

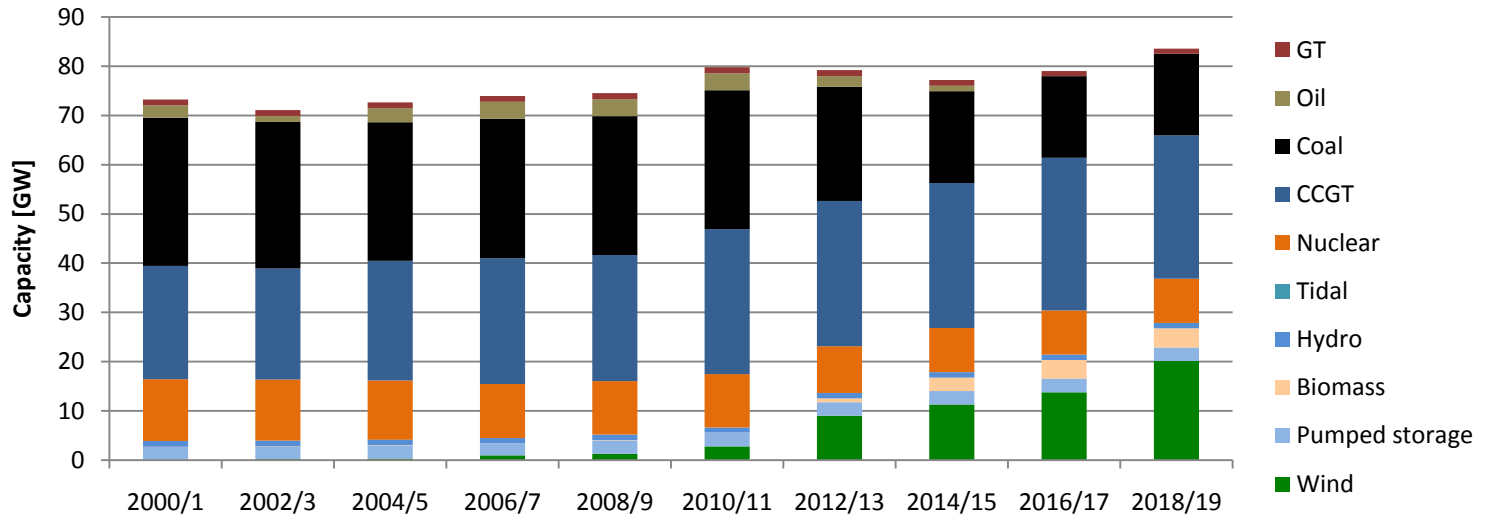
Future Trading Arrangements Working Group 2

Boaz Moselle and Jason Mann
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ofgem

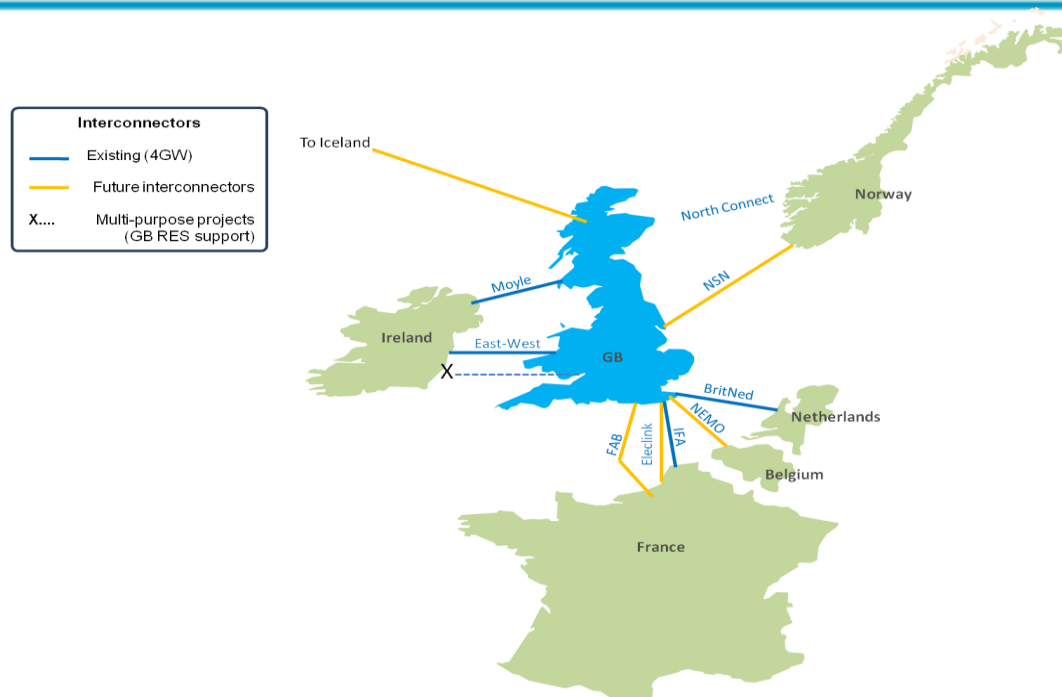
1. Challenges facing the sector
2. Key principles
3. Issues and potential levers
4. Potential future work-streams

