

Renewable Energy and PPAs: Hedging with EEX Power Futures

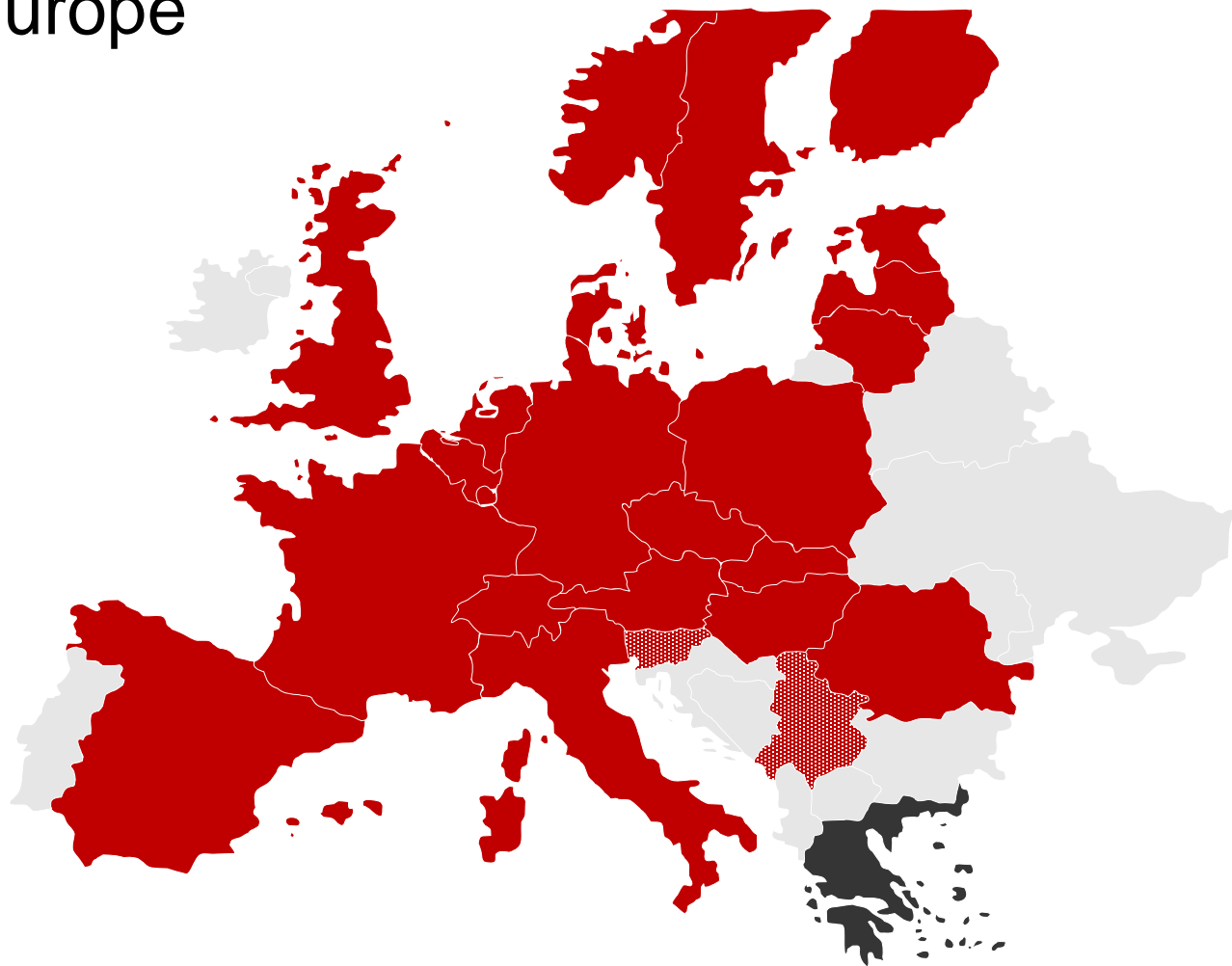
FIA EU Operations Committee, London, 18 September 2019
Viviana Ciancibello, Senior Business Developer, EEX

EEX Power Markets house the benchmark price references for Europe

EEX connects 264 trading participants from 28 countries:

- | | |
|--------------------------|--------------------------|
| 8 Austria | 1 Luxembourg |
| 1 Belgium | 10 Netherlands |
| 1 Bulgaria | 6 Norway |
| 1 Croatia | 10 Poland |
| 20 Czech Republic | 1 Portugal |
| 7 Denmark | 3 Romania |
| 2 Finland | 4 Slovakia |
| 13 France | 4 Slovenia |
| 57 Germany | 14 Spain |
| 2 Greece | 3 Sweden |
| 3 Hungary | 20 Switzerland |
| 1 Ireland | 33 United Kingdom |
| 34 Italy | |

