



**Response by Energia to the SEM
Committee consultation SEM-14-008**

Integrated Single Electricity Market (I-SEM)

***High Level Design for Ireland and Northern Ireland
from 2016***

4 April 2014

1 Executive Summary

In this response we consider the high level design proposals for energy trading arrangements and capacity remuneration mechanisms under I-SEM, as presented in consultation paper SEM-14-008. Our consideration and evaluation of these fundamental market design pillars has been supported by economic consultancies Baringa¹ and NERA² respectively. We would encourage the regulatory authorities (RAs) to read their independent reports which accompany this response.

Market power and liquidity is a recurring theme of our response. This is because undesirable outcomes can come about in energy or capacity markets as a result of market dominance which interferes with the efficient operation of the market and increases costs to consumers. These outcomes are seen today in the SEM's forward market. It is imperative that the new market is designed with appropriate regulatory and competition enhancing measures to prevent this continuing in the I-SEM.

Energy Trading Arrangements

Forward markets are essential to the proper functioning of retail markets as evidenced by the recent activities of Ofgem in the GB electricity market. Forward markets drive retail pricing by setting the effective cost of hedging for retail suppliers. Therefore, low levels of liquidity, or unjustifiably high prices, in forward markets will result in higher prices for consumers. It will also reduce retail competition over the mid to long term. This again is to the detriment of consumers.

Analysis of the current SEM forward market, conducted by Baringa, indicates that SEM forward market dynamics are consistent with the expected outcomes in a market where market power exists. This outcome is reinforced by the mandatory pool structure in SEM which:

- i. Dis-incentivises merchant generation from participating in forward market timeframes due to scheduling risk, and
- ii. Prevents vertically integrated suppliers from using their generation assets:
 - a. to mitigate against low levels of liquidity or volume withholding; and
 - b. to impose a de-facto price cap on forward market pricing levels.

These barriers to a more efficient forward market would be removed under our proposals for Option 1.

¹ The Baringa report was written by experts who have worked with a number of clients across Europe to assess the implications of the EU Target Model and have supported clients to influence the Framework Guidelines and Network Codes underpinning it. They have also supported DECC and National Grid on UK EMR and have advised Ofgem on several modifications to the GB gas and electricity trading arrangements.

² The NERA report was written by experts at NERA with direct experience of many different electricity markets, including the SEM. A team from NERA advised on the design of the SEM's original capacity mechanism and a member of that team peer reviewed this report.

The core principle of the EU Target Model is efficient market coupling. To achieve efficient market coupling, liquidity in ex-ante spot timeframes is required. The presence of an ex-post pool in Option 2 and Option 4 therefore acts as a barrier to the natural pooling of liquidity in ex-ante timeframes (including the forward market).³ Both designs would be unique within Europe and therefore are untested. There is significant risk (particularly with Option 4) of further design changes being necessary as it is unlikely to be Target model compliant. Therefore neither option 2 or 4 can be considered a feasible HLD.

Option 1 and Option 3 can be viewed as part of a continuum. By adding appropriate market power mitigation and liquidity measures to Option 1 the HLD moves towards Option 3. Option 3 represents a far extreme on this continuum but its proposed (and untested) use of EUPHEMIA (as the day ahead pool algorithm) generates potential significant risks for I-SEM regulators, consumers and generators, coupled with a significant ceding of market governance and control from the SEMC to European institutions.⁴ Energia has had sight of analysis undertaken by Energy-Link Partnership which modelled the Euphemia Algorithms under Option 3. This analysis (based on 'typical day' studies) has confirmed our concerns in relation to the levels of outturn prices and schedule outcomes in I-SEM.

To proceed with Option 3 without rigorous 'proof of concept' testing, or the development of a back-up design, would therefore be a high-risk strategy for the SEMC to adopt. It is a risk that need not be taken, given the regulatory measures to be implemented alongside Option 1 suggested in this response.

Energia's recommendation for the I-SEM HLD energy trading arrangements is therefore Option 1 with appropriate market power mitigation and liquidity measures. We make detailed recommendations regarding these measures (including market making obligations on dominant participants) in section 4.2.4.7 of this response.⁵

As evidenced by recent experience in the GB electricity market, implementation of these recommendations will ensure Option 1 delivers liquid forward and spot markets with efficient market coupling while insulating I-SEM participants and consumers from the potential significant risks associated with Option 3. Approaching the HLD in this way has the additional benefit of allowing regulators to monitor the dynamics of I-SEM and roll back market power mitigation measures if the conditions for adequate competition (and therefore efficient market operation) in each market timeframe have been met.

³The reasons for this are discussed in more detail in section 4.2.1 and 4.2.2 of this response.

⁴It is important to emphasise that our concern with regards to EUPHEMIA relates solely to its proposed use under Option 3 and not to the general use of the algorithm itself. Please note that we have no concerns regarding the use of EUPHEMIA under any of the other HLD options proposed in the consultation paper.

⁵ A high-level overview of the Energia position on all design options is provided in section 4.2.5 of this response.

Capacity Remuneration Mechanisms and Generation Adequacy

A capacity remuneration mechanism (CRM) is an attempt to overcome the failure of the energy-only market to prompt or retain adequate retention of, and investment in, capacity, by replacing revenues from energy price spikes with a smoothed payment for capacity. It should be recognised that the Generation Capacity Statement (GCS) prepared by the TSOs, and referred to prominently in the consultation paper⁶, does not in any way represent a meaningful assessment of long-term security of supply and should not be mistaken for a genuine assessment of generation adequacy based on generation economics. The GCS provides little more than a snap shot of the current position with forward projections based on demand forecasts, potential new connections, and notified generation retirements with some discretion applied in later years. It does not consider revenue adequacy or power generation economics and therefore should not be misconstrued to give a false sense of (long term) security.

EC State Aid guidelines stipulate that a CRM can only be justified when demonstrable market failures give rise to a generation adequacy problem. We asked NERA to evaluate whether conditions on the island of Ireland meet these criteria such that there remains a need for the re-designed SEM to include a CRM. On this question, their comprehensive report accompanying this response concludes:

“In 2007, when the [all-island electricity] market was set up, and again when the RAs conducted a Medium Term Review between 2009 and 2011, they concluded that the small size of the market, the market power of dominant companies, and the inherent regulatory/political risk would all deter efficient investment in generator capacity. The solution adopted then was to include a Capacity Remuneration Mechanism within the SEM. These particular problems have not disappeared since the RAs last looked at the electricity market, which implies that some form of CRM is still required. The RAs would therefore need strong arguments to support a decision to remove the CRM now, to persuade investors that conditions had changed, and that the decision was not driven purely by short term political considerations. Otherwise, the RAs would inject new and additional regulatory risk into investors’ perceptions of the all-island market, with adverse consequences for investment and consumers’ interests”.
(NERA Report, Executive Summary)

Frontier Economics have considered a similar, albeit narrower, question specifically considering the ‘small market problem’ in abstract terms and conclude that ***“the SEM has numerous characteristics [specifically relating to its small size] which would tend to imply significant potential benefits from the continuation of a [capacity] mechanism”*** (Frontier Economics Report, Executive Summary)⁷.

Accepting the necessity of a CRM going forward, it would be judicious for the SEM Committee, in the interests of the consumer, not to rush into discarding the current

⁶ For example paragraph 3.38 of SEM-14-008 refers: “The January 2013 All-Island Generation Capacity Statement (2013-2022) projected a generation surplus out to 2022 on an unconstrained All-Island Market basis”.

⁷ Frontier Economics Report for the Electricity Association of Ireland, April 2014.

mechanism. The current CRM is too easily dismissed in the consultation paper and is done so without convincing reason, especially in the absence of well thought through and workable alternatives that address the ‘market failures’ prevalent in the all-island market, this is a view strongly shared by NERA. They suggest **“adopting relatively minor tweaks to the [existing] design such as altering the ex post component of the current CRM or adapting the rules to exclude foreign generators”** (NERA Report, p. 58).

It is clear from the quality of the consultation paper that consideration of CRMs has suffered in a bid to meet project timelines. NERA reviewed the various options being considered for a CRM in the consultation paper and identified “major gaps” in the proposed designs that overlook “important factors” specific to the all-island electricity market. This gives us considerable cause for concern. We strongly recommend therefore that a further detailed consultation is conducted regarding capacity mechanisms in the I-SEM before rushing ahead with a decision, potentially resulting in a CRM that is not fit-for-purpose, simply to meet project milestones.

The challenge and risk of selecting, designing and implementing an entirely new CRM by 1 January 2017 that crucially addresses the market failures it is attempting to remedy should not be underestimated. Serious consideration should therefore be given to retaining the current CRM with minimal change as NERA recommend above⁸. As we have been advised, we understand this is very much possible in the context of both EU Target Model requirements and State Aid compatibility.

Evaluation of the HLD

The I-SEM HLD will have major and long lived consequences for retaining and incentivising future investments and for competition within the all-island electricity market. This will in turn have a major and long term impact on the cost to consumers. It would therefore be contrary to consumers’ interests to rush the selection of the HLD by ignoring important factors and risks for the sake of meeting project milestones. It is imperative therefore that a more robust impact and risk assessment be undertaken that importantly considers all feasible options, and this should be carried out earlier in the decision making process than is currently planned. In particular, as a minimum it is imperative that the RAs undertake a detailed assessment of energy trading option 3, including a full evaluation of its risks and uncertainties (especially given the risks we identify with this option).

With respect to capacity mechanisms, we have a considerable concern that the proposals, as presented in the consultation paper, do not permit any meaningful evaluation and may not be fit-for-purpose. Following a review of the CRM options in the consultation paper NERA conclude:

⁸ As recently as 2012 (and following a lengthy review) it was deemed by the SEM Committee to be “generally working well and that there is no compelling need to make major changes to the current design”. CPM Medium Term Review (2012), Final Decision Paper (SEM-12-016), 6 March 2012, page 3.

“The options have not therefore been developed to the point where anyone can conduct a comprehensive evaluation of the system best suited to the all-island SEM. Indeed, the SEM Consultation assesses each option by a different set of criteria, which prevents a proper comparison of their relative merits” (NERA Report, page 17).

It is our strong recommendation, for reasons explained earlier, that serious consideration be given to retaining the current CRM with minimal change. However should the RAs choose to proceed with a new CRM; any subsequent evaluation of options should at the very least address fundamental questions such as what market failure the CRM is intended to remedy, how it achieves this, how its design will mitigate the impact of market power and what new regulatory/political risks does it introduce. Any shortlist of options taken forward for this further necessary evaluation should importantly include a long-term price based mechanism (Option 2a) as this form of CRM is demonstrably well suited to addressing the market failures prevalent in the all-island electricity market. Any of the so-called ‘quantity-based’ mechanisms are susceptible to the abuse of market power and many of the options put forward offer no improvement over an energy-only market and would not be fit-for-purpose.

As a final but important point of process, it should be stressed that picking any form of ‘hybrid’ option (for either the energy market or CRM) at this stage without the benefit of consulting stakeholder views would be inappropriate. Proceeding with such a ‘hybrid’ would introduce significant risk of not achieving the objectives of the I-SEM programme and would inject unnecessary uncertainty by opening up the process to potential legal challenge.

The Need to Avoid Unnecessary Complexity

A number of the options put forward in the consultation paper for both energy trading and CRM design are overly complex. Whilst the all-island market is unique in important respects that are relevant to market design (e.g. small size, market power, state-owned dominance and high levels of wind penetration) the island of Ireland should not be considered an innovation hub. We would strongly advocate simplicity and familiarity in market design where possible as this facilitates widespread understanding across stakeholders and investors. Understanding, coupled with targeted market analysis and reporting, increases confidence and thereby improves conditions for investment.

Facilitation of Renewables

Given 40% renewable targets by 2020 it will be important to integrate renewables into the market subject to the existing de-minimus threshold and providing that imbalance arrangements are not overly penal for wind but are yet sufficient to reward flexibility. Joined up thinking with respect to renewable support mechanisms is required, both in respect of energy trading arrangement and CRMs. On the latter note wind should remain eligible for capacity payments. Wind provides a capacity benefit to the system, and existing wind has been built in an environment of a CRM and relies on these payments. The perception of regulatory risk in Ireland would be

dramatically and irreversibly heightened if wind were to be excluded from any revised CRM, and a higher cost of capital in the I-SEM will inevitably result in higher end user prices.

Under new market arrangements there will be an important role for wind aggregators and this should be supported. The market power mitigation measures we propose elsewhere in the paper include mandated counter trading (i.e. mandating thermal generators to offer to buy in the DA and IDM markets (reduce output) at prices related to their SRMC) which, along with enhanced efficiency of interconnector flows will be an important consideration in helping efficient trading reduce curtailment of wind. Grid upgrade, importantly including the North-South interconnector, is required irrespective of market design. Our recommendation for option 1 with market power mitigation regulation will lead to a liquid DA and IDM for renewables.

Credit and Collateral Requirements

Finally, we note that credit and collateral requirements have become an increasing burden on energy suppliers and traders over recent years. Any increase in credit/collateral requirements under the I-SEM will hamper retail competition, increase costs to suppliers and ultimately increase costs to end users.

Overly onerous credit/collateral requirements discourage new entrants and reduce the ability of existing independent companies to compete for new customers. Increasing credit/collateral requirements can also favour market dominance by state owned companies. Any choice of energy market or CRM design must be cognisant of these issues and subsequent detailed design process must focus on minimising these costs.

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2 Introduction

Energia welcomes this opportunity to respond to the SEM Committee's consultation paper on the I-SEM High Level Design (SEM-14-008).

Market re-design is a hugely important and complex undertaking. There is no universal blueprint for either energy trading or capacity mechanism design because crucially the market should be 'fit-for-purpose' given its unique market conditions. On the island of Ireland these conditions include:

- Small market size
- High levels of wind penetration, with 40% targets by 2020
- High concentration of state-owned generation assets
- High concentration of state-owned retail market share
- Pronounced illiquidity problems in the forward market timeframe
- A pre-existing capacity mechanism specifically introduced among other reasons to attract investment and retain capacity in a small market.
- An evolving neighbouring market with its own market failure and dominance concerns, and
- Relatively limited interconnection⁹

The expertise and experience necessary to inform optimal market design under this unique set of conditions does not reside in any one individual or company and this view is reflected in our approach to this response. We have endeavoured to understand the issues through internal workshops (drawing upon a wealth of expertise and experience from across the business) and by actively participating in the HLD Review Group (which notably focused almost exclusively on the energy trading arrangements). We have also engaged renowned experts from Baringa and NERA to assist us in the process. Energia has also had sight of analysis undertaken by Energy-Link Partnership which modelled the Euphemia Algorithms under Option 3. This analysis (based on 'typical day' studies) has confirmed our concerns in relation to the levels of outturn prices and schedule outcomes in I-SEM. In addition, through the Electricity Association of Ireland (EAI) we have engaged Frontier Economics to analytically assess the economic rationale for a capacity mechanism on the island of Ireland. The following independent reports accompany this response and are referenced hereafter as applicable:

1. **Baringa Report #1:** "Promoting forward liquidity and mitigating market power under the I-SEM", April 2014
2. **Baringa Report #2:** "I-SEM HLD consultation: background paper on Option 3", April 2014

⁹ In the form of two long distance sub-sea interconnectors to the neighbouring market, which are susceptible to prolonged outages if compromised.

3. **NERA Report:** “The capacity remuneration mechanism in the all-island market”, April 2014
4. **Frontier Economics Report:** “Benefits of a capacity remuneration mechanism in the SEM”, A Report Prepared for the Electricity Association of Ireland, April 2014

We have carefully given due consideration to market design issues from a diversity of perspectives and have strongly challenged our own thinking and predispositions along the way with a view to being open minded and forward thinking. We consider in significant detail the market dynamics and technical feasibility of the energy trading options proposed. Our evaluation of the extremely high level CRM options put forward is unavoidably less detailed due to the lack of information provided in the consultation paper. However NERA’s comprehensive report is deeply insightful and germane to the issues that will have to be considered in the choice of CRM and its design in the all-island market and we would encourage the RAs to read this. This response attempts to encapsulate this substantial body of work within the limited timescale afforded to respond. Our considered views, from a private sector perspective, reflect our portfolio of renewables, modern gas-fired thermal generation and strong retail presence (which includes recent entry into the ROI domestic market and DSU services) as well as our strategic plans for further growth, development and innovation on the island of Ireland.

The remainder of this response is structured as follows. Section 3 provides general comments covering key high level considerations. Section 4 discusses and analyses the energy trading arrangements in considerable detail and concludes with recommendations to proceed for Option 1 with regulatory measures to address market power and provide liquidity in the forward timeframe. Section 5 concentrates on capacity remuneration mechanisms (CRMs) and stresses the need for the continuation of a long-term price based mechanism in the context of market power and the small size of the all-island market. We maintain that serious consideration should be given to retaining the current CPM with minimal changes required. In this section we also raise significant concerns, shared by NERA, about the quality of the CRM coverage in the consultation paper and call for this to be redressed given its critical importance to investors and consumers and its long-lived consequences. It would be unwise and counterproductive, we caution, to rush the selection of a CRM by ignoring important factors for the sake of meeting project milestones. Section 6 concludes with key messages and recommendations. Annex 1 refers to supporting evidence and external reports and annex 2 (for completeness) provides our response to the detailed questions presented in the consultation paper.

3 General comments

The purpose of this section is to provide important high level comments and background information regarding I-SEM and the significant decisions that will have to be made in relation to it. We would ask the RAs to consider these points carefully and to keep them in mind when reviewing the detailed discussion of energy trading arrangements and capacity remuneration mechanisms in subsequent sections of the response.

3.1 SEM pool design is not a panacea

There are aspects of the SEM pool design that we like and should be retained (for example the capacity mechanism, firm access and shallow connection policy) but it has become increasingly apparent that it is far from ideal. For example, it fails to deal effectively with market power and does not provide anywhere near satisfactory liquidity in the forward timeframe (the Baringa Report#1 attached elaborates on this latter point). We thus see market reform and regional integration under I-SEM as an opportunity to address some key shortcomings with current SEM design, namely:-

- Lack of forward market liquidity and failure to address market power in this timeframe
- Poor incentives for provision of flexibility
- Weak and inefficient exit signals for older inflexible plant
- Lack of real time trading to improve efficiency which will become more important as wind increases

3.2 HLD assessment and decision-making

In addition to meeting the HLD criteria (appropriately defined, assessed and benchmarked), there needs to be a high degree of confidence (before committing to a proposed and final decision) that the I-SEM HLD:

- Is practically and technically feasible;
- Is Target Model compliant;
- Is readily adaptable to future Target Model requirements;
- Does not cede control of I-SEM to European governance, systems and institutions over which the island of Ireland would realistically have little influence;
- Is fit-for-purpose to meet the all-island market requirements and conditions;
- Is not overly complex
- Has been through a genuine consultation process

It has been indicated in both SEM-14-008 and the I-SEM workshop on 25 February 2014 that a single option (integrating energy trading with capacity remuneration) will be selected and taken forward for further consideration and consultation and that only in the final decision paper will there be an assessment of risks and uncertainties.

We have deep concerns about this proposed approach and timing for assessing the options and for informing decision-making.

Notwithstanding the need for a robust process, we can appreciate that it may not be feasible (given time constraints, though this should be reviewed) or necessary to undertake a detailed and deep assessment of all options, including their risks and uncertainties. For example, Options 2 and 4 for energy trading and CRM Options 1 (strategic reserves), 2b (short-term price based), 4 (capacity obligations) and 5a and 5b (reliability options) can be quite easily ruled out early in the process for reasons discussed later in this response. However it is imperative to undertake a full assessment of the remaining options, which must crucially consider risks and uncertainties early in the process rather than at the final decision point. For instance, we see a material risk (that cannot be easily mitigated) in Option 3 for trading energy that relies on Euphemia and this concern is detailed in Baringa Report#2. We also consider the perceived or actual exertion of market power to be a considerable and irrefutable risk under any quantity-based CRM and this is discussed at length in the NERA Report. If these and other key risks and uncertainties are not fully assessed early in the process this could lead to sub-optimal decision making with detrimental consequences should the identified risks materialise.

In assessing the HLD it is also important to take a holistic view of the market arrangements that incorporates the inter-dynamics between the energy market, capacity remuneration mechanism and system services regime. In particular, long-term revenue adequacy for generation assets, within the context of significant and increasing levels of wind penetration, is essential to delivering security of supply and therefore stability within the market design moving forward.

3.3 Security of supply

The consultation paper highlights security of supply as a key HLD criterion and particularly encourages feedback from both TSOs and market participants on how well the *energy trading* options specifically perform against this measure¹⁰. There is an important distinction between short-term and long-term security of supply that should be made clear. The former refers to the system operator's statutory duty of operating the electricity system securely from minute to minute and hour to hour. In a competitive market, long term security of supply is not the responsibility of the system operator, but it is of direct interest to consumers (and to the regulator, acting on behalf of consumers). Having made this distinction it is then worth clarifying that the Generation Capacity Statement (GCS) prepared by the TSOs, and referred to prominently in the consultation paper¹¹, does not in any way represent a meaningful assessment of long-term security of supply and it should not be mistaken for a genuine assessment of generation adequacy based on generation economics. The

¹⁰ The cursory assessment of CRMs in the consultation paper inexplicably gives little (if any) consideration to security of supply.

¹¹ For example paragraph 3.38 of SEM-14-008 refers: "The January 2013 All-Island Generation Capacity Statement (2013-2022) projected a generation surplus out to 2022 on an unconstrained All-Island Market basis".

GCS provides little more than a snap shot of the current position with forward projections based on demand forecasts, potential new connections, and notified generation retirements with some discretion applied in later years. It does not consider revenue adequacy or power generation economics and therefore should not be misconstrued to give a false sense of (long term) security. The actual capacity margin that materialises over the coming decade depends crucially on the redesign of the SEM. If for example the I-SEM were to threaten the revenue adequacy of existing plant, for example, by a reduction in the capacity payment, further plant may retire earlier than anticipated by the system operators, which could turn the excess supply currently forecast into a shortage.

3.4 Capacity remuneration mechanisms

As supported by the NERA and Frontier Economics reports which accompany this submission, a capacity remuneration mechanism (CRM) is a necessary and central feature of any redesigned market under I-SEM (even if the current explicit price cap is removed), and is fully justifiable in the context of EC state aid guidelines.

