

Day-Ahead Trading between EU and UK following Brexit

Presentation on MRLVC from EU TSOs after initial CBA

Stakeholder Engagement, 04 May 2021





Background

EU-UK Trade and Cooperation Agreement - Energy

Trade and Cooperation Agreement (TCA)

Energy

Other Areas

Electricity Trading over Interconnectors

Regulation Fundamentals

- No Discrimination
- No Transmission Charges

New Trade Arrangements

- TSOs to develop
- Day Ahead to apply from Apr 2022

TSO and Regulatory Cooperation

TSOs

- Replace ENTSO's
- Security of Supply

Regulators

- Replace ACER
- Market Transparency (REMIT)

North Sea Grid Cooperation

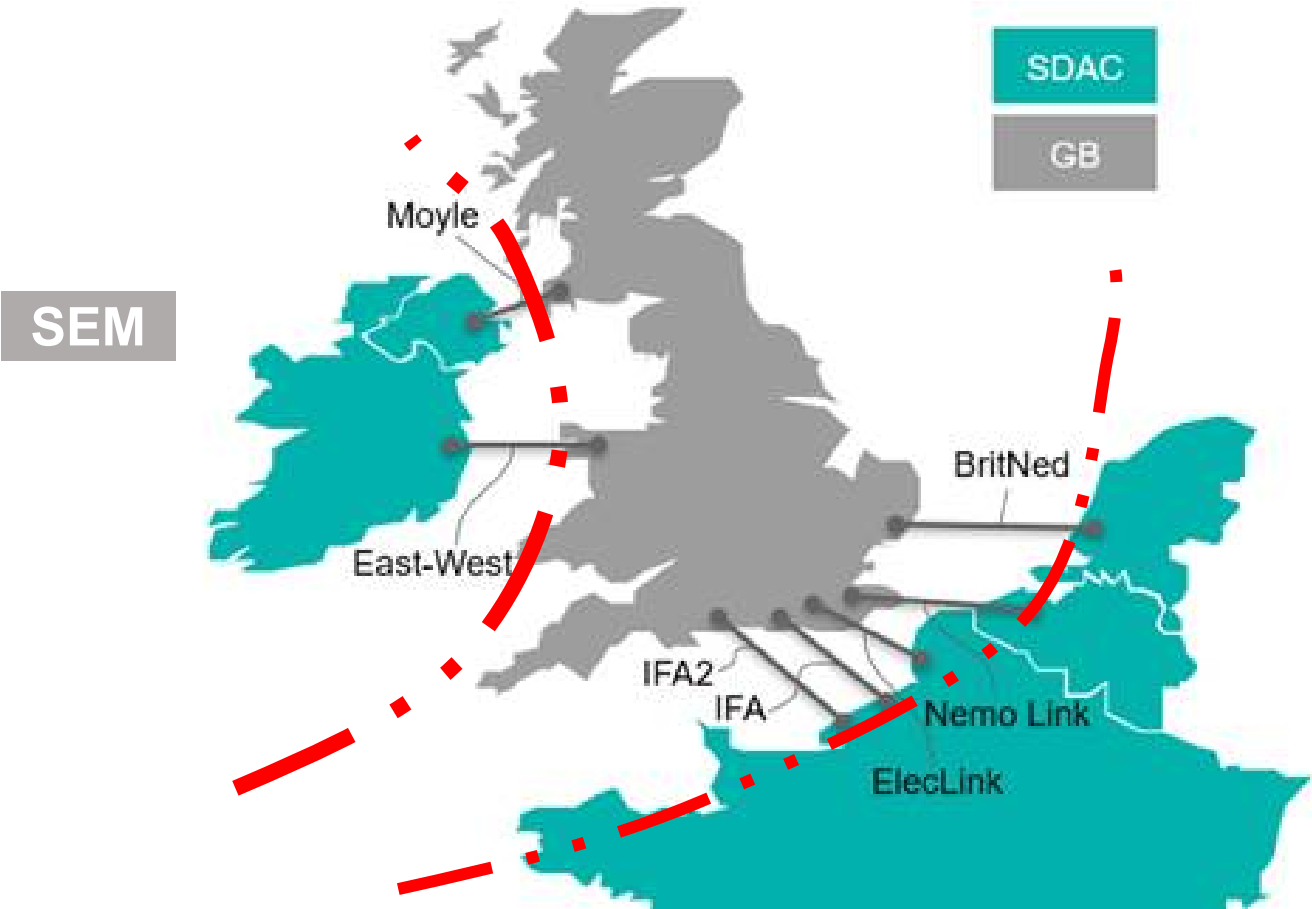
- Restore North Sea Energy Cooperation Group
- Multipurpose projects
- Maritime planning
- Support framework and finance