5 non-European participants
Canada, Cayman Islands, USA








- Exchange traded EEX Power Futures
- EEX Trade Registration Services for Power Futures
- New Market Area

* As of 31 May 2018

ECC Updates

Migration from Eurex Classic to C7 – Timeline 2019

Timeline	Changes	Expected impact on Members
 01 Apr 2019	Trade Entry Service (TES) Migration <ul style="list-style-type: none"> TES is moved to T7, affecting Straight-Through Processing 	<ul style="list-style-type: none"> Usage of T7 GUI for maintenance of STP Auto-Approval rules 
 12 Aug 2019	C7 Release 5.0 <ul style="list-style-type: none"> Position & Transaction Mgmt Implementation of ECC specific clearing services Availability of C7 platform services and functionalities 	<ul style="list-style-type: none"> Roll-out of C7 GUI, FIXML, Reports to CMs, NCMs, and Vendors  Simplified Outsourcing EMIR Trade Reporting Changes Migration of EUA Futures Settlement to SMSS (Payments) – like BOM
 18 Nov 2019	C7 Release 6.0 <ul style="list-style-type: none"> Decommissioning of EUREX Classic @X-tract GUI Migration of Product Assignments Decommissioning of Transaction Size Limits (TSLs) 	<ul style="list-style-type: none"> Adoption of new T7 limits (daily position limits) Mandatory roll-out of T7 Clearing Member GUI for trading limits maintenance Further smaller changes to FIXML and Reports

CONFIRMED

Simulation planned from 16 September 2019 onwards

ECC Updates

Brexit – Clearing Member Preparations

The likeliness of a no-deal Brexit on 31 October 2019 is increasing. ECC has recommended the following actions for its CMs:

In case of UK entities:

- A written confirmation of all the necessary licences or exemptions in place to continue offering ECC-related services to your clients in a no-deal scenario
- The necessary infrastructure in place to fulfil ECC's payment requirements > access to Target2 account

In case of new EU27 entities:

- The transfer of clients from the UK entity to the new EU27 entity must be completed duly in advance (at least 3 weeks) and an agreement with ECC on a firm transfer date must be done

