Single Electricity Market

CPM Medium Term Review

Work Package 6 onwards

Discussion Paper

12th April 2011

SEM/11/019

1 CONTENTS

2 INTRODUCTION

The Capacity Payments Mechanism (CPM) falls wholly under the Joint Regulatory Arrangements and thus lies under the administration of the Single Electricity Market Committee (SEMC). It is managed within the electricity section of the Utility Regulator, with shadow management responsibilities falling to the Commission for Energy Regulation (CER). The CPM was designed in liaison with interested parties through extensive consultation. It is a fixed revenue system whereby Generators are paid regulated quantities (Capacity Payments) of money for providing available generation capacity to the market. The money is sourced by concurrent Capacity Charges levied on all Suppliers that purchase energy from the pool.

The intention for the CPM was to provide capacity adequacy through economic signals that are directly meaningful to the investment decisions of generators and to the decisions of demand-side participants. These economic signals should lead to socially efficient decisions on new investments, on maintenance of existing capacity and on demand response.

The core of the CPM takes the form of a fixed annual sum of money, called the Annual Capacity Payment Sum, which is calculated by the RAs on an annual basis. The Annual Capacity Payment Sums (ACPS) for the Trading Years 2007 to 2011 were / are:

Year	BNE Peaker Cost (€/kW/yr)	Capacity Requirement (MW)	ACPS (€m)	ACPS Change (% Yr on Yr)
2007	64.73	6,960	450.5	-
2008	79.77	7,211	575.2	27.7%
2009	87.12	7,356	640.9	11.4%
2010	80.74	6,826	551.1	-14.0%
2011	78.73	6,922	544.9	-1.1%

Table 2.1: The Annual Capacity Payment Sums (ACPS) for the Trading Years 2007 to 2011

The SEM Committee considers the CPM as a key feature of the SEM design. The SEM Committee believes 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. It should achieve capacity adequacy consistent with efficient energy market signals, and without interfering with the market forces that drive generation investment decisions other than those related to the provision of capacity reserves. It should not "double pay" generators. Overall prices should efficiently signal when, where and what types of new generators are required – and efficiently signal when, where and what market exit is appropriate.

In the 'Capacity Payment Mechanism and Reserve Charging High Level Decision Paper '(15 July 2005, SEM-53-05[1]) the Regulatory Authorities listed the following criteria which the CPM should fulfil;

- Incentivise appropriate levels of market entry and exit;
- Encourage an efficient mix of plant types;
- Not "double pay" generators;
- Reduce risk premium for investors;
- Is compatible with the energy market;
- Encourage short-term availability when required;
- Encourage efficient maintenance scheduling;
- Not increase costs to customers for desired security margin;
- Reduce market uncertainty;
- Not unfairly discriminate between participants; and
- Be transparent, predictable and simple to administrate.

The SEM Committee 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 it is mindful that the CPM provides signals for new entry/investment and should reward plant and capacity in accordance with its performance.

The objectives of the CPM were distilled in the paper 'Capacity Payment Mechanism and Reserve Charging High Level Decision Paper' (SEM-53-05) as:

- **Capacity Adequacy/ Reliability of the system**
  The CPM must encourage both new construction and maintain availability of capacity in the SEM. Security of the system, in both the long and short-term will be the core feature of any CPM.
- **Price Stability**
  The CPM should reduce market uncertainty compared to an energy only market, taking some of the volatility out of the energy market.
- **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 will reduce investor confidence in the market and increase implementation costs.
- **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.
- **Susceptibility to Gaming**
  The CPM should not be susceptible to gaming and, ideally, should not rely unduly on non-compliance penalties.
- **Fairness**

[1] Capacity Payments Mechanism and Reserve Charging High Level Decision Paper - http://www.allislandproject.org/en/capacity-payments-decision.aspx?article=aa084bc6-3d33-4c7f-91a4-903a34011106

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. Buyers in the SEM should pay in proportion to the benefits they receive.

Ongoing development of SEM and the CPM was always anticipated by the Regulatory Authorities during their design. It is judged that to date, and likely in the medium term future, the SEM is working well, that there are known challenges ahead but that for now these can be met whilst continuing to meet the SEM Strategic Objectives and the CPM Objectives **without fundamentally redesigning the SEM.**

The following Figure 2.1, show's a high level overview of the current design of the capacity payment mechanism in the SEM.

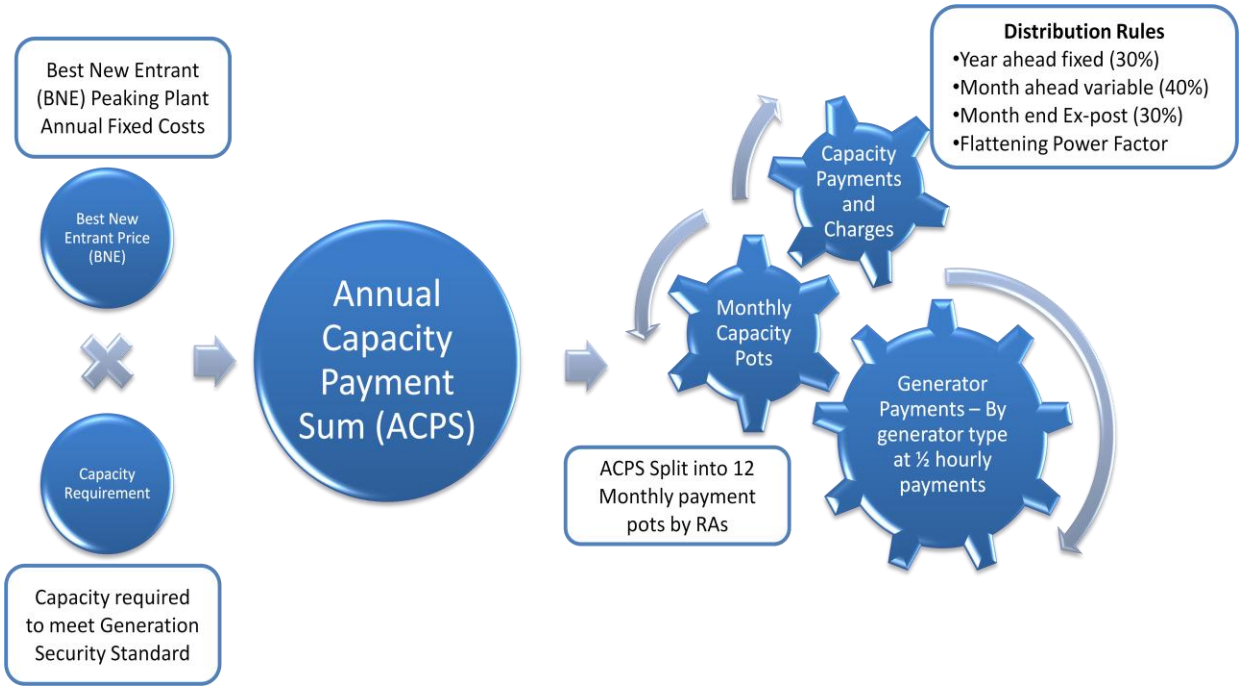


Figure 2.1: Overview of the current capacity payment mechanism in the SEM

The RAs have already produced a consultation document (SEM-09-023[2]), relating to the perceived volatility of the ACPS and proposed a number of options to help reduce the level of volatility. In that paper, the SEM Committee signaled 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 its objectives.

The RAs have now completed three iterations of calculating the ACPS. Figure 2.2 shows the historic levels of the Capacity Requirement and Annual Capacity Payments Sum from 2007 to 2011.

[2] http://www.allislandproject.org/en/cp_current-consultations.aspx?article=d0838608-f292-40b8-be79-6e8d15e8db3c

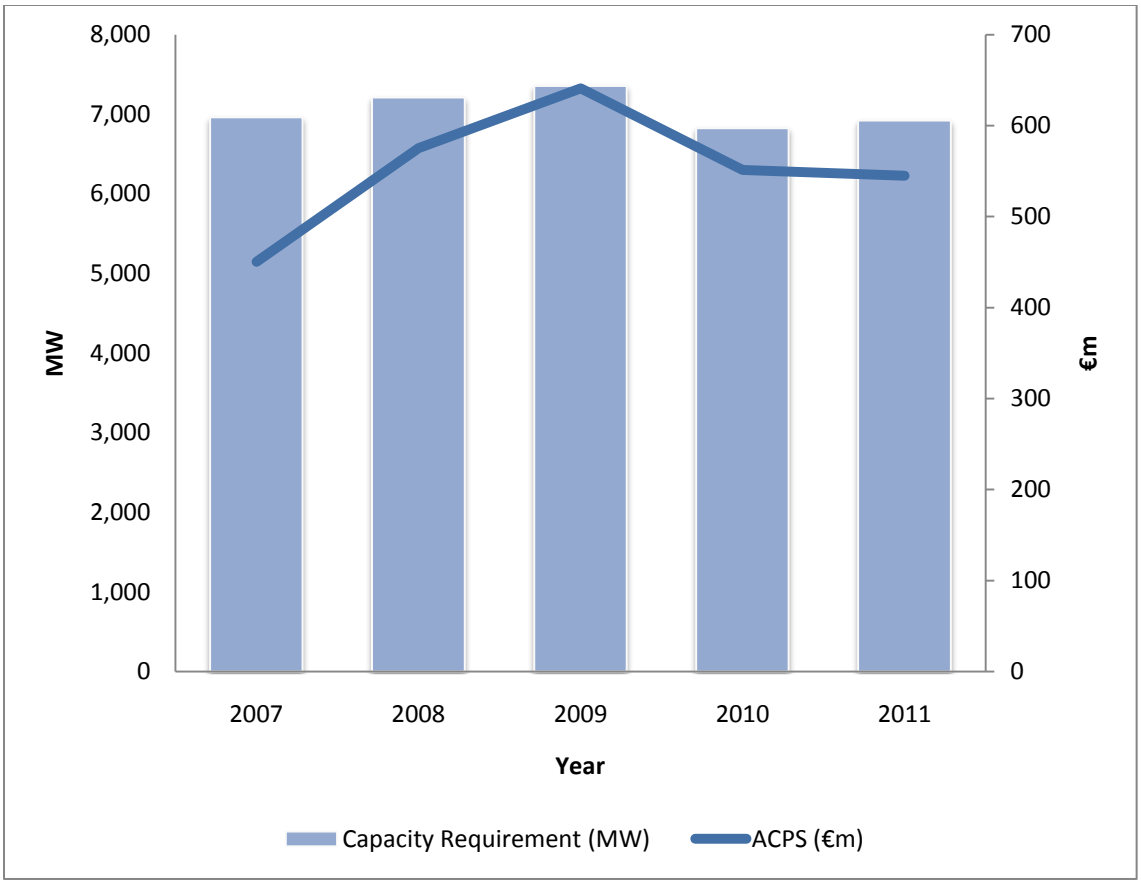


Figure 2.2: Historic levels of the Capacity Requirement and Annual Capacity Payments Sum

The SEM Committee 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 this review of the CPM.

2.1 CONTEXT OF THIS REPORT

On the 8 of April 2009 the SEM Committee published a consultation paper (SEM-09-035)[3], documenting the scope of work that the SEM Committee proposed to carry out in relation to a medium term review of the Capacity Payment Mechanism.

In the past the SEMC had signaled its intention to consult on the appropriate mechanism to address a key concern raised by industry participants regarding the stability of the capacity payment pot due to the annual determination of the Best New Entrant Fixed Cost (BNEFC) and the Annual Capacity Payment Sum (ACPS). The RAs, on behalf of the SEM Committee, intend to review the current process used for distributing the capacity pot among generators and the calculations for payments by suppliers.

This section of the paper covers the review of the remaining work packages (6, 8, 9 and 10). This paper will investigate the following areas;

- Treatment of Generator types in the CPM,
- Incentives for Generators,
- Timing and distribution of Capacity Payments,
- Impact of the CPM on Customers.

2.1.1 THE POYRY REPORT

As part of the investigation into the Medium term review the RAs procured consultancy support from Poyry for some aspects of the work required.

Poyry produced a detailed report, which is attached in Appendix 1, providing a number of alternative options and possible improvements to the RAs, identifying the pros and cons of the different solutions and how the recommendations meet the objectives of the CPM. The report details the performance of the current CPM design, the performance of the CPM in future years and offers options for reform.

They attempted to examine if the current design of the CPM can be improved to optimally meet its defined objectives. The initial work focused on constructing and calibrating a CPM model that allows them to test the impact of changes to the regime on the level and timing of capacity payments and the consequent distributional impacts on generators. Calibrating this against 2008 data they highlighted some issues with the operation of the current mechanism, these included:

- Adequacy of the level of payments when capacity is scarce;
- Distribution of payments across generator types, in particular the potential for the current design to overcompensate intermittent generators;
- Uncertainty in future payments, increasing risks for new entrants; and
- Concerns over inefficiencies in the exit signal.

[3] http://www.allislandproject.org/en/cp_current-consultations.aspx?article=4dde96cc-fdda-458b-9a3c-dc4a00692ac5

In future years the electricity market in the SEM is expected to change significantly in the medium term. The Republic of Ireland and Northern Ireland have set a target of 40% for renewable generation by 2020. In light of the dominance of wind as a renewable resource, it is likely to be the primary driver in pricing and dispatch in the SEM.

The Poyry report looks at possible reform options from the issues highlight from the current mechanism.

Issue	**Possible reform options**
Level of payments when capacity is scarce	▪ Increasing the proportion of ex-post payments to reward generators available during system tightness ▪ Removing the flattening power factor and/or revising distribution of monthly pots ▪ Increasing the size and types of contracts under Ancillary Services so as to reward flexibility appropriately
Distribution of payments across generator types	▪ Increasing the proportion of ex-post payments to reward firm generation ▪ Introducing generator adjusted payments or capacity credits
Uncertainty in future payments	▪ Fixing the BNE price or constituents of the BNE for several years ▪ Introducing a new entrant capacity price or guarantee
Concerns over the level of exit inefficiencies	▪ Increasing the proportion of ex-post payments to decrease the payout for unreliable generation ▪ Introducing a penalty for plants which declare themselves available but fail to respond when called upon ▪ Increasing the size and types of contracts under Ancillary Services so as to reward flexibility appropriately

Poyry's analysis of the medium term performance of the CPM found that there were no significant changes in the performance of the current design in this new wind environment. Wind changes the distribution of aggregate capacity payments but does not materially mitigate or exacerbate the overall performance of the mechanism.

