets



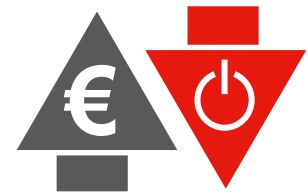
EEX Members provide balancing services on Spot & hedge via Futures



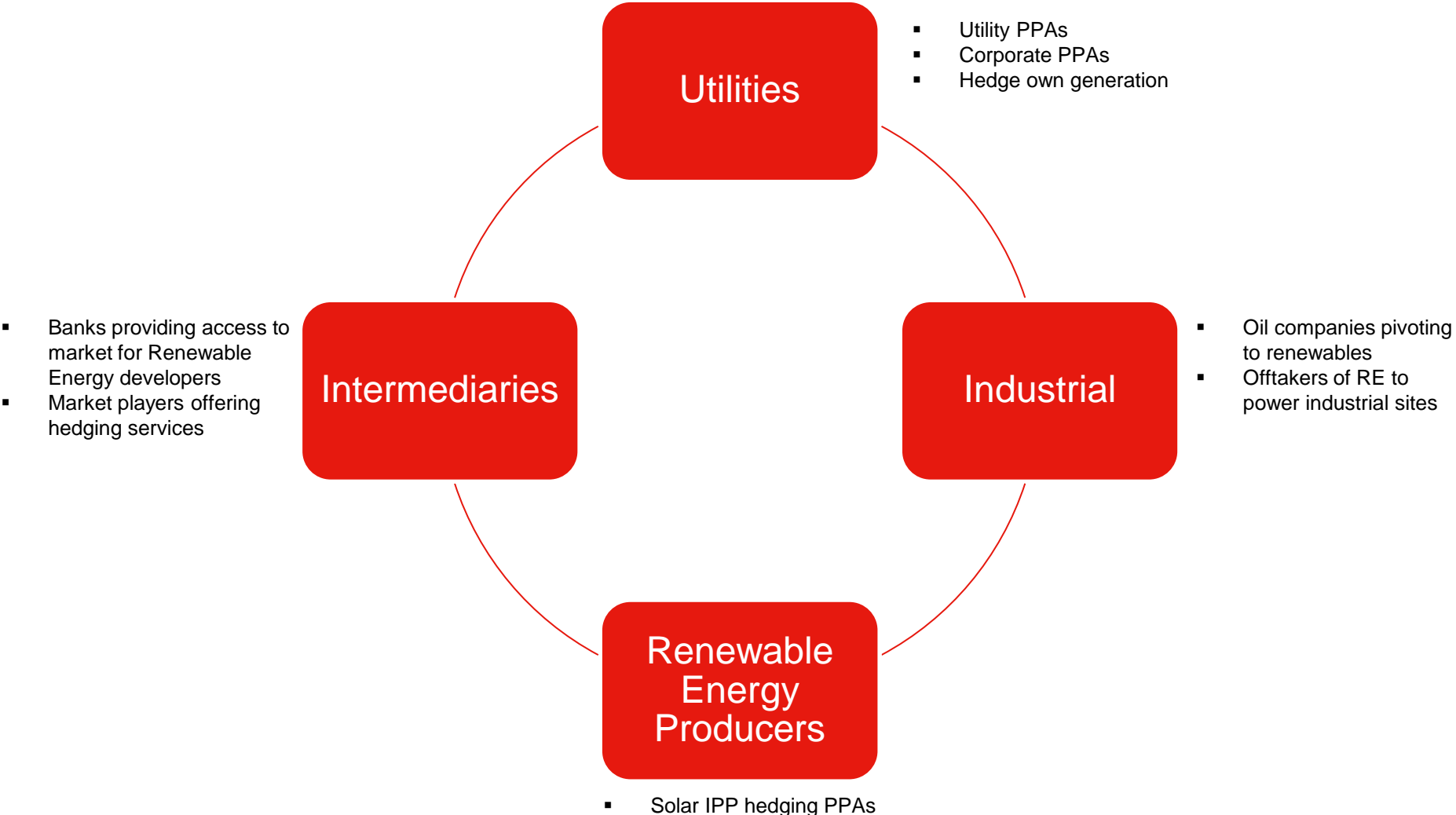
Banks provide financing once PPA is in place