ECC Updates

Brexit – EEX Group's Preparations

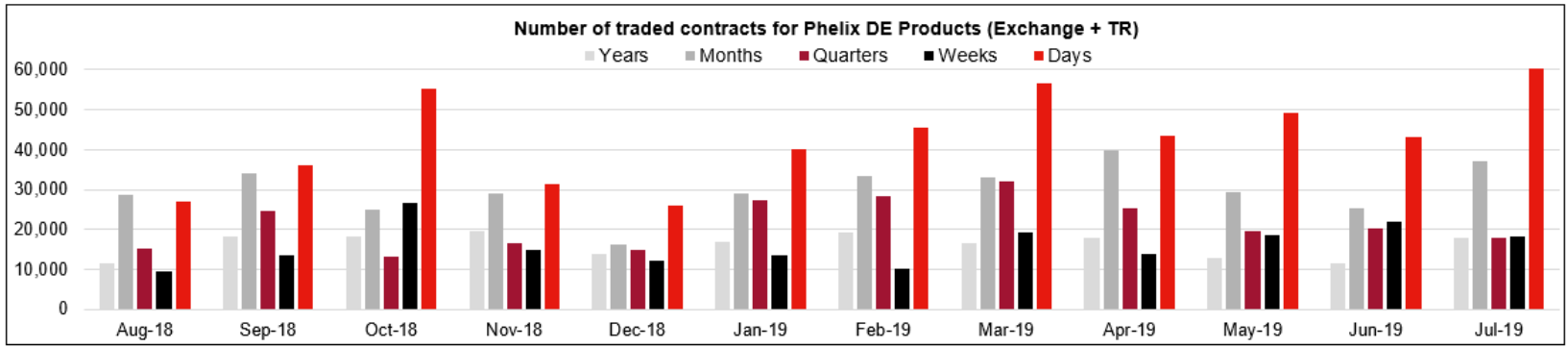
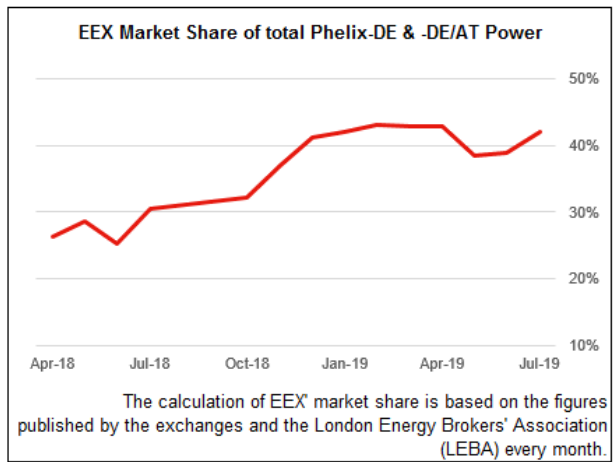
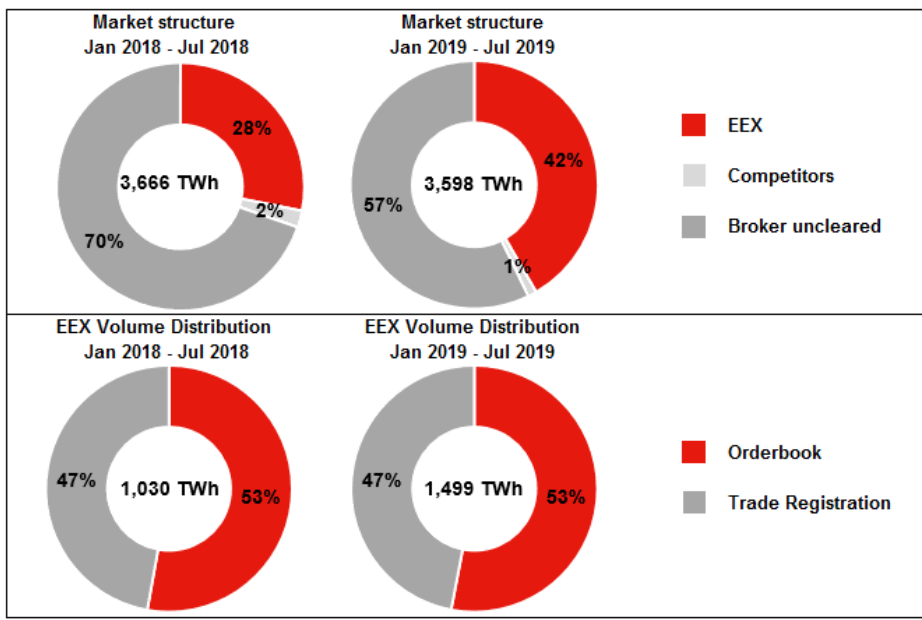
Relevant for UK members to maintain access to EEX and Powernext derivatives trading services:

- ☑ EEX and Powernext became *Recognised Overseas Investment Exchanges (ROIE)*

Relevant for UK Clearing Members to maintain access to ECC clearing services:

- ☑ ECC is recognized in the context of the temporary recognition regime by the Bank of England.
- ☑ ECC obtained a legal opinion on enforceability of its Clearing Conditions in the UK.

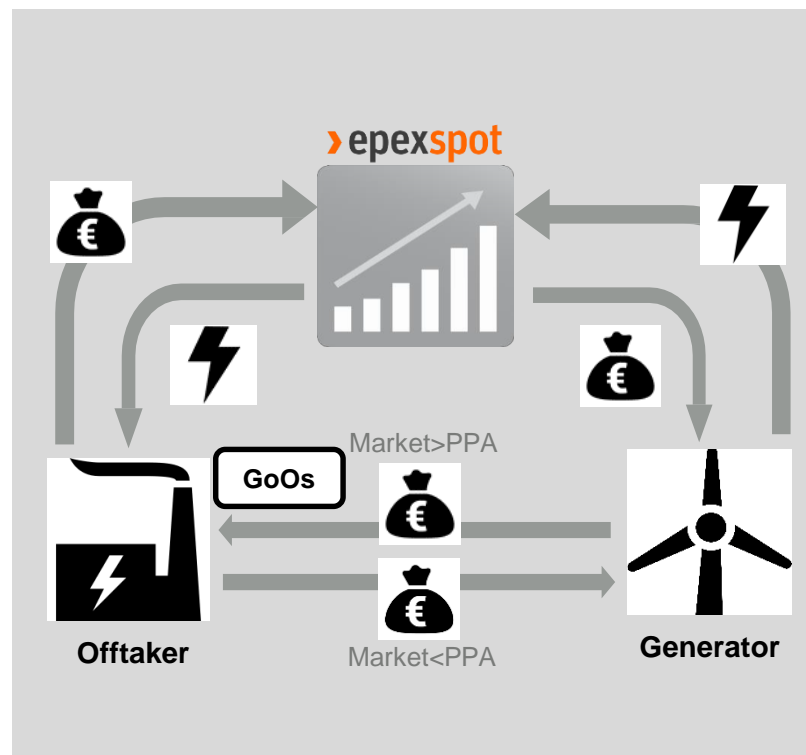
EEX Phelix (DE) Power Futures continues to grow in liquidity and market depth



