

Single Electricity Market Scope of CPM Medium Term Review

Consultation Paper

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1 BACKGROUND

In May 2005 the Regulatory Authorities (RAs) set out the options for the Single Electricity Market (SEM) Capacity Payment Mechanism (CPM)¹. In the paper the RAs indicated their proposal to develop a fixed revenue capacity payment mechanism that would provide a degree of financial certainty to generators under the new market arrangements and a stable pattern of capacity payments. The principles outlined were incorporated in the design of the CPM and in the Trading and Settlement Code (TSC).

In March 2006² a consultation document was published that incorporated a more detailed consideration of the comments received on the design of the CPM and put forward a number of alternative options for the CPM and the processes that the RAs propose for determining the annual capacity payment and the general process by which it is proposed that input parameters to the CPM would be set.

The March 2006 paper reiterated the proposed outline of the CPM for the SEM suggesting that annual capacity payments should be fixed and that the annual fixed sum be divided into a number of within-year pots, i.e. Capacity Periods. The paper also set out proposals for the determination of the Annual Capacity Payment Sum (ACPS). The paper proposed that the annual aggregate capacity payments should be set by multiplying an appropriate level of required generation capacity by the relevant fixed costs of a best new entrant peaking generator. The RAs proposed that, for the purposes of determining the ACPS, the cost of new entrant generation should be assessed in terms of a 'Best New Entrant' (BNE) peaking plant. The cost of the BNE peaking plant calculated would be expressed in €/kW per year (as an annualised payment) and multiplied by the capacity requirement to calculate the ACPS.

¹ <http://www.allislandproject.org/en/capacity-payments-consultation.aspx?page=2&article=0e5940cb-4c5d-4e01-982d-2b3587c33d2d>

² <http://www.allislandproject.org/en/capacity-payments-consultation.aspx?page=2&article=94ef0599-001a-4923-a706-7682f76ec79b>

2 CPM OBJECTIVES

The criteria, which have formed the basis of the Regulatory Authorities' decision making process in relation to the CPM, are outlined below.

1) Capacity Adequacy/ Reliability of the system

The CPM must encourage both the construction and maintained availability of capacity in the SEM. Security of the system, will be the core feature of the CPM.

2) Price Stability

The CPM should reduce market uncertainty compared to an energy only market, taking some of the volatility out of the energy market

3) Simplicity

The CPM should be transparent, predictable and simple to administer, in order to lower the risk premium required by investors in generation. A complex mechanism could reduce investor confidence in the market and increase implementation costs.

4) Efficient price signals for Long Term Investments

In theory it would be possible to incentivise vast amounts of capacity over and above that necessary for system security in the SEM, although the cost of implementing such a scheme may be unacceptable to customers. The CPM should meet the criterion in this section at the lowest reasonable cost. Revenues earned by generators should still efficiently signal appropriate market entry and exit.

5) Susceptibility to Gaming

The CPM should not be susceptible to gaming and, ideally, should not rely unduly on non-compliance penalties.

6) Fairness

The CPM should not unfairly discriminate between participants. An appropriate CPM will maintain reasonable proportionality between the payments made to achieve capacity adequacy and the benefits received from attaining capacity adequacy.

3 PREVIOUS BNE CALCULATIONS

As part of the Regulatory Authorities' (RAs) agreed duties in the administration of the Capacity Payments Mechanism of the SEM, there have to date been three iterations of calculations by the RAs for the Fixed Costs of a Best New Entrant Peaking Plant. The three iterations have been conducted for the Trading Years 2007, 2008 and 2009. These are summarised below.

3.1 2007 BNE CALCULATION

On 13 February 2007 the RAs published a Consultation Paper entitled 'Fixed Cost of a New Entrant Peaking Plant for the Capacity Payment Mechanism; Decision and Further consultation Paper' (SEM-07-014). A subsequent Decision Paper (SEM-07-187), stipulating the final Best New Entrant Fixed Costs for 2007 was published on 18 May 2007. The plant chosen for the BNE for 2007 was:

- Alstom 13E2 Gas Turbine
- Distillate-fired
- Located in the Republic of Ireland (RoI)
- Annualised fixed cost of €85.04/kW/yr
- Estimated Infra-marginal Rent of €14.19/kW/yr
- Estimated Ancillary Service Revenue of €6.12/kW/yr
- Adjusted annualised fixed cost of **€64.73/kW/yr**

3.2 2008 BNE CALCULATION

The BNE Fixed Costs for 2008 were worked out based upon the settings for 2007, with indexing applied to certain parameters. This is described in the paper 'Annual Capacity Payment Sum – Final Value for 2008' (AIP-SEM-07-458).