- Tariff & Quota Free Trade in Goods
- Transport
- Fisheries
- Union Programmes
- Social Security
- Law enforcement & Judicial cooperation
- Movement of People

New EU-UK Governance

- Partnership Council (Ministerial Level)
- **Specialised Committee for Energy**
- Replacements for ACER and ENTSOe/g

Implications of the UK/EU Trade and Cooperation Agreement



New Day-Ahead Cross-Border Trading Arrangements

Electricity Trading over Interconnectors

New Trade Arrangements

- TSOs to develop
- Day Ahead to apply from Apr 2022

Given the outcome of the TCA new Day-Ahead Cross-Border Arrangements are needed between the UK and EU.

TCA Annex ENER-4 specifies the requirements of the new Day-Ahead cross-border trading arrangements between the EU and UK.

The requirements look to find a landing zone between the current arrangements (left) and the previous arrangements (right).



SEM - Intraday Trading
Channel - Explicit Trading
Norway - Price Coupling

“Landing Zone” for new arrangements



SDAC Price
Coupling



Relative Efficiency

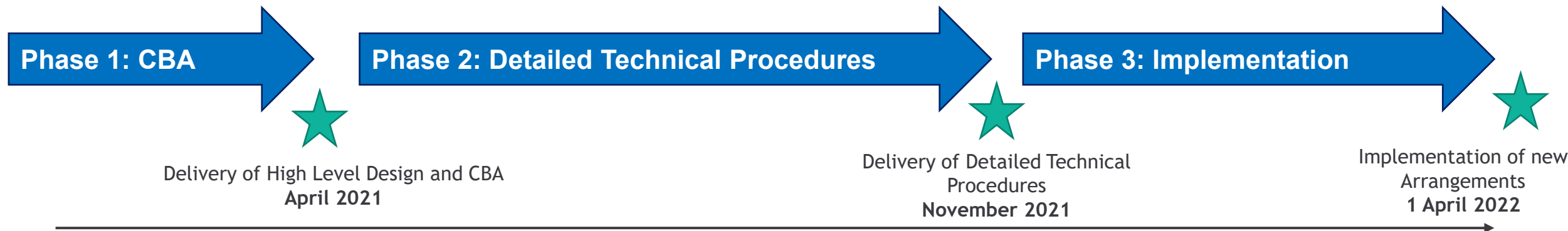
Timeline

Electricity Trading over Interconnectors

New Trade Arrangements

- TSOs to develop
- Day Ahead to apply from Apr 2022

- UK and EU TSOs have been given the responsibility to develop these arrangements
- Timelines have been defined (Annex ENER-4 Part2).
- Three parts to the work:
 1. Develop a **High Level Design (HLD)** and **Cost Benefit Analysis (CBA)** of the High Level Design
 2. Develop **Detailed Technical Procedures** to implement the High Level Design and seek regulatory opinions
 3. Following approval from the Specialised Technical Committee for Energy, to **implement** the approved mechanism



Current Status

Completed:

- Cost Benefit Analysis and High Level Design Options

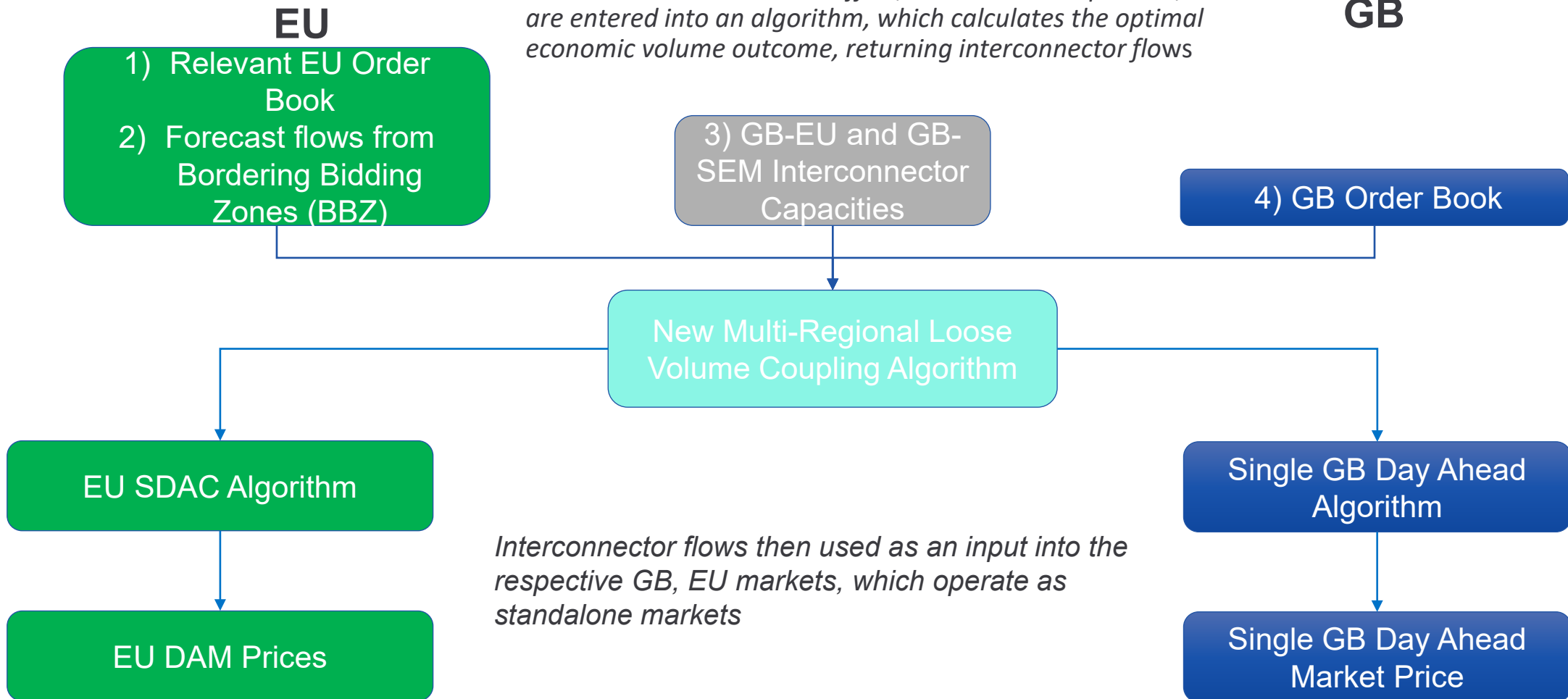
In Progress:

- CBA published by UK and EU TSOs for industry feedback (26th April to the 16th May)
- UK TSOs and EU TSOs will provide recommendations to BEIS/EC respectively
- ACER(EU NRAs) and UK RAs feedback to EC/BEIS respectively.
- Consideration then of next steps by BEIS/EC and Special Committee for Energy

Volume Coupling of markets

MRLVC General Concept

GB & relevant EU bids and offers, and network capacities, are entered into an algorithm, which calculates the optimal economic volume outcome, returning interconnector flows