Financial / Synthetic PPAs create Spot Price Risk Exposure

Financial PPAs as a first guarantee of revenues for the Generator and long-term price certainty for the Offtaker; but physical flows are executed on the Spot market

Financial / Synthetic PPA

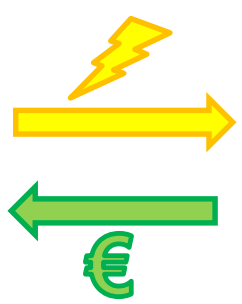
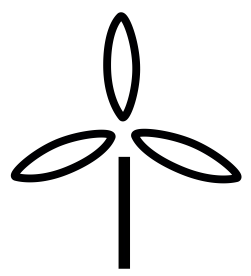


- Future-based agreement from 10 up to 20+ years
- **Production is sold at the Spot market**, offtaker procures via wholesale market, no physical delivery via balancing accounts
- Different options for structuring such as CfDs, Options, Index-based
- **In combination with GoOs** to qualify as “green power” as no direct access to renewable power from a certain generator

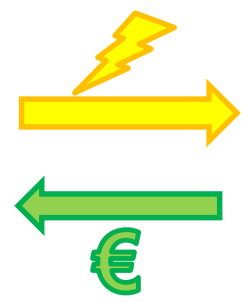
- Due to Spot price risk exposure, a **long-term hedge** can be made on the Futures market to offset risk, ideally to the same tenor of the PPA