- Estimated Infra-marginal Rent of €0.00/kW/yr
- Estimated Ancillary Service Revenue of €6.18/kW/yr
- Adjusted annualised fixed cost of **€79.77/kW/yr**

3.3 2009 BNE CALCULATION

On 4 July 2008 the SEM Committee (SEMC) published a Consultation Paper entitled 'Fixed Cost of a Best New Entrant Peaking Plant for the Calendar Year 2009' (SEM-08-083). A subsequent Decision Paper (SEM-08-109), stipulating the final Best New Entrant Fixed Costs and Capacity Requirement for 2009 was published on 11 September 2008.

The plant chosen for the BNE for 2009 was:

- Siemens SGT5 2000E Gas Turbine
- Distillate-fired
- Located in the Republic of Ireland (RoI)
- Annualised fixed cost of €93.81/kW/yr
- Estimated Infra-marginal Rent of €0.00/kW/yr

- Estimated Ancillary Service Revenue of €6.69/kW/yr
- Adjusted annualised fixed cost of **€87.12/kW/yr**

3.4 ANNUAL CAPACITY PAYMENTS SUM (ACPS)

The annualised fixed cost of the BNE Peaker is then multiplied by Capacity Requirement resulting in the Annual Capacity Payments Sum (ACPS). The ACPS for the Trading Years 2007, 2008 and 2009 were / are:

ACPS 2007	€450,517,348
ACPS 2008	€575,221,470
ACPS 2009	€640,854,720

Table 1 – ACPS for the Trading Years 2007, 2008 and 2009

4 OBJECTIVES OF SCOPING PAPER

On 9 March 2009 the SEMC published a consultation paper (SEM-09-023), presenting options to introduce further stability in the CPM. In this paper, the SEMC signalled its intention to carry out a further review of the CPM in the medium term. The main purpose of this review is to examine if the current design of the CPM can be further improved to optimally meet the objectives set out in section 3.

This paper documents the scope of work that the SEMC intend to carry out in relation to a medium term review of the Capacity Payment Mechanism. The SEMC have now completed three iterations of calculating the capacity pot. The SEMC believe that the SEM is now well enough established and there is sufficient historical data and opinions collated from the various consultation processes to allow the RAs to carry out a review of the CPM.

The SEMC considers the CPM as a key feature of the SEM design. The SEMC believe that extensive analysis and consultation on this topic took place prior to SEM Go Live and that the concept of the CPM should remain in place. The SEMC wishes to satisfy that the correct signals and appropriate incentives or rewards are inherent in the design, so as to meet its objectives optimally. In particular the SEMC are mindful that CPM provides signals for new entry/investment and should reward plant and capacity in accordance with its performance.

The areas under consideration in this paper are detailed below. Each of these areas is discussed later in this paper:

- Assessment of CPM in SEM (historical analysis)
- Impact of CPM on Customers
- Incentives for Generators Capacity
- Payments when Capacity is needed
- Distribution of Capacity Payments
- Capacity Requirement Calculation
- WACC Methodology
- Infra Marginal Rent & CPM
- Impact of Exchange Rate in CPM
- Treatment of Wind in CPM
- Treatment of Interconnector in CPM
- Relationship of CPM with Ancillary Services
- Impact on Diversity of Generation & Security of Supply

The RAs, on half of the SEMC, intend to review the current process used for distributing the capacity pot among generators and the calculations for payments by suppliers. There have been a number of information notes and documents relating to this topic (such as the Information note on Treatment of Different Technology Types under the CPM³). This consultation paper details out the current process for calculating the Annual Capacity Payment Sum. The paper then details the key strategic areas that should be considered going forward.

The intention of this paper is to give market participants visibility of the RAs intentions in relation to the CPM and to seek comments on the proposed work streams.

³ <http://www.allislandproject.org/en/capacity-payments-consultation.aspx?article=18746b49-ac99-41b6-9682-57ad8606ae68>

The RAs have already produced a consultation document (SEM-09-023), relating to the perceived volatility of the CPM and proposed a number of options to help reduce the level of volatility. This particular issue is not regarded as part of the scope of this paper, but depending on the response from market participants, may be added to the scope when the responses have been fully reviewed and assessed.