Having established the need, the CRM crucially should be designed to meet the all-island market requirements and conditions which give rise to the need for a CRM in the first place. The importance of designing a CRM that is ‘fit-for-purpose’ cannot be overstated, as stressed in the NERA report:

“Questioning the purpose of each option will be important to ensure that the design of the new I-SEM, and of its CRM in particular, is tailored to conditions within the island of Ireland, and is not merely selected to avoid administrative hurdles” (page 18).

However the consultation paper does not specify the CRM objectives and this, among other reasons, makes it difficult to respond to. More importantly it may contribute to a misunderstanding of the ‘market failure’ it is aiming to address in the all-island context. This should be clearly set out along with a clarification of the economic function of capacity mechanisms generally.

The potential for market power abuse is often a key consideration in the design of energy markets and this is especially important in the all-island context. Equal, if not more, weighting should be given to market power considerations (or the perception of such) in the design of capacity mechanisms. As NERA point out:

“The energy component of the all-island SEM is constrained by rules intended to mitigate the impact of market power. Concerns over market power arise both from the incentive for private sector generators to raise prices if that would increase their profits, and from the ability and tendency of state-owned generators to lower prices for political reasons. The same concerns should inform the design and evaluation of any CRM” (page 19).

The consultation paper does demonstrate some understanding of market power concerns in relation to CRMs but clearly this is not been given sufficient attention. For example in their evaluation of CRM option 3, NERA observe:

“The SEM Consultation recognises the need for market power mitigation measures in the original contract auction, but overlooks the need for similar measures to facilitate secondary contract trading” (page 26).

NERA also review state aid guidelines and advise that:

“The clear lesson from the State Aid guidelines is that the economics of the all-island electricity market is important to the design of any capacity payment and need to be considered in combination with any legal constraints”. (page 13)

Unfortunately the coverage and consideration of CRMs in the consultation paper is limited and does meet the required standard to enable any reasonable evaluation. NERA comment:

“The options have not therefore been developed to be point where anyone can conduct a comprehensive evaluation of the system best suited to the all-island SEM. Indeed, the SEM Consultation assesses each option by a different set of criteria, which prevents a proper comparison of their relative merits” (page 17).

We stress that it would be contrary to consumers’ interests to rush the selection of a CRM by ignoring important factors for the sake of meeting project milestones. The current CPM appears too easily dismissed in the consultation paper and we are not convinced why, especially in the absence of well thought through and workable alternatives that address the identified ‘market failure’. The challenge and risk of selecting, designing and implementing an entirely new CRM by 1 January 2017 should not be underestimated. And ultimately, assuming a CRM is necessarily designed to suit all-island conditions and address the identified ‘market failure’, we should end up back where we started – i.e. the objectives should be the same and the constraints are broadly similar (the evolutionary versus revolutionary outcome from the CPM Medium Term review would also suggest this). Serious consideration should therefore be given to retaining the current CPM with minimal changes implemented as required.

NERA’s advice below is especially noteworthy:

The RAs use the alleged incompatibility of the existing CRM with the day ahead market coupling pillar of the Target Model as an excuse for a complete review of the CRM design. However, in practice, it need not be necessary to fundamentally redesign the CRM in order to make the mechanism compliant with the target model (page 57).

We will further reference and draw from the NERA report heavily in this response but we would encourage the RAs to read it in full. It is both insightful and germane to the

issues that will have to be considered in the choice of CRM and its design in the all-island market. NERA advised the RAs on the design of the SEM's original capacity mechanism and would be willing to discuss their report with the RAs if that would be helpful. We also refer later in this response to the Frontier Economics report which provides an excellent conceptual framework for understanding the benefits of capacity mechanisms in small markets. This report was prepared for the Electricity Association of Ireland of which we are members.

3.5 Market power and liquidity

Low levels of liquidity or unjustifiably high prices in forward markets will result in higher prices for consumers. These undesirable outcomes can come about as a result of market dominance which interferes with the efficient operation of the market and increases costs to consumers. These outcomes are seen today in the SEM. It is imperative that the new market is designed with appropriate regulatory and competition enhancing measures to prevent this continuing in the I-SEM.

Energia considers the continued presence of a market power mitigation strategy to be an essential control on market power in the all-island market, irrespective of the final market design implemented under I-SEM. Arguments that increased interconnection, market coupling and demand side participation will reduce the relevant market share of all participants in the all-island market below any reasonable level of concern with regard to competition policy are overly optimistic and simplistic. For the foreseeable future, absent significant divestment of ESB generation assets, Energia considers the retention of a market power mitigation strategy as central to the protection of the market, participants and customers from anti-competitive effects arising from the effective local market dominance of one player in a relatively small market.

The design of a market power mitigation strategy should be tailored to the preferred market design but is needed under *any* design. A pool structure does not substitute for an effective market power mitigation strategy. Indeed a pool structure (based on our considerable experience of operating in the SEM) exasperates the exertion of market power and undermines liquidity in the forward market timeframe.

Enhanced liquidity provisions in the forward timeframe are needed and are considered to be another central feature of I-SEM under any design. A clearly apparent doctrine in the consultation paper is that the provision of a robust and liquid reference price in the spot market is a necessary condition for forward market liquidity and, if this condition is met; a liquid financial market in the forward timeframe will naturally develop. This perception is of significant concern to Energia because it does not align with our experience of the SEM which has a highly liquid spot market but highly illiquid forward market. This, and experience elsewhere (such as in the GB market as the Baringa Report demonstrates), proves that liquidity in the spot market, whilst being desirable, is not a sufficient condition for the development of a liquid forward market. We would further note that financial institutions are withdrawing from

energy markets across Europe and it is unlikely that new players will enter the I-SEM without physical positions (either supply or generation). It is vital to the health of any market to get the existing players to trade.

Finally, as emphasised in section 3.4 above, market power concerns (including the perception of such) should inform the design and evaluation of any CRM.

3.6 Facilitation of renewables

Given 40% renewable targets by 2020 it will be important to integrate renewables into the market subject to the existing de-minimus threshold and providing that imbalance arrangements are not overly penal for wind but are yet sufficient to reward flexibility. Joined up thinking with respect to renewable support mechanisms is required, both in respect of energy trading arrangement and CRMs. On the latter note wind should remain eligible for capacity payments. Wind provides a capacity benefit to the system, and existing wind has been built in an environment of a CRM and relies on these payments. The perception of regulatory risk in Ireland would be dramatically and irreversibly heightened if wind were to be excluded from any revised CRM. a higher cost of capital in the I-SEM will inevitably result in higher end user prices.

Under new market arrangements there will be an important role for wind aggregators and this should be supported. The market power mitigation measures we propose elsewhere in the paper include mandated counter trading (i.e. mandating thermal generators to offer to buy in the DA and IDM markets (reduce output) at prices related to their SRMC) which , along with enhanced efficiency of interconnector flows will be an important consideration in helping efficient trading reduce curtailment of wind. Grid upgrade, importantly including the North-South interconnector, is required irrespective of market design

3.7 Interaction with DS3 system services review

Revenue adequacy must be considered holistically (including energy, capacity and system services) providing that the risk / return trade-offs between revenue streams are appropriately adjusted. For example it would be erroneous to assume indifference between €1 in capacity payments and €1 of system service revenues unless the assumed risk was equivalent. This principle should be observed in any assessment of revenue adequacy and points to the distinction made in section 3.3 above between short term (flexibility) and long term (generation adequacy) security of supply.

3.8 Dispatch

TSOs should have the flexibility to act prior to gate closure and in close to real time, thus preserving absolute control of the system and system planning and security. None of the energy trading options proposed under I-SEM therefore have any bearing on the TSO's ability to run the power system safely and securely.

Constraint trades with TSO would need to be physically and financially firm. Therefore generators must be able to reflect in their INC and DEC pricing the lost opportunity of trading in energy markets. Note that this would also need to be the case under Option 3

3.9 Credit and collateral requirements

Credit and collateral requirements have become an increasing burden on energy suppliers and traders over recent years. Any increase in credit/collateral requirements under the I-SEM will hamper retail competition, increase costs to suppliers and ultimately increase costs to end users.

Overly onerous credit/collateral requirements discourage new entrants and reduce the ability of existing independent companies to compete for new customers. Increasing credit/collateral requirements can also favour market dominance by state owned companies. Any choice of energy market or CRM design must be cognisant of these issues and subsequent detailed design process must focus on minimising these costs.

4 Energy Trading Arrangements

This section covers energy trading arrangements under I-SEM and specifically considers the proposed Options 1 to 4 in SEM-14-008¹²:-

- Option 1: Adapted Decentralised Market
- Option 2: Mandatory Ex-Post Pool for Net Volumes
- Option 3: Mandatory Centralised Market
- Option 4: Gross Pool – Net Settlement Market

Following a discussion of key market dynamics and principles in this section, the proposed energy trading options are assessed. The conclusions from this assessment are:

- i. Options 2 and 4 must be decisively ruled out by the SEMC on feasibility and/or compliance grounds; and
- ii. Options 1 and 3 are points on a continuum with Option 3 being located at the extreme.
- iii. Choosing Option 1 with appropriate regulatory measures allows the market to achieve the benefits of Option 3.
- iv. Choosing Option 3 does not allow the market to achieve the benefits of Option 1 with further regulatory measures.
- v. Option 3 introduces additional significant risk to the I-SEM programme.

We conclude with recommendations to proceed with Option 1 with further regulatory measures to address long-standing market power issues in the SEM and provide liquidity in the forward timeframe, in line with intentions of Option 3.

Designed correctly, Option 1 will deliver on the intentions of Option 3 without the associated downside risks. It will also provide additional flexibility to the RAs allowing them to monitor the market and remove regulation in light of demonstrable evidence that the conditions for adequate competition (and therefore efficient market operation) in each market timeframe have been met.

We strongly caution against Option 3 because of the potential risks of using EUPHEMIA as the I-SEM day-ahead pool algorithm (outlined in section 4.2.3 and the accompanying Baringa report “I-SEM HLD Consultation: Background paper on Option 3.”) These risks, coupled with the resulting loss of governance over the technical operational dynamics of the day-ahead market under Option 3 make proceeding with the design an unwarranted risk for I-SEM participants and consumers. We further note that evidence in the SEM has demonstrated that a pool structure (or other liquid spot market) without appropriate regulatory intervention (as undertaken by Ofgem in the GB electricity market) will fail to deliver liquidity, or address long-standing market power issues in the forward market timeframe.

¹² As noted earlier, a full assessment of the HLD should holistically and appropriately consider energy markets, CRMs and system services.

4.1 Key market dynamics, principles and observations

Before undertaking an assessment of the energy trading options as proposed in SEM-14-008 it is useful to consider some key market dynamics, principles and observations. We do this below under the following headings:

- Importance of forward markets
- Importance of spot markets
- SRMC bidding principles
- Mandatory pool structures and market power
- Evidence of the failure of the SEM forward market (and outcomes consistent with the exertion of market power)
- Physical forward trading and self-scheduling
- Simplicity
- Liquidity in forward / day-ahead markets
- Credit / Collateral Requirements

4.1.1 Importance of forward markets

To date, the HLD process has been predominantly focused on the design of day-ahead, intra-day and balancing markets without enough consideration being given to the development of a functional I-SEM forward market. Liquidity in forward market timeframes, however, is essential to deliver retail competition. It provides suppliers with easy access to hedging products at transparent and competitive market prices and thereby achieves better outcomes for consumers.¹³ A liquid forward market is also essential to encourage investment by merchant generation. It allows merchant generators to sell forward to “lock in” spark spreads therefore guaranteeing returns on investment. Careful consideration therefore needs to be given in the HLD process as to what option is most likely to deliver a functional I-SEM forward market.

4.1.2 Importance of spot markets

A functional day-ahead market is important to send appropriate price signals to the forward market and provide an opportunity for market participants to manage imbalance risk. A functional day-ahead market is also required to:

- i. deliver efficient market coupling;
- ii. provide strong reference pricing for renewable support mechanism; and
- iii. develop strong price signals for demand-side participation either directly or through ‘time of use’ tariffs.

A functional intra-day market is required to allow participants to trade out forecast errors at a fair market price.

¹³ Analysis conducted by the consultancy Baringa on NDC versus DC pricing in the SEM forward market indicates an average premium of c€2.50/MWh is paid by suppliers in the NDC market. This premium has a significant impact on SEM retail pricing. It should be noted that suppliers will “cherry pick” these products and therefore the price spread between NDC offer prices and DC prices on untraded products is significantly higher.

4.1.3 SRMC Bidding Principles

There is likely to be some form of relaxation of SRMC bidding principles under I-SEM for the following reasons:

- i. The requirement for generators to translate commercial cost dynamics into EUPHEMIA bid formats. Unless a formula is mandated¹⁴ (in the case of translation into sophisticated offer formats) generators will require a degree of discretion over how best to recover start up and no-load costs from the market. This reduces transparency and makes it more difficult to enforce SRMC bidding principles.
- ii. The potential requirement, subject to CPM design, for generators to recover their cost of capital and fixed costs through 'scarcity rents' in the energy market.

4.1.4 Mandatory pool structures and market power

Mandatory pool structures are a recognised mechanism for delivering spot market liquidity. Experience of the current SEM mandatory pool however proves that spot market liquidity is not sufficient for the development of a liquid forward market. In fact, under certain circumstances, mandatory pool structures can amplify the opportunity for a dominant participant to exercise market power in day-ahead and forward market timeframes.

Market power in the current SEM ex-post mandatory pool is managed through SRMC bidding principles. Any relaxation of these principles under I-SEM would significantly increase opportunities for a large generation portfolio, with a diverse fuel mix, to manipulate pool scheduling dynamics and price.¹⁵ Even with SRMC bidding principles a pool structure in I-SEM would allow such a participant to exert significant market power in forward timeframes. This is because the SEM generation cost curve is characterised by a tight banding of a large number of CCGTs. Given the small size of the market, generators can therefore lose significant market share due to small differences in SRMC. This 'cliff edge' effect means that a mandatory pool structure in the SEM, even with the inclusion of SRMC bidding principles, strongly favours a participant with a large fuel diverse portfolio because they can be assured of maintaining a significant level of pool market share, regardless of fuel price movements or wind generation levels.

The mechanics of pool algorithms introduces an element of scheduling risk for generators. This occurs when the algorithm excludes a generator despite its SRMC being below the market price. Scheduling risk exposes a generator to basis risk between its SRMC and the pool price because the spot value of the fuel it has purchased forward is less than the price it would have achieved had it been scheduled in the energy market. This introduces a disincentive for merchant generation to engage in forward market timeframes and increases hedging risk for

¹⁴ The issue with mandating a formula is that it is likely to be discriminatory, favouring some asset types more than others because of the difference in cost dynamics across technology types.

¹⁵ We note that the generation portfolio of ESB includes gas, coal, oil, wind, hydro and pumped storage assets.

vertically integrated utilities not scheduled in the pool. A dominant player has significantly less exposure to scheduling risk because the size and diversity of its generation portfolio allows it to maintain spot market share.

Mandatory pool structures allow even ring-fenced entities to be integrated 'virtually' at the group level. This is because the strike price of a CfD between group entities only determines cash flows and has no real impact on underlying profitability for the group. A group entity, with a dominant generation company, can therefore push up prices and/or withhold volume in forward market timeframes without necessitating a like for like increase in the tariffs of its retail company (i.e. 'virtually' vertically integrate). This is because the cost base of its generation company compared to the revenues from its supply company determines its profit margins at the group level. This effectively delivers a lower cost of hedging for the group entity compared to other suppliers and will 'choke off' retail competition if not monitored and addressed.

Such a strategy would be significantly more difficult to implement under physical bilateral trading arrangements. This is because of the ability of generators to self-schedule to meet forward physical bilateral commitments will improve competitive dynamics in forward market timelines as discussed in sections 4.1.5, 4.2.4.3 and 4.2.4.4.¹⁶ Furthermore, we suggest the regulatory authorities monitor for virtual vertical integration by dominant group companies regardless of the I-SEM high-level design. This could be achieved by:

- i. Disclosure of forward bilateral trading activities of dominant players to the regulatory authorities;
- ii. Analysis of forward market hedging levels versus spot purchases for dominant ring-fenced supply companies; and
- iii. Analysis of forward fuel hedging levels versus forward sales for dominant ring-fenced generation companies.

It is therefore evident from the high-level analysis presented above that a mandatory pool structure in I-SEM will present a dominant participant with a significantly greater opportunity to exert market power in both spot and forward timeframes.

4.1.5 Physical forward trading and self-scheduling

The ability to trade forward physically and self-schedule generation to meet physical commitments provides participants and regulators with a market based mitigation measure against exertion of market power in forward market timeframes. It introduces a de-facto price control on forward market pricing (the marginal costs of alternative generation) while allowing merchant generators to secure forward market spark spreads. A bilateral market structure also has the advantage of aligning with most other European markets (it is Target Model compliant) and removes the risks of using EUPHEMIA as the I-SEM pool algorithm (discussed further in the detailed assessment of HLD Option 3 in section 4.2.3 below).

¹⁶ The ability to self-schedule generation to meet forward market commitments significantly improves market access for all generation in forward timeframes and therefore provides a de-facto price cap into the forward market, the cost of alternative generation.

4.1.6 Evidence of the failure of the SEM forward market (and outcomes consistent with the exertion of market power)

The Baringa report “I-SEM HLD Consultation: Promoting forward liquidity and mitigating market power in the I-SEM” indicates significant liquidity issues in the current SEM forward market. This lack of liquidity in the SEM forward market disincentivises investment, constraining retail competition and increasing costs for consumers.

A summary of the findings of the Baringa report relating to liquidity levels in the SEM forward market and the possible exertion of market power is provided below:

- The ownership of a single large, fuel diverse, generation portfolio in the SEM provides ESB with significant opportunities to exert market power in both forward and spot market timeframes. See Figure 2-3 in section 2.4.1 of the report.
- ESB holds an overall SEM market position across their ring-fenced companies that is long thermal generation relative to retail supply. See Figure 2-3 and Figure 2-4 in section 2.4.1 of the report.
- Other SEM suppliers hold overall SEM market positions that are short thermal generation relative to retail supply. This means they have an exposure that they need to hedge through the SEM forward market. See Figure 2-3 and Figure 2-4 in section 2.4.1 of the report.
- There is restricted access to the SEM non-directed forward contract market because the volumes available and timings of trading windows are at the discretion of sellers.
- This should be contrasted to other European forward markets that trade on all business days throughout the calendar year.
- There is a lack of volume sold in the SEM non-directed forward contract market. This is indicative of “either a lack of participation by supply or demand, or an unwillingness to transact at the market pricing level”.
- Total forward contracts sold across SEM direct and non-directed forward markets in 2013 equated to just c33% (calculated as a percentage of annual market demand). This compares to a corresponding figure of 240% for the German financial forward market. See Table 2-1 in section 2.4.3 of the report.
- This comparison therefore indicates that there are significant liquidity issues in the SEM forward market.
- For contracts ‘delivered’ in 2013, ESB sold less than 60% of its thermal generation through the SEM forward market. This indicates that there is potentially significant additional volume available if appropriate regulatory measures were in place.
- Analysis of the bid / offer spreads in the SEM non-directed forward OTC market indicates that they are significantly higher than other European forward markets (up to €9/MWh in the data provided). See Table 2-2 and Table 2-3 of section 2.4.4 of the report.

- The combination of large bid / offer spreads and low trade volume “is indicative of low levels of liquidity and will lead to high transaction costs and therefore higher retail costs for consumers.”
- Analysis of the pricing level of contracts traded through the SEM non-directed OTC platform compared to the corresponding directed contract price (calculated for the relevant trading day using the directed contracts pricing formula) indicates premiums of up to €6.8/MWh on OTC traded contracts.¹⁷ These substantial premiums are indicative of a lack of competition in the SEM forward market. See Table 2-4 in section 2.4.5 of the report.
- Baringa also note that while directed contracts can be used to mitigate forward market power, the current volume sold is not sufficient to have any material effect on pricing levels in the SEM non-directed forward contract market.
- The combined factors of wholesale market concentration (i.e. the presence of a single large, fuel diverse, generation portfolio in the SEM) and low trade volumes (because of restricted access to market and non-directed contract pricing levels) has led to a lack of interest from daily market and media reports in the SEM forward market and consequently a lack of transparency.
- They also note the “general lack of regulatory reporting and detailed analysis carried out on the dynamics of the SEM forward contracts market”.
- Baringa therefore conclude based on their analysis that SEM forward market outcomes “could be regarded as being consistent with the presence of a dominant player” that has “limited incentives to trade in the forward market, to the detriment of competitive pricing and consumer choice.”

Based on these findings Energia has concluded that exertion of market power in forward market timeframes may be indicated by:

- i. Substantial differentials between DC, PSO and NDC/OTC pricing levels;
- ii. Large bid offer spreads in the SEM OTC market;
- iii. Low levels of volume offered for sale relative to market demand; and
- iv. Low levels of volumes sold forward by ESB generation relative to their SEM pool market share.¹⁸

The effect of the exertion of market power in forward market timeframes would be to:

¹⁷ It is worth noting that the premiums reported by Baringa represent only the pricing levels of the products traded on the NDC OTC platform. It is safe to assume that SEM suppliers are ‘cherry picking’ these prices. Therefore, given the excessive spreads on products sold through the NDC OTC platform, the actual offered price level of the NDC OTC market is significantly higher than the figures presented, hence the lack of volume transacted. The dynamic here is that suppliers are prepared to take spot exposure (or fuel-basis risk on pool exposure) because it is likely to be cheaper than paying premiums on NDC OTC forward contract pricing. The risk of this exposure, however, is passed through in retail pricing and therefore is increasing costs for SEM consumers.

¹⁸ This is the pool share excluding wind generation. It should be noted however that a portfolio with a high but negative correlation between thermal market share and wind market share could in theory use wind generation as a hedge for forward market positions.

- i. Restrict the access of suppliers to competitively price hedging products; and
- ii. Will “choke off” competition in retail supply, or alternatively, wholesale generation.¹⁹

Therefore Energia strongly supports the conclusion drawn by Baringa that “further examination of the SEM forward contracts market is required as part of the I-SEM design process”.

