



NWE Day-Ahead Price Coupling: Questions & Answers

1. What is the NWE Price Coupling Initiative?

North Western Europe (NWE) Price Coupling is a project initiated by the Transmission System Operators (TSOs) and Power Exchanges (PXs) of the countries in North Western Europe (=> question 4). This cooperation aims at coupling the day-ahead wholesale electricity markets in this region, increasing the efficient allocation of interconnection capacities of the involved countries and optimizing the overall social welfare.

2. What is the purpose of the Initiative?

The overall objective is to implement a day-ahead market coupling in the NWE region based on the price coupling principle, using one single algorithm, calculating simultaneously the market prices, net positions and flows on interconnectors between the national markets. The single coordinated matching function is necessary to implement by 2014 the European Day-Ahead Target Model in order to optimize cross-border trades, based on implicit auctions and facilitated through Price Coupling of Regions (PCR)

3. What is PCR?

PCR, which stands for 'Price Coupling of Regions' is the initiative of 6 power exchanges, APX-ENDEX, Belpex, EPEX Spot, GME, Nord Pool Spot and OMIE to develop a price coupling algorithm with the ultimate goal that this algorithm will be used for European Price Coupling.

This initiative started in 2009. The PCR parties signed the PCR Cooperation Agreement and PCR Co-ownership Agreement in June 2012. PCR is open to other power exchanges that want to join.

The NWE regions (CWE, Nordic-Baltic and GB) will use this algorithm for price coupling within NWE.

4. Which countries are involved in the Initiative?

The NWE Price Coupling initiative covers the Nordic region (Denmark, Finland, Norway, Sweden) , Great Britain, and the CWE region (Belgium, France, Germany, Luxemburg and Netherlands).

Although the Baltic States and Poland are not directly involved, they are currently coupled to the Nordic market via NPS and this coupling will continue to be supported. The same applies for the Austrian market: Austria is not directly involved, but Austrian prices are determined at the same time as German prices, since they are part of a single bidding area.

5. Who are the partners?

The 17 partners of this project comprise TSOs and PXs from countries above: APX-Endex/ Belpex, EPEX SPOT and Nord Pool Spot from the PX side; 50Hertz, Amprion, Creos, Elia, Energinet.dk, Fingrid, National Grid, RTE, Statnett, Svenska Kraftnät, Tennet B.V.(Netherlands), Tennet GmbH (Germany) and TransnetBW from the TSO side.



6. Regarding the number of partners, how is the project organized?

The project is led by a joint steering committee (JSC), consisting of responsible delegates of each partner. The JSC is chaired by one TSO and one PX representative.

The operational work is carried out by two working groups (WG), one technical and one legal, regulatory and market WG. Each of these WG comprises several Task Forces dedicated to a certain topic, e.g. Shipping, Algorithm or Regulatory questions.

7. What is the timeframe of the project until go-live?

Regarding a project of this technical complexity, high-level requirements and size, covering several countries with more than a dozen of companies involved, there are a lot of dependencies. The most important goal is the reliability and the robustness of the final solution, guaranteeing the best solution for market participants. The parties target a go-live by end of Q2 2013 subject to successful finalization of the testing of the price coupling solution and subject to receiving the necessary regulatory approvals in time.

8. Why is the project not expected to go live according to the ACER roadmap?

The NWE parties started the project in 2011 based on the assumptions that most systems and procedures currently in place in the regions could remain. However, the outcome of the design phase has shown that quite some changes must be introduced. The current market coupling systems in CWE and Nordic will be replaced by the PCR system. The EMCC solution for the CWE-Nordic interconnections will be replaced by another solution. New solutions must be introduced in GB and for the GB-CWE interconnections. These changes, which are in fact development projects by themselves, have led to a longer implementation time of the overall project.

9. Which systems will be used?

Euphemia is the name of the algorithm that NWE will use. Euphemia is an algorithm developed by the Price Coupling of Regions (PCR) Initiative for a pan-European day-ahead price coupling solution. Euphemia starting point was the COSMOS system which has been in use since November 2010 for CWE and which has recently be introduced for the trilateral coupling between Czech Republic, Hungary and Slovakia.

Euphemia is a Greek woman's name meaning 'well spoken of' or 'well-regarded'. As the algorithm name it consists of the prefix EU- and the acronym PHEMIA ('Pan-european Hybrid Electricity Market Integration Algorithm'). The algorithm is hybrid because it supports any mix of ATC-based and flow-based network models.

Each Power Exchange continues to use its own trading systems and has to ensure the compatibility with the coupling solution.

TSO systems will remain as much as possible the same as today in CWE and the Nordic regions. Some marginal adjustments will be brought to these systems to be able to take into account the interconnectors between these two regions and with GB.



10. What does the algorithm do?

The algorithm matches energy demand and supply for 24 hours simultaneously and returns execution prices and the net position of bidding areas. This process maximizes social welfare (consumer surplus, supplier surplus and congestion rent) and takes into account limit prices of orders and network constraints. A large variety of orders and network features are taken into account and available according to local market rules.

11. How does the algorithm work?

The algorithm runs a combinatorial optimization process based on (i) the modeling of the matching problem, (ii) the implementation of dedicated branch-and-bound strategies and (iii) the utilization of a standard optimization solver. The code of the algorithm uses java and it is interfaced with the matching system via an Oracle database.

12. What exactly is the difference between the existing solution, consisting of CWE, the Nordic Market Splitting and the ITVC between the two solutions?

