

Innovation and Integration: Contributions from Operators of Exchange Platforms in Volatile Price Environments

Paris-Dauphine – Chaire European Electricity Markets
HEC Energy & Finance Chair

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Juan Perez, Director Strategy & Business Development

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2013 Spot Power Trading Activity on EPEX SPOT

265,5 TWH

+ 2%

Intraday: 19,7 TWh (+25%)



19,2 TWH

+ 12%

Intraday: 0,7 TWh (Start: 6/2013)



61,3 TWH

± 0%

Intraday: 2,9 TWh (+ 27%)



346 TWH

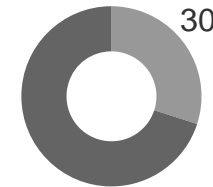
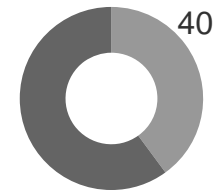
in 2013 on all
EPEX SPOT markets

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Share of national
consumption (2013)



Delivery zones



swissgrid

Rte
Réseau de transport d'électricité

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Agenda

1. The context for power markets
2. The adequacy and flexibility challenges
 - a) Contributions of Exchanges to address the adequacy challenge
 - b) Contributions of Exchanges to address the flexibility challenge

The context for power markets

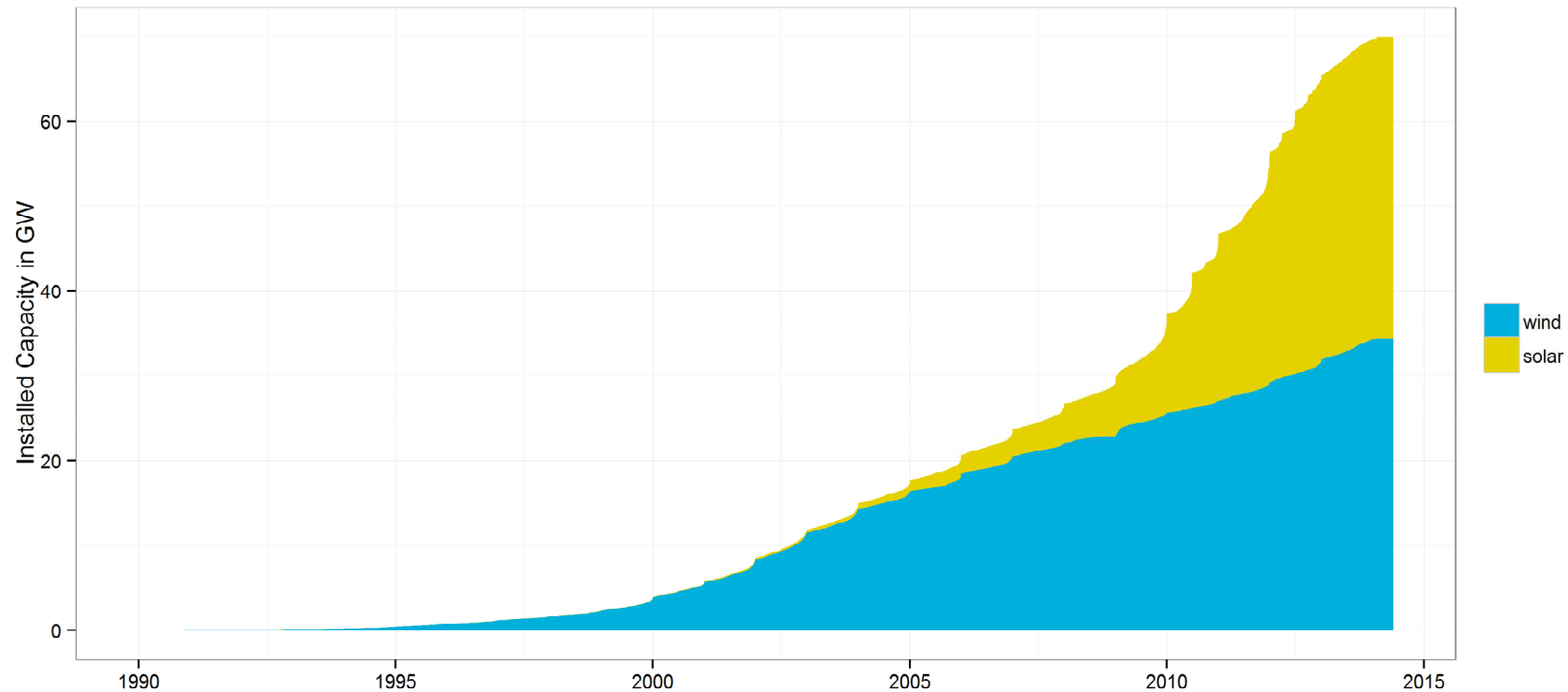
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RES development has boosted need to balance on the Intraday market