4.1.7 Simplicity

The simplicity of a bilateral electricity market design facilitates widespread understanding across stakeholders and investors. Understanding, coupled with targeted market analysis and reporting, increases confidence and thereby improves conditions for investment. As evidenced by the actions of Ofgem in the GB electricity market, appropriate regulatory intervention (such as the measures set out in section 4.1.8 and 4.2.4.7) incentivises competitive behaviour and therefore lowers costs for consumers.

4.1.8 Liquidity in forward / day-ahead markets

Based upon experience of the current SEM market, a pool structure is unlikely to deliver forward market liquidity without appropriate intervention by regulators. Under Option 1 (bilateral market arrangements) an alternative approach is to mandate participants with market power in spot and forward timeframes:

- i. To act as market makers²⁰ in the I-SEM forward market with mandated spreads, improving forward market liquidity and delivering a competitive forward market price;
- ii. To sell forward volume financially in the I-SEM forward market (with a reference price against the day-ahead market). This provides both day-ahead and forward market liquidity, and generates a strong incentive on the participant to behave competitively in the day-ahead market ensuring a competitive day-ahead market price;
- iii. To frequently publish self-supply metrics (facilitating monitoring of self-supply positions between dominant group entities in forward market timeframes);
- iv. To counter bid forward physical bilateral generation sales in day-ahead and intra-day timeframes;²¹ and

¹⁹ This is because market power facilitates a dominant participant to increase or decrease forward market pricing levels.

²⁰ Note that any credit requirements of these market makers must be agreed with the oversight of the RAs.

²¹ The dynamics of counter bidding of forward physical generation sales (bidding in day-ahead and intra-day timeframes to ‘buy back’ a previously sold position) are set out in the first example provided in section 4.2.4.3 below. We note from Section 1.2.2 of the Baringa report “I-SEM HLD Consultation: Background paper on Option 3” that counter bidding measures have been introduced into the Iberian market to promote day-ahead liquidity. Counter bidding of forward physical bilateral positions should achieve similar results to gross portfolio bidding in a market with a single large, dominant, fuel diverse generation portfolio.

- v. To offer physically un-contracted generation into day-ahead and intra-day markets.

These measures could be further augmented with volume limits on interconnector capacity holdings, bolstering DAM liquidity whilst also reserving sufficient interconnector capacity to ensure efficient market coupling through day-ahead and intra-day timeframes.

4.1.9 Credit / Collateral Requirements

Credit and collateral requirements have been an increasing burden on energy suppliers and traders over recent years. Any increase in credit/collateral requirements under the I-SEM will impede retail competition, increase costs for suppliers and ultimately increase costs to end users.

Overly onerous credit / collateral requirements discourage new entrants and reduce the ability of existing independent companies to compete for new customers. Given the financial structures of independent companies, onerous credit / collateral requirements can also reinforce market dominance by state owned companies. Any choice of energy market or CRM design must be cognisant of these issues and subsequent detailed design process must focus on minimising these costs.

Any pool based market has the potential to impose increased credit/collateral and/or working capital requirements on suppliers, particularly if there is to be more frequent cash settlement than under the current SEM. The design of any such financial arrangements must be a major consideration in choosing the market design.

4.1.10 Summary of General Conclusions

- i. Forward market pricing drives retail customer pricing as it sets the cost of hedging (or in the case of an illiquid forward market, the cost of not hedging) for retail suppliers.
- ii. Weakened SRMC bidding principles could provide an opportunity for dominant players to exercise market power in a mandatory pool or bilateral market.
- iii. A mandatory pool structure will provide dominant participants with a greater opportunity to 'virtually' vertically integrate because of the stability in their pool market share and result in opportunities to exert market power in forward market timeframes – as is evident in the current SEM.
- iv. A HLD that allows physical forward trading and self-scheduling mitigates the potential to exert market power by providing a route to market for all generators that provides a de-facto price control in forward market timeframes.
- v. Combined with mandated volume commitments and market maker obligations²² in the financial forward market, as well as robust self-supply monitoring in forward market timeframes, the opportunity for dominant players to exert

²² Note that any credit requirements of these market makers must be agreed with the oversight of the RAs.

market power in forward and day-ahead timeframes can further be reduced. This also has the associated benefit of encouraging liquidity into the day-ahead market.

- vi. Given the economic incentives on all participants to optimise positions and avoid balancing costs, further liquidity will then gather into spot timeframes.
- vii. Competitive behaviour can be reinforced through simple trading arrangements, targeted market reporting and appropriate regulatory intervention. This leads to widespread understanding and therefore confidence, thereby creating the conditions required for sustained investment.

4.2 Detailed assessment of energy trading options

In addition to the criteria outlined in the consultation paper, the energy trading option selected for I-SEM must provide stakeholders with a high degree of confidence of their:

- 1. Technical and practical feasibility;
- 2. Compliance with the EU Target Model compliance; and
- 3. Adaptability to future EU Target Model requirements.

4.2.1 Assessment of Option 2

4.2.1.1 Overview

The volume requirements of running an ex-post pool with complex offers for balancing purposes within the context of a small market such as the I-SEM means that trade volumes in forward market timeframes need to be limited. This imposes an artificial barrier on the natural pooling of liquidity within these timeframes that will adversely affect the efficiency of cross border coupling in day-ahead and intra-day markets, whilst also reducing liquidity in the ex-post pool, adversely affecting scheduling and price formation in the balancing timeframe. Given the requirement in the high-level design to impose artificial limits on trade volumes across forward and ex-post market timeframes, we conclude that this design represents the worst of all possible scenarios with regards to encouraging the natural pooling of appropriate liquidity through the market high-level design.

4.2.1.2 Forward market development

The requirement to spread volume between forward and balancing timeframes, and the resulting weakening of price formation in the day-ahead and balancing market, will introduce significant uncertainty for market participants regarding reference pricing and therefore adversely affect forward market development. The requirement for the imposition of volume restrictions in the physical forward market will further exacerbate these liquidity problems.

4.2.1.3 Imbalance management

Issues regarding liquidity in the ex-post pool could lead to volatile balancing market prices, while volume restrictions in forward, day-ahead and intra-day market

timeframes will limit market participant access to these markets and make it harder for participants to manage their imbalance exposures.

4.2.1.4 Conclusions

When the issues highlighted above are considered in conjunction with the technical challenges of 'bolting' an ex-post pool balancing mechanism onto physically traded ex-ante markets, it is difficult to see how the HLD can be considered feasible. This conclusion is supported by the fact that the design would be unique worldwide (and therefore untested) and is consequently radically different to other European electricity markets.²³ It is not therefore a workable, practical solution for the I-SEM moving forward.

4.2.2 Assessment of Option 4

4.2.2.1 Overview

HLD Option 4 guarantees sufficient liquidity in the balancing timeframe by implementing the day-ahead and intra-day markets as financial structures around a mandatory ex-post pool. While this maximises liquidity in the balancing timeframe, the socialisation of balancing costs within an ex-post pool structure, combined with scheduling risk, is unlikely to produce sufficient incentives for participants to trade in ex-ante timeframes. This means the ex-post pool price is likely to remain the main reference price for the I-SEM market under this design making it difficult to see how it can deliver efficient cross border coupling or address current issues in the SEM forward market.

4.2.2.2 Interconnector trading

To the extent that there is participation in day-ahead and intra-day timeframes, it is highly likely that the HLD will incentivise imports to SEM over exports due to the uncertainty faced by generators in relation to their ex-post schedules. As has been discussed, scheduling risk is a barrier to forward trading in the current SEM and its affects are even more acute in day-ahead and intra-day market timeframes. This is because the short-term nature of trading in these markets increases scheduling risk by removing the opportunity to average market prices over more extended contract periods.

In the forward market timeframe, the HLD reduces the effectiveness of the I-SEM interconnectors as long term hedging instruments for suppliers. This is because FTRs will cash out on the day-ahead market price but the ex-post pool is likely to remain the main reference price for financial forward contracting, and therefore retail pricing. A supplier holding an FTR will therefore face basis risk between the day-ahead market price and the ex-post pool price. This exposure will significantly reduce the value of FTRs as hedging instruments resulting in a significant reduction in revenues for IC owners.

²³ Cross reference paragraph 7.4.27 of the consultation paper.

If the issues with financial trading in day-ahead and intra-day timeframes are combined with the reduced utility of FTRs for suppliers, there is a risk that the HLD could actually result in the reduced use of I-SEM interconnection when compared to the present SEM arrangements. This risk clearly indicates that the high-level design is contrary to the intentions of the EU Target Model and therefore may not be compliant.

4.2.2.3 Day-ahead and forward market liquidity

As previously discussed, the forced pooling of liquidity into the ex-post timeframe under Option 4 is likely to result in the ex-post pool price remaining the main reference price for forward financial contracting, and therefore retail pricing. The fact that financial forward contracts will “cash out” on the ex-post pool price is a significant disincentive on participants to engage in the day-ahead and intra-day market timeframes under this design.

In forward market timeframes, the exposure to scheduling risk, combined with the continuation of a mandatory pool market design, will do little to address current issues in the SEM forward market. This is because the design is unlikely to change the current pool dynamics, or reduce opportunities for dominant participants to exert market power in the forward market. The opportunity to exert market power in the ex-post pool could also increase if SRMC bidding principles were relaxed.

4.2.2.4 Wind Generation

At first glance, Option 4 would seem to deliver a better outcome for wind generation, assuming wind is content to accept imbalance market pricing, reinforcing the view that incentives to participate in ex-ante timeframes are likely to be weak for all participants. This is because the design reduces exposure to imbalance risk for wind by socialising imbalance costs across participants. This is only achievable at the expense of efficient market coupling in all timeframes. The HLD is therefore unlikely to reduce the requirement for SO to SO countertrading and will do nothing to address long-term wind curtailment issues.

4.2.2.5 Inequalities in HLD

The financial nature of the day-ahead and intra-day markets in the HLD introduces discrimination against participants. To the extent that participants engage in ex-ante timeframes, the HLD strongly favours those participants with most certainty in their ex-post pool positions. Furthermore, to the extent that gate closure times in the ex-post pool do not align with the I-SEM intra-day market, the design will discriminate against marginal generators. This is because marginal generation will be required to balance physical changes in I-SEM demand caused by fuel price led financial trading on interconnectors. They may not however be able to update their offer submissions to the ex-post pool / constraint payment mechanism to reflect fuel led changes to their SRMCs. This dynamic is illustrated in more detail below.

4.2.2.5.1 Illustration of Market Coupling Dynamics

SCENARIO	HLD Option 4 - MARKET COUPLING DYNAMICS
GB GAS PRICES DECREASE	GB MARKET PRICE REDUCES
	SEM PRICES REMAIN UNCHANGED DUE TO MIS-ALIGNMENT OF GATE CLOSURE TIMES
	INTRA-DAY TRADING OCCURS IN THE DIRECTION OF GB TO SEM
	INTERCONNECTOR EXPORTS DECREASE / IMPORTS INCREASE
	SEM DEMAND REDUCES
	MARGINAL GENERATOR IS TURNED DOWN
	REVENUE RECEIVED BY MARGINAL GENERATOR FROM GAS SELL BACK LESS THAN LOST OPPORTUNITY IN POOL
GB GAS PRICES INCREASE	GB MARKET PRICE INCREASES
	SEM PRICES REMAIN UNCHANGED DUE TO MIS-ALIGNMENT OF GATE CLOSURE TIMES
	INTRA-DAY TRADING OCCURS IN THE DIRECTION OF SEM TO GB
	INTERCONNECTOR EXPORTS INCREASE / IMPORTS DECREASE
	SEM DEMAND INCREASES
	A MARGINAL GENERATOR IS TURNED UP
	REVENUE RECEIVED BY MARGINAL GENERATOR FROM POOL LESS THAN GAS PURCHASE COST

4.2.2.6 Potential inefficiencies

The market coupling dynamics outlined above will lead to potential inefficiencies in the HLD, particularly during periods of GB gas price volatility. These coupling dynamics will also result in inefficiencies in cross border balancing actions by the TSO, because GB balancing market prices will update hourly for changes in underlying fuel costs whereas I-SEM balancing prices may not. This potential mismatch, combined with the additional complication of conversion of complex bid formats, could lead to instability in the market design because of the potential for future compliance issues with the Electricity Balancing Network Code.²⁴

4.2.2.7 Conclusions

Option 4 discriminates against participants with uncertainty in their ex-post schedules (particularly marginal gas-fired thermal generation) and is potentially inefficient to the extent that ex-post and intra-day gate closures are not aligned. It will do little to address issues in the current SEM forward market because scheduling risk will remain a central feature of the market design. There is also significant uncertainty around the ability of Option 4 to incentivise efficient use of I-SEM interconnection through either ex-ante or balancing timeframes. The design is therefore unlikely to deliver a market led solution for curtailment and consequently reduce the requirement for SO to SO countertrading on interconnectors.

The uncertainty regarding the ability of Option 4 to achieve efficient market coupling stems from it not being in the spirit of the EU Target Model, a conclusion supported by the fact that its introduction would be a unique coupling solution within the European context.²⁵ It is therefore unlikely that Option 4 will deliver a stable basis for trading arrangements in I-SEM over the mid to long term, particularly given the future

²⁴ It should be noted that many of the issues discussed in the context of Option 4 that relate to an ex-post pool balancing mechanism are equally applicable to Option 2, if gate closures between coupled markets are not aligned. To avoid unnecessary repetition in the report, the commentary provided on Option 2 focused on other significant issues with that HLD.

²⁵ See paragraph 9.4.39 in consultation paper. German daily financial futures are not equivalent to the financial trading structures proposed under Option 4. Day-ahead and intra-day financial trading under Option 4 will have a **physical** impact on the SEM ex-post pool because of the change in SEM demand caused by the associated variations in physical interconnector flows.

requirement for further market integration in balancing timeframes. It is therefore difficult to see how Option 4 is a workable, practical solution for the I-SEM moving forward.

4.2.3 Assessment of Option 3

4.2.3.1 Overview

HLD Option 3 addresses the issues associated with an ex-post mandatory pool structure by implementing a day-ahead mandatory pool. The clear benefit of a day-ahead mandatory pool is that it generates liquidity in the day-ahead market by forcing participants to trade within this timeframe. This guarantees access to the I-SEM spot market, allowing participants to manage imbalance positions. In theory, it should also deliver efficient day-ahead market coupling and generate a clear day-ahead market reference price for the I-SEM forward market. The validity of these assumptions however depends upon the quality of the solution delivered by EUPHEMIA for the I-SEM day-ahead pool.

4.2.3.2 Potential risks of a EUPHEMIA pool

To the extent that the market schedules and prices produced by EUPHEMIA are sub-optimal (or do not reflect key technical generator characteristics) the efficiency of the I-SEM market and market coupling solution, is reduced. If the quality of the solution is significantly worse than the current SEM pool algorithm, this will result in a substantial increase in costs for I-SEM consumers compared to current market arrangements. Therefore, the key question regarding the feasibility of Option 3 is whether the EUPHEMIA algorithm can efficiently schedule and price an I-SEM day-ahead pool.²⁶ There are several reasons why this question requires serious consideration which are discussed in more detail below. Energia has also had sight of analysis undertaken by Energy-Link Partnership (EL) which modelled the Euphemia Algorithms under Option 3, this analysis acted to confirm Energia's concerns in relation to the levels of outturn prices and schedule outcomes in I-SEM based on EL's typical day studies

4.2.3.2.1 Offer formats in a EUPHEMIA pool

The envisaged widespread use of sophisticated offer formats under Option 3²⁷ adds complexity to the I-SEM coupling problem relative to other larger European bilateral

²⁶ Please cross-reference paragraph 8.4.12 of the consultation paper where the importance of the efficiency of the unit commitment process is discussed.

²⁷ Based on paragraphs 8.2.4, 8.3.6 and 8.4.12 of the consultation paper we have concluded that Option 3 envisages widespread (or possibly mandated) use of sophisticated offer formats for thermal generation units in the day-ahead pool. This conclusion is consistent with the TSO receiving nomination schedules directly from EUPHEMIA, which assumes a reasonable high degree of technical feasibility in pool generation schedules – see paragraphs 8.3.7, 8.4.6 and 8.4.12. We note the diagram referenced 8.2.7 in the consultation paper indicates the use of simple bids is also possible. We assume this is to facilitate non-thermal generation offering into the pool. As discussed later in this section, predominant use of simple bid formats by thermal generation in Option 3 would greatly reduce the perceived benefits of implementing a mandatory pool design.

markets that use simple bid formats.²⁸ Combined with the relatively small size of the I-SEM market, EUPHEMIA may therefore be able to achieve a solution that is considered 'optimal' for the overall European coupling problem (the objective function of the algorithm), without necessarily providing an optimal solution for the I-SEM.²⁹ To our knowledge, the performance of EUPHEMIA using predominantly sophisticated offer formats has not been tested for I-SEM and therefore needs full and rigorous investigation before a decision can be taken on whether or not to proceed with Option 3.

The potential impact of sub-optimal solutions for Option 3 is:

1. inefficient scheduling of generation assets;
2. potentially higher and/or unpredictable price outcomes for participants; and
3. increased scheduling risk for generators.

These issues are discussed in more detail in the sections that follow. It should be noted, however, that if sub-optimality is a feature of the EUPHEMIA pool solution it could substantially increase costs for I-SEM consumers.

The alternative of restricted use of sophisticated offer formats in the HLD significantly undermines the perceived benefits gained from implementing a mandatory pool structure. This is because:

- It weakens spot market power mitigation measures, making it significantly more difficult to implement bidding principles.
- It reduces transparency, because of the flexibility required by generators to reflect no-load and start costs within the constraints of simple bid formats.

²⁸ Cross reference section 6.1 of the EUPHEMIA Public Description reproduced below. The full document can be found at the following link:

https://www.n2ex.com/digitalAssets/89/89745_euphemia---public-description---nov-2013.pdf

"By ignoring the particular requirements of the block, complex, merit and PUN orders, the market coupling problem resolves into a much simpler problem which can be modeled as a Quadratic Program (QP) and solved using commercial off-the-shelf solvers. However, the presence of these orders renders the problem more complex. Indeed, the "kill-or-fill" property of block orders and the minimum income condition (MIC) of complex orders require the introduction of binary (i.e. 0/1) variables. Moreover, the strict consecutiveness requirement of merit and PUN orders adds up to the complexity of the problem."

A number of power exchanges actually limit the use of sophisticated offer formats to reduce this complexity. Cross reference section 2.3 of the Baringa report "I-SEM HLD Consultation: Background paper on Option 3".

²⁹ Cross reference section 7.2 of the EUPHEMIA Public Description reproduced below. The full document can be found at the following link:

https://www.n2ex.com/digitalAssets/89/89745_euphemia---public-description---nov-2013.pdf

"7.2. Properties of the solution

During the execution of EUPHEMIA, several feasible solutions can be found. However, only the solution with the largest welfare value (complying to all network and market requirements) found before the stopping criterion of the algorithm is met is reported as the final solution.

It should be noted that for difficult instances some heuristics⁴ are used by EUPHEMIA in its execution. Thus, it cannot be expected that the "optimal" solution is found in all cases."

- It results in a further reduction in the technical feasibility of the EUPHEMIA pool schedules, reducing the efficiency of the market design by providing an inefficient starting position for the intra-day and balancing markets. Please note that these inefficiencies will result in additional costs for I-SEM consumers.³⁰
- To the extent that generators are given freedom over offer formats but forced to trade exclusively through EUPHEMIA it will:
 1. Provide large portfolio players with a diverse fuel mix significant opportunity to exert significant market power (by manipulating pool dynamics), introducing uncertainty into scheduling and pricing outcomes for other participants;³¹
 2. Increase opportunities for generators to exert local market power in balancing timeframes;

4.2.3.2.2 Schedule formation in a EUPHEMIA pool

The primary function of EUPHEMIA is to facilitate trade between markets (the matching of bids and offers), not to schedule generation. This is reflected by the objective function of the algorithm, to maximise social welfare, defined as the point where supply and demand curves intersect. By contrast, the objective function of the SEM pool algorithm is to minimise the cost of production thereby assuming price-taking participation by demand. When combined with the problems of managing generator scheduling anomalies (e.g. multiple starts for generation assets) and translating SEM complex offers into sophisticated offer formats, there is a real risk that EUPHEMIA will produce pool schedules that are less optimal than the current SEM algorithm – e.g. over-commit I-SEM generating units to meet demand. To our knowledge, this dynamic has not been tested for I-SEM and needs full and rigorous investigation before a decision could be taken on whether or not to proceed with Option 3. In particular, careful consideration needs to be given to the affect sub-optimal generation schedules would have on price formation in a EUPHEMIA pool.

4.2.3.2.3 Price formation in a EUPHEMIA pool

Due to the mandatory pool structure demand is likely to come to market as price taking bids. This is because suppliers will want to mitigate their exposure to intra-day and balancing timeframes. EUPHEMIA will therefore have significant bid volumes at the price cap for the I-SEM region. This presents a concern because of the lack of price maker participation on the bid side of the market under Option 3. When EUPHEMIA sets the price for the I-SEM pool it will therefore have only limited

³⁰ This is because the inefficiencies would be a direct result of scheduling generation through the EUPHEMIA algorithm. This is to be distinguished from the market participants using EUPHEMIA to optimise their trading positions, as would be the case under Option 1. Under a bilateral design, there is a strong economic incentive, provided by the balancing market, to respect the technical constraints of generators. To ensure these incentives are not diluted in Option 1 strong market power mitigation measures in balancing timeframes are required - see section 4.2.4.4 below. It is worth noting, however, that exactly the same market power mitigation measures are required under Option 3, as discussed in section 4.2.3.5 below.

³¹ As discussed in section 4.1.3 above this will undermining the framework for effective competition in wholesale and retail markets leading to cost increases for consumers over the mid to long term.

restrictions imposed by the bid side of the market. To our knowledge, this dynamic has not been tested for I-SEM and needs full and rigorous investigation before a decision could be taken on whether or not to proceed with Option 3. In particular careful consideration needs to be given to whether I-SEM generators in general, and large portfolio players in particular, could have significant power to manipulate prices in a EUPHEMIA pool through the use of sophisticated offer formats.