Generation mix will change considerably over the next decade



- Intermittent generation**
 - Higher uncertainty leading to increasing reserves by 5 TWh by 2020
 - Greater flexible plant needed to accommodate volatility
 - Siting and congestion issues with generation locating far from load
- Plant retirement**
 - Capacity margins will tighten e.g. LCPD will see 12GW thermal close
- New technologies**
 - E.g. DSR and storage

GB is increasingly connected to Europe both physically and in terms of market model

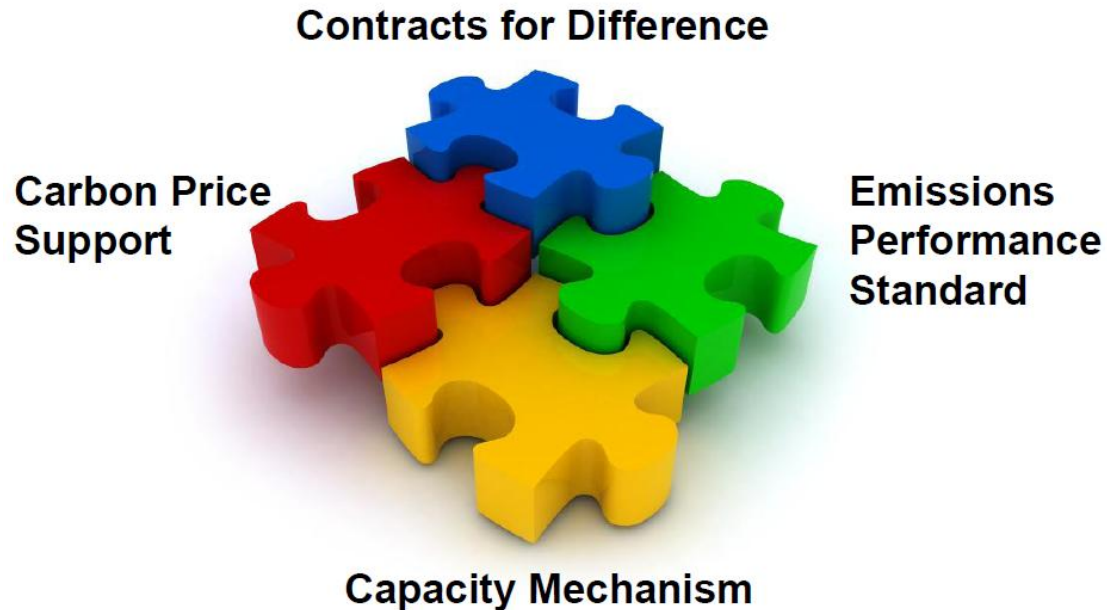


Physical interconnection

- Current 4GW to increase to 10GW+?
- Potential to be interconnected with six markets

EU Target Model

- GB trading arrangements need to be coherent with evolving EU arrangements for GB consumers to benefit



Capacity mechanism

- Uncertain interaction with existing trading arrangements
- GB energy price not sole driver of investment