Solar and Wind Installed Capacity in Germany



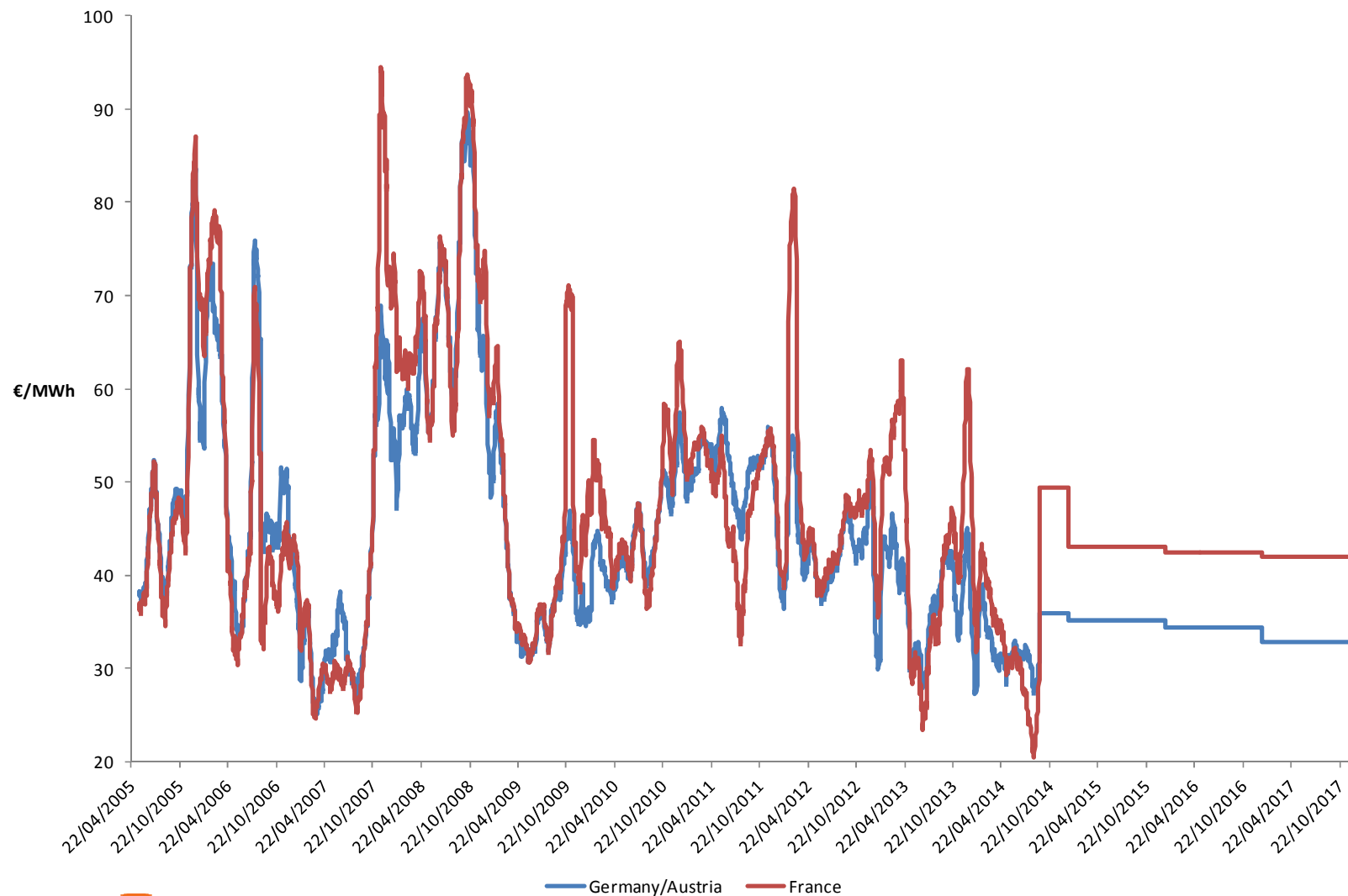
Source: Statkraft

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EPEX SPOT wholesale power prices in France & Germany