5 CURRENT METHODOLOGY

While SMP pricing ensures that SMP reflects the value of energy, the Capacity Payments Mechanism attaches a value to the provision of capacity within the market. The Capacity Payments Mechanism is intended to strike a balance between providing the highest capacity prices at periods of highest loss-of-load probability or tightest margin in order to value the provision of capacity appropriately, and providing a stable set of investment signals.

Under the Capacity Payments Mechanism, Capacity Payments are made in respect of Generator Units based on a measure of their availability, and hence the provision of capacity. Capacity Payments are funded by Capacity Charges, which are levied in respect of Supplier Units based upon their electricity consumption.

The Diagram below shows the current method used.

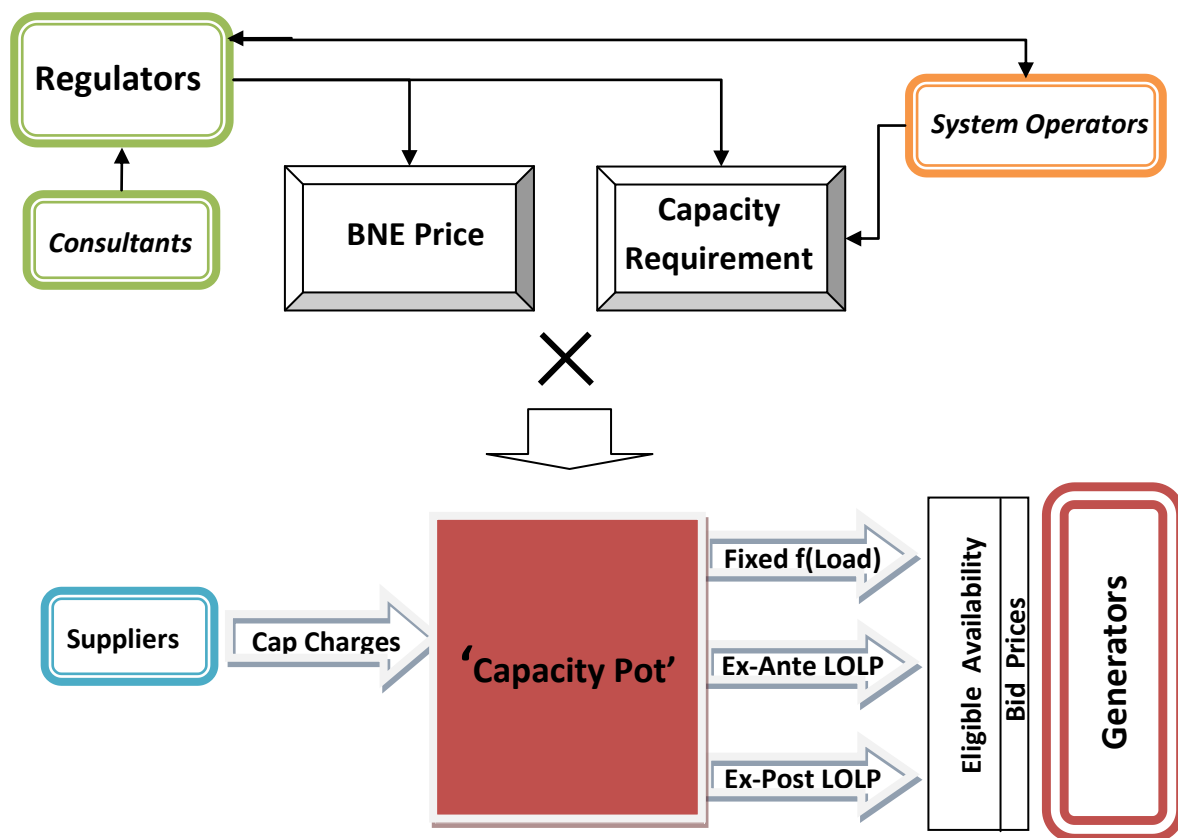


Figure 1 – Process for Calculation of Capacity Pot

For the past two iterations, the RAs have carried out an annual exercise of determining the size of the capacity pot. This entails the estimation of the cost of a BNE Peaker with assistance from engineering consultants. RAs simulate the approach of a rational investor in choosing technology type, size and plant dynamics and also consider the desire of the TSO's. The RAs have fully consulted on the process and as a result have noted significant responses from generators but almost nothing from suppliers.