CfDs/FiTs

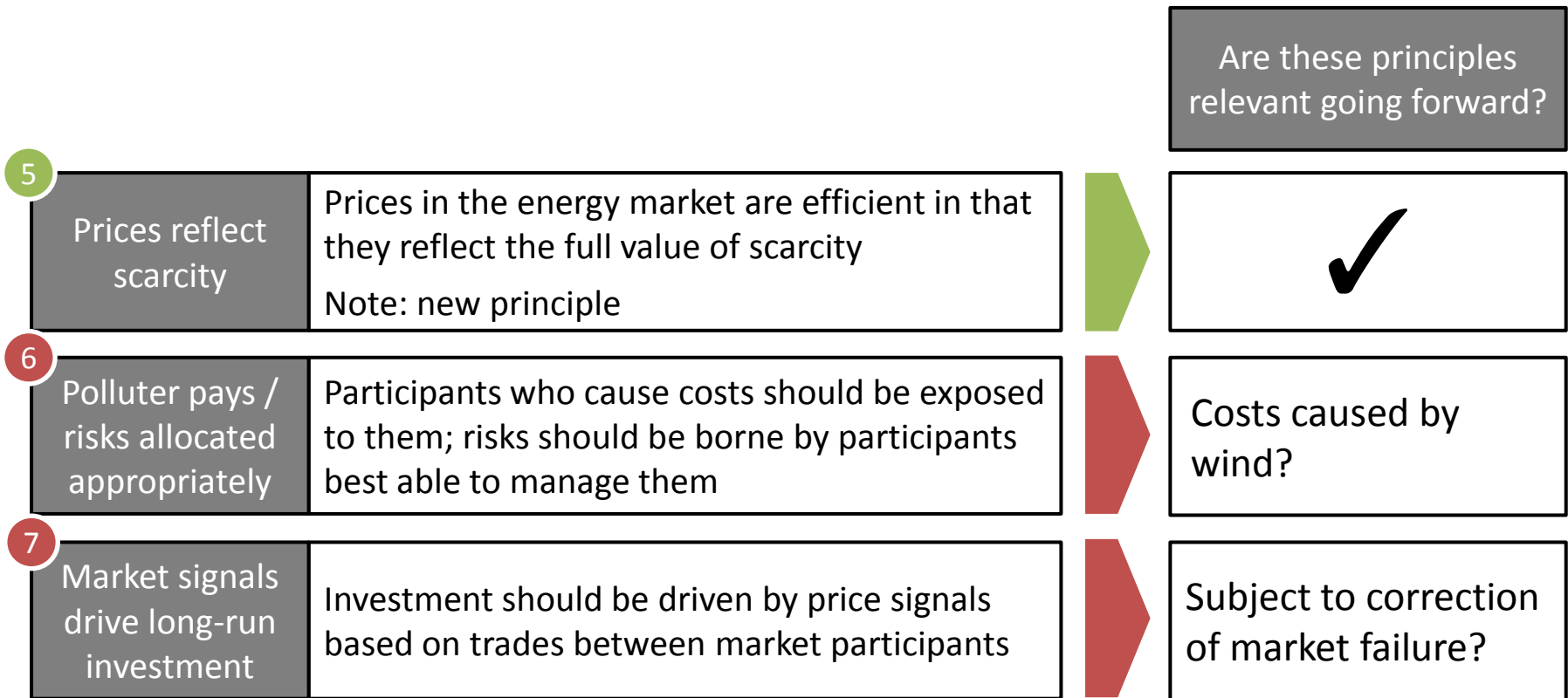
- Uncertain impact on market price

1. Challenges facing the sector
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The principles underlying NETA remain broadly relevant but possible to re-interpret some of them

		Are these principles relevant going forward?	
1	<p>Competition where possible</p> <p>Competition-driven solutions should be encouraged where possible</p>	➔	✓
2	<p>Efficient dispatch</p> <p>The arrangements should result in the most overall efficient dispatch</p>	➔	✓
3	<p>Non-discrimination</p> <p>Equal treatment for all participants in the market with no undue discrimination for or against any participant in the market</p>	➔	✓
4	<p>Minimum regulatory oversight</p> <p>Market polices itself with ex post competition policy to deal with possible abuses</p>	➔	Financial regulation?

The principles underlying NETA remain broadly relevant but possible to re-interpret some of them, cont.



We need to keep these principles in mind when considering the issues that follow...

1. Challenges facing the sector
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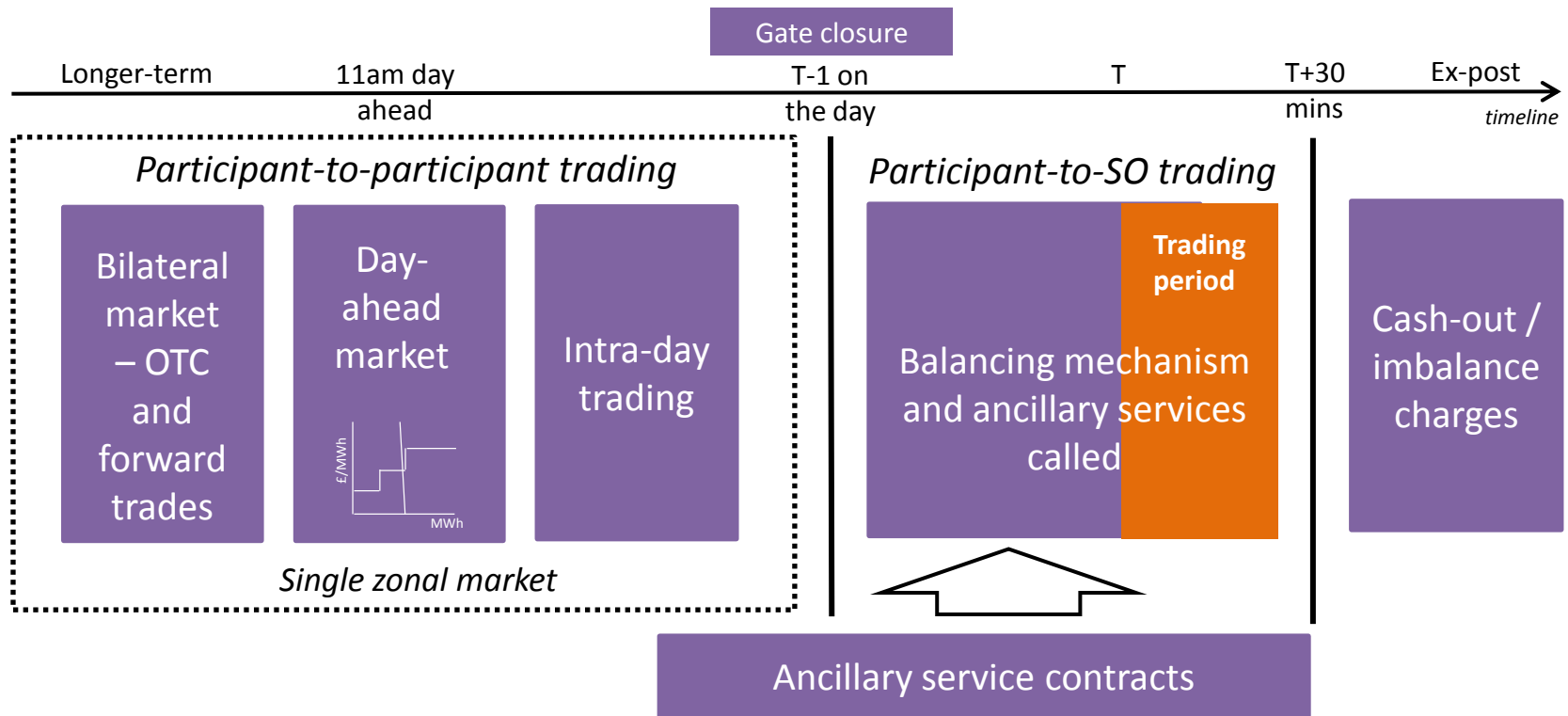
Eight broad issues identified that the FTAs need to consider



- Initially seven broad issues were identified in Ofgem's open letter (February 2013)
- Addition of 'Financial regulation' as an eighth broad issue following feedback from stakeholders in the first Forum (July 2013)

The GB trading arrangements

We have a range of potential levers...



