Single Electricity Market

Treatment of Curtailment in Tie-Break situations

Proposed Decision paper

3 October 2012

SEM-12-090

Contents

1 INTRODUCTION

The SEM Committee has been dealing with considerations associated with the increasing penetration of intermittent generation, mostly wind, on the SEM and on the all-island electricity system for the past number of years. This process commenced in February 2008 with the publication of the discussion paper SEM-08-002,[1] and evolved into the workstream known as *Scheduling and Dispatch*. One of the key issues which emerged over the course of this workstream, and the various consultations held by the Regulatory Authorities, has been how to treat the curtailment of wind energy in the SEM.

A central question that has arisen in relation to this issue is the following; on what basis do the Transmission System Operators (TSOs) make the decision for curtailment, when the plant available is seen as equal by the TSOs, i.e. no deciding indicator, including a bid price differential, exists to support such a decision?

The purpose of this paper is to propose to industry how the SEM Committee wishes to address this matter.

This paper is structured in the following manner:

- **Section 1** provides an introduction to this issue.
- **Section 2** briefly outlines the background and development of this present workstream, including the treatment of curtailment in tie-breaks, since February 2008.
- **Section 3** outlines the main themes of the submissions received to the consultation paper SEM-12-028. This section is broken into five parts which separately deals with each option consulted upon in SEM-12-028 and general comments received.[2]
- **Section 4** provides a critique of the options detailed in SEM-12-028 and outlines the SEM Committee proposed decision in relation to the treatment of curtailment in tie-break situations.
- **Section 5** provides a summary of proposed decision made in this paper and the next steps of this workstream.

All responses to this paper should be sent in electronic format to Jamie Burke (jburke@cer.ie) at the Commission for Energy Regulation. Responses are due by close

[1] Please refer to '*Wind Generation in the SEM: Policy for Large-Scale, Intermittent Non-Diverse Generation'*, which can be found here.
[2] Please refer to SEM-12-028 which can be found here.

of business Friday 2 November 2012. In particular the SEM Committee would like respondents to focus on the following questions.

1. Do you agree with the proposed decision of the SEM Committee? If not, please set out your reasons why and with reference to the five criteria identified above.

2. Do you consider that the proposed decision has been clearly defined? If not, could you please provide comment on how this could be addressed, including the outline of the *defined curtailment limit.*

3. Do you find the proposed rule-set for the differentiation of curtailment events from those of constraints amenable? If not, please set out why. In addition, could you please provide additions/modifications that could be made to the rule-set for to facilitate differentiation.

The SEM Committee will consider all responses received and will then publish a decision on this matter.

2 BACKGROUND

As noted in the introduction, considerations about the treatment of wind in the SEM commenced in February 2008, with the publication of the discussion paper SEM-08-002. This was followed by a number of papers which discussed the de-loading of wind, including SEM-09-073 and SEM-10-060.[3] The SEM Committee's final decision on *Scheduling and Dispatch,* SEM-11-062 was published in August 2011.[4] That paper outlined decisions in a number of areas but indicated that the treatment of constraints and curtailment in tie-break situations would be subject to a further consultation.

A tie-break situation arises where there is a requirement for the TSO to 'turn-down' wind generation as all other options on the priority dispatch hierarchy (outlined in Section 4.4 of SEM-11-062) have been exhausted. As wind has a marginal price of zero in the SEM, there is no merit order or other distinguishing feature to determine which wind plant should be turned down first to resolve the constraint or curtailment. Subsequent to this, the SEM Committee published a consultation paper SEM-11-063 and a clarification note SEM-11-086 on this matter. Following consideration of the responses to this consultation, a decision paper, SEM-11-105, was published on 21 December 2011.

In section 3.5 of SEM-11-105, the SEM Committee decided to treat curtailment issues in a tie-break situation on a firm access quantity basis (FAQ), i.e. applying a grand-fathering approach to curtailment issues. Subsequent to the publication of SEM-11-105, the SEM Committee received a number of submissions in relation to section 3.5 of the SEM-11-105. On 23 February the SEM Committee met with representatives of IWEA, NIRIG, Meitheal Na Gaoithe and NOW Ireland at the SEM Committee meeting. These bodies presented their views and opinions in relation to Section 3.5 of SEM-11-105.

At an Extra Ordinary SEM Committee Meeting held on 5 March 2012 the SEM Committee determined that further consultation was necessary to provide an additional opportunity for all members of the industry and the public to comment on the merits of the options for the treatment of curtailment issues in a tie-break situation. This decision was taken in order to ensure that a full and transparent consultation process was carried out prior to making a final decision on this matter. The SEM Committee believed that on reflection aspects of its consultation process, which led to the decision outlined in Section 3.5 of SEM-11-105, were deficient.

As a result, the SEM Committee decided that its decision to treat curtailment issues in a tie-break situation on a firm access quantity basis (as set out in Section 3.5 of the SEM-11-105) was to be withdrawn.