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

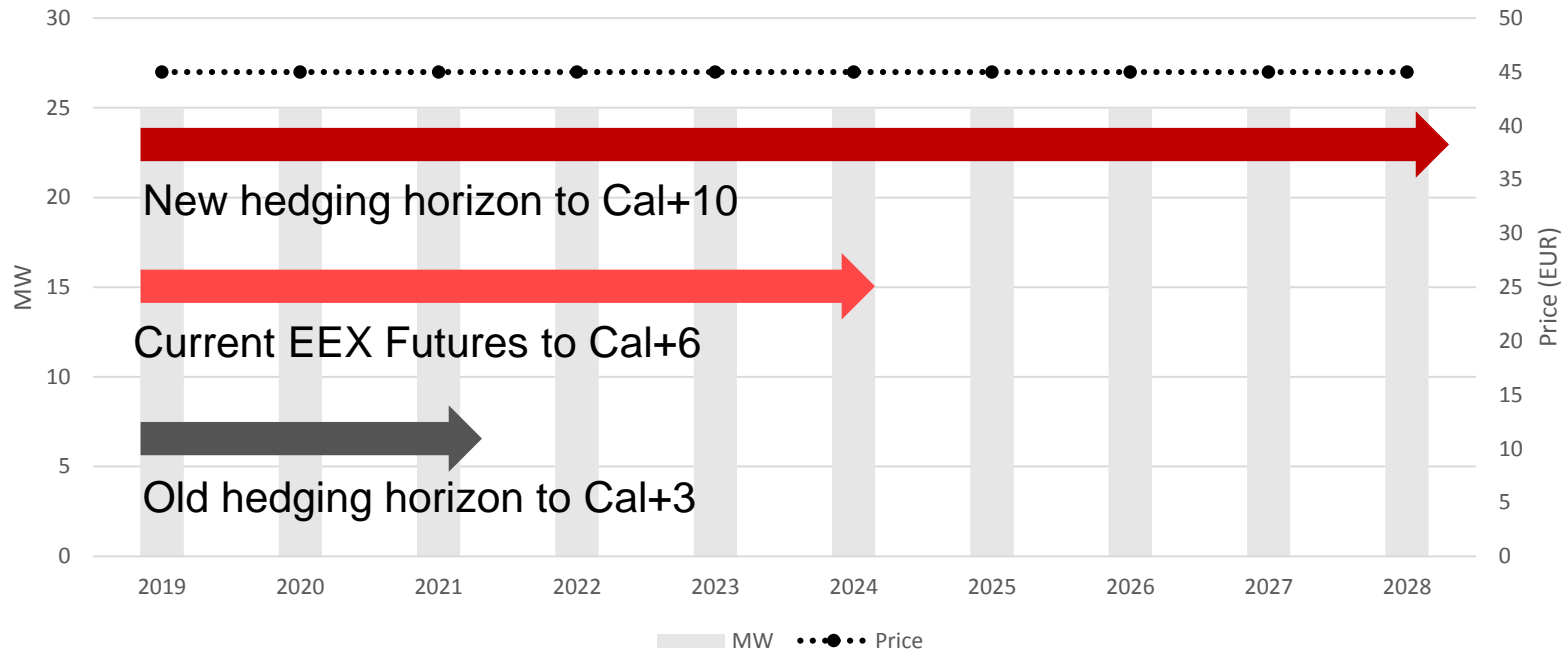


EEX Members sell Power from their own RE assets via LT Corporate PPAs



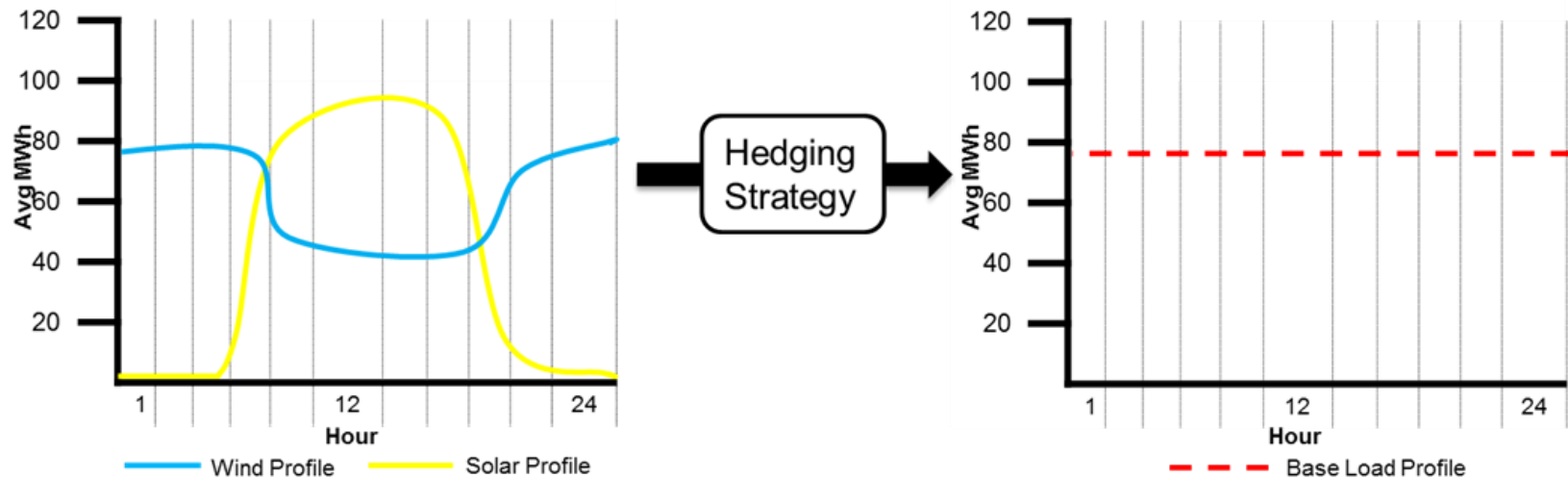
Renewable Energy financing extends the hedging profile of EEX Members to the long-term

10-Year PPA Fixed Price and Volume Profile



- EEX Members are now seeking to hedge longer term in order to help secure financing from Banks and/or manage Merchant Risk from RE assets
- EEX is in process of **listing calendar expiries to Cal+10 in German, Spanish and Italian Power** to support long-term hedging of Renewable Energy assets

