



GREEK ELECTRICITY MARKET DESIGN STUDY

December 2014

Future market design recommendations

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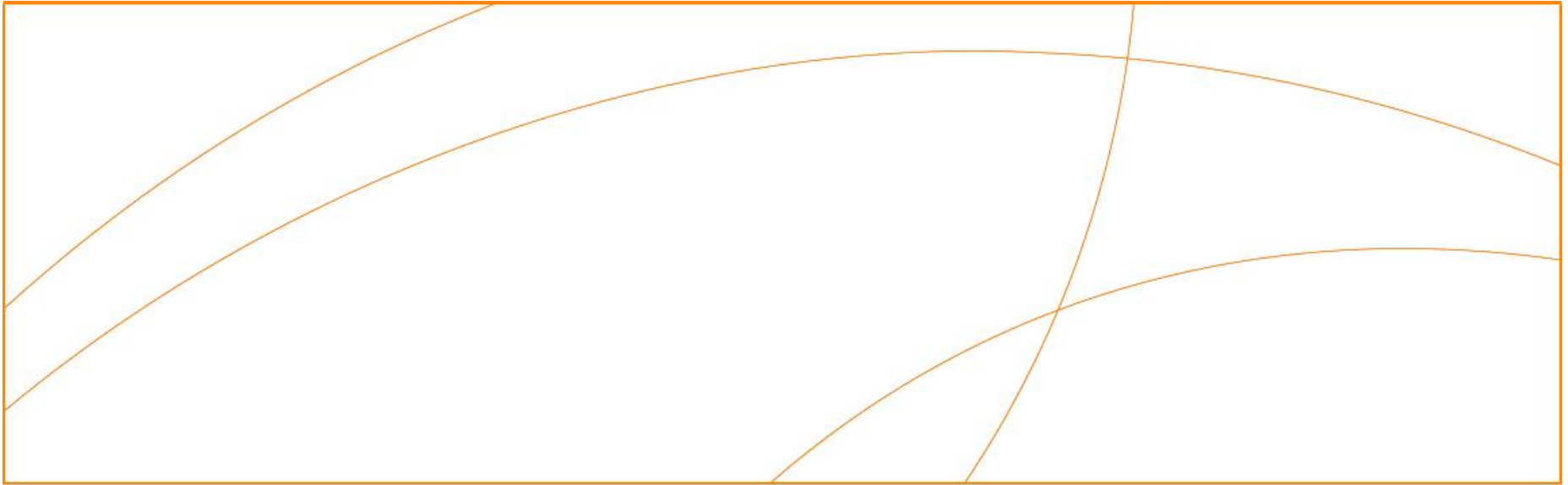
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CONTEXT

ELECTRICITY MARKETS ARE UNDERGOING TRANSFORMATION

Electricity market design must be well suited and adaptive to changes in the underlying generation mix and demand behaviour



- Across Europe, electricity markets are undergoing transformation. The generation mix is changing as the penetration of renewable generation technologies, such as wind and solar, increases in pursuit of ambitions for power sector decarbonisation.
- At the same time, electricity demand is also evolving. Greater electrification of heat and transport will increase overall demand, while the advance of 'smart' technologies has the potential to change patterns of consumption.
- The conventional model of electricity market design based on dispatching large scale, controllable thermal generation to meet predictable patterns of demand is, therefore, becoming less relevant.
- **Market design must evolve to reflect the new order**

INTEGRATION OF RENEWABLES IN THE MARKETS

Renewables are now a mainstream component of the market and the markets should be in a position to work effectively with increasing levels of renewables



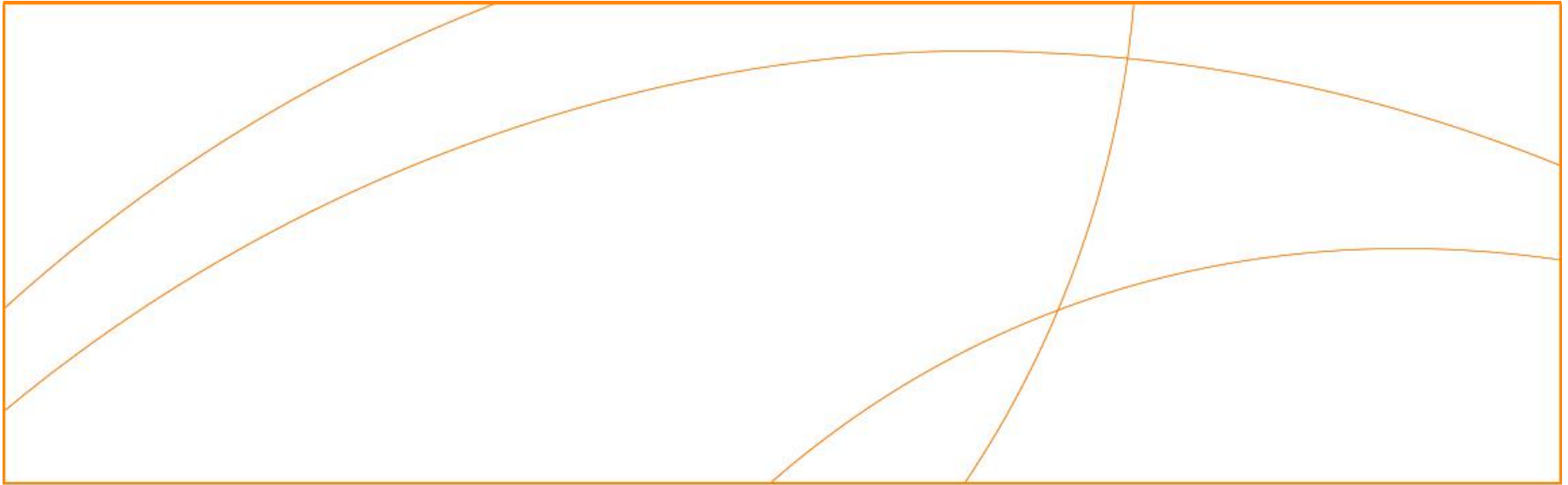
- The growth in renewable generation has generally been backed by support schemes to allow technologies to develop and become more established. Support schemes vary in nature, but they have tended to shelter renewables from the market to some extent, rather than include them within it.
- Now, renewables are becoming a mainstream component of the generation mix and certain technologies can be classed as mature. In this context, renewables must be integrated to the electricity market designs of the future.
- However, integration necessitates market arrangements that work for renewables, allowing management of risks associated with market participation. Forcing integration without workable arrangements is not appropriate.
- **Integration of renewables must occur alongside development of market arrangements that work for renewables**

TRANSITION TOWARDS RENEWABLES MARKET INTEGRATION

Market design must support integration of renewables over time



- There are two intertwined objectives:
 1. to **integrate renewables within the market**; and
 2. to make the market **fit for purpose** for a high RES future.
- Delivering an integrated and effective market must take account of today's starting point and the long-term goal. Market design developments need to be phased:
 1. to manage the transition; and
 2. to deliver the ultimate integrated market
- This report presents Pöyry's future market design recommendations for the Greek electricity market, taking into account the objectives and reflecting the need for a managed transition.

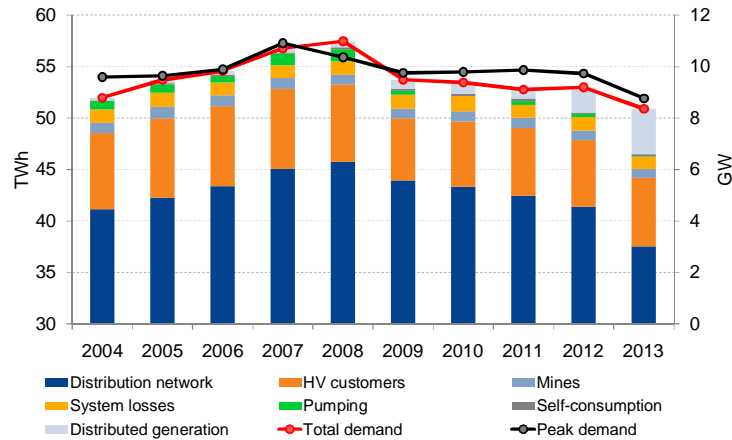


EXISTING GREEK MARKET SITUATION

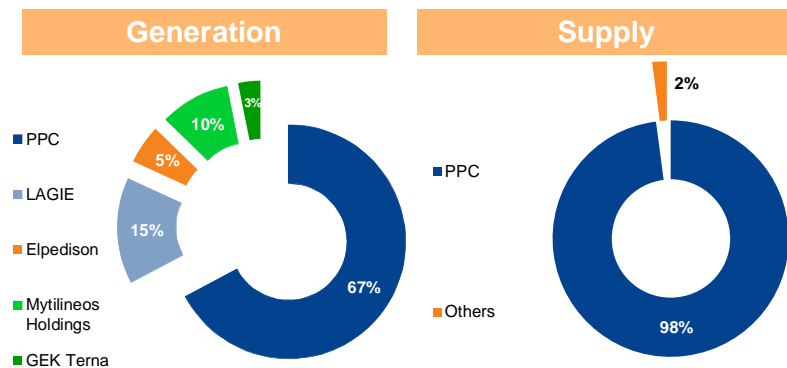
THE GREEK ELECTRICITY MARKET IN THE RECENT PAST

Competition in the Greek electricity market has so far been limited

Evolution of Greek electricity demand



Market shares in 2013



Overview of the recent past of the Greek electricity market

The Greek electricity market is structured around a gross mandatory pool with a 'technical' algorithm, which co-optimises energy and reserve at the Day-Ahead stage. A Capacity Adequacy Mechanism ('CAM') complements the energy market arrangements, and an ex-post market clears deviations.

The liberalisation process delivered private investment in gas-fired generation. Elpedison, GEK Terna and Mytilineos Holdings now own 2.6GW of conventional installed capacity on the Greek electricity system. Different expectations of market fundamentals compared to the outturn situation (i.e. depressed demand coupled with high gas prices and low carbon prices) rendered gas-fired generation less favourable than lignite in the recent past and the imposition of interim measures (Variable Cost Recovery Mechanism in combination with the 30%-rule) enabled CCGTs to contribute to the fuel mix. In 2013 generation from private gas-fired units accounted for 18% of total generation. The remaining 15% came from RES. PPC, however, dominated the generation side with a 67% share. With the removal of the 30%-rule in 2014, PPC has further strengthened its position on the generation side.

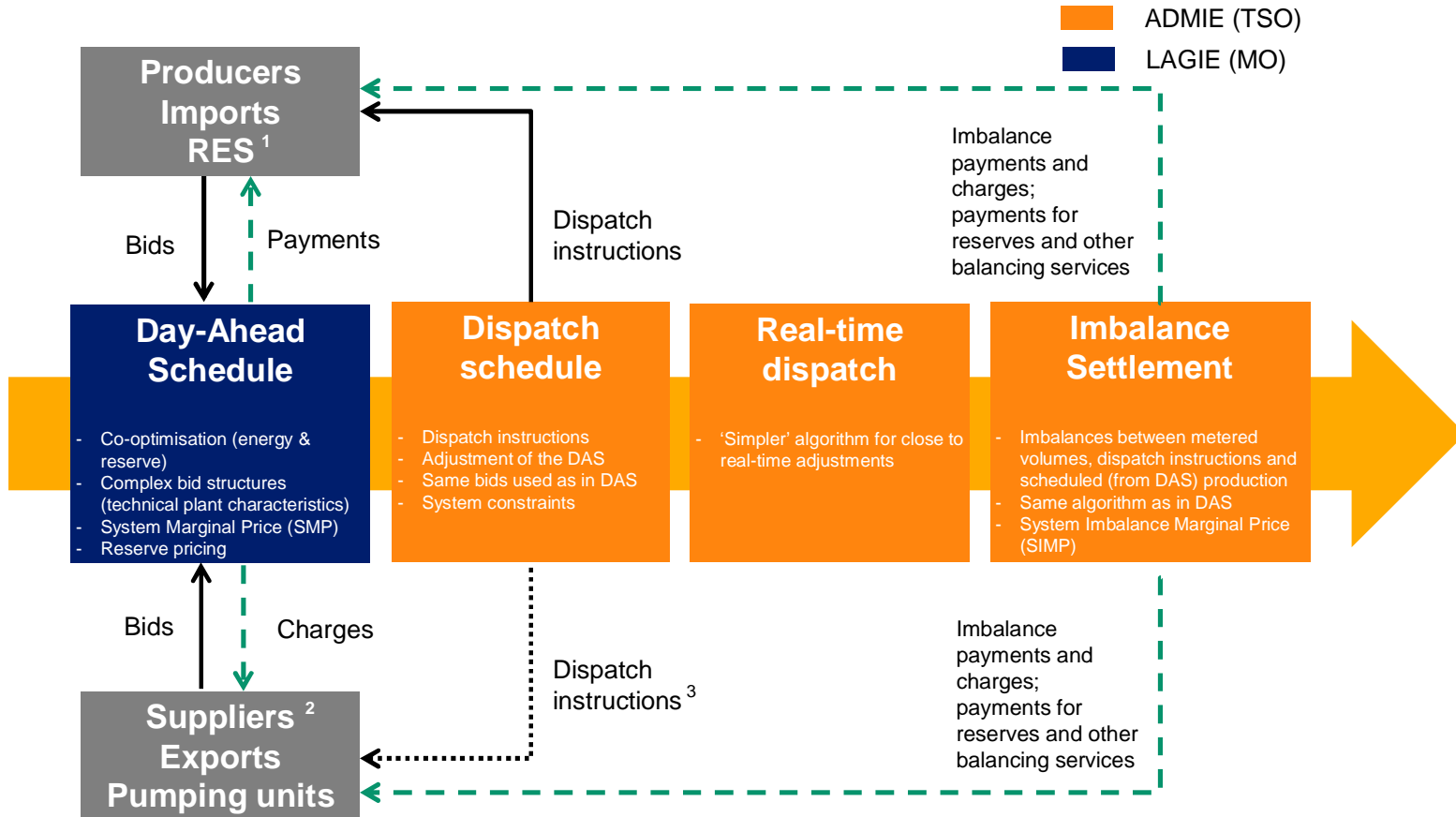
Lignite has traditionally been the main fuel for power generation. Lignite generation is however expected to decrease as lignite plants retire, with gas-fired generation and RES expected to further strengthen their position in the mix.