Issue 1: Integration of Renewables



Managing uncertainty

- With higher penetration of renewables, requirements for trading out imbalances closer to real time is likely to increase going forward due to uncertainty
- Intermittent generators without PPAs need to manage balancing cost exposure
- How can they manage these risks?

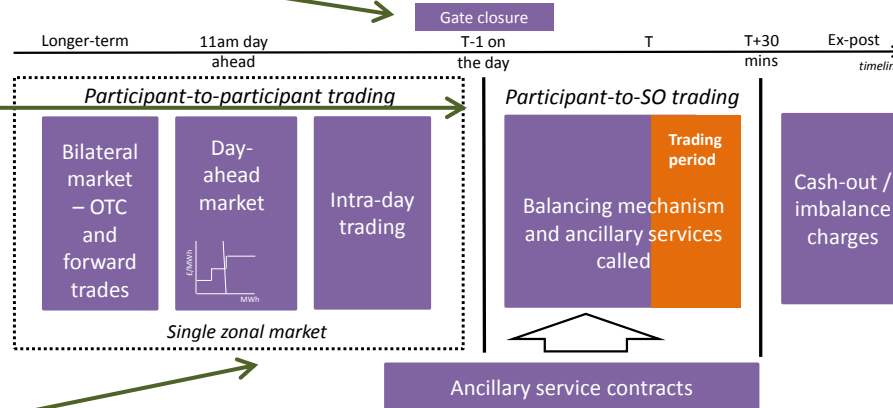
Route to market for renewables

- A low competitiveness of the PPA market might hinder the development of renewables, as smaller players rely on PPAs to sell power and obtain finance
- Generators without PPAs might be subject to basis risk trying to sell their output
- Can trading arrangements facilitate PPAs?



1 **Timing of gate closure**
To allow for greater participant-participant or SO-participant trading leading up to real time in the future
Ofgem's current minded-to position in EBSCR is not to move gate closure

2 **Enhance near real time trading**
Take measures to encourage parties to trade out imbalances with each other, leading up to real time



3 **Central aggregator**
Central aggregator taking on all renewable output and managing it centrally
Potential efficiency improvement via pooling to reduce imbalance risk?

4 **Improve within day trading**
For example, Balancing Energy Market where market participants and SO can trade balancing products
Clearing price can be used as reference price e.g. for financial products

Other potential levers?

Issue 2: Efficient balancing and system operation



Specific issues

Congestion costs

- Insufficient signals on the market to generate electricity where it is needed, resulting in high congestion costs (£12.5m in 2000/01 v £212m in 2012/13)
- e.g. wind being constructed in Scotland

Increasing reserve requirement

- Higher proportion of intermittent generation will lead to an increased reserves e.g. National Grid estimate additional 5 TWh of reserve for wind by 2020
- Reserve procurement to become more transparent and dynamic

Need for additional ancillary services

- Enhanced system services procured via market mechanisms may be required in order to maintain a reliable electricity system with high wind penetration
- Interactions between markets for these services and energy markets