As noted in the SEM Committee Communication of 29 March 2012 the withdrawal of Section 3.5 of SEM-11-105 took effect as of the date of publication of the communication. As stated in the same communication, all other parts of SEM-11-105

[3] Please refer to the following links here and here.
[4] Please refer to the following link here.

(i.e. Section 3.1, 3.2, 3.3, 3.4, 3.6) remained as final decisions of the SEM Committee with full force and effect as and from 21 December 2011.[5]

The communication also stated that the SEM Committee would issue a consultation document in relation to the treatment of curtailment issues in a tie-break situation inviting responses from industry and the public. That consultation paper, SEM-12-028, was published on 26 April 2012 and it outlined four options for dealing with the curtailment of wind energy in tie-break situations.[6]

Respondents to SEM-12-028 were specifically asked to provide supporting factual/ impact based data, which clearly demonstrated the net effects of any ultimate decision on curtailment on the below issues:

- Impact on the consumer and Dispatch Balancing Costs;
- Facilitation of Ireland and Northern Ireland 2020 Renewable Targets;
- Efficiency of Entry Signal;
- Stable Investment Environment; and
- Consistency of treatment for constraints and curtailment.

SEM-12-028 stated that the list was non-exhaustive and that the SEM Committee would welcome any other supporting factual/ impact based data which could inform its decision-making. Respondents were also welcome to put forward alternative approaches to dealing with matter.

In consideration of the responses received this SEM workstream now moves to proposed decision phase.

[5] For SEM-11-063, SEM-11-086, SEM-11-105 and 29 March 2012 SEM Committee Communication please refer to the following link here.
[6] For SEM-12-028 please refer to the following link here.

3 SUBMISSIONS TO SEM-12-028 & RA'S RESPONSE

On 26 April 2012 the SEM Committee published a consultation paper (SEM-12-028) on the treatment of curtailment in tie-break situations. The paper outlined the problem of curtailment, the mechanisms being implemented to minimise curtailment in line with requirements of Directive 2009/28/EC[7] and a number of options for the treatment of curtailment in tie-break situations. It was noted in the paper that these options would not solve the core problem of curtailment, nor were they intended to. Rather they were proposed mechanisms to share the burden of curtailment in as fair a manner as possible, against a set of criteria.

The options explored by the SEM Committee in SEM-12-028 therefore referred specifically to the treatment of curtailment for wind generators in a tie-break situation. In order for this situation to arise, the TSOs will already have turned down other forms of generation in line with hierarchy outlined in SEM-11-062, in order to facilitate the maximum amount of wind which the network can accommodate at that point in time and still maintain safe and secure operation. The proposed decision in this paper therefore also refers to curtailment in the tie-break situation.

SEM-12-028 stated that in arriving at the most appropriate mechanism for dividing up the burden of curtailment, the SEM Committee must first of all consider its primary duties set out in legislation in Ireland and Northern Ireland.

There was a considerable level of response received to SEM-12-028, ninety-three individual submissions were provided. Most respondents had a direct financial interest in the windfarm industry on the island. Some submissions were part confidential. All non-confidential responses have been published on the All-Island Project website alongside this paper. They were:

ABO Wind Ireland Ltd.	ABO Wind Northern Ireland Ltd.
AI Bridges	Allen Mellon
ART Generation Ltd.	B9 Energy
Ballybane Windfarms Ltd.	Barna Wind
Bord Gáis Energy	Blackrock
Bord na Mona	Brockaghboy Windfarm Ltd
Cafferkey	Coillte

[7] Such mechanisms (e.g. the DS3 Programme) were referred to at a high level. It was not the purpose of SEM-12-028 to consult on how curtailment should be minimised in line with the requirements of the EU Renewables Directive, but rather how it should be dealt with, if and when curtailment events do occur.

Craydel	CWind
CWS Moriarty	DP Energy
Dunmore Power	Dunmore Wind
DW Consultancy	Ecocem
Ecopower	EirGrid & SONI
Element Power	Empower
Endesa Ireland	Energia
Enterprise Ireland	ESB Wind Development
FTCO	Gaelectric
Gaelforce Wind	Harland & Wolff
Hg Capital	IWEA
KBM Windfarm	KCWF
Kilronan Windfarm	Mainstream
McDowell Purcell	MnaG
MRIA	NIRIG
Nordex Energy	NOW Ireland
OES	Oriel
Pallas Windfarm	Pigeon Top Windfarm
REI	Renewable UK
RES	ReWind
Saorgus	Saporito
SIAC Holdings	Siemens
SSE	SSE Windfarms (collective)
TCI	Tra Investments

Vestas	Wind Prospect
Windsource	WMI
WYG	

The SEM Committee welcomes and thanks those respondents who provided modelling on the effects of the four options detailed in SEM-12-028. Even though this modelling provided a significant amount of information and in some cases arrived at different conclusions, it has informed the SEM Committee's thinking on this matter.

There is always going to be a considerable level of uncertainty associated with any modelling (e.g. demand levels, transmission network construction etc.) and the SEM Committee recognises that for stakeholders to complete their analysis many assumptions had to be made. In particular, the SEM Committee notes that respondents have had to take a view on levels of non-firm wind connected to the system; this is a key variant when analysing results for grandfathering by reference to Firm Access Quantity (FAQ) and pro-rata curtailment options.