They state that the underlying concerns identified in 2008 remain and would need to be addressed going forward. There were several ways to reform the CPM in order to limit the impact of the issues identified. Following from the back cast analysis and a review of international experiences, Poyry developed several main scenarios, to model the reform options. Following this analysis they conducted an impact assessment, comparing with the status quo.

The report details the performance of the current CPM design, the performance of the CPM in future years and offers options for reform. It identifies 4 scenarios which it further investigates. These scenarios are referenced within this report.

Scenario	Main features
Capacity credit scenario	▪ De-rated capacity credit specific to each technology ▪ 50:50 Ex-ante/ex-post payment weighting applied equally to new entrants and existing players
New entrant scenario	▪ Capacity-credit adjusted BNE price guarantee for new entrants over several years ▪ Residual pot allocated based on 70:30 status quo to existing plants
Ex-post –ex-ante rebalancing scenario	▪ Ex-post/ex-ante payment weighting changed to 50:50 Scenario is technology neutral, applies equally to new entrants, existing players ▪ Flattening power factor removed; considerations on how ex-post payments are made (annual vs. monthly).
Payments for flexibility	▪ A larger role for ancillary services to improve system reliability ▪ Status quo 70:30 ex-ante, ex-post split for all plants applying equally to new entrants and existing players

For each of these scenarios the Poyry report investigated the:

- Efficiency of the capacity payment signal.
- Distribution of payments across generators.
- Impact on interconnectors and DSUs.
- Impact of wind variability on investment signals.
- Impact on entry and exit decisions.

This paper will attempt to revise the main points of each of the scenario in conjunction with the remaining work packages (6, 8, 9 and 10). It will inter-act each work package with some of the scenarios modelled by the Poyry report. This paper will investigate the following areas;

- Chapter 3 - Treatment of Generator types in the CPM,
- Chapter 4 - Incentives for Generators,
- Chapter 5 - Timing and distribution of Capacity Payments,
- Chapter 6 - Impact of the CPM on Customers.

3 WORK PACKAGE 6 -TREATMENT OF GENERATOR TYPES IN CPM (WIND ETC)

As was previously stated the findings of the Poyry report are going to be used in the following discussion of the work package 6 Treatment of Generator types in the CPM. Within this work package the RAs will discuss, the Poyry capacity credit scenario, Capacity Credit of Wind Generation – A variable energy Source, CPM Impact on Interconnectors and on Energy Limited Units.

In line with the CPM objective of fairness, the SEM Committee believe that the market should reward all generators (including wind generators and new emerging technologies such as marine wave / tidal generators and energy storage) equitably for the contribution to capacity adequacy that they provide. The Trading and Settlement Code (T&SC) treats all generation equally and should not be altered to deliver explicit preferential payment for one technology over another. However, the capacity revenue received by all generators should be reflective of their contribution to generation adequacy in the long term, and also their availability to respond to demand at times of low capacity margin on the system.

In the past it has been highlighted in previous responses that there is a potential over-payment to intermittent generation under the current arrangements and one respondent raised a concern that this may act to block the development of the complementary conventional generation needed to maximise the electricity generated from this intermittent capacity. It has also been suggested that since the CPM is a fixed pot determined in advance, if some forms of generation are being over-rewarded in respect of its contribution towards capacity, then other forms of generation (which potentially contribute more) are consequently being paid less for their contribution.

In its simplest terms, the generator payments are paid based on current available capacity and price. Currently the CPM values Eligible Availability within each half-hour equally from all technology sources, irrespective of start-up times, ramp rates, likelihood of tripping during start-up, or the diversity of those technologies. It only differentiates between various sources of availability by the time-value assigned to that availability through its current three payment streams.

All generation gets paid a capacity payment based on its Eligible Availability in each half-hour. Wind generation's effective availability is not the installed megawatt capacity of the wind generator, but the capability of the wind generator to generate given the prevailing wind conditions. In practice, this is calculated as the megawatt hours generated by a wind generator in a half hour, converted to a megawatt availability figure (interconnection is also similar). This is in contrast to a conventional generator with a fuel source sufficient to generate at full capacity throughout the day. Such a generator will get paid a capacity payment for all of its installed capacity, as all of its capacity is continuously available to generate.

In previous consultations it had been highlighted that **Capacity Credits** should be taken into account when determining capacity payments. In the SO's studies as highlighted in the Generation Adequacy Report (All-Island Generation Capacity Statement 2011-2020[4]), capacity credit has been determined by subtracting a forecast of wind's half hourly generated output from the electricity demand curve. The use of this lower demand curve results in an improved adequacy position. This improvement can be given in terms of extra MWs of installed conventional capacity. This MW value is taken to be the 'capacity credit' of wind. The capacity credit of wind will vary from year to year, depending on whether there is a large amount of wind generation when it is needed most.

[4] http://www.eirgrid.com/media/GCS%202011-2020%20as%20published%2022%20Dec.pdf

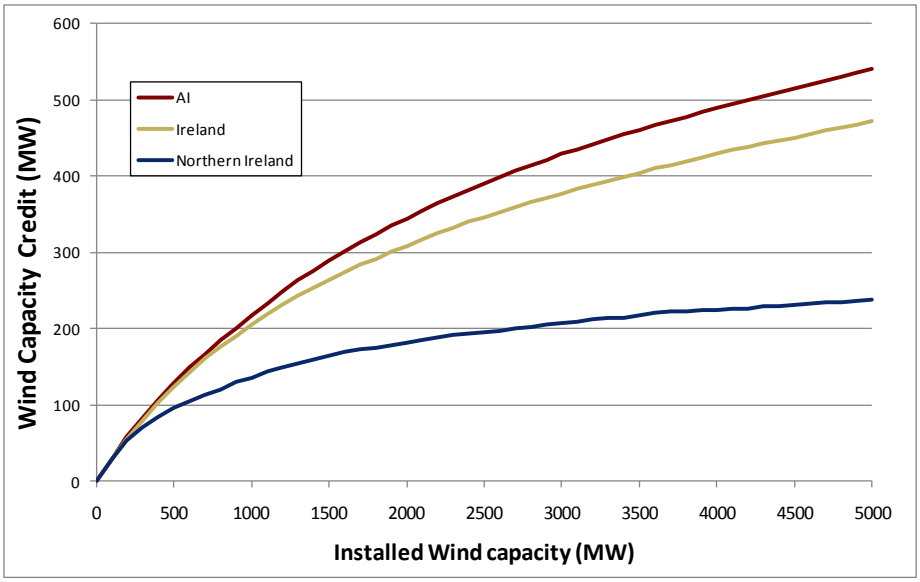


Figure 3.1 Capacity credit of wind generation for Ireland and Northern Ireland compared to the all-island situation. (The wind profiles were taken from 2009)

Eirgrid compiled a report to the RAs of CPM payments in the first year of the SEM, within this study they applied the capacity payments based on a capacity credit of each unit against the installed all island MW capacity, and recalculated the distribution of payments against the received payments.

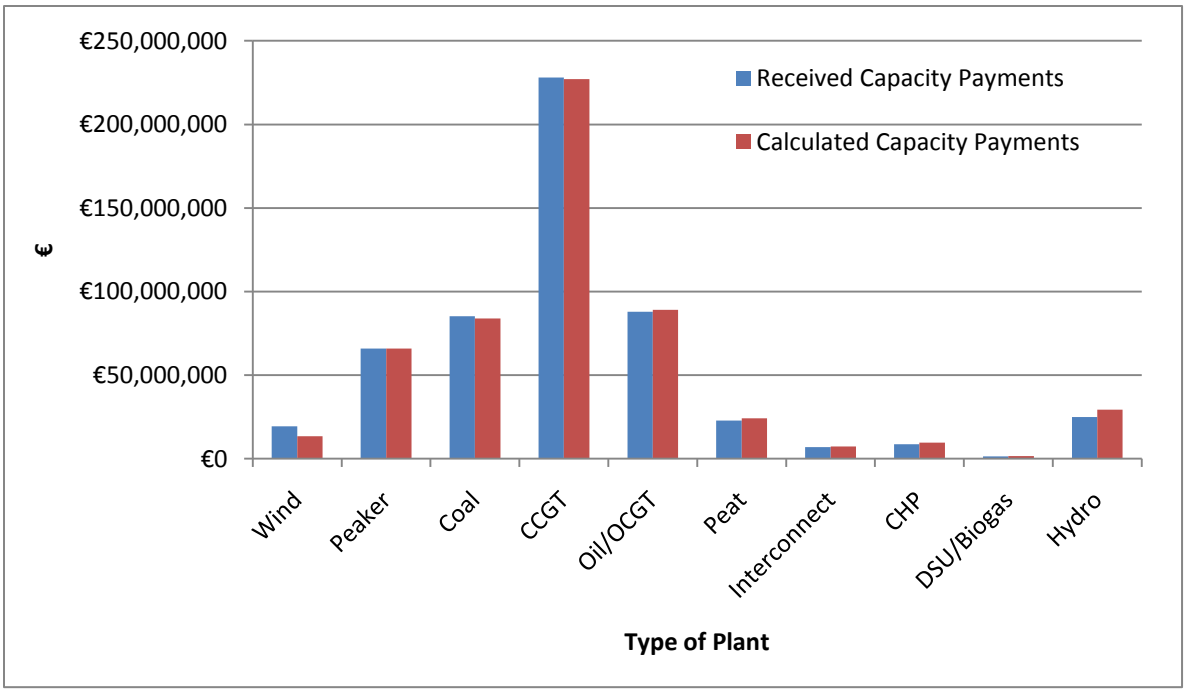


Figure 3.2– Received and calculated Capacity Payments in the first year of the SEM.

This paper was compiled as an information Note on the Preliminary Analysis of the Treatment of Different Technology Types under the Capacity Payment Mechanism (AIP-SEM-08-177[5]).The main findings were that, in the first year of the SEM, wind received more capacity payments than if the capacity payments were calculated based on a capacity credit of each unit against the installed all island MW capacity, and high merit type plants were receiving less (hydro in particular).It should be noted that there are other approaches to compute the capacity credit of wind[6].

The SEM Committee is mindful that the remuneration of wind is subject to two regulated components, one of which is the CPM where as the other one is the Feed-in-Tariff (FIT). Any change in the remuneration of wind within the CPM should be considered in conjunction with the FIT arrangements.

As the SEM develops, changes in technology type will impact other technologies capacity credit. For example, as the wind penetration increases in future years, its percentage capacity credit will drop and it will become less relevant (per installed kW) in providing capacity adequacy. This is a well-known phenomenon that arises due to the high correlation between the availability of individual wind farms that are geographically close.

3.1.1 THE CAPACITY CREDIT SCENARIO

It can be stated that different types of technology generation can offer different contributions to system security. This capacity credit scenario could introduce generator/technology adjusted payments or 'capacity credits' which weight fixed payments towards generators likely to be available in times of tight system margin. In this reform option, each plant or plant type is allocated a 'capacity credit factor' through which ex-ante payments are adjusted to take account of the 'firm capacity' provision of generators with the intention to reward generator contribution at peak demand with a higher capacity credit. This scenario would provide a long-term investment signals in plants that tend to be available when margin is lowest.

Within this scenario, which is in Section 6 of the Poyry Report, a 50:50 split was included of the overall capacity pot between ex-post and ex-ante payments and the flattening power factor was changed to 0.5. A de-rated capacity credit specific to each technology was applied to the ex-ante payments. The ex-post payments were split to generators based solely on availability and was divided into monthly pots under the current monthly pot weightings. The capacity credit adjusted payments on the other hand were split evenly for each generator across all trading periods.This scenario was applied to 2008 data and 2020 forecast data.

Figure 3.3 shows the change in capacity payments by technology in 2008 and 2020 forecast data.

[5] http://www.allislandproject.org/en/cp_decision_documents.aspx?page=2&article=8e3f466f-7d94-4d7e-b9f3-fb35bcf32ff4

[6] See for instance - "Determining the capacity value of wind: A survey of methods and implementation", M. Milligan and K. Porter, NREL, National Renewable Energy Laboratory, at www.nrel.gov/wind - http://www.nrel.gov/wind/pdfs/43433.pdf.

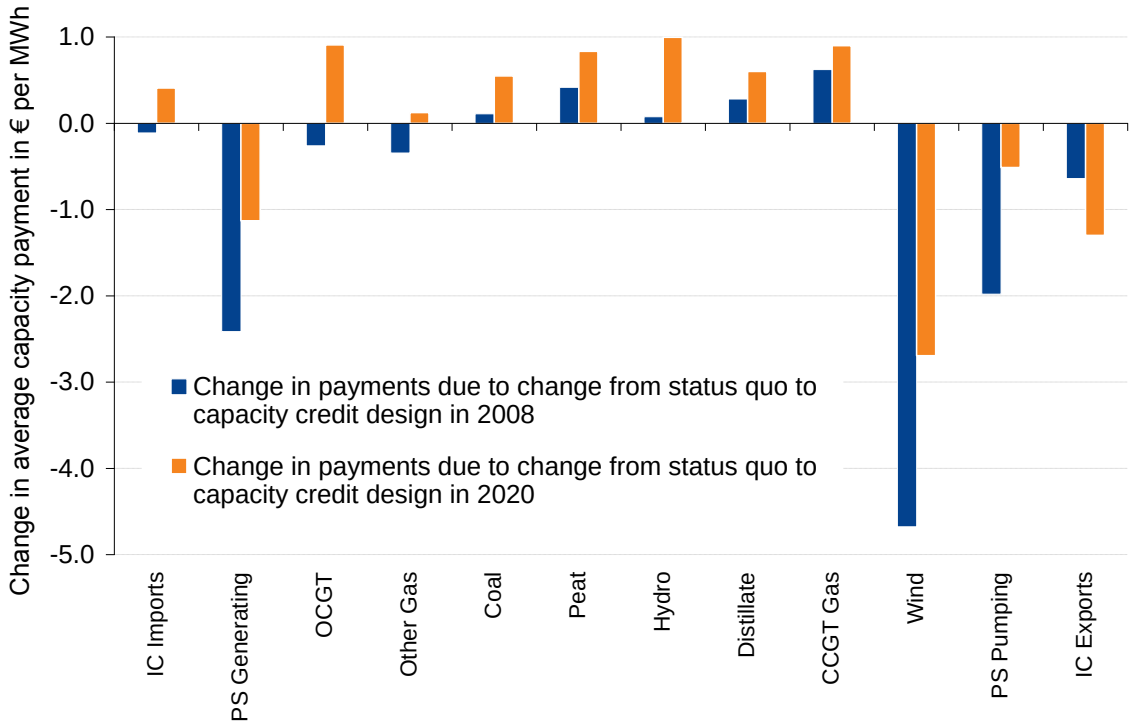


Figure 3.3 - Change in capacity payments, € per available MWh by technology, from status quo to capacity credit scenarios in 2008 and 2020

There was a significant re-distribution of payments across technologies in the results. In this scenario, wind, pumped storage and hydro plants experience a significant decline in their revenues. Similarly, the interconnector, biogas and oil OCGT units experience a decline in their payments. Conversely, CCGTs, and other remaining conventional generators experience an improvement in their revenues.