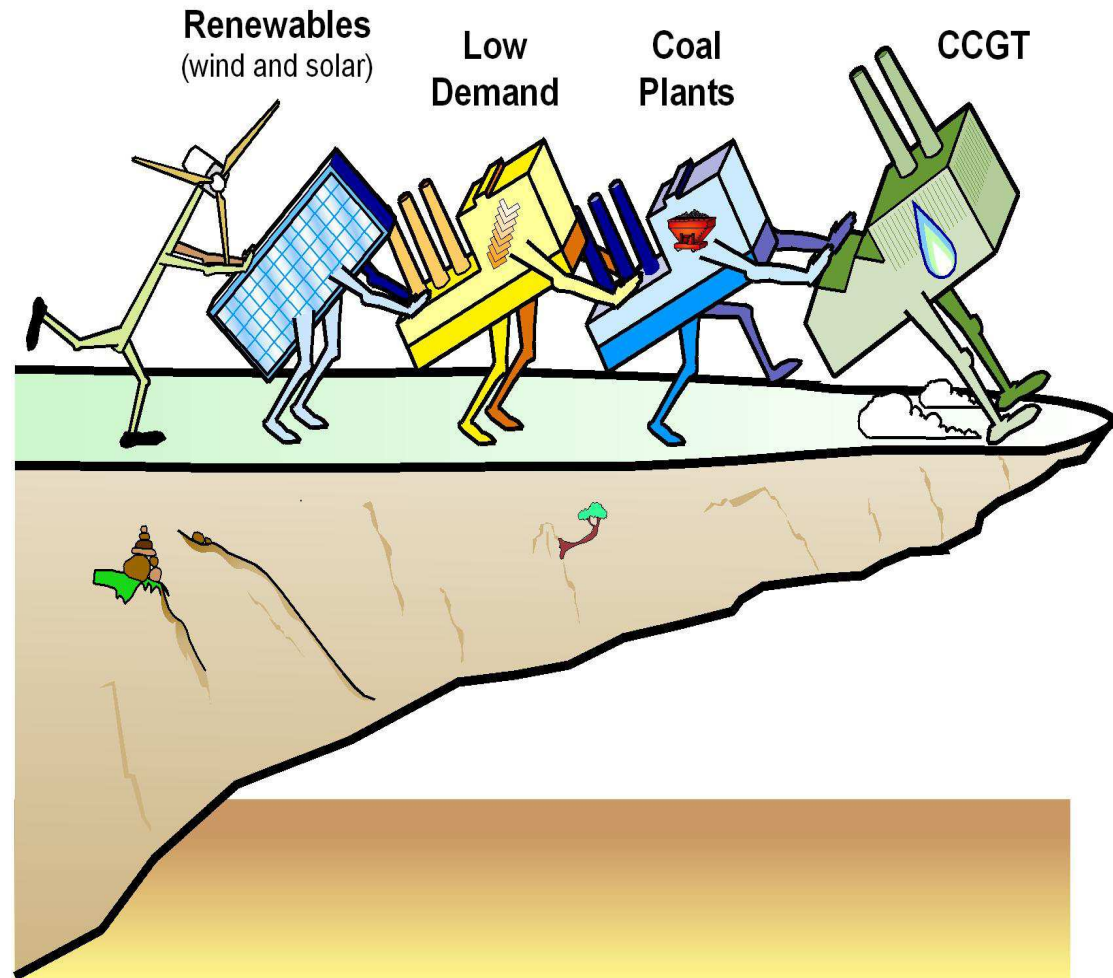
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Difficult times for thermal generation in Europe

- Thermal plants throughout Europe struggle to be profitable as they face a “perfect storm”: low power demand, combined with the growth of renewable power generation, reduces running hours. Low power prices and spreads further add to the pressure on plant revenues.