4.2.3.2.4 Scheduling risk and forward market development

Extensive use of sophisticated offer formats introduces the potential for scheduling risk in EUPHEMIA.³² Scheduling risk occurs due to the algorithm being able to paradoxically reject “in the money” Block and MIC orders. The magnitude of this risk is unknown and, to our knowledge, is untested for I-SEM. Scheduling risk in EUPHEMIA could restrict I-SEM financial forward market development (as has been the case in the current SEM market) and therefore this dynamic needs to be investigated further before a decision could be taken on whether or not to proceed with Option 3.

4.2.3.2.5 Technical feasibility of generation schedules in a EUPHEMIA pool

Sophisticated bid formats are required to impose technical feasibility on generation schedules in EUPHEMIA but there is a concern that their use could result in sub-optimal schedules and adverse price outcomes. The alternative is to allow self-scheduling by generators outside of EUPHEMIA to meet day-ahead pool positions. This approach would significantly increase exposure to intra-day and balancing markets, particularly for marginal generators. Generators would therefore need the flexibility to manage the cost of these exposures through their offer submissions into the day-ahead market. This could increase costs for I-SEM consumers. It could also result in limitations surrounding the modelling of generator technical and commercial characteristics in EUPHEMIA, having a material, and destabilising effect on price formation and scheduling in the mandatory pool. This dynamic would make I-SEM pool outcomes unpredictable, and further constrain the development of a functional I-SEM forward market.

4.2.3.3 EUPHEMIA governance arrangements

The EUPHEMIA algorithm was developed by power exchanges participating in the Price Coupling Regions Initiative (PCR). Under current governance arrangements request for changes to the algorithm need to be prepared by the PCR Algorithm Working Group and submitted to a Steering Committee.

In the future it is anticipated that the governance of the algorithm will be established under rules and guidance set out under the Network Code on Capacity Allocation and Congestion Management (CACM). Current drafting of CACM allows for a number

³² The dynamics of the EUPHEMIA algorithm that cause scheduling risk are described in more detail in Section 6.3 of the “EUPHEMIA Public Description”.
https://www.n2ex.com/digitalAssets/89/89745_euphemias_public_description_nov-2013.pdf

of committees (made up of representative from power exchanges, TSOs and stakeholders) to oversee the maintenance and development of the systems, procedures and algorithms for market coupling.

It is important to note the broad base of the governance arrangements and the fact that current governance arrangements are in flux. The combination of these factors could make it more difficult for the SEMC to exert influence on other stakeholders to get changes to EUPHEMIA implemented should they be required under Option 3. This issue is further amplified by the bespoke nature of the use of EUPHEMIA under the HLD.

4.2.3.4 Summary of Baringa report on Option 3

Viridian commissioned an independent report entitled “SEM HLD Consultation: Background Paper on Option 3” by the consultancy Baringa.³³ The report looked at two main areas:

- I. The accuracy of the comparison being made between I-SEM under Option 3 and the Iberian market;
- II. An assessment of the proposed use of the EUPHEMIA algorithm under Option 3.

The findings of the report are summarised in the sections below.

4.2.3.4.1 Comparison between I-SEM and Iberian market

The main conclusions drawn by Baringa on the accuracy of the comparison with the Iberian market are:

- Participation in the Iberian day-ahead market is **voluntary**. Generators and supplier maintain the option to self-dispatch to meet physical bilateral contract commitments.
- There is also substantial differences in plant mix between the Iberian market and the I-SEM. The Iberian market has substantially more nuclear and hydro generation. Note that these units do not tend to utilise sophisticated offer formats.
- Minimum Income Constraint offers in the Iberian market are only utilised by conventional thermal units – i.e. CCGTs, coal and oil plant.
- Conventional thermal generation (including CCGTs) accounted for less than 25% of 2013 demand in the Iberian market compared to over 65% of demand in SEM.
- Therefore, the number of thermal generation units utilising sophisticated offer formats in the Iberian market is a significantly smaller proportion of the overall market than is likely to be the case in I-SEM under Option 3. MIC orders account for only 16% of offers submitted to the Iberian day-ahead market in Q4 2013.

³³ A copy of the report has been included with our response.

- While the size of thermal generation assets is similar in the two markets, the ratio between individual unit size and the overall size of the market will be significantly larger in the I-SEM.
- A high ratio between unit size and overall system size could influence the performance of the EUPHEMIA algorithm if a significant number of units in I-SEM under Option 3 utilise sophisticated offer formats, thereby imposing integer constraints.
- The Iberian market is currently operating the EUPHEMIA algorithm in parallel with the rest of Europe. Full market coupling is targeted for May 2014.
- The algorithm replaced by EUPHEMIA in the Iberian market dated from the 1990s and therefore is arguably less sophisticated than the scheduling software that is currently employed in SEM.
The previous Iberian market scheduling software employed an iterative heuristic technique, whereas the SEM software aims to optimise the unit commitment problem by minimising production costs of generation.

In summary, the Iberian market is not a good comparison for the I-SEM.

4.2.3.4.2 Assessment of proposed use of EUPHEMIA under Option 3

The main conclusions drawn by Baringa regarding the proposed use of EUPHEMIA under Option 3 are:

- The HLD relies exclusively on EUPHEMIA to schedule generation in the day-ahead timeframe. This is unique within Europe.
- It is likely that the majority of I-SEM thermal generators will seek to reflect their technical and commercial dynamics using sophisticated offer formats.
- Therefore, the success of the design depends on the ability to manage unit commitment through sophisticated offer formats in EUPHEMIA.
- Use of sophisticated offer formats can cause problems for market clearing algorithms.
- Widespread use of sophisticated offers may result in scheduling risk, sophisticated offers that are rejected despite being “in the money”.
- Scheduling risk could have an adverse effect on the dynamics and pricing in the I-SEM forward market. This could be detrimental for I-SEM consumers.
- It is unlikely that EUPHEMIA has been rigorously tested under potential stress scenarios for I-SEM.
- A recommendation is therefore made to test, at both the market and generation unit level, the combination of widespread use of sophisticated offer formats in a small pricing area with limited interconnection. This is because testing of the algorithm is unlikely to have focused on this scenario to date. Only the Iberian market employs EUPHEMIA with unit based bidding and sophisticated offer formats. As discussed in section 4.2.3.4.1 the Iberian market however is not a reliable benchmark for the I-SEM.
- The governance arrangements for the algorithm are likely to require widespread agreement from a broad base of stakeholders across Europe.

- With the exception of the Iberian market, stakeholders with bilateral market designs have largely driven the development focus of the algorithm.
- It is therefore uncertain whether any proposed modifications of the algorithm to support the implementation of Option 3 would receive widespread support. Consequently, a lower risk implementation pathway for the I-SEM programme” may be a modified version of the Option 1 HLD.

In summary, there is therefore considerable risk in assuming (without rigorous testing) that EUPHEMIA can be used as described in Option 3.

4.2.3.5 Wind generation

The efficient scheduling of interconnection is the core principle of the EU Target Model. Given the large volume of wind generation in the SEM (that will continue to increase under I-SEM) there is a trade off required between exposure to balancing responsibility and efficient market coupling, which will help mitigate curtailment. This can be seen within all of the HLD options proposed.

There is little discernible difference for wind under Option1 or Option 3. Under both designs wind is subject to increased exposure to imbalance risk. This is exposure mitigated under Option 2 and Option 4 (to the extent that wind does not participate in ex-ante timeframes) but these designs cause issues with liquidity in spot timeframes.³⁴ Exposure to imbalance risk however could be reduced under Option 3, if portfolio bidding by wind generation were allowed (similar to Option 1). This would allow forecast errors to be offset, reducing the exposure of the overall wind portfolio to imbalance risk. It would also facilitate the formation of aggregators to allow smaller wind participants to access portfolio benefits. This addition to the HLD, however, does not address the more fundamental issues that have been discussed.

4.2.3.6 Market power mitigation measures³⁵

As discussed in section 4.1.3, SRMC bidding principles will be harder to enforce under I-SEM.³⁶ Therefore, a participant with a large generation portfolio and a diverse fuel mix would be able to exert significant market power across day-ahead, intra-day and balancing market timeframes under Option 3. Their ability to maintain a significant presence in the pool regardless of fuel movements or wind generation levels also means that they would also have significant opportunity to exert market power in forward timeframes. Therefore, to ensure market competitive dynamics and therefore drive down costs for customers, a robust suite of market power mitigation measures would be required under Option 3. These measures are set out below:

³⁴ To the extent that wind does not trade in ex-ante timeframes it reinforces the conclusion that incentives to trade in the day-ahead and intra-day markets will be weak.

³⁵ Cross reference the market power mitigation measures suggested by Baringa in section 4 of their report entitled “I-SEM HLD Consultation: Prompting forward liquidity and mitigating market power in the I-SEM”.

³⁶ This is likely to be the case under all HLD options.

- i. Dominant participants need to be mandated to sell financial forward contracts to mitigate market power in the day-ahead pool. Given the reduction in transparency resulting from the loss of complex offer formats and the potential weakening of SRMC bidding principles, volume commitments in the financial forward market would need to be significantly higher than Directed Contract volumes in the current SEM to be effective.
- ii. Market Maker obligations need to be imposed on dominant participants to mitigate market power in forward market timeframes.³⁷ The obligation to provide regulated bid / offer spreads in the forward market would provide a strong incentive to price into forward markets at competitive prices.
- iii. Increased transparency around the forward market contracting activities of dominant ring-fenced entities, in both fuel and electricity markets, is required to remove the opportunity for such entities to ‘virtually’ vertically integrate and thereby “choke off” competition in the retail electricity market.³⁸
- iv. Mandated forward trading through SEM OTC platform (or other designated platforms) to promote transparency and price discovery in forward timeframes.
- v. Monitoring of holding limits for FTRs by participants with the option to impose volume limits to manage potential exertion of market power via I-SEM interconnectors.
- vi. Careful consideration needs to be given to the appropriate treatment of pumped storage and hydro assets in day-ahead and balancing timeframes. The flexibility of these units provides significant opportunity for exertion of market power as noted in section [4.7 of the Baringa Report].³⁹
- vii. To the extent that SRMC bidding principles are weakened under Option 3, the following measures are required to mitigate market power in the balancing market:
 - a. A high degree of transparency;
 - b. License conditions restricting the scope for the exercise of local market power; and
 - c. Contractual arrangements between generators and the TSO, particularly for pumped storage and hydro assets.Without such measures, the ability to exercise market power in balancing timeframes may undermine economic incentives in the spot markets.
- viii. Publishing of trade data from forward, day-ahead, intra-day and balancing market timeframes. Data should be published as soon as possible after trade execution to facilitate self-policing of I-SEM by participants.⁴⁰

³⁷ The credit requirements of market makers must be agreed with the oversight of the I-SEM regulatory authorities.

³⁸ As previously discussed reduced competition in the retail electricity market will lead to higher prices for I-SEM consumers over the mid to long term.

³⁹ For example, in the GB electricity market, four pumped storage assets are controlled by three portfolio players. It is not uncommon for individual pumped storage units to submit a balancing bid-offer spread of £500/MWh or more.

⁴⁰ Dominant ring fenced entities would need to provide regulators with counterparty specific trade volumes to facilitate adequate monitoring of ‘virtual’ vertical integration.

- ix. A strong and independent market monitoring function that can provide expert analysis on market dynamics across all trading timeframes and report potential abuses of market power to relevant authorities.
- x. A clear redress mechanism for the abuse of market power by I-SEM participants.

4.2.3.7 Conclusions

The potential risks identified with Option 3 coalesce around the anticipated widespread use of sophisticated offer formats in the I-SEM pool. The requirement to use sophisticated offer formats originates from an assumption in the HLD that it is possible to translate much of the current ex-post SEM pool into the day-ahead timeframe using the EUPHEMIA algorithm. There is a potential and significant risk, however, of sub-optimal schedules and price outcomes from EUPHEMIA if sophisticated offer formats are widely used. If Option 3 was implemented without the widespread use of sophisticated offer formats however, it would substantially undermine as significant part of the perceived benefits of the mandatory pool structure as generator costs would be internalised and make market monitoring by reference to a units SRMC difficult or impossible.⁴¹

Section 4.2.3.2 above highlighted valid concerns regarding the proposed use of the EUPHEMIA as a pool algorithm in the HLD. These concerns are amplified by the fact that other European markets, including the Iberian market, do not use EUPHEMIA as is being proposed under Option 3. This means the market design is unique and therefore untested.⁴²

The main issue with proceeding with Option 3 therefore is uncertainty. This uncertainty is made more acute by the potential lack of control over the governance of the EUPHEMIA algorithm as discussed in section 4.2.3.3. Unless rigorous testing of the proposed use of EUPHEMIA in the design is completed prior to a decision being taken on whether or not to proceed with Option 3, issues with a EUPHEMIA pool solution may only become apparent reasonably late on in the detailed design phase.⁴³ Therefore, even if it were possible to introduce changes to the EUPHEMIA algorithm to address those issues, it could result in significant delays to the I-SEM project and substantial increase implementation costs. It would therefore seem prudent for the SEMC to work with participants to develop a 'plan B' following a decision to proceed with Option 3.

Significant issues with pool outcomes could have serious implications for the functioning of the I-SEM across all market timeframes. Consequently, if issues were identified, and it was not possible to introduce changes to the EUPHEMIA algorithm,

⁴¹ See section 4.2.3.2.1 above.

⁴² See section 4.2.3.4 above.

⁴³ Please note the timing of market trials were towards the end of the project plan during the implementation of SEM. Unless offer formats are mandated and complex offer translations formalised market trials may be the first chance for I-SEM day ahead pool outcomes to be properly tested. Please note, in the Iberian market the switch to EUPHEMIA did not require a change in offer formats so assumptions around bidding behaviours were not required.

adopting the design could have costly implications for I-SEM participants. It would therefore seem prudent for the SEMC to work with participants to develop a 'plan B' following a decision to proceed with Option 3. Again, it would therefore seem prudent for the SEMC to work with participants to develop a 'plan B' following a decision to proceed with Option 3.

For the reasons outlined above, a decision to implement Option 3 would be a high-risk strategy for the SEMC. Furthermore, it is an unnecessary risk when the option of proceeding with Option 1, with the regulatory measures we suggest, is considered.

It is important to note that our concern regarding EUPHEMIA relates exclusively to its proposed use under Option 3 and not to the general use of the algorithm itself. Please note that we have no concerns regarding the use of EUPHEMIA under any of the other HLD options proposed in the consultation paper.

4.2.4 Assessment of Option 1

4.2.4.1 Overview

Option 1 retains the ability for generators to self-schedule to meet physical contractual commitments in forward market timeframes. The design therefore uses the EUPHEMIA algorithm to optimise positions at the day-ahead stage, rather than to determine them. This aligns with the use of the algorithm with other European bilateral markets, mitigating the risks discussed in the previous section. This is because in a bilateral market there is not a significant requirement for the use of sophisticated offer formats and substantially more price making participation on the bid side of the market.

The main concern with implementing I-SEM as a bilateral market is spot market liquidity and market power mitigation. These are discussed in significant detail below. In summary, our finding is that:

- A bilateral market itself is a useful mitigation measure against market power in forward timeframes;
- A bilateral market provides a strong economic incentive to participate in spot markets in the absence of market power;
- Spot market liquidity can be delivered by means of market power mitigation measures that also address market power issues in forward market timeframes.
- The market power mitigation measures require under Option 1 are not substantially more complex than those required under Option 3, negating the requirement to risk the implementation of a pool structure using EUPHEMIA.
- Option 1, with the market power mitigation measures we suggest, will deliver a similar market to that under Option 3, with the benefit of increased competition in the forward market and without the associated risks of Euphemia. Furthermore, it will allow the RAs to gradually remove regulation

from the market, if it can be shown that the market will operate efficiently without intervention.

4.2.4.2 Benefits of self-scheduling for Merchant Generators

The ability for merchant generators to self-schedule to meet forward market commitments removes scheduling risk and therefore promotes liquidity in the physical forward market. This is because self-scheduling provides a merchant generator with the ability to “lock in” forward market spark spreads without exposure to basis risk between its SRMC and the pool price. The ability to “lock in” fixed spark spreads will help incentivise investment by merchant generation and improve liquidity in forward market timeframes, reducing the market power of dominant participants. It will also align the I-SEM with the GB market and create a level playing field for cross boarder trading.

4.2.4.3 Self-scheduling as a market power mitigation measure

The ‘backstop’ of self-scheduling to meet forward market commitments introduces a de-facto price cap on forward market pricing. This is because asset owners can choose to sell generation that is “in merit” in forward market timeframes even if there is a risk it may be “out of merit” in the day-ahead market. In the case of a vertically integrated utility, this would take the form of using its generation assets as a backstop hedge for retail positions. In both cases, the generation would only be scheduled to run if the asset owner were unable to secure power below its SRMC through the day-ahead or intra-day markets. This dynamic significantly reduces the opportunity for a dominant participant to exert market power in the forward market.

4.2.4.4 Economic drivers of spot market liquidity

Participants, acting rationally in a bilateral market, have a strong economic incentive to participate in day-ahead and inter-day timeframes. The dynamics of this are set out below:

EXAMPLE 1: A generator that has sold 50% of its output through physical bilateral trading in forward market timeframes should bid marginally below its SRMC in the day-ahead market up to the level of its physical contractual commitments and offer at SRMC for the remaining 50% of its output.⁴⁴ Once the day-ahead market clears the generator will then self-schedule to reflect its final day-ahead position, turning down if it has bought volume and turning up if it has sold volume. In the intra-day timeframe a similar dynamic will occur. The generator should be willing to bid marginally below SRMC for scheduled volumes and offer at SRMC for unscheduled volumes. Following intra-day gate closure the generator will then self-schedule to balance its position.

EXAMPLE 2: A supplier that has bought 40% of its requirements through physical bilateral trading and 40% of its requirements through financial bilateral trading in forward market timeframes and is exposed for 20% of its requirements, will price take

⁴⁴ Throughout the terms “bid” and “offer” denotes orders to buy and sell respectively.

for up to 60% of its requirement in the day-ahead market (to close out its financially contracted position and exposure). The 40% of its requirement secured through forward physical contracting however should appear in the day-ahead market as bids marginally below SRMC by the contracting generators as set out in EXAMPLE 1. In the intra-day timeframe the supplier will net its forecast error against its unsecured volumes and trade its resulting position in the intra-day market.

EXAMPLE 3: A generator that has sold 60% of its output through financial bilateral trading in forward market timeframes should bid at its SRMC in the day-ahead market up to the level of its financial contractual commitments and offer at SRMC for the remaining 40% of its output. Once the day-ahead market clears the generator will then self-schedule to reflect its final day-ahead position, turning up to match the physical volume sold through the day-ahead market. In the intra-day timeframe the generator then holds a physical position from the day-ahead market and should be willing to bid marginally below SRMC for scheduled volumes and offer at SRMC for unscheduled volumes. Following intra-day gate closure the generator will then self-schedule to balance its position.

EXAMPLE 4: In the day-ahead timeframe a wind generator forecasts that it has 10MW of wind available for day D. To manage forecast errors it decides to sell 70% of its forecast output through the day-ahead market by submitting a price taking offer for 7MW. This offer is cleared due to the liquidity provided through EXAMPLES 1 to 3 above. In the intra-day timeframe the wind generator produces 11MW. It is able to either accept the bids provided by thermal generation or submit offers into the intra-day market again due to the liquidity provided through EXAMPLES 1 to 3. These offers will be taken by generators assuming they are below their SRMC.⁴⁵

Therefore, if market power is adequately addressed the dynamics outlined above should drive liquidity into spot market timeframes, providing spot market access for wind generation, thermal generation and suppliers.

4.2.4.5 Wind Generation

There is little discernible difference with regards to the treatment of wind generation under Option 1 or Option 3. The economic incentives described in section 4.2.4.4, combined with the market power mitigation measures set out in 4.2.4.6, will ensure access to market for wind generation in spot market timeframes. In fact, the presence of a large volume of wind generation in the I-SEM significantly strengthens the incentive for vertically integrated suppliers to engage in day-ahead and intra-day markets, while competitive dynamics between thermal generators (combined with appropriate market power mitigation measures in the balancing timeframe) will achieve equitable pricing for wind.

The ability for wind to avail of portfolio bidding would allow forecast errors to be offset. This reduces the exposure of the overall wind portfolio to imbalance risk. It

⁴⁵ Competitive dynamics across thermal generation will support the price achieved by wind in day-ahead and intra-day timeframes.

would also facilitate the formation of aggregators to allow smaller wind participants to access portfolio benefits.

Option 1 potentially presents more flexibility for wind generation than Option 3 (assuming wind is mandated to participate in the day-ahead pool under Option 3) because it is possible to use referencing pricing for support mechanisms to manage exposures to imbalance risk.

4.2.4.6 PTRs vs FTRs on Interconnectors

The examples below set out the high-level dynamics of day-ahead coupling under PTRs and FTRs.

EXAMPLE 1: A participant holds an import (or export) PTR. The participant has the option to either nominate the flow or release the capacity to the day-ahead market. If they nominate the flow it will be based on the anticipation of a positive spread in the direction of the capacity holding – i.e. the flow should be efficient. If they release the capacity to the day-ahead market, they will achieve the price spread in the direction of the capacity. Effectively the PTR becomes an FTR in this scenario. Normally the minimum price spread in a given direction is set at zero.

EXAMPLE 2: A participant holds an import (or export) FTR. As this is a financial instrument cashed out on the price differential achieved through the day-ahead coupling process between the interconnected markets, it has no effect on the interconnector capacity available for the day-ahead market coupling process.

To avoid the risk of anti-competitive behaviour in the day-ahead market under PTRs (the locking in of uneconomical flows into the day-ahead market via nominations) the option of implementing FTRs on interconnectors could be investigated. FTRs are not excluded under a bilateral market design. It should be noted however, that active monitoring and reporting of achieved spreads on nominated IC flows would achieve a similar effect.

4.2.4.7 Market Power Mitigation Measures⁴⁶

Given the considerable scope for the exertion of market power in I-SEM under any HLD option, a robust suite of market power mitigation measures is required. These measures are set out below:

- i. Dominant participants need to be mandated to sell financial forward contracts to mitigate market power in the day-ahead market. Given the reduction in transparency resulting from the loss of complex offer formats and the potential weakening of SRMC bidding principles, volume commitments in the financial forward market would need to be significantly higher than Directed Contract volumes in the current SEM to be effective.

⁴⁶ Cross reference market power mitigation measures suggested by Baringa in their report entitled “I-SEM HLD Consultation: Prompting forward liquidity and mitigating market power in the I-SEM”.