The current mechanism for distribution of the pot is defined in the Capacity Payment Factors Decisions Paper published in December 2006 (SEM-231-06). The CPM is split into 12 monthly pots. These are then further split into 3 payments:

- **Capacity Period Fixed Sum (currently 30%)** - Profiled into Trading Periods based on Forecast Demand in that Trading Period relative to the minimum Forecast Demand in the relevant Capacity Period. Profile determined before start of Year.
- **Capacity Period Variable Sum (currently 40%)** - Profiled into Trading Periods based on forecast Loss of Load Probability in that Trading Period relative to sum of forecast Loss of Load Probabilities for each Trading Period in the Capacity Period. Profile determined before start of Capacity Period.
- **Capacity Period Ex-Post Sum (currently 30%)** - Profiled into Trading Periods based on ex-post Loss of Load Probability in that Trading Period relative to sum of ex-post Loss of Load Probabilities for each Trading Period in the Capacity Period. Profile determined ex-post, after Capacity Period.

6 AREAS UNDER CONSIDERATION IN MEDIUM TERM CPM REVIEW

There are a number of areas that the SEMC have identified that should be considered within the scope of the CPM medium term review. These are based both on internal discussions and from comments received from market participants to consultations relating to the CPM. The areas under consideration are as follows:

- Assessment of CPM in SEM (historical analysis)
- Impact of CPM on Customers
- Incentives for Generators Capacity
- Payments when Capacity is needed
- Distribution of Capacity Payments
- Capacity Requirement Calculation
- WACC Methodology
- Infra Marginal Rent & CPM
- Impact of Exchange Rate in CPM
- Treatment of Wind in CPM
- Treatment of Interconnector in CPM
- Relationship of CPM with Ancillary Services
- Impact on Diversity of Generation & Security of Supply

The RAs, on behalf of the SEMC, plan to have a work stream for each of the areas above. Some of the work streams will run in parallel, while some will be dependent on the output of other work streams. Each work stream is described briefly below.

6.1 ASSESSMENT OF CPM IN SEM

The RAs propose to analyse the data relating to the CPM from SEM Go Live to determine whether the CPM is meeting the current objectives. Specifically the RAs propose to look at:

- The effect of the distribution of capacity payments on availability, particularly at times when capacity is needed most.
- The effect of the scheme on incentives/signals to enter and exit the market.
- The effect of the scheme on the type of plant planned or being built.
- The effect of the scheme on the diversity of generation.
- The effect of the scheme on use of the Moyle interconnector.

The RAs propose that this activity should be carried out first as the findings from this investigation may act as an input into the other areas of work described below.

Consultation Point 1:

The RAs welcome comments and backup material from participants in relation to any historical analysis they have carried out in relation to the CPM.

6.2 IMPACT OF CPM ON CUSTOMERS

Following on from the scope detailed in section 7.1, the RAs intend to investigate the impact that the CPM has had on customers and the retail market. This will be based on initially assessing the historical data on the CPM. The RAs will also assess the calculations being used to determine the capacity payments applied to suppliers.

Consultation Point 2:

The RAs welcome comments from participants in relation to the impact of the CPM on consumers and the methodology for payments by suppliers

6.3 INCENTIVES FOR GENERATORS

Currently under the CPM, generators are paid almost wholly based on Eligible Availability. This means that two generators who have the same EA value get the same⁴ payments regardless of the other parameters that make up the generator. The flexibility of the generator is not taken into consideration.

The RAs propose that there is the potential to expand the criteria that could be used to determine how the capacity pot is paid out. Some suggested parameters that have previously been discussed that could be used to further incentivise the generators and act as additional entry and exit signals to the market are detailed below:

- Fast Start
- Reliable Start
- Short Minimum Up and Down times
- High Ramp Rates

The RAs understand that with the increase in renewables on the island of Ireland, the requirement for more flexible plant will also increase. Therefore there is the option of creating the incentives via the CPM to attract the appropriate mix of plant and reward accordingly. An incentive mechanism will also act as an exit signal for those inefficient and underperforming plants that do not provide a value-add to the changing generation portfolio.

As well as incentives, there is also the option to introduce disincentives in the event that availability is not forthcoming when required or dispatched by the TSOs; this could fall under the 'reliable start' criterion for example.

This area of consideration could enhance the CPM Objectives relating to Capacity Adequacy, Efficient price signals for Long Term Investments and Fairness; however, it could reduce the predictability and simplicity of the Calculations for the CPM.

⁴ A small adjustment is made to distinguish the price of unscheduled quantities but it has diminishing effect compared to the weighting of Eligible Availability

Consultation Point 3:

The RAs welcome comments from participants in relation to incentives that could be introduced within the Capacity Payment Mechanism or covered under the Ancillary Services mechanism.