On the supply side there has been limited new entry with two suppliers (other than PPC) gaining a sizeable share of the market in 2011 but later going bankrupt. Even though retail tariffs were quasi-liberalised in 2013, PPC is still dominating the retail side with a 98% market share as of end of 2013. Some small retailers are now entering the market, but PPC still holds a strong position with around 97% share (as of August 2014).

The economic crisis had an impact on electricity demand, which has been declining from 2008 onwards. An increasing share of final demand is met by distributed generation. Demand from HV consumers (primarily industrial) has however been stable over the last three years and showing signs of recovery. Expectations are that demand will start increasing again in the near future.

GREEK ELECTRICITY MARKET TRADING ARRANGEMENTS

Energy is traded at the Day-Ahead stage (in a gross mandatory pool) with an ex-post Imbalance Settlement acting both as a balancing and imbalance market



¹ RES currently do not submit bids to the Day-Ahead market. They are included in the schedule (and the dispatch) as 'must-run' generation

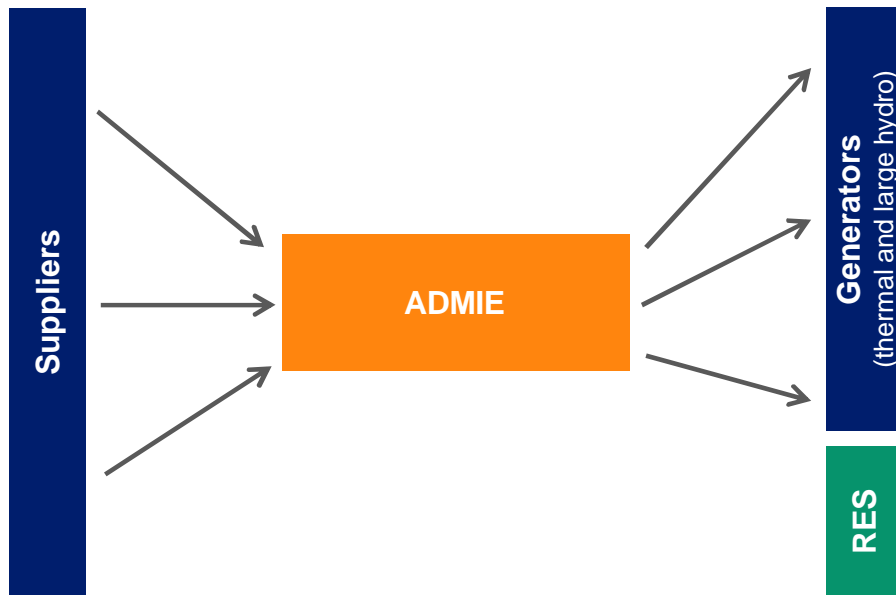
² Demand currently does not submit price-quantity offers to buy electricity in the Day-Ahead market. It is included as inelastic demand

³ In practice no dispatch instructions are issued to demand

CAPACITY ADEQUACY MECHANISM

The CAM has so far taken the form of regulated payments as there is limited competition for the market-based enduring format to be applied

Under the transitional arrangements, which are currently in place, ADMIE agrees contracts with generating units that can cover the capacity obligations placed on suppliers. The suppliers are in their turn required to make the payments to fund these contracts at a regulatory set price. Up until the end of July 2013 all thermal and hydro plants were receiving the payments corresponding to one CAC per available MW with no distinction between different types of generation.

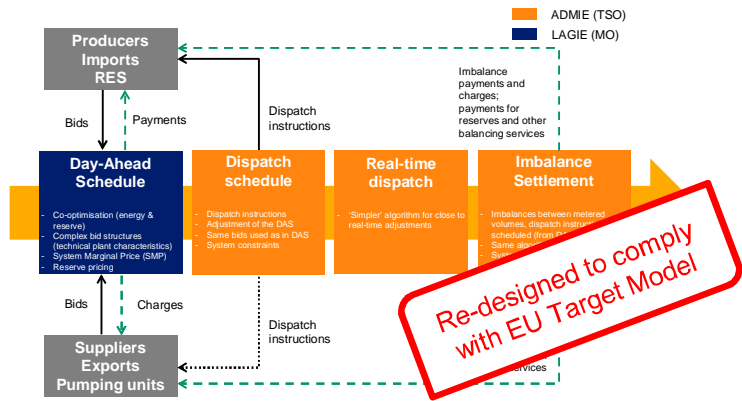


- Changes to this transitional mechanism were introduced in August 2013:
 - Old generating units with a total installed capacity of 1249MW are no longer eligible for participating in the transitional Capacity Adequacy Mechanism. These generating units are: Liptol, Aliveri 3 & 4, Lavrio 1 & 2 and Ag. Georgios 8 & 9.
 - The remaining generating units (excluding RES and distributed generation) continue to issue Capacity Availability Certificates. However, flexible gas-fired units issue an **additional** certificate per available MW and are therefore eligible for double payment.
 - Suppliers participate in the Transitional CAM with an effective payment of €56,000/MW per annum corresponding to their actual end-user demand (and accounting for demand satisfied by distributed RES generation).
- The most recently proposed changes to the CAM did not present significant change from the 'status quo' as capacity payments are expected to remain regulated. A form of 'flexibility' payment is envisaged and RES are still not expected to be rewarded for their capacity contribution.

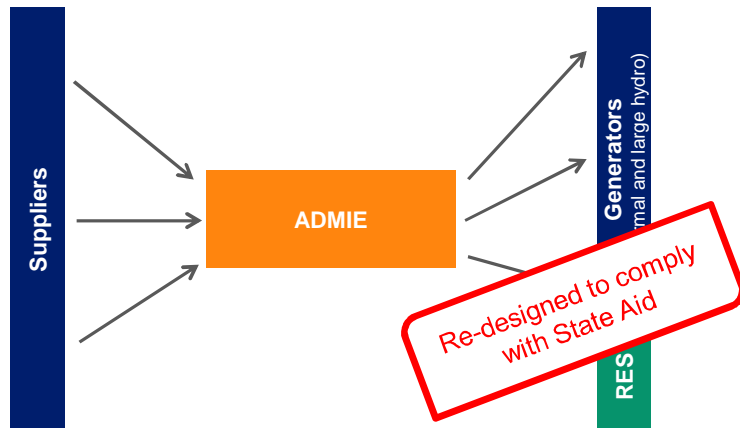
RECENT DEVELOPMENTS IN THE GREEK ELECTRICITY MARKET

The Greek electricity market is at the early stages of re-defining itself with additional effort required to create a competitive integrated market

Current energy trading arrangements



Current Capacity Adequacy Mechanism



Current developments in the Greek market

Changes in market arrangements to ensure compliance with the EU Target Model and the State Aid guidelines are coinciding with an ongoing privatisation plan.

Steps towards the rationalisation of the market have already taken place. The Variable Cost Recovery Mechanism and the 30%-rule have been fully abandoned as of July 2014 with the SMP now more closely reflecting market fundamentals. Retail tariffs are now liberalised and consumers can choose their electricity provider with PPC however still offering the most competitive tariffs. A robust multi-year methodology for transmission use of system charges has now been put in place and the privatisation of ADMIE is underway.

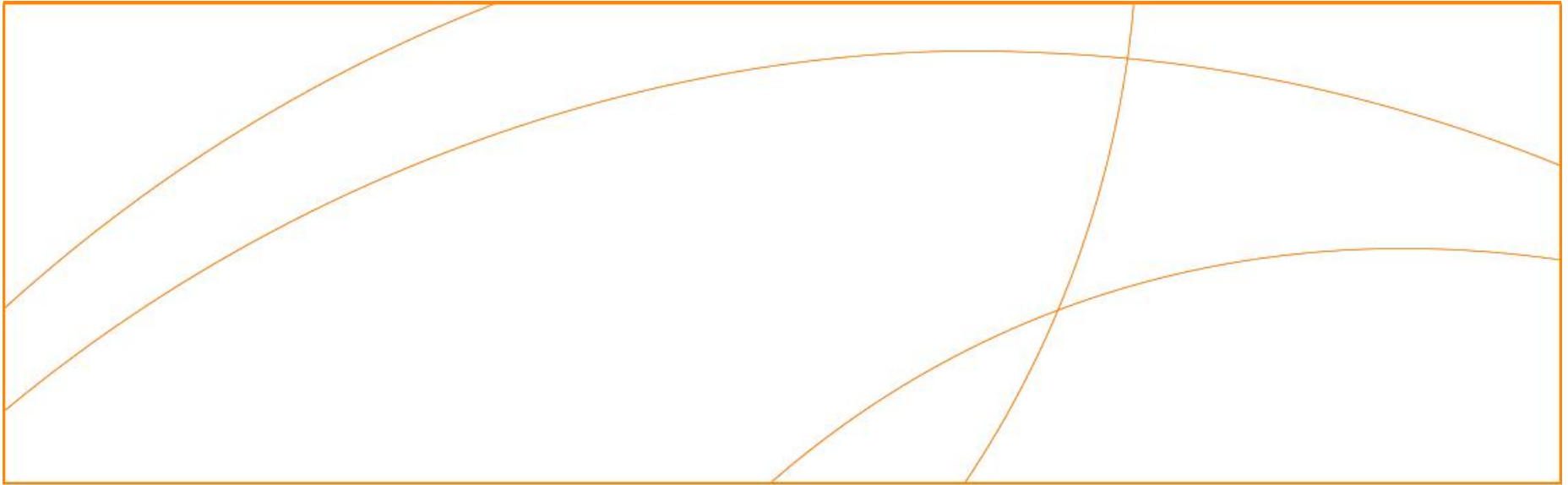
Currently, capacity payments are still regulated with gas-fired generation receiving additional payments for providing 'flexibility'. The Capacity Adequacy Mechanism, however, is expected to undergo further change in the near future as the European Commission is demanding a more market-based approach for rewarding capacity. The decision with regards to the format of the new Capacity Remuneration Mechanism is still ongoing.

VPP style forward products, which will provide access to low cost lignite and hydro to suppliers other than PPC are considered but a decision is still pending.

Introduction of a new market design to ensure compliance with the EU Target Model may mean significant change for market participants in terms of electricity trading. Changes will include: introduction of forward trading, new bid structures, introduction of an Intraday market, separate balancing and reserve markets. Market participants will need to adapt to a new order, where they will have to assume a more active role.

The proposed privatisation of parts of PPC ('small PPC') is aimed at increasing competition both on the generation and the supply side. 30% of PPC's generation and a corresponding share of the supply portfolio is intended to be span off.

Ultimately, the Greek electricity market is undergoing significant change in terms of structure and design. Some aspects have still not been defined. This presents an opportunity for a more structured approach of defining a design, which is more well suited to a low carbon world and promotes a level playing field for all market players. Cooperation and dialogue between all stakeholders is essential. Effective competition in this new market should ultimately aim at delivering a landscape which promotes investment in the right type of generation and bringing benefits to consumers.

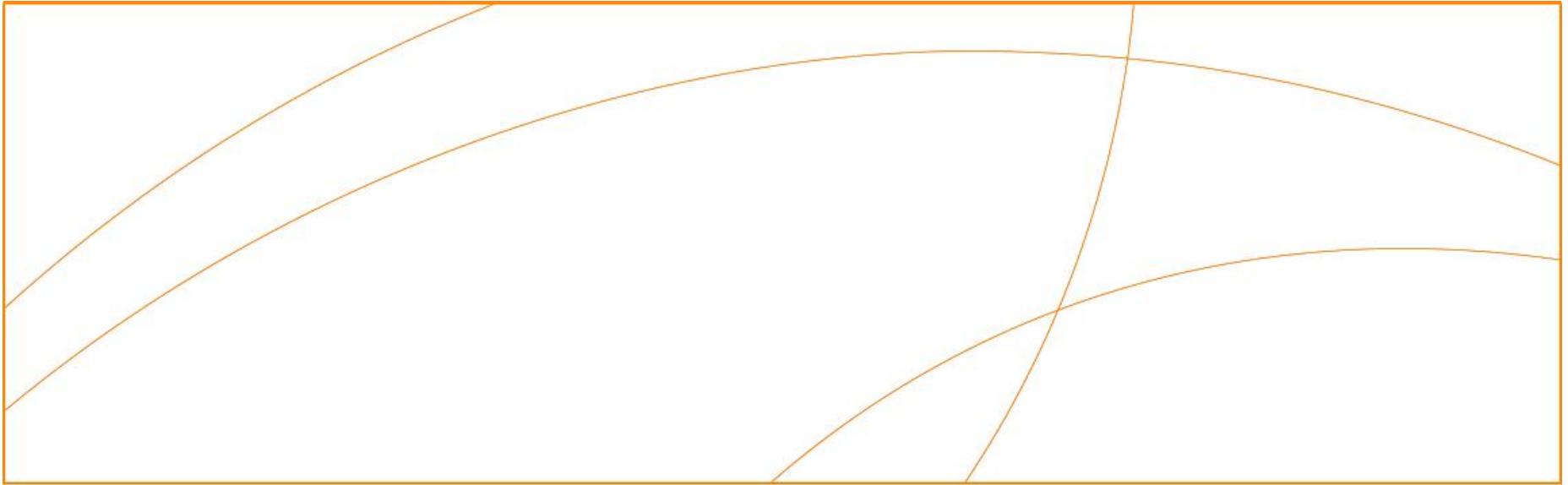


EUROPEAN REQUIREMENTS

EUROPEAN REQUIREMENTS ARE SHAPING FUTURE MARKETS













- The EC's 'Target Model' for cross-border electricity trading and the recently adopted EC State Aid Guidelines require adaptation to the design of electricity trading arrangements, capacity remuneration schemes and support mechanisms for renewable generation technologies.
- The Target Model, to be set out in a series of Network Codes (or Guidelines), will provide the framework for a more harmonised way of trading electricity across Europe and ensuring that the right tools are in place for market participants to manage their risks.
- When it comes to the electricity sector, the EC State Aid Guidelines put forward a set of requirements for any form of support mechanisms, including Capacity Remuneration Mechanisms and renewables support schemes, generally steering towards more market-based approaches unless certain criteria can be demonstrated.
- Electricity arrangements in many EU countries need to be adapted to comply with these requirements.