At the moment, the prices and the flows in the Nordic and CWE markets are calculated independently by using different price coupling algorithms; in a first step, the Interim Tight Volume Coupling (ITVC) solution calculates the flows between the Nordics and CWE based on all orderbooks, which is then followed by the separate price calculations including the ITVC results in CWE and the Nordics.

By implementing the NWE Price Coupling solution, the market coupling design will be simplified: One single algorithm will be used to calculate all market prices, net positions and cross-border flows at the same time, which will highly increase robustness of the system and efficiency of the markets.

13. What is the future role of EMCC which currently carries out the ITVC between CWE and the Nordics?

EMCC was set to deliver interim volume coupling services. Price coupling as in CWE and later NWE is however the agreed target design for day-ahead markets in Europe. The NWE Price Coupling initiative will deliver a solution that will replace the interim volume coupling. This will also facilitate reaching the target model of an integrated European power market by 2014.

12. What is the gain for market participants?

NWE Price Coupling will optimize the use of cross-border capacities in a region that accounts for two thirds of European consumption, delivering signals for a more efficient use of investments in the power sector across Europe. Liquidity will be increased, volatility will decrease, buyers' and sellers' surplus will be optimized across all involved markets.

13. How will this impact the end consumers?

The initiative will lead to an optimized allocation of capacities over a region covering more than 60% of electricity consumption and contribute in this way to a higher security of supply. Furthermore, it will bring about a fruitful competition for the ongoing European integration projects, leading to more efficient use of power and productive investments in Europe.



14. Is the Initiative open for others to join?

NWE is restricted to the TSOs and Power Exchanges of the involved countries. However, there are several other regional market coupling initiatives (=> question 15).

15. Will Market Coupling be further extended after the implementation of NWE?

NWE is part of a bigger picture, the so-called European Price Coupling, a goal set by the European Commission and due to be implemented by end of 2014. To achieve this target, parallel market coupling initiatives have emerged, such as CWE, NWE and CEE.

To facilitate the overall integration process, several Power Exchanges launched the Price Coupling of Regions project, an open initiative that today comprises five major Power Exchanges across Europe. PCR's goal is the efficient deployment of a coordinated day-ahead price coupling algorithm by taking into account the contractual and regulatory frameworks of each region (=> question 3).

In parallel, the TSOs have through ENTSO-E established a task force together with the non-NWE TSOs in order to facilitate the extension to the remaining EU countries.

16. How does the NWE project interlink with the CWE Flow-based project?

The CWE flow based project and the NWE project are in fact two separate projects but they are indeed interlinked now, because the implementation schedules of both projects have become very close. Implementing NWE before CWE Flow based has the advantage that the volume coupling algorithm of EMCC (which becomes obsolete after the NWE Price Coupling go-live) does not have to be adapted anymore.

17. How will the specific case of UK with two power exchanges be managed in NWE?

In order to form a common reference price for electricity across the two participating GB PXs (N2EX and APX Power UK), it is necessary to design and operate an open access platform where all GB interconnectors and GB PXs can be connected. This open access platform, the so-called "GB virtual hub" will do this by allowing the liquidity of connected GB PXs involved in the PCR algorithm to be pooled and, as a result, the cross border capacity of connected GB interconnectors to be allocated by the algorithm in a coordinated manner.

18. What are the fall-back solutions envisaged in case NWE market coupling cannot be successfully run?

For the fallback solution the NWE parties will continue with the current arrangements in place for the CWE region, the Nordic-Baltic region and the CWE-Nordic interconnectors (except the Baltic cable).

For the borders internally in the CWE region and for the CWE-Nordic interconnectors (except the Baltic cable) this means using the shadow auction system of CASC.

Internally in the Nordic-Baltic region, in case the NWE Price Coupling fails, NPS will perform a price coupling 'locally' for its own region. There will not be explicit auctions on a border per border basis in the Nordic-Baltic region.



For GB, the IFA and BritNed cable the fallback mode will be explicit auctions, which will be performed on the relevant auction platform (CMS IFA or BritNed Kingdom depending on the situation of decoupling).



Annex: Definitions

Market Coupling

Market Coupling is a method to manage capacity congestion between adjacent power spot markets by optimizing the capacity allocation. It allows the matching of power exchanges' orders and the implicit allocation of the available cross border capacities received from the TSOs.

Market Splitting

In market splitting the implicit auction of transmission capacity is handled within the day ahead electrical energy auction by one single power exchange. Sometimes the transmission capacity between the internal bidding areas of a region is not enough to get a complete convergence of price, and the result is that there are different prices in different bidding areas. Thus the term 'market splitting' refers to the fact that the limited transmission capacity leads to a split between to market areas.

Volume Coupling

Coordinated day-ahead Auction involving two or more power markets. Cross-border volumes computed by an Auction Office are transferred to the exchanges which enter them as price acceptant bids into their system. The calculated flows are based on anonymous order books and the available transmission capacities, while the pricing authority remains with the involved power exchanges.

Price Coupling

Price coupling between different countries allows creating a single exchange zone – and consequently single price zones when interconnection capacities do not limit cross-border electricity exchanges. It improves the market liquidity and participates in the creation of a single European electricity market.

Price Coupling of Regions

Initiative by six Power Exchanges to create a price coupling solution encompassing the markets from Portugal to Finland.

Flow Based capacity calculation

Method to calculate transfer capacity at several interconnections simultaneously in order to get rid of the capacity split between borders.