Conventional generators appear to benefit from this scenario. This re-distribution of payments is higher in 2020 which would provide efficient investment signals in future years and lead to tangible increments in payments for the most reliable generators.

The Capacity Credit scenario would lead to major change in the CPM methodology. The inputs and the appropriate method of computing the capacity credit values of power plants would be subject to industry consultation and regulatory approval. Several important factors would influence the capacity credit of each power plant such as the historic generation adequacy, the penetration factor of the plant, the size and availability of the generating units with the SEM etc. This design in effect could add an extra layer of complexity and implementation issues would need to be considered. This could increase regulatory risk leading to a decreasing predictability of payments, but this scenario does have benefits as detailed below.

Table 3.1 shows the benefits and risks of implementing the Capacity Credit scenario.

Benefits	Risks
It increases incentives for conventional generators and reduce incentives for less reliable generators.	Adds a significant layer of complexity which could be difficult to implement.
It will lead to higher levels of reliability and is fairer as it rewards flexibility.	Increases regulatory risk in the market as it entails calculation of a new set of inputs (capacity credits) which would be subject to industry consultation and regulatory approval.
It will provide efficient price signals for long term investments.	It could also lead to increased price volatility and decreasing predictability of payments.

Table 3.1– Benefits and risks of the Capacity Credit scenario

Should the RAs look more closely at a Capacity Credit scenario for the payment of different generation types?

Is a Capacity credit methodology appropriate for the CPM?

3.1.2 CAPACITY CREDIT OF WIND GENERATION – A VARIABLE ENERGY SOURCE

As with all generation units, payments to wind power units through the capacity payments mechanism should be reflective of their contribution to capacity. The CPM does recognise the value of the wind in the calculation of the ACPS and under the ex-post payment stream. It should be noted that significant changes to the CPM, for example having a separate capacity pot for wind, would require changes to the Trade and Settlement Code. It would also have implementation issues and would require in-depth consultation.

The wind capacity factor gives the amount of energy actually produced in a year relative to the maximum that could have been produced, had wind farms been generating at full capacity all year. The contribution of wind generation to generation adequacy is referred to as the capacity credit of wind generation. The capacity factors for ROI and NI are shown for the last few historic years in the charts below.

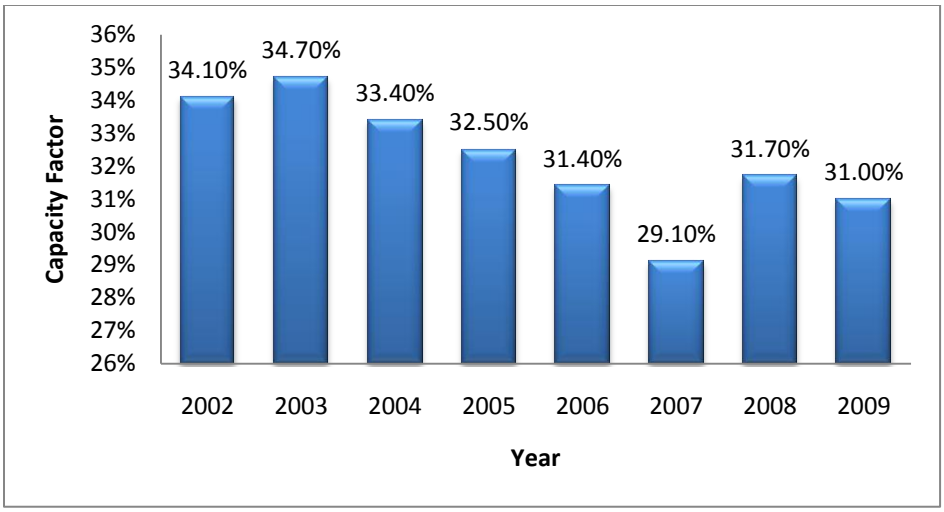


Figure 3.4 -Historic Wind Capacity Factor in ROI

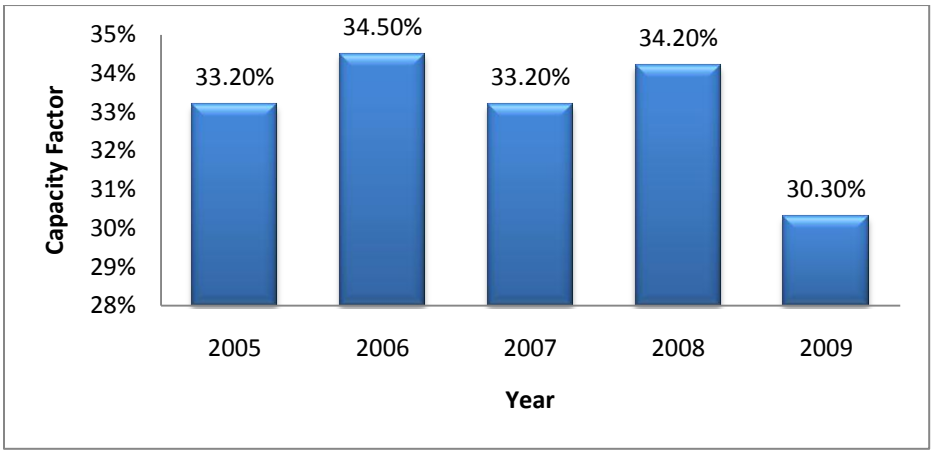


Figure 3.5 - Historic Wind Capacity Factor in NI

As previously stated this wind capacity credit is accounted for in the current CPM methodology by simply granting Eligible Availability based on 'unconstrained' generation, and the division of the capacity payment in any hour is a function of wind's availability in that hour. The increased penetration of wind in future years will have an impact on the SEM which will affect existing generators and also new entrants. The increased penetration of wind will also increase the variability of its availability and will likely produce uncertainty in the level of payments for conventional generators. As the amount of wind capacity increases it may lead to declines in average energy payments and lower average capacity payments.

Does the current mechanism fairly reward wind or does it need to be revised?

Should there be a separate stream of capacity payments for wind?

The RAs welcome alternative suggestions for allocating capacity payments between generator types.

3.1.3 CPM IMPACT ON INTERCONNECTORS

Interconnection is key to the development of an EU-wide market for electricity, where interconnectors are an integral part of the system and contribute to the security of supply of the network. The current interconnector has had a high utilisation since it was commissioned and the interconnection between the SEM and the GB electricity market is set to increase over the coming years as efforts to create regional European markets gather pace. Trades across the current and new interconnectors would have an effect on the level of effective demand served by generators on the island. The SEM Committee is actively working to reduce barriers to trade across interconnectors in the SEM and to incentivise the economic use of interconnector capacity.

Figure 3.6 shows the Monthly Moyle Flows since 2008.

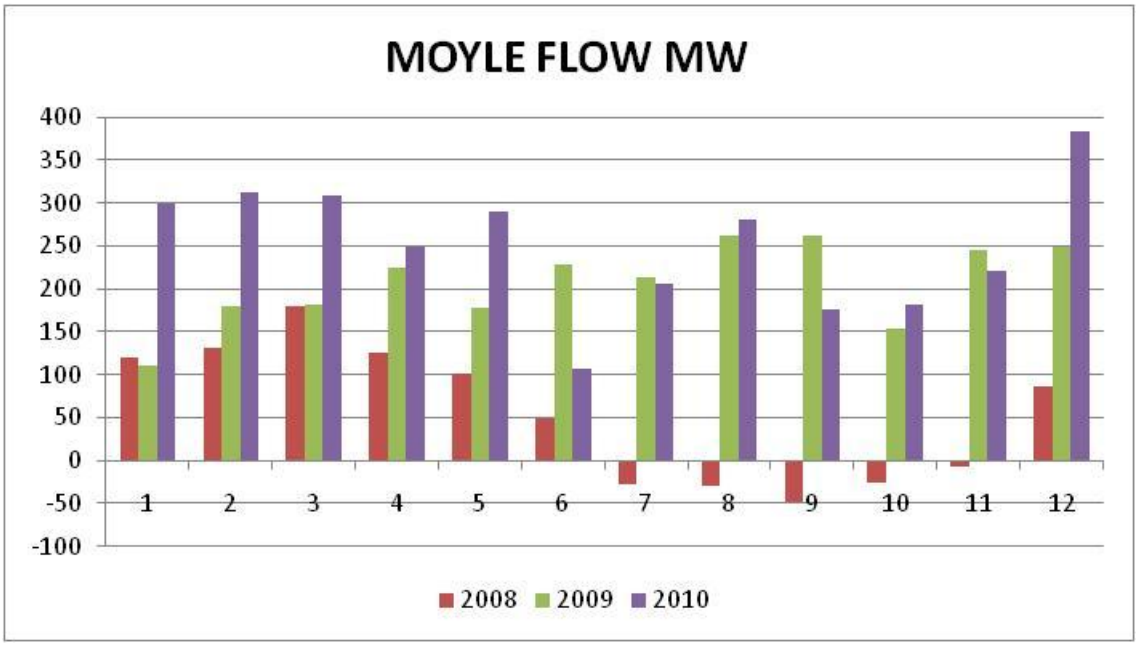


Figure 3.6 Monthly Moyle Flows

On 23 April 2009, the SEM Committee published an Information Paper on Short to Medium Term Interconnector Issues in the SEM (SEM-09-042[7]) and later a SEM Regional Integration – paper on longer term issues published 10 September 2009 (SEM-09-096[8]). On 3rd March 2010 the SEM Committee published the responses to SEM-09-096, SEM Regional Integration - Consultation Paper Responses and SEM Committee Decision (SEM-10-011[9]). These papers discuss the way forward for SEM Regional Integration. The SEM will continue to develop to conform to EU regulations and to maximise the benefits of increased interconnection.

Moyle and the new East-West interconnector will be providing Generators in Great Britain with access to the SEM (and conversely Generators in Ireland access to BETTA). Any interconnector user which holds interconnector

[7] http://www.allislandproject.org/GetAttachment.aspx?id=1d75d1bf-76fd-4794-b234-be0485c30118

[8] http://www.allislandproject.org/GetAttachment.aspx?id=3ea8c7f0-6184-4501-9e17-ca59bb356bd4

[9] http://www.allislandproject.org/GetAttachment.aspx?id=8dd9e94f-8330-46ce-81b3-ad9ea360ea18

capacity can offer that capacity at a price at the day-ahead stage in the same way as any other Generator in the SEM and can be rewarded commensurately. If these interconnector users choose not to offer capacity to the SEM or if they are not in the market schedule they will not receive CPM payments, irrespective of whether the Moyle Interconnector is available or not. The owners of interconnectors do not have any opportunity earn capacity payments in the SEM.

The CPM rewards Generators based on the level and price of capacity they are prepared to offer at the day-ahead stage (i.e. at gate closure), the level of capacity actually provided by such Generators on the day and the estimated value such capacity has in relation to each Trading Period. The Regulatory Authorities have previously[10] stated the reasons why payments to Interconnectors under the CPM are against metered flows rather than any other measure of availability of such units.

The SEM rules at present allow SEM participants to trade with neighbouring electricity markets, but were designed primarily to suit the Moyle Interconnector. While it aims to comply where possible, the Moyle interconnector is not subject to EU rules on cross border electricity trading. In particular, SEM rules do not permit the reallocation of unused capacity to the market (Use it or Lose it - UIOLI). The planned EirGrid East West interconnector is due to be operational in 2012 and at that time both the Moyle and East West will be subject to EU rules on interconnectors.

The CPM is designed to reward Generators for the provision of capacity so as to maintain an adequate level of supply security in the SEM. It has been stated in other responses[11] that the capacity payments charge for exporting ICs does not adequately take into account the security of supply value of the interconnector and should be abolished. The implications of capacity charges for exporting interconnector units at times of high wind generation will need to be considered and how the benefits of 'exporting wind' are distributed to customers in other markets.

In order to accommodate increased levels of interconnection and to ensure compliance with EU rules on congestion management the RAs have cited the efficient use of current and future SEM interconnectors with neighbouring markets as a key priority.

On the 4th of December 2010 the UK Coalition Government issued a consultation on "Electricity Market Reform"[12], within this document they indicated their views on a Capacity Mechanism which "will ensure there remains an adequate safety cushion of capacity as the amount of intermittent and inflexible low carbon generation increases." Any introduction of a CPM in the GB market would have an impact on future interconnector trades, and the RAs will be monitoring closely the impacts of these changes, if any, to the GB electricity market and the SEM. The RAs will continue to engage with stakeholders and policymakers at European level to influence the development of regional integration and will continue to develop a coordinated approach to congestion management with Ofgem concerning the GB and SEM markets, in particular the explicit auctioning of capacity on ICs.

Poyry commented on how each scenario would impact on the interconnectors within the SEM. In 2020 interconnector import payments will likely increase due to the fact that it will likely be importing during tight

[10] http://www.allislandproject.org/GetAttachment.aspx?id=4d00e422-1fe8-432b-9181-da91d7afedf5

[11] The SEM Committee published a Consultation Paper (SEM-09-035) in April 2009, setting out the scope of work in relation to a medium term review of the CPM. The SEM Committee published the responses to the consultation paper in November 2009 and a clarifying note (SEM-09-105) on the scope of the medium term review.

[12] http://www.decc.uk/assets/decc/Consultations/emr/1041-electricity-market-reform-condoc.pdf

system stress at a higher frequency in 2020 compared to 2008, also the increased penetration of wind and its variability is likely to increase the importance of interconnectors in the system.

Should interconnector users' payments and charges be treated differently than under the current methodology in the CPM?

The RAs welcome alternative suggestions for allocating capacity payments between ICs / IC users.

3.1.4 ENERGY LIMITED UNITS

Energy limited Units are treated separately under the CPM, Section 5 of the Trading and Settlement Code contains the Market Rules for the calculation of Eligible Availability for Energy Limited Units and Pumped Storage.