In addition to the information provided by respondents, the SEM Committee requested independent analysis, from the Transmission System Operators (EirGrid and SONI). The results of this modelling are examined in section 3 below. Assumptions used by the TSOs, such as the level of non-firm build-out are detailed in the TSOs report SEM-12-090a, which is published alongside this paper. This modelling provided by the TSOs was also considered by the SEM Committee in arriving at this proposed decision.

Below is an outline of the comments made in respect of the four options detailed in SEM-12-028 and other general observations.

A SEM Committee response is provided in each section below.

Option 1 - Grandfathering

Grandfathering involves creating a merit order list on the basis of appropriate criteria, which the TSOs can follow in determining which plant should be turned down first in a curtailment event. Grandfathering can take a number of forms, e.g. 'last-on first-off', where the last plant connected would be the first to be turned down, or grandfathering with reference to FAQ or Gate or some other distinguishing characteristic.

In SEM-12-028, the SEM Committee described grandfathering with reference to FAQ.

A considerable majority of respondents were against the grandfathering with reference to FAQ approach to the treatment of curtailment. Most of these respondents considered that this option, if ultimately adopted, would not deliver on any of the criteria required by the SEM Committee. Some respondents highlighted their own projects which would simply not move to completion if Option 1 was adopted. This was primarily on the basis

that projects which had a later FAQ (for example non-firm Gate 3 projects) would be required under grandfathering with reference to FAQ to shoulder levels of curtailment which would make these projects non-viable.

These submissions mostly outlined the following theme. Linking curtailment to FAQ, as per the treatment of constraints, is incorrect. Placing large amounts of curtailment on non-firm projects will mean that future non-firm projects will be unable to build. Ultimately, this will result in a movement away from a non-firm connection policy (which is against that outlined the SEM High Level Design) and Ireland and Northern Ireland failing to reach their respective 2020 renewables targets. Respondents suggested that a failure to achieve these targets would have a direct adverse impact on the all-island consumer in terms of a higher System Marginal Price (SMP), i.e. greater levels of wind (as price-taking plant with a zero marginal prices) lowers the SMP under current SEM arrangements.

One respondent noted that:

> '(u)nder a grandfathering approach RoI and NI will fail to meet renewables targets. Projects will not build under this regime until firm access is delivered due to the extreme curtailment levels they would experience as non firm generators. There will not be sufficient firm access or firm access projects to deliver on these targets'.

Another respondent considered that:

> 'Curtailment is a system wide issue caused by excessive generation compared to demand, or for reasons of system security. Firm access is determined by the development of grid infrastructure and therefore has no connection to the issue of curtailment. (N)on-firm generators will simply be unable to build if curtailment is grandfathered to protect firm projects. (M)odelling has shown that if overall curtailment levels of 3-5% are required, non-firm projects will experience over 20% curtailment, which will effectively prevent them from constructing.

As indicated in the above text a number of respondents provided modelled results on the effects of adopting each of the options outlined in SEM-12-028. One of these respondents showed that adopting Option 1 would result in a net market cost of €33 million in 2020, when compared against a pro-rata approach. Another submission indicated that grandfathering of curtailment by reference to FAQ would negatively impact the all-island consumer by approx. €42 million per year by 2020.

This respondent also suggested that 'assuming an average curtailment of just 2% on the island, the immediate impact could be that non-firm Gate 1 & 2 experience curtailment of up to 9% and temporary connections experience curtailment of up to 13%' if grandfathering by reference to FAQ was adopted. This would be in addition to non-firm generators taking on levels of curtailments which would make them financially unviable.

Responses rejecting grandfathering by reference to FAQ outlined their views that windfarm projects would not connect on a non-firm basis (i.e. they would wait to build until FAQs are delivered or would not build at all). If this happened the theory behind grandfathering by reference to FAQ would be undermined as there would be no or very few non-firm projects to curtail in the first 'pot'. This would result in pro-rata allocation of curtailment across all firm windfarms by default. Indeed many respondents outlined their concerns over the credibility of delivery of FAQ along the published timelines. It was argued that any delays to FAQ delivery would further impact on levels of wind connections under a grandfathering by reference to FAQ approach.

It must be noted that a number of the respondents to SEM-12-028 favoured Option 1 (i.e. grandfathering with reference to FAQ). A number of these responses were provided to the SEM Committee on the basis on confidentiality.

One non-confidential respondent considered that Option 1:

> 'benefits customers, is the most efficient and cost effective approach, provides an efficient entry signal, improves bankability, improves investor confidence, provides consistency of decision making and certainty, and will facilitate achievement of renewable targets'.

This respondent went on to state that:

> 'the evidence provided by (those stakeholders against the adoption of grandfathering) to the SEM Committee prior to the re-opening of the decision failed to consider the critical impact of financeability and investment viability. Without such consideration their conclusions on project build-out are unsubstantiated (...) a grandfathering approach to curtailment is most likely to promote the achievement of the renewable targets for 2020 on economic viability and financing efficiency grounds'.