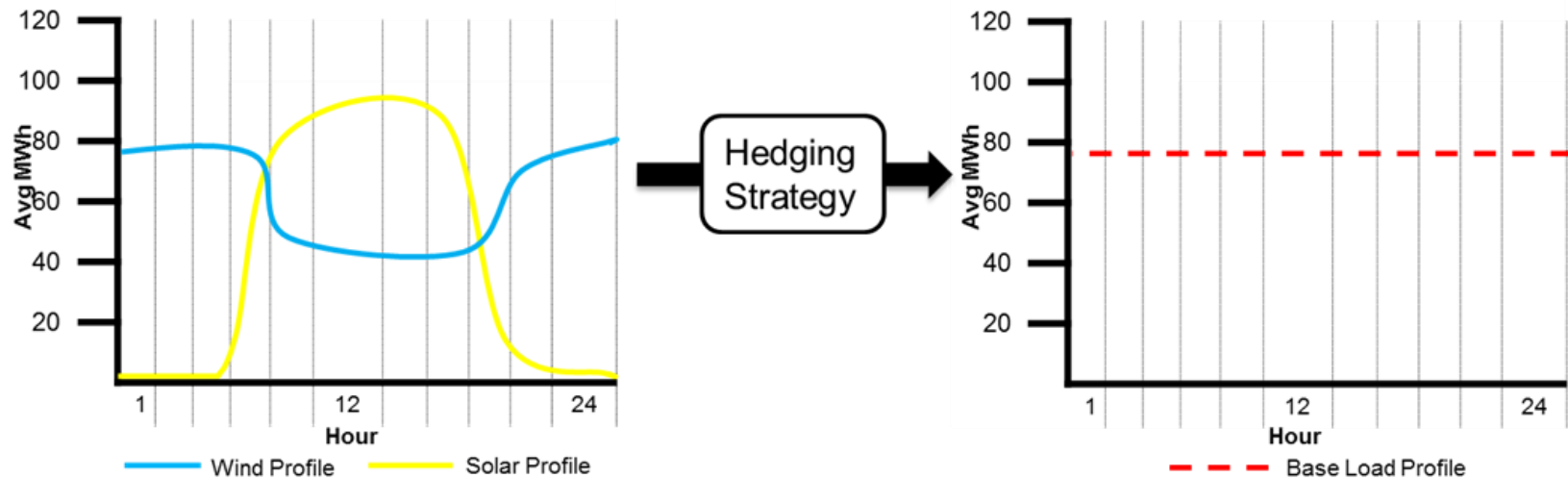
EEX Members sell Power via LT Corporate PPAs



Who are the PPA Hedgers on EEX?



Managing Renewable Energy Price Risk with Base Futures requires a Hedging Strategy



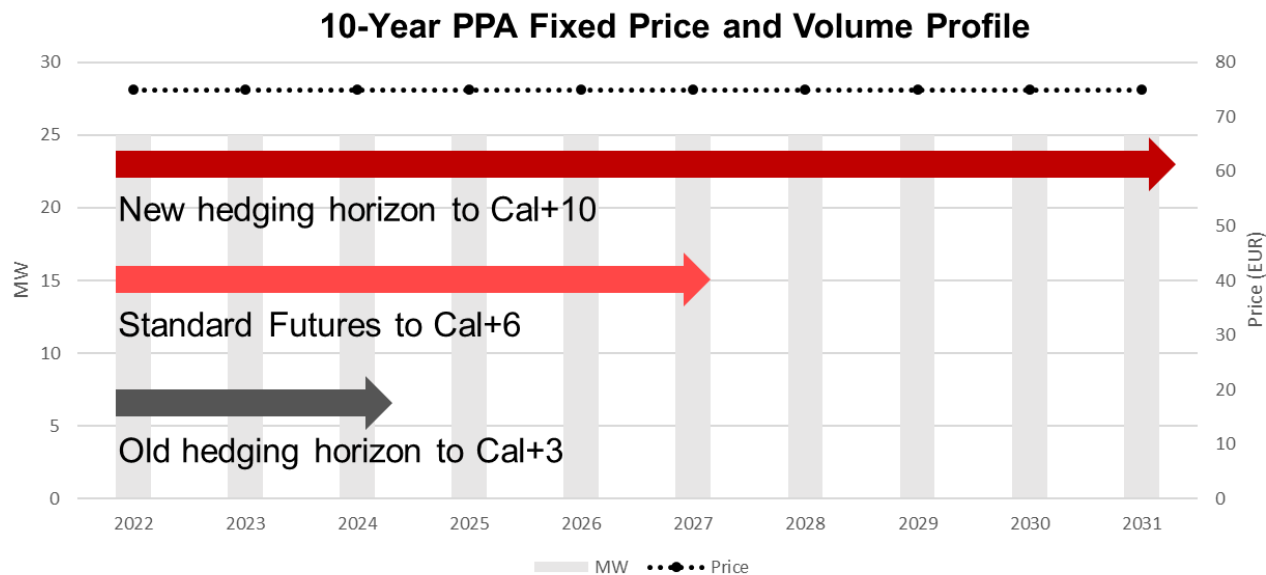
- Base Futures are a **best-fit product** and attract the most liquidity, creating a **strong price signal** and opportunities for trading at fair market prices
- To use the Base Futures to manage the risk of a wind or solar profile, a **Hedging Strategy needs to be designed** to translate the variable generation profile into a constant Base load profile
- Different Hedging Strategies can be employed, such as a **value-neutral hedge**