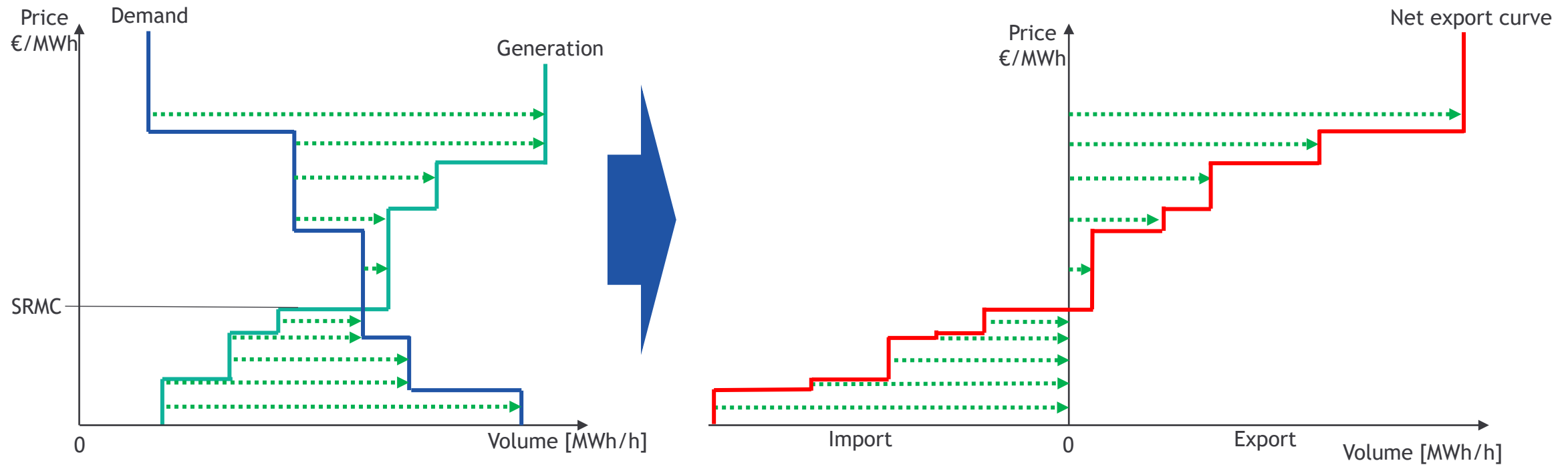
The framework from the FTA

Annex ENER-4.

3. The net energy positions over electricity interconnectors shall be calculated via an implicit allocation process by applying a specific algorithm to:

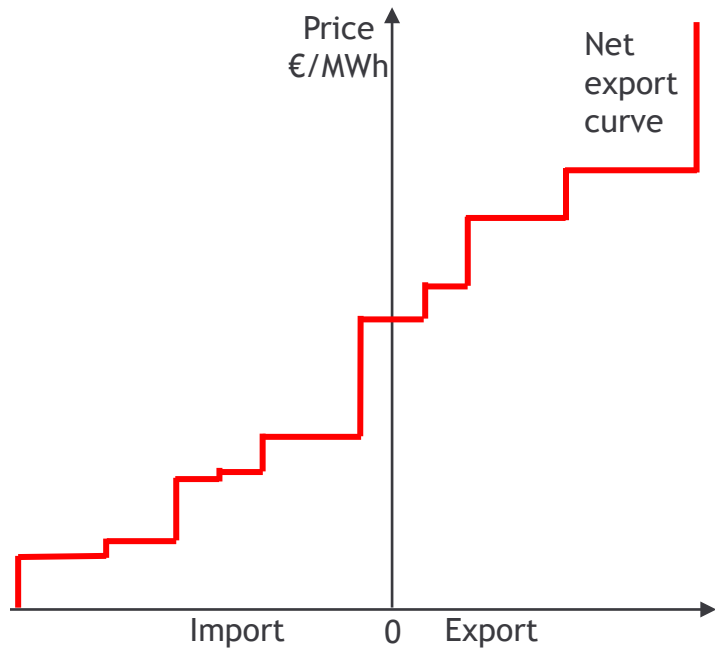
- (a) **commercial bids and offers for the day-ahead market timeframe from the bidding zones established in accordance with Regulation (EU) 2019/943 which are directly connected to the United Kingdom by an electricity interconnector;**
- (b) **commercial bids and offers for the day-ahead market timeframe from relevant day-ahead markets in the United Kingdom;**
- (c) network capacity data and system capabilities determined in accordance with the procedures agreed between transmission system operators; and
- (d) **data on expected commercial flows of electricity interconnections between bidding zones connected to the United Kingdom and other bidding zones in the Union, as determined by Union transmission system operators using robust methodologies.**

Creating a net export curve from a order book



Including expected commercial flows of electricity interconnections between bidding zones connected to the United Kingdom and other bidding zones in the Union