Finally, this respondent considered that 'some key measures for mitigating high levels of curtailment have been identified by the TSOs and that the predicted best case levels of curtailment are based on optimistic assumptions'.

In this respondent's view a mid-case curtailment, 'is likely to be factored into the planning of banks, technical advisors and investors, leading to a financing inefficiency, which (this respondent believes) would have an extremely detrimental impact on project economic viability, leading to between 40% and 65% fewer projects being viable in a credible 2018 pro rata scenario or an open ended pro rata scenario respectively, as compared with a grandfathering scenario'.

Another respondent favoured grandfathering because to do otherwise 'would retroactively affect the financial viability' of their windfarm project'. This submission further noted that '(r)etroactively incorporating curtailments and/or constraints on (…) existing projects would result in a default of the financial model'.

SEM Committee response

The SEM Committee acknowledges that there are persuasive arguments for implementation of grandfathering by reference to FAQ, many of which were discussed in SEM-12-028.

One could consider that grandfathering by reference to FAQ protects existing investments and those projects which can deliver firm MWs in the short term. However, grandfathering by reference to FAQ would place a high level of curtailment on non-firm projects until such time as they are firm.

It should be noted that respondents both for and against grandfathering by reference to FAQ included implicit assumptions in their arguments. A number of respondents who were against grandfathering by reference to FAQ assumed that its adoption would result in the 2020 renewable targets not being met because wind generators will not move to construct, the net result of which could lead to higher SMP for consumers. If one were to make the implicit assumption that grandfathering by reference to FAQ actually facilitates the meeting of the 2020 targets it can then be shown that the level of markets costs under this approach are equal to those costs seen under pro-rata, i.e. because the same level of wind is connected by 2020 in both scenarios.

Similarly, one respondent in favour of grandfathering by reference to FAQ makes the implicit assumption that the vast majority of viable non-firm windfarms will build once there is firm capacity available on the transmission network. This could lead to a concern of a considerable length of time to deliver the amount of renewable generation required to deliver the 2020 renewable targets on the island. This assumption has to be contrasted against the point made by other respondents that the introduction of grandfathering by reference to FAQ now will simply mean that these non-firm projects will not build largely because of industry expectations of delays in FAQ provision.

SEM-12-028 details the perceived benefits with respect to grandfathering by reference to FAQ. With respect to consumer costs it was stated that all other things being equal, it is likely that the grandfathering by reference to FAQ will be cheaper for the all-island customer, as firm wind generators that are curtailed are eligible under the SEM Trading and Settlement Code to receive market price compensation in the form of Constraints payments, while non-firm generators are not eligible for these payments. Essentially if firm generators are constrained or curtailed down they are financially compensated (kept whole). Non-firm generators in such a scenario are not. The TSOs carried out independent analysis on this issue, the assumptions and results of which can be found in the accompanying document (SEM-12-090a) and which is further discussed in the next section of the paper.

The proposed SEM Committee position in relation to this option is also outlined in the next section of the paper.

Option 2 – Pro Rata

The pro-rata treatment of curtailment essentially means that wind generators, irrespective of allocated FAQ, will be turned down by the TSOs by an equal percentage in order to ensure system security.

The vast majority of respondents were in favour of adopting a pro-rata approach to curtailment; however most of these recognised the SEM Committee's concerns with permanent pro-rata (Option 2). The primary theme in support of Option 2 was that a pro-rata approach is the most fair and appropriate way to deal with curtailment, as it is a system-wide issue. These respondents favoured a variant of Option 3 presented in SEM-12-028. It can be said that some respondents showed equal support for both Option 2 and the variant of Option 3.

Some respondents maintained that the SEM Committee, in its criteria for decision-making, should be focusing on the perceived 'net' saving for the all-island consumer, as opposed to specifically focusing on Dispatch Balancing Costs (DBC). Respondents in favour of a pro-rata approach argued that such 'net' savings are significant, when compared against a grandfathering by reference to FAQ approach.

One of the concerns with respect to Option 2 is the possibility of renewable overbuild, beyond the 2020 renewable targets. Permanent pro-rata or 'uncapped curtailment' could have a direct impact on consumers in terms inefficient grid roll-out and the Public Service Obligation levy in Ireland. The respondents who were in favour of Option 2 addressed this concern in their submissions. One noted that:

> 'Pro-rata provides some natural protection against overbuild versus targets. In ROI, REFIT will not be released in quantities much in excess of national targets, creating a de facto cap. In NI there will be a de facto cap on capacity in NI due to wider Electricity Market Reform policy changes (post 2017). Investment in projects will become less viable as more wind is added to the system and overall curtailment levels increase; this will significantly slow down the rate of connection beyond that required on the system and is dependent on future targets and implementation of mitigation measures'.