Long-Term Hedging on EEX

- Since 29th May 2018, **48** long-term hedges of have been registered OTC in **Spanish Power**, with a total volume of **18 TWh**. This is equivalent to **3%** of the electricity consumption of Germany.
- Four long-term hedges have been registered in **Italian Power** with a total volume of **0.26 TWh**; the Italian PPA market is poised for further growth in the coming years as costs for solar power projects are highly competitive.
- The first **5 MW** long-term hedge was cleared in Polish Power on 18 December 2019.
The Polish deal proves the value for **multinational utilities with renewable energy assets across the EU** to hedge long-term on EEX Power Futures and offload their PPA risk onto ECC, even in relatively **illiquid markets**.
- **Long-term hedging in German Power** is expected to rise as assets fall out of EEG subsidies and the German government is preparing a legal framework for PPAs. German Power can also be a **proxy hedge** ie. for offshore wind developments in Denmark.

Extension to Cal+10 in German, Spanish and Italian Power

- Cal+10 reflects the current shift in the market from the old hedging horizon to Cal+3 for conventional power generation to the new long-term hedging demand for renewable energy.
- A settlement price curve to Cal+10 is published daily on the EEX website for DE, ES and IT Power, bringing more **price transparency** to PPAs and renewable energy asset valuations.
- PPA players can now benefit from **long-term price risk hedging** and **counterparty risk management** by the ECC.



Example 1: Long-Term Hedge on Spanish Power

Trade Date	Product	Expiry Year	Expiry Month	Trade Price	Initial Margin per Contract	Lots (MW)	Initial Margin (in EUR)	Trade Volume (in MWh)	Notional Value
04/15/2021	Spanish Power Base Year	2023	12	41.70 €	11,563 €	2	23,126 €	17,520	730,584 €
	Spanish Power Base Year	2024	12	41.70 €	11,507 €	2	23,014 €	17,568	732,586 €
	Spanish Power Base Year	2025	12	41.70 €	14,454 €	2	28,908 €	17,520	730,584 €
	Spanish Power Base Year	2026	12	41.70 €	15,855 €	2	31,710 €	17,520	730,584 €
								106,758 €	70,128
Initial Margin in % of Notional Value									3.65%

- Long-term hedges are primarily bilaterally negotiated then registered for clearing at a flat price and flat volume.
- This deal represents a total trading fee cost of **876.60 EUR** per counterparty (EEX & ECC trading fees = 0.0125 EUR/MWh)
- Initial margin requirements for long-term hedges are generally stable at **3 to 7%** in terms of notional value, but are dependent on recent volatility in the respective contracts and market.
- Initial margin is a form of collateral; accepted collateral can vary according to the clearing bank.

Example 2: Long-Term Hedge on Spanish Power

Trade Date	Product	Expiry Year	Expiry Month	Trade Price	Initial Margin per Contract	Lots (MW)	Initial Margin (in EUR)	Trade Volume (in MWh)	Notional Value	
10/5/2021	Spanish Power Base Year	2028	12	---	54,285 €	10	542,850 €	87,840	3,987,936 €	
	Spanish Power Base Year	2029	12	---	55,188 €	10	551,880 €	87,600	3,955,140 €	
								1,094,730 €	175,440	7,943,076 €
									Initial Margin in % of Notional Value	13.78%

- These were the first trades registered in EEX's new long-term contracts for Spanish Power; here, **Cal+7** and **Cal+8** were traded.
- The initial margin requirement was higher than average for two reasons: first due to the long-term contracts being relatively illiquid, second due to a recent "market shock" event in the European and Spanish power markets.
- Still, market participants benefit from counterparty credit risk in volatile market environments, also for long-term hedging.

Role of the Exchange in the PPA Market

Price Transparency

- EEX's market prices provide reliable price references.
- Project developers and buyers of PPAs can assess their valuations against EEX wholesale prices.

Price Risk Management

- Manage power price risk for renewable energy assets.
- Reduce the overall risk exposure for the largest risk element in RE portfolios.

Counterparty Risk Management

- Trading and hedging on EEX alleviates counterparty risk for trading participants.
- This is especially important for long-term risk management.

Enabler of Renewable Energy Growth

- Price and counterparty risk is offloaded onto the clearing house, freeing internal risk capacity within trading participants.
- This enables them to take on more PPAs and facilitate growth of renewable energy capacity in Europe.

Thank you!

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