Source: CERA

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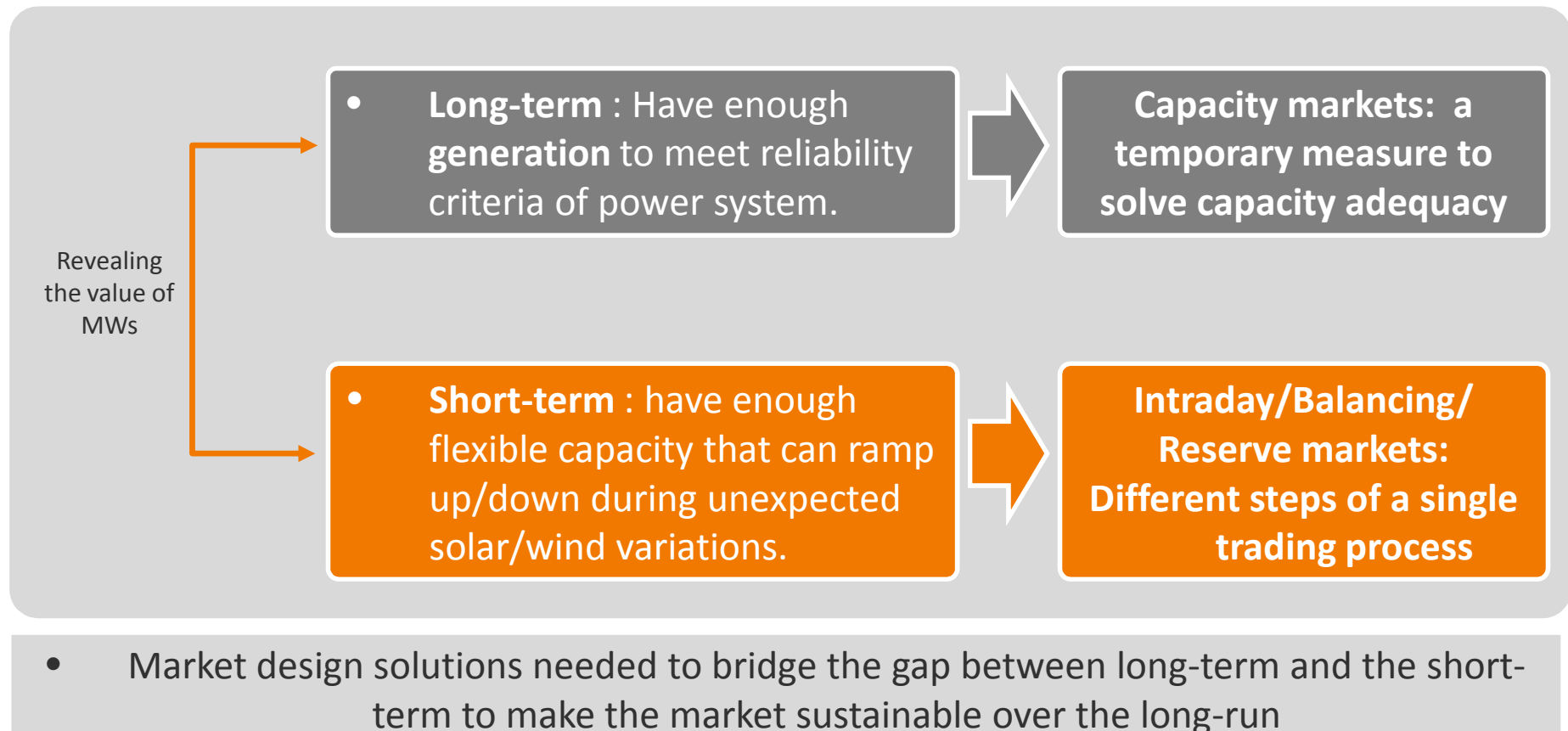
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The challenges:

