FCR COOPERATION

1ST STAKEHOLDER WORKSHOP

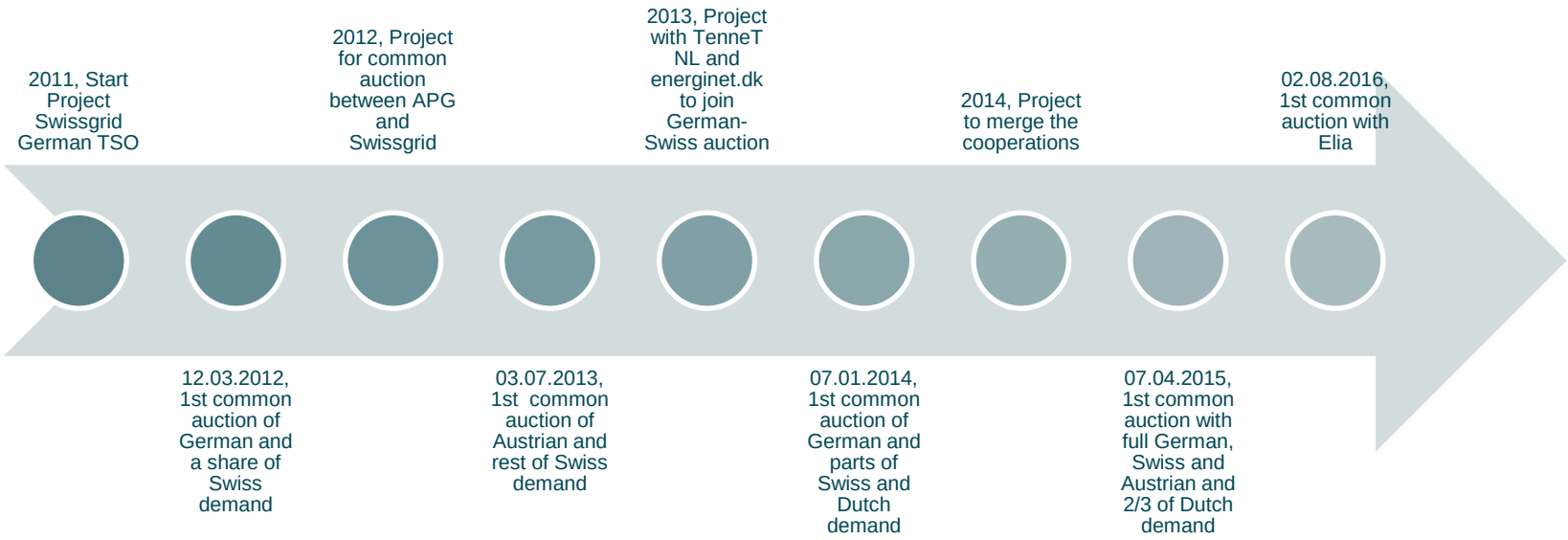
Content

- FCR cooperation presentation
- Public consultation: context & process
- Public consultation: topics

Content

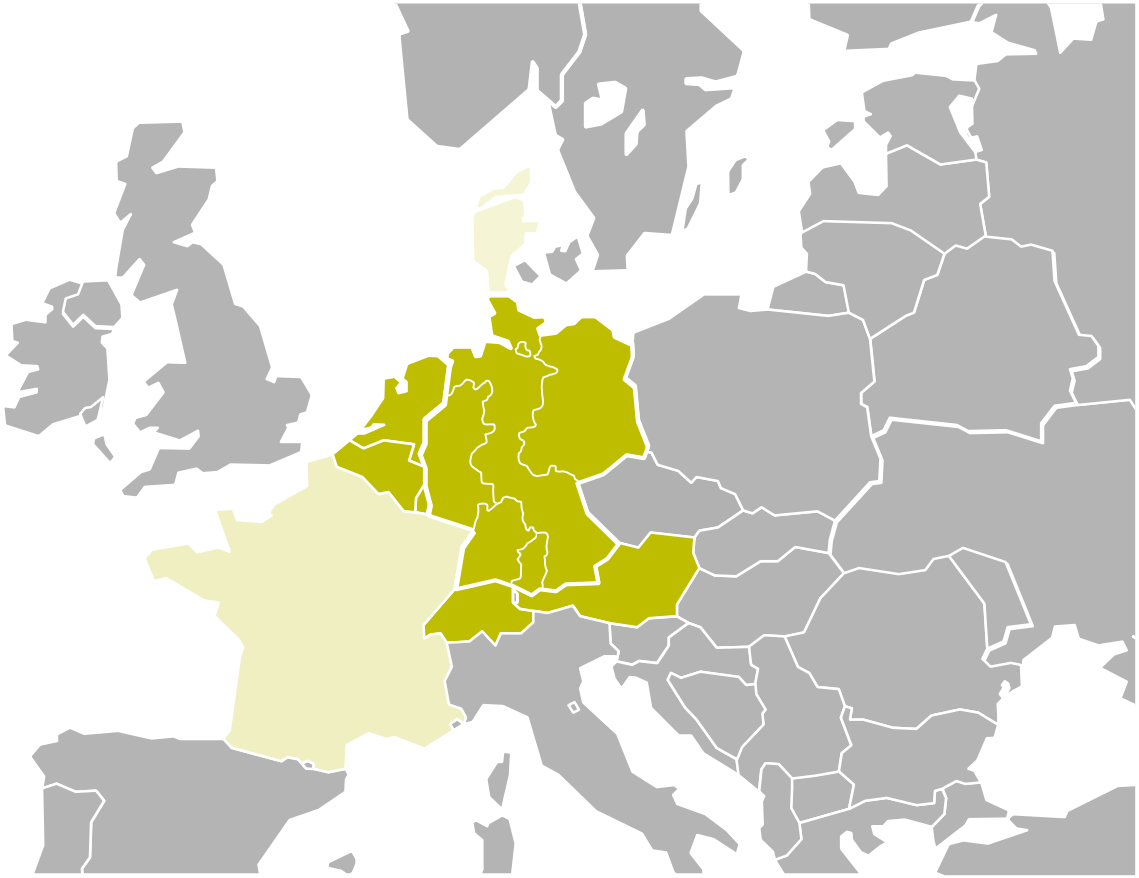
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Road to current FCR Cooperation
History of the projects



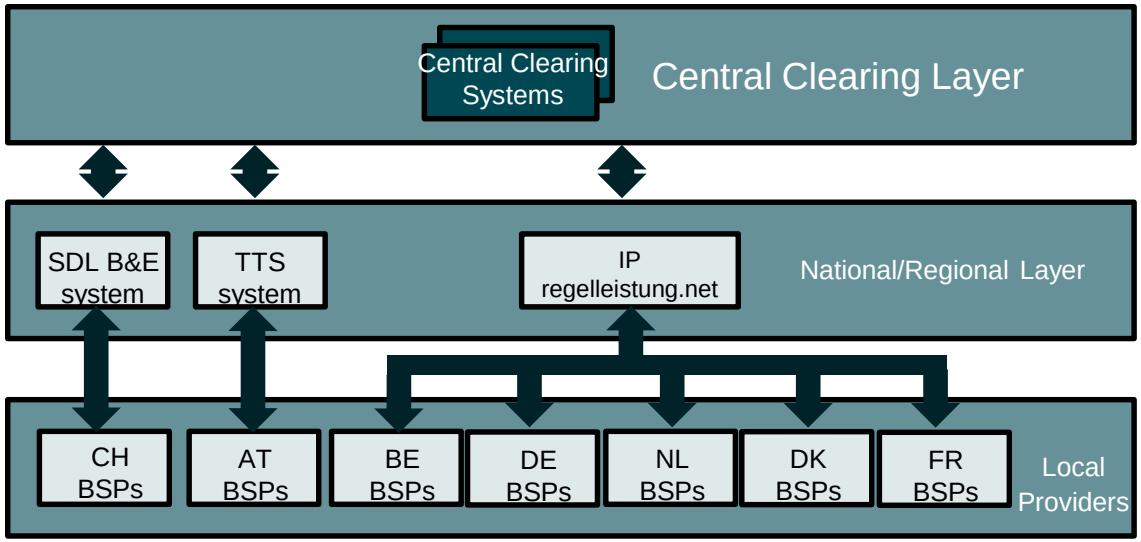
Overview of the FCR Cooperation

- 8 TSOs from 6 countries current member of the cooperation
- Common demand of 844 MW for 2016 in common auction, more than a quarter of the ENTSOE wide demand
- Further coupling of Denmark planned
- Further coupling of France planned (01/2017) ➔ 1.4 GW common auction



System layout

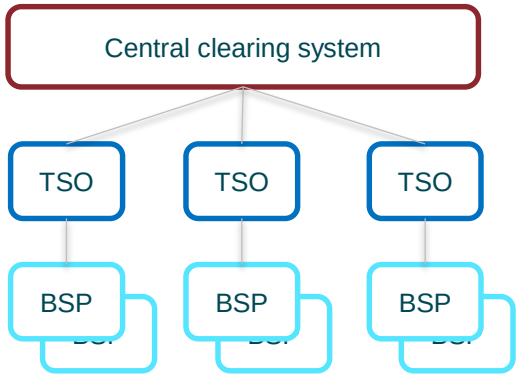
- Systems / Layer according to functionality:
  - Central clearing system (CCS)
  - Bidding on national/regional auction systems
  - Interface from TSOs to suppliers unchanged