The current methodology regarding the optimisation of energy limited and pumped hydro storage units are complex but essentially aim to allocate Eligible Availability each day to the units such that the energy limit is sensibly reflected. Any changes to this methodology would involve industry consultation and regulatory approval and would add a significant layer of complexity.

Should energy limited and pumped hydro storage units be treated differently to the current methodology in the CPM?

4 WORK PACKAGE 8 - INCENTIVES FOR GENERATORS

This section looks at Ancillary Services and the CPM with the flexibility payment scenario, Capacity Penalties and the scenario of incentives for new entrants outlined in the Poyry report.

The options for incentivising capacity adequacy relate to the objectives and the aims of the CPM and whether the mechanism is helping to delivering the right signals for generation capacity. An improved incentive mechanism may also act as an exit signal for inefficient or underperforming plants that do not provide sufficient service relative to their competitors. There may be scope in this for the enhancement of 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.

4.1 ANCILLARY SERVICES AND THE CPM

Ancillary Services are products, other than energy, that are required to ensure the secure operation of the transmission system. The Transmission System Operators (TSOs), EirGrid in Ireland and SONI in Northern Ireland, are charged with providing a secure, reliable and efficient electricity system and, in that context, for procuring all necessary Ancillary Services (AS). AS payments and other system charges are paid/levied outside the SEM by the TSO's on a jurisdictional basis through the transmission use of system charges.

Following consultation in February 2008, the SEM Committee published a High Level Decision paper providing a policy framework for the harmonisation of AS across the island. This paper the Harmonised All-Island Ancillary Services Policy decision paper (SEM/08/013[13]) stated the following with reference to the CPM (emphasis added):

"Reserve payments serve the purpose of ensuring that sufficient plants are available in the right locations, capable of providing the response required by the TSO. The issues relating to the design of the CPM (including how it interacts with the provision of AS) were consulted on previously by the RAs during the development of the CPM. The CPM does not, and was not designed to; ensure that generators offer sufficient reserve within certain geographical boundaries or to particular technical specifications."

The RAs continue to believe that the responsibility of incentivising the ***type*** of operational generation capacity required to maintain system security and reliability may be better dealt within the remit of ancillary service payments.

The RAs believe that the CPM is tailored to ensure that it would pay a Best New Entrant (BNE) peaker generator at a sufficient rate to cover its long run costs, given forward looking estimates of its running and all its other revenues.

Its other revenues include Ancillary Services revenues. There is an interlinked relationship between the services provided by Ancillary Services and the CPM. The current AS incentivises services such as reserve, reactive power and black start. There are additional services considered in the Harmonised All-Island Ancillary Services consultation such as warming contracts, CCGT multimode operation and pre-emptive response. These services arguably capture some aspects of flexibility.

[13] http://www.allislandproject.org/GetAttachment.aspx?id=20252281-e52a-4ae5-a2a4-102c8546b045

Consequentially, if ancillary service payments increase to the BNE peaker, the total capacity payment it will need to receive to recover its long-run costs will decrease. This has the effect of decreasing the CPM total pot, and therefore the CPM payments to all other generation.

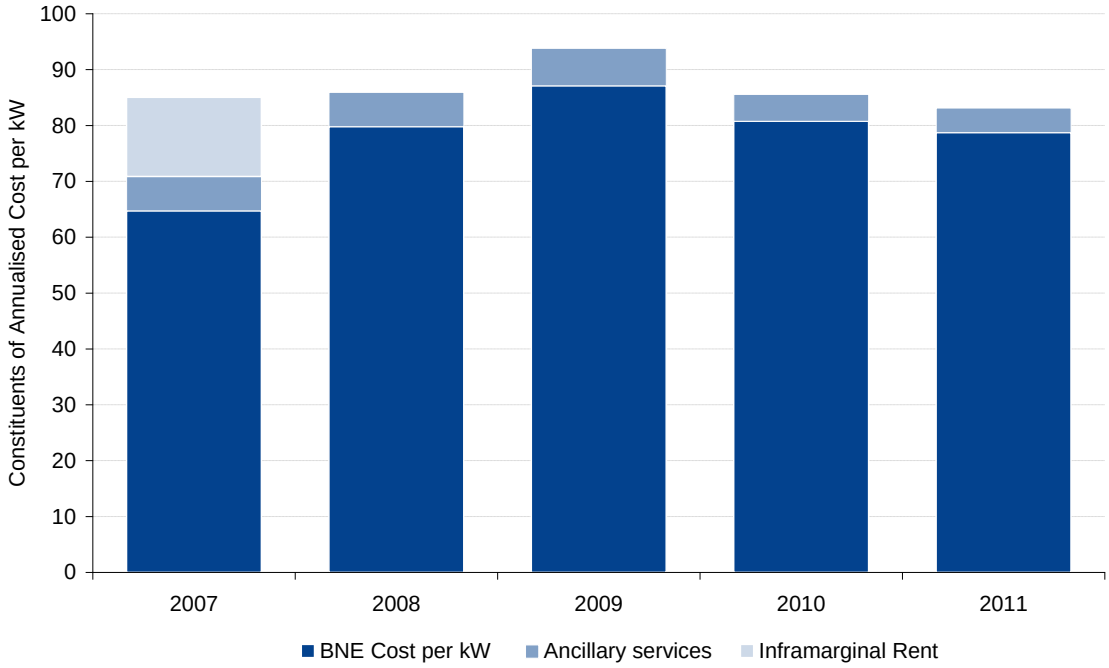


Figure 4.1 – BNE Cost from 2007 - 2011

As the ancillary services pot increases to cater for flexibility, size and product variety in the market, it will have an overall impact on the size of the CPM total Pot. With this in mind and with the impact of wind in future years Poyry investigated the scenario of providing a flexibility payment within the CPM.

4.1.1 FLEXIBILITY PAYMENT SCENARIO

Chapter 7 of the Poyry report investigates the outcome of this scenario and looks at the efficiency of the capacity payment signals, the distribution of payments across generators and its impact on entry and exit decisions.

The main features of this scenario involve the creation of a separate pot for flexibility payments either as part of an expanded ancillary services, or complementary to the capacity payment mechanism equal to 25% of the ACPS.

Poyry then deducted the flexibility sum from the ACPS and allocated the remaining capacity pot on the basis of the re-balancing scenario. The residual pot was to be allocated on the basis of (a) a 50:50 split of the overall capacity pot between ex-post and ex-ante payments; (b) setting the flattening power factor to 0.5; (c) dividing ex-post payments into current monthly pot weightings while ex-ante payments are applied similarly across all trading periods.

The key results in this scenario show;

- Significant increase in payments for hydro, pumped storage, biogas, coal/oil and oil plants.
- Other generators experience a marginal decline.
- CCGT's experience significant gains in 2020, largely at the expense of wind and peat plants.

The Table 4.1 summarises the comparisons in performance between the having a flexibility scenario and the current status quo scenario against the CPM objectives.

Reform option	**Performance**
Capacity adequacy	▪ There is limited impact on balance. Flexibility payments are likely to increase incentives for conventional generators and reduce incentives for wind. The scenario as modelled increases incentives for pumped storage (when generating), OCGTs, and in 2020 all other technologies except for wind, hydro and interconnector imports. This could improve the investment case for conventional generation.
System reliability	▪ An explicit payment for flexibility significantly increases the payments received by 'firm' generators. Complemented by an increased emphasis on ex-post payments this is likely to improve system reliability.
Efficient price signals for long term investments	▪ The scenario ensures improved payments for conventional generators in 2008, increasing in future years relative to the status quo design. However, increased payments may not be enough in light of expected declines in energy revenues due to a higher penetration of wind.
Price stability	▪ Price stability is eroded in this design. The increased ex-post constituent makes payments harder to predict, but the increased certainty of flexibility payments results in larger predictable payments for non-wind plants.
Fairness	▪ All generators receive equal payment for each MW supplied. Any discrimination is outside the CPM and is intended to address fairer remuneration for flexibility compared to the current design.
Simplicity	▪ Assuming the flexibility pot is added to the expanded ancillary services pot, it is less likely to be any more complex to the status quo. A new scheme developed outside the AS could increase complexity and it would be difficult to access.
Susceptibility to gaming	▪ Susceptibility to gaming remains unchanged compared to the status quo. It may increase given the complex technical nature of assessing individual assets.
Regulatory risk	▪ Depending on the design chosen, this scenario may result in minimal regulatory risk compared to status quo as it entails changing only the inputs in the CPM algorithm for the residual and expanding the services delivered by ancillary services. However there is additional uncertainty in specifying the nature, size and products and process for offering flexibility services and payments. It does not address the regulatory risk resulting from the annual review of the ACPS pot.

Table 4.1– Performance of the flexibility payment vs. the status quo scenarios

A flexibility payment would in itself improve the provisioning of adequate reliable or flexible generators; it would provide the market with reward incentive for reliability or flexibility generators without affecting the level of price stability. However key disadvantages will be in the complexity of the design of a flexibility payment which in itself could lead to increased regulatory risk for generators.

The CPM and the AS revenue payment streams have two separate objectives and it is the RAs view that these should remain separate. As the SEM develops, the RAs believe that the CPM is not an appropriate mechanism to incentivise generator flexibility and that the best long term signals for conventional generators and new generators for the incentive for reliability or flexibility is the development of new or modified Ancillary Services. The SEM Committee is therefore not actively looking to pursue this option.

4.1.2 NEW OR MODIFIED ANCILLARY SERVICES

In June 2009, the RAs published a consultation paper (SEM-09-062 - Harmonised Ancillary Services and Other System Charges Rates Consultation[14]), developed by the SOs, detailing the proposed payments' and charges' to be applicable in the first year of implementation. Subsequently, the RAs reviewed the proposal and comments received and reached a decision in August 2009 to postpone the harmonised Ancillary Services Project Go-Live until 1st February 2010 to allow adequate time for all involved to smoothly effect the transition to the new arrangements.

On 4thJanuary 2010 the RAs published the Harmonised All-Island Ancillary Services Rates and Other System Charges Decision Paper (SEM-10-001), this decision included information on the all-island AS arrangements for generator payments/charges, as well as a commitment to incentivise compliance by generators with the Grid Codes. The work was to provide a harmonised regime for provision and procurement of ancillary services across the island of Ireland. Within this paper the RAs considered that the proposal by the TSOs for harmonised rates for Reserve was reasonable and meets the requirements of the RAs, as highlighted in the February 2008 HLD decision paper. This included the option for the TSOs to suggest new or modified services if considered of benefit to the efficient operation of the system. The new harmonised arrangements went live on 1st February 2010.

As the market matures and the generation mix develops, there is a case for increasing the size, number of products and expanding the scope of Ancillary Services to incentivise flexibility. The RAs believe that these new or modified services could be developed to provide generators with appropriate incentives to deliver flexible capacity and performance if these qualities are considered to benefit the system.

An increase in Ancillary Services payments to the BNE peaker would implicitly mean a reduction to the ACPS. It should be noted that any decisions made on the CPM cannot be made without considering the impact of Ancillary Services. This 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 is appropriate in both mechanisms.

The CPM and the AS revenue payment streams have two separate objectives and it is the RAs view that these should remain separate. Should the CPM offer payments for Flexibility?

4.2 CAPACITY PENALTIES

[14] http://www.allislandproject.org/GetAttachment.aspx?id=4826fcd0-ba52-4f5d-987d-245fe49dd19b

All generation that makes itself available deserves payment for its contribution to capacity adequacy, but if the generation is not available when required then the generator should not be eligible for payment. The CPM should ensure that a poorly performing plant be given the correct signals and be incentivised to exit the market if it is not providing value to the system.

The SEMC is strongly minded to consider an appropriate mechanism for penalising generators for not providing capacity when they have declared that they would. This would incentivise the availability of generators when actually needed.

The following section will look at penalising generators that have failed to deliver capacity when required and rebating payments to generators that have provided the required capacity. The amount of the penalty should be reasonable, appropriate and proportionate to the circumstances.

4.2.1 HOW A PENALTY SYSTEM MIGHT WORK

There are various types of penalty systems that could be considered, for example

- A point system could be developed where the generator will receive points based on the scale and impact of the failure. These points could accumulate over time; the accumulation of these points would set the severity of the penalty. At the end of a set period the points could reduce back to zero.
- A 'traffic light' flag system, where flags and penalties would be issued by the System Operator.
- Another option would involve explicitly penalising each failure event. The RA's have developed a candidate arrangement for this labelled 'Capacity Declaration Penalties', described below.

4.2.2 CAPACITY DECLARATION PENALTIES (CDP)

The idea of the Capacity Declaration Penalty (CDP) is that the generator should provide a 'product' or 'service' in return for the received payment. This product is the commitment to be available when needed. If the generator fails to be available when required to generate, then a penalty (the loss of a portion of their CPM payment) would be applied.

One option to consider is if a generator fails to provide capacity when its is called to do so[15], or fails a test instructed by the TSO (to prove it is capable to provide capacity), then it must rebate a certain % (to be consulted on), of its CPM payments made for the provision of capacity since it last demonstrated its capability to generate (either through test or its last provision), or for the X months (3 months is suggested) prior to the failure, whichever is shorter.

If required an additional design option could be used to allow the generator to mitigate the risk. This mechanism poses to it by requesting periodic tests on itself (the frequency of these requests could be capped at say five or six per annum). This might work in practice by the System Operators issuing the dispatch instruction at a time of their choosing within one week of receiving the request.

Another option would be to have no penalty tests but to penalize those who fail to be available when required to generate. A period of tight margin would be declared by the System Operators through a pre established criteria

[15] This would often be simple failure to start events for most thermal units, but other types of failure such as failure to ramp or run-up as expected from Technical Offer Data could also be included in the penalty mechanism.

and any generator who failed to generate their committed firm capacity at those times would be liable to face a Capacity Declaration Penalty as they failed to provide the 'product' or 'service'.

4.2.3 APPEALS

A generator on whom a penalty is imposed and who is aggrieved by the imposition or the nature of the penalty, the amount of the penalty or any date by which the penalty is required to be paid, might be permitted to apply to a relevant delegated body of the SEM Committee which could consider any aggravating or mitigating circumstances that it considers which could have an effect on the conditions and level of the penalty imposed. Such an appeals mechanism would need to be carefully designed, such that the appeals brought to it are genuine and manageable in terms of volume.