- adequacy
- and flexibility

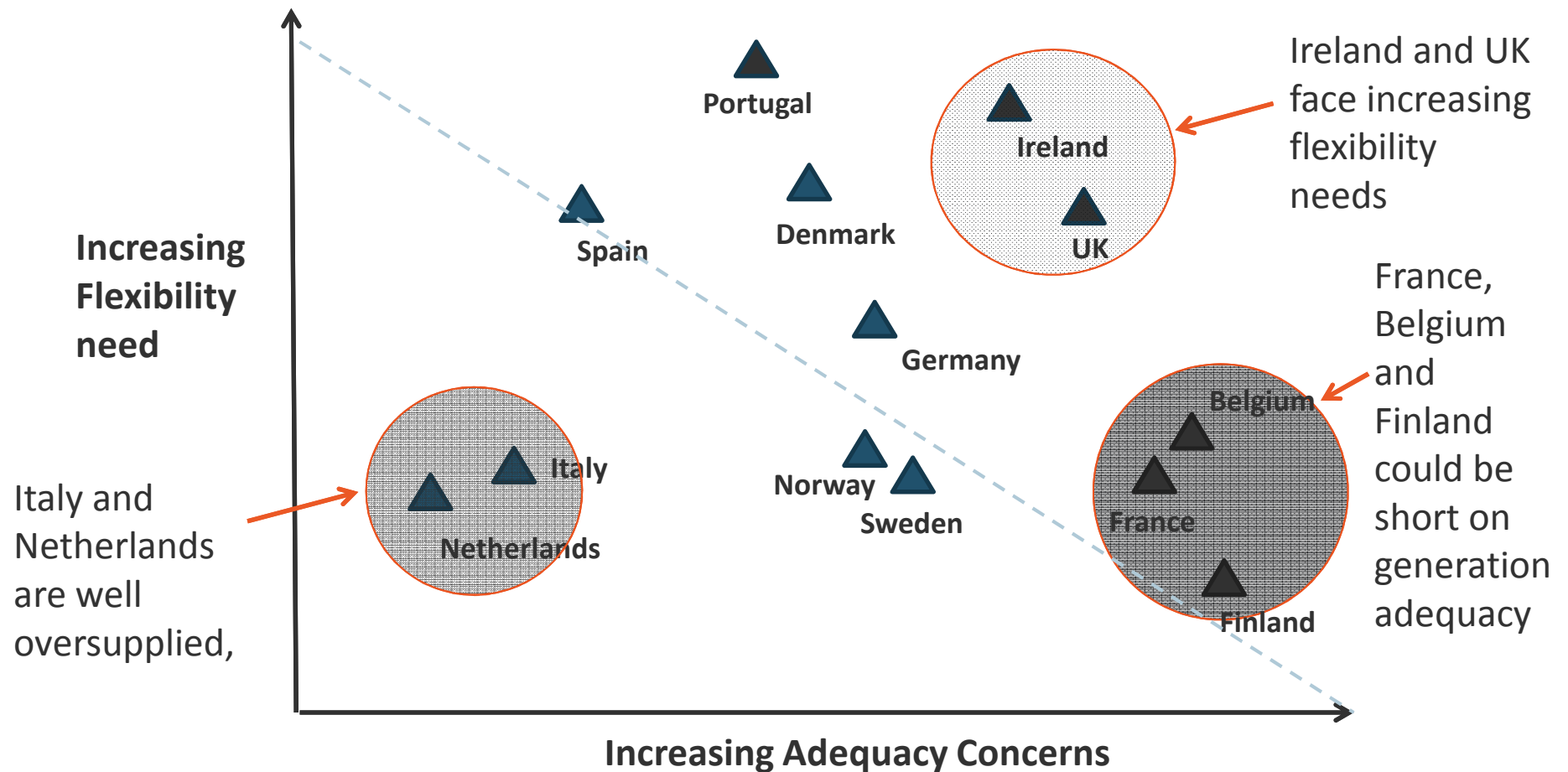
From energy to capacity markets

Address the long-term and short-term issues in the energy market



Adequacy & flexibility needs: a contrasted picture

Outlook for reserve margins and flexibility needs



Contributions of Exchanges to address the adequacy challenge

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What are the root causes of the missing money/adequacy problem?

The root cause of missing money

Regulation/ design

- Suppressed spot prices from price caps and offer caps set to limit the exercise of market power
- Subsidies for RES that do not need spikes to recover fixed costs
- Suppressed prices due to regulated generators operating in competitive markets

Threat of prosecution

- Suppressed spot prices due to the threat of market power prosecution of generators bidding under scarcity conditions

TSO actions

- Actions by system operators that prevent prices from increasing fast enough and far enough to reflect the value of lost load (i.e. 5% voltage reductions)

OOM market payments

- Suppressed prices due to out-of-market payments to some generators

Lack of demand-side response

- Inability to price reliability in the marketplace because of a lack of real-time central control of power flows to specific consumers.
- Inability to clear the market from the demand side due to a lack of metering and real-time billing