Dampened imbalance prices

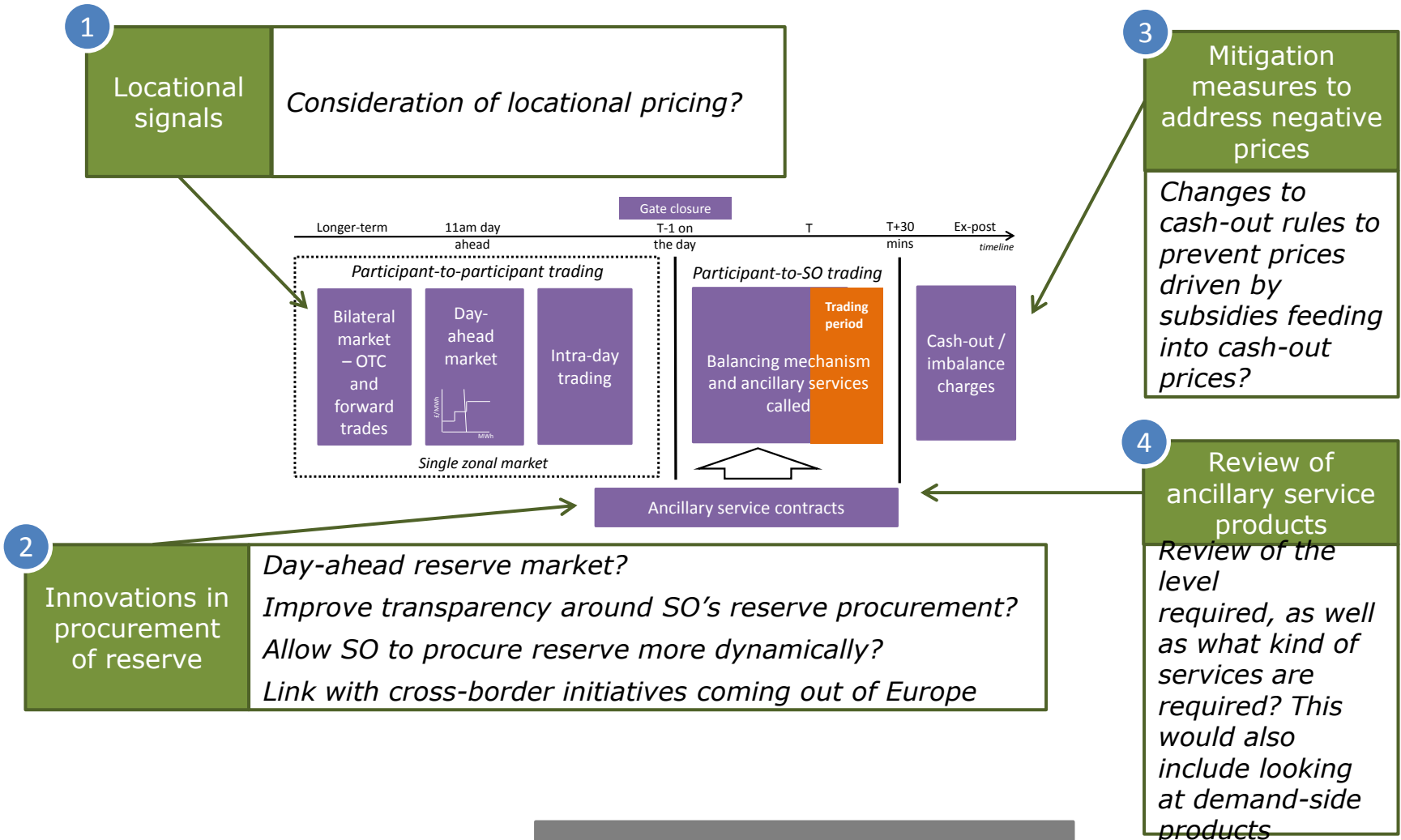
- Various features of the current balancing arrangements dampen cash-out prices and incentives on the market to balance efficiently

Distorted negative prices

- Due to renewable CfDs/FiTs, renewable generators will bid negative prices into the Balancing Mechanism, which could result in negative System Sell Prices
- Potential inefficient curtailment and cross-border trading



Potential levers



Other potential levers?



Issue 3: Effective Integration with EU Market



Specific issues

Locational pricing & market coupling

- According to the CACM Network Code bidding zones should be defined to “ensure efficient congestion management and overall market efficiency”
- Target Model is based on market coupling with a single reference price per zone

Cross-border balancing

- Electricity Balancing Network Code promotes rules around procurement e.g. standard products sold on cross-border exchanges
- Payment for balancing products should also be on a pay-as-clear basis

Treatment of interconnectors in Capacity Mechanism

- Incorporating interconnectors into the Capacity Mechanism is an EMR implementation issue in the short-medium term
- Provides opportunity for market participants to trade flexibility across borders