- ii. Market Maker obligations need to be imposed on dominant participants to mitigate market power in forward market timeframes.⁴⁷ The obligation to provide regulated bid / offer spreads in the forward market would provide a strong incentive to price into forward markets at competitive prices.
- iii. Increased transparency around the forward market contracting activities of dominant ring-fenced entities, in both fuel and electricity markets, is required to remove the opportunity for such entities to ‘virtually’ vertically integrate and thereby “choke off” competition in the retail electricity market.⁴⁸
- iv. Mandated forward trading through SEM OTC platform (or other designated platforms) to promote transparency and price discovery in forward timeframes.
- v. Monitoring of FTRs / PTRs holdings with the option to impose volume limits to manage potential exertion of market power via I-SEM interconnectors.
- vi. Investigation of the option of implementing FTRs or if PTRs are implemented, monitoring and reporting of achieved spreads in day-ahead market on nominated interconnector flows.
- vii. Mandated ‘counter bidding’ of bilateral positions by dominant participants to ensure liquidity and market access in day-ahead and intra-day timeframes.⁴⁹
- viii. Mandated obligation on dominant entities to offer physically un-contracted generation into day-ahead and intra-day timeframes.
- ix. Mandated participation in the I-SEM balancing market from the day-ahead time-frame to facilitate constraint management by the TSO.⁵⁰
- x. Careful consideration needs to be given to the appropriate treatment of pumped storage and hydro assets in day-ahead and balancing timeframes. The flexibility of these units provides significant opportunity for exertion of market power.⁵¹
- xi. To the extent that SRMC bidding principles are weakened under I-SEM, the following measures are required to mitigate market power in the balancing market:
 - a. A high degree of transparency;
 - b. License conditions restricting the scope for the exercise of local market power; and
 - c. Contractual arrangements between generators and the TSO, particularly for pumped storage and hydro assets.

⁴⁷ The credit requirements of market makers must be agreed with the oversight of the I-SEM regulatory authorities.

⁴⁸ As previously discussed reduced competition in the retail electricity market will lead to higher prices for I-SEM consumers over the mid to long term.

⁴⁹ ‘Counter bidding’ is the placing of a bid in the day-ahead or intra-day market to try to ‘buy back’ a previously sold bilateral position. The dynamics of this are outlined in EXAMPLE 1 in section 4.2.4.4 above. Mandated counter bidding would produce a similar effect to gross portfolio bidding in I-SEM because of the presence of a single large, dominant, fuel diverse generation portfolio.

⁵⁰ Constraint trades with TSO would need to be physically and financially firm. Therefore generators must be able to reflect in their INC and DEC pricing the lost opportunity of trading in energy markets. Note that this would also need to be the case under Option 3.

⁵¹ For example, in the GB electricity market, four pumped storage assets are controlled by three portfolio players. It is not uncommon for individual pumped storage units to submit a balancing bid-offer spread of £500/MWh or more.

Without such measures, the ability to exercise market power in balancing timeframes may undermine economic incentives in ex-ante markets.

- xii. Publishing of trade data from forward, day-ahead, intra-day and balancing market timeframes. Data should be published as soon as possible after trade execution to facilitate self-policing of I-SEM by participants.⁵²
- xiii. The introduction of unit trading (with the exception of wind) in day-ahead and intra-day timeframes should be investigated, and if deemed feasible, considered. Unit bidding would greatly aid transparency in day-ahead and intra-day timeframes.
- xiv. A strong and independent market monitoring function that can provide expert analysis on market dynamics across all trading timeframes and report potential abuses of market power to relevant authorities.
- xv. A clear redress mechanism for the abuse of market power by I-SEM participants.

In forward market timeframes, the market power mitigation measures required in Option 1 and Option 3 are almost identical but any market power mitigation measure in Option 1 is augmented by the competitive dynamic stemming from self-dispatch. This is because there is significant opportunity for a dominant participant to exercise market power in forward market timeframes under a pool structure.

In spot market timeframes, significant market power mitigation measures are required in Option 3, as SRMC bidding principles cannot be enforced to the same extent as under the current SEM. Consequently, the market power mitigation measures in spot timeframes under Option 1 and Option 3 are similar. Option 3 therefore should not be considered a significantly better approach to managing market power in spot timeframes, particularly if unit bidding is introduced into the design of Option 1 to aid transparency.

In balancing market timeframes, there is no difference between Option 1 and Option 3 in relation to the market power mitigation measures required if participation in the balancing market is made mandatory from the day-ahead stage under Option 1. This is because of weaker enforcement of SRMC bidding principles under Option 3 and the potential for sub-optimal or technically infeasible pool schedules.

4.2.4.8 Conclusions

Potential issues with Option 1 coalesce around concerns about market power, spot liquidity and transparency. These are genuine concerns and require appropriate attention for the HLD to be workable. Section 4.2.4.7 discusses a range of measures that could be introduced that would address these issues.

While market power is an issue under bilateral trading arrangements, a detailed analysis of Option 3 indicates that it is not significantly reduced under a mandatory

⁵² Dominant ring fenced entities would need to provide regulators with counterparty specific trade volumes to facilitate adequate monitoring of ‘virtual’ vertical integration.

pool structure because of the loss of complex offer formats and the potential weakening of SRMC bidding principles. Furthermore, a mandatory pool structure, utilising EUPEHMIA, raises additional, potentially significant, risks for the I-SEM consumer (as outlined in section 4.2.3) compared with proceeding with Option 1 with the regulatory measures we suggest. These risks are amplified by the governance arrangements that exist for EUPHEMIA and the resulting loss of influence of the SEMC to exert influence over the functioning of the I-SEM algorithm if issues arise. Therefore, it is difficult to view Option 3 as a feasible HLD.

Energia therefore strongly recommends that Option 1 is chosen (with appropriate market power mitigation measures similar to those outline in section 4.2.4.7) as the I-SEM HLD. As evidenced by recent experience in the GB electricity market, implementation of these recommendations will ensure Option 1 delivers a liquid forward market and efficient market coupling while insulating I-SEM participants and consumers from the potential significant risks associated with Option 3. Approaching the HLD in this way has the additional benefit of allowing regulators to monitor the dynamics of I-SEM and roll back market power mitigation measures if the conditions for adequate competition (and therefore efficient market operation) in each market timeframe have been met.

Furthermore, Energia strongly recommend that a dedicated work stream is set up as part of the I-SEM detailed design phase to examine market power issues regardless of the HLD option that is selected by the SEM Committee.

4.2.5 High-Level Overview of Energia Views on HLD options

4.2.5.1 Summary of arguments against option 2

- i. Option 2 is a unique design worldwide and therefore untested.
- ii. Bolting an ex-post pool onto physical bilateral forward markets would be extremely difficult to implement from a technical perspective.
- iii. It would also lead to liquidity management issues across all timeframes.
- iv. Option 2 is therefore not a workable, practical design.

4.2.5.2 Summary of arguments against option 4

- i. Option 4 is unlikely to produce sufficient incentives for participants to actively engage in ex-ante timeframes.
- ii. The design therefore generates potential liquidity issues in forward timeframes that will result in inefficient interconnector use.
- iii. It is therefore unlikely to prove a stable design for the I-SEM over the longer term, particularly given the requirement for further integration in balancing timeframes.
- iv. It is inequitable concerning the opportunities it provides for trading in day-ahead and intra-day timeframes, favouring those participants with more certainty in their ex-post pool schedules.

- v. It is potentially inefficient if intra-day and ex-post gate closure are not aligned, particularly during periods of GB gas market volatility. Similar issues potentially exist with the ex-post pool in Option 2.
- vi. The HLD would be unique within Europe, is not in the spirit of the Target Model (will not deliver efficient cross border trading activities) and therefore is not feasible over the long-term.

4.2.5.3 Summary comparison of options 1 and 3

The table in Annex 2 provides a summary comparison of HLD Options 1 and 3 across all trading timeframes. It also summarises the suggested regulatory measures to improve liquidity and address market power concerns.

4.2.5.4 Summary of arguments supporting option 1

- i. Option 1 and Option 3 are part of a continuum with Option 1 moving towards Option 3 as appropriate market power mitigation and liquidity measures are added.
- ii. Option 3 represents an extreme position on this continuum, forcing all I-SEM trading through European platforms.
- iii. This introduces significant potential risks into the HLD coupled with a loss of influence for the SEMC over I-SEM because of the requirement to use EUPHEMIA as a pool algorithm.
- iv. If pool outcomes under Option 3 prove sub-optimal, this has potentially serious implications for the efficiency of market coupling and the functioning of the HLD (across all trading timeframes).
- v. The mandatory pool structure of Option 3 however does not significantly improve market power mitigation in the I-SEM. This is due to:
 - a. The potential for exertion of market power in forward market timeframes; and
 - b. The potential weakening of SRMC bidding principles in I-SEM.
- vi. Any move away from a mandatory pool structure is a move towards Option 1.
- vii. Under Option 1, there are economic incentives on generators to counter bid physical positions in both day-ahead and intra-day timeframes.
- viii. These incentives can be reinforced by the market power mitigation measures suggested in section 4.2.4.7 above.
- ix. Due to the potential weakening of SRMC bidding principles there is unlikely to be significant difference in balancing timeframes between Option 1 and Option 3, particularly if bidding in the balancing mechanism is made mandatory from the day-ahead timeframe in Option 1.
- x. Combined with appropriate market power mitigation measures Option 1 can deliver the outcomes intended to be delivered by Option 3, but without exposing I-SEM to the potential risks of a mandatory pool scheduled by EUPHEMIA.
- xi. Under Option 1 Market Power Mitigation measures can be rolled back, once a fully functioning bilateral market had been established.

- xii. Therefore, Option 1 with the regulatory measures outlined in section 4.2.4, is the best HLD option for the I-SEM providing a stable footing for the energy market over the long-term.

5 Capacity Remuneration Mechanisms

In this section of our response, which should be read in conjunction with the Frontier Economics report and particularly the NERA report, we consider capacity remuneration mechanisms (CRMs) under I-SEM.

The consultation paper presents an extremely high level taxonomy of CRM options that are incompletely specified and assessed. It does not define the CRM objectives or what assessment criteria are being used to evaluate the options. It also contains inconsistencies and ambiguities which further frustrate any meaningful evaluation. As NERA state:

“The options have not therefore been developed to the point where anyone can conduct a comprehensive evaluation of the system best suited to the all-island SEM. Indeed, the SEM Consultation assesses each option by a different set of criteria, which prevents a proper comparison of their relative merits” (page 17).

We therefore do not provide a detailed evaluation of the options proposed, as we did in the previous section on energy trading arrangements, because this is simply not possible.

On the above note, it is important to point out that the quality of the CRM coverage in the consultation paper lags well behind that of the energy trading arrangements⁵³. The consideration of CRMs appears rushed and not properly thought through. This gives us considerable cause for concern, as detailed elsewhere in this response.

We strongly recommend that further detailed consideration be given to capacity mechanisms in the I-SEM project before rushing ahead with a decision, potentially overlooking important fundamentals, simply to meet project milestones. Retaining the existing CPM with minimal changes as required should be given serious consideration – this option is too readily dismissed in the consultation paper, this is a view shared by NERA⁵⁴.

Even if a minimal change approach is taken in the medium term, the RAs could further consult on CRM reform at an appropriate point in the future. The RAs could aim to complete this CRM consultation process sometime after the implementation of the I-SEM which would release valuable resources across market participants, RAs and their advisors, to concentrate upon the detailed design and implementation challenges of the energy trading aspect of the I-SEM. Such an approach would help to minimise implementation risks and would instil investor confidence.

⁵³ We hasten to add that the coverage of energy trading arrangements in the consultation paper is not perfect but it does provide sufficient information and clarity to enable a reasonable understanding and assessment of the options.

⁵⁴ NERA state: “The RAs use the alleged incompatibility of the existing CRM with the day-ahead market coupling pillar of the Target Model as an excuse for a complete review of the CRM design...[However]...the need to comply with the EU Target Model need not require significant changes to the CRM in the SEM” (pages 57-58).

The remainder of this section considers the justification for a CRM in the all-island electricity market in the context of State Aid guidelines and the potential constraints on CRM design arising from both EU requirements and the specific characteristics of the all-island market. We provide a qualified assessment of the CRM options put forward in the consultation paper and recommend a long-term price based mechanism. We conclude with key recommendations to re-visit the economic reasoning behind capacity mechanisms and to fully explore options to retain the existing CRM with minimal changes (such as removing payments from interconnectors as proposed in GB or moving to a fully ex-ante payment).

5.1 I-SEM needs a CRM

A CRM is an attempt to overcome the *failure of the energy-only market* to prompt adequate investment in capacity, by replacing revenues from energy price spikes with a smoothed payment for capacity. EC State Aid guidelines stipulate that a CRM can only be justified when demonstrable *market failures* give rise to a generation adequacy problem. We asked NERA to evaluate whether conditions on the island of Ireland meet these criteria such that there remains a need for the reformed SEM to include a CRM. On this question, their comprehensive report accompanying this response concludes that:

[T]here is no reason to think that the market failures recognised by the RAs in 2007 and 2012 are no longer present in 2014. To the extent that these market failures are well understood, have already received the concerted attention of the RAs and are not soluble by alternative means, a CRM remains a necessary feature of the reformed SEM” (page 16).

Frontier Economics have considered a similar, albeit narrower, question put to them by the Electricity Association of Ireland. They specifically consider the ‘*small market problem*’ in abstract terms, ignoring other characteristics such as market power and illiquidity in the forward market, and conclude based on conceptual analysis and stylised modelling that:

“the SEM has numerous characteristics [specifically relating to its small size] which would tend to imply significant potential benefits from the continuation of a [capacity] mechanism”.

I-SEM needs a CRM because the *specific characteristics* of the all-island market which necessitated the introduction of the existing CPM in 2007, and determined its objectives (since reviewed in 2012), still prevail.

During the design process, the RAs explained the objectives of the CPM⁵⁵:

“This decision is driven by the need to attract timely investment, retain capacity and encourage efficient exit recognising, specific characteristics of

⁵⁵ SEM Proposed High Level Design (31 March 2005), page 24.

*the all island market. Particularly, **the scale of the market, the relative size of new investments and their impact on market dynamics and consequent uncertainty**” (emphasis added).*

The small market problem

The minimum efficient scale of a CCGT plant constructed in Great Britain is now about 900MW, and the minimum efficient scale of an OCGT is about 565MW. A 202MW OCGT is used as the benchmark for the “best new entrant” peaking plant in the all-island market. In Great Britain a 900MW CCGT represents 1.6 per cent of peak demand. By contrast, in the SEM this would represent 13.9 per cent of peak demand. Even a 202MW OCGT represents 3.1 per cent of peak demand⁵⁶.

The significance of small system size for requiring a capacity mechanism is well explained and illustrated in a stylised way using a saw-tooth analogy in the Frontier Economics Report. It explains that in a competitive energy-only market with perfect information, average prices will over time tend to follow a “sawtooth” pattern. This reflects prices rising to scarcity levels as demand grows over time, until new entry is triggered which causes prices to drop again, and the process repeats.

Among other things, this simplified analogy illustrates a reliance on extreme prices to attract investments which in practice is highly susceptible to political and regulatory intervention to prevent prices rising to these levels – i.e. an implicit cap is placed on prices⁵⁷. The resulting non-credibility of reliance on peak prices to reward investments is a form of market failure leading to under-provision of capacity.

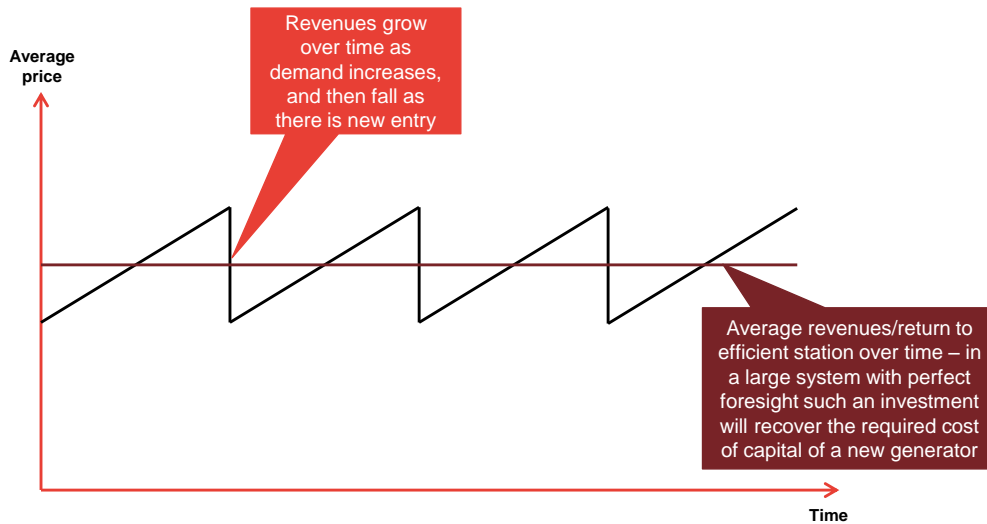
In a small system, the saw-tooth effect is more pronounced, both in depth and duration, as can be seen in Figure 1 below sourced from the Frontier Economics report. This has important consequences for investor risk and the cost of capital which consequently translates into an increased risk of supply shortages or higher electricity prices -i.e. market failure. This is because a longer duration between price spikes increases the payback period for investments which exposes them in a bigger way to unexpected changes in regulatory or market arrangements. This brings greater regulatory risk and increases financing costs. The greater depth of the saw-tooth in small systems increases the volatility of cash-flows which has the effect of raising the cost of capital. A capacity mechanism reduces the volatility of cash flows to the overall benefit of customers – i.e. it addresses the market failure that is exasperated in a small market.

⁵⁶ See section A.3.5 of the NERA report.

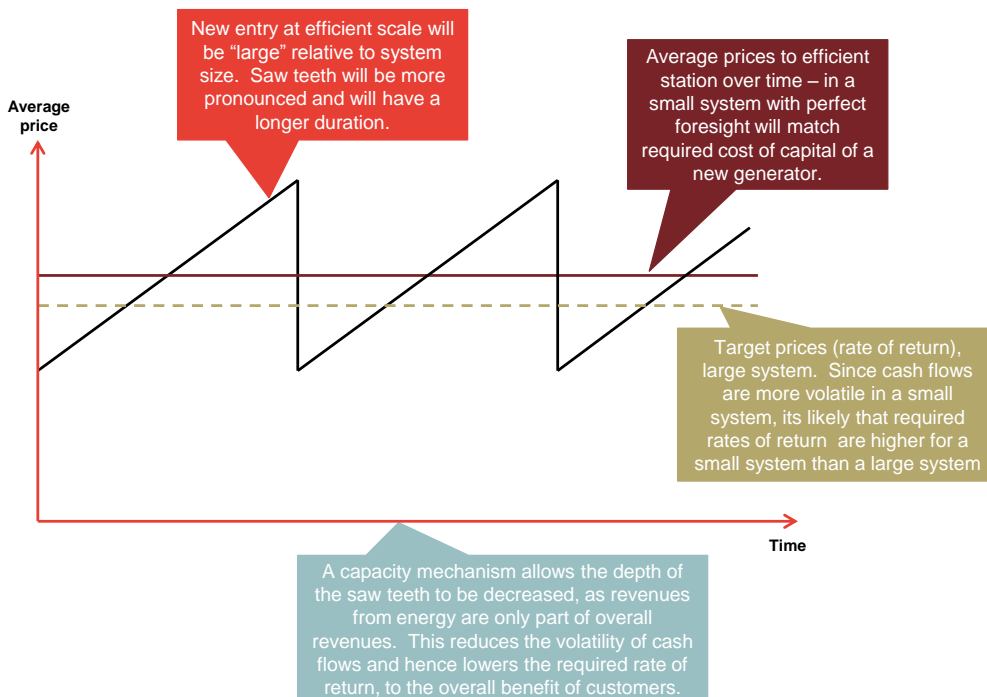
⁵⁷ Inelastic demand makes electricity prices more volatile, heightening the regulatory and political risks surrounding the reliance on high prices, diminishing expected revenues and deterring investment. Relating to this, the risk of regulatory intervention is further accentuated by market power concerns and the difficulty of distinguishing between exertion of market power and scarcity prices. State owned dominance in the wholesale and retail markets also gives rise to a strong perception of non-commercial objectives and that prices are implicitly capped. This is discussed further later in this response.

Figure 1. Sawtooth pattern in systems of different size

Stylised sawtooth: large system



Stylised sawtooth: small system



Source: Frontier Economics

The saw-tooth analogy explained briefly above helps to illustrate some of the conditions which give rise to market failure in electricity markets and why they are particularly pronounced in a small system such as the SEM, which is also susceptible to market power and the perceived vagaries of state-owned dominance that further deter investment in capacity as further discussed below.

Coordination problems

In the absence of a capacity mechanism, the small market problem is made worse by relaxing the assumption of perfect information which can give rise to ‘*coordination problems*’ (see section A.2.4 of the NERA report for further details). For example it raises the possibility of ill-timed entry, perhaps coinciding with an unforeseen demand shock such as recession. The resulting impact would be particularly severe in a small system, leading to a protracted period of low revenues and poor returns for investors. A capacity mechanism dampens the impact of such shocks.

The existence of market power raises another coordination problem that can affect small systems in particular, as explained by NERA below:

“An additional co-ordination problem that can afflict small markets with large, long-lived investment is premature capacity additions by a player with market power. Due to the long-lived nature of power plants (25 years or more), and the occasional need for new investment in a relatively small market, a player with market power can forestall entry by others by prematurely constructing new capacity before the price of capacity rises high enough to remunerate a new entrant. With long-lived investment, this strategy can be supported as a credible threat by the incumbent. However, this leads to a lack of entry by competitors and investment that occurs “too often” (with energy sold by the incumbent at a price that is “too high”)” (p.37).

The entry of two state-owned plants in Cork coinciding with the worst recession in decades is a good example of coordination problems in practice. Given the small size of the all-island market, this would have had a far more detrimental impact on existing and future investment if the existing capacity mechanism did not exist to help dampen the effect.