There were a number of respondents against the adoption of Option 2. One highlighted possible financeability issues with a pro-rata treatment of curtailment, which could have a direct impact on the cost faced by the all-island consumer. This respondent stated that:

> 'A pro-rata treatment of curtailment would, at a minimum, substantially alter banks appetite for involvement in the market; the risk profile of the market; the terms of finance offered to investors; and, the basis of the equity investors returns. The inefficiency introduced into the financing of required investments would increase costs for customers, restrict investment in wind and prevent achievement of 2020 renewable targets'.

Other responses against pro-rata argued that existing investments had been made on the basis of lower levels of assumed curtailment and so to now implement pro-rata would significantly impact on the business case of many existing windfarms and their ability to fund their repayments.

SEM Committee response

As highlighted in SEM-12-028, a pro-rata approach to curtailment in a tie-breaks situation suggests that a greater number of projects will connect on a non-firm basis, when compared to grandfathering by reference to FAQ. However, financeability concerns for future projects (and those already connected) with 'uncapped curtailment' are present.

The TSO modelling shows that if a pro-rata approach to curtailment was adopted now it would increase DBC by €1.8 million. It should be noted that this is within the margin of error for these studies. The modelling shows that by 2020 this figure increases to €9 million, based on the levels of non-firm wind build. Costs are smaller if one assumes less non-firm build out.

In respect of the point made about 'net' savings to the all-island consumer, it is noted that these savings are based on a premise that grandfathering by reference to FAQ itself will result in the island missing its 2020 renewable targets. This, according to respondents, will be largely due to the fact that non-firm wind generation will not build, because they will 'wait' until full firm network access is available.

However, it should be noted that the SEM Committee, in SEM-12-028, could not have taken a pre-determined view that one option (i.e. pro-rata) will facilitate the meeting of the targets over another option (i.e. grandfathering by reference to FAQ) and therefore result in large-scale 'net' market savings. SEM-12-028 clearly sets out the perceived positive attributes of each option under a number of criteria, one being impact on the all-island consumer through DBC, another being facilitation of the 2020 renewable targets.

Arguments are presented in both criteria, but to be truly open to all options presented in SEM-12-028, the SEM Committee had to take the view, prior to consultation, that all were equal in result. In that sense, if one perceives that grandfathering by reference to FAQ and pro-rata both result in the 2020 renewable targets being met, then market savings resulting from wind penetration are equal under both options.

The point made by one of the respondents that investment in projects will become less viable as more wind is connected to the system is likely to apply for all approaches to curtailment. However it must be contrasted against the point made in the accompanying report (SEM-12-090a) that the percentage of curtailment seen by non-firm wind farms under pro-rata is expected to be 4%, assuming curtailment mitigation measures are in place.

In Ireland REFIT 2 is designed to support the addition of 4,000MW of new renewable electricity capacity to the Irish grid, which includes onshore wind, hydro and biomass landfill gas technologies – the vast majority of which will be onshore wind.[8] With all non-firm wind farms under a pro-rata approach experiencing the same level of curtailment, REFIT 2 has the potential to support nearly double what is required for Ireland to meet its 2020 targets. This would imply that out-of-market support mechanisms will not act as a 'natural protection' against overbuild, certainly in the case of Ireland. The SEM Committee is of the opinion that associated costs of such should be transparent and would be best covered outside of the market arrangements.

The SEM Committee does not deem it appropriate to comment on specific financing arrangements for windfarm projects, such as the level of equity return required by investors, or gearing level under grandfathering by reference to FAQ versus pro-rata etc. Such matters are purely a commercial consideration between the developer and the financier. It is also not appropriate for the SEM Committee to rest its proposed decision specifically on the ability of windfarms to finance themselves under any potential option. A holistic approach to the criteria of SEM-12-028 must be taken.

Option 3 – Temporary Pro Rata

This option is a slight alteration to Option 2. It involves the pro-rata treatment of curtailment up to the 40% all-island target and then to moving to grandfathering by reference to FAQ after that point (i.e. at 40% + has been reached). For clarity, all generators firm and non-firm would be turned down on a pro-rata basis up until the renewable targets are reached (or in advance of a certain date). After this point, non-firm generation would be turned down ahead of firm generation, with no reference to Gate.

A significant majority of respondents were in favour of the general intent of Option 3, but with a modification applied. One respondent proposed the construct of this modification, which was subsequently supported by the majority of respondents. The main concern with the option as presented in SEM-12-028 was that it still linked the grandfathering of curtailment to firm access, which in turn raised difficulties around the longer-term viability of projects. One respondent noted that:

> 'While this (option as presented in SEM-12-028) may provide certainty in the short term it is completely insufficient for the long-term certainty of these projects and does not significantly improve the bankability of a project. Projects are only likely to connect when they have secured firm access for the same reasons outlined under Option 1'.

Another respondent stated that the option as proposed 'will not deliver on the 2020 renewable targets as it creates huge uncertainty at the changeover point'. This respondent went on to note:

[8] Please refer to REFIT 2 Terms and Conditions on the DCENR website which can be found here

'that as this option is firmness dependent, projects will still only build when firmness has been delivered. Given the likely delays in the delivery of firmness, build out rates will be slower than under a pro-rata option and will deliver fewer MW by 2020. This option cannot facilitate the early connection of wind, particularly when compared to a pro-rata option'.