PROPOSALS FOR ENDURING ELECTRICITY TRADING ARRANGEMENTS

FORWARD TIMEFRAME

We propose the introduction of a financial forward market allowing for concentration of physical trade and improved liquidity in the DA and ID markets

	Public consultation	Recommendation	Rationale for recommendation
Energy	<p>Physical forward trading with market power mitigation</p> <p>Physical </p> <p>Financial </p> <p>No Forward </p>	<p>Market power mitigation if there is physical forward trading</p> <p>Physical </p> <p>Financial </p> <p>No Forward </p>	<p>We propose forward trading to be based on financial rather than physical products.</p> <p>Trading in the forward timeframe is an important tool for managing risk both for generation and supply. It is important however for trading in the forward timeframe to not compromise liquidity and distort prices in the closer to real-time markets.</p> <p>Financial forward trading in the form of two way contracts for difference provide a hedge against price risk arising in the Day-Ahead and Intraday markets without having an impact on liquidity in those markets. Options can also hedge for certain volume risk. Ultimately, limiting physically traded volumes in the forward timeframe allows for concentration of physical trade closer to real time and, therefore, improved liquidity is expected in the closer to real-time markets (Day-Ahead and Intraday).</p> <p>Financial trading means that such trades will not provide the right to physically nominate or dispatch generation, unlike physical forward trading.</p> <p>It is our understanding that the public consultation does not preclude financial forward trading in addition to the proposed physical forward trading. If physical forward trading is deemed to be a desirable feature of the new market design, it should be restricted so that liquidity in the closer to real-time markets is not compromised and, in addition, the new market design should also cater for financial forward trading allowing market participants to choose which products are best suited to their needs.</p>
Reserve and dispatch	<p>Reserve market (Y, M, W) </p> <p>No reserve procurement (Y, M, W) </p>	<p>Reserve market (Y, M, W) </p> <p>No reserve procurement (Y, M, W) </p>	<p>Market power mitigation measures should be adopted for as long as market power is of concern (in the presence of dominant market players). If physical trading forms part of the market design then a maximum allowed volume traded forward could be set. Instruments such as VPPs can also be used, whereby dominant market players are obligated to offer part of their generation either to other generators or directly to suppliers at a pre-determined price.</p> <p>Reserve procurement is important for the TSO to ensure secure system operation. When considering reserve procurement, reserve pricing and how reserve costs are reflected in imbalance prices should be taken into account so that balancing and imbalance price distortions are avoided. We are aligned with the recommendation in the public consultation for not having reserve procurement in the forward timeframe, but rather at the Day-Ahead stage. However, we do acknowledge that in some cases forward reserve procurement may provide the TSO with greater comfort.</p>


















DAY AHEAD

We propose the introduction of a voluntary, exclusive Day-Ahead market (with collective exclusivity across organised Day-Ahead, Intraday and Balancing markets)

	Public consultation			Recommendation			Rationale for recommendation
Energy	Mandatory	Portfolio	Simple	Mandatory	Portfolio	Simple	<p>Mandating participation in a market pools liquidity in that specific timeframe, e.g. to deliver a robust reference price. This price can then be accessed by all market participants, including independent suppliers and smaller generators. This does not however mean that a voluntary market can not deliver a high degree of liquidity; Nord Pool is a good example of a liquid voluntary day-ahead market (complemented by mainly financial forward trading).</p> <p>An exclusive Day-Ahead market effectively means that trading in a centrally organised Day-Ahead market is the only way for a physical contract nomination at the Day-Ahead stage. But in a voluntary exclusive market, market participants have the freedom to choose between day-ahead, Intraday and balancing market timeframes for trading based on their needs and risk management strategy. Making the centrally organised Day-Ahead market 'exclusive' means that market participants can only trade in the central market and not bilaterally, as there is no other market route in this timeframe. The Day-Ahead market is 'voluntary', however. Parties can still choose to 'by-pass' the Day-Ahead market and trade in the (again) centrally organised Intraday market. Therefore, parties can choose between the collectively exclusive centrally organised Day-Ahead, Intraday and Balancing markets.</p> <p>If mandatory participation is combined with bidding regulation (as proposed in the public consultation) this would limit market participants' ability to choose the desired market to trade in, especially those with forecast error at the Day-Ahead stage. If, on the other hand, no such bidding rules are in place, market participants can place themselves out of merit (by submitting very high bids) or ensure their volumes are scheduled by submitting zero (or even negative) bids, rendering mandatory participation meaningless for thermal participants.</p> <p>For variable renewable generation (including wind) mandating participation in the Day-Ahead raises a risk which cannot be easily mitigated. At the Day-Ahead stage wind still has a reasonable amount of forecast error. It should, therefore, have the freedom to choose the amount it wishes to trade Day-Ahead and be in a position to choose to trade volumes Intraday as forecasting becomes more accurate.</p> <p>If there are concerns that voluntary participation may not deliver sufficient liquidity, market liquidity promoting measures can be put in place. These include using the Day-Ahead price as the reference price for forward financial products and imposing market maker obligations on some market participants. Making the Day-Ahead market 'exclusive' aims at further improving liquidity in this market timeframe as there is no other market route in this timeframe for trading electricity.</p>
	Voluntary exclusive	Gross portfolio	Block	Voluntary exclusive	Gross portfolio	Block	
	Voluntary non-exclusive	Unit	Sophisticated	Voluntary non-exclusive	Unit	Sophisticated	
Reserve and dispatch	Procure reserve before the DA run (unit)	Procure reserve after the DA run (unit)	Procure reserve before the DA run (unit)	Procure reserve after the DA run (unit)	Procure reserve before the DA run (portfolio)	Procure reserve after the DA run (portfolio)	
	Procure reserve before the DA run (portfolio)	Procure reserve after the DA run (portfolio)	Procure reserve before the DA run (portfolio)	Procure reserve after the DA run (portfolio)	Procure reserve before the DA run (portfolio)	Procure reserve after the DA run (portfolio)	

DAY AHEAD

We propose unit-based bidding as the default model

	Public consultation	Recommendation	Rationale for recommendation	
Energy	Mandatory 	Portfolio 	Simple 	<p>Ultimately, the choice between portfolio and unit based bidding depends on the importance which is placed on the efficiency gains arising from allowing market participants to manage trading their own portfolio on an aggregate basis, set against the market liquidity and the transparency of market data for market monitoring purposes arising from more disaggregate bids.</p> <p>We propose unit based bidding for the majority of generation to allow for greater transparency given the current composition of market portfolios. In the future, and assuming a less concentrated market, a move towards gross portfolio bidding could be considered.</p> <p>Under unit bidding, where a market participant submits separate bids for each generating unit within its portfolio, the information for each generating unit is available even from the Day-Ahead stage before the nominations to the TSO. There is greater transparency regarding the bids and it would be easier for regulatory authorities to assess the bid structures and market participants' behaviour. Under unit based bidding the optimisation is carried out by a central algorithm across the entire market generation portfolio. The outcome of a central optimisation is as good as the amount and type of information it can accommodate. It is however very difficult to input all necessary information into an algorithm and unit bidding may restrict a market participant's ability to optimise within its portfolio if it cannot accurately reflect commercial and technical characteristics in the allowed bidding structures, potentially leading to an efficiency loss.</p> <p>Portfolio bidding would allow market participants to better optimise their own assets, while accounting for more complex factors, which cannot necessarily be reflected in the market bidding structures of each individual unit. It also allows participation in the market by financial players, which may result in even greater liquidity in the market. Portfolio bidding can however make ex-post market monitoring more complex. It may also mean reduced transparency in the presence of vertically integrated players, as they would be allowed to submit a bid for their 'net' position.</p> <p>There is however a way for increasing transparency and also promoting liquidity. This is to impose gross portfolio bidding. Under gross portfolio bidding, a market player is obligated to submit separate bids for generation and demand. This discourages internal netting within the portfolio. This still does not provide for the highest degree of transparency.</p>
	Voluntary exclusive 	Gross portfolio 	Block 	
	Voluntary non-exclusive 	Unit 	Sophisticated 	
Reserve and dispatch	Procure reserve <u>before</u> the DA run (unit) 	Procure reserve <u>after</u> the DA run (unit) 	Procure reserve <u>before</u> the DA run (unit) 	Procure reserve <u>after</u> the DA run (unit) 
	Procure reserve <u>before</u> the DA run (portfolio) 	Procure reserve <u>after</u> the DA run (portfolio) 	Procure reserve <u>before</u> the DA run (portfolio) 	Procure reserve <u>after</u> the DA run (portfolio) 

DAY AHEAD

We propose a de minimis threshold for unit-based bidding and the use of intermediary arrangements to allow for portfolio bidding for demand and RES

	Public consultation	Recommendation	Rationale for recommendation																																				
Energy	<table border="1"> <tr> <td>Mandatory</td> <td>Portfolio</td> <td>Simple</td> <td>Mandatory</td> <td>Portfolio</td> <td>Simple</td> </tr> <tr> <td>Voluntary exclusive</td> <td>Gross portfolio</td> <td>Block</td> <td>Voluntary exclusive</td> <td>Gross portfolio</td> <td>Block</td> </tr> <tr> <td>Voluntary non-exclusive</td> <td>Unit</td> <td>Sophisticated</td> <td>Unit</td> <td>Sophisticated</td> <td></td> </tr> </table>	Mandatory	Portfolio	Simple	Mandatory	Portfolio	Simple	Voluntary exclusive	Gross portfolio	Block	Voluntary exclusive	Gross portfolio	Block	Voluntary non-exclusive	Unit	Sophisticated	Unit	Sophisticated		<table border="1"> <tr> <td>Mandatory</td> <td>Portfolio</td> <td>Simple</td> <td>Mandatory</td> <td>Portfolio</td> <td>Simple</td> </tr> <tr> <td>Voluntary exclusive</td> <td>Gross portfolio</td> <td>Block</td> <td>Voluntary exclusive</td> <td>Gross portfolio</td> <td>Block</td> </tr> <tr> <td>Unit</td> <td>Sophisticated</td> <td></td> <td>Unit</td> <td>Sophisticated</td> <td></td> </tr> </table>	Mandatory	Portfolio	Simple	Mandatory	Portfolio	Simple	Voluntary exclusive	Gross portfolio	Block	Voluntary exclusive	Gross portfolio	Block	Unit	Sophisticated		Unit	Sophisticated		<p>A requirement for unit bidding at the lowest levels would place an onerous burden on the smallest participants, and instead we propose that a de minimis level applies to ensure that the smallest generators may bid collectively.</p> <p>We also propose intermediary arrangements by which agents may be appointed to interface with the market on behalf of participants (for combinations of bidding, collateral and/or settlement), with some restrictions to ensure that market power is not enhanced by these arrangements. This provides route to market options for smaller and/or independent parties, who can appoint a third party to interact with the market on their behalf. This allows for gross portfolio bidding for demand-side units, demand and some variable renewable generation.</p> <p>When it comes to bid types we propose to allow market participants to use both simple and block bids. Sophisticated bids could be considered but we believe that through the use of block bids, generating units can reflect their fixed (start-up) costs in an equally effective way.</p> <p>We propose for the reserve procurement to take place after the clearing of the Day-Ahead market, allowing the market to first solve the main problem of electricity trading and then procure the required balancing capacity. The considerations regarding pricing of reserve and treatment of reserve costs in imbalance prices as described in the forward timeframe still apply.</p>
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INTRADAY

We propose Intraday auctions as a transitional step towards the introduction of an exclusive, continuous Intraday market

	Public consultation	Recommendation	Rationale for recommendation
Energy	<p>Exclusive Continuous</p> <p>Non-exclusive Auctions</p>	<p>Exclusive Continuous</p> <p>Non-exclusive Auctions</p>	<p>We propose an exclusive Intraday continuous market for the long-term market design with exclusive periodic auctions acting as a transitional step.</p> <p>The Intraday is a key timeframe for the Target Model. This is the market where market participants can refine their positions closer to real-time based on updated information with regards to plant availability and wind, solar and demand forecast.</p> <p>We consider two options regarding the participation in the Intraday markets, namely a centralised Intraday market, which is the exclusive route for trading electricity Intraday and the potential for allowing trading outside of the centralised market. Mandating participation Intraday is not considered, as a collective exclusivity for the Day-Ahead and the Intraday markets will effectively deliver similar results whilst providing choice to market participants regarding the share of electricity traded in each timeframe.</p> <p>We propose an exclusive centralised Intraday market, whether that is continuous or that is only based on auctions. This means market participants cannot trade Intraday bilaterally outside the market, leading to a potential for greater liquidity. Access to electricity trades becomes easier for all market participants through a centralised platform.</p> <p>There is currently an ongoing discussion regarding the role of Intraday auctions in the single European market. Italy at the moment does not have continuous trading, but holds periodic Intraday auctions. Even though the current requirement of the Network Codes is for continuous trading there is always a chance that periodic Intraday auctions are kept in place for longer than expected and do become a more enduring feature of the market. Therefore, when designing transitional arrangement for periodic auctions we have to consider the possibility of such a design to be in place for longer than originally intended.</p> <p>The main benefits of Intraday auctions is enhanced liquidity as all volumes are concentrated in the auctions as well as providing a solution to pricing Intraday cross-border capacity (which is a more complex problem with continuous trading). As auctions will be periodic, market participants will not have access to trades when required. Continuous trading on the other hand does provide access to electricity trades when needed with the flipside of lower liquidity (and pending a proposal for pricing cross-border capacity with continuous trading).</p>
Reserve and dispatch			