The market power problem

The all-island electricity market is highly concentrated and has one potentially dominant state-owned player, ESB⁵⁸. Dominant players distort competitive outcomes which is a form of market failure. In a small market it is relatively easier for a dominant player to forestall entry by others, or to at least credibly threaten to, as explained above. This is just one example. According to NERA, the failure of competition in the SEM can materialise in a variety of ways. Because the demand curve for electricity is highly inelastic there is the potential for a dominant player to unduly influence energy prices. When the dominant player is state-owned, such as ESB, the perception of non-commercial objectives can compound this market failure, as explained by NERA, and this can have the effect of placing an additional implicit cap on prices⁵⁹. A capacity mechanism can help to overcome these market failures,

⁵⁸ See section 2.1.3 of NERA report for details.

⁵⁹ See section A.3.4 of NERA report for details.

but should be carefully designed to ensure it is not undermined by the same market failures, such as market power.

Forward market illiquidity problems:

The available evidence (see NERA and Baringa reports) strongly suggests that the forward market for electricity sold in the SEM is illiquid and uncompetitive. NERA consider this a market failure which can be somewhat addressed by a CRM.

“A CRM cannot make a market liquid or competitive, and the forms of CRM that rely on capacity trading would be subject to the same problems. However, some forms of CRM can substitute for a liquid and competitive forward market by providing generators with a more predictable and stable stream of future income, reducing the risks they face and hence the cost of financing new investment” (NERA report, page 42).

The market failures discussed above are likely to be made worse by:

- Increasing penetration of renewables, as this reduces the likelihood of conventional plants being able to secure revenue from peak prices.
- Unsignalled changes to the regulatory framework, as this undermines investor confidence and increase the base level of return they require. As NERA point out in this context:

“...it should be noted that regulators in the SEM have proven willing to change established arrangements in ways that deny the recovery of costs that market participants were expecting to recover”⁶⁰

The presence of the above market failures in the SEM illustrate that investor credibility in the stability and strength of the regulatory regime is more important because of longer payback periods and the threat of market power being exerted by the state-owned incumbent. This is relevant from the point of view that the SEM already has a capacity mechanism that has been recently reviewed, concluding in 2012⁶¹ with evolutionary rather than revolutionary changes. Any decision to remove the current CRM and not to replace it with a well-designed market-wide alternative that addresses the same market failures the CRM is intended to remedy would heighten investors' perceptions of regulatory risk and hence increase the risks of regulatory failure highlighted above. In the context of the recently published GCS, referred to in section 3.3 of this response, and its 'projected surplus generation' out to 2022, this could also signal the opportunistic use of CRMs and would be contrary to CRM objectives which is to stabilise prices and revenue streams over the longer term. Of course the GCS does not provide an assessment or projection of long-term security of supply, as explained already in section 3.3, and thus any temptation to

⁶⁰ Page 40 of the NERA report provides several examples to substantiate this point.

⁶¹ Single Electricity Market CPM Medium Term Review, Final Decision Paper, 6 March 2012 – SEM-12-016.

remove or dilute the existing CRM on this basis would be mistaken⁶². These points are borne out in the NERA report:

“In 2007 the RAs recognised that the conditions in the SEM justified such a mechanism (a position they reaffirmed as recently as 2012 in their Medium Term Review). There seems to be no reason to believe that conditions in the SEM have changed sufficiently to remove the need for a CRM. Even if the SEM could manage without a CRM in the short term, it would be opportunistic (and therefore harmful to investment) to remove the CRM now, with the intention of re-introducing it later, if it became necessary” (page 15).

Finally, it is important to understand that the real and perceived regulatory risks to cost recovery elucidated above are likely to exacerbate the problem of under-investment, even if the current explicit price cap (coupled with a BCoP that prescribes SRMC bidding) is removed in the reformed energy market.

As NERA explain:

“The real and perceived regulatory risks to cost recovery are likely to exacerbate the problem of under-investment, even if the price cap is removed in the reformed energy market. An illiquid forward market that cannot provide adequate investment signals, and the problems of coordinating large and long-lived investment on a small island (especially in the presence of market power as described in Appendix B.3), provide further evidence of potential market failures in the SEM” (page 43).

Thus we conclude (as supported by the NERA and Frontier Economics reports) that a capacity remuneration mechanism is a necessary and central feature of any redesigned market under I-SEM to address identified market failures, and is fully justifiable in the context of EC state aid guidelines.

5.2 Constraints on CRM design

This section considers potential constraints on CRM design which include:

- Market power
- State Aid compatibility
- Target Model compatibility
- Compatibility with the I-SEM energy trading arrangements

5.2.1 Market power

As detailed in the NERA report, the all-island market is highly concentrated by European standards in both electricity supply (HHI of 2,697) and generation (HHI of 2,590), with the state-owned incumbent ESB having a dominant position in both the

⁶² It would be necessary to review the forecast of capacity and to check that any new arrangements achieve security of supply.

retail and wholesale market. ESB has a portfolio which generates more than enough power to meet the needs of its downstream customers. The other major suppliers have net short positions. ESB also has “deep pockets” and because it is state-owned it may respond to non-commercial pressures in the energy and capacity markets.

The potential for market power abuse is often a key consideration in the design of energy markets and we have heavily underlined its importance in section 4 of this response. The energy component of the all-island market is constrained by rules intended to mitigate the impact of market power, at least in the spot market. Concerns over market power arise both from the incentive for private sector generators to raise or lower prices if that would increase their profits, and / or from the ability and tendency of state-owned generators to lower prices for political reasons. The same concerns should inform the design and evaluation of any CRM. The presence of a dominant player and large imbalances between the supply and demand for capacity in the all-island market, as elucidated above, are important constraints when considering CRM design.

NERA explain throughout their report how market power can be exerted in the context of capacity mechanisms and consider the conditions (including small market size) which accentuate the ability to do this. They also explain how the exertion of market power is less easily detectable in capacity markets compared with (spot) energy markets. On the latter note, for example, it is *relatively* straightforward to detect the abuse of market power in the (spot) energy market with reference to short run marginal cost. It is far more difficult in the context of capacity markets because the relevant calculation of “net going forward costs” (i.e. the difference between forecast revenues and costs) is far less objective (i.e. it is not a simple function of plant efficiency and fuel prices). This is why, as NERA explain, US capacity markets such as PJM and New England strictly regulate all incumbent generator bids into the capacity auction. Having illustrated the extent of regulatory intervention in these capacity markets NERA conclude:

“As a result, although capacity markets in the US are competitive auctions in form, in practice they are often administered payments in outcome” (NERA Report, page 27).

It is worth noting at this junction that the EC guidelines on State Aid and a number of statements by the RAs in the consultation paper put great emphasis on the desirability of using markets to set the price of capacity. Importantly, however, as NERA point out:

“In practice, capacity markets will not produce efficient prices or desirable outcomes if they allow individual providers of generating capacity and demand-side resources to move prices significantly by expanding or contracting their supply...the price-elasticity of the demand for capacity has a major influence over the degree of market power possessed by individual sellers (and buyers). In some conditions, “inelastic” demand for capacity (e.g.

a fixed obligation) gives many suppliers a major influence over the price of capacity. A CRM may produce a better outcome if it dampens the change in prices caused by any variation in supply (e.g. by including a demand curve). As with regulatory/political risk, achieving this aim may require some trade-off, this time between providing accurate short-term price signals and preventing the manipulation of prices” (NERA Report, page 19).

Market power imbalances (both wholesale and retail) in the SEM have minimal impact in the context of the current capacity mechanism because capacity payments to available capacity are determined centrally rather than by market participants. However it is important to recognise that market power can distort the capacity procurement process in a capacity remuneration mechanism. Examples of exerting market power are: overstating the capacity offer price, withholding capacity or depressing the offer price (i.e. to deter new entry or force exit of competitors) all of which undermine efficiency. A design feature that helps counteract market abuse is central procurement (as opposed to a de-centralised or bilateral procurement system) but this approach needs to be carefully thought through and implemented to be effective.

As a final note of caution:

“Careful consideration of market power and measures to mitigate its effects should form part of the design process for the future CRM (or any alternative market arrangement)”. (See NERA Report, Appendix B.3.)

5.2.2 State Aid compatibility

We asked NERA to consider the question of State Aid in relation to CRMs and with specific reference to the draft guidelines on environmental and energy aid published in December 2013. Their assessment on the need for a CRM was with reference to these guidelines. They also considered any potential constraint on CRM design implied by the guidelines. Some of their views in relation to this have already been discussed above in relation to the emphasis given to market mechanisms for determining capacity prices. The presumption implied by this emphasis is that the market is functioning well enough to establish competitive prices. NERA conclude as follows:

“The State Aid guidelines rely on economic criteria such as identifying market failure as a means to establishing the need for a CRM. The clear lesson from the State Aid guidelines is that the economics of the all-island electricity market is important to the design of any capacity payment and need to be considered in combination with any legal constraints” (NERA Report, page 13).

Frontier Economics also consider the State Aid guidelines and point to the following sections with potential relevance to CRM design:

- **the overall amount of aid should be calculated in a way which implies, or results in, beneficiaries earning a rate of return which can be considered reasonable; and**
- **the measures should not undermine investment decisions on generation which predated the measure.**

The first of these requirements relates to the return expected by investors. In relation to this requirement Frontier Economics importantly point out that:

“...the required level of investor returns can be increased by the characteristics of the market in question. In considering the rate of return for investors in a market with a capacity mechanism, it is important to recognise that a “reasonable” rate may well be below that required were the same market to be energy only” (Frontier Economics Report, pages 16-17).

The second of the above requirements relates, as Frontier Economics point out relates to:

“the importance of regulatory stability and forward looking interventions (i.e. the need to avoid interventions with a retrospective effect). As we argue above, this may be particularly relevant to the SEM, where the regulatory authorities clearly believed that a capacity payments mechanism was required right from the inception of the market”. (Frontier Economics Report, pages 16-17).

5.2.3 Target Model compatibility

The EU Target Model is silent on CRMs, it neither requires nor prohibits them and it does not prescribe any particular CRM design. However, the design of any CRM must be compatible with market coupling under the Target Model. We asked NERA to consider this question in the context of the existing capacity mechanism.

According to NERA’s assessment, the current CRM in the SEM is unlikely to be compatible with the EU Target Model. This is because of the ex post component which inhibits risk management in cross-border trading, with the risk it creates acting as a barrier to trade.

However they do not consider this a difficult problem to resolve, with one solution being to replace the current ex post component with a payment fixed ex ante. According to NERA, this is unlikely to have a significant effect on incentives to be available because the ex post payment is only known after the half-hour has occurred. Another solution they suggest would be to follow the example of the UK government’s proposals of excluding foreign generators and traders from participating in the CRM, so that trade between the SEM and BETTA is driven the difference between energy prices alone. See Appendix B.4 of the NERA report for further details.

NERA conclude that ***“complying with the EU Target Model may require adopting relatively minor tweaks to the design such as altering the ex post component of the current CRM or adapting the rules to exclude foreign generators”***. (page 58)

The upshot is that target model compatibility can be achieved with minimal change to the existing CPM.

5.2.4 Compatibility with I-SEM energy trading arrangements

As noted above, the EU Target Model is silent on CRMs. To the extent that I-SEM must be compliant with EU Target Model requirements there is no a priori reason to believe that I-SEM design should in any way restrict the choice of CRM design. More importantly the CRM design should be specific to market requirements and conditions– i.e. it should aim to address identified market failure(s). This should be the fundamental determinant of CRM design, not its perceived compatibility with the energy trading arrangements under I-SEM. It is also important to understand that the real and perceived regulatory risks to cost recovery elucidated earlier are likely to exacerbate the problem of under-investment, even if the current explicit price cap (coupled with a BCoP that prescribes SRMC bidding) is removed in the reformed energy market.

5.3 Assessment of CRM options

Having established the compelling and continued need for a CRM in the all-island electricity market, and with an understanding of the potential constraints on its design as discussed above; this section provides an assessment of the broad CRM options proposed in SEM-14-008. We have been assisted by NERA in this assessment and will refer heavily to NERA’s expert input throughout the discussion.

As noted earlier the consultation paper presents an extremely high level taxonomy of CRM options that are incompletely specified and assessed. It does not define the CRM objectives or what assessment criteria are being used to evaluate the options. It also contains inconsistencies and ambiguities which further frustrate any meaningful evaluation. As NERA state:

“The options have not therefore been developed to the point where anyone can conduct a comprehensive evaluation of the system best suited to the all-island SEM. Indeed, the SEM Consultation assesses each option by a different set of criteria, which prevents a proper comparison of their relative merits” (page 17).

We therefore cannot provide a detailed evaluation of the options proposed, because this is simply not possible. Instead we share NERA’s insights on an appropriate way forward and their high-level appraisal of the options, including the steps the RAs will have to go through to evaluate each design.

The first and most important exercise in any assessment is to clearly set out the reasons for having a CRM because this will determine its fundamental objectives and consequently the form of CRM most suited to meeting those objectives.

“The CRM currently operating within the all-island market is an attempt to overcome the market failures that prevent an energy-only market from delivering an efficient mix of generation. These market failures are still relevant to the choice of CRM. When considering the design of a reformed CRM (or any alternative market arrangement), the RAs should consider the coverage of the scheme, the need to provide efficient signals for market entry and exit, avenues for abuse of dominance, and its compatibility with the EU Target Model” (NERA Report, page 14).

NERA also advise that:

“Elucidating the reasons will also be important to ensure that the proposed CRM passes the scrutiny of the European Commission under the rules on State Aid. The current CRM was introduced with the aim of promoting investment in generator adequacy. Conditions in the SEM have not changed so radically since the last time the RAs reviewed it. The SEM still appears to face several of the problems that afflict electricity markets and make a CRM necessary:

- ***The market is small and open to abuse of market power by dominant producers;***
- ***Investors receive imperfect signals from electricity prices, because of transactions costs (e.g., lack of demand side participation, and insufficient “granularity” of energy prices) and the lack of liquid forward markets;***
- ***Prices still vary widely, so generator adequacy suffers from the “missing money” problem owing to a variety of actual and threatened interventions in the market. These interventions include explicit price caps, regulation of generator bidding, and regulatory and political interventions that deny generators the opportunity to recover their costs”.***

It is our strong recommendation, for reasons explained earlier, that serious consideration be given to retaining the current CRM with minimal change. However should the RAs choose to proceed with a new CRM; any subsequent evaluation of options should at the very least address the following questions:

- What is the purpose of the proposed CRM, in terms of the market failure it is intended to remedy?
- How exactly will the proposed CRM remedy that market failure?
- Will the CRM reduce (or offset) existing regulatory/political risks? What new regulatory/political risks does it introduce?

- How will the proposed CRM mitigate the impact of market power (both withholding supply to raise prices and expanding or maintaining supply to lower prices)?
- How will the proposed CRM manage cross-border trading with the currently proposed EMR and how can it be adapted to accommodate specific changes in: (1) day-ahead versus within-day trades over the interconnector; (2) different eligibility rules for interconnector capacity in Britain; and (3) different levels of penalty for non-performance in Britain?

With the above in mind we provide a brief evaluation of the options proposed in the consultation paper with direct reference to chapter 5 of the NERA Report, salient extracts are re-produced below.

5.3.1 Strategic Reserve (Option 1)

“Although other electricity markets have sometimes adopted a strategic reserve, the grounds for maintaining one remain obscure. As we explain in greater detail in Appendix B, Section B.1, a strategic reserve does not contribute towards generator adequacy, contrary to the suggestion in the SEM Consultation. Instead (as the SEM Consultation goes on to recognise), strategic reserve enables generators of one favoured type to displace other (usually cheaper) generators of a different type. The favoured generators are then held off the market until all other sources have been exhausted”.

“The decision to include a CRM in the original design of the SEM sprang from concerns over future security of supply (generator adequacy) due to: the small size of the market; the potential for the market to oscillate between surpluses and shortages; and the regulatory/political risk attached to a reliance on extreme electricity prices to attract investment. The design adopted in 2007 also acknowledged the “missing money” due to the Bidding Code of Practice and an explicit price cap (by adopting a solution which made up for the “missing money” whilst carefully avoiding over-remuneration). In turn, those restrictions on bidding reflected concern about the market power of dominant players within the electricity sector. Any decision to proceed with a “strategic reserve” targeted on a limited number of generators would have to explain why all these concerns were no longer relevant”.

“If the RAs decide to proceed with a new electricity market that only contains a strategic reserve and no other CRM, it will be important to explain to market participants how the new market is intended to encourage investors to build and maintain capacity. As noted in Section 2.1.2, the current forecast of a capacity surplus lasting for several years depends implicitly on maintaining the current level of incentives. If the RAs plan to remove the current CRM and not to replace it with any market-wide alternative, it will be essential to review the forecast of capacity and to check that the new market will achieve long term security of supply, in the form of generator adequacy”.

“Any decision to proceed with a strategic reserve and no other CRM would have to be backed up by a rigorous explanation. In particular, the RAs would have to explain to investors why none of the reasons for introducing a market-wide CRM in 2007 were now relevant, to avoid creating a perception of opportunism and increasing regulatory risk”.

Energia’s Views: For the above reasons, further detailed in the NERA report, Energia does not support Option 1 (Strategic Reserves) and would strongly recommend that it should not be considered further by the RAs.

5.3.2 Long Term Price Based (Option 2a)

“The SEM Consultation regards this type of CRM as a spot price (i.e., “price-based”) system, because it assumes that there is no obligation or penalty for under-performance, except the loss of revenue at the current capacity price. However, the Consultation discusses the effects of deviations between forecast and actual capacity (and demand). Such deviations seem to imply a pre-commitment. In any case, even a system which pays for actual capacity (“ex post”) might impose penalties on generators who repeatedly declare capacity available (and collect capacity payments), but who then provide no output when requested”.

“The SEM Consultation also suggests that interconnector users would benefit from offering capacity (when delivering power into the SEM) or pay for using capacity (when exporting power to Britain) “if the ex ante capacity price is added to bids into the [Day-Ahead Market]”.⁴³ However, it is not clear that including the payment per MWh of available capacity in the price per MWh of electricity is efficient. Under the current proposals for EMR in Britain, electricity exported from Ireland to Britain would not earn a capacity payment of any kind. The evaluation would have to examine the potential distortions caused by this approach”.

“In any case, unless this CRM is viewed as a development of the existing scheme which requires no further approvals at European level, it will need a convincing explanation of the reason for including it in the SEM. It appears to be aimed at strengthening incentives to invest by compensating for “missing money”. To show that it can achieve this aim, the supporting documentation would have to demonstrate that it provides a stable mechanism – ideally a more stable mechanism than relying high energy prices to encourage investment”.

Energia’s Views: Our preference is to retain the existing CRM with minimal changes. We would support Option 2a (Long-Term Price Based mechanism) as the next best alternative because this form of CRM has worked in the all-island electricity market as confirmed by the RAs as recently as 2012.

5.3.3 Short Term Price Based (Option 2b)

“...this option moves the determination of capacity payments closer to real time, by using a formula related to current estimates of scarcity (a “regulated scarcity rent function”).

Whereas option 2a dispenses with the ex post element of the existing CRM, option 2b relies on it entirely. The SEM Consultation describes a final calculation undertaken ex post based on actual availability and demand.⁴⁵ If the result is intended to mimic the current ex post calculation, it provides an odd basis for rewarding capacity. Ex post, the value of capacity is either zero (if supply exceeded demand) or the difference between the energy price and VOLL (if demand exceeded supply). A loss of load probability is a prediction about the future; calculating it ex post with actual data produces a hybrid concept that has no economic meaning”.

Energia’s Views: Option 2b (Short-Term Price Based) is seriously flawed for reasons explained above and should not be considered further.

5.3.4 Capacity Auctions (Option 3)

“The SEM Consultation suggests that this type of CRM is to be found in the proposed capacity mechanism for Britain, but that description overlooks the current proposals for penalties.⁵⁰ Whereas early versions of the EMR foresaw penalties based on energy prices (rising to VOLL during a capacity shortage), the latest proposals anticipate a penalty rate fixed somewhat lower than VOLL, in conjunction with a cap on any individual market participant’s total annual penalties defined as a multiple of its annual capacity payments. The SEM Consultation omits these details, but recognises the reason for them, namely that some providers may be unable to bear the risk of high penalties, causing them not to take part in the auction.⁵¹ The penalty aspects of the design are crucial and will have to be spelled out before any meaningful evaluation can be carried out”.

The SEM Consultation suggests that option 3 will provide “a relatively stable environment for capacity investment”, but its stability depends on the methods used to determine total capacity requirements and for defining eligible capacity.⁵² The stability and transparency of a contract auction can be undermined by discretionary changes to rules such as the definition of eligible capacity and the required quantity of capacity.

This option anticipates users taking on contractual obligations in advance, so they must be able to trade their obligations, to reflect changes in their sell-side offers (available capacity). Without such trading, energy companies would not be able to adjust their portfolio of generation capacity, which would restrict long term competition in the wholesale electricity market.

In 2007, there were severe doubts about the degree of competition and the level of liquidity in the wholesale electricity market. The SEM therefore forces transparent trading and restricts generators' bidding, through compulsory participation in the day-ahead market and a Bidding Code of Practice. Given the importance of capacity trading to the success of option 3, and the potential influence of market power and illiquidity, a similar approach to trading would be required in the capacity market. Any evaluation of this option must therefore consider measures to ensure that capacity trading takes place on an efficient, transparent and non-discriminatory basis. The SEM Consultation recognises the need for market power mitigation measures in the original contract auction, but overlooks the need for similar measures to facilitate secondary contract trading."

Energia's Views: We would have significant concerns about Option 3 (Capacity Auctions) unless combined with strong and appropriate market power mitigation measures relevant to the all-island market, and given the complexity of this option we would see significant implementation risks associated with it.

5.3.5 Capacity Obligations (Option 4)

"This option is a variant of option 3, in which the buy-side obligation is decentralised and allocated among all the energy suppliers in the market.

Option 4 also relies on capacity trading, to a greater extent than option 3. It anticipates that suppliers will take on capacity obligations in advance, and procure capacity from generators to meet these obligations. Generators and suppliers must be able to trade the resulting obligations, to reflect changes in both their sell-side offers (available capacity) and their buy-side obligations (the demand of their consumer base). Without such trading, energy companies would not be able to adjust their generation portfolio or to supply customers beyond the level of their available capacity. Obstacles to capacity trading would therefore severely restrict competition in both wholesale and retail electricity markets.