- The CCS is a separate module with full flexibility
- Easy adaption of principles and extension
- No dependencies from interfaces with Market participants

Operational responsibilities

- Cooperation according to TSO-TSO Model
- TSOs operate their national/regional auction systems
- Sole responsibilities for BSPs (contracting, controlling and settlement) in its Control Area by the respective connecting TSO
- Each TSO sends its demand to the its national/regional central clearing system
- Overall demand = sum of TSO demand
- Bids selected through a common algorithm



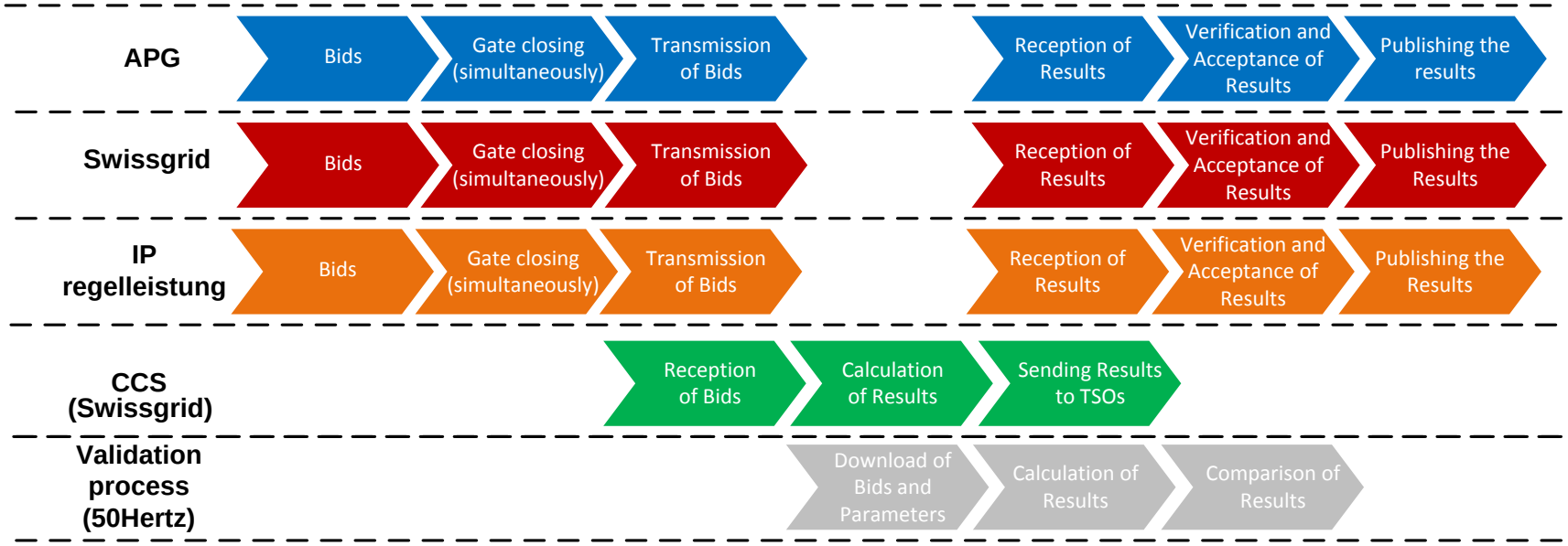
Market characteristics

- Week base product Monday > Sunday 168
- Symmetric & divisible (except CH)
- Minimum 1MW, resolution 1MW
- Pay-as-bid
- Weekly auction with:
  - Gate opening time (GOT) on Friday W-2 @12h
  - Gate closing time (GCT) on Tuesday W-1 @15h
- Market Clearing is based on cost minimization considering:
  - Limit of maximum import / export for each country
  - Individual products

Cooperation characteristics

- Market design allows difference in products and procedures between TSOs
- Fair governance
- Hybrid properties – divisible bids, block and conditional bids
- Own “in-house” development, flexible system and SW architecture, processes and market clearing algorithm
- The payment to market participants is pay-as-bid and each TSO pays the average awarded bid price multiplied by its own demand (TSO-TSO settlement)
- No need for the cross-border capacity allocation
- No need for exchanges of energy schedules

Processes



- every Tuesday at 15:00 gate closure at the same time on all countries for the next week
- transfer of bids and parameters to the CCS
- running market clearing algorithm at CCS at 15:07 (it must have finished by 15:17)
- validation of CCS through separate calculation and comparison of results by 50Hertz and detecting of decoupling
- verification and acceptance of results by every partner
- then confirmations to market participants and publishing results

Decoupling

- Different properties of bids (divisible / indivisible / conditional indivisible)

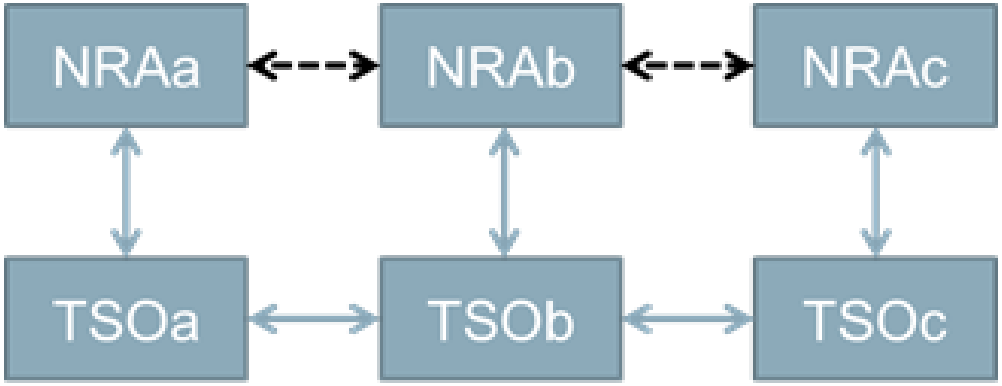
- To speed up the implementation, decisions made in the early project stage AT-DE-CH-NL:
  - To keep the bid types
  - Limiting the maximal indivisible bid size in CH to 25 MW
  - Adjustment of the German legislation and therefore following contracts between TSOs and BSPs in Germany – to focus on the minimization of the overall procurement cost – was not caught till the start of the market

→ **Decoupling as a temporary measure**

→ **Estimation based on historical data suggested 4 cases per year**

→ **Since the start of the market operation, 3 decouplings encountered**

Regulatory framework



- Regular holding of implementation Group between NRAs and TSOs
- Creates a forum for dialogue and discussion of FCR cooperation
- Brings together the NRAs itself and NRAs with TSOs

Content

- FCR cooperation presentation
- Public consultation: context & process
- Public consultation: topics

Public consultation

- FCR cooperation indicates following benefits:
  - socio economic benefit for the participating countries
  - increased robustness of supply
  - positive influence on security of supply

- TSOs and NRAs of the countries involved have identified a set of priorities regarding cooperation evolutions

- It was decided to address these topics through a joint public consultation of stakeholders carried out by TSOs with NRAs supervision.