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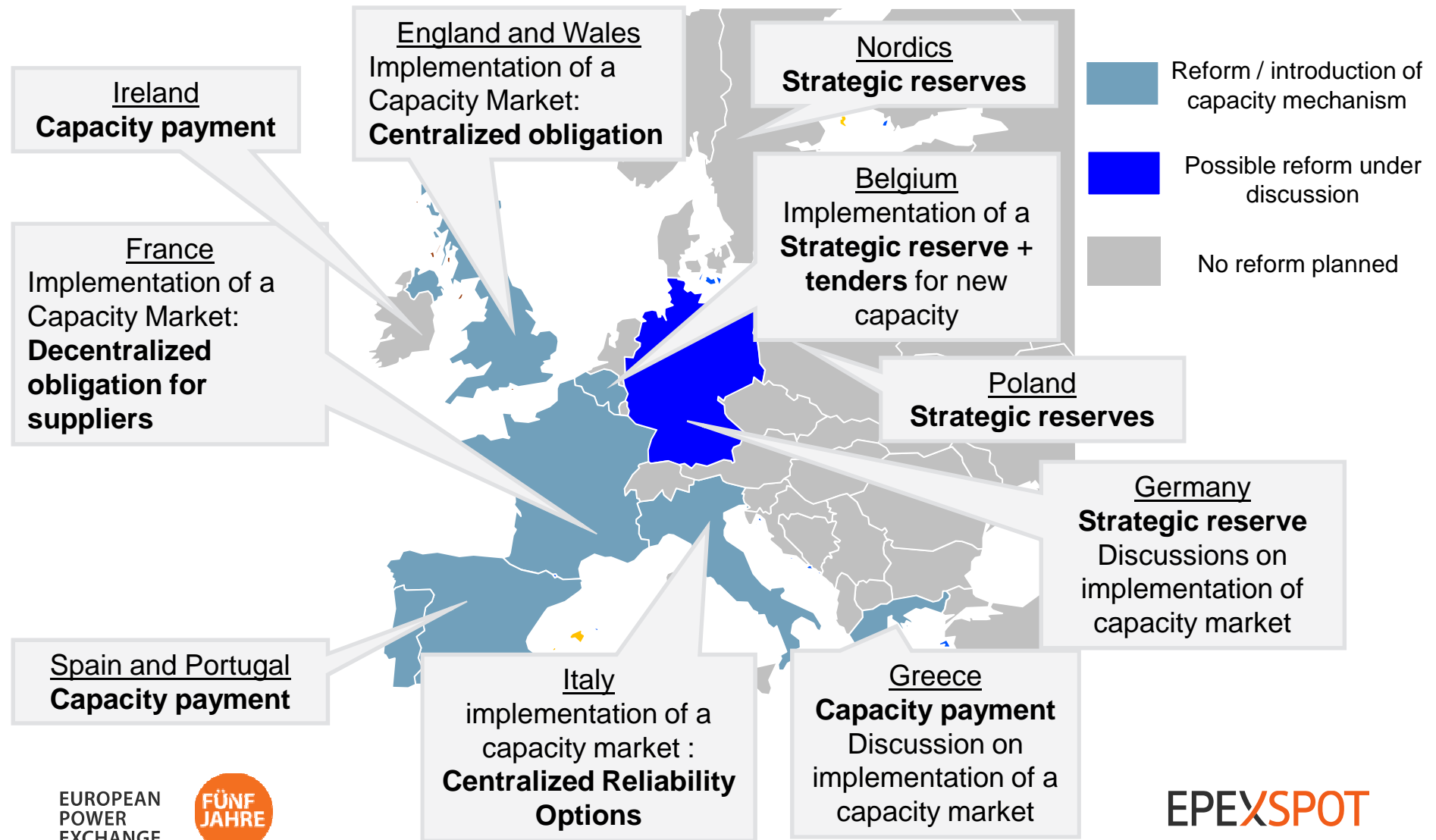
What is the “missing money” problem?

« The missing money problem is not that the market pays too little, but that it pays too little when we have the required level of reliability »

Stoft, S (2002)