As noted above, concerns over the degree of competition in wholesale markets in 2007 led to restrictions on generators' bidding in the SEM, through compulsory participation in the day-ahead market and a Bidding Code of Practice. Given the importance of capacity trading in this option, and the potential influence of market power, a similar approach is required in a capacity market. Any evaluation of this option must consider measures to ensure that capacity trading takes place on an efficient, transparent and non-discriminatory basis. The SEM Consultation overlooks this need".

Energia's Views: Given its decentralised nature and reliance on capacity trading this option is entirely ill-suited to the all-island market conditions and should not be considered further.

5.3.6 Reliability Options (5a: Centralised; 5b: Decentralised)

“Judging by the description in the SEM Consultation, reliability options really are just a forward contract settled like a contract for difference at the current spot or reference price of energy. If sold by auction, they may not offer any additional value over expected energy prices. Offering such contracts three or four years ahead is unlikely to improve investment incentives, as they would not constitute a long-term “bankable” commitment. They offer no additional revenue to offset “missing money” and energy prices will continue to rise and fall unabated, so there is no obvious diminution of regulatory/political risk”.

Finally, as specified in the SEM Consultation, the “reliability options” (5a and 5b) appear to be nothing more than long term electricity contracts settled financially (“contracts for difference”) against an electricity market reference price. It is not clear what problem these options are intended to solve. For instance, they would not be expected to offer any more revenue than is available from the electricity market, so they do not contribute any of the “missing money”.

Energia’s Views: Given the above and for reasons further explained in the NERA Report, Options 5a and 5b (Centralised and Decentralised Reliability Options) should not be considered further.

5.4 Conclusion and recommendations

We strongly recommend that further detailed consideration be given to capacity mechanisms in the I-SEM project before rushing ahead with a decision, potentially overlooking important fundamentals, simply to meet project milestones. Retaining the existing CPM with minimal changes as required should be given serious consideration – this option is too readily dismissed in the consultation paper, this is a view shared by NERA⁶³.

Even if a minimal change approach is taken in the medium term, the RAs could further consult on CRM reform at an appropriate point in the future. The RAs could aim to complete this CRM consultation process sometime after the implementation of the I-SEM which would release valuable resources across market participants, RAs and their advisors, to concentrate upon the detailed design and implementation challenges of the energy trading aspect of the I-SEM. Such an approach would help to minimise implementation risks and would instil investor confidence.

Finally it is important to point out that credit / collateral costs should be considered under any option for reforming the CRM.

⁶³ NERA state: “The RAs use the alleged incompatibility of the existing CRM with the day-ahead market coupling pillar of the Target Model as an excuse for a complete review of the CRM design...[However]...the need to comply with the EU Target Model need not require significant changes to the CRM in the SEM” (pages 57-58).

6 Concluding comments

- Our consideration and evaluation of the I-SEM Electricity Trading Arrangements and Capacity Remuneration Mechanisms has been supported by economic consultancies Baringa and NERA respectively.
- We therefore encourage the RAs to read their independent reports which accompany this response.
- Market power and liquidity is a recurring theme of our response. This is because undesirable outcomes can come about in energy or capacity markets as a result of market dominance which interferes with the efficient operation of the market and increases costs to consumers.
- These outcomes are seen today in the SEM's forward market.
- It is imperative that the new market is designed with appropriate regulatory and competition enhancing measures to prevent this continuing in the I-SEM.

Energy Trading Overview

- Forward markets are essential to the proper functioning of retail markets as evidenced by the recent activities of Ofgem in the GB electricity market.
- Forward markets drive retail pricing by setting the effective cost of hedging for retail suppliers. Therefore, low levels of liquidity, or unjustifiably high prices, in forward markets will result in higher prices for consumers. It will also reduce retail competition over the mid to long term. This again is to the detriment of consumers.
- Analysis of the current SEM forward market, conducted by Baringa, indicates that SEM forward market dynamics are consistent with the expected outcomes in a market where market power exists. This outcome is reinforced by the mandatory pool structure in SEM which:
 - a. Dis-incentivises merchant generation from participating in forward market timeframes due to scheduling risk; and
 - b. Prevents vertically integrated suppliers from using their generation assets:
 - i. to mitigate against low levels of liquidity or volume withholding; and
 - ii. to impose a de-facto price cap on forward market pricing levels.

These barriers to a more efficient forward market would be removed under our proposals for Option1.

- The core principle of the EU Target Model is efficient market coupling. To achieve efficient market coupling, liquidity in ex-ante spot timeframes is required.
- The presence of an ex-post pool in Option 2 and Option 4 therefore acts as a barrier to the natural pooling of liquidity in ex-ante timeframes (including the forward market). Both designs would be unique within Europe and therefore are untested.

- There is significant risk (particularly with Option 4) of further design changes being necessary as it is unlikely to be Target model compliant. Therefore neither option 2 or 4 can be considered a feasible HLD.
- Option 1 and Option 3 can be viewed as part of a continuum. By adding appropriate market power mitigation and liquidity measures to Option 1 the HLD moves towards Option 3.
- Option 3 represents a far extreme on this continuum but its proposed (and untested) use of EUPHEMIA (as the day ahead pool algorithm) generates potential significant risks for I-SEM consumers and generators, coupled with a significant ceding of market governance and control from the SEMC to European institutions.⁶⁴
- Energia has had sight of analysis undertaken by Energy-Link Partnership which modelled the Euphemia Algorithms under Option 3. This analysis (based on 'typical day' studies) confirms our concerns in relation to the levels of outturn prices and schedule outcomes in I-SEM.
- To proceed with Option 3 without rigorous 'proof of concept' testing, or the development of a back-up design, would therefore be a high-risk strategy for the SEMC to adopt. This is a risk that need not be taken, given the regulatory measures that can be applied to Option 1 suggested in this response.
- Energia's recommendation for the I-SEM HLD energy trading arrangements is therefore Option 1 with appropriate market power mitigation and liquidity measures. We make detailed recommendations regarding these measures (including market making obligations on dominant participants) in section 4.2.4.7 of this response.
- As evidenced by recent experience in the GB electricity market, implementation of these recommendations will ensure Option 1 delivers liquid forward and spot markets with efficient market coupling while insulating I-SEM regulators, participants and consumers from the potential significant risks associated with Option 3.
- Approaching the HLD in this way has the additional benefit of allowing regulators to monitor the dynamics of I-SEM and roll back market power mitigation measures if the conditions for adequate competition (and therefore efficient market operation) in each market timeframe have been met.

Capacity Remuneration Mechanisms

- A capacity remuneration mechanism (CRM) is an attempt to overcome the failure of the energy-only market to prompt adequate retention of, and investment in, capacity, by replacing revenues from energy price spikes with a smoothed payment for capacity.

⁶⁴It is important to emphasise that our concern with regards to EUPHEMIA relates solely to its proposed use under Option 3 and not to the general use of the algorithm itself. Please note that we have no concerns regarding the use of EUPHEMIA under any of the other HLD options proposed in the consultation paper.

- EC State Aid guidelines stipulate that a CRM can only be justified when demonstrable market failures give rise to a generation adequacy problem.
- We asked NERA to evaluate whether conditions on the island of Ireland meet these criteria such that there remains a need for the re-designed SEM to include a CRM. On this question, their comprehensive report accompanying this response concludes:

“In 2007, when the [all-island electricity] market was set up, and again when the RAs conducted a Medium Term Review between 2009 and 2011, they concluded that the small size of the market, the market power of dominant companies, and the inherent regulatory/political risk would all deter efficient investment in generator capacity. The solution adopted then was to include a Capacity Remuneration Mechanism within the SEM. These particular problems have not disappeared since the RAs last looked at the electricity market, which implies that some form of CRM is still required. The RAs would therefore need strong arguments to support a decision to remove the CRM now, to persuade investors that conditions had changed, and that the decision was not driven purely by short term political considerations. Otherwise, the RAs would inject new and additional regulatory risk into investors’ perceptions of the all-island market, with adverse consequences for investment and consumers’ interests”.

(NERA report, Executive Summary)

- Accepting the necessity of a CRM going forward, it would be judicious for the SEM Committee, in the interests of the consumer, not to rush into discarding the current mechanism. The current CRM is too easily dismissed in the consultation paper and is done so without convincing reason, especially in the absence of well thought through and workable alternatives that address the ‘market failures’ prevalent in the all-island market, this is a view strongly shared by NERA.
- It is clear from the quality of the consultation paper that consideration of CRMs has suffered in a bid to meet project timelines.
- NERA reviewed the various options being considered for a CRM in the consultation paper and identified “major gaps” in the proposed designs that overlook “important factors” specific to the all-island electricity market. This gives us considerable cause for concern.
- We strongly recommend therefore that further detailed deliberation be given to capacity mechanisms in the I-SEM project before rushing ahead with a decision, potentially resulting in a CRM that is not fit-for-purpose, simply to meet project milestones.
- The challenge and risk of selecting, designing and implementing an entirely new CRM by 1 January 2017 that crucially addresses the market failures it is attempting to remedy should not be underestimated.

- Serious consideration should therefore be given to retaining the current CRM with minimal change⁶⁵. These changes could include moving to an entirely ex-ante mechanism and removing capacity payments from IC flows.
- As we have been advised from both an economic and legal perspective, we understand this is very much possible in the context of both EU Target Model requirements and State Aid compatibility.
- A decision to continue with the current mechanism with minimal change would have the added benefit of easing resource constraints on the RAs, their advisors and market participants and significantly reduce the delivery risk associated with the I-SEM programme.

⁶⁵ As recently as 2012 (and following a lengthy review) it was deemed by the SEM Committee to be “generally working well and that there is no compelling need to make major changes to the current design”. CPM Medium Term Review (2012), Final Decision Paper (SEM-12-016), 6 March 2012, page 3.

7 ANNEX 1 – INDEPENDENT EXPERT REPORTS

The following non-confidential reports accompany and support this response (they are submitted as separate documents prefaced by their Annex reference):

Annex A.1.1: Baringa Report #1: “Promoting forward liquidity and mitigating market power under the I-SEM”, A Report for Viridian, April 2014

Annex A.1.2: Baringa Report #2: “I-SEM HLD consultation: background paper on Option 3”, A Report for Viridian, April 2014

Annex A.1.3: NERA Report: “The capacity remuneration mechanism in the all-island market”, A Report for Viridian, April 2014

Annex A.1.4 Frontier Economics Report: “Benefits of a capacity remuneration mechanism in the SEM”, A Report Prepared for the Electricity Association of Ireland, April 2014

8 ANNEX 2 – SUMMARY COMPARISON OF HLD OPTIONS 1 AND 3

The following table is referenced in section 4.2.5.3 of this response, it is submitted as a separate document prefaced by its Annex reference:

Annex A.2.1: Summary comparison of HLD Options 1 and 3

9 ANNEX 3 - SEM-14-008 CONSULTATION RESPONSE TEMPLATE

1.1 RESPONDENT DETAILS

COMPANY	Energia
CONTACT DETAILS	Kevin Hannafin; kevin.hannafin@energia.ie ; Tel: 07787136820
MAIN INTEREST IN CONSULTATION	<ul style="list-style-type: none"> - Thermal and renewable generation - Renewable development - Business and domestic electricity supply - Demand side units - Energy services

1.2 GENERAL COMMENTS

Please see sections 1, 2, 3 and 6 of our main response for 'General Comments'.

Our response to the detailed questions in this standard template should be read in conjunction with our main response to SEM-14-008 and its accompanying reports. Our answers below will heavily reference relevant sections (and reports) from our main response.

1.3 PURPOSE OF THE DOCUMENT (SECTION 1)

Question	Answer
1. Which option for energy trading arrangements would be your preferred choice for the I-SEM market, and why?	<p>The core principle of the EU Target Model is efficient market coupling. To achieve efficient market coupling, liquidity in spot timeframes is required.</p> <p>The forward market however drives retail pricing. Therefore, to achieve competitive pricing for I-SEM consumers, a liquid forward market is required. (See section 2.1 of the Baringa report "I-SEM HLD Consultation: Promoting forward liquidity and mitigating market power in the I-SEM" (the Forward Liquidity and Market Power report) accompanying this response.)</p> <p>The HLD process has focused on spot and balancing timeframes with insufficient consideration given to the functioning of the forward market.</p> <p>In section 2.4 of the Forward Liquidity and Market Power report, Baringa highlight fundamental issues with the functioning of the current SEM unregulated forward contract market. These issues include limited market access, low trade volumes, wide bid / offer spreads and large premia in NDC pricing levels when compared to DC</p>

	<p>pricing. In section 2.5 they go on to suggest that “[t]hese issues, combined with a high level of [spot] market concentration, could be regarded as being consistent with the presence of a dominant player with limited incentives to trade in the forward market, to the detriment of competitive pricing and consumer choice”.</p> <p>In section 3 of the same report they conclude that because “Option 1 will have a positive effect on participation in the forward market by merchant generation, as well as providing confidence to vertically integrated suppliers that their generation resources will be dispatched if they are in-the-money. Improved access to alternative generation sources will mitigate the ability of dominant participants to elevate prices in forward market timeframes.”</p> <p>A bilateral design also has the additional benefits of:</p> <ol style="list-style-type: none"> 1. Full EU Target Model compliance, future proofing the design for the long term; 2. Simplicity in terms of trading arrangements making it easier for investors to understand; and 3. Flexibility, in terms of allowing regulators to monitor the dynamics of I-SEM and roll back market power mitigation measures if the conditions for adequate competition (and therefore efficient market operation) in each market timeframe have been met. <p>Therefore Energia’s preferred option for the I-SEM HLD is Option 1 – i.e. a bilateral market design. A full description of the market power mitigation measures required under a bilateral design is provided in the answer to question 7 below and in section 4.2.4 of this response.</p> <p>As evidenced by recent experience in the GB electricity market (see section 2.6 of the Forward Liquidity and Market Power), implementation of these recommendations into a bilateral design will ensure I-SEM achieves competitive electricity pricing across all market timeframes lowering costs for I-SEM consumers.</p> <p>They will also ensure the design delivers efficient market coupling and a liquid forward market.</p>
<p>2. Is there a requirement for a CRM in the revised HLD, and why?</p>	<p>Yes. The small size of the I-SEM relative to the large size of a new entrant makes the market significantly more sensitive to:</p> <ul style="list-style-type: none"> • Appropriate new entry: this is because it will take a significantly long time for demand growth in I-SEM to establish a new entry signal. • Inappropriate new entry: this is because it will depress electricity prices significantly long time for prices to return to the level required to recover LRMC. • Market power: because of small market size and sensitivity of price to additional capacity it is easier for a dominant player to forestall new entry and to credibly

	<p>threaten this.</p> <p>Other issues with an energy only market include:</p> <ul style="list-style-type: none"> • Volatile electricity prices with negative effects on I-SEM consumers and investors • Implementation of a cap on electricity prices – prices would need to rise to VOLL for significant periods of time to remunerate investments. • Market power: the ability of a dominant generation portfolio to depress prices below LRMC. • Increasing wind penetration: This reduces load factors for thermal generation and therefore will increase price levels and volatility to recover fixed costs in an energy only market • History of regulatory interventions and perception of opportunistic use of CRMs should the current CRM be discontinued or significantly diluted in the context of (an incorrectly) perceived capacity surplus
<p>3. If there is a requirement for a CRM in the revised HLD, what form would be your preferred choice for the I-SEM, and why?</p>	<p>Serious consideration should be given to retaining the current CRM with minimal change as NERA recommend in their report accompanying this response⁶⁶. This mechanism is tried and tested in the all-island market. As we have been advised from both an economic and legal perspective, we understand it is very much possible to retain the current mechanism with minimal change in the context of both EU Target Model requirements and State Aid compatibility. It is best suited to addressing the identified market failures prevalent on the island of Ireland and should not be so easily dismissed.</p> <p>Should a new CRM be pursued our preference is Option 2A as investors are familiar with it and this form of CRM is demonstrably well suited to addressing the market failures prevalent in the all-island electricity market.</p> <p>Strategic reserve in I-SEM would distort the market and under such a mechanism, a small market like the I-SEM is extremely likely to become reliant on the mechanism to deliver new capacity. – i.e. the “slippery slope syndrome”. It also deters rather than incentivises efficient entry and exit, contrary to what the CRM should be trying to achieve in the all-island context.</p> <p>A short-term price mechanism would introduce significant increased volatility into capacity prices increasing availability risk for generators and therefore discourage investors – i.e. it offers no clear improvement over an energy only market and would fundamentally fail to address the identified market</p>

⁶⁶ As recently as 2012 (and following a lengthy review) it was deemed by the SEM Committee to be “generally working well and that there is no compelling need to make major changes to the current design”. CPM Medium Term Review (2012), Final Decision Paper (SEM-12-016), 6 March 2012, page 3.

	<p>failures requiring a CRM in the all-island market in the first place. A short-term price based mechanism is also vulnerable to exertion of market power by a dominant participant.</p> <p>A 'quantity' based mechanisms would be susceptible to exertion of market power in the I-SEM due to the existence of a single large generation portfolio and the decentralised mechanisms would give considerable cause for concern.</p>
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1.4 TOPICS FOR THE HIGH LEVEL DESIGN OF ENERGY TRADING ARRANGEMENTS (SECTION 4)

Question	Answer
4. Are these the most important topics to consider in the description of the HLD for the revised energy trading arrangements for the single electricity market on the island of Ireland?	<p>The SEMC need to take a holistic approach to the design of the I-SEM. A key consideration is revenue adequacy for generators to ensure security of supply and deliver competitively priced electricity to consumers. It is difficult to fully comment on the feasibility of an overall design for I-SEM without an appreciation of the individual revenue streams for generators – i.e. energy market, CRM and ancillary services.</p> <p>As set out in question 1 above, Energia also strongly emphasise the importance of a competitive forward market to ensure competitive pricing for I-SEM consumers.</p>
5. Are there other aspects of the European Internal Electricity Market that should form part of the process of the High Level Design of energy trading arrangements in the I-SEM?	<p>It is essential that the HLD is flexible enough to accommodate any future changes to the Target Model – e.g. the Network Balancing Code. All other European markets allow for some degree of bilateral physical trading and therefore it would seem prudent to align with this philosophy to future proof the I-SEM design.</p>

1.5 SUMMARY OF THE OPTIONS FOR ENERGY TRADING ARRANGEMENTS (SECTION 5)

Question	Answer
6. What evidence can you provide for the assessment of the HLD options with respect to security of supply, efficiency, and adaptability?	<p>Sections 4.2.1, 4.2.2 and 4.2.3 of this response highlights significant concerns regarding the ability of Options 2, 3 and 4 to deliver efficient market outcomes, which will have detrimental effects on costs for I-SEM consumers.</p> <p>Option 1 will provide the most efficient and stable design for electricity trading arrangements and therefore deliver security of supply. This is because it most closely aligns with other European markets and therefore facilitates adaptability should there be future changes to the EU Target Model.</p>

1.6 ADAPTED DECENTRALISED MARKET (SECTION 6)

Question	Answer
<p>7. Are there any changes you would suggest to make the Adapted Decentralised Market more effective for the I-SEM (for instance, a different choice for one or more of the topics or a different topic altogether)?</p>	<p>Energia suggest the following adaptations are implemented to Option 1. Please cross reference section 4 of the Forward Liquidity and Market Power report</p> <ul style="list-style-type: none"> i. Dominant participants need to be mandated to sell financial forward contracts to mitigate market power in the day-ahead market. Given the failings in the current SEM forward market, the reduction (as under other options) in transparency resulting from the loss of complex offer formats and the potential weakening of SRMC bidding principles, volume commitments in the financial forward market would need to be significantly higher than Directed Contract volumes in the current SEM to be effective. ii. Market Maker obligations need to be imposed on dominant participants to mitigate market power in forward market timeframes. The credit requirements of market makers must be agreed with the oversight of the I-SEM regulatory authorities. The obligation to provide regulated bid / offer spreads in the forward market would provide a strong incentive to price into forward markets at competitive prices. iii. Increased transparency around the forward market contracting activities of dominant ring-fenced entities, in both fuel and electricity markets, is required to remove the opportunity for such entities to ‘virtually’ vertically integrate and thereby “choke off” competition in the retail electricity market. Reduced competition in the retail electricity market will lead to higher prices for I-SEM consumers over the mid to long term. iv. Mandated forward trading through SEM OTC platform (or other designated platform) to promote transparency and price discovery in forward timeframes. v. Monitoring of FTRs / PTRs holdings with the option to impose volume limits to manage potential exertion of market power via I-SEM interconnectors. vi. Investigation of the option of implementing FTRs or if PTRs are implemented, monitoring and reporting of achieved spreads in day-ahead market on nominated interconnector flows.