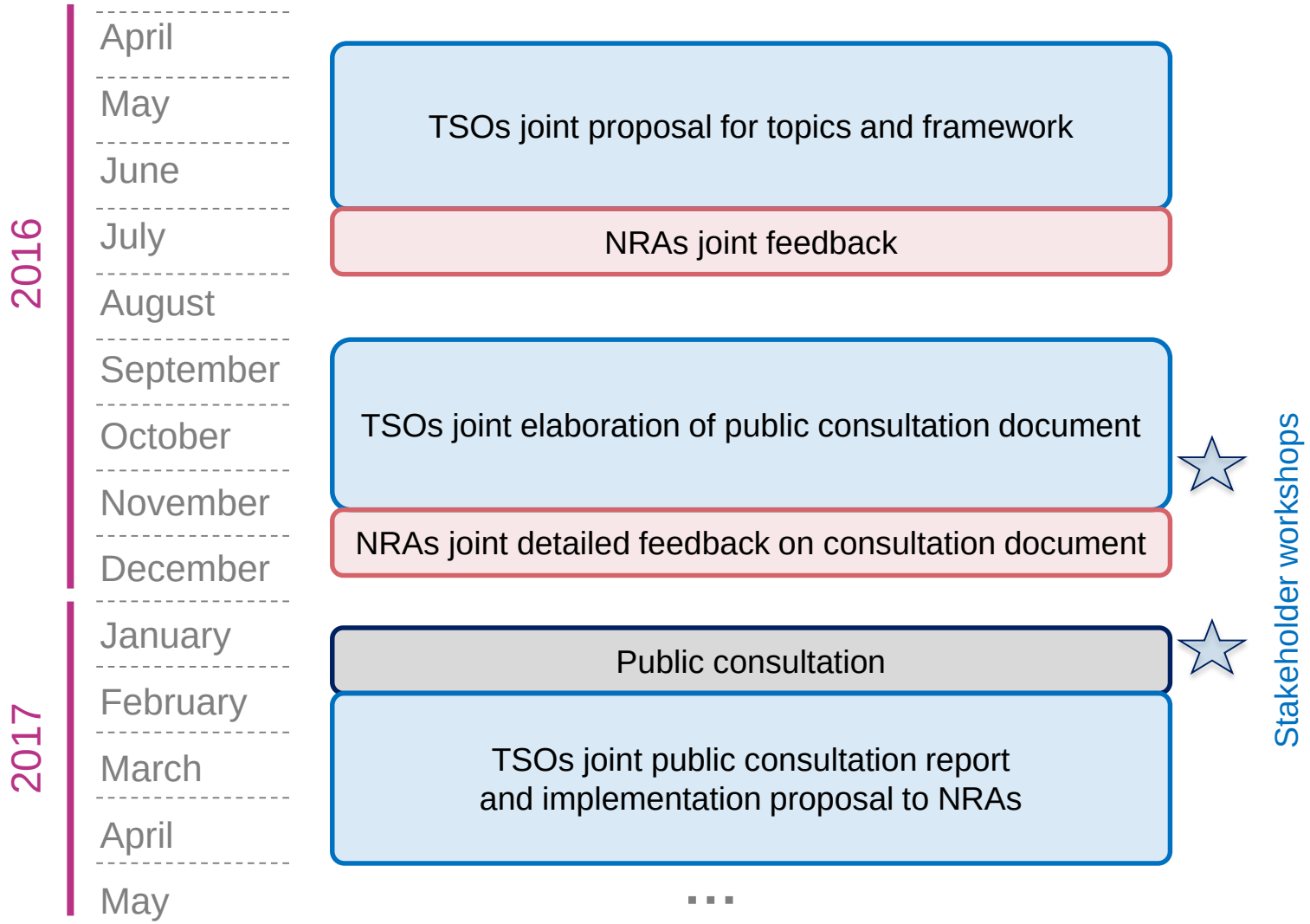
- After consultation TSOs will make a joint proposal to NRAs for implementation of the appropriate measures

Potential for future market development

- The market design could be developed further e.g.
  - Auction frequency and product duration
  - Bid design (Symmetric vs. asymmetric products, divisible, indivisible)
  - Transfer of obligation
  - Payment principle (PAB vs. marginal pricing)
  - Harmonization of Market rules

- An improved market design could
  - Ease the access for smaller market players
  - Improve the investment signals
  - Strengthen the international market integration
  - Increase socioeconomic benefits

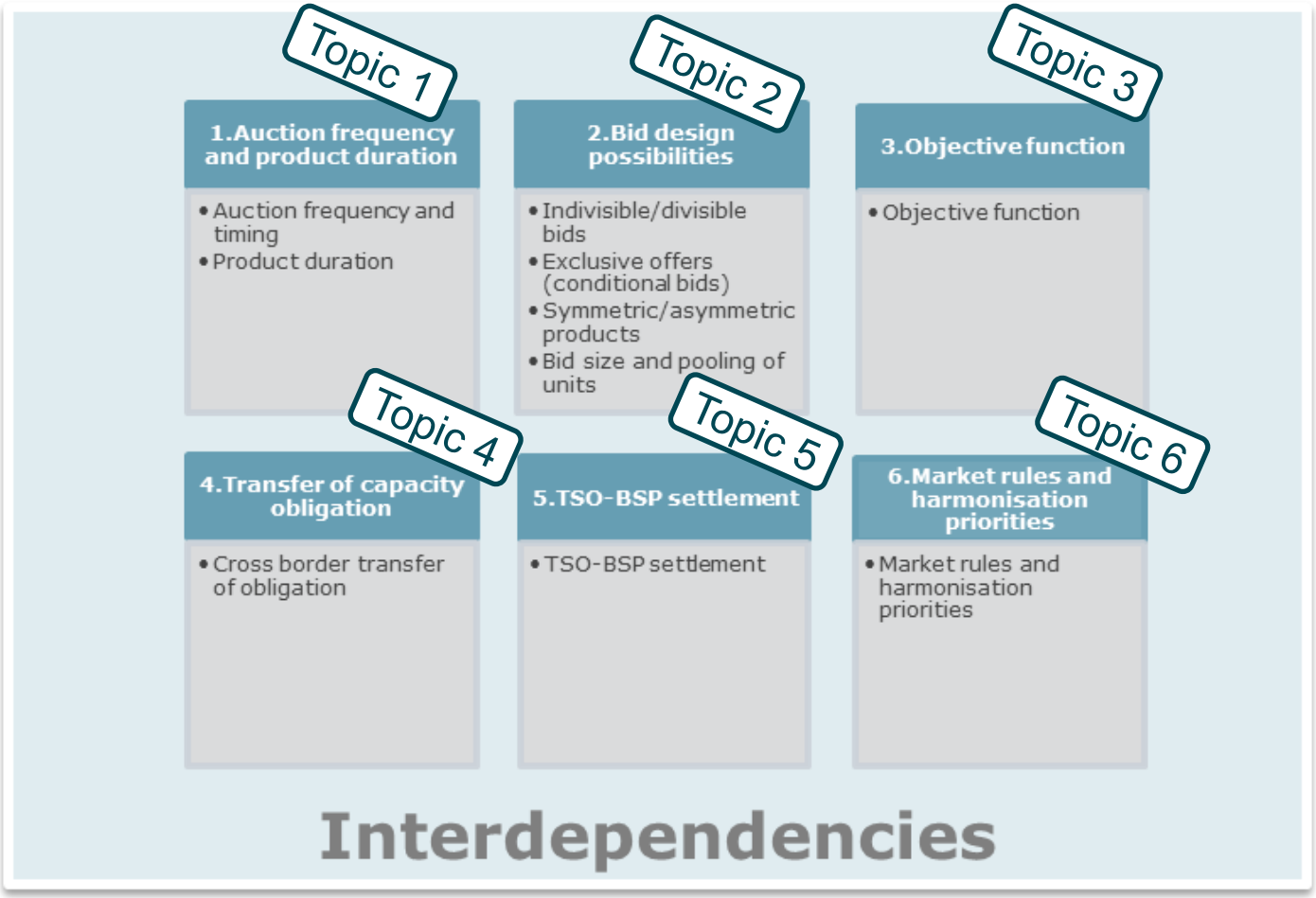
Planned timeline



Content

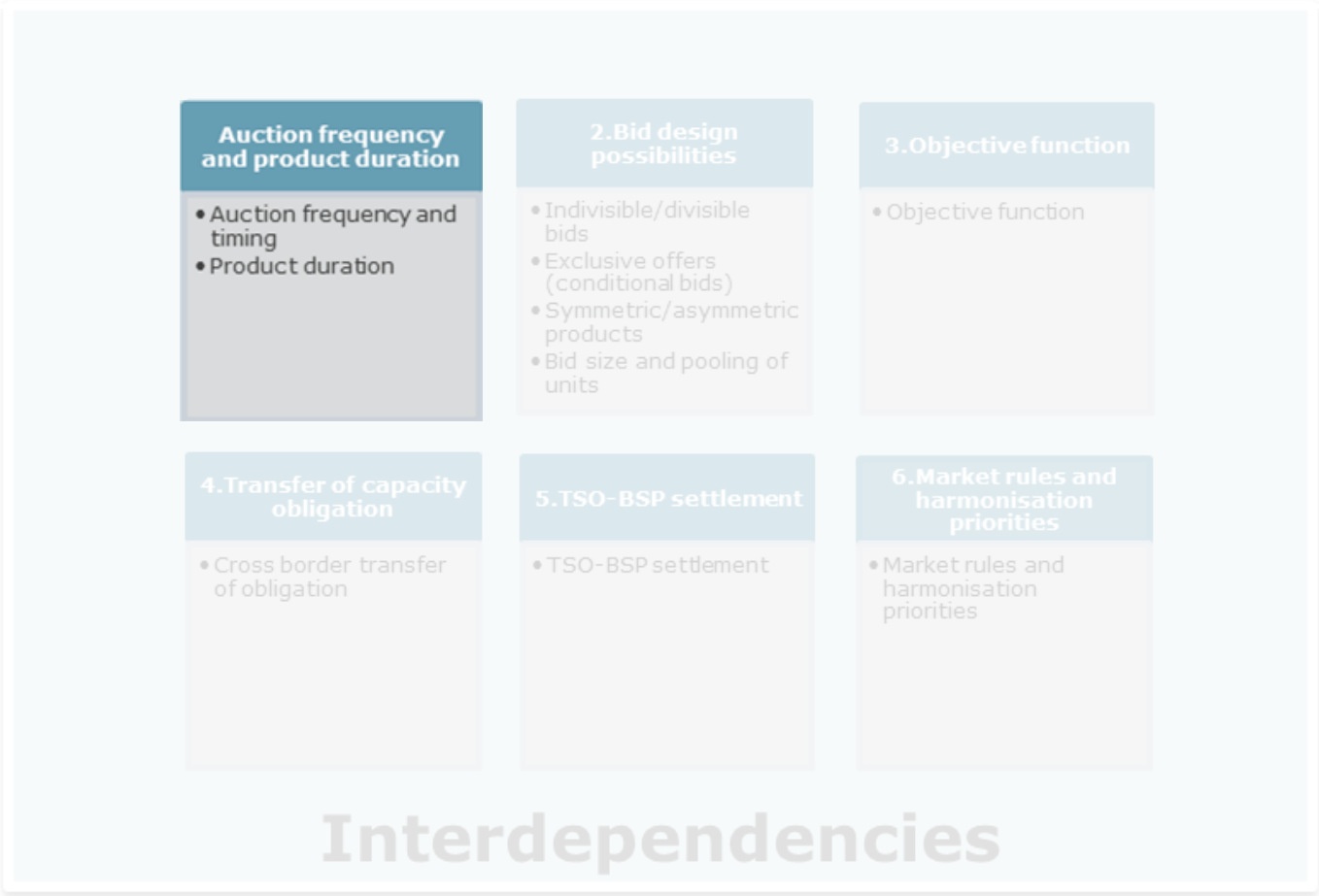
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Topics that are part of the market consultation