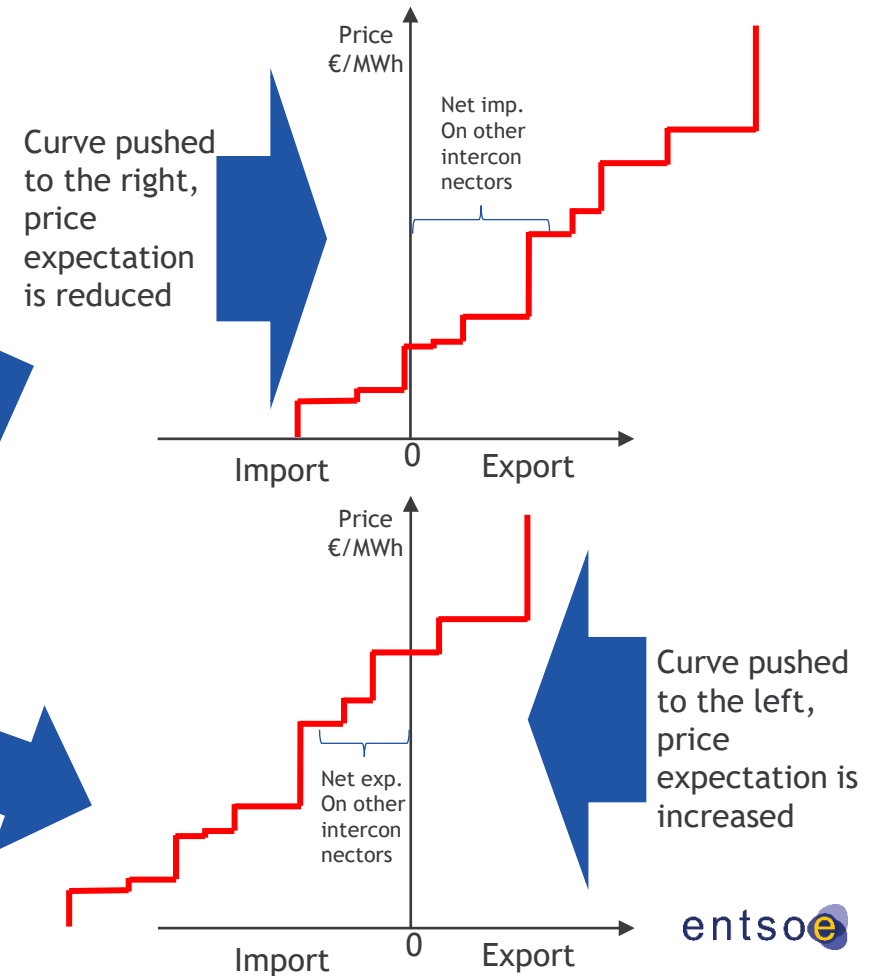
The following is based on the assumption that flows from other bidding zones are price in-flexible.



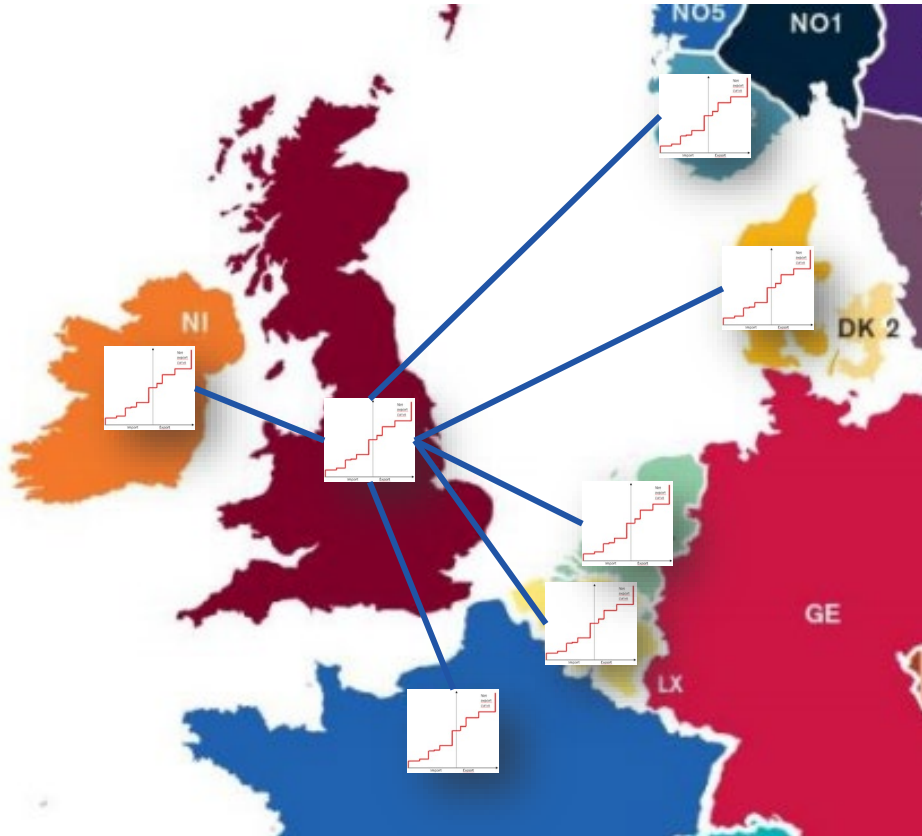
$$+ \sum (\text{import} + \text{export})$$

Net imp

Net exp



Volume coupling process



A market operator is tasked with:

1. Generating net export curves for all 7 areas
2. Adjust net export curves for the 6 EU bidding zones subject to forecasted flow on bidding zone borders to other areas
3. Optimising the socio-economic welfare in the 7 bidding zones, subject to adjusted net export curves, ramping constraints and interconnector capacities
4. Extracting the flow on each interconnector after optimisation
5. Enter price in-flexible bids (consumption or production) in each of the 7 bidding zones, reflecting the flow of the interconnectors