	<p>vii. Mandated 'counter bidding' of bilateral positions by dominant participants to ensure liquidity in day-ahead and intra-day timeframes. 'Counter bidding' is the placing of a bid in the day-ahead or intra-day market to try to 'buy back' a previously sold bilateral position. Mandated counter bidding would produce a similar effect to gross portfolio bidding in I-SEM because of the presence of a single large, dominant, fuel diverse generation portfolio.</p> <p>viii. Mandated obligation on dominant entities to offer physically un-contracted generation into day-ahead and intra-day timeframes.</p> <p>ix. Mandated participation in the I-SEM balancing market to facilitate constraint management by the TSO. Constraint trades with the TSO must be physically and financially firm. Therefore generators must be able to reflect in their INC and DEC pricing the lost opportunity of trading in energy markets. Note that this would also need to be the case under Option 3.</p> <p>x. Careful consideration needs to be given to the appropriate treatment of pumped storage and hydro assets in day-ahead and balancing timeframes. The flexibility of these units provides significant opportunity for exertion of market power. For example, in the GB electricity market, four pumped storage assets are controlled by three portfolio players. It is not uncommon for individual pumped storage units to submit a balancing bid-offer spread of £500/MWh or more.</p> <p>xi. To the extent that SRMC bidding principles are weakened under I-SEM, the following measures are required to mitigate market power in the balancing market:</p> <ul style="list-style-type: none">a. A high degree of transparency;b. License conditions restricting the scope for the exercise of local market power; andc. Contractual arrangements between generators and the TSO, particularly for pumped storage and hydro assets. <p>Without such measures, the ability to exercise market power in balancing timeframes may undermine economic incentives in ex-ante markets.</p> <p>xii. Publishing of trade data from forward, day-ahead, intra-day and balancing market timeframes. Data</p>
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	<p>should be published as soon as possible after trade execution to facilitate self-policing of I-SEM by participants. Dominant ring fenced entities would need to provide regulators with counterparty specific trade volumes to facilitate adequate monitoring of 'virtual' vertical integration.</p> <p>xiii. The introduction of unit trading (with the exception of wind) in day-ahead and intra-day timeframes should be investigated, and if deemed feasible, considered. Unit bidding would greatly aid transparency in day-ahead and intra-day timeframes.</p> <p>xiv. A strong and independent market monitoring function that can provide expert analysis on market dynamics across <u>all</u> trading timeframes and report potential abuses of market power to relevant authorities.</p> <p>xv. A clear redress mechanism for the abuse of market power by I-SEM participants.</p> <p>As evidenced by recent experience in the GB electricity market, implementation of these recommendations in a bilateral market design will ensure I-SEM provides competitive pricing for consumers by delivering efficient market coupling and a liquid forward market for the I-SEM.</p>
<p>8. Do you agree with the qualitative assessment of the Adapted Decentralised Market against the HLD criteria? If not, what changes to the assessment would you suggest (including the relative strengths and weaknesses of an option)?</p>	<p>Option 1, with the addition of the market power mitigation measure we have suggested (cross reference our answer to question 7), will deliver a stable basis for energy trading for the I-SME over the long-term.</p> <p>With the appropriate regulatory oversight we therefore believe it can deliver upon all of the high-level design assessment criteria.</p>
<p>9. How does the Adapted Decentralised</p>	<p>Option 1, with the addition of the market power mitigation measure we have suggested (cross reference our answer to question 7) will deliver a stable basis for electricity trading for the I-SME over the long-term. It will drive both</p>

<p>Market measure against the SEM Committee's primary duty to protect the long and short term interests of consumers on the island of Ireland?</p>	<p>wholesale and therefore retail competition within the I-SEM, delivering both short and long-term benefits to the consumer.</p>
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1.7 MANDATORY EX-POST POOL FOR NET VOLUMES (SECTION 7)

Question	Answer
<p>10. Are there any changes you would suggest to make the Mandatory Ex-post Pool for Net Volumes more effective for the I-SEM (for instance, a different choice for one or more of the topics or a different topic altogether)?</p>	<p>No. The design is not feasible for the reasons outlined in section 4.2.1 of this response.</p>
<p>11. Do you agree with the qualitative assessment of Mandatory Ex-post Pool for Net Volumes against the HLD criteria? If not, what changes to the assessment would you suggest (including the relative strengths and</p>	<p>No. The design is not feasible for the reasons outlined in section 4.2.1 of this response.</p>

weaknesses of an option)?	
12. How does the Mandatory Ex-post Pool for Net Volumes measure against the SEM Committee's primary duty to protect the long and short term interests of consumers on the island of Ireland?	The design is not feasible for the reasons outlined in section 4.2.1 of this response.

1.8 MANDATORY CENTRALISED MARKET (SECTION 8)

Question	Answer
13. Are there any changes you would suggest to make the Mandatory Centralised Market more effective for the I-SEM (for instance, a different choice for one or more of the topics or a different topic altogether)?	<p>Energia suggest the following adaptations would need to be implemented to Option 3 but stress that the design is high-risk for I-SEM regulators, generators and consumers due to the use of the EUPHEMIA as the day-ahead mandatory pool algorithm. This is discussed at length in section 4.2.3 of this response. Please cross reference the market power mitigation measures suggested by Baringa in section 4 of their report entitled Forward Liquidity and Market Power.</p> <ul style="list-style-type: none"> i. Dominant participants need to be mandated to sell financial forward contracts to mitigate market power in the day-ahead market. Given the failings in the current SEM forward market, the reduction in transparency resulting from the loss of complex offer formats and the potential weakening of SRMC bidding principles, volume commitments in the financial forward market would need to be significantly higher than Directed Contract volumes in the current SEM to be effective. ii. Market Maker obligations need to be imposed on dominant participants to mitigate market power in forward market timeframes. The credit requirements of market makers must be agreed with the oversight of the I-SEM regulatory authorities. The obligation to provide regulated bid / offer spreads in the forward market would provide a strong incentive to price into forward markets at competitive prices.

	<p>iii. Increased transparency around the forward market contracting activities of dominant ring-fenced entities, in both fuel and electricity markets, is required to remove the opportunity for such entities to ‘virtually’ vertically integrate and thereby “choke off” competition in the retail electricity market. Reduced competition in the retail electricity market will lead to higher prices for I-SEM consumers over the mid to long term.</p> <p>iv. Mandated forward trading through SEM OTC platform (or other designated platform) to promote transparency and price discovery in forward timeframes.</p> <p>xi. Monitoring of holding limits for FTRs by participants with the option to impose volume limits to manage potential exertion of market power via I-SEM interconnectors.</p> <p>v. Careful consideration needs to be given to the appropriate treatment of pumped storage and hydro assets in day-ahead and balancing timeframes. The flexibility of these units provides significant opportunity for exertion of market power. For example, in the GB electricity market, four pumped storage assets are controlled by three portfolio players. It is not uncommon for individual pumped storage units to submit a balancing bid-offer spread of £500/MWh or more.</p> <p>vi. To the extent that SRMC bidding principles are weakened under I-SEM, the following measures are required to mitigate market power in the balancing market:</p> <ul style="list-style-type: none">a. A high degree of transparency;b. License conditions restricting the scope for the exercise of local market power; andc. Contractual arrangements between generators and the TSO, particularly for pumped storage and hydro assets. <p>Without such measures, the ability to exercise market power in balancing timeframes may undermine economic incentives in ex-ante markets.</p> <p>vii. Publishing of trade data from forward, day-ahead, intra-day and balancing market timeframes. Data should be published as soon as possible after trade execution to facilitate self-policing of I-SEM by participants. Dominant ring fenced entities would</p>
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	<p>need to provide regulators with counterparty specific trade volumes to facilitate adequate monitoring of 'virtual' vertical integration.</p> <p>viii. A strong and independent market monitoring function that can provide expert analysis on market dynamics across <u>all</u> trading timeframes and report potential abuses of market power to relevant authorities.</p> <p>ix. A clear redress mechanism for the abuse of market power by I-SEM participants.</p> <p>Please note the similarity of these measures to the measure required under Option 1. The requirements for significant market power measures under Option 3 is due to the likely weakening of SRMC bidding principles under I-SEM, either due to changes to the CRM or because of translation from complex offers to EUPHEMIA offer formats.</p>
<p>14. Do you agree with the qualitative assessment of Mandatory Centralised Market against the HLD criteria? If not, what changes to the assessment would you suggest (including the relative strengths and weaknesses of an option)?</p>	<p>The integrity of the Option 3 design depends upon the feasibility of using EUPHEMIA as the I-SEM day-ahead pool algorithm. For the reasons outlined in section 4.2.3 of this response and the accompanying Baringa report "I-SEM HLD Consultation: Background paper on Option 3", we question the validity of this assumption and note that much of the perceived benefits of Option 3 can be achieved by implementing appropriate market power mitigation measures into Option 1, similar to those set out in the answer to question 7 above.</p> <p>Energia has also had sight of analysis undertaken by Energy-Link Partnership (EL) which modelled the Euphemia Algorithms under Option 3, this analysis acted to confirm Energia's concerns in relation to the levels of outturn prices and schedule outcomes in I-SEM based on EL's typical day studies</p> <p>If the proposed use of EUPHEMIA is not feasible then it undermines the ability of the design to deliver upon the high-level design assessment criteria.</p> <p>It is important to note that our concern regarding EUPHEMIA relates <u>exclusively</u> to its proposed use under Option 3 and not to the general use of the algorithm itself. Please note that we have no concerns regarding the use of EUPHEMIA under any of the other HLD options proposed in the consultation paper.</p>
<p>15. How does the Mandatory Centralised</p>	<p>As noted in section 4.2.3 of this response, Energia view a decision to proceed with Option 3 as a high-risk strategy.</p>

<p>Market measure against the SEM Committee’s primary duty to protect the long and short term interests of consumers on the island of Ireland?</p>	<p>This is predominantly due to uncertainty regarding the proposed use of EUPHEMIA coupled with a loss of governance over the I-SEM day-ahead market.</p> <p>Issues with the I-SEM day-ahead market would have serious repercussions for the integrity of the design and the functioning of the I-SEM in all timeframes. Therefore, adopting the design without first completing rigorous “proof of concept” testing would not be in the interest of I-SEM consumers and could have costly consequences. Furthermore, we consider it an unnecessary risk given the option to implement an adapted version of design Option 1.</p> <p>If a decision were taken to proceed with Option 3 Energia strongly recommend that an alternative ‘Plan B’ design is developed.</p> <p>It is important to note that our concern regarding EUPHEMIA relates <u>exclusively</u> to its proposed use under Option 3 and not to the general use of the algorithm itself. Please note that we have no concerns regarding the use of EUPHEMIA under any of the other HLD options proposed in the consultation paper.</p>
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1.9 GROSS POOL – NET SETTLEMENT MARKET (SECTION 9)

Question	Answer
<p>16. Are there any changes you would suggest to make the Gross Pool – Net Settlement Market more effective for the all I-SEM (for instance, a different choice for one or more of the topics or a different topic altogether)?</p>	<p>No. For the reasons outlined in section 4.2.2 of this response Energia does not believe Option 2 is a feasible design within the context of the EU Target Model.</p>
<p>17. Do you agree with the qualitative</p>	<p>No. As discussed in section 4.2.2 of this response we believe there are EU Target Model compliance issues with Option 4 and therefore we do not believe the design</p>

<p>assessment of Gross Pool – Net Settlement Market against the HLD criteria? If not, what changes to the assessment would you suggest (including the relative strengths and weaknesses of an option)?</p>	<p>will provide a stable basis for I-SEM electricity trading arrangements over the mid to long term. This is due to the likely liquidity issues in ex-ante timeframes that will be a barrier to efficient market coupling.</p> <p>In addition to our concerns about liquidity in ex-ante timeframes, we also question the equitableness and efficiency of the design.</p>
<p>18. How does the Gross Pool – Net Settlement Market measure against the SEM Committee’s primary duty to protect the long and short term interests of consumers on the island of Ireland?</p>	<p>Non-compliance will cause future instability in I-SEM electricity trading arrangements. The design is also unlikely to achieve the potential benefits of market coupling or reduce curtailment issues under I-SEM (the requirement for SO to SO countertrading). This is detrimental for the I-SEM consumer.</p> <p>The potential inequities and inefficiencies in the design could also cause issues for revenue adequacy, particularly for marginal generators. This could have longer term issues for investment and security of supply in the I-SEM.</p>

1.10 CAPACITY REMUNERATION MECHANISMS (CHAPTER 10)

Question	Answer
<p>19. What are the rationales for and against the continuation of some form of CRM as part of the revised trading arrangements for the I- SEM?</p>	<p>Please refer to the NERA and Frontier Economics reports that accompany this response which support the continuation of a CRM. There are no reasonable arguments that support the removal of a CRM in the all-island market which suffers from several market failures as a result of its small size, market power and high levels of wind penetration.</p> <p>Energy only markets increase volatility of electricity prices. This is particularly the case in a small market like I-SEM with increasing levels of wind penetration that will then require thermal generators to spread fixed costs over lower utilisation factors. They are also vulnerable to “missing money” via implicit or explicit price caps and/or market power.</p> <p>These concerns would combine in I-SEM to make an energy-only market a risky prospect for investors, thereby increasing the cost of capital for investing in the market. This could lead to significant issue attracting new investment into the market with</p>

	<p>detrimental effects on the I-SEM consumer.</p> <p>See section 5.1 of our response for further detailed explanation. Please also cross reference our answer to question 4.</p> <p>Further high level comments:</p> <ul style="list-style-type: none"> • The existing CRM would be retained with minimal changes • Option 2A should be progressed if the existing CRM is not retained. • Option 3 would require significant regulatory interventions and adaptations to suit the all-island market conditions (market power and highly concentrated market) and be tailored to accommodate wind • The CRM must be designed for the all-island context which is a small concentrated market that already has a (long-term price based) capacity mechanism (which rewards wind). • State Aid proposed requirements, should they be deemed to apply, are sufficiently flexible that most CRM designs for the particular characteristics of the SEM should be capable of being argued as permissible interventions. The clear lesson from the State Aid guidelines is that the economics of the all-island electricity market is important to the design of any capacity payment and need to be considered in combination with any legal constraints. • Theoretical solutions to perfect markets should not be ‘tested’ on the Irish market which is a long way from being perfect (market dominance, regulatory risk, market size) • The ‘decentralised reliability option” has not been adopted elsewhere and the assessment of this approach does not appear to be balanced.
<p>20. Are these the most important topics for describing the high level design of any future CRM for the I-SEM?</p>	<ul style="list-style-type: none"> • The objective of the CRM in the context of the market failure it is attempting to remedy must be explicitly defined (this has not been done) • See Chapter

1.11 STRATEGIC RESERVE (CHAPTER 10.7)

Question	Answer
<p>21. Are there any changes you would suggest to make the design of a Strategic Reserve mechanism more effective for the I-SEM (for instance a different choice for one or more of the topic?)</p>	<p>High level comments:</p> <ul style="list-style-type: none"> • A high risk exists that this will not deliver revenue adequacy for market participants • A Strategic Reserve is effectively an intensive ancillary service rather than a CRM – it provides an opportunity for generators to exit the residual energy market. • Capacity that is held as strategic reserve is kept separate from the energy market. All other generation capacity would still be reliant on the energy only market to recover their capacity costs (where this has proven insufficient in the context of high levels of low marginal cost, variable renewables • This would not address the significant increase risk identified in the Frontier Economics report. • EAI considers that a Strategic Reserve is inappropriate for a small, relatively isolated system with exceptional levels of variable generation (It depends on energy market signals to be the primary driver of investment).
<p>22. Do you agree with the initial assessment of the strengths and weaknesses of a Strategic Reserve Mechanism? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?</p>	<p>No. Energia does not agree with the assessment of Strategic Reserves. See section 5.3.1 of this response.</p>
<p>23. Would a Strategic Reserve Mechanism work or fit more</p>	<p>Would not address market failures prevalent in the all-island electricity market irrespective of energy trading arrangements. See section 5.3.1 of this response.</p>

effectively with a particular option for the energy trading arrangements. If so, which one and why?	
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1.12 LONG-TERM PRICE-BASED CRM (CHAPTER 10.9)

Question	Answer
24. Are there any changes you would suggest to make the design of a Long-term price-based CRM effective for the I-SEM (for instance a different choice for one or more of the topic?)	<p>A Long term Price-based CRM would represent the minimum change from the current arrangements</p> <p>Securing state approval is achievable because it is the most appropriate way of addressing market failures in Ireland</p> <p>This Option requires minimal change to satisfy market coupling requirements by not paying capacity for interconnector flows.</p> <p>Definition of capacity margin becomes important as the mechanism must be responsive to this value to ensure an appropriate exit signal exists.</p>
25. Do you agree with the initial assessment of the strengths and weaknesses of a Long-term price-based CRM? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?	
26. Would a Long-term price-based CRM work or fit	

<p>more effectively with a particular option for the energy trading arrangements. If so, which one and why?</p>	
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1.13 SHORT-TERM PRICE-BASED CRM (CHAPTER 10.10)

Question	Answer
<p>27. Are there any changes you would suggest to make the design of a Short-term price-based CRM effective for the I-SEM (for instance a different choice for one or more of the topic)?</p>	<p>High level comments:</p> <p>Provides little benefit over an energy-only market.</p> <p>Historically, the day-ahead LOLP mechanism in the England & Wales Pool provided an elegant solution to capacity pricing in theory, but in practice did not deliver a reliable signal for short term operational planning or long term investment, and was open to manipulation.</p> <p>See section 5.3.2 of our response.</p>
<p>28. Do you agree with the initial assessment of the strengths and weaknesses of a Short-term price-based CRM? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?</p>	<p>See section 5.3.2 of our response.</p>
<p>29. Would a Short-term price-based CRM work or fit more effectively with a particular option for the</p>	<p>A short-term price based mechanism would not address the identified market failures, therefore this question is irrelevant. See section 5.3.2 of our response.</p>

energy trading arrangements. If so, which one and why?	
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1.14 QUANTITY-BASED CAPACITY AUCTION (CHAPTER 10.11)

Question	Answer
30. Are there any changes you would suggest to make the design of a Quantity-based Capacity Auction CRM effective for the I-SEM (for instance a different choice for one or more of the topic)?	<p>High level comments:</p> <p>Depending on contract arrangements and the opportunity to deviate from reliability standard the value of the CRM could fluctuate greatly from year to year (similar to the saw tooth price profile) due to the effect of Unit size relative to the size of market</p> <p>Less predictable capacity price may impact consumers as Suppliers would have difficulty hedging their positions</p> <p>Liquidity risk for secondary trading given small market size and market power</p> <p>Penalty regime may increase non-delivery risks (relative to current CRM or energy-only)</p> <p>See section 5.3.3 of this response.</p>
31. Do you agree with the initial assessment of the strengths and weaknesses of a Quantity-based Capacity Auction CRM? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?	See section 5.3.3 of this response.
32. Would a Quantity-based Capacity Auction	A quantity-based capacity auction would be susceptible to market power abuse. Its compatibility or otherwise with the energy trading arrangements is irrelevant unless it addresses

CRM work or fit more effectively with a particular option for the energy trading arrangements. If so, which one and why?	the identified market failures. See section 5.3.3 of this response.
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1.15 QUANTITY-BASED CAPACITY OBLIGATION (CHAPTER 10.12)

Question	Answer
33. Are there any changes you would suggest to make the design of a Quantity-based Capacity Obligation CRM effective for the I-SEM (for instance a different choice for one or more of the topic)?	<p>High level comments:</p> <p>Given the relatively small size of the Irish market, its high concentration and market dominance, CRM designs that rely on liquid trading of capacity instruments between market participants cannot be effective without significant regulatory intervention.</p> <p>Value of CRM could fluctuate greatly from year to year (similar to the saw tooth price profile) due to the effect of Unit size relative to the size of market</p> <p>Relies on liquid trading with capacity providers - liquidity risk for secondary trading given small market size and vertical integration</p> <p>Unpredictable capacity price would impact consumers as Suppliers would have difficulty hedging their positions raising questions as to its compatibility with dynamic retail market</p> <p>Questionable Credit cover requirements could be onerous</p> <p>High RES penetration has resulted in significantly higher installed capacity than peak demand. Capacity obligations present a benefit for vertically integrated market participants who can secure certificates from within their generation portfolio and significantly reduce the capacity revenue available to non-portfolio players</p> <p>See section 5.3.4 of this response.</p>
34. Do you agree with the initial	See section 5.3.4 of this response.

<p>assessment of the strengths and weaknesses of a Quantity-based Capacity Obligation CRM? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?</p>	
<p>35. Would a Quantity-based Capacity Obligation CRM work or fit more effectively with a particular option for the energy trading arrangements. If so, which one and why?</p>	<p>The question is irrelevant.</p>

1.16 CENTRALISED RELIABILITY OPTIONS (CHAPTER 10.14)

Question	Answer
<p>36. Are there any changes you would suggest to make the design of a Centralised Reliability Option CRM effective for the I-SEM (for instance a different choice for one or more of the topic)?</p>	<p>Reliability options are</p> <p>This option introduces potential naked exposure to high pay-outs. Both centralised and decentralised reliability options result in generators entering a one-way CfD. It is presumed that where the SMP is in excess of the strike price the generator will be generating and therefore will have revenue from which to pay the difference payment. It is not clear under any of the energy options that this will in fact be the case. If the generator is scheduled as a result of a non-energy balancing action the revenue the generator receives will be paid as bid. The generator will therefore not have received the revenue from which to pay the difference payment and the reliability option will be a liability.</p>

	<p>Physical backing will be required for this to deliver security of supply, reducing any simplicity and efficiency benefits of this option</p> <p>See section 5.3.5 of this response.</p>
<p>37. Do you agree with the initial assessment of the strengths and weaknesses of a Centralised Reliability Option? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to the others)?</p>	<p>See section 5.3.5 of this response.</p>
<p>38. Would a Centralised Reliability Option work or fit more effectively with a particular option for the energy trading arrangements. If so, which one and why?</p>	<p>See section 5.3.5 of this response.</p>

1.17 DECENTRALISED RELIABILITY OPTIONS (CHAPTER 10.15)

Question	Answer
<p>39. Are there any changes you would suggest to make the design of a</p>	<p>High level comments:</p> <ul style="list-style-type: none"> Given the relatively small size of the Irish market, we do not consider that CRM designs which rely on liquid trading of capacity instruments between market participants can be effective.

<p>Decentralised Reliability Option CRM effective for the I-SEM (for instance a different choice for one or more of the topic)?</p>	<ul style="list-style-type: none"> • There is insufficient detail to assess viability particularly the decentralised option as we believe no example exists for this globally, Consequently, the implementation risk is higher than in other options • To avoid “naked exposure” to CfD payments, generators need to be confident of being scheduled whenever energy prices exceed the strike price. Both centralised and decentralised reliability options result in generators entering one-way a CfD. It is presumed that where the SMP is in excess of the strike price the generator will be generating and therefore will have revenue from which to pay the difference payment. It is not clear under any of the energy options that this will in fact be the case. If the generator is scheduled as a result of a non-energy balancing action the revenue the generator receives will be paid as bid. The generator will therefore not have received the revenue from which to pay the difference payment and the reliability option will be a liability. • Relies on liquid trading with capacity providers. • May not have a common price across suppliers. • Proposed design unclear how obligations enforced if suppliers can choose different strike prices, potentially “free riding” on reliability procured by competitors • Physical backing will be required for this to deliver security of supply, reducing any simplicity and efficiency benefits of this option <p>See section 5.3.5 of this response.</p>
<p>40. Do you agree with the initial assessment of the strengths and weaknesses of a Decentralised Reliability Option? If not, what changes to the assessment would you suggest (including the strengths and weaknesses of an option relative to</p>	<p>See section 5.3.5 of this response.</p>

the others)?	
41. Would a Decentralised Reliability Option work or fit more effectively with a particular option for the energy trading arrangements. If so, which one and why?	See section 5.3.5 of this response.