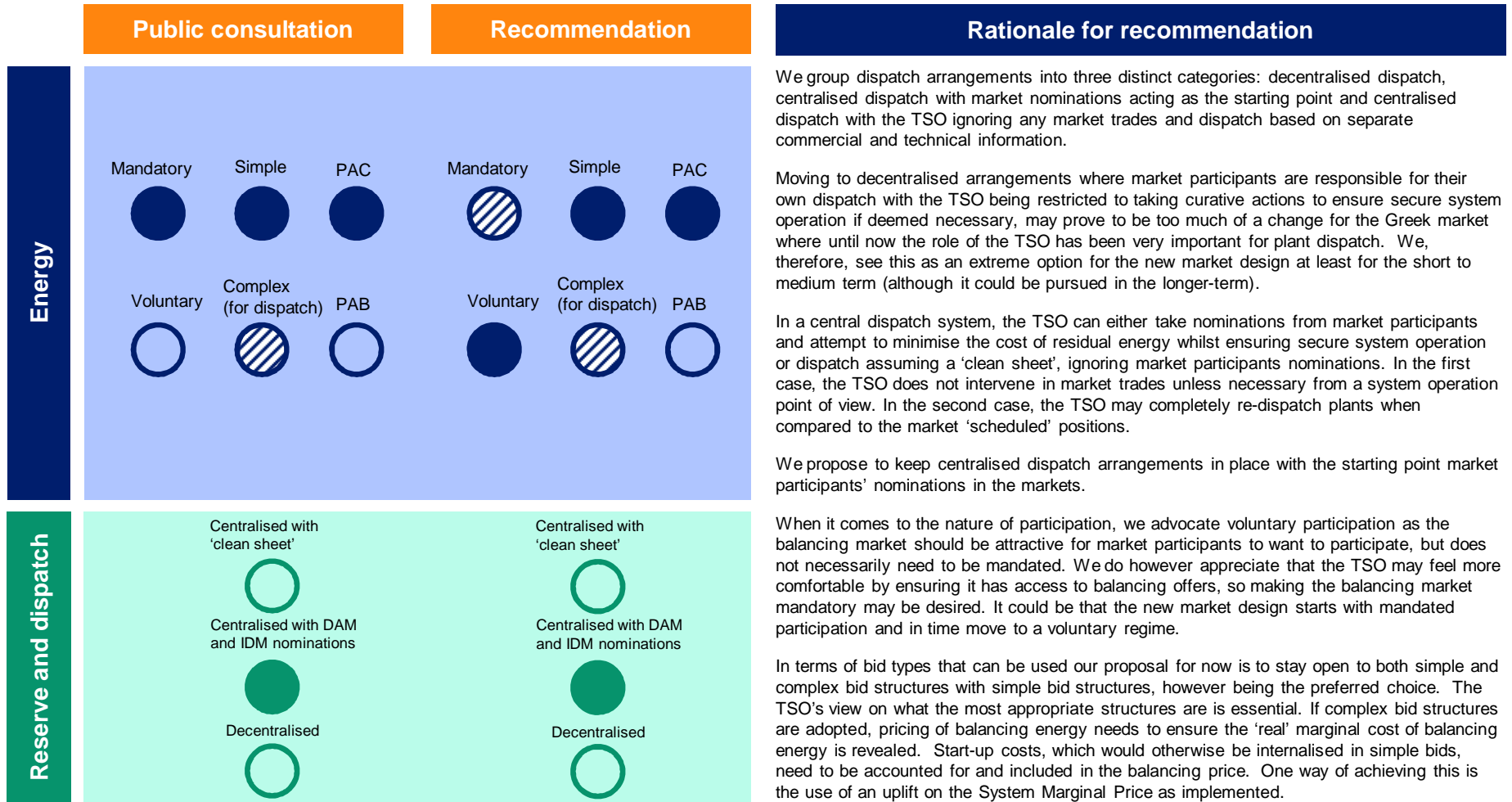
INTRADAY

We propose Intraday auctions as a transitional step towards the introduction of an exclusive, continuous Intraday market

	Public consultation	Recommendation	Rationale for recommendation
Energy	<p>Exclusive: Solid dark blue circle</p> <p>Continuous: Solid dark blue circle</p> <p>Non-exclusive: Hollow dark blue circle</p> <p>Auctions: Circle with diagonal stripes</p>	<p>Exclusive: Solid dark blue circle</p> <p>Continuous: Solid dark blue circle</p> <p>Non-exclusive: Hollow dark blue circle</p> <p>Auctions: Circle with diagonal stripes</p>	<p>Given Greece's geographical position and the adoption of auctions in the Italian market we propose to also adopt Intraday auctions as a transitional step. This will allow Greece to be aligned with neighbouring Italy. Intraday auctions should ideally be carried out simultaneously with the Italian market to allow access to Italian demand and generation.</p> <p>That said it is very important for auctions to be sufficiently frequent with the last auction being as close to real-time as possible. More frequent auctions means more opportunities for market participants to refine their market positions, but also relatively lower liquidity in each auction. The dilemma between having very frequent and more infrequent auctions is similar to the overall dilemma between continuous trading and periodic auctions. Effectively, the greater the number of auctions Intraday the closer you get to the outcome of a continuous trading, having more trading opportunities at the expense of reduced liquidity.</p> <p>The Intraday gate closure should be as close to real-time as possible allowing market participants to have the best information possible regarding their availability in real-time. This is most important for intermittent generation and in particular wind, where forecasting significantly improves even up to 1 hour ahead of real-time.</p> <p>We propose to have five Intraday auctions aligned with neighbouring Italy. In addition we propose to hold a number of additional within-zone Intraday auctions (indicatively 3) with the last auction taking place as close to real-time as technically possible (allowing for the TSO to account for updated market nominations).</p>
Reserve and dispatch			<p>Products offered Intraday should have the same granularity as imbalance settlement periods. If that is not the case market participants do not have the tools to ensure that they can balance over settlement period timeframes. As set out in the Electricity Balancing Network Code, we propose a 30 minute imbalance settlement period and therefore 30 minute Intraday energy products should be offered. An alternative option (potentially during a transitional period) is to have a 60 minute settlement period, which would create alignment with neighbouring Italy.</p>

BALANCING

We propose centralised dispatch arrangements with market nominations acting as the starting point; participation is voluntary and energy is paid on a PAC basis

















BALANCING

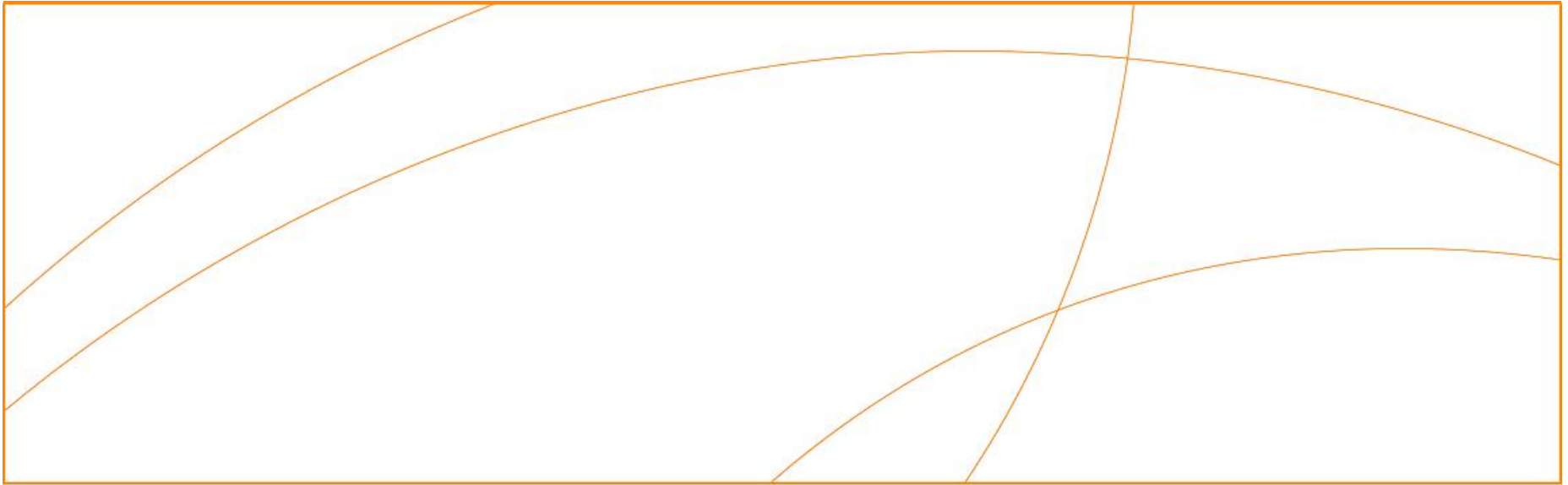
We propose centralised dispatch arrangements with market nominations acting as the starting point; participation is voluntary and energy is paid on a PAC basis

	Public consultation	Recommendation	Rationale for recommendation
Energy	<p>Mandatory Simple PAC</p> <p>Voluntary Complex (for dispatch) PAB</p>	<p>Mandatory Simple PAC</p> <p>Voluntary Complex (for dispatch) PAB</p>	<p>When it comes to pricing of balancing energy the Electricity Balancing Network Code states the preferred choice is to have marginal pricing. It is however open to other options as long as the TSO provides sufficient justification for such a choice.</p> <p>Marginal pricing means all energy balancing offers are included in a bid ladder with the 'cleared' price being equal to the highest energy balancing offer. All activated balancing energy is paid a uniform marginal price. Marginal pricing is also referred to as pay-as-cleared ('PAC').</p> <p>An alternative pricing method is to pay balancing energy based on the bid price of each offer, known as pay-as-bid ('PAB'). This means that activated balancing energy is paid at the price balancing energy is offered by each provider to the TSO.</p> <p>In theory, if balancing energy providers had perfect foresight, the outcome of a PAB system and a PAC 'auction' would be the same. In such a case, in a PAB system providers would tend to bid up to the expected marginal provider. As market participants are unlikely to have perfect information, inefficiencies may arise in a PAB system. On the other hand, in a PAC system balancing energy providers are incentivised to bid closer to their marginal cost, leading to more efficient outcomes.</p>
Reserve and dispatch	<p>Centralised with 'clean sheet'</p> <p>Centralised with DAM and IDM nominations</p> <p>Decentralised</p>	<p>Centralised with 'clean sheet'</p> <p>Centralised with DAM and IDM nominations</p> <p>Decentralised</p>	<p>We propose to adopt the already preferred by ENTSO-E option of PAC pricing for activated balancing energy.</p> <p>Where the TSO uses balancing energy offers for resolving non-energy balancing issues mechanisms have to be put in place for distinguishing energy and non-energy actions so that those are not included in calculating the marginal balancing energy price. For example, this can be done through 'flagging and tagging' of non-energy actions or the use of an unconstrained schedule which will effectively deliver the 'unconstrained' balancing energy price.</p> <p>It is important for some energy actions to be identified by the TSO and even under a PAB regime provisions need to be made in certain cases to avoid the exercise of market power. For example, in the case where a generating unit needs to be frequently 'on' to provide for voltage control with that unit being the only one that can provide that service, there may be a need for restrictions on the bidding by that unit. It may even be more desirable to put a long term agreement in place between the unit and the TSO for providing such a service.</p>