4.2.4 DISTRIBUTION OF PROCEEDS

The penalties collected could be redistributed to the generator units that successfully provided capacity during the penalty period in question. Alternatively, penalties could be used to offset Capacity or Imperfections Charges levied to suppliers by the Market Operator. In the first case, the Best New Entrant would expect to be 'penalty-neutral' over the course of its life, whereas in this second case, the Best New Entrant would expect to incur a net cost instead. This means that a compensatory effect would emerge between the choice of distribution arrangements and the size of the ACPS.

The RAs welcome views on what would be the most appropriate form and method of issuing penalties. In addition, the RAs welcome further suggestions from respondents on the scope and nature of penalties and on other penalties options.

Do respondents agree with the SEM Committee, that an appropriate mechanism for penalising generators for not providing capacity when they have declared that they would, would increase the incentive to encourage the availability of generators when actually needed?

Do respondents believe the CDP arrangement as described would fit the SEM CPM design?

What should an appeals process involve / include?

How should the proceeds from penalties be distributed?

4.3 NEW ENTRANT SCENARIO

As highlighted in Option 6 in the Work Package 7 - BNE Calculation Methodology paper, the SEMC along with its consultants investigated how a new entrant guarantee could be applied in the CPM.

There are several ways to provide a new entrant guarantee, these include:

- Guaranteeing the BNE price at the time of commissioning for all new entrants adjusted by capacity credits, for a few years, and leaving the residual pot to be allocated among existing generators;
- Guaranteeing a BNE price only to conventional generators for a period of several years, and allocating the residual to renewable and existing generators.

In this scenario, which is in Section 8 of the Poyry Report, Poyry assessed the impact of creating a separate new entrant pot out of the Annual Capacity Payment sum (ACPS). Each new entrant is guaranteed a BNE price for 5 years, adjusted by de-rated capacity credit. The total sum of this guarantee is deducted from the ACPS. The remaining sum is allocated according to the re-balancing scenario on the basis of (a) a 50:50 split of the overall capacity pot between ex-post and ex-ante payments; (b) setting the flattening power factor to 0.5; and (c) dividing ex-post payments into current monthly pot weightings while ex-ante payments are applied similarly across all trading periods.

The intention of the 'fixed price for new entrant' scenario is to provide an increased level of stability to new entrants in order to encourage market entry, and also appropriate market exit for older plants. The idea is to incentivize investment by establishing a predictable income for new entrants.

The success of this scenario will depend on the level of new entrants entering the market. As long as the number of new entrants is limited, this scenario is likely to perform significantly better at re-distributing the available pot to new entrants and marginally worse for existing generators compared to the status quo. The new entrant scenario would improve the certainty for new entrants and help to deliver new capacity when it is needed by reducing the cost of capital for these entrants but at a price for the existing generators.

This could potentially result in calls to increase the size of the ACPS pot or the provision of grandfathered minimum payments to existing generators to protect them from diminished revenues. In effect this scenario should be done without adding risk in the remuneration of existing generators.

On balance this scenario seems to perform significantly well for new entrants but is likely to deliver sub optimal results for the market as a whole compared to the status quo design. There is a mixed performance on prices which may cause instability and it introduces discrimination to the process as new entrants are treated differently from existing generators. Another issue is that a new entrant scheme entails the greatest regulatory risk as it would require changes to the existing principles and objectives of the CPM.

Table 4.2 identifies the comparisons in performance between the new entrants vs. the status quo scenarios.

Reform option	Performance
Capacity adequacy	▪ The scenario improves adequacy by incentivising and providing certainty to new entrants. However depending on the size of the guarantee it could decrease payments to existing generators and increase premature exit.
System reliability	▪ The scenario's performance is mixed. The capacity adjusted new entrant guarantee ensures reliable generators are incentivised at a higher rate. However it is based on installed capacity and historic availability (thus may require a penalty clause to ensure plants are available when called upon). ▪ For reliable existing generators, the decreased payment as a result of the guarantee reduces their incentives, as does the diminished payments for new entrants once the guarantee is exhausted.
Efficient price signals for long term investments	▪ The new entrant guarantee provides a certain, predictable and (in a few cases) comparably large increment in average payments and is likely to incentivise new entry even in light of expected declines in energy revenues due to a higher penetration of wind. ▪ Lower revenues for existing generators and for new entrants (once they have exhausted the guarantee) could encourage inefficient exit in light of lower energy revenues in future years.
Price stability	▪ The scenario's performance is mixed. It provides significant certainty for new entrants for the period of guarantee; however for existing generators it increases uncertainty by adding an additional risk to capacity payments (the annual amount of guarantee). It also increases the risk for new entrants once they have exhausted their guarantee.
Fairness	▪ The scenario discriminates in favour of new entrants. The justification is debatable since there are other less discriminatory ways of encouraging new entrants such as increasing the size of the ACPS pot.
Simplicity	▪ The payment structure is simple and predictable for new entrants for the period of guarantee. However, it increases the level of uncertainty for existing generators who will need to estimate the set-aside for new entrants, in addition to the current uncertainties of the annual process.
Susceptibility to gaming	▪ The risk of gaming remains unchanged compared to the status quo. However, if the level of the new entrant guarantee is linked to system scarcity, there could be a risk of withholding entry so as to increase the level of the guarantee.
Regulatory risk	▪ The operation and design of the new entrant scheme entails the greatest regulatory risk across all options. It would require major changes to the SEM T&SC. ▪ It partially addresses the regulatory risk of the annual review of the ACPS for new entrants but not for existing generators.

Table 4.2 – Performance of the new entrant vs. the status quo scenarios

Benefits	Risks
It will incentivise and provide certainty and stability to new entrants.	It introduces discrimination, as new entrants are treated differently from existing generators
It would help to deliver new capacity when it is needed by reducing the cost of capital for new entrants	Incumbents will receive lower payments and it could encourage inefficient exit for existing generators.
It would provide efficient price signals for long term investments.	It would increase regulatory risk and it would require major changes to the SEM Trading & Settlement Code and the existing principles and objectives of the CPM.

Table 4.3– Benefits and risks of the New Entrant scenario

Should New Entrants be treated differently to incumbents in the CPM?

The RAs welcome comments on the feasibility of introducing a new entrant guarantee.

5 WORK PACKAGE 9 - TIMING & DISTRIBUTION OF CAPACITY PAYMENTS

The SEMC are of the view that capacity payments should remain valued at the best new entrant peaking price and weighted across the trading periods of year and day. Actual capacity at the demand peak or more specifically the 'margin valley' is more valuable to the system than the capacity at other times.

The CPM affects both generators and Suppliers:

- Generators who are available in any given Trading Period (availability being measured as Eligible Availability as described within the T&SC) will receive an amount of the total money allocated to that Trading Period for payments (Fixed plus Variable plus Ex-Post) in proportion to their available capacity when compared with the total available capacity in that Trading Period.

- Suppliers are charged an amount of the money allocated to that Trading Period for charges in proportion to their metered demand when compared with the total metered demand in that Trading Period.

- Settlement of the CPM is then undertaken on a monthly basis consistent with the definition of the Capacity Period.

The CPM has many design features (12 monthly pots, fixed capacity price, ex-ante variable fixed capacity price together constituting 70% of the payment) which in itself reduces a great degree of volatility for generators. The SEMC choose these allocations in a desire to provide an effective short-term signal for generation which does not introduce excessive volatility or uncertainty, while balancing this against the need to provide longer-term stability for investment and the other Objectives for the CPM. One of the aims of the mechanism should be to provide certainty to the investors if they build reliable plants and maintain them properly, so that the plants are ready to produce and provide a product to consumers when needed. Each year these allocations are consulted upon.

The following section will highlight the current distribution of payments and indicate the findings of Poyry's report.

5.1 CURRENT DISTRIBUTION OF PAYMENTS

The current mechanism for distribution of the pot is defined in the Capacity Payment Factors Decisions Paper published in December 2006 (SEM-231-06)[16].

Firstly, the CPM fixed pot is divided year-ahead into 12 monthly pots. Each monthly pot of money must be paid out in each relevant month. Therefore, if the majority of events where there is a lack of available generation occur in a single month, and a particular generator is out on maintenance for that month, the generator in question will still receive revenues under the CPM for the other eleven months. This distribution reduced the risk for individual generators of "losing out" by not being available at the times when availability is most required.

Secondly, within each month, availability is priced under three "streams".

[16] Capacity Payment Factors Decision Paper - December 2006 - http://www.allislandproject.org/en/capacity-payments-consultation.aspx?page=1&article=882fd997-402b-4f8a-8264-424a42204832

- **Year Ahead - 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 (i.e. values the required availability using a half-hourly index profile that is calculated prior to the start of the Year).
- **Month Ahead - 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. (i.e. provides a forward-looking time-of-day signal for generators, valuing the required availability more during periods of low margin than high margin). The Variable component of the capacity payments mechanism can be driven largely by scheduled outages.
- **Month End - 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. (i.e. values each trading periods' availability based on the system conditions present at any given time). The Ex Post element of the Capacity Payment can be affected by short term availability.

5.2 FIXED, VARIABLE AND EX-POST ALLOCATIONS

The Capacity Period Payment Sum is split into - Fixed, Variable and Ex-Post (Capacity Period Fixed Sum, Capacity Period Variable Sum and Capacity Period Ex-Post Sum respectively).

Under the T&SC algebra, since the start of the SEM the SEMC have maintained the settings for FCPP and ECPP as;

FCPPy = 0.3

ECPPy = 0.3

The magnitude of the Variable Ex-Ante component (VCPP) is a simple function of the above two parameters and is thus implicitly:

VCPPy = 0.4

These 3 payments have a Flattening Power Factor applied. The Flattening Power Factor options are further discussed in section 5.3.

In the past, the RAs considered this allocation provided the best fit to the various Objectives of the CPM, providing a level of certainty sought by respondents to previous CPM consultations (whereby 70% of payment allocation is effectively known prior to each Trading Day) while maintaining an element designed to reflect the actual value of capacity in any Trading Period, determined on an ex-post basis, so as to provide an incentive for capacity to be made available in response to short-term signals. The RAs welcome comments on new ideas and arguments for and against this system.

The ex-post element is only known after the capacity period has passed but it indicates the actual margin of the capacity period. The RAs recognise that the ex-post element provides a degree of risk to generators since, unlike the fixed and variable elements; it is not known ahead of time and therefore retains a degree of uncertainty. However the objectives for the CPM include the requirement to provide a short-term signal in the event of capacity shortages and the RAs believe it is essential that such a short-term signal is provided.

While the variable element which is linked to forecast margin provides a degree of short-term signal, only the ex-post element can provide the close to real-time signals needed when capacity is in short supply due to, for example, a major unplanned outage of a large power station.

An increase or decrease in any of these elements would have an impact on generators and investors, such as;

- An increase in the fixed element would reduce the cost of capital for investors since it would provide greater certainty, but would go against some of the objectives of the CPM.
- A high ex-post element would provide a greater risk to single site or small generators since the financial consequences of a failure for such a generator would be much more significant than for a portfolio player, but this would increase availability at the precise periods where it is needed.
- Reducing the ex-post element would address problems such as errors in the demand forecast and the need for a longer-term measure of availability.

The three existing streams are significantly complex. The Authorities have knowledge of the difficulty that new entrants have faced in deciphering the inner workings of the mechanism and this is an important objective to be considered. With the future increase in wind penetration the forecast of wind availability will also introduce additional uncertainty in the calculation of the forecast of the system margin, as it is considered that a wind forecast rarely coincides with the actual outturn for more than one or two days ahead.

The RAs believe it is necessary to strike a balance between the ex-ante and ex-post elements such that the signal from one element does not "swamp" the signal from the other element. The question to ask is what is the correct balance between these payments, taking into account the objectives of the CPM?
The ex-post stream comes closest to reflecting the volatility in energy prices that would be seen in an energy only market, where as the fixed stream and the variable stream provide more stable revenues to generators.

- Is it better to be 100% ex-post and reward availability when margins are at the tightest?
- Is it better to incentivise new investment and provide a stable long term revenue stream by offering 100% fixed?

Availability and stability can impact system security; any rebalancing of the Fixed, Variable and Ex-Post elements must take into account the overall objectives of the CPM.

Benefits	Risks
A re-balancing of the components could improve efficiency without significantly increasing the volatility of prices.	An increase or decrease in any of these elements would have an impact on different participants.
It would require no changes to the SEM Trading & Settlement Code and maintain the existing principles and objectives of the CPM.	An unbalanced allocation could"swamp" the signal from another element.
Modification of the components would be the easiest to implement and would require the least amount of resource constraint.	

Table 5.1– Benefits and risks of changing the weighting of the 3 components.

The RAs welcome comment on:

- Should the design of the distribution allocations be changed?
- The weighting of the 3 components.
- Should the current values be maintained?
- New ideas on the distribution allocation.

5.3 FLATTENING POWER FACTOR ANALYSIS

The CPM has many design features (12 monthly pots, fixed capacity price, ex-ante variable fixed capacity price together constituting 70% of the payment) which reduces a great degree of volatility for all generation. A Flattening Power Factor (FPF) was introduced into the Loss Of Load Probability Table (LOLP Curve) calculation to have the objective of reducing the volatility in the Capacity Payments Mechanism, as the LOLP was considered to give rise to 'lottery' effects in months of high margin.

In March 2007 the RAs published a Decision paper on the Loss of Load Probability Curve for Capacity Payment Mechanism Decisions Paper and Response to Detailed Comments (AIP-SEM-07-65[17]). This paper focused on the key issues and presents the Regulatory Authorities' conclusions in relation to the determination of the Loss of Load Probability Curve.

Choosing an appropriate value for the FPF is a matter of striking an appropriate balance between retaining sufficient volatility to signal the need for availability in times of low margin and avoiding excessive volatility that would render the mechanism highly unpredictable during periods of high margin.

Section M.30 of the T&SC 4.3 states that it is the responsibility of the System Operators (SOs) to propose a value for the FPF to the RAs. On the 6th of August 2010 the System Operators (SOs), Eirgrid and SONI, Published a paper on the "Proposed Value for the Flattening Power Factor for the year 2011"[18]. This paper carried out an assessment of the 2009 capacity payments and the impact of different Flattening Power factors on the Ex-Post and Variable Payments by Plant Type; it also looked at how changes in the FPF may impact on the behaviour of generators who control predictable generation units.

In the current design of the CPM, the System Operators (SOs) calculate the system margin as a step to calculating capacity payments. This involves several aspects, notably (a) a Loss of Load Probability curve, which relates Margin to Loss of Load Probability; and (b) a Flattening Power Factor ($0 \leq FPF \leq 1$) which is applied to the determine how 'steep' or 'flat' the LOLP curve is.