6.4 CAPACITY PAYMENTS WHEN CAPACITY IS NEEDED

An area that needs to be given due consideration and could be linked with the concept of incentives described in Section 7.3 above is that Capacity Payments should reward generators for being available when the capacity is needed.

It has been suggested that the current scheme does not adequately reflect the differing value of capacity through the day, week and season. The RAs intend to investigate the impact of when capacity payments are made and determine if a more appropriate distribution of the pot is possible. This area of work will need to occur in conjunction with the work on the distribution of the capacity pot as defined in section 7.5 below.

6.5 DISTRIBUTION OF CAPACITY PAYMENTS

The RAs propose to review the distribution of capacity payments as described in Section 6 to determine if it is the best split and deemed to be fair. The RAs propose to determine whether the split of the pot into 12 monthly pots is a correct method to use and whether it sends out the appropriate signals to plants for availability. For example, plant maintenance periods are generally in the summer period when the capacity pot is smaller. This may result in reduced capacity being available in the summer period.

In addition, the algebra that is used to split the pot into 12 monthly sub-pots ignores the LOLP in each month, instead profiling over a smooth load-following shape. This may be reviewed during assessments of the distribution of the capacity payments

Another area the RAs intend to review is the weightings of the three streams (fixed, variable & ex post sums) to consider if these should be rebalanced to reward the provision and availability of capacity more accurately.

Of the monthly pot, currently 70% of the Pot (30% Fixed + 40% Variable) is determined on an ex ante basis which provides a high level of stability for generators and investors. However, the actual Loss of Load Probability (LOLP) is only used in calculating 30% of the pot.

The analysis required for these aspects of the pot is very closely linked to any incentive options that are being considered above.

Consultation Point 4:

The RAs welcome comments from participants in relation to the timing and distribution of Capacity Payments as described in Sections 7.4 and 7.5.

6.6 CAPACITY REQUIREMENT CALCULATION

As well as calculating the value for a 'Best New Entrant' Peaker plant, the RAs are also responsible for determining the Capacity Requirement. This is done in conjunction with the TSOs.

Based on the experience to date, the RAs see merit in reviewing the process in order to improve the accuracy of the calculation and the level of transparency. Suggested areas for the RAs to investigate are:

- a. Calculation of Capacity Requirement Methodology – The RAs will revisit the methodology used to calculate the capacity requirement to ensure it is the most optimal method and the original assumptions used in the methodology remain valid.
- b. CREEP Algorithm⁵ – The RAs will look at working with the TSOs on improving the transparency of the overall methodology.
- c. Forced Outage Probability (FOP) – The RAs have received a number of comments about the setting used in the calculations and the variance from what has occurred in reality. Some participants believe that the current setting of 4.23% is too low. The RAs propose to revisit the setting of this parameter.

Consultation Point 5:

The RAs welcome comments from participants in relation to the Capacity Requirement Calculation and what parameters should be considered in the review.

6.7 WACC METHODOLOGY

In BNE calculations, the calculation of WACC is a key area that historically has resulted in a lot of comments from Market Participants. The RAs intend to look at the methodology used in calculating the various WACC parameters to ensure the approach is fully transparent and that all assumptions used are clear and understood. This work will be carried out for both jurisdictions within the SEM.

⁵ CREEP is an adequacy assessment program used by the TSO to derive the scheduled outages forecast. It is a critical tool in determining the Capacity Requirement.

Consultation Point 6:

The RAs welcome comments from participants in relation to the calculation of WACC and the approaches that could be used in calculating the various WACC parameters.

6.8 INCLUSION OF INFRA MARGINAL RENT IN CPM

One area that the RAs propose to investigate is Infra Marginal Rent for the BNE Peaker. Infra marginal rent did occur in the 2007 pot, however, in 2008 and 2009, there were no infra marginal rent deductions from the capacity pot.

The RAs are aware that there is new plant due to commission over the next 2 to 3 years and it would be useful to determine the impact this may have on the infra marginal rent costs in the BNE peaker calculations.

Consultation Point 7:

The RAs welcome comments from participants in relation to impact of Infra Marginal Rent on the BNE Peaker.

6.9 IMPACT OF EXCHANGE RATE IN CPM

One area that the RAs intend to look at is the impact the exchange rate has had on CPM payments and the options available in order to reduce any impact that exchange rate fluctuation may have on the CPM. The RAs will initially look at the historical payments and use this to determine if any improvements can or need to be made in this area.