IMBALANCE SETTLEMENT

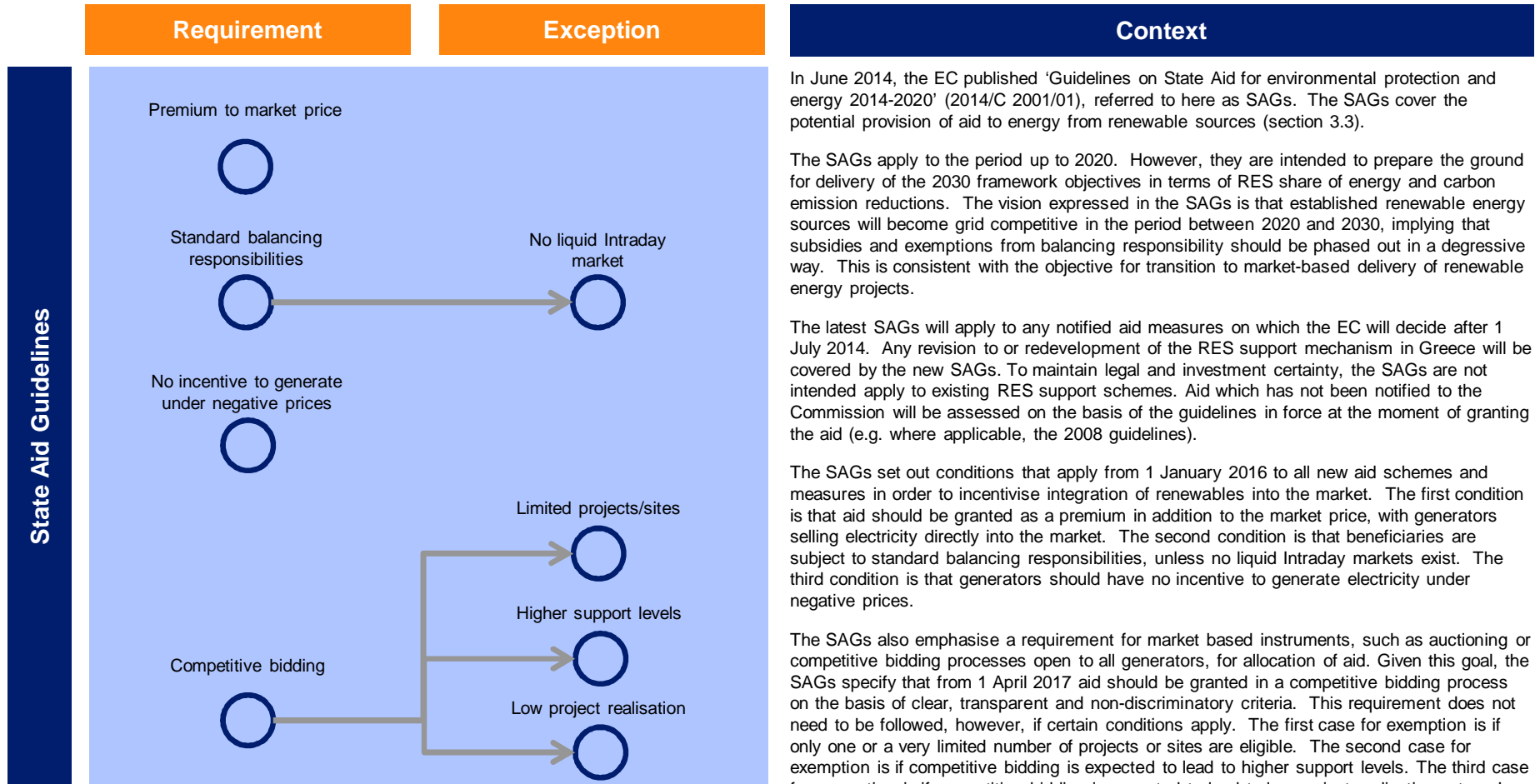
We propose a single marginal pricing regime for imbalances

	Public consultation	Recommendation	Rationale for recommendation
Energy	<p>Imbalance per portfolio</p>  <p>Imbalance per unit</p>  <p>Single</p>  <p>Dual</p>  <p>Total costs</p> 	<p>Imbalance per portfolio</p>  <p>Imbalance per unit</p>  <p>Single</p>  <p>Dual</p>  <p>Total costs</p> 	<p>The Electricity Balancing Network Code suggests imbalance prices have to be greater than or equal to the average balancing energy price(s). Given the preferred choice of marginal pricing for balancing energy this now effectively means marginal pricing for imbalances as well.</p> <p>A single pricing scheme for imbalances values imbalances consistently independent of the direction. This means imbalances pay or get paid the same price, which reflects the cost of the marginal balancing energy action (assuming marginal pricing for balancing energy). The same price is applied to all imbalances irrespective of the direction. This now means, when the system is short, all imbalances in the direction opposite to the system (long) get paid at the single imbalance price, whereas all imbalances in the same direction as the system (short) pay that same imbalance price. Similarly, when the system is long, all imbalances in the direction opposite to the system (short) pay the single imbalance price, whereas all imbalances in the same direction as the system (long) get paid the same single imbalance price.</p> <p>In a dual imbalance price scheme, a different imbalance price is applied to imbalances helping the system and imbalances in the same direction as the system. This means that imbalances which help out the system may be underpaid or overcharged. For example, when the system is short a generating unit that is long does not get paid the same price as that charged to a generating unit in shortfall. Similarly, when the system is long, a generating unit, which is short pays a price greater than that paid to a generating unit which is long.</p> <p>If a single marginal pricing system is in place there is then no difference between imbalances being calculated on a unit basis or a portfolio basis. We propose that imbalance is calculated per unit but settled per portfolio with opportunities for independent companies to pool settlement to offset collateral requirements.</p> <p>Socialising reserve costs amongst grid users (whether it is demand or generation) does not lead to cost-reflective imbalance prices. Imbalance prices are damped as they do not include the procurement costs. In a perfectly functioning energy market, these costs would be passed through by providers in the balancing energy offers and there would be no need for an upfront fee in €/MW. Our proposal is therefore to include reservation costs in imbalance prices in a targeted manner whereby recovery is greater over periods when reserve capacity is more valuable. We do however acknowledge that socialising reservation costs does offer greater simplicity.</p>
Reserve and dispatch	<p>Targeted reserve costs</p>  <p>'Socialised' reserve costs</p> 	<p>Targeted reserve costs</p>  <p>'Socialised' reserve costs</p> 	



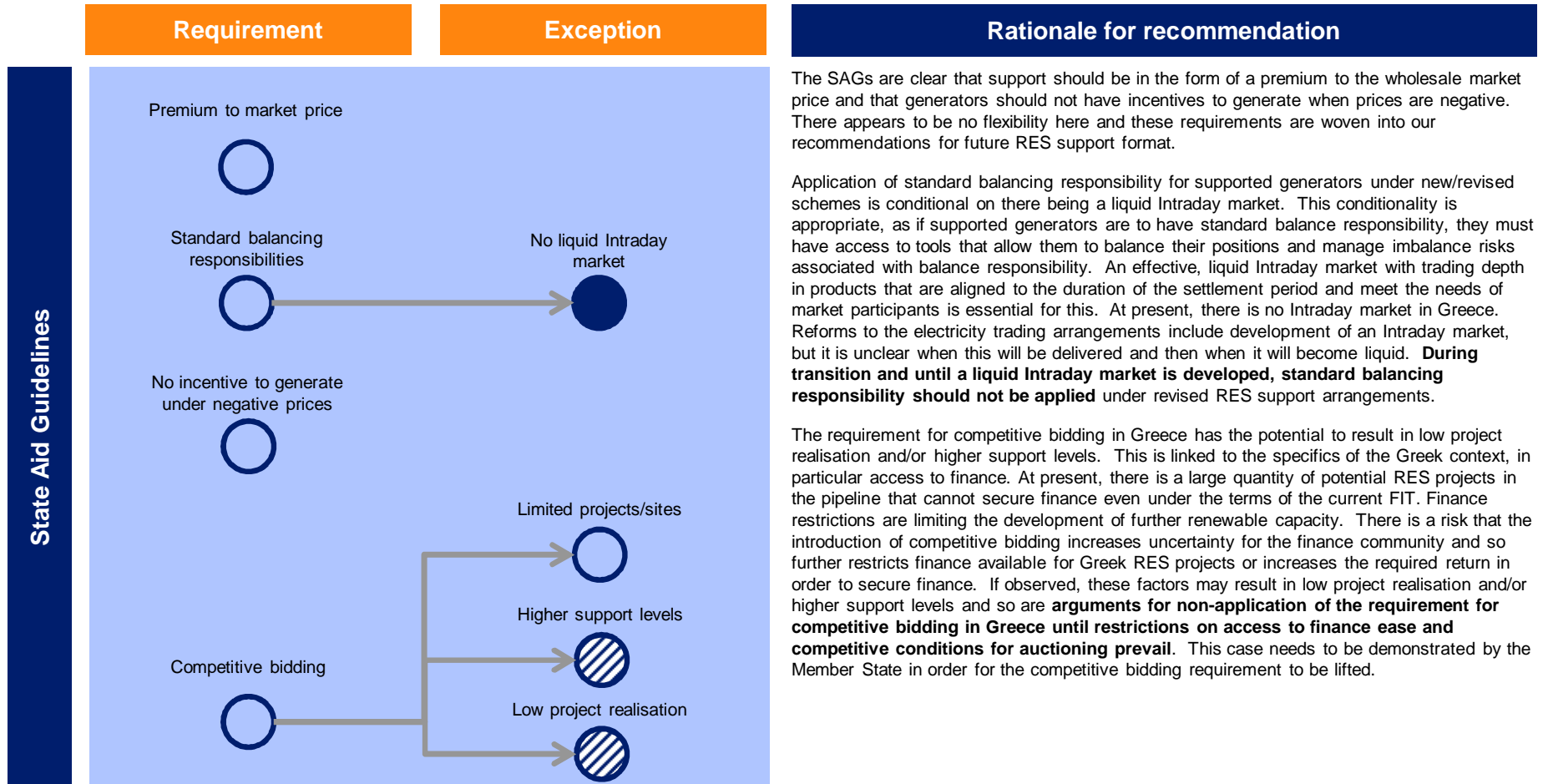
PROPOSALS FOR TRANSITIONAL AND ENDURING RES SUPPORT ARRANGEMENTS

STATE AID GUIDELINES FOR OPERATING AID









State Aid Guidelines

STATE AID GUIDELINES FOR OPERATING AID



FUTURE RES SUPPORT FORMAT OPTIONS

Aid can take several forms

RES support format	Options	Summary description
	<div style="display: flex; flex-direction: column; align-items: center; justify-content: center;"> <div style="margin-bottom: 10px;">One-way variable FiP </div> <div style="margin-bottom: 10px;">Two-way variable FiP </div> <div style="margin-bottom: 10px;">Fixed FiP with cap and floor </div> <div style="margin-bottom: 10px;">Fixed FiP </div> <div style="margin-bottom: 10px;">Green certificate </div> <div style="margin-bottom: 10px;">€/MW supplement </div> </div>	<p>RES support in the form of a 'premium' to the wholesale price could take several forms as set out below.</p> <p>A variable Feed-in Premium (FiP) flexes support based on difference between wholesale price and a 'strike' price. The strike price can be set to reflect levelised costs of a project/technology through an administrative process or through a price discovery mechanism. Two possible variable FiP options are as below. In both cases, the generator relies on wholesale revenue and so must interact with market (directly or indirectly) to secure overall revenue requirements:</p> <ul style="list-style-type: none"> • One-way payments allow for top-up to the strike price, but no pay-back. If the energy price is below strike price, support payment tops up to strike price, but if the energy price is above strike price, there is no support and the generator keeps the upside. • Two-way payments allow for top-up to the strike price and pay-back. If the energy price is below strike price, support payment tops up to strike price, but if the energy price is above strike price, the generator makes difference payment to return the upside. This model has been accepted by the European Commission as being compatible with the current SAGs for UK. <p>Fixed Feed-in Premium with cap and floor provides constant €/MWh support payment in addition to wholesale revenue within limits that moderate upside and downside potential on overall revenue. If the energy price plus fixed premium is below the floor, support is topped up to reach the floor. If the energy price plus fixed premium is above the cap, support is restricted at the cap. As with options above, the generator relies on wholesale revenue and so must interact with market (directly or indirectly).</p> <p>A fixed Feed-in Premium (no cap and floor) provides constant €/MWh support payment without moderation, in addition to wholesale revenue. Again, the generator relies on wholesale revenue and so must interact with market (directly or indirectly).</p> <p>A Green Certificate Market creates value in addition to wholesale market value. The 'green' value can be captured through sale of the certificate.</p> <p>Wholesale market revenue can be supplemented by €/MW payment stream. Support can be calculated based on expectations of wholesale capture revenues, support is set to provide 'missing money' needed to provide a defined return for a set capex.</p> <p>An example of each option is provided in the Annex.</p>











FUTURE RES SUPPORT FORMAT

We propose the introduction of a variable Feed-in premium ('FiP') as the basis for new renewables support scheme in Greece given SAG approval elsewhere

Options	Rationale for recommendation
<div style="display: flex; align-items: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-weight: bold; padding-right: 10px;">RES support format</div> <div style="flex: 1;"> <p>One-way variable FiP</p> <p>Two-way variable FiP</p> <p>Fixed FiP with cap and floor</p> <p>Fixed FiP</p> <p>Green certificate</p> <p>€/MW supplement</p> </div> </div>	<p>The current RES support in the Greek market is a banded feed-in tariff. RES plants receive a fixed rate for the entirety of their output. This fixed rate differs depending on the technology type, location of the project and in some cases project size and/or year of commissioning. The Market Operator participates on behalf of RES in the market with RES generated electricity benefiting from priority dispatch when it comes to TSO dispatch instructions. FiTs are paid to RES generators through a Renewables Account managed by the Market Operator supported through various revenue streams some of which are linked to market prices.</p> <p>Under the current FIT, renewables are in theory shielded from market exposure. However, in practice, given the cashflows under the current scheme there is an exposure when national policy does not provide for sufficient supplemental cash in the form of taxation. FIT supported renewables have an incentive to 'run' no matter what the market conditions are (i.e.. negative prices) as they receive a per MWh payment.</p> <p>As mentioned previously, a new RES support scheme will need to comply with the SAGs. Our recommendation in respect of the future scheme is linked to experience to date under the SAGs, notably the approval of a form of variable FiP in GB as being consistent with the SAGs.</p> <p>Linked to this decision, we propose a variable FiP as the target approach in Greece. This can take either the form of a one-way or a two contract for difference ('CfD'). A variable FiP limits the exposure of RES generators to movements in the wholesale price, which is determined by drivers beyond the control of RES generators. If such exposure is not limited, this may result in an increased associated risk and increase the cost of projects. A variable FiP on the other hand should provide for greater investor certainty and ultimately deliver efficiency gains in the form of lower cost of capital. In comparison, the fixed FiP and Green Certificate retain exposure to wholesale price risk and so entail greater wholesale market risk exposure to the generator. The €/MW supplement model has the potential for regulatory risk, given the administrative nature of the top-up payment and its sensitivity to regulatory decisions concerning anticipated wholesale revenues.</p> <p>The variable FiP still creates a need for wholesale market interaction as RES generators would need to secure revenue streams from wholesale markets in order to secure sufficient revenue in aggregate. As RES penetration grows, however, and cannibalisation of market revenue potentially increases, policy makers need to monitor the ongoing balance between market and support in overall revenue streams to ensure that build levels are appropriate.</p> <p>Revised arrangements should not affect support for projects already under the current FIT or expecting to commission under it. Enforced retrospective change to support arrangements must be prevented to avoid undermining existing projects and damaging investor confidence going forward. Projects under the existing FiT may, however, be given the choice to switch to the revised arrangements should they wish to do so. If a project does transition, it will be bound by the obligations and conditions of the revised RES support mechanism.</p>