[17] http://www.allislandproject.org/GetAttachment.aspx?id=316ea18e-0064-4404-a905-246287dad1d4

[18] http://www.allislandproject.org/GetAttachment.aspx?id=b162dcae-2d49-40bc-bfe9-498e7ccfa72b

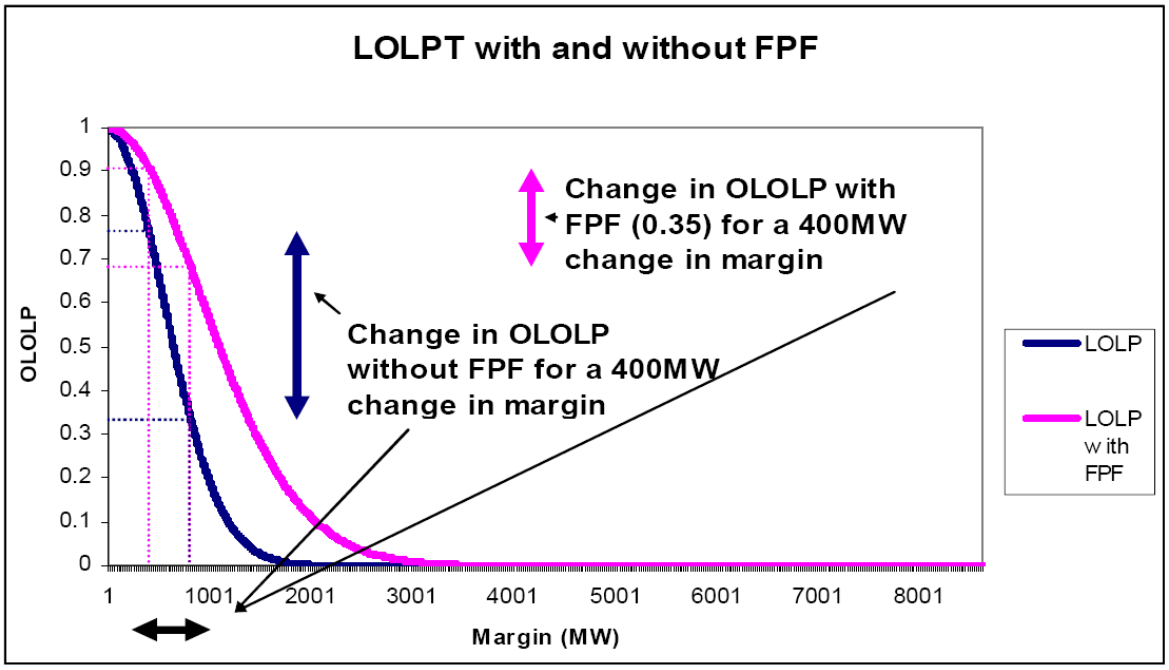


Figure 5.1- The LOLP Curve with and without a FPF for a 400 MW change in Margin.

Before the commencement of SEM, high load days would be the days that contributed the most to LOLE but with future increased wind penetration, days with high load and **low** wind will continue to contribute the most to LOLE, this has been demonstrated in the cold winter periods of Jan 2010 and Dec 2010 when the island suffered extreme weather events, with long periods of negative temperatures and anti-cyclone type events.

The following analysis looks at the sensitivity of the impact of the Flattening Power Factor. The runs are based on an ex ante - ex post rebalancing scenario which assumes a 50:50 split between ex-post and ex-ante capacity payments, but with Flattening Power Factor set at 0.35 (as currently defined in the CPM), 0.5, 0.75 and 1.0.

The Tables below highlight the results of changing the FPF.

	0.35	0.5	0.75	1
Highest price of the year	41	79	175	314
Price at time of lowest margin	32	52	96	146

Table 5.2– Extreme prices, under each FPF

Table 5.2 presents the highest capacity price for 2008 and the price at the time of the lowest margin under each FPF. Changing the FPF from 0.35 to 1.0, leads to a seven-fold increase in capacity prices at times of lowest margin, with this increase offset by decreases in the capacity price during periods of high margin.

MW	0.35	0.5	0.75	1
1000	30.1	47.3	82.7	121.9
2000	11.9	13.8	15.7	16.7
3000	6.7	6.8	6.8	6.9
4000	5.0	5.0	5.0	5.1
5000	4.8	4.8	4.8	4.8

Table 5.3 – Average price when margin is below

Table 5.3 highlights the average prices for each period when system margin is below 1,000 MW to 5,000 MW. The average prices when there is sufficient margin is similar across the FPF sensitivities, however, below 1,000 MW, FPF of 1.0 results in significantly higher capacity payments during tight margin periods.

€/MW	0.35	0.5	0.75	1
25	120	253	409	481
50	0	32	117	158
75	0	4	44	84
100	0	0	23	48
125	0	0	15	31
150	0	0	7	20
175	0	0	1	17
200	0	0	0	16
225	0	0	0	9
250	0	0	0	5
275	0	0	0	4
300	0	0	0	1
325	0	0	0	0
350	0	0	0	0

Table5.4 – Number of half hour periods when capacity prices is above

Table 5.4 highlights the number of periods when capacity price is above €50, €100, €150. Under the current FPF, in a 50:50 ex-post ex-ante rebalancing scenario, there are no periods when capacity is above €50, however as FPF increases, the number of periods above €50increases.

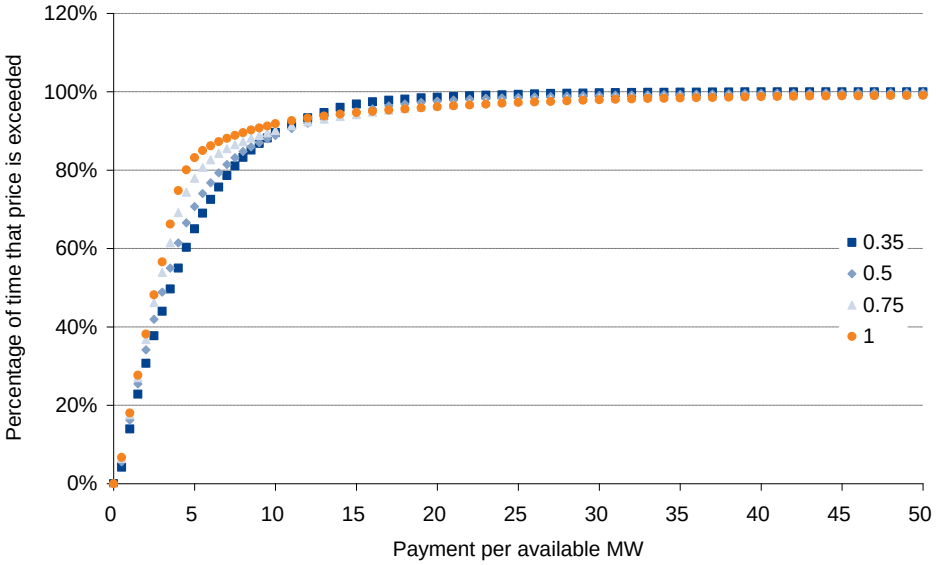


Figure 5.2 – Frequency distribution of capacity payments

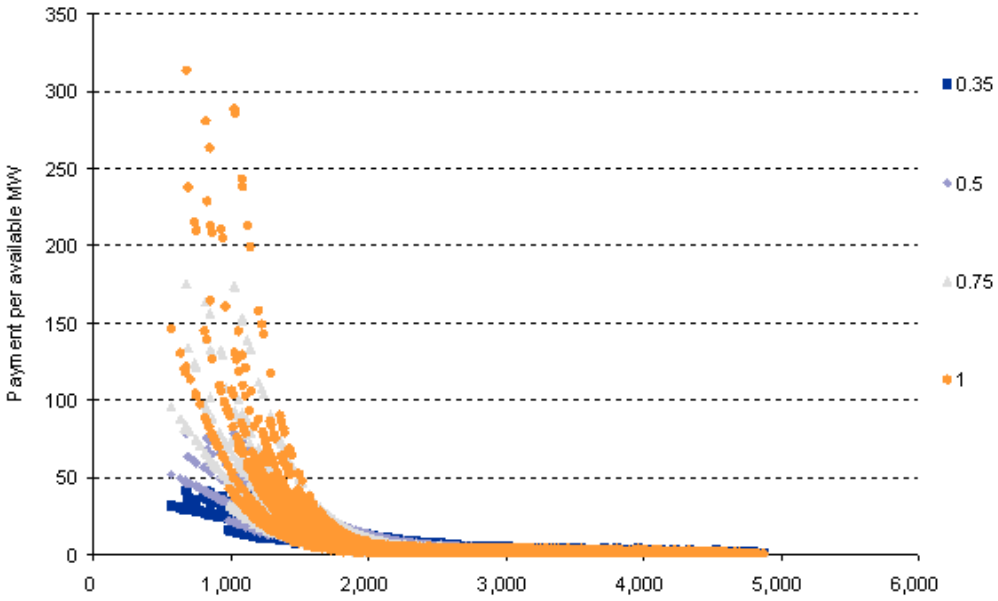


Figure 5.3–Relationship between Capacity Payments and margin

Figure 5.2 (Frequency distribution of capacity payments) and Figure 5.3 (Relationship between Capacity Payments per MW and margin) provide additional evidence for the impact of changing the FPF.

There are significantly more extreme prices as the FPF moves towards 1. The level of impact of the FPF will have an effect depending on the size of each of the Fixed, Variable and Ex-Post elements.

The SO's in the past have indicated that there may be scope for moving to two FPFs, which would enable the creation of two LOLP curves: on one hand, a 'flatter' curve for stable Variable payments that retain the link to the margin but incorporate the error inherent in a forecast of the margin; on the other hand, a steeper curve closer to

the actual LOLP curve that introduces the appropriate level of risk to the Ex-post payment that drives the necessary investment in availability.

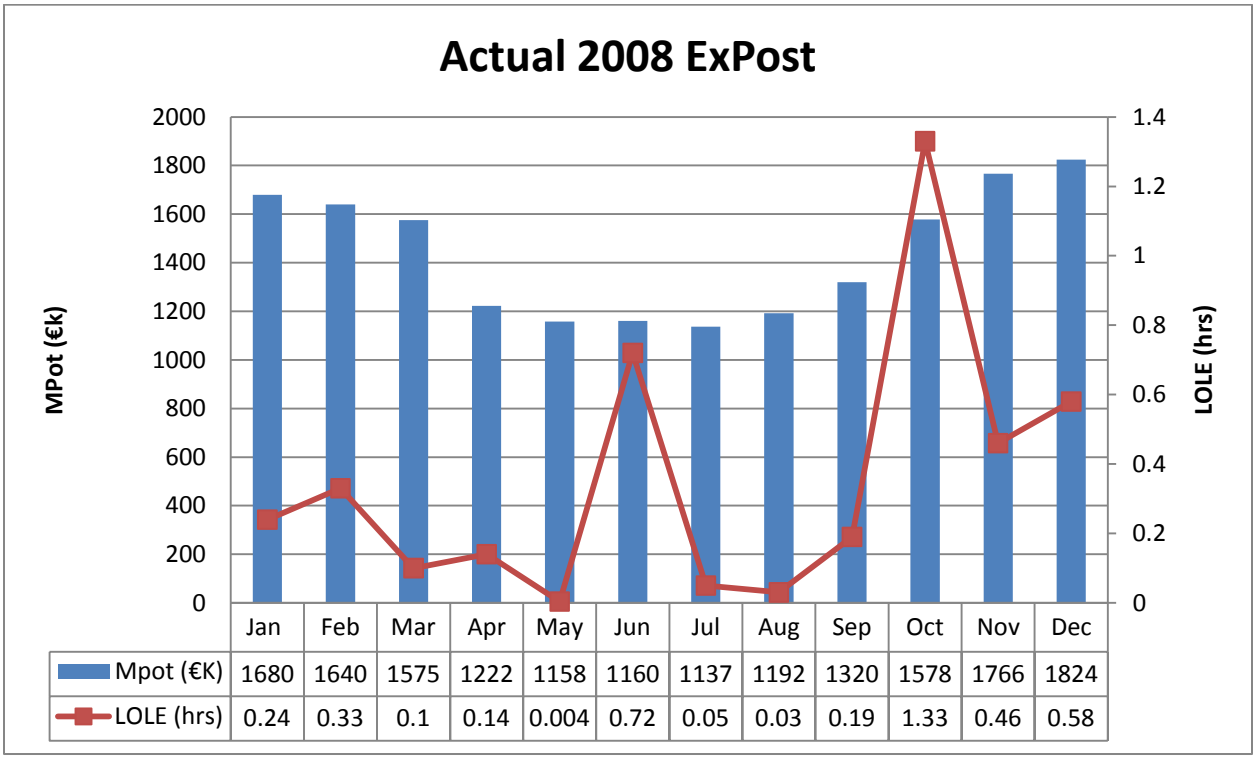
Should a FPF be applied within the CPM?

Should the current value be maintained or changed?

If the mechanism moves to a heavier weighed ex-post payment will the FPF be as effective?

5.4 ALTERNATIVE APPROACHES TO THE DISTRIBUTION AND TIMING OF CAPACITY PAYMENTS

There is also the substantive issue of the annual distribution of the CPM pot of monthly splits calculated year-ahead. The current methodology uses the Fixed, Variable and Ex-Post weighting factors to settle the CPM on a Monthly basis weighted by peak to trough forecast demand. However historically, the SEMC has observed that the co-incidence of high forecast demand and tight outturn margin has been poor. In Figure 5.4 the monthly pot for 2008 was calculated year ahead but the timing of the tightest margins actually happened in summer rather than winter:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mpot (€K)	1680	1640	1575	1222	1158	1160	1137	1192	1320	1578	1766	1824
LOLE (hrs)	0.24	0.33	0.1	0.14	0.004	0.72	0.05	0.03	0.19	1.33	0.46	0.58

Figure 5.4 - 2008 CPM Monthly Payments and Actual LOLE

The Ex post LOLE in 2008 shows that the monthly payments did not correspond with the periods of tightest margin very well at all.

The RAs would like to put forward some candidate approaches to the distribution and timing of capacity payments for consideration for respondents (though other ideas are also welcome) these are:

- 50:50 split between ex-post and ex-ante capacity payments100% Ex-post Annualised calculation, no flattening, with Generator Payment Guarantees.
- 100% Ex Post with Floors – The "SOCAP Model".