Those respondents against pro-rata (Option 2) were also against this option, with the same arguments used. One stated that there is no material difference in the financing outcome for Option 3 as compared with Option 2. As a result, the arguments provided in their submission against Option 2 equally apply to Option 3.

SEM Committee response

It is acknowledged that the vast majority of respondents favoured a modification to Option 3, compared to that presented in SEM-12-028. It is worth noting that the option consulted upon was not definite in form. Footnote 14 of SEM-12-028 stated that this option could be designed in a number of ways. For example, grandfathering could be applied once the TSOs have indicated that the 40% targets have been achieved. Alternatively it could be applied from a certain date (e.g. 1 January 2018). Grandfathering could then apply with reference to firmness or with reference to connection date.

The linking of firmness to Option 3 after the achievement of the 2020 targets was one possible form. The SEM Committee actively welcomed any proposal from stakeholders for different variants of the options outlined in SEM-12-028, including Option 3.

The proposed SEM Committee position in relation to this option is outlined in the next section of the paper.

Option 4 – Pro Rata with generators taking the risk

This option would see the risk of curtailment borne by wind generators only, with no impact on DBC and no direct cost to the all-island electricity customer. Under this option, wind generators would be turned down on a pro-rata basis in a curtailment event.

A modification to the Trading and Settlement Code would be made which would see wind curtailment events treated differently in terms of market compensation compared to other events where wind generation is turned down by the TSO (e.g. constraint events). Wind generators would not receive market compensation when turned down in a curtailment event.

No respondents supported this option. Consideration must be given to the fact that the vast majority of respondents have a direct financial interest in the windfarm industry on the island. One respondent noted that this option:

> ‘(W)ill only deliver on one of the four criteria required by the SEMC as it would involve no cost of compensation being paid by the all-island consumer. However due to the lower build out rate under this option it will not benefit from the energy production cost savings of (other pro-rata options). Therefore the net market savings of this option is much less than that of (other pro-rata options).

The rejection of the option from respondents was primarily based on the belief that, (i) it would make renewable projects unviable with the removal of compensation for curtailment, (ii) it represents a significant change to the SEM principles and (iii) it would be a retrospective step that would threaten regulatory stability in the SEM.

It is worth noting that one respondent considered compensation of curtailment should be dealt with as a separate matter, should reflect European law and ultimately be subject to a separate consultation.

SEM Committee response

SEM-12-028 indicated that while the SEM Committee aims to provide as much certainty as possible in order to encourage appropriate and efficient levels of investment, this is not a guarantee to investors that SEM policy cannot change or should not change when the SEM Committee considers its overall objectives, particularly its primary objective relating to customer protection. Indeed the SEM Committee has been carrying out extensive consultation over the past number of years on a range of issues associated with ‘wind in the SEM’ and has viewed these matters as SEM Day 2 issues.

SEM-12-028 also stated that now might be a good time to review and change the policy related to payment of firm wind generation in curtailment events. It should also be noted that the renewable support schemes in both Northern Ireland and Ireland do not provide any compensation when Generators are not running. The timing of this decision is appropriate at this stage because many project investors have not made their investment yet (e.g. Gate 3 in Ireland) and are waiting for the conclusion of this policy workstream and associated outputs (e.g. delivery by EirGrid of constraint reports to Gate 3 generators in Ireland) before committing to an investment.

The proposed SEM Committee position in relation to this option is outlined in the next section of the paper. However, it is worth noting at this point that the SEM Committee consider that compensation of curtailment should not be an indefinite feature of the SEM. Such an action would place an undue and inappropriate burden on the all-island consumer indefinitely.

General Comments:

Options Proposed in SEM-12-028

Some respondents considered that all of the options presented in SEM-12-028 would severely damage the renewables sector and favoured an approach where curtailment,

minimised to greatest possible extent, is compensated by way of payment of a support price for lost output, either from the market or from an out-of-market support scheme.

Curtailment Mitigation Measures & 2009 Renewables Directive

A number of respondents highlighted the need for implementation of curtailment mitigation measures. As one noted, 'the allocation of curtailment, would be incomplete without highlighting the urgent need to advance progress on mitigation measures to minimise and reduce curtailment'. This respondent went on to state that an 'overall strategy and plan needs to be put in place. Minimisation of curtailment includes and extends past the DS3 programme'.

There was concern among nearly all respondents, including those for and against grandfathering by reference to FAQ, that a delay in implementation of mitigation measures from that set out in the DS3 programme would threaten the financial viability of windfarms.

A related issue raised by respondents was that of EU Member State obligations under the 2009 Renewables Directive (the 'Directive), which include the integration of renewable energy and the minimisation of curtailment. It was noted by these respondents that the SEM Committee must remain cognisant of these requirements during the decision-making process. Some respondents, who were in favour of a pro-rata approach, questioned whether grandfathering by reference to FAQ could meet the obligations identified in the Directive, in particular Article 16(2). One of these respondents went on to state that 'the intent of the Directive clearly recognises that the costs of curtailment should not act as a barrier to entry for the connection of renewable generation'.