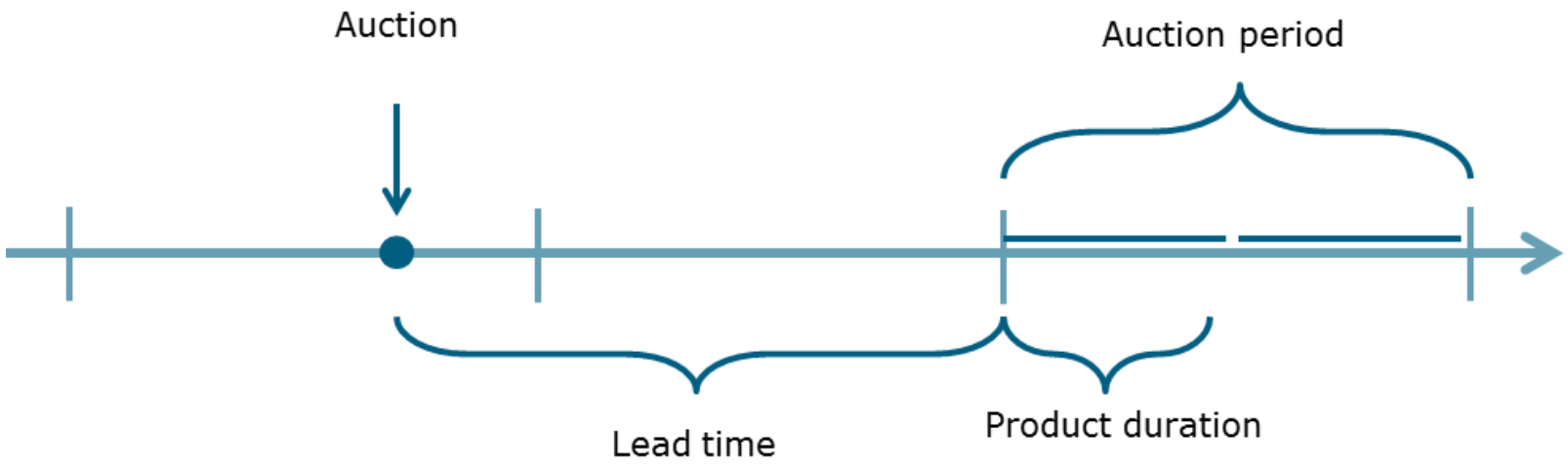
Auction frequency and product duration

Topic 1



Topic 1

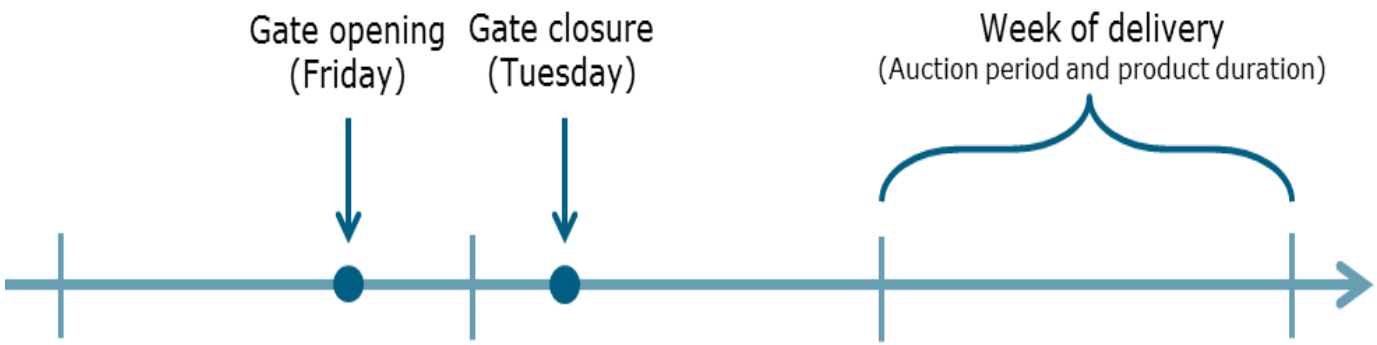
Some definitions



Topic 1

Should the auction frequency be increased?

Current market design is weekly procurement, weekly products and gate closure D-6 at 15:00



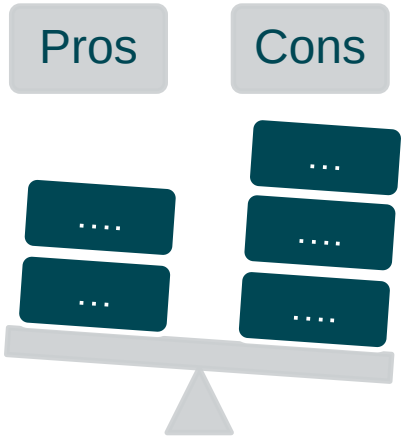
Topic 1

Should the auction frequency be increased?

Increasing the auction frequency often leads to gate closure closer to the time of delivery i.e. shorter lead time

Should the auction frequency be increased? (e.g. moving to daily auctions)

What are the benefits and challenges of increasing auction frequency?



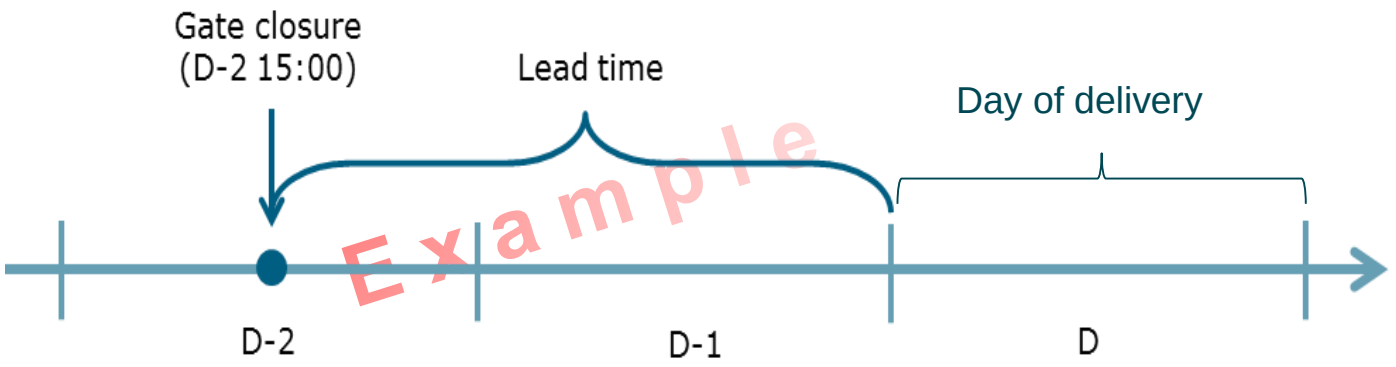
Topic 1

What should the timing of the auction be?

Example of auction frequency timed with frequency of the spot market i.e. daily auctions

What are your views regarding GCT (in case of weekly / daily)?

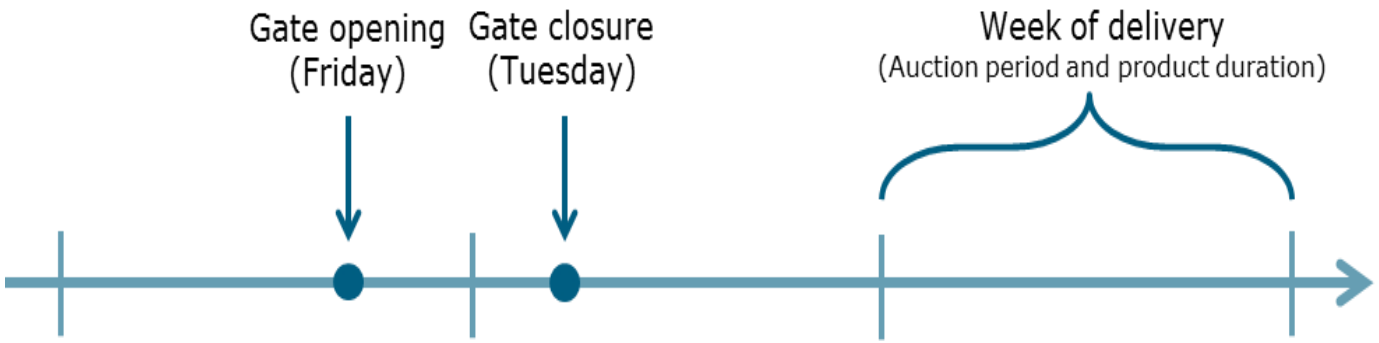
Would it be beneficial to time (before / after) the auction with another energy market? Which markets are relevant?