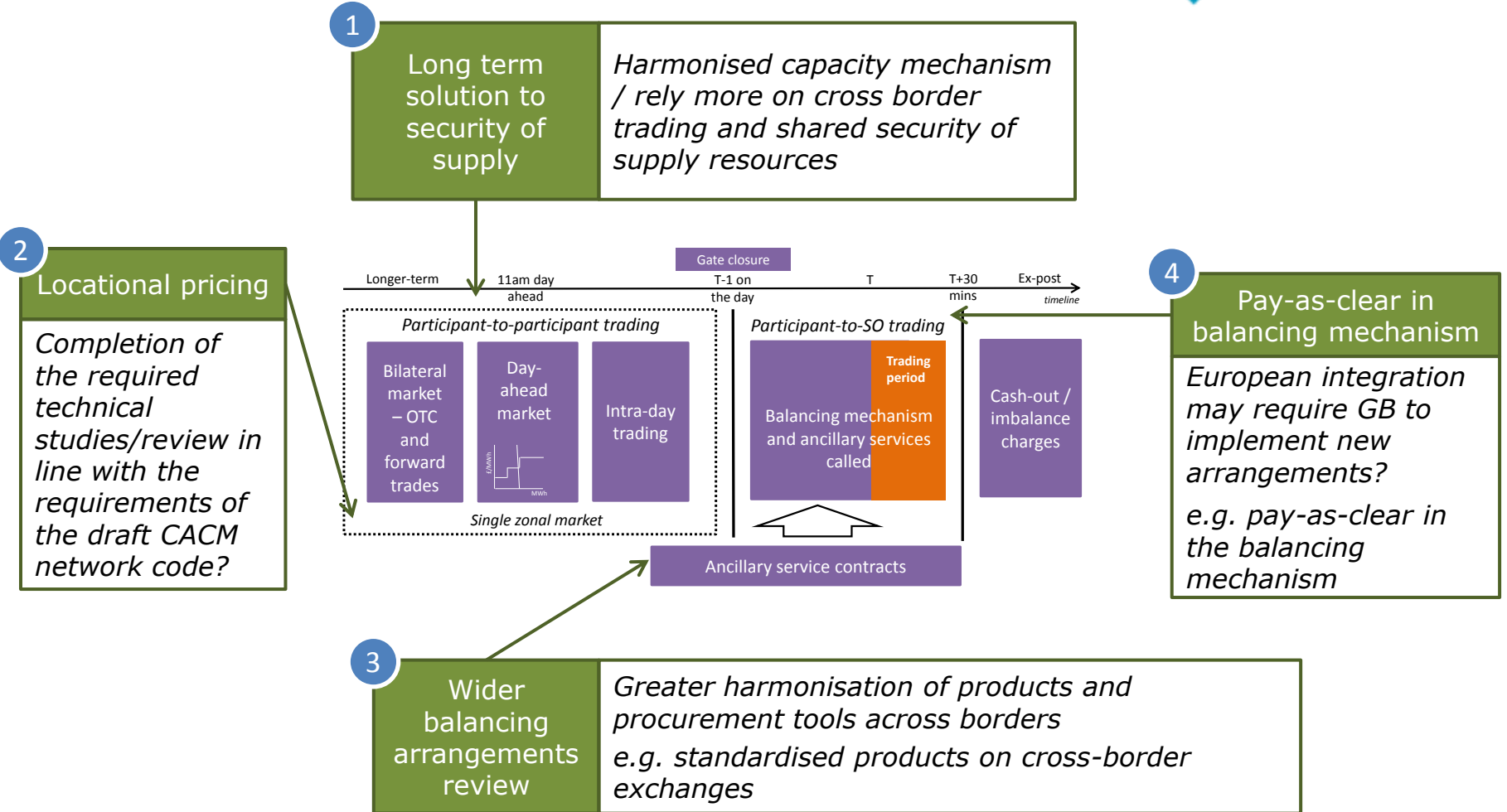
Long-term security of supply

- In the longer-term, there is a question of whether Member States will be required to harmonise any form of national support scheme or whether cross-border solutions alone will be sufficient to ensure security of supply

Longer term



Potential levers





Issue 4: Incentives to maintain & invest in new capability



Specific issues

Few locational signals

- Single energy price which may not meet bidding zone requirements from Europe
- Generation and load has muted incentives to invest where benefit is highest

Longer term

'Missing money' problem

- Prices unable to fully reflect scarcity due to cash-out not reflecting full costs of balancing, pay-as-bid balancing services and threat of government intervention
- Capacity Mechanism intended to be a temporary measure to address market failure?
- What is the long term role of markets with respect to investment?

Longer term

Transition to technology-neutral schemes for low carbon

- EMR long-term vision of technology neutral CfD auctions and long-term EU view to remove country-specific low carbon support schemes (and rely on EU ETS)
- Renewables need access to appropriate tools to compete with other technologies



Incentives to maintain & invest in new capability

Potential levers

1

Reliability options to provide flexibility?

*Future evolution of Capacity Mechanism: Market participants and/or SO can hold call options that require plant to provide energy/reserves when prices rise above strike price?
Provides steady income, with scarcity rents paid back*

2

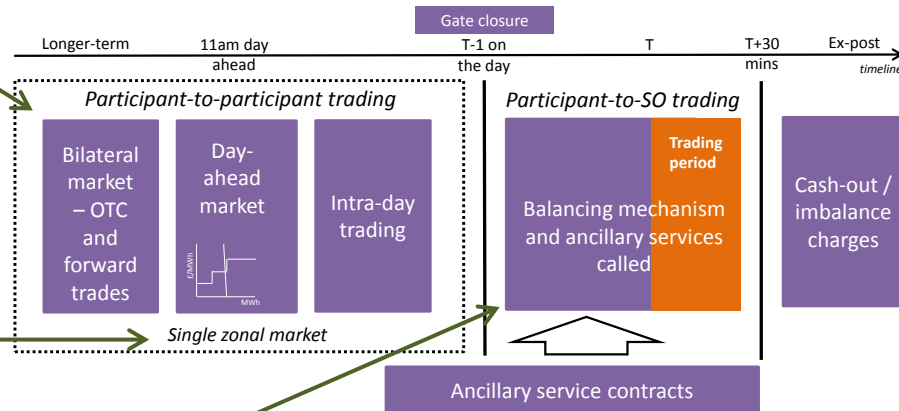
Locational signals

Consideration of locational pricing

3

Improved reserve / energy market interaction

*Short-term market for reserves allowing arbitrage with the energy market e.g. reduction of reserves when energy price is sufficiently high
Adopted in several US markets such as PJM and NYISO*



Other potential levers?