VARIABLE FIP PRICE PARAMETERS

Risk is reduced the closer to real time the reference price and Day-Ahead is the only real option pending a liquid Intraday market

	Transitional	Target	Rationale for recommendation
RES support	<p>Forward</p>  <p>Administered</p> 	<p>Forward</p>  <p>Administered</p> 	<p>The choice of the reference price and the strike price are important design factors under a variable FIP.</p> <p>In terms of the reference price the Day-Ahead market appears to be the most attractive choice as a starting point, as the Day-Ahead market will deliver a clear price and is expected to have sufficient liquidity. Difference payments should be calculated at half-hourly or hourly granularity depending on the granularity of day-ahead traded products. This approach, as opposed to using an average of day-ahead prices, is more reflective of the likely capture price for a wind farm given the variability of production and prices throughout a day.</p>
	<p>Day-ahead</p>  <p>Competition</p> 	<p>Day-ahead</p>  <p>Competition</p> 	<p>If a liquid Intraday market develops in time, then an Intraday reference becomes a possibility. This would require a robust reference price and so would probably be structured around Intraday auctions, rather than continuous trading. If trading migrates to Intraday, an Intraday reference reduces basis risk and imbalance risk for supported generators. The suitability of an Intraday auction reference could be linked to a minimum liquidity requirement, with the alternative being reversion to the Day-Ahead market.</p>
	<p>Spot</p> 	<p>Spot</p> 	<p>Using an average forward price as reference opens up gap with capture price and so presents basis risk for wind generation.</p> <p>The strike price is dependent on the allocation process, which, based on the SAGs, should be based on a competitive process when conditions for such a process are in place. However, administered allocation is appropriate in the transitional phase as the conditions for competitive allocation are not in place. The strike price should be indexed to adjust for inflation.</p> <p>The price parameters for a supported project should be specified in a contract to reduce the potential for revisions in future.</p>

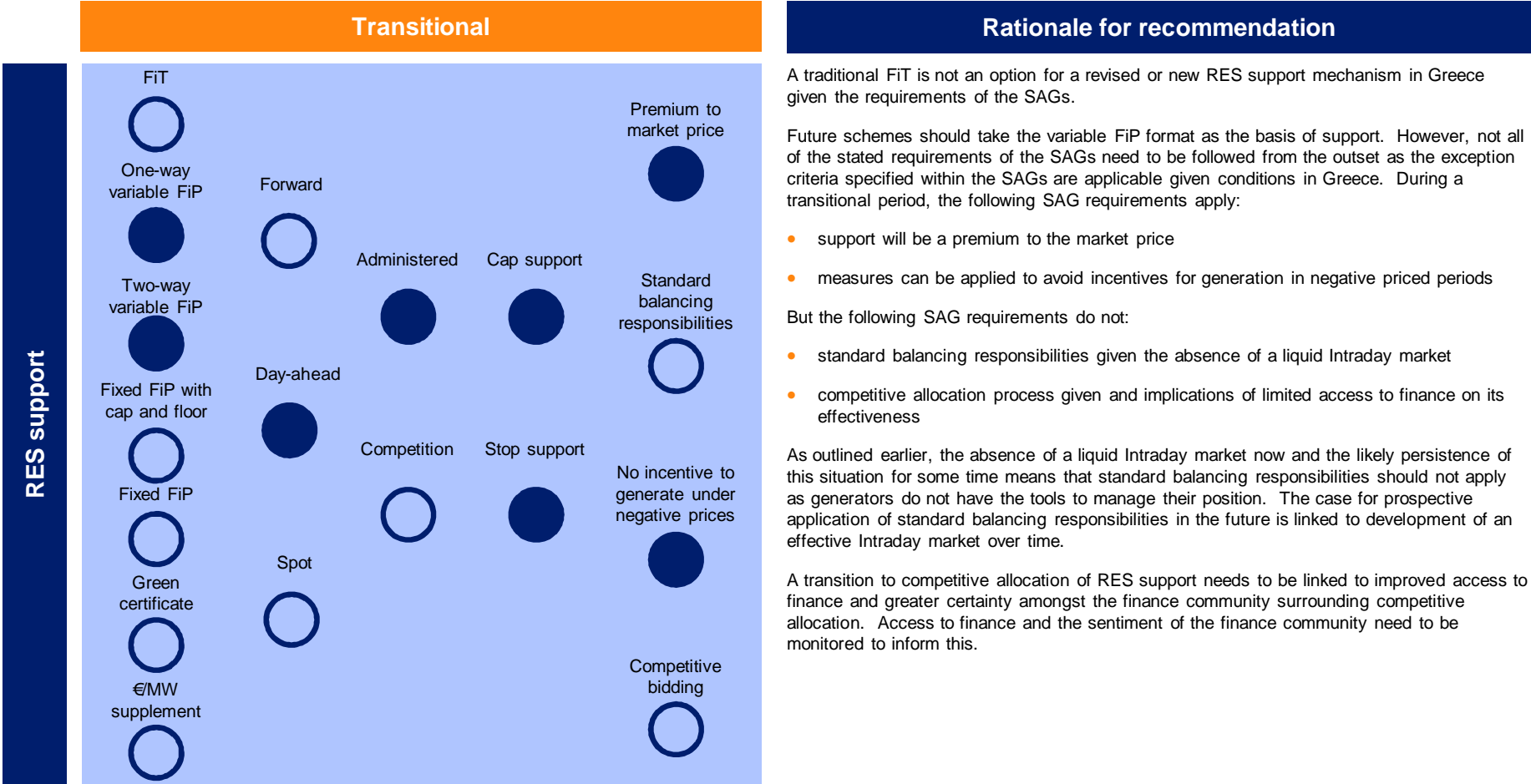
VARIABLE FiP NEGATIVE PRICING INCENTIVES

There is clear circularity between the likelihood of negative prices and the incentives created by the support regime

	Transitional	Target	Rationale for recommendation
RES support	<p>Cap support</p>  <p>Stop support</p> 	<p>Cap support</p>  <p>Stop support</p> 	<p>The SAGs require that support does not give incentives to run when wholesale prices are negative. If the variable FiP reference price is linked to day-ahead (or Intraday) prices, and operating aid is paid on a per MWh basis, then the potential for negative prices increases as the quantity of low/zero SRMC supported generation increases.</p> <p>To manage this and mitigate the potential for supported generators to run when the reference price is negative, we suggest the approach recently approved by the European Commission for GB. This has two features:</p> <ul style="list-style-type: none"> • It caps support at the strike price, which means that the supported generator still has an incentive to run until reference price equals inverse of support value • It stops support payments if the reference price is negative for more than 6 hours <p>This limits the incentives for supported generation to run in periods when the variable FiP reference price is negative.</p> <p>Supported generators can still submit negative bids into the balancing market to cover the opportunity cost of any lost support revenue foregone in the event that the TSO turns down their generation output.</p>

FUTURE RES SUPPORT FORMAT

The introduction of a variable Feed-in premium ('FiP') and full compliance with SAGs should be phased contingent upon competitive conditions in Greece



A traditional FIT is not an option for a revised or new RES support mechanism in Greece given the requirements of the SAGs.

Future schemes should take the variable FiP format as the basis of support. However, not all of the stated requirements of the SAGs need to be followed from the outset as the exception criteria specified within the SAGs are applicable given conditions in Greece. During a transitional period, the following SAG requirements apply:

- support will be a premium to the market price
- measures can be applied to avoid incentives for generation in negative priced periods

But the following SAG requirements do not:

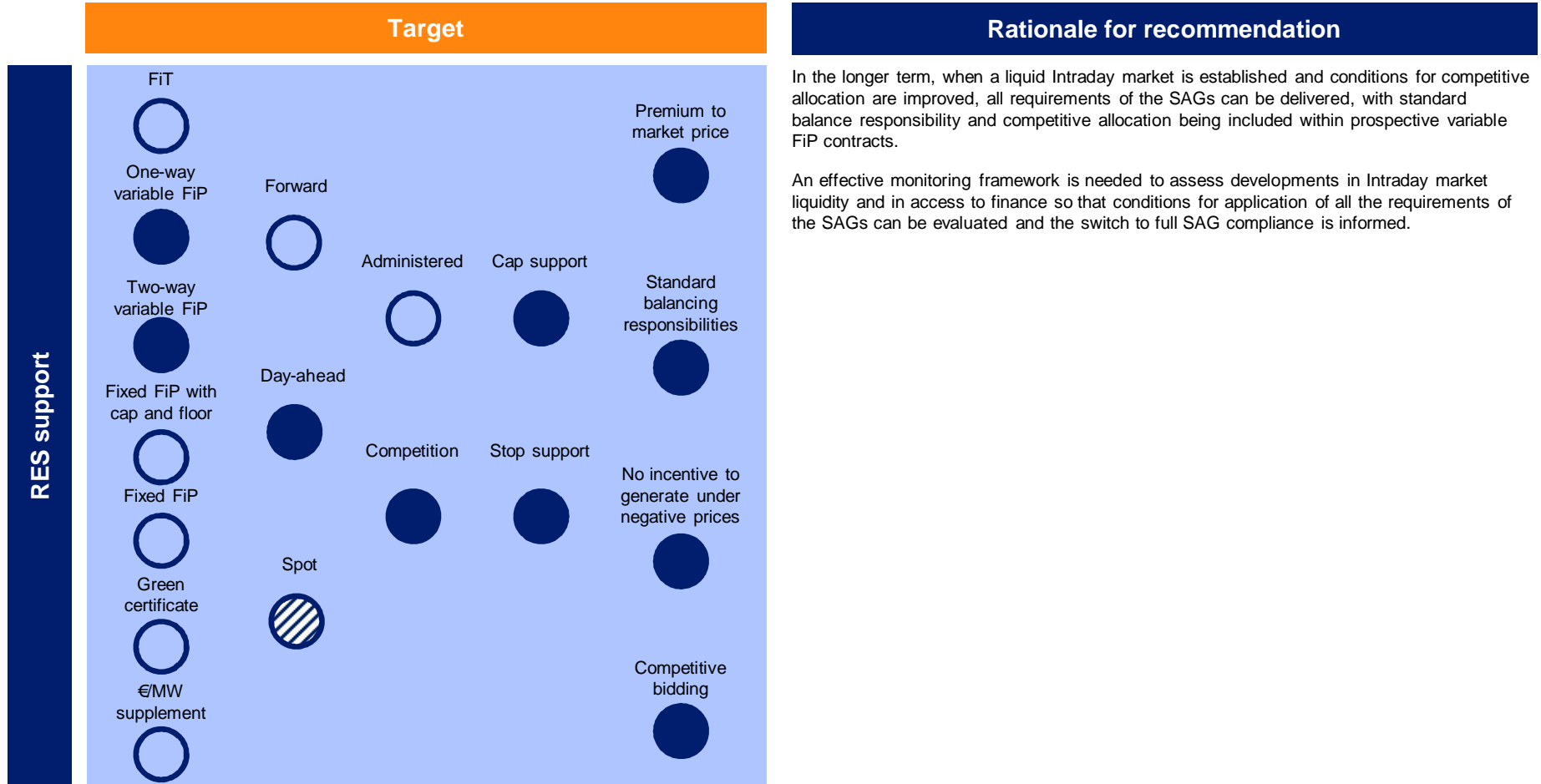
- standard balancing responsibilities given the absence of a liquid Intraday market
- competitive allocation process given and implications of limited access to finance on its effectiveness

As outlined earlier, the absence of a liquid Intraday market now and the likely persistence of this situation for some time means that standard balancing responsibilities should not apply as generators do not have the tools to manage their position. The case for prospective application of standard balancing responsibilities in the future is linked to development of an effective Intraday market over time.

A transition to competitive allocation of RES support needs to be linked to improved access to finance and greater certainty amongst the finance community surrounding competitive allocation. Access to finance and the sentiment of the finance community need to be monitored to inform this.