A few respondents questioned the compatibility of any of the proposed options outlined in SEM-12-028 with that of the obligations under the Directive. These respondents, in turn, queried as to whether the SEM Committee recognised that the obligations under the Directive, were superior to the criteria identified in SEM-12-028. One respondent noted that:

> 'the SEMC's (...) role is first and foremost to minimize cost, before any targets and rules for renewables are considered. The SEMC must operate within the overall legal framework, and minimize cost within that framework. That legal framework is largely non-optional, and not amenable to trade-offs, while the cost aspects of its function are. In conclusion on this point, it is our understanding that the SEMC must minimize cost within the constraints imposed firstly by the EU legal framework and secondly the national legal framework'.

Fifth criterion identified in SEM-12-028

The fifth criterion set out in SEM-12-028 concerns consistency of treatment for constraint and curtailment events. This criterion can be effectively split into two, (i) whether the TSOs can identify constraints from curtailment, given that the two events often occur together, and (ii) whether it is actually appropriate to treat them the same.

Some respondents questioned the need at all for this criterion in SEM Committee decision-making and stated that a transparent algebraic formula should be established by the TSOs to clearly distinguish between the two events so to facilitate market payments. One respondent noted that:

> 'There is no reason for ensuring consistency of treatment for constraints and curtailment; they are distinct, and should be distinguished from one another. A clear, transparent definition which can be applied in a mechanistic manner in real time is the key. There may be instances of overlap, but an understood proxy definition will separate the treatment of a network issue from a system operational issue'.

However, those respondents in favour of grandfathering by reference to FAQ considered that in the context of constraint groups (where dispatching down is carried out as per SEM-11-105), both constraints and curtailment should be treated the same. One respondent stated that:

> 'The consistent treatment of constraints and curtailment in a non-discriminatory manner can only be achieved where these two events can be categorically separated. Although these are two separate events, the similar treatment of them by the market is appropriate in the context of constraint groups, and a pro rata approach would contradict this'.

Delay in the provision of FAQ

Like the potential delay in curtailment mitigation measures, most respondents outlined their concerns in relation to FAQ dates and the probability of extension to such dates. The fact that FAQ methodology is currently not aligned between Ireland and Northern Ireland was also highlighted by some respondents. As one stated:

> 'The vast majority of projects in Ireland and Northern Ireland are associated with significant deep reinforcement works (...) analysis of the impacts of these upgrades on our portfolio of projects conclude that it is likely that the actual FAQ dates will shift out on'.

The net result of this delay, as indicated by respondents, would be to threaten the financial viability of certain wind projects and create uncertainty for investors which in turn would make it harder for the island to meet its 2020 renewable targets. This would have a knock-on impact on SMP.

One respondent considered that there was over 850MWs of conventional plant connection offers blocking capacity for projects that are not being progressed, and may well have passed their longstop dates. The net result of this would be to detrimentally affect FAQ dates for renewable generation.

Voluntary Insurance Proposal

As indicated in SEM-12-028 the SEM Committee welcomed any alternative approaches to dealing with curtailment in tie-break situations from respondents. One respondent in particular submitted a helpful proposal, which could be implemented in addition to pro-rata (their favoured option). This respondent believed this voluntary proposal would:

> 'reduce the levels of uncertainty around both of these options whilst also providing some protection to the consumer. The basic principle of the scheme is that a baseline curtailment level is agreed for a given tranche of projects. Projects would suffer the effect of this baseline curtailment level irrespective of actual curtailment levels. During periods of low curtailment the projects would pay into a balancing fund and during periods of high curtailment they would receive payments from the fund'.

The respondent saw this as an optional insurance scheme that 'developers could choose to avail of', which would require SEM Committee consultation outside of the current decision-making process.

SEM Committee response

Options Proposed in SEM-12-028

The SEM Committee rejects the view that all of the options presented in SEM-12-028 would severely damage the renewables sector and notes that the purpose of SEM-12-028 and this workstream is put in place a set of rules to allocate curtailment in a fair and transparent manner. Other workstreams are involved in mitigation of curtailment in line with the requirements of Directive 2009/28/EC.

Curtailment Mitigation Measures & 2009 Renewables Directive

The SEM Committee acknowledges that increasing levels of curtailment is a serious issue for the financial viability of certain windfarms. As stated in SEM-12-028 the core of the problem is that curtailment is an unavoidable consequence of high levels of wind penetration at certain times, system security constraints and no amount of grid development will fully alleviate it.[9] The goal, as the Directive recognises in Article 16 paragraph 2(c), is to minimise it to as low a level of possible through 'appropriate grid and market-related operational measures'.

[9] Although it is acknowledged, as pointed out by one respondent, that grid development in circumstances can facilitate reducing curtailment, e.g. allowing transit of wind power from the on-shore system to interconnectors.

