

The pivotal role of TSOs

in European energy market integration





To meet the needs of modern society, the energy market is having to change.

Concerns about environmental sustainability and dwindling supplies of conventional fossil fuels are prompting ever stronger interest in greener sources of energy.

But the development and exploitation of renewable and dynamic sources takes time and necessitates the seamless integration of new infrastructure into existing power grids. At the same time, TSOs are duty-bound to maintain and expand these grids and have the financial resources to meet these obligations.

Meanwhile, consumers' top priorities are security of supply, competitive pricing and safety.



How come transmission system operators hold the key to an efficient European energy market?

There is little doubt that a smoothly functioning cross-border energy market is the only realistic way of ensuring that the EU energy sector remains secure, sustainable, efficient and cost-effective.

Transmission system operators (TSOs) are crucial cogs in this process, because they play a leading role in the workings of interconnecting energy markets.

Consequently, it is only logical that TSOs are being asked to play a key role in the ongoing implementation of the European Union's Third Energy Package, aimed at creating an Internal Energy Market (IEM).

This role comprises two main missions:

- Facilitating cross-border exchanges for electricity market parties trading on power exchanges;
- integrating renewable energies into the power supply whilst ensuring that the increasingly complex energy network operates safely and reliably at all times.

The success of both these missions hinges on efficiently managing energy flows through cross-border interconnections between Europe's national and regional grids to balance supply with demand and avoid congestion.

Collaboration between TSOs is therefore vital for guaranteeing that power is delivered where it is needed, when it is needed. And this is precisely what the new flow-based market coupling method (or Flow-Based), jointly developed by power exchanges and TSOs in Central Western Europe (CWE), will help to achieve.

TSOs in Central Western Europe have set a new benchmark

To this end, and to facilitate electricity trading within Europe, CWE TSOs teamed up with power exchanges to continue their improvement of the method currently used to calculate available transmission capacities for cross-border trading.

The resulting, improved method will further optimise the allocation of cross-border flows and thereby enhance the functioning of the Internal Energy Market. This optimisation is imperative in light of the greater volatility of energy being fed into the grid.

The recently adopted regulation on Capacity Allocation and Congestion Management (CACM), which sets out the methods for the calculation and allocation of day-ahead and intraday capacity, establishes Flow-Based as a target model

Therefore, the Central Western Europe TSOs' proactive approach has set a pioneering example that could now be taken up across Europe.



Fulfilling the need to take account of greater power grid dynamics

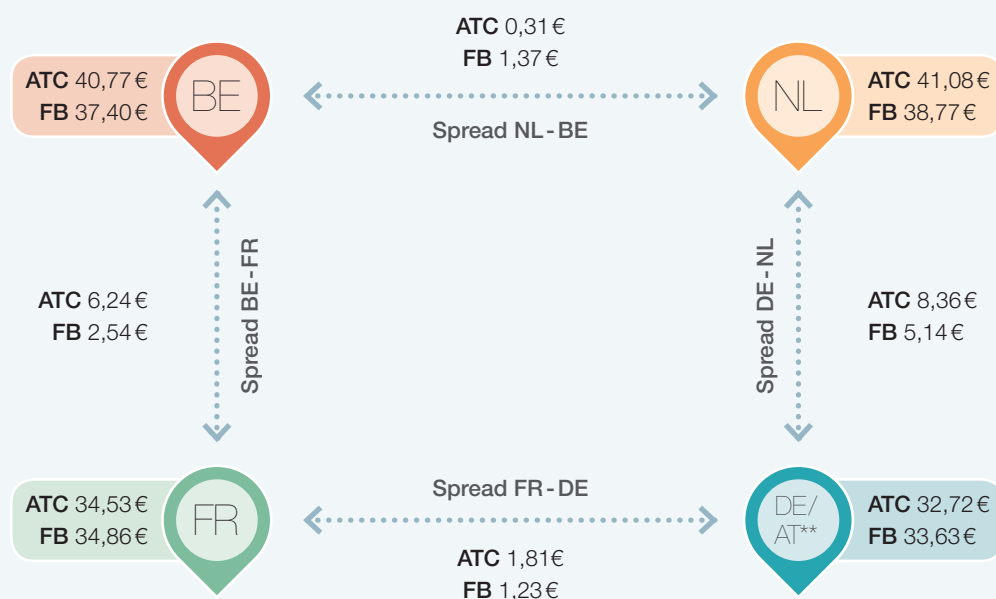
TSOs are duty-bound to manage the energy system and guarantee that the grid for which they are responsible operates safely and reliably at all times.