Should the product duration be shortened?

Topic 1

Current market has consistency between auction period and product duration:
Weekly procurement and one weekly base (168h) product



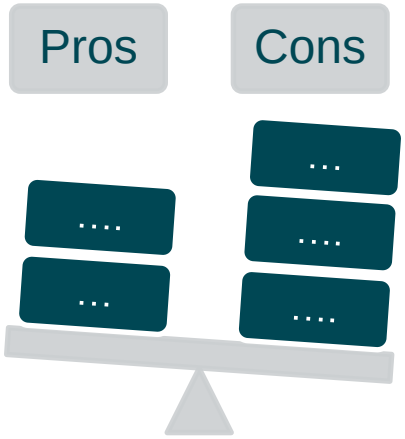
Topic 1

Should the product duration be shortened?

Shorter product duration is a natural consequence of increased auction frequency

Should the product duration be shortened?

What are the benefits and challenges of shortening the product duration?



Topic 1

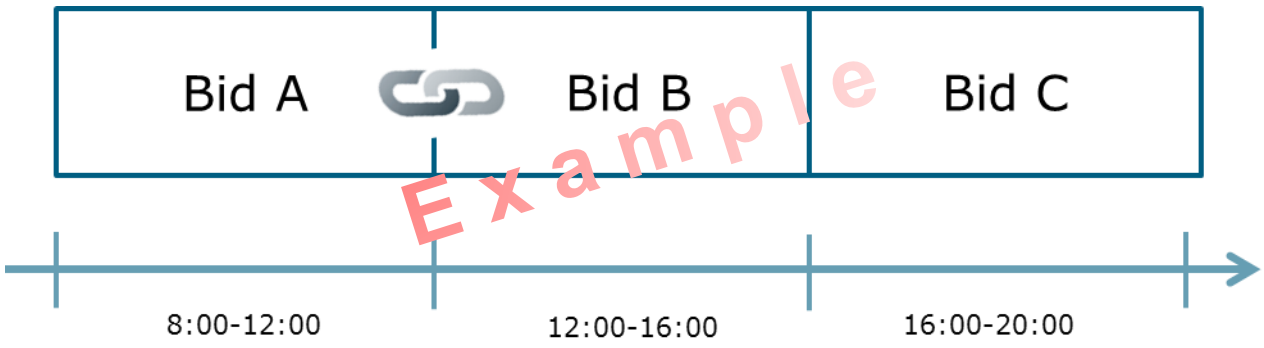
What should the product duration be?

Which product duration would you prefer or which combinations?

- Week (168h)
- Week peak / offpeak product
- Day product (24h)
- 4h product
- 1h product
- Other option

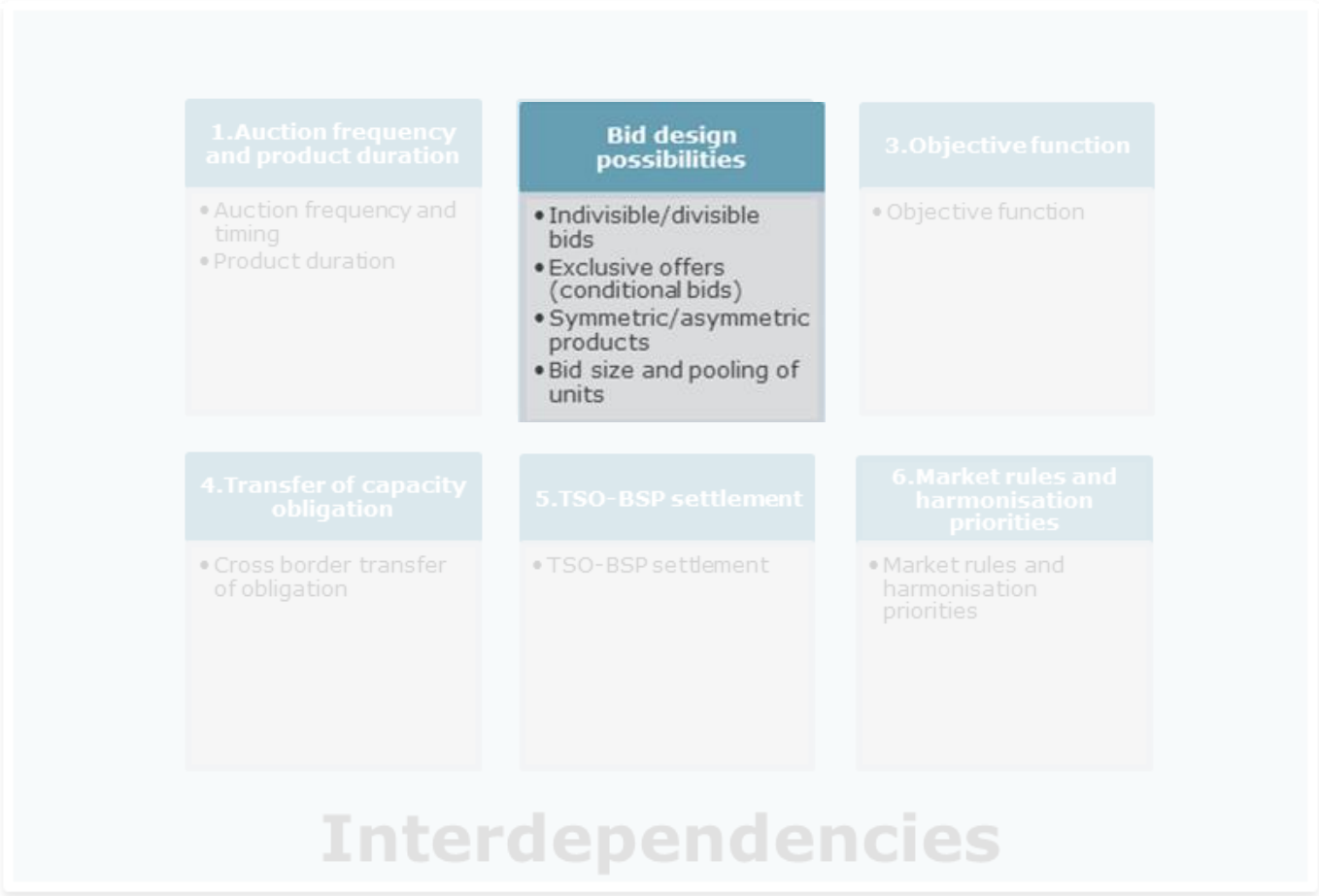
For which product durations are linked bids in time relevant?

Example of product duration of 4 hours, with the possibility to link bids in time



Topic 2

Bid design possibilities



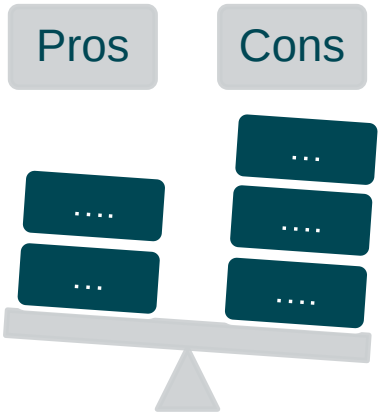
Topic 2

Should both indivisible bids and divisible bids be allowed?

Current market design allows divisible bids, while only Swiss BSPs can provide indivisible bids. The inconsistency in bid design possibilities leads to decoupling of the market into two regions

Should indivisible bids be introduced? Should both divisible – and indivisible bids be allowed?

What are the benefits and challenges of allowing indivisible bids?

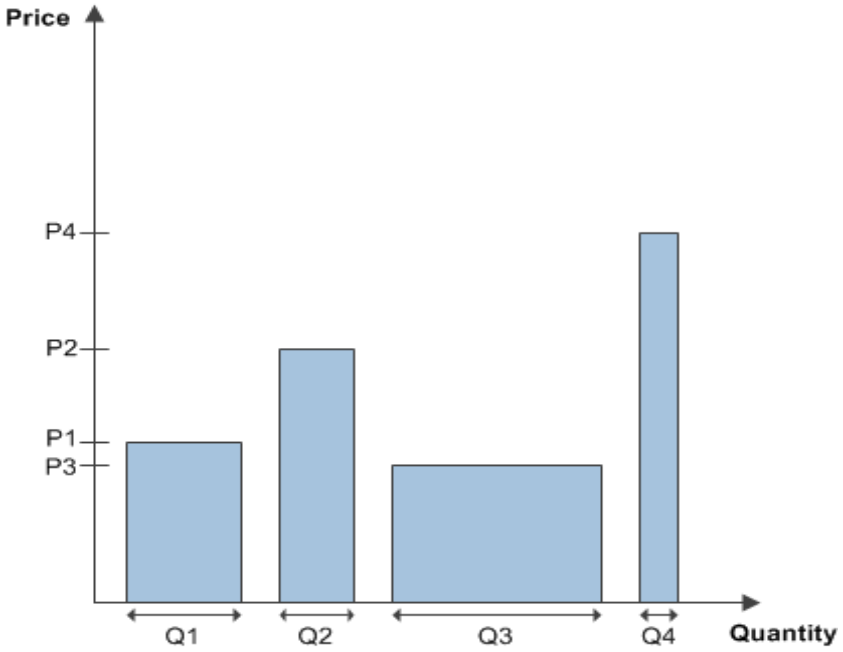


Topic 2

Should Exclusive Offers be allowed?