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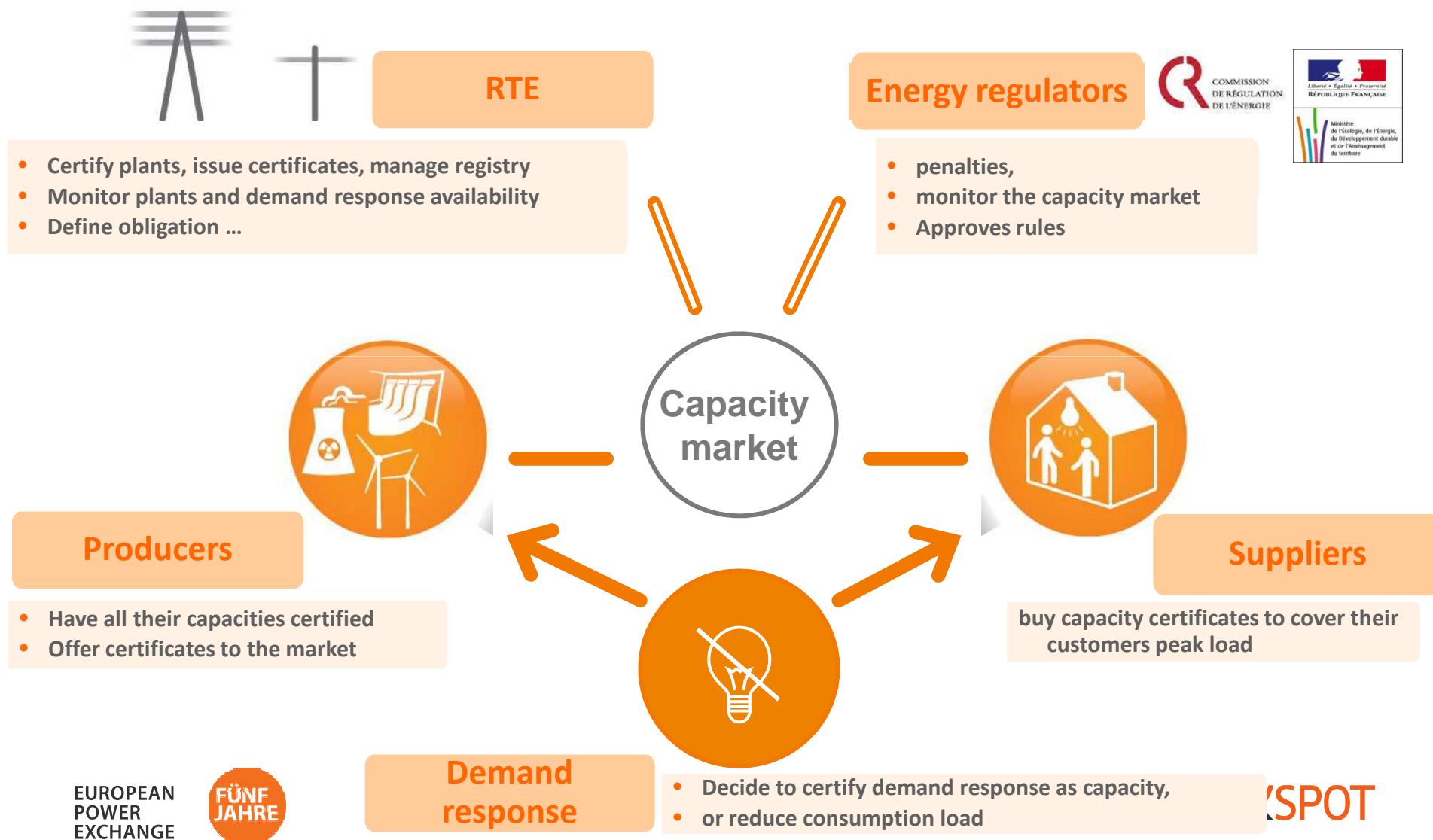
A volatile price environment or rather a volatile regulatory environment?



Integration of new technologies: DSM, storage, ...

- DSM is needed as a market needs both active demand/supply
- The market will not be sustainable in the long run without active demand participation, especially with growing supply side variations
- Time-of-use pricing is still not the rule... (i.e. in many countries regulated tariffs still the rule and market is the exception)
- DSM integration is probably the biggest challenge for electricity markets together with storage! Capacity markets can probably help...
- DSM can also be a way to reduce the flexibility conundrum!

Decentralized Capacity Market in France



Contributions of Exchanges to address the flexibility challenge

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Develop trading of flexibility: contributions of the Exchange

1) What has been done?

- Introduction of 15-Minute contracts – 2011 in Germany, 2013 in Switzerland – better balancing of portfolios as well as of forecasting errors
- In September, the volume in 15-minute contracts reached 477 GWh and represented 20 % of the total intraday volume traded on the German and Swiss markets

2) What is being done?

- Reduction of lead-time between end of intraday trading and delivery
- Local 15mn call auction in Germany to launch on 9 December 2014