Consultation Point 8:

The RAs welcome comments from participants in relation to impact of exchange rate fluctuations may have on the CPM

6.10 TREATMENT OF WIND IN CPM

Following on from the Wind Information note published in December 2008 (AIP-SEM-08-177), the RAs propose to continue the work undertaken and progress the next steps as defined in the information note.

'It is recognised that further analysis is required in advance of consulting further on correction of this overpayment. To this end, the following are the next steps that the RAs will carry out. Further analysis as follows:

- calculation of Study-Inferred Capacity Credits for wind generation on the island based on actual data for the first twelve months of the SEM;*
- calculation of Study-Inferred Capacity Credits for all other generation types on the island, including Demand Side Units, based on actual data for the first twelve months of the SEM, and*
- completion of analysis regarding the remuneration of all generation types and Demand Side Units for the first twelve months of the SEM similar to that completed for the first eight months of the SEM, the findings of which are presented here.'*

The ongoing work will be taken into consideration to allow the RAs to make an informed decision on any proposed changes.

Consultation Point 9:

The RAs welcome comments from participants in relation to the Treatment of Wind within the CPM.

6.11 TREATMENT OF INTERCONNECTOR IN CPM

As part of the Medium Term review, the RAs will liaise closely with the existing RA work stream working on Interconnector Issues. This is to ensure that relevant proposals made as a result of the CPM review are taken into consideration during the ongoing work in Interconnector area.

Consultation Point 10:

The RAs welcome comments from participants in relation to the Interconnector treatment within the CPM.

6.12 RELATIONSHIP OF CPM WITH ANCILLARY SERVICES

As part of the Medium Term review, the RAs will liaise closely with the work stream working on Ancillary Services Harmonisation. This is to ensure that any proposals made as a result of the CPM review complement the ongoing work in Ancillary Services (AS).

There may be opportunities to use the work completed to date on AS harmonisation as an input to the CPM Review. It should be noted that any decisions made on the CPM cannot be agreed without fully considering and assessing the impact of Ancillary Services. This consideration would include ensuring any reward for flexibility within the ancillary services process is taken into account in any CPM changes to ensure that the overall level of award are appropriate in both mechanisms (and cost neutral to customers).

Consultation Point 11:

The RAs welcome comments from participants in relation to the relationship between the Ancillary Services and the CPM.

6.13 IMPACT ON DIVERSITY OF GENERATION & SECURITY OF SUPPLY

One area of concern within the RAs and the approach to the CPM Medium Term Review is the potential impact any future changes may have on the diversity of Generation and security of supply. Although the RAs do not intend to use the CPM as a method to expand the diversity of generation, they are aware of the high dependence on fossil fuel imports, in particular gas. It is the RAs intention to be cognisant of this concern and consider any impacts on the diversity of generation in the analytical work to be carried out.

6.14 OTHER ASPECTS OF CPM

The RAs believe they have captured the key areas of consideration for the CPM Medium Term review within this document. However, the RAs are aware that there may be other market participant concerns that have not been considered or referenced within the above scope. The RAs encourage market participants to provide any other aspects of the CPM that should be included in the scope of the Medium Term Review

Consultation Point 12:

The RAs welcome comments from participants in relation to any other aspects of the CPM that should be included in the scope of the Medium Term Review

7 NEXT STEPS

Following the completion of this consultation period the RAs intend to set up a project team to assess the responses and action the areas identified. A short decision paper will be published by the RAs on the results of this consultation paper to provide transparency on the final scope of the CPM Medium Term review. It is expected that a decision paper will be produced in Q3/09.

Once the final scope is agreed, the bulk of the detailed analytical work will be carried out by the RAs. The RAs expect this to be an intense period and plan to be in a position to have a consultation paper published in Q2/2010 detailing the findings of the analysis and any resulting proposals for changes to the CPM.

It is expected that close liaison will be required with a number of existing work streams established by the RAs (e.g. Ancillary Services Harmonisation, Interconnector, Dispatch & Balancing & Wind in the SEM Teams).

In terms of external liaison, the RAs expect to have a number of meetings with the TSOs as part of the development of the various work streams. Liaison will also be required with SEMO in order to determine the impact on the central market systems due to any possible changes. In addition, the RAs will hold industry forums as required on some or all of the final work streams.

8 VIEWS INVITED

Views are invited regarding any and all aspects of the proposals put forward in this Consultation Paper, and should be addressed (preferably via email) to both Kevin O'Neill at kevin.oneill@niaur.gov.uk and Priti Dave-Stack at pdave-stack@cer.ie by **5pm on Tuesday 16 June 2009**.