Exclusive Offer means:

- Only one (or none) of the Exclusive Offers can be activated
- The activation of a sub-offer belonging to an Exclusive Offer excludes the activation of the other sub-offers belonging to that Exclusive Offer



The example illustrates four Exclusive sub-Offers with (quantities/prices): (Q_1/ P_1), (Q_2/ P_2), (Q_3/ P_3) and (Q_4/ P_4), respectively with the same delivery period. Only one of these offers can be accepted by the algorithm.

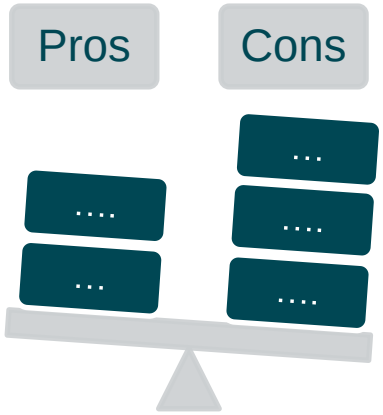
Topic 2

Should Exclusive Offers be allowed?

Current market design only allows Swiss BSPs to provide Exclusive Offers

Should Exclusive Offers be allowed for all BSPs?

What are the benefits and challenges of allowing Exclusive Offers?



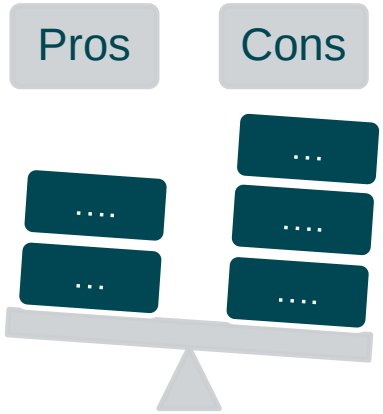
Topic 2

Should asymmetric bids be allowed?

Current market design only allows for symmetric bids. Asymmetric bids can be procured in two auctions – one for downwards FCR and one for upwards FCR, or it can be procured in one auction.

Should asymmetric bids be allowed? Should both asymmetric and symmetric bids be allowed?

What are the challenges and benefits of allowing asymmetric bids?



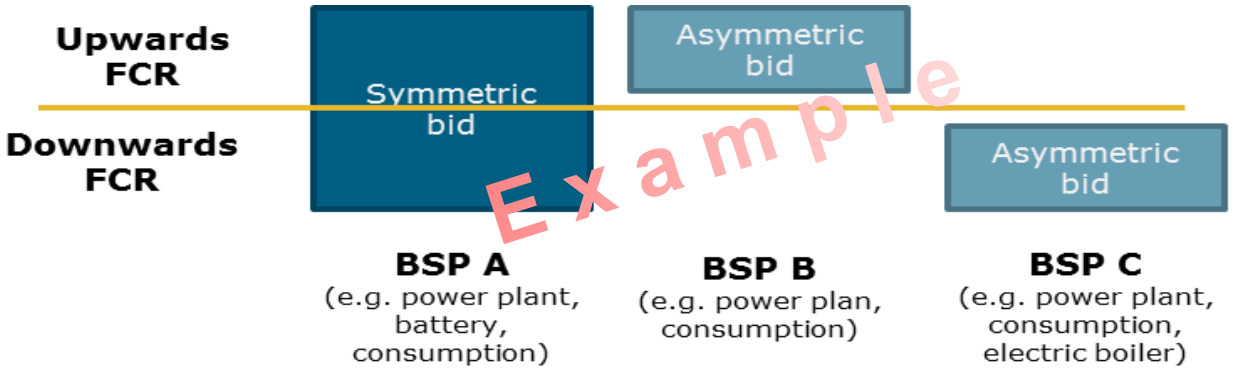
Topic 2

How should asymmetric bids be procured

Example of symmetric and asymmetric bids in the same auction.

Should symmetric and asymmetric bids be allowed in the same auction?

Would allowing both symmetric and asymmetric bids facilitate more capacity in the market?



Bid size and pooling of units

Topic 2

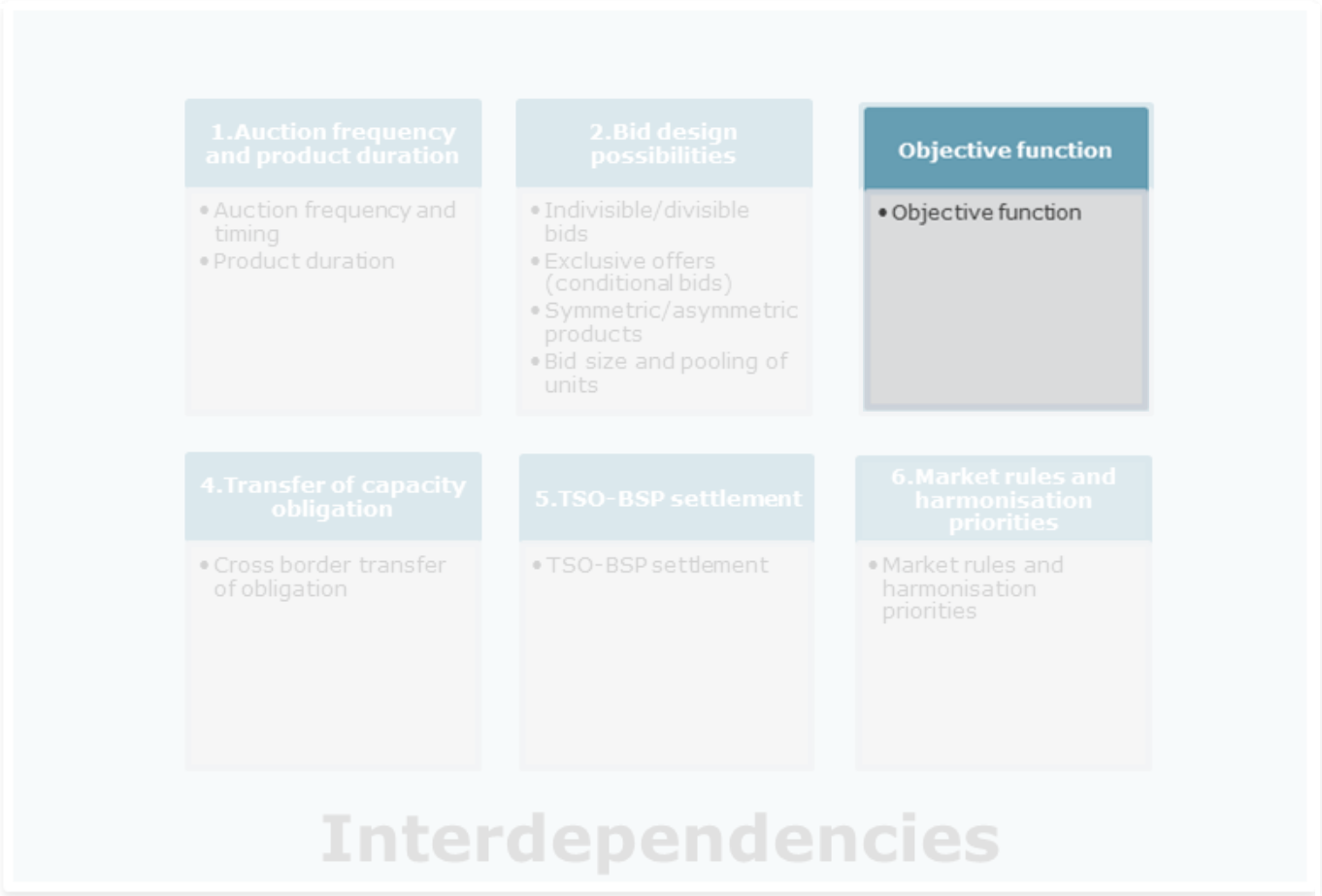
TSOs underline that cross border pooling cannot be implemented since it does not respect SO GL FCR import / export limits.

Are you satisfied with current pooling rules?

Are you satisfied with minimimum bid size of 1 MW?

Objective function

Topic 3



Topic 3

Should the objective function be changed?

The current market has a simple bid structure and simple auction algorithm. Increasing the bid design possibilities increases complexity of the algorithm.