FUTURE RES SUPPORT FORMAT

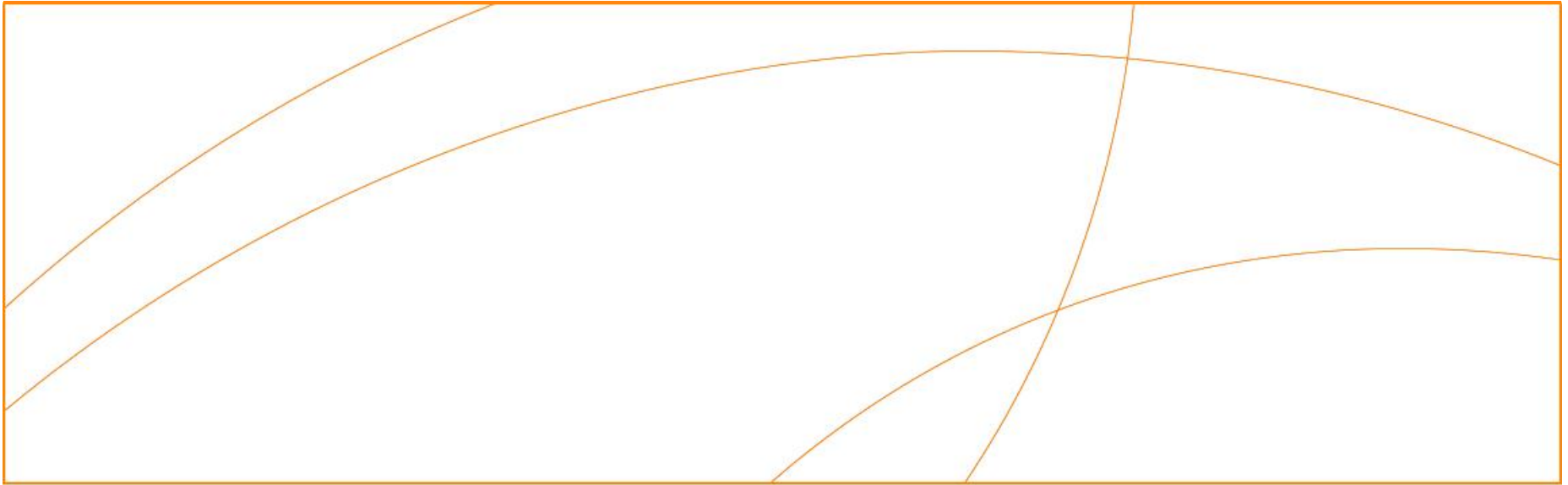
The introduction of a variable Feed-in premium ('FiP') and full compliance with SAGs should be phased contingent upon competitive conditions in Greece



Rationale for recommendation

In the longer term, when a liquid Intraday market is established and conditions for competitive allocation are improved, all requirements of the SAGs can be delivered, with standard balance responsibility and competitive allocation being included within prospective variable FiP contracts.

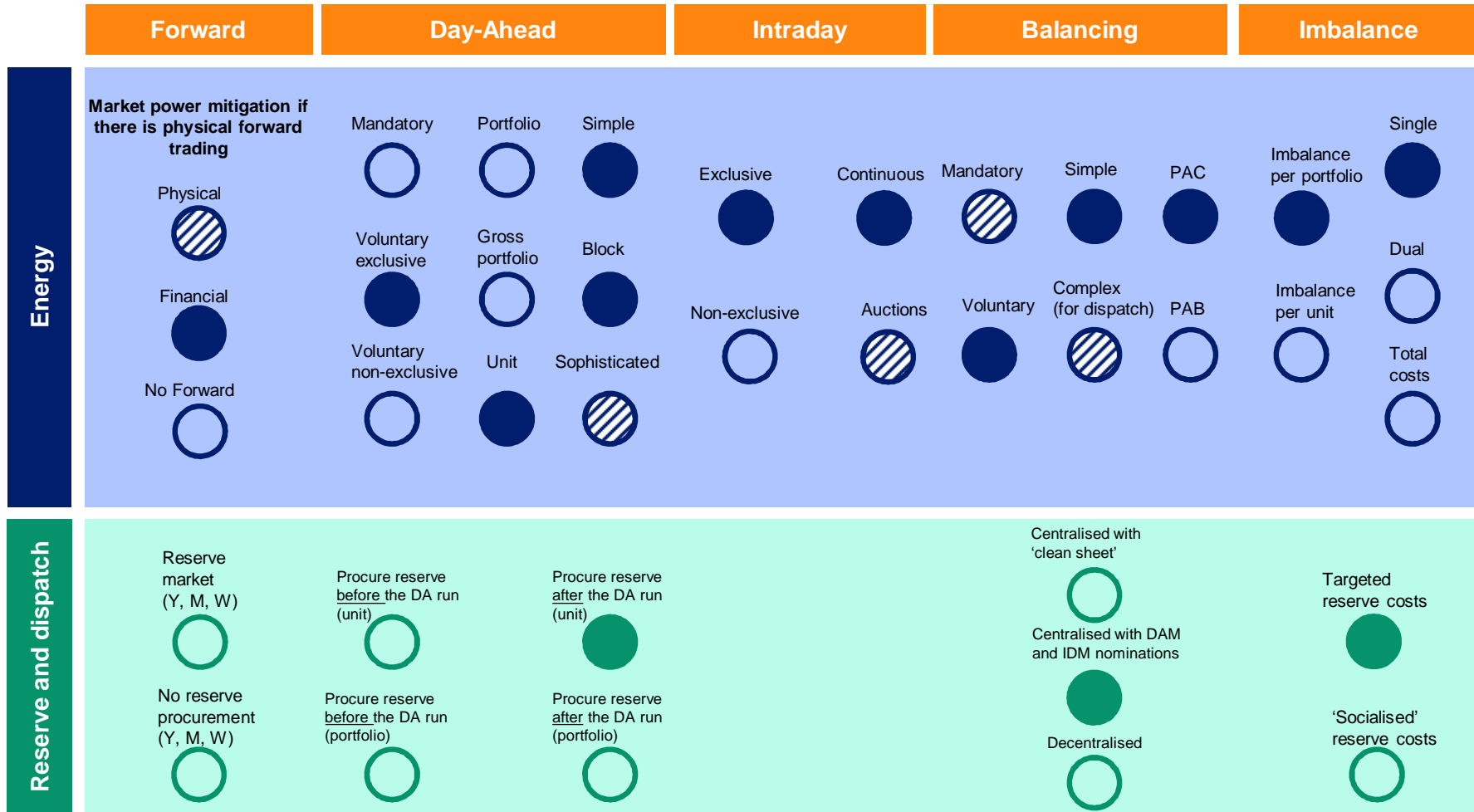
An effective monitoring framework is needed to assess developments in Intraday market liquidity and in access to finance so that conditions for application of all the requirements of the SAGs can be evaluated and the switch to full SAG compliance is informed.



SUMMARY OF RECOMMENDATIONS

PROPOSED ELECTRICITY MARKET DESIGN

Our proposed market design is broadly in line with the public consultation recommendations and within the spirit of the Target Model



PROPOSED ELECTRICITY MARKET DESIGN

Our proposed market design is broadly in line with the public consultation recommendations and within the spirit of the Target Model

	Recommendations	Rationale
Forward	<ul style="list-style-type: none"> Financial forward trading over a centralised platform Market power mitigation: VPP contracts 	<p>We propose forward trading to be based on financial rather than physical products. Limiting physically traded volumes in the forward timeframe allows for concentration of physical trade closer to real time and, therefore, improved liquidity is expected in the closer to real-time markets (Day-Ahead and Intraday). Concentration of physical trading in the closer to real-time markets is better suited to a world with increasing levels of intermittent generation.</p> <p>Trading in a centralised marketplace provides for greater transparency and reinforces liquidity. VPP contracts allow for limiting market power in the presence of dominant players as there is then less of an incentive for exercising market power in the closer to real-time markets.</p>
Day-Ahead	<ul style="list-style-type: none"> Voluntary exclusive market (collective exclusivity across DA, ID and Balancing) Unit bidding (portfolio for RES and demand) Market power mitigation: bidding restrictions on dominant players Simple and block bid structures 	<p>A mandatory market restricts the freedom of choice between trading in different timeframes. Making the Day-Ahead market voluntary allows parties to choose to 'by-pass' the Day-Ahead market and trade in the centralised Intraday market. This allows market participants to choose the combination of markets better suited to their risk management strategy and acknowledges the importance of the Intraday timeframe. Making the centralised Day-Ahead and Intraday markets collectively exclusive improves liquidity as there is no other route for trading electricity in this timeframe.</p> <p>We propose unit based bidding for the majority of generation to allow for greater transparency given the current composition of market portfolios. In the future, and assuming a less concentrated market, a move towards gross portfolio bidding could be considered. But a requirement for unit bidding at the lowest levels would place an onerous burden on the smallest participants, and instead we propose that a de minimis applies to ensure that the smallest generators may bid collectively.</p> <p>We also propose intermediary arrangements by which agents may be appointed to interface with the market on behalf of participants (for combinations of bidding, collateral and/or settlement). This provides route to market options for smaller and/or independent parties, who can appoint a third party to interact with the market on their behalf. This allows for gross portfolio bidding for demand-side units, demand and some variable renewable generation.</p> <p>Bidding restrictions on dominant players can further limit the exercise of market power.</p> <p>Simple and block bids are widely used in European markets.</p>

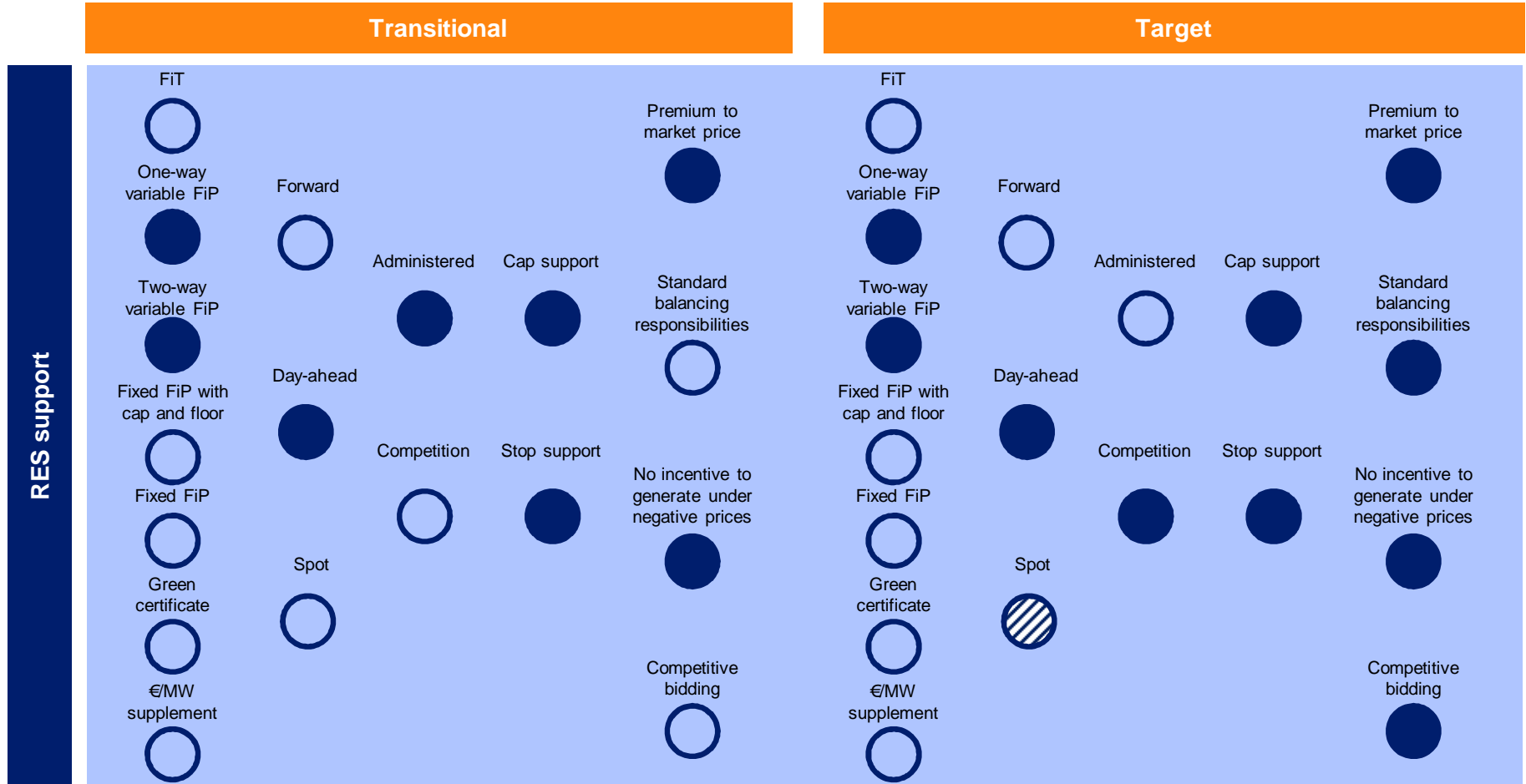
PROPOSED ELECTRICITY MARKET DESIGN

Our proposed market design is broadly in line with the public consultation recommendations and within the spirit of the Target Model