Issue 5: Facilitating Demand Side Response

Facilitating DSR

Specific issues



Different routes to market

- Participation in some mechanisms (e.g. STOR) may preclude participation in others
- Suppliers exposed to demand volatility as a result of customers providing DSR

Balancing arrangements

- Some SO arrangements might be seen as obstacles to DSR participation
- E.g. predicting load a month or week in advance of delivery

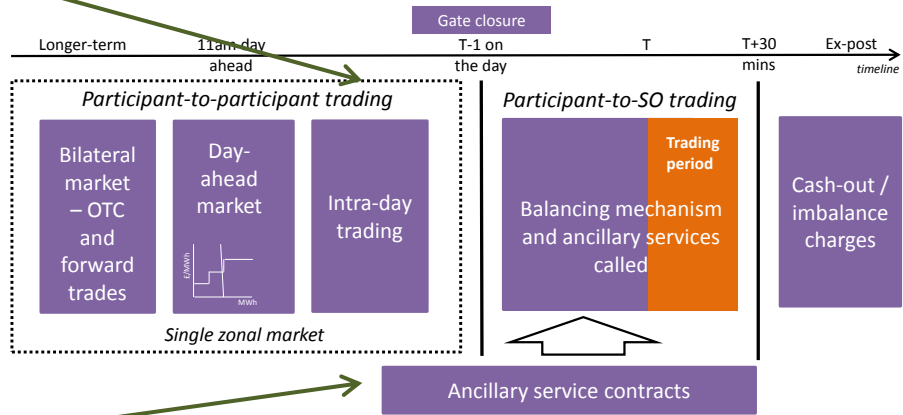
Facilitating DSR

Specific issues



1 Review of intra-day flexibility

May require additional arrangements to ensure that intra-day demand-side capacity is sufficiently available and valued appropriately?



2 Review of ancillary service procurement

Review of the level required, as well as what kind of services are required? This would also include looking at demand-side products

Other potential levers?



Issue 6: Institutional arrangements



Role of SO

- Role of SO may need to evolve due to increasing intermittent share of generation and increased responsibilities under ITPR and EMR

Role of DNOs

- Role of DNOs will need to evolve as embedded generation and demand-side involvement increases

Institutional arrangements

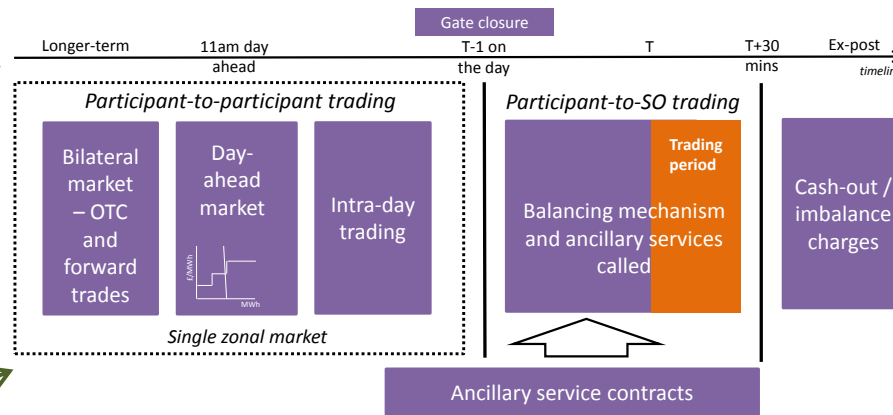
Potential levers



1

Larger role for SO

SO to have an increased role in planning the network, wind forecasting, taking larger position in ancillary service markets etc. More transparency of SO activity?



2

Larger role for DNOs

DNOs develop a commercial relationship with retailers/customers to encourage "smarter" use of network / DSR? Distribution network charges to better signal the benefits of DSR?



Issue 7: Interaction with gas market

Interaction with Gas Market

Specific issues



Need for gas as flexibility

- The future will see higher levels of intermittency and hence greater need for flexible generation, with gas turbines likely to play an important role here
- A higher demand for flexibility may affect the price, balancing arrangements and valuation of line pack

European integration of gas market

- Gas Target Model from Europe will be a factor influencing GB design
- Implications for trading arrangements, quality, security of supply arrangements etc

Interaction with Gas Market

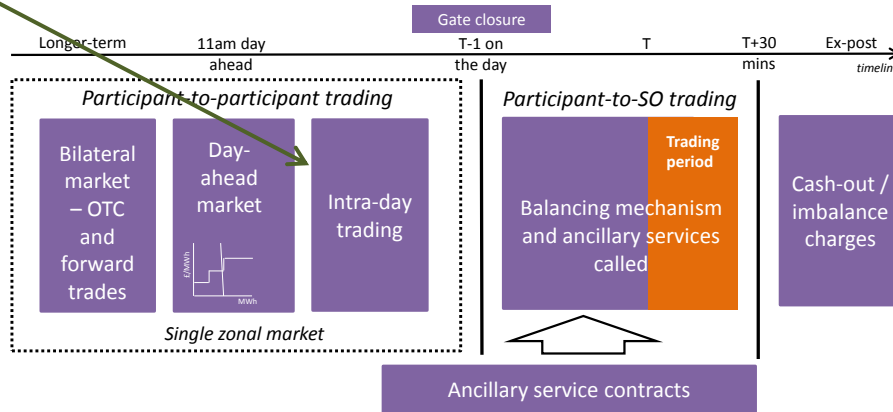
Potential levers



1

Review of flexibility products and pricing

Like electricity, may require evolution of gas market arrangements to ensure that flexibility is sufficiently available in terms of products and that these products are valued appropriately? E.g. line pack



Other potential levers?