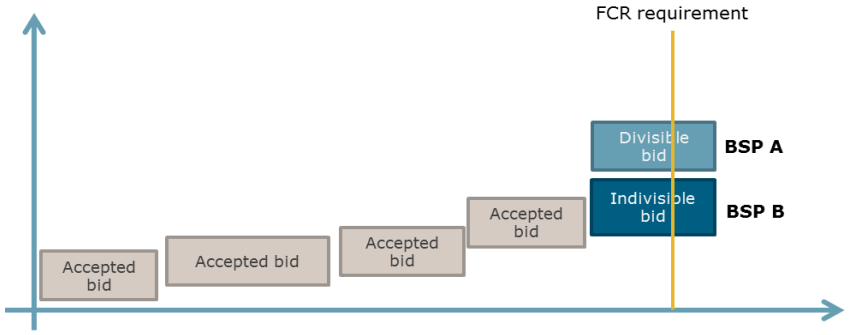
Option 1: Allow both paradoxically rejected divisible bids and paradoxically rejected indivisible bids

➔ **Procurement cost minimisation algorithm**

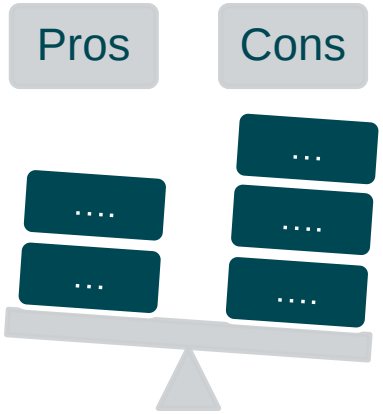
Option 2: Forbid paradoxically rejected divisible bids and allow paradoxically rejected indivisible bids

➔**Such as market coupling algorithm**

What are the benefits and challenges of both options?

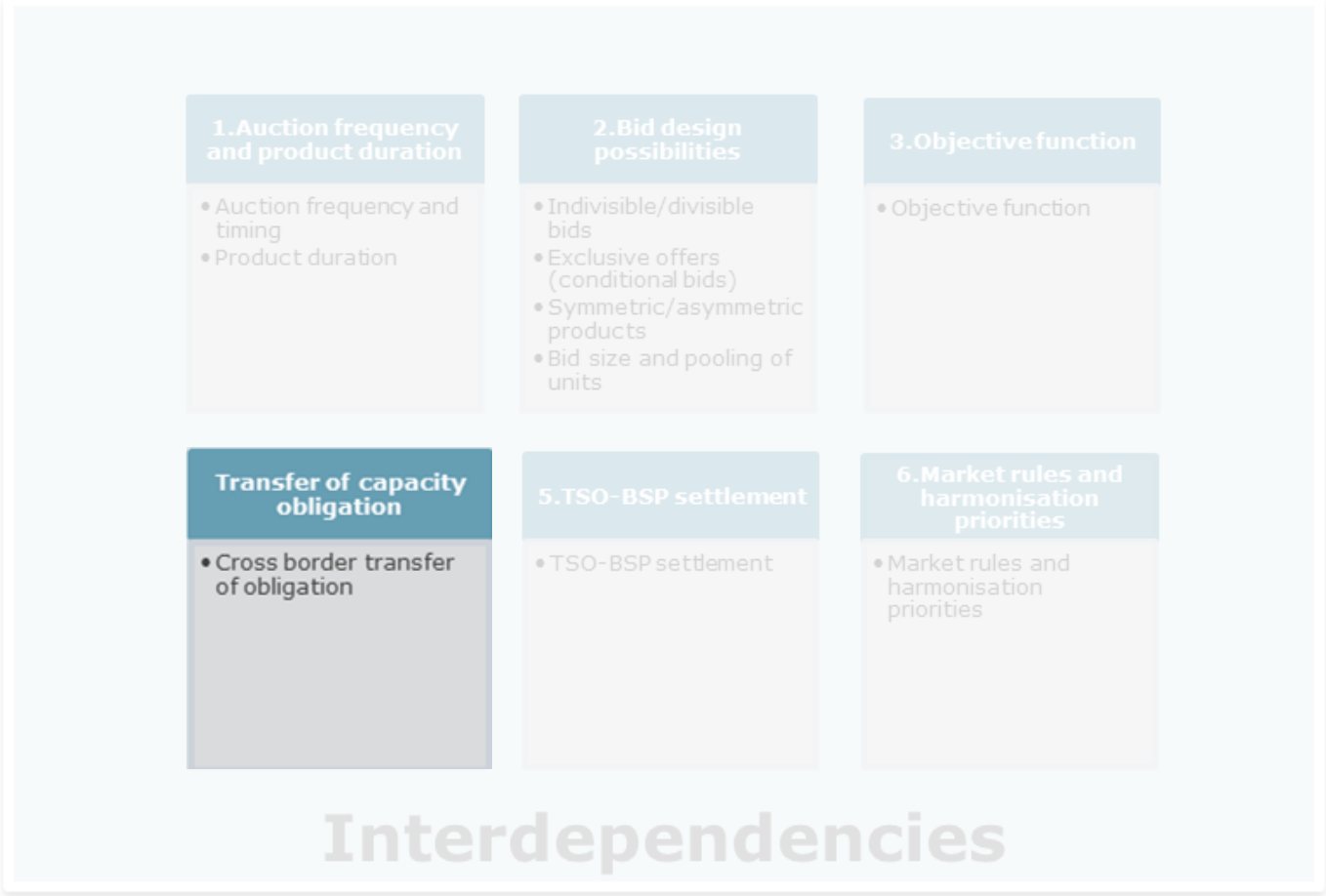


A bid is paradoxically rejected when its price is strictly lower than the marginal price and not fully accepted



Transfer of capacity obligation

Topic 4



Topic 4

Should cross border transfer of capacity obligation be possible?

The transfer of capacity obligation among BSPs after the FCR auction is also referred to as secondary market.

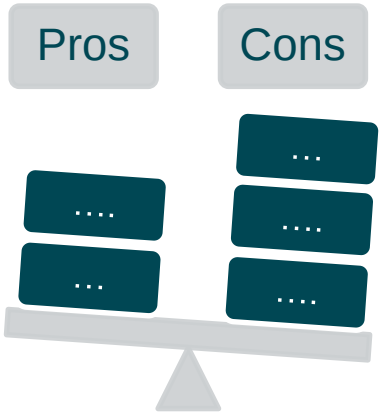
Cross border transfer of capacity obligation must respect the FCR country specific import/export limits specified by System Operation Guideline (SO GL)

Topic 4

Should crossborder transfer of capacity obligation be possible?

The current market does not allow cross border transfer of capacity obligation, but some countries allow transfer within control areas. Transfer of capacity obligation within countries is not part of this consultation.

What are the challenges and benefits of the cross border transfer of capacity obligation?



Topic 4

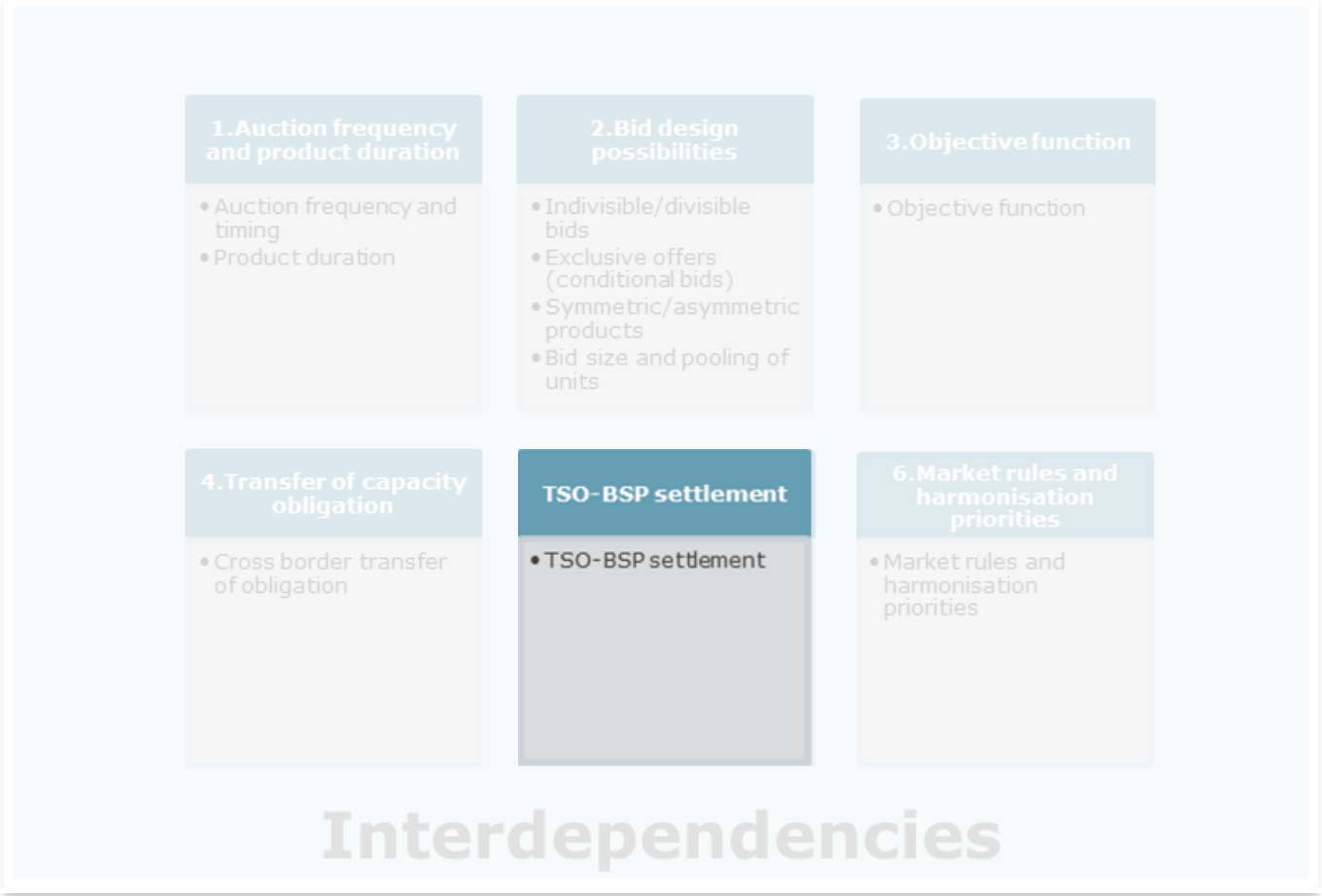
For what market design does transfer of capacity obligation make sense?