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



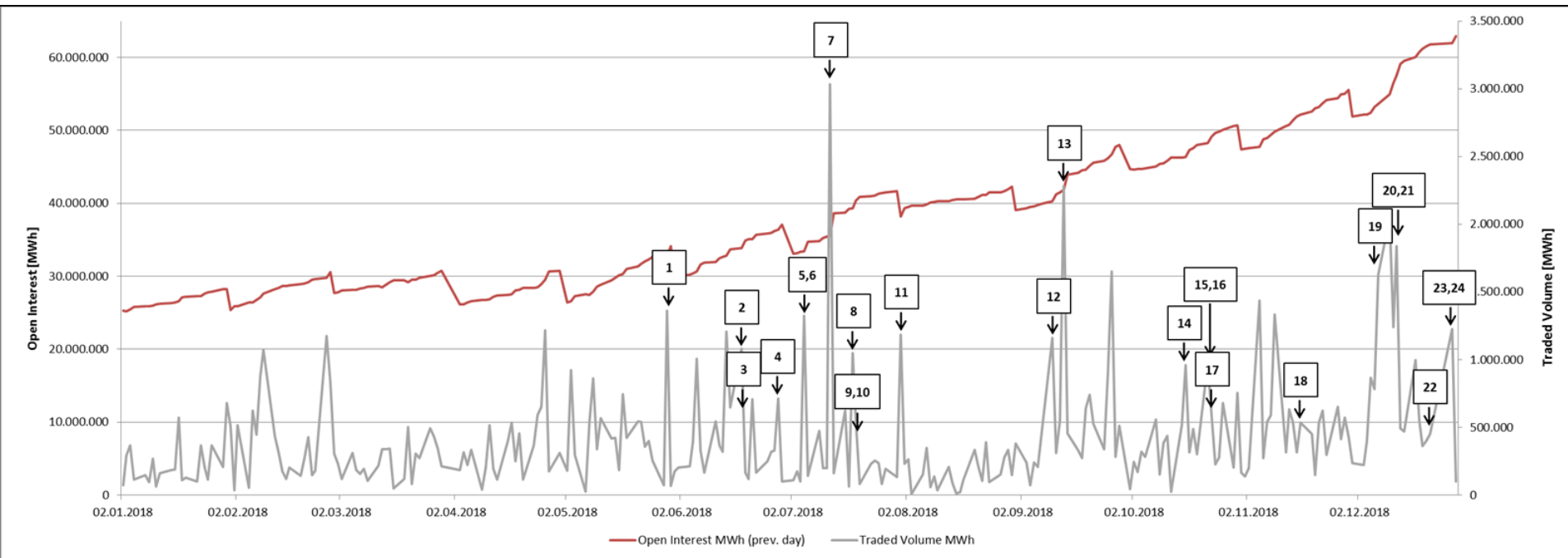
- Base Futures are a **best-fit product** and attract the most liquidity, creating a **strong price signal** and opportunities for trading at fair market prices
- To use the Base Futures to manage the risk of a wind or solar profile, a **Hedging Strategy needs to be designed** to translate the variable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

Proof of Concept: 23rd Long-Term hedge on Spanish Power cleared on 10.01.19

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	
10/01/2019	Spanish Power Base Month	2019	2	52.54 €	2,903 €	2	5,806 €	1,344	70,614 €	
	Spanish Power Base Month	2019	3	52.54 €	2,608 €	2	5,216 €	1,488	78,180 €	
	Spanish Power Base Quarter	2019	4	52.54 €	6,880 €	2	13,759 €	4,368	229,495 €	
	Spanish Power Base Quarter	2019	7	52.54 €	7,264 €	2	14,529 €	4,416	232,017 €	
	Spanish Power Base Quarter	2019	10	52.54 €	6,163 €	2	12,326 €	4,416	232,017 €	
	Spanish Power Base Year	2020	12	52.54 €	15,196 €	2	30,393 €	17,568	923,023 €	
	Spanish Power Base Year	2021	12	52.54 €	13,140 €	2	26,280 €	17,520	920,501 €	
	Spanish Power Base Year	2022	12	52.54 €	11,826 €	2	23,652 €	17,520	920,501 €	
	Spanish Power Base Year	2023	12	52.54 €	17,958 €	2	35,916 €	17,520	920,501 €	
								167,877 €	86,160	4,526,846 €
									Initial Margin in % of Notional Value	3.71%

- A 2 MW long-term hedge was cleared in Spanish Power on 10 January 2019, with an **initial margin requirement of 167,877 EUR**
- The **execution price of each trade** was **52.54 EUR**
- The **Initial Margin percentage** of the notional value of the trade was **3.71%**

Long-term Hedges contribute to overall Liquidity and Open Interest in Spanish Power



- The Spanish government was the first to eliminate subsidies for greenfield Wind and Solar projects, hence the **high demand for hedging Price Risk on exchange**
- EEX expects similar developments in Germany, Italy, and other EU markets as subsidy schemes are phased out

Thank you!

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