	Recommendations	Rationale
Intraday	<ul style="list-style-type: none"> Voluntary exclusive market (collective exclusivity across DA, ID and Balancing) Gradual move to continuous trading with auctions as transitional Frequent ID auctions with last auction 2 hours ahead of real-time When continuous move gate closure as close to real-time as possible 	<p>An exclusive ID market promotes liquidity as market participants cannot trade electricity and refine their positions Intraday outside centralised marketplaces. Both periodic auctions and continuous trading have merits. Starting off with periodic auctions will make for a smoother transition towards continuous trading, allowing for alignment with neighbouring Italy, which already has periodic Intraday auctions. Having sufficiently frequent auctions is important for reacting to demand and intermittent generation forecast changes.</p> <p>A gate closure as close to real-time as possible will allow for trading to account for changes in wind forecasting as forecast errors are significant even up to 1 hour ahead.</p> <p>Intraday products should be aligned with imbalance settlement periods (i.e. if imbalance settlement period is 30 minutes, then 30 minute block ID products should also be available).</p>
Balancing	<ul style="list-style-type: none"> Centralised dispatch model with market nominations (DA and ID) acting as the starting point PAC for balancing energy 	<p>Moving to decentralised dispatch arrangements may mean significant change for the Greek electricity market, currently based on a gross mandatory pool. A centralised dispatch model appears as a more viable option, allowing for the TSO to maintain greater control when it comes to unit commitment and dispatch instructions. Nominations from the market trades are to be the starting point of dispatch with the TSO's role being to ensure a feasible dispatch schedule rather than an overall cost minimisation.</p> <p>A voluntary balancing market can work equally well as a mandatory one, but giving the TSO greater comfort of having access to balancing energy is important and mandatory participation may be deemed more appropriate.</p> <p>PAC pricing for balancing energy should deliver more efficient outcomes as providers are incentivised to bid closer to their marginal costs. Simple bids should be used, but if complex bids are adopted then start-up costs should be included in the balancing energy price.</p>
Imbalance Settlement	<ul style="list-style-type: none"> Single price for imbalances Imbalances calculated per unit basis but settled per portfolio 30min (or 60min as alternative) imbalance settlement period Targeted allocation of reserve costs 	<p>Imbalances are valued consistently under a single pricing regime regardless of the direction of the imbalance. A dual pricing regime may on the other hand may undervalue countervailing imbalances that help the system. If a single marginal pricing system is in place there is then no difference between imbalances being calculated on a unit basis or a portfolio basis. We propose that imbalance is calculated per unit but settled per portfolio with opportunities for Independent companies to pool settlement to offset collateral requirements.</p> <p>The imbalance settlement period should be set equal to 30 minutes, in line with the minimum requirement of the EB NC, as an even shorter period may mean significantly higher metering costs. An alternative option (potentially during a transitional period) is to have a 60 minute settlement period, which would create alignment with neighbouring Italy. Reserve procurement costs should be distributed in imbalance prices in a targeted way, rather than pro-rata.</p>

FUTURE RES SUPPORT

We propose the introduction of a variable Feed-in premium ('FiP') for the new renewables support scheme assuming competitive conditions arise in Greece



FUTURE RES SUPPORT

We propose the introduction of a variable Feed-in premium ('FiP') for the new renewables support scheme assuming competitive conditions arise in Greece

	Recommendations	Rationale
Format	<ul style="list-style-type: none"> Operating aid Variable Feed-in Premium 	<p>We propose to adopt a variable feed-in premium ('FiP'). This can take either the form of a one-way or a two-way contract for difference ('CfD'). A variable FiP limits the exposure of RES generators to movements in the wholesale price, which is determined by drivers beyond the control of RES generators. If such exposure is not limited, this may result in an increased associated risk and increase the cost of projects. A variable FiP on the other hand should provide for greater investor certainty and ultimately deliver efficiency gains in the form of lower cost of capital.</p>
Pricing	<ul style="list-style-type: none"> Hourly day-ahead wholesale reference price Strike price set by competitive process when conditions allow and administrative process until then 	<p>In terms of the reference price the Day-Ahead market appears to be the most attractive choice as a starting point, as the Day-Ahead market will deliver a clear price and is expected to have sufficient liquidity. An Intraday reference price could be used in time, when sufficient liquidity has developed.</p> <p>Difference payments should be calculated at half-hourly or hourly granularity depending on the granularity of traded products in the reference market. This approach, as opposed to using an average of day-ahead prices, is more reflective of the likely capture price for a wind farm given the variability of production and hourly prices throughout a day.</p> <p>The strike price is dependent on the allocation process, which, based on the SAGs, should be based on a competitive process when conditions for such a process are in place. However, administered allocation is appropriate in the transitional phase as the conditions for competitive allocation are not in place. The strike price should be indexed to adjust for inflation.</p>
Negative price incentives	<ul style="list-style-type: none"> Cap support Stop support 	<p>To manage incentives to run when wholesale reference price is negative, we suggest that support is capped at the strike price and stopped if the reference price is negative for an extended period, as has been approved by the EC for UK.</p>
Application	<ul style="list-style-type: none"> No retrospective change 	<p>Revised arrangements should not affect support for projects already under the current FiT or expecting to commission under it. Enforced retrospective change to support arrangements must be prevented to avoid undermining existing projects and damaging investor confidence going forward. Projects under the existing FiT may, however, be given the choice to switch to the revised arrangements should they wish to do so.</p>

ASSESSMENT OF PROPOSED MARKET DESIGN

Our recommendations share commonalities with the public consultation and should better meet policy and commercial objectives compared to the current market

Assessment

	Current	Public consultation	HWEA
Secure	2	2	2
Sustainable	2	3	4
Affordable	2	2	2
Robust	1	2	2
Financeable	1	2	2
Competitive	1	2	3

Secure: Both the public consultation and our proposal provide the TSO with sufficient tools to ensure a secure operation of the system over short timescales. Appropriately rewarding flexible capacity is key to also maintain the right type of capacity on the system. Further products can be developed to provide for upfront payments for flexibility as long as the underlying price signals from the ex-ante markets are appropriate. In terms of ensuring long term capacity adequacy and capable capacity a Capacity Remuneration Mechanism can be considered if an energy-only market is seen as not sufficient for delivering long-term security of the system. If that is the case, any Capacity Remuneration Mechanism should appropriately reward capacity when available.

Sustainable: Our proposal gives low carbon intermittent generation the right tools in the ex-ante markets for ensuring that risks can be managed. Financial forward trading allows for risk management without locking in physical nominations. Exclusive close to real-time markets, which aim at enhanced liquidity, give access to trades and should provide robust market prices. A well functioning Intraday market should allow intermittent generation to refine their position Intraday. Single marginal imbalance pricing ensures imbalances are valued consistently. The current electricity trading arrangements do not allow for Intraday trading, making it almost impossible for intermittent generation to manage balancing risks. The public consultation does not allow for sufficiently frequent auctions or a short gate closure time in the transitional arrangements, making it more difficult for intermittent generation to trade Intraday and limit their imbalance exposure.

Affordable: Both the public consultation and our proposal aim at delivering energy prices, which are at the same time high enough to ensure sufficient capacity on the system and ensure that the 'real' marginal cost of supplying electricity is faced by consumers. Including market power mitigation measures in the presence of dominant market players discourages the exercise of market power, which could potentially deliver high prices. Transparency delivered through trading only via centralised marketplaces and unit based bidding at the Day-Ahead timeframe foster simpler market monitoring with the regulatory authorities being able to detect anti-competitive behaviour. A variable FIP reduces 'out of market' support payments and encourages efficient interaction with the wholesale market.

ASSESSMENT OF RECOMMENDATIONS

Our recommendations share commonalities with the public consultation and should better meet policy and commercial objectives compared to the current market

Assessment

	Current	Public consultation	HWEA
Secure	2	2	2
Sustainable	2	3	4
Affordable	2	2	2
Robust	1	2	2
Financeable	1	2	2
Competitive	1	2	3

Robust: Regulatory intervention is always possible and in some cases may be viewed as a greater risk than market risk. As both the public consultation and our proposal are based on increased trading by market participants when compared to the current market design, greater responsibility is placed on market participants with the regulator's role being somewhat reduced. Both proposals aim at delivering high levels of liquidity in the centralised markets, with our proposals better targeted at liquidity across Day-Ahead and Intraday market to suit market participants' needs. Unlike the public consultation, our proposal does not allow for physical trading in the forward timeframe, improving liquidity and reference price robustness in close to real-time markets. Enshrining RES support in contractual form can make them less susceptible to political/regulatory revision.

Financeable: Lenders and investors views are shaped by the perception of market and regulatory risk. In the past, the frequent regulatory changes in the energy trading arrangements, capacity payment regime and the renewables support have increased uncertainty and made project financing less appealing. That said, the economic downturn also has an important role. Market risk arising as a result of the wider national economic situation is difficult to tackle with any market design. Both the public consultation and our proposal do however aim at limiting the regulatory role and at least try to minimise regulatory risk, alleviating one of the two risk components. A variable FIP limits market risk and, if contained within a contract, regulatory risk creating an improved risk-reward balance for investors.

Competitive: The current market design (and in particular the design until mid 2013) did not promote competition amongst generators, with conventional generators being more reliant on mechanisms other than the 'main' energy markets and having little incentive to compete in the energy market. Renewables were effectively outside of the market with no incentive to compete with other resources. Both the public consultation and our proposal provide for more opportunities for competition over different timeframes. However, unlike the public consultation, our proposal does not mandate participation in a certain timeframe, allowing market participants to shape their own risk management strategy. With a variable FIP, RES must interact with the wholesale market and so the competitive environment within the wholesale market is enhanced.

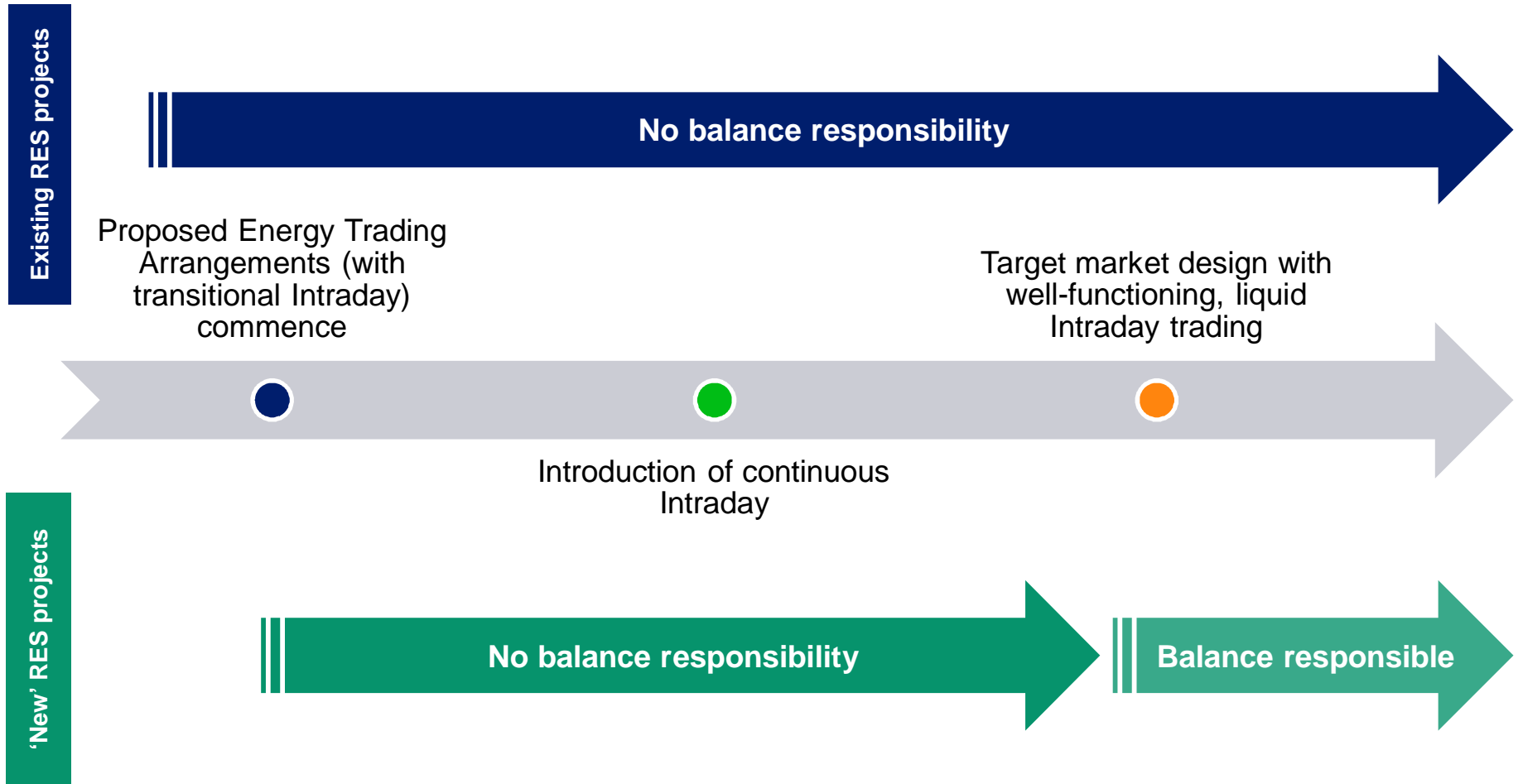
IMPACT OF MARKET DESIGN ON STAKEHOLDERS

A market design should consider different types of market players and consumers

	Impact of proposed market design
Consumers	<ul style="list-style-type: none"> • The market design aims at promoting competition over all timeframes and effectively delivering efficient pricing to suppliers and by extension to consumers • Transparency of information in the centrally organised marketplaces allows regulatory authorities to monitor market player behaviour and be in position to limit exercise of market power and mitigate risk of excessive payments by consumers • Allowing market players to choose the close to real time timeframe in which they wish to trade electricity should deliver more efficient outcomes and consumers should also benefit • The proposed RES support is intended to be a robust framework which enhances project financeability with the associated gains for consumers in the form of lower support payments required as result of potential lower cost of capital
Conventional generators (thermal and large hydro)	<ul style="list-style-type: none"> • The proposed market design provides for access to liquid centrally organised marketplaces where generators can access robust market prices • Block bid structures should allow for reflecting start-up and no-load costs for thermal generating units and ensuring full cost recovery • The introduction of an Intraday market should allow more flexible plants to capture additional value whilst allowing parties to respond to changes in demand and variable renewable generation output
RES	<ul style="list-style-type: none"> • The proposed market design provides for access to liquid centrally organised marketplaces where RES can access robust market prices • Allowing for aggregation (including third parties) gives a route to the market for smaller RES projects, as well as promoting more accurate forecasting by third parties • The proposed RES support gives a reasonable degree of revenue certainty and should make project financing less costly

ROADMAP FOR RES

For existing projects under FiT a central body will resume balance responsibility for them; new projects should be balance responsible once ID market becomes liquid





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