With gate closure closer to real time and shortened product duration, crossborder transfer of capacity obligation may become less relevant.

For which auction frequency, lead time, and product duration does transfer of capacity obligation lose some importance for you?

TSO-BSP settlement

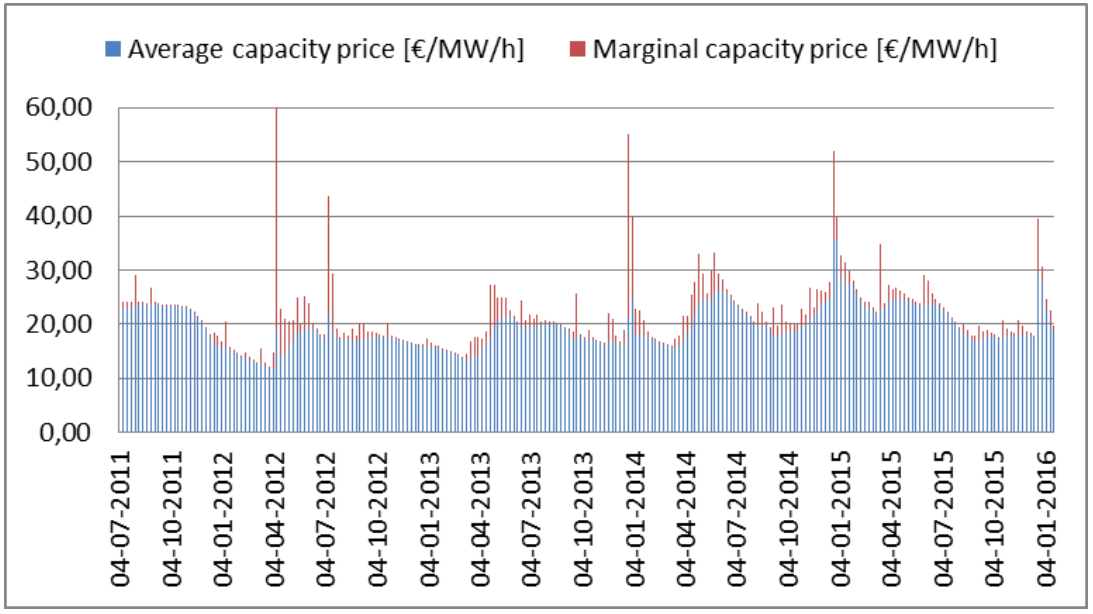
Topic 5



Topic 5

Should the settlement be changed to marginal pricing?

With Pay-as-bid settlement, all BSPs are paid according to their own bid price. With marginal pricing all BSPs are paid the same, namely the price of the marginal bid.



FCR price in Germany

We can observe that BSPs already try to bid the expected marginal price

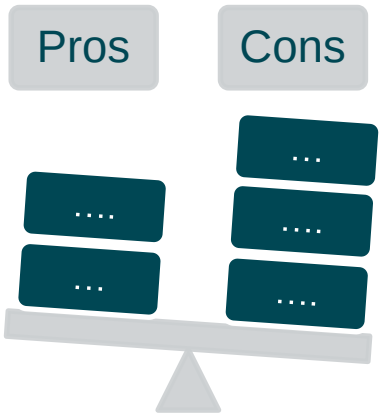
Topic 5

Should the settlement be changed to marginal pricing?

In the current market design, settlement is handled according the pay-as-bid-principle.

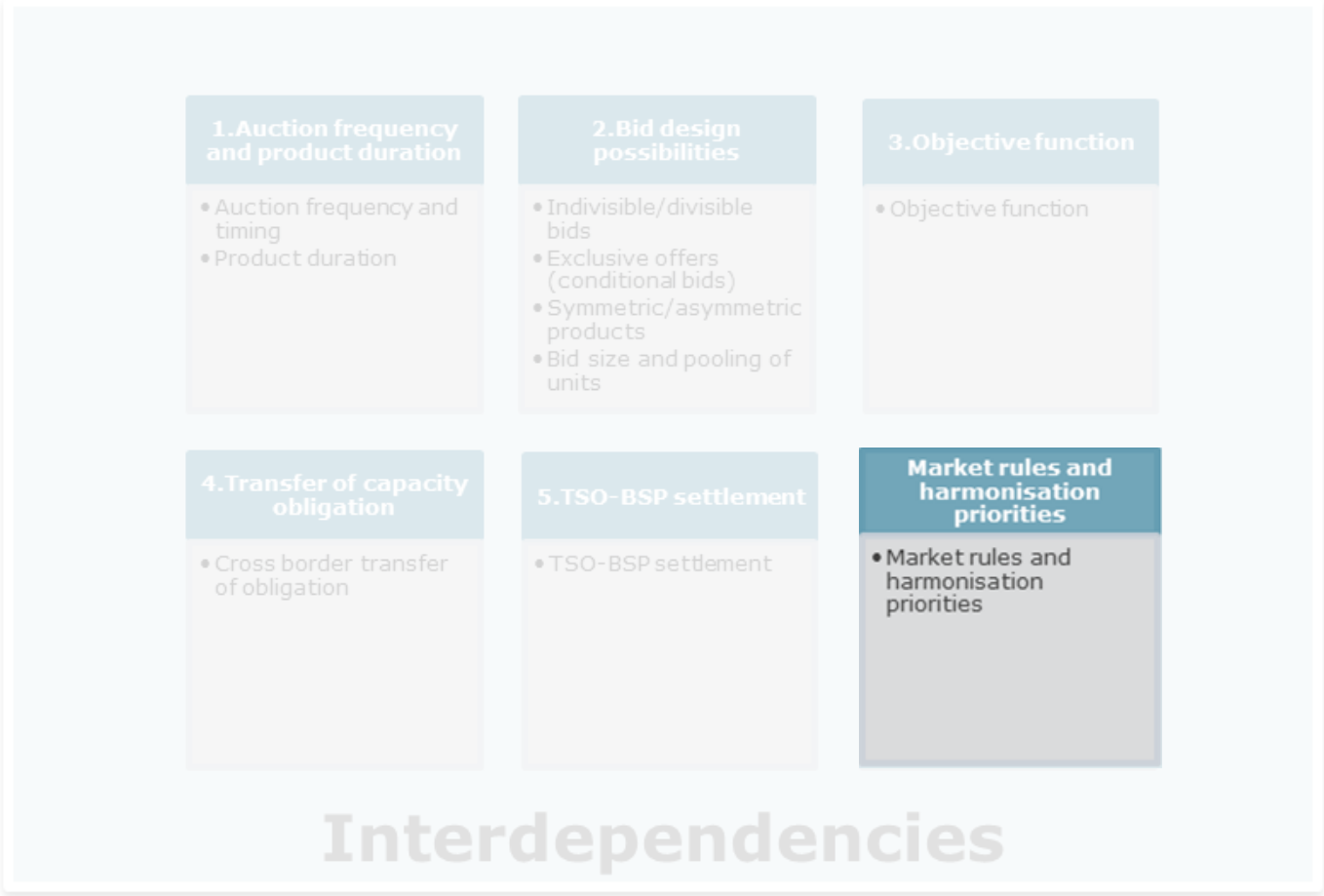
Should marginal pricing be introduced?

What are the benefits and challenges of introducing marginal pricing?



Harmonisation of market rules

Topic 6



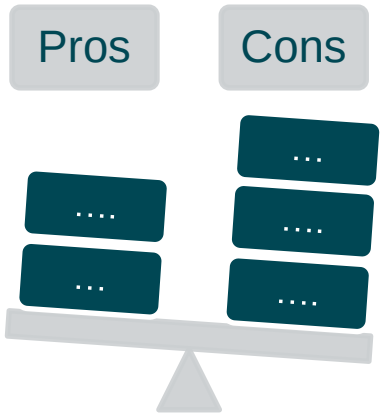
Topic 6

Harmonisation priorities

There are differences in between the different national market rules

What are the benefits and challenges of harmonisation?

What should be harmonised in priority?



Thank you for your attention

06.10.2016, 1ST STAKE HOLDER WORKSHOP ON “FCR COOPERATION” MARKET DESIGN EVOLUTIONS