The CBA study

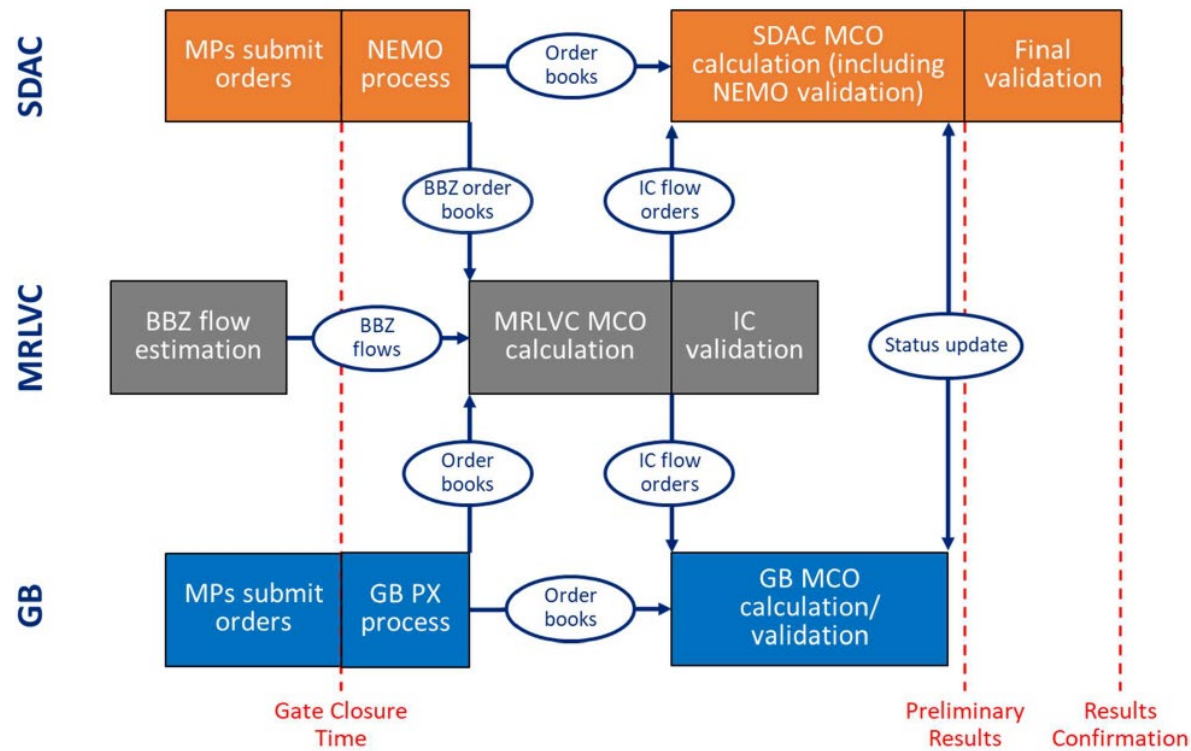
Overview of CBA and HLD

- Review of Historical Implementations
- Comparing “As-Is” against two MRLVC designs
 - Qualitative and Quantitative Analysis
- Assessment against a range of criteria
 - e.g. Welfare, Revenues, Environmental Benefits, Ease and Cost of implementation/Operation, Complexity, Impact on existing processes, etc..
- CBA identified a number of aspects for consideration, that are critical to a “good” MRLVC solution
 - e.g. Bordering Bidding zone estimation accuracy, impacts on SDAC, necessity for common order books for MRLVC and SDAC, critical impacts on implementation timelines
- Additional design variations also included for consideration to mitigate challenges identified in CBA
- CBA should be considered an aid for parties to drawing conclusions, not a definitive answer
 - This was by design, due to: limited time available to perform the CBA analysis, necessity for both qualitative and quantitative considerations, and the range of design options being dependent on the willingness to adapt existing processes