Issue 8: Financial regulation



Impact of MiFID II* and EMIR** on trading

- Could lead to increased requirements to use clearing/power exchanges instead of OTC trading, which could fundamentally change the way power is traded in GB
- Potential impacts on capital requirements, trading strategies, market liquidity
- Together with EU TM and market coupling could lead to more centralised trading

Impact of REMIT***

- Designed to remove market manipulation / abuse and to govern more closely how companies report, track and monitor energy trading
- Leading to increased reporting requirements for parties, as well as the need for robust processes to provide additional data on inside information to the regulator

* Markets in Financial Instrument Directive (MiFID II)

** European Market Infrastructure Regulation (EMIR)

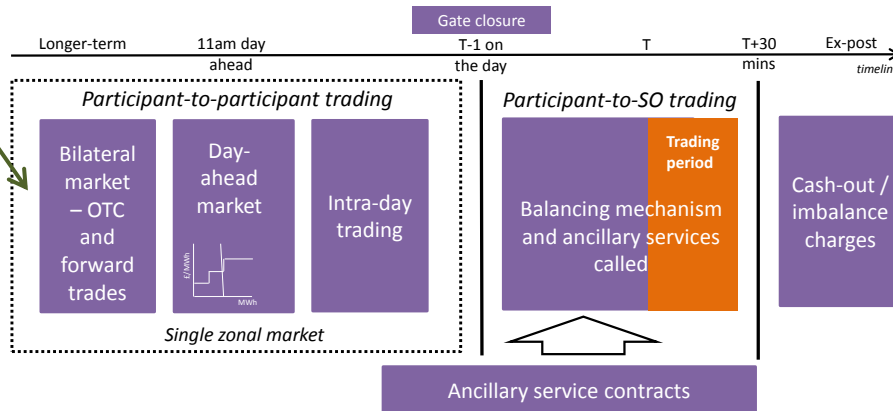
*** Regulation on Energy Market Integrity and Transparency (REMIT)



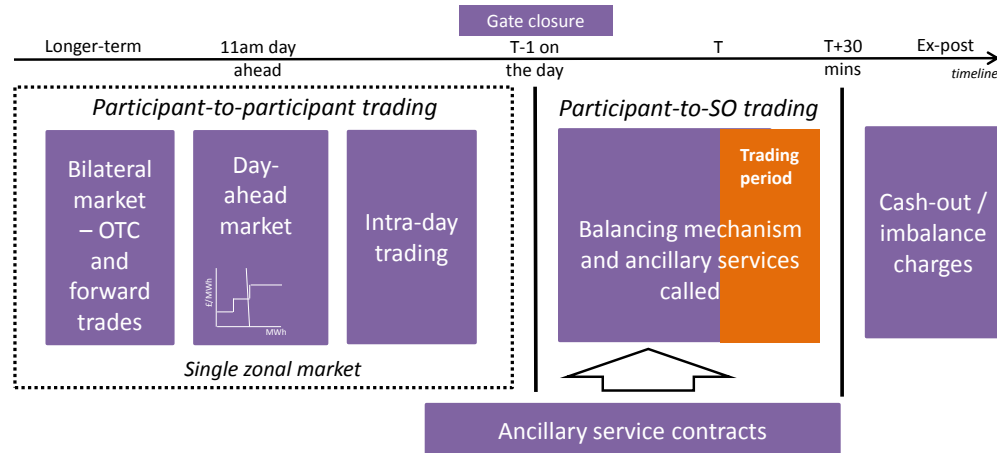
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Assess effects of financial regulation

Need to further investigate possible implications for GB market, such as the impact of regulation on OTC trading
Role for FTAs to facilitate the transition to a MiFID II / EMIR world?
Review role of power exchanges?



Grouping of potential levers



Participant-participant trading	SO-participant trading	Cash-out / imbalance charges	Locational pricing & market coupling	Institutional arrangements	Gas market arrangements	Financial regulation
<ul style="list-style-type: none"> • Enhance near real time trading • Review of intra-day flexibility 	<ul style="list-style-type: none"> • SO procurement innovations e.g. day-ahead reserve market • Improve reserve procurement and energy market interaction • Ancillary service review • Within day SO-participant market e.g. Balancing Energy Market • Wider review of balancing e.g. Pay-as-clear in BM 	<ul style="list-style-type: none"> • Address negative prices feeding in to cash-out • Further sharpen cash-out prices and incentives to balance efficiently 	<ul style="list-style-type: none"> • Market splitting • Role of interconnectors 	<ul style="list-style-type: none"> • Role of SO • Role of DNOs • Central aggregator 	<ul style="list-style-type: none"> • Review of flexibility products & pricing in gas 	<ul style="list-style-type: none"> • Impact on OTC trading from new financial regulation • Transition to the new regulation

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Short-medium term work-streams (post 2014)

How do trading arrangements need to evolve to provide for transition to EMR and implement the European Target Model?

- Participant-participant trading
- SO-participant trading
- Cash-out and imbalance charges
- Locational pricing and market coupling
- Institutional arrangements
- Gas market arrangements
- Financial regulation

Longer term work-streams (post 2025)

What is the future role of the market to deliver security of supply, low-carbon and affordable energy?

- Role of market in providing security of supply (e.g. lighter touch CM vs energy-only with shared resources across EU vs EU harmonised CM)
- Role of market in delivering low-carbon energy (e.g. technology-neutral support vs no support)
- Providing affordable energy (e.g. competition vs more active role of regulator/government)