This entails accurately calculating cross-border capacity to be traded on the market and then allocating that traded power as efficiently as possible.

Power generation by TSOs' grids used to be more predictable, so a more static method of calculation sufficed. But higher volumes of energy flowing through interconnections across Europe and the advent of frequently decentralised, renewable energies made the development of a more sophisticated, dynamic capacity calculation method essential.

ELECTRICITY PRICES

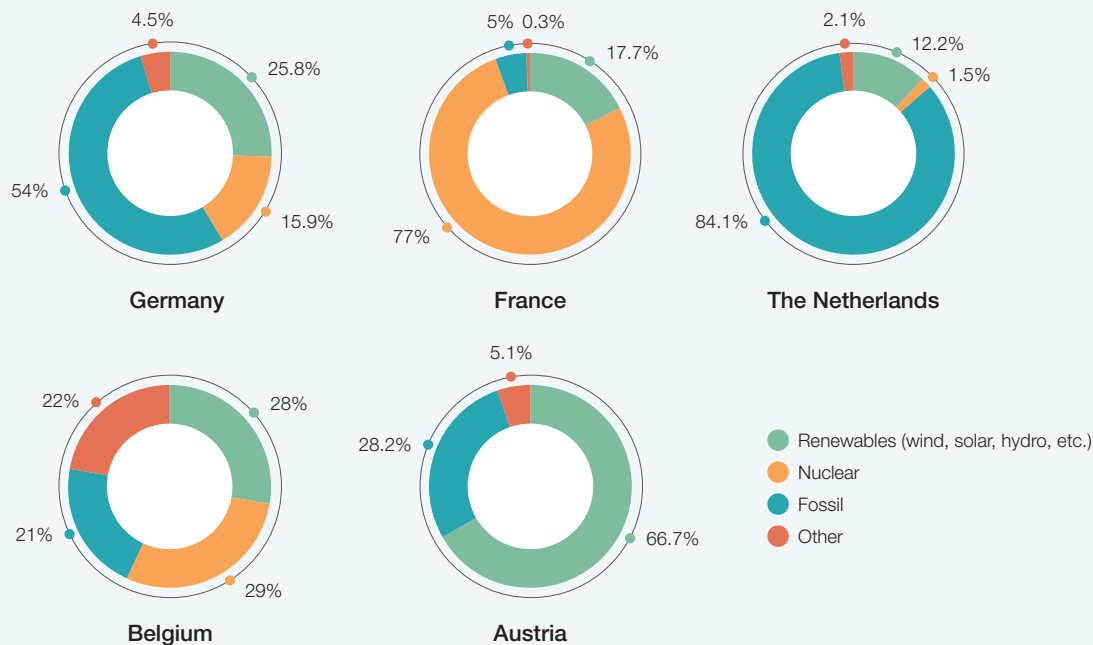
Simulations in 2014* compared the previous ATC-method and the new Flow-Based method electricity prices (€/MWh) in and the spread between countries. On average, a decrease in prices and spread has been observed.



*based on daily comparison of Flow-Based and ATC methods during the parallel run period in 2014

**Incl. Luxembourg, which is part of the German control block

CURRENT ELECTRICITY MIX (data from 2014)



So why are energy markets becoming more dynamic?

The rise across Europe of renewables, like wind and solar power, in conjunction with a drop in the supply of conventional power in the recent years is increasingly contributing to energy market volatility.

This overall trend is expected to endure, with the share of renewable energy predicted to continue increasing.

A crucial contribution by TSOs

So all energy players need to prepare for an even more dynamic and volatile market, and the anticipated rise in frequency of stressed grid situations will heighten the need for highly accurate short-term forecasts of energy flows.