5.4.1 50/50

This approach is an ex ante - ex post rebalancing scenario which adoptsa 50:50 split between ex-post and ex-ante capacity payments. The main features of this scenario, which is in Chapter 5 of the Poyry report, are;

- Changing the weighting between ex-post and ex-ante payments to 50:50.
- Increases the flattening power factor to 0.5.
- Splitting the ACPS to monthly pots based on forecast demand and sharing intra-monthly split evenly across all trading periods.

The scenario is technology-neutral and applies equally to new entrants and existing players.

The re-balancing scenario is considered by Poyry as an improvement to the current CPM design. Under this scenario, modelling indicates that payments would be re-distributed primarily from wind to other generators. In future years, all technologies except wind experience marginally higher level of payments compared to the status quo.

At the margins, by improving the remuneration for most generators, this scenario is likely to ensure that the market can provide a higher level of capacity adequacy compared to the status quo.

In general, this scenario provides a marginal improvement to the status quo design. Table 5.5 summarises the comparisons in performance between the two scenarios.

Reform option	Performance
Capacity adequacy	▪ This scenario provides increased capacity payments for most conventional generators in 2008 compared to the status quo. All technologies except wind experience a small increase in 2020.
System reliability	▪ The emphasis on ex-post payments increases the remuneration for reliable generators improving system reliability at the margin.
Efficient price signals for long term investments	▪ The scenario ensures higher payment for conventional generators in 2008, increasing in future years. This could improve their investment case relative to the status quo design. However, the increased payments may not be enough in light of expected declines in their energy revenues due to a higher penetration of wind.
Price stability	▪ Price stability is eroded since a greater proportion is now based on ex-post outturn availability, thus harder to predict.

Fairness	▪ All generators receive equal payment for each MW supplied as in the status quo, however the shift to ex-post leads to higher payments for flexible generators.
Simplicity	▪ A higher proportion of ex-post payments makes it harder to predict the total likely revenue in advance. ▪ The scenario is simple and transparent as the status quo, since it only requires changes to the CPM algorithm.
Susceptibility to gaming	▪ Susceptibility to gaming remains unchanged compared to the status quo.
Regulatory risk	▪ The scenario results in minimal additional regulatory risk compared to status quo as it entails changing only the inputs in the CPM algorithm already specified in the TSC.

Table 5.5 – Performance of the re-balancing vs. status quo scenarios

Benefits	Risks
The re-balancing scenario seems to provide improved efficiency without significantly increasing the volatility of prices	An increase or decrease in any of these elements would have an impact on different participants.
The scenario is simple and transparent as the status quo, since it only requires changes to the CPM algorithm and it would require no major changes to the SEM Trading & Settlement Code.	An unbalanced allocation could“swamp” the signal from another element.
It would have minimal regulatory risk and it would be the easiest to implement and would require the least amount of resource constraint.	

Table 5.6– Benefits and risks of re-balancing scenarios

5.4.2 100% EX POST WITH FLOORS – THE 'SOCAP' MODEL

This approach was devised in consultation with the System and Market Operators and attempts to divorce the 'fairness' objective from the 'revenue stability' objective, by:

- Paying CPM monies based primarily on 'fairness', using Annual half-hourly profiles of Ex-post LOLP
- Providing a Floor Arrangement or revenue guarantee that mitigates the downside risk for generators
- Possibly making the Floor Arrangement more generous (i.e. certain) for New Entrants (optional).

SOCAP stands for **S**ystem **O**perator **C**apacity **A**llocation **P**rogramme. An Excel model which demonstrates the model is provided in Appendix 2 with this document so that respondents may manipulate the model to get a better comprehension than can be given in descriptive text here.

Within this model, all CPM monies are settled ex-post, at the end of the year, with healthy guarantees (payment floors) that limit downside risk for generators. Generators receive provisional payments during the year that are then 'washed up' at end of year. This model pays generators purely on the basis of the variable called 'Annual Ex-Post LOLP'; which is a vector with half-hourly actual Loss of Load Probability (LOLP) values for the entire year. This means that the entire year is examined at the end of the year, and the money is proportionately placed in half-hours where the instantaneous LOLP was historically the highest[19]. No monthly splits are applied ex-ante.

The cash flow is managed by the System Operators (SO's), in which they place provisional funds in a monthly profile according to their opinion of forecast LOLP and with the outages programme. Those monies are then paid month – to – month, but at the end of the year the allocations are 'washed up' so that the exact ACPS is paid out, and the distribution exactly matches the annual profile of historic instantaneous LOLP.

The SO's are responsible for the calculation of provisional monthly pots at M+1 (possibly M+2) for the Market Operator to use to make the provisional payments for month M and for publishing a profile of forward pots that signal the temporal need for capacity over the remainder of the Trading Year. The model also features a constraining mechanism on the SO's to ensure:

1. That the provisional money cannot be assigned to a single month or to just a handful of months – for example if the system suffers a very tight January and February is forecast to be critical, the SO's cannot put the whole pot in those two months, even if the forecast LOLP suggests it will be correct ex-post to have done so.
2. That the money is not saved during years of high margin such that a large 'glut' of money requires to be paid in December. This means the SO's would put some non-trivial amount in the early months; even if the forecast and observed LOLP suggested that the pot should be zero or very minimal in the early months.

The constraints are designed to firstly limit the uncertainty regarding the flow of provisional money to generators during the year, and also to help indemnify the SO's against the impact of forecast error on LOLP. The tuning of these constraint parameters is something it would be preferable for the industry and the operators to agree upon.

[19] Looking at the results of the Poyry work, this method is considered by the SEM Committee to be one that maximises the fairness objective of the CPM without going outside an annual exercise, but it could be replaced by any method that accomplishes the aim. Other ideas include having the SO's simply send flags to all generators to indicate upcoming periods of tight margin. Ex-post the ACPS could be simply spread evenly across the flagged periods.

In theory the constraints could be set so high as to have never have a binding effect. In this case the SO's would be free to put the provisional ACPS wherever they like during the Trading Year without constraint.

In the accompanying Excel model, the method works by having the SO's assign a 'draft' pot to each month at the beginning of the year based on the SOs forecast of LOLE. This is then used to set constraints on the provisional monies that are paid out in January and for the re-assignment of the remaining ACPS once January is finished. This pattern propagates, so that at the start of each month the SO's produce a new rolling forecast of the LOLE for each month left in the year. They also calculate the actual ex post LOLE for the month just passed. This is used to adjust the constraints on the pot for the month just passed. This process is best demonstrated in the accompanying Excel spreadsheet.

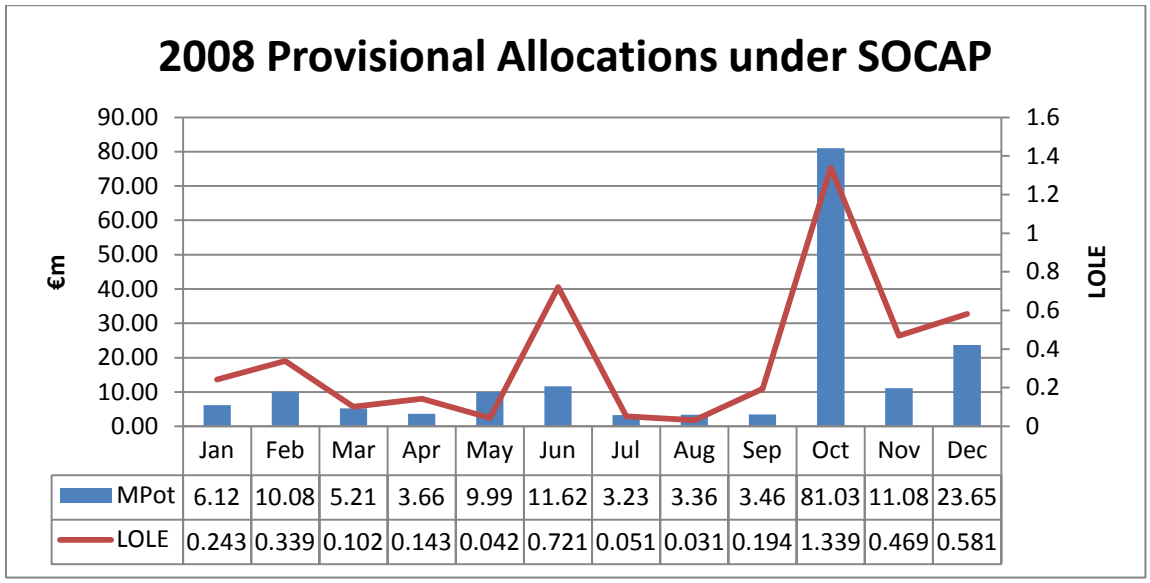
Importantly, under the draft model, none of the SO's calculations / forecasts are financially binding due to the 'wash up', which takes place at year end. These are two critical optional settings that the SEM Committee would welcome comment on:

- Regarding the decisions the SO's make in the allocation of provisional monthly pots, should these decisions instead of being non-binding be partially or wholly binding? For example, if €50m is assigned to January for provisional settlement in February; should that €50m 'stick', even partially, at the end of the Trading Year when the LOLP of all the months is known?

- Regarding the annual 'wash up'; should the settlement instead be continually washed up each month? In this way, previous CPM payments made in the year will be subject to continuous amendment each month instead of a final adjustment being made at year end. Is this better in a financially practical sense?

- Is monthly resolution the most appropriate setting? Should the SO's deliver the forecast and provisional allocation on a weekly basis instead? Should the provisional settlement be done weekly instead of monthly?

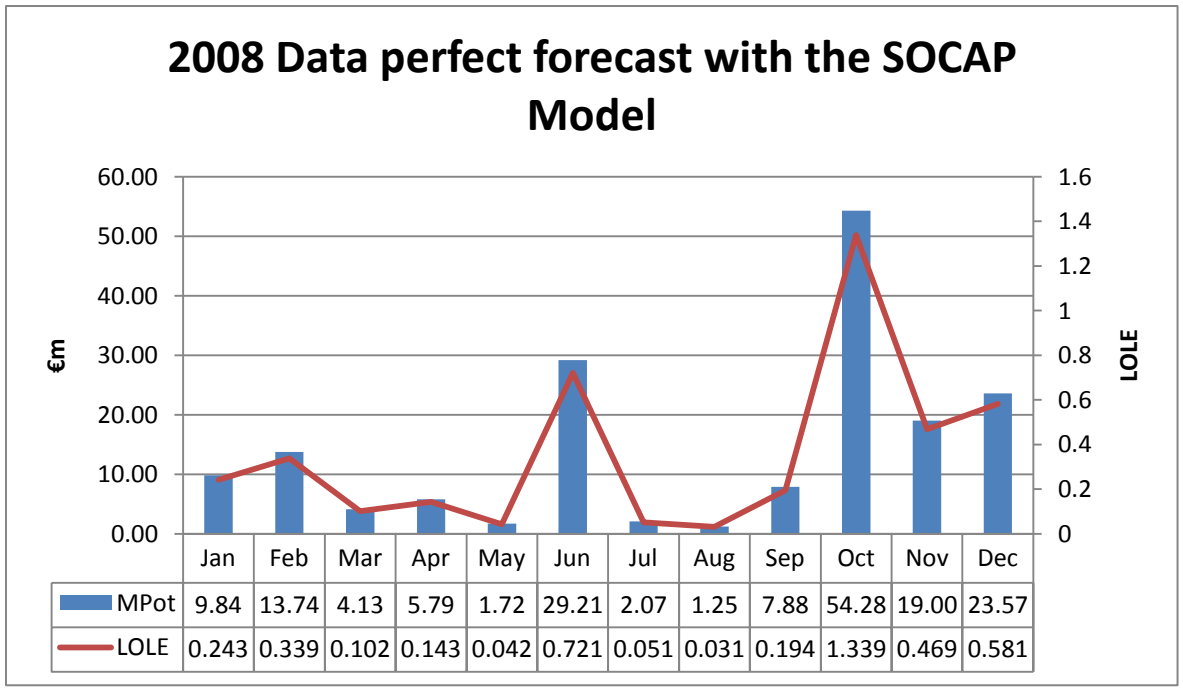
Applying moderate constraints on the SO's allocation programme and assuming moderate forecast errors on the LOLP, the allocation in 2008 could have produced the following:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MPot	6.12	10.08	5.21	3.66	9.99	11.62	3.23	3.36	3.46	81.03	11.08	23.65
LOLE	0.243	0.339	0.102	0.143	0.042	0.721	0.051	0.031	0.194	1.339	0.469	0.581

Figure 5.6 - 2008 CPM Monthly Payments assuming moderate forecast errors

Applying no (or arbitrarily high) constraints and assuming a perfect forecast by the SO's, the provisional allocation would have matched the final allocation (i.e. there would be nothing to wash up). This would appear as:



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MPot	9.84	13.74	4.13	5.79	1.72	29.21	2.07	1.25	7.88	54.28	19.00	23.57
LOLE	0.243	0.339	0.102	0.143	0.042	0.721	0.051	0.031	0.194	1.339	0.469	0.581

Figure 5.7 - 2008 CPM Monthly Payments assuming perfect forecast

The SOCAP model is attached in Appendix 2.

5.4.2.1 GUARANTEE OR 'PAYMENT FLOOR'

The SOCAP model is thought by the SEM Committee to attain something close to an ideal alignment between the provision of genuine capacity adequacy and financial reward, maximising the fairness objective of the SEM. It would also however represent in its own right a substantial increase in the uncertainty and volatility faced by generators regarding the stream of capacity payments they would receive.

To mitigate this effect and meet the objective of revenue stability in the CPM, it is considered appropriate to offer generators some guarantee or 'payment floor' that will protect them, on an annual basis, from unexpected distortions to their CPM revenues. The Floor would be a function of availability - e.g. "We guarantee you'll earn at least:"

$$\text{Floor} = \text{X\%} \times \text{ACPS} \times \frac{\text{Your EA}}{\sum \text{All EA}}$$

Where 'Your EA' is the Eligible Availability of the Generator, 'All EA' is the sum of all Eligible Availability in the SEM, and X is a % value between 0 and 100. The generator will be paid either the Floor, or the Annual EP-LOLP-based payment, whichever is higher. Note that the formula gives no guarantee unless the Generator provides at least some availability.