Intro: recap on the proposed MRLVC design

Two options for the MRLVC implementation

Option 1: use the full order books



Option 2: use the preliminary order books

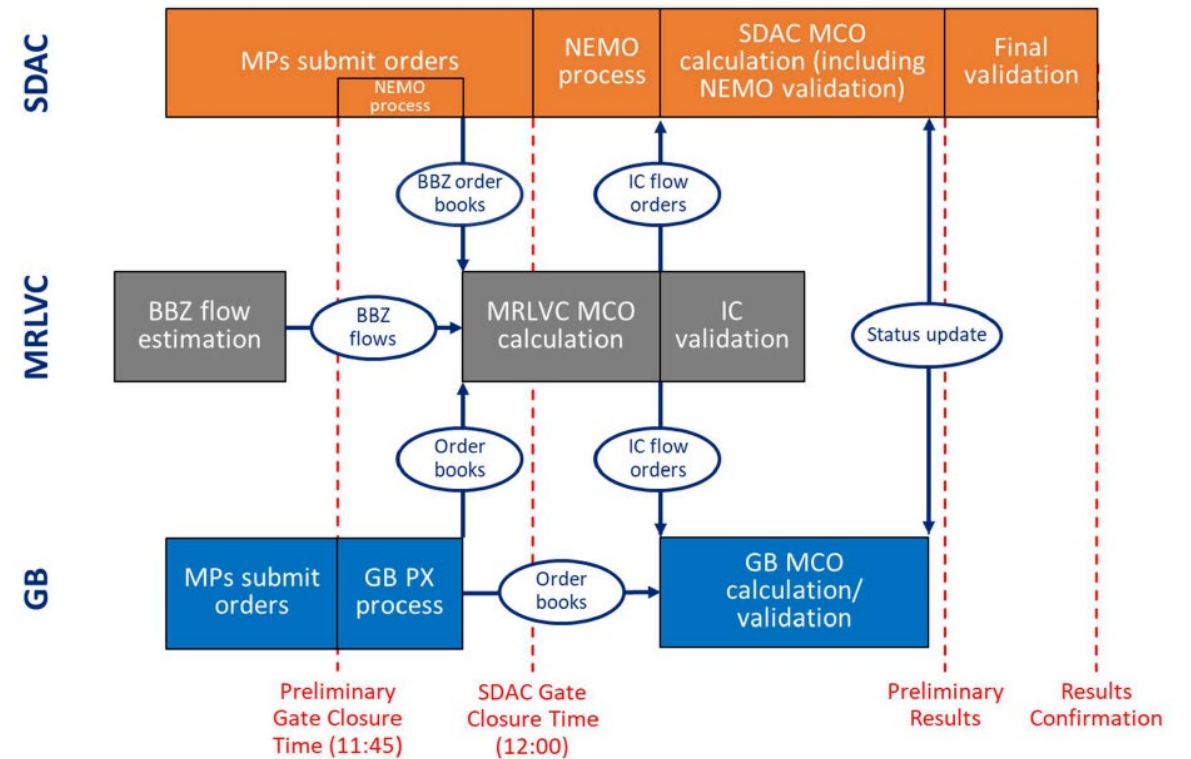


Figure 4 – High-level summary of quantitative and qualitative assessment

Aspect	High-level MRLVC options		Counterfactuals		
	Common Order Books	Preliminary Order Books	Explicit Auctions	ID Price Coupling (SEM-GB)	Separate DA Coupling (NSL)
Consumer and producer welfare	Yellow	Red	Yellow	Red	Yellow
Interconnector revenues	Yellow	Red	Yellow	Red	Green
Impact on CO2 and low carbon targets	Yellow	Red	Red	Yellow	Yellow
Meeting market needs	Yellow	Red	Yellow	Yellow	Yellow
Compatibility with IC technical requirements	Green	Green	Yellow	Green	Green
Operational complexity of allocation process	Yellow	Yellow	Green	Green	Green
Futureproofing	Yellow	Yellow	Yellow	Yellow	Yellow
Operational impact on SDAC	Red	Green	Green	Green	Green
Roles and governance	Yellow	Yellow	Green	Green	Green

No issues, or only small issues
 Material issues, potentially manageable
 Severe issues likely to be challenging to resolve

Options for Implementation

- Options Assessed in the CBA
 - Preliminary Order Books
 - Common Order Book (with SDAC process impacts)
 - No Change: Retain existing arrangements
- Variations identified in the CBA
 - Common Order Book (with SDAC gate window closure earlier)
 - Common Order Book (with SDAC results later)

Feedback on the MRLVC design proposed in the CBA

Preliminary feedback from SDAC OPSCOM

Operational

It is not possible to introduce LVC without impacting the SDAC processes (under the assumption that current SDAC timings are kept).

Additional process steps are needed.

Additional data exchanges are needed.

Both SDAC and GB DAM need to provide a confirmation of their results. In case this does not work either on the SDAC or on the GB side, this would lead to a full decoupling. Issues in GB could lead to an SDAC decoupling, which is considered unacceptable (1).