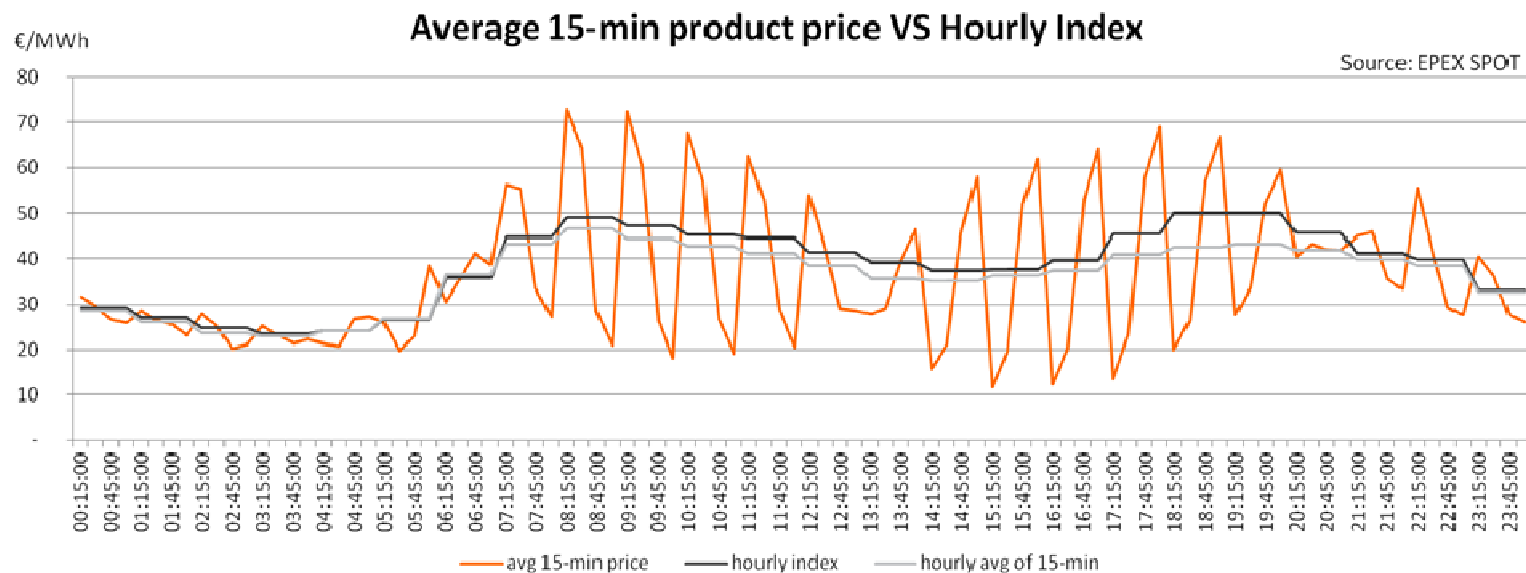
3) What can be done?

- Develop new products with market actors and grid operators
- A question of short term price signal and liquidity
 - **Price signal:** flexible generation/demand could benefit from a premium
 - **Liquidity:** concentrating liquidity on given periods for all market actors could be useful
- A value for MWs: through the option premium or through the capacity market

The Intraday market can reveal a value for flexibility

- **What is the value of flexibility?**

- High price volatility
- The price of 15-min. Products should reflect “intra-hourly” production variations.
- A price signal for 15-min. reveals need for flexibility, and could give incentives to develop more.
- EPEX Spot is launching a 15mn auction in december to concentrate liquidity and improve price reference for quaretrs



New tools to manage price/volume risk: Intraday Options

- Need tools to allow buyers and sellers of flexibility to better manage price and volume risks in high iRES environment
- Will only work if everyone can be held accountable for imbalances (including RES)
- Requires a mature energy market (i.e. Germany)
- Tool to “**transform volume risk into price risk**” which can be hedged at the exchange
- **The closer to real-time the option expiry, the greater the flexibility required**
- **The more long-term the product is, the more difficult it is to price/structure...**

Flexibility option buyers

- Manage exposure to volatile prices close to real-time
- Buyer hedges high volatility (i.e. option goes into the money and will be exercised)
- ‘Insurance’ against volume risk due to weather, forced outages, etc...

Flexibility option sellers

- Manage exposure to volatile prices close to real-time
- Seller relies on low volatility (i.e. option will not be exercised and the seller collects the premium)
- Provide a revenue (option premium) that reduces the risk of offering flexibility (i.e. not committing resource earlier)

Contributing to Europe, to the Market and to Market Prices

- We recommend the swift finalisation of the Internal Energy Market, as well as tapping the full potential of Energy Only Markets
- Each Member State to carefully consider whether capacity markets are needed or not
- In Member States with mature energy markets, this are the preferred solution to address the flexibility challenge and ensure security of supply
- Market-based reference price signals shall be the basis of decision making for market participants
- In Member States where this proves inapplicable or insufficient to counter acute challenges to the security of supply, complementary capacity mechanisms shall support the completion of the Energy Only Market
- Like in the French case, such capacity mechanisms shall comply with the overall goal of an integrated European Internal Market for electricity, i.e. be market-based, non-discriminatory and coordinated across borders

The graphic features a dark orange background with several overlapping circles. A large white circle at the top center contains the text 'FIVE YEARS'. Below it, two smaller orange circles contain the text 'POWER FOR TODAY.' and 'POWER FOR TOMORROW.'. To the left, two dark grey circles contain the text 'EUROPEAN POWER EXCHANGE' and 'WWW.EPEXSPOT.COM'.

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