It was discussed whether this arrangement would be any different in effect to having separate fixed and variable capacity streams, since the Floor could be considered a type of fixed payment. The SEM Committee is of the view that the mechanism is genuinely different mathematically, because it is intended that the floors should only bind rarely. This is different to having a fixed payment stream as the concept of 'fairness' of payments is conserved – arguably perfectly when no Payment Floors bind - while still giving the financial comfort required to deliver lower cost of capital and long term bank ability of capacity payments.

Of key importance in the formula proposed above is the value of X. At a high level the SEM Committee believes a value of 50% would be a reasonable candidate value but welcomes comments from respondents in this regard.

5.4.2.2 ANNUAL 'WASH UP'

Using the proposed mechanisms (SOCAP and Payment Floors), the final CPM monies for Trading Year T would be settled for all generators under a 'wash up' arrangement.

Possible variations of the SOCAP design include:

- Making the within-year SO allocation financially binding, perhaps 40% during the year, so only 60% is 'washed up'.
- Fencing off some of the pot for fixed payments – this would mean using the above design for just a subset of the whole ACPS and continuing with a separate 'fixed' stream of some kind.

Possible variations of the Floor Guarantee mechanism include:

- Assigning a higher value of X for New Entrant generators to help lower to the cost of capital for investment. The higher X value could apply for perhaps three or five years from the time of commencement of participation in the SEM.

5.4.2.3 BENEFITS AND RISKS OF THE ALTERNATIVE APPROACHES TO THE DISTRIBUTION AND TIMING OF CAPACITY PAYMENTS

Benefits	Risks
It can lead to an ideal alignment between the provision of genuine capacity adequacy and financial reward and maximises the fairness objective of the SEM.	It would require major changes to the SEM Trading & Settlement Code, and would require a large amount of resource to implement.
It separates the 'fairness' objective from the 'revenue stability' objective, allowing the mechanism to deliver both without having to choose a 'half-way house'.	It could increase opportunities for gaming, which would require increased monitoring by the MMU.
–It gives the System Operators the ability to send explicit monetary signals for the provision of capacity adequacy, improving the tools available for prevention of load shedding.	

Table 5.1– Benefits and risks of changing the distribution and payments of capacity payments

The RAs welcome comments on the feasibility of introducing a SOCAP Model.

The RAs also welcome comment on:

- The concept that the SO's would 'push money around' and signal need for capacity within-year.
- The value to the system of more explicitly incentivising capacity providers to make sure they will be available when the system will genuinely need them most.
- Whether a Floor; set high enough; is a sound tool for delivering revenue stability and lowering the cost of capital, and if not why not.
- The implications for Cash Flow and Credit for participants and operators.

The RAs welcome alternative suggestions for allocating an effective distribution and timing payments system.

6 WORK PACKAGE 10 - IMPACT OF CPM ON SUPPLIERS

This section looks at aligning charges to suppliers with payments to generators.

The SEM Committee acknowledges the comments received in previous consultations and notes that there have been concerns raised in relation to the 'shaping' of capacity charges for suppliers, and the degree to which this has impacted on their ability to set tariff structures that their customers want.

Capacity Charges are levied in respect of Supplier Units based upon their electricity consumption which in turn fund the Capacity Payments which are made in respect of Generator Units based on a measure of their availability; these charges are settled on a monthly basis.

Currently, the ACPS is collected from suppliers by applying a demand-weighted profile of charges across the months in the Trading Year. There is no alignment between the charges levied on suppliers and the payments made to generators on a half-hourly basis, although the two sets of profiles do tend to map to each other in terms of pattern over the course of a Trading Year (the Fixed component of the payments aligns with the charging profile). The complete rules for levying of Capacity Charges to suppliers are written on two pages in Chapter 4 of the T&SC.

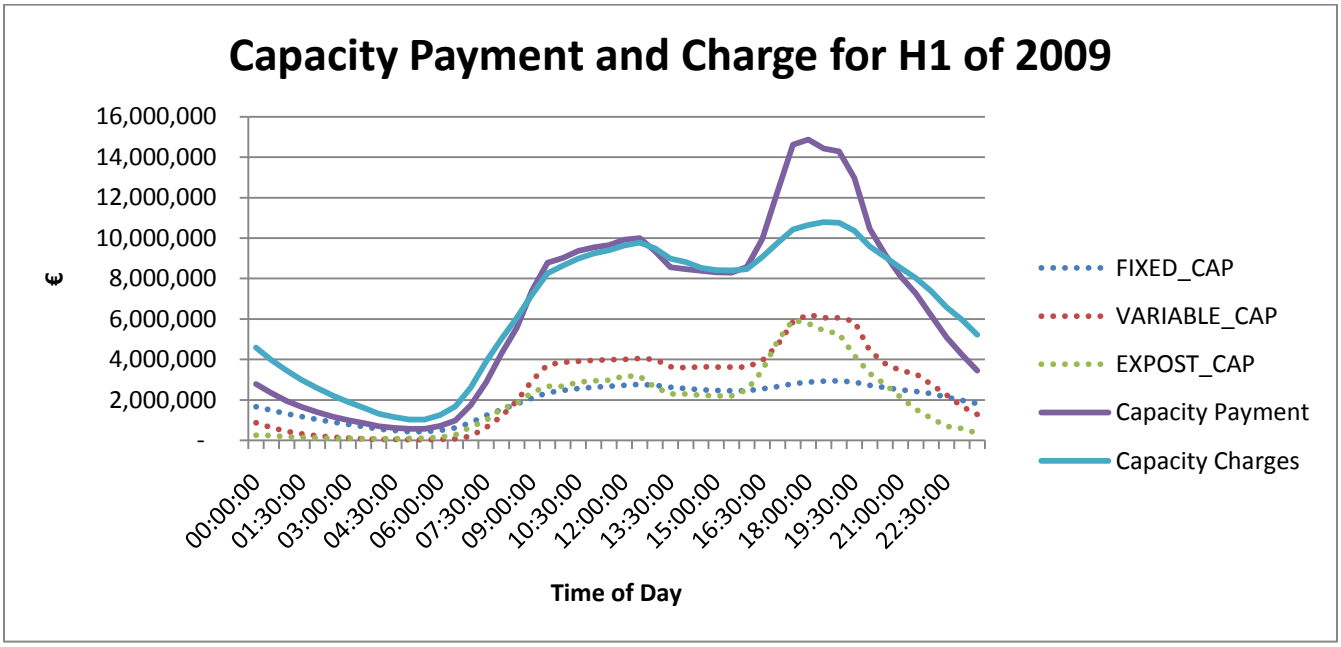


Figure 6.1 –Sum of the Payments and charges during the first half of 2009.

This consultation paper would like to seek more detailed comments, particularly from Supplier participants as to whether this scheme of charging could be improved, particularly in the context of a potential move toward more explicitly ex-post temporal allocations of capacity payments to Generators.

Broadly, the SEM Committee is of the view that, as the SEM is now mature and there is more knowledge and transparency in the market environment, that it would be preferable to align capacity charges with capacity payments on a half-hourly basis. This would be expected to maximise the utility of the Mechanism from an economic perspective, and send signals to consumers (via their suppliers) as to the true time-varying cost of their consumption decisions (since demand directly sets LOLP). In practical terms, this would mean that the policy for

capacity charging simply evolves such that the profile is aligned with the profile for payments caused by the capacity payment structure (be it SOCAP or otherwise).

The opposite option is to leave the existing algebra exactly as it is. A middle-ground policy may involve a re-write of the algebra in a way that more closely aligns the charges with the payments. This policy path would require more extensive development following completion of the decisions relating to the Capacity Payments.

The RAs welcome comments from respondents / suppliers on options for shaping supplier Capacity Charges, in the context of the existing design and in the context of the other Capacity Payment proposals in this document.

7 CONCLUSIONS

Simply put, the CPM pays out a fixed pot of money to be shared amongst all generation. The total pot is tailored to ensure that it would pay a best new entrant peaker generator at a sufficient rate to cover its long-run costs at equilibrium, given forward looking estimates of its running and all its other revenues. The rate at which the BNE peaker is paid per installed kW is multiplied by an amount of generation capacity to maintain security of supply to normal standards. The resulting sum of money becomes the ACPS.

Rather than just pay all generators their relative share of the CPM total pot based on installed capacity, it was deemed appropriate during the design of the mechanism to send signals through it.

These signals incentivise generators to make their capacity available as much as possible, and to make it available at more valuable times. The following balance was struck;

- Firstly, the fixed pot is divided year-ahead into 12 monthly pots.
- Secondly, within each month, availability is priced under the three component "streams".

The CPM values Eligible Availability within each half-hour equally from all technology sources, irrespective of start-up times, ramp rates, likelihood of tripping during start-up, flexibility, or the non-diverse nature of those technologies. It currently only differentiates between various sources of availability by the time-value assigned to that availability through its three payment streams.

This mechanism was introduced at the start of the SEM as the best fit system that incorporates the following CPM objectives;

- Capacity Adequacy/ Reliability of the system
- Price Stability
- Simplicity
- Efficient price signals for Long Term Investments
- Susceptibility to Gaming
- Fairness

The main purpose of this review was to examine if the current design of the CPM can be further improved to meet its original objectives.

The electricity market in the SEM is expected to change significantly in the medium term. The Republic of Ireland and Northern Ireland have set a target of 40% for renewable generation by 2020 to meet broader EU renewable energy targets. In light of the dominance of wind as a renewable resource, it is likely to be a primary driver in pricing and dispatch in the SEM.

The impact of increasing intermittency is likely to be two-fold:

- It will alter the volume and mix of generation available at any point in time. This makes (a) the ex-post constituent of capacity payments more volatile; and (b) the level of aggregate payments less predictable thereby increasing risks in the market.
- Intermittency shifts the nature of capacity required in the system, and compounds the difficulties of having a single signal for capacity and flexibility. It may also change the roles and relationship between ancillary services and capacity payments in delivering flexibility and availability at peak.

Poyry's analysis of the medium term performance of the CPM finds that there are no significant changes in the performance of the current design in this new environment. Wind changes the distribution of aggregate capacity payments but does not materially mitigate or exacerbate the overall performance of the mechanism. It results in (a) variability of revenues; and (b) leads to low load factors for conventional plants which increases the uncertainty of energy revenues and a greater reliance on capacity payments for cost recovery.

Assessment criteria	Rebalancing scenario	Capacity Credit scenario	New Entrant scenario	Payments for Flexibility	SOCAP Model scenario
Capacity adequacy	=	=	✓	✓	✓
Reliability of the system	✓	✓	×	✓	✓
Price stability	×	×	✓NewGen×ExGen	×	✓
Simplicity	?	×	×	×	=
Efficient price signals for long term investments	✓	✓	✓	✓	✓
Susceptibility to gaming	=	=	=	=	×
Fairness	=	=	×	=	✓
Minimise regulatory risks	=	×	×	=	=

Key	Better	Same	Worse
	✓	=	×

Table 7.1– Comparisons of reform packages with the status quo mechanism (Note: Ex-Gen refers to existing plants, while New-Gen refers to new entrants under the new entrant scenario.)

The CPM objectives are essential in the development of any changes to the mechanism, as indicated in Table 7.1 shows the comparison of the reform packages investigated by Poyry, the Price Stability, Regulatory Risk and Fairness are worst in a number of the scenarios investigated. The final objective relates to simplicity or complexity or, perhaps more, to comprehensibility. It is not true to say that just because something is complex that it is inherently inferior. The key to this objective is whether the outcome produced by the chosen mechanism is predictable (i.e. for a given set of inputs the output can be predicted), transparent and the results can be understood. A mechanism which gave rise to prices which were not predictable or transparent or which could not be understood would fail to meet this objective.

From the above table it can be see that the SOCAP Mode is the scenario which has the most improvements with the status quo mechanism. It separates the 'fairness' objective from the 'revenue stability' objective and can lead to an ideal alignment between the provision of genuine capacity adequacy and financial reward. Although it would require major changes to the SEM Trading & Settlement Code, it would require a large amount of resource to implement and it could increase opportunities for gaming, which would require increased monitoring by the MMU.

From Poyry's findings, they have identified the "Payments for Flexibility" scenario as the scenario which provides the most improvements. The flexibility payments scenario does improve flexibility in the system but, depending on its design could result in increased complexity, price volatility and decreasing predictability of payments. As previously stated in Section 4.1, the SEM Committee believe that the CPM is not an appropriate mechanism to incentivise generator flexibility and that the best long term signals for conventional generators and new generators for the incentive for reliability or flexibility is the development of new or modified Ancillary Services. The SEM Committee is therefore not actively looking to pursue this option.

The rebalancing scenario offers the next best scenario to develop the CPM objectives; it seems to provide improved efficiency without significantly increasing the volatility of prices. Where as the scenario is simple and as transparent as the status quo, it only requires changes to the CPM algorithm and it would require no major changes to the SEM Trading & Settlement Code, meaning it would be the easiest to implement and would require the least amount of resource constraint.

The rebalancing scenario becomes more complex if there is a movement away from a rebalancing of the Fixed, Variable and Ex-Post components. The Ex-post model has its advantages and disadvantages but its development must be taken in context of the CPM objectives.

Whilst the Regulatory Authorities recognise there will be concerns expressed by respondents in relation to the reallocation process required for the ex-post options, the improved accuracy in pricing, even with the reallocation, the ex-post process does provide a form of short-term signal which the longer-term ex-ante approaches cannot provide. Respondents should recognise that the effects of the reallocation process could be mitigated to an extent by reducing the proportion of the fixed revenue amount allocated to the ex-post element. The Regulatory Authorities concur with this view and consider it an important input in seeking to select a “best fit for purpose” CPM.

The SEM Committee continues to believe that the concept of the CPM should remain in place and wish to ensure that any changes identified to the CPM do not jeopardise the current investors in the SEM, as investments made to date have been based on a maintained CPM. They are also aware of the consequent perception of increased regulatory risk but wish to continue to meet the SEM Strategic Objectives and the CPM Objectives without fundamentally redesigning the CPM.

8 VIEWS INVITED

Views are invited regarding any new ideas or good arguments pro or against all aspects of the proposals put forward in this discussion Paper, and should be addressed (preferably via email) to both Jody O'Boyle at jody.o'boyle@niaur.gov.uk and Clive Bowers at cbowers@cer.ie by **5pm on 31st May 2011.**

Respondents to this consultation are also asked to provide evidence and supporting information to backup any opinions expressed in their response.

The SEMC intends to publish all comments received. Those respondents who would like certain sections of their responses to remain confidential should submit the relevant sections in an appendix marked confidential together with an explanation as to why the section should be treated as confidential.