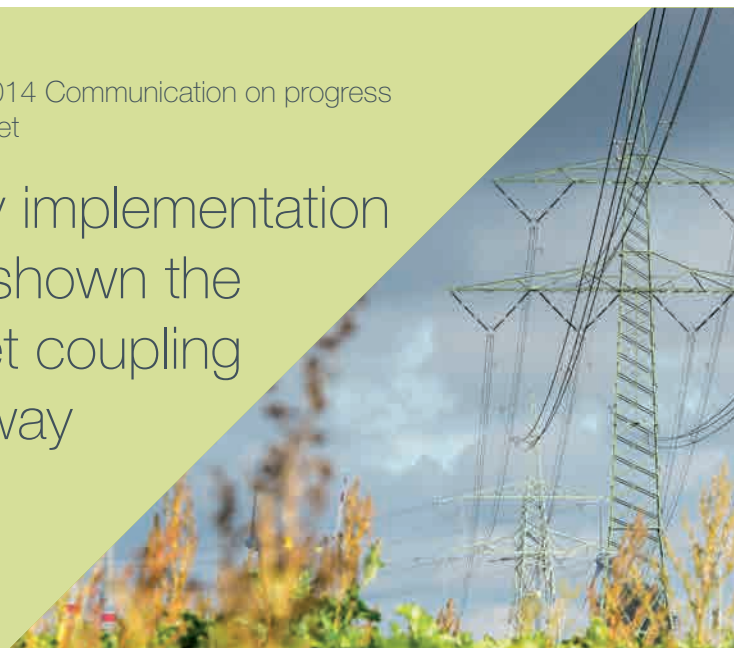
Accordingly, TSOs have developed technologies that enable them to share more accurate information faster, leading to more finely tuned, dependable calculations and greater transparency. One such technology is the flow-based method referred to above, which allocates capacity where it is most needed and with the fewest possible grid constraints.

In an integrated manner, Flow-Based takes account of the linkage between cross-border interconnections, the specific situations of national grids, increased grid dynamics and the greater unpredictability of power generation (e.g. due to the presence or absence of wind).

Consequently, the method considers far more information than its predecessors, without sacrificing any transparency. Indeed, Flow-Based generates a more accurate picture of a more complex reality and thus provides energy players, policymakers and authorities with a better basis for decision-making on investments in generating facilities and network infrastructure.

According to the European Commission's 2014 Communication on progress towards completing the Internal Energy Market

Pilot projects and early implementation at regional level have shown the way: day-ahead market coupling is a milestone on the way towards an Internal Energy Market.



How teamwork by TSOs will help to realise the European Internal Energy Market

The development and implementation of Flow-Based depended on the extensive alignment of systems and approaches between CWE TSOs and close cooperation with regulatory authorities and power exchanges.

As a result, today's CWE TSOs work with the same information, using compatible IT systems and harmonised procedures. This improvement constitutes a major step towards the establishment of a true Internal Energy Market for Europe.

Realistic market modelling will boost competition on the European Internal Energy Market

The greater accuracy of flow-based predictions makes the new type of forecasts more reliable than those generated using previous methods. So Flow-Based will optimise trading on day-ahead power exchanges without losing touch with the physical realities of transmission system operation.

As a result, the forward capacity market (FCM) should make the Internal Energy Market function more efficiently, helping electricity market participants to transact cross-border trades at prices that more closely reflect the actual circumstances of grid operation. In addition, Flow-Based permits exchanges between countries with complementary energy mixes.

Flow-Based constitutes a major advance towards the integration of Europe's energy markets, as well as preparing them more effectively than ever before for the transition to renewable energy.

CWE TRADING REGION



Geography

The new market coupling method Flow-Based was developed by 13 partner organisations from 6 European countries

Germany

- TSOs: Amprion, TransnetBW, TenneT, 50Hertz
- Power exchange: EPEX SPOT
- Regulatory authorities: Federal Network Agency (BNetzA)

France

- TSO: RTE
- Power exchange: EPEX SPOT
- Regulatory authority: Energy Regulation Commission (CRE)

Netherlands

- TSO: TenneT
- Power exchange: APX
- Regulatory authority: Authority for Consumers and Markets (ACM)

Belgium

- TSO: Elia
- Power exchange: APX
- Regulatory authority: Commission for Electricity and Gas Regulation (CREG)

Luxembourg

- TSO: CREOS
- Regulatory authority: Luxembourg Institute of Regulation (ILR)

Austria

- TSO: Austrian Power Grid AG (APG)
- Power exchange: EPEX SPOT
- Regulatory authority: Energie-Control Austria (E-Control)



German situation

Germany has a high proportion of installed capacity in renewable energy. The CWE Flow-Based method enables the more accurate consideration of renewable energy injected into the European grid, helping to further integrate renewables into the European market.