The introduction of LVC will:

require more time for the operational processes (the indicated 10-15 additional minutes; this is considered very optimistic),

make the processes more complex,

meaning that the market coupling will become more sensitive for issues and (severe) incidents in case the current SDAC timings are kept.

(1) There is an alternative where the issue in GB would not result in the decoupling of SDAC. Instead the ICs would bear the imbalance of the unmatched bids.

SDAC changes roadmap

It is foreseeing the following big implementation projects, which require heavy testing:

February 2022: Core FB

September 2022: Nordic FB

2024: 15 min MTU implementation

The introduction of LVC by April 2022 will lead to challenges with respect to the resourcing of these projects.

Implementation timeline of one year for LVC is not considered realistic.

Additional IT infrastructure for GB has to be put in place (not by SDAC).

Backup/Fallback procedures

Principles

1. Aim to ensure orderly energy markets in SDAC and GB – in particular:
 - Market participants should know the grid topology and interconnector capacities relating to the markets they are bidding into, and how capacity on any decoupled interconnection will be allocated
 - Implicit allocation of capacity is as efficient as possible (e.g., using the correct order books)
2. Avoid creating any additional risk of decoupling (partial or full) to SDAC
3. Use capacity as optimally as possible, subject to #1 and #2

Proposed MRLVC fallback procedure

- MRLVC-determined IC flows set to zero
- Capacity allocated in intraday arrangements rather than use shadow auctions (avoid delay to SDAC; poor shadow auction valuations; reduced operational complexity for all)
- GB DAM rerun in isolated fallback mode

Feedback from concerned TSOs on the CBA

Even with the limited timeframe available to complete the CBA, it does provide **valuable insights into the implementation of MRVLC**, and has helped to identify the key elements needed for a beneficial MRLVC.

While the CBA indicates that MRLVC may be beneficial to trade – if able to be implemented in the right way – there are some aspects in the CBA that need to be highlighted.

On the MRLVC design:

- The EU TSOs have strong concerns on the result of the perturbation approach. It seems that for some bidding zones, the actual ‘error’ introduced is quite limited even in the high scenario. This effect plays especially for bidding zones not directly connected to DE or NO2. In turn, this gives a too optimistic view on the impact of forecasting errors.
- For all interconnectors a revenue loss compared to implicit allocation can be observed. Depending on the interconnector and the forecasting error, this can be in the range of 1-15%.
- In addition to the welfare loss from the DA allocation, the maximum UIOSI pay-out exceeds the DA congestion income for LTTRs in all cases. This would lead to a further income loss for the interconnectors.

On the explicit allocation:

- The consultant indicated that they faced significant issues with the modelisation of the explicit allocation.
- Explicit allocation is a worst case scenario (upper bound to welfare loss). The large welfare loss is tied to the interconnectors on the FR-GB border, for other interconnectors the impact seems more limited.

Qualitative analysis:

- The future offshore development (i.e. creation of hybrid interconnectors) will in principle not introduce new issues with the MRLVC but may exacerbate existing challenges such as the FAPD and flow forecasting issues. This is true for Offshore Bidding Zones and the Home Market solution.

EU TSOs recommendation

EU TSOs Proposed Recommendation to EC

Both the MRLVC solutions, as defined and evaluated in the CBA and in line with the Trade and Cooperation Agreement (TCA), **are not recommended** by the EU TSOs based on the perceived risks to the existing EU day-ahead processes.

- **Preliminary Order Books** => market manipulation and risks to orderly market functioning
- **Common Order Books (*without a change in SDAC timings*)** => increased impact on SDAC processes leading to an increased risk of decoupling events

However, where certain requirements are met, the EU TSOs could recommend a variation of the Common Order Books, -described as an alternative in the CBA, that has the potential to provide volume coupling while minimising the risks identified in the CBA, but may not be in accordance with the Annex to the TCA.

The variation being a **Common Order Books** with the extension of SDAC timing either:

- a) **An earlier gate window closure for SDAC**
- b) **A later publication of results from SDAC**

The requirements to enable the development of this volume coupling variant need to be accepted by the EC and other impacted parties, and implemented in line with the relevant change procedures set out in EU legislation.

The requirements being:

- Use of common order books for MRLVC and SDAC
- BBZ methodology designed and implemented by all relevant parties, and approved by all NRAs
- All SDAC parties agree to change SDAC timings, and it needs to be supported by all NRAs and the EC
- The implementation of the volume coupling should not impact the ongoing SDAC and SIDC projects
- Proving the value of coupling through parallel runs of significant length prior to implementation, with a confirmation that the results are seen as acceptable for a go-live