The SEM Committee believes that it is fully compliant with the intent and obligations of the Directive. It is also confident that the actions being taken such as the DS3 programme are being done so in a strategic and focused manner, while being aware, in the first instance, of the reliability, security and safety of the electricity system. In any event, the SEM Committee considers that even if curtailment has been minimised to the greatest extent possible, there remains a need for a clear and objective ruleset for the treatment of curtailment in tie-break situations if and when there is a need for curtailment.

As detailed in the decision paper SEM-11-062 the SEM Committee has decided to adhere to an 'absolute' interpretation of priority dispatch whereby economic factors are only taken account of in exceptional situations and where this can be done in a manner that does not threaten the delivery of renewables targets. Parties with mandatory priority dispatch under EU Directives (renewables, qualifying hybrid plants, high efficiency CHP) are now given priority over those afforded priority dispatch at the discretion of a Member State (peat).

It is worth stressing that at no point does the 2009 EU Renewables Directive state that financial compensation must be paid if renewable energy generators are curtailed for the safe and reliable operation of the electricity system on the island.

Initiatives currently being developed by the SEM Committee to address curtailment include:

- DS3, *Delivering a Secure, Sustainable Electricity System*[10] – a TSO led programme which aims through a number of mechanisms to increase the secure level of system non-synchronous penetration (typically wind) from 50% (currently) to 75% in the coming years.
- The East-West Interconnector, supported by the TUoS customer in Ireland, to be operational by Q4 2012.
- In May 2011, the SEM Committee published its decision Single Electricity Market - *Demand Side Vision for 2020* (CER11/078) which set out thirteen decisions for implementation.

These measures are in addition to the SEM Committee's decision on Scheduling & Dispatch (SEM-11-062) which provides for the policy to minimize curtailment through the absolute interpretation of the priority dispatch requirements of Article 16 paragraph 2(b), of the Directive. It is clear that the SEM Committee is actively looking to minimise curtailment of wind generation to as low a level as possible on the island. However, the intent of this workstream is to apportion that remaining curtailment in a manner which best meets the criteria identified in SEM-12-028.

[10] For further details on the DS3 Programme, please refer to here on the EirGrid website.

Fifth criterion identified in SEM-12-028

The SEM Committee still considers this criterion to be an important operational factor. This issue of whether it is appropriate that both events are treated in a similar manner or, whether it is appropriate that they are treated differently, will be discussed in the next section of the paper.

Returning to the operational aspect of this criterion the SEM Committee is in agreement with respondents who believe that there needs to be a clear, transparent and clearly defined rule-set for distinguishing between the two events.

It is worth noting SEM-11-086 at this point. In Q3 2011 the TSOs stated to the SEM Committee that it was not always possible, where there is significant interaction between multiple network constraints and curtailments, to determine definitely and unambiguously what and how much generation is associated with resolving specific constraint and curtailment issues. This is particularly the case when there is a high level of interaction between the two.

However after further discussion with the Regulatory Authorities the TSOs have now provided to the SEM Committee a rule-set for differentiating between episodes of constraints and curtailment. This proposed rule-set is included as a separate annex to this paper for consultation with stakeholders. Please see SEM-12-090b.

Delay in the provision of FAQ

The SEM Committee shares the concern of respondents regarding the potential for and the impact of delays in the development of key transmission infrastructure projects on the island. Separately, both the CER and UR, are taking jurisdictional approaches to incentivising electricity grid roll-out in an efficient manner. This issue is further discussed later in the paper.

On the issue of ‘capacity blocking’, it is noted that EirGrid has initiated a process to investigate improvements in FAQ opportunities. However the cases referred to by respondents as ‘blocking capacity’ still have valid connection offers and therefore removal of such applicants before expiration of the longstop dates would be incorrect, subjective in nature and could lead to the creation of an arbitrary, non-transparent process for the modelling and provision of FAQ.

Voluntary Insurance Proposal

The SEM Committee consider that this insurance or ‘curtailment hedging’ proposal is worth exploring but does not believe it to be within the SEM Committee’s remit to initiate this process. However, it also agrees with the respondent, who submitted it, that it should be completely voluntary in nature and examined outside of this consultation process. At first glance, it appears that it could be constructed in a number of ways, e.g. as a pot operated privately between stakeholders who voluntarily enter it or as a pot operated by a body independent of the stakeholders involved.

The SEM Committee (and RAs) would be happy to discuss the operation of such a mechanism with stakeholders after the conclusion of this workstream, if there is an appetite. However, it is considered at present that this mechanism should be developed outside of the regulatory framework.

4 SEM-12-028 OPTIONS

This section of the paper provides a critique of each of the options identified in SEM-12-028, with reference to the five criteria. As stated in SEM-12-028 these criteria should not be viewed in isolation of one another and there is a significant degree of interaction between them, e.g. the financial viability of windfarms projects directly affects the attainment of the 2020 renewable targets.

Based on this analysis the SEM Committee has arrived at a proposed option for implementation. Submissions and data provided by respondents to SEM-12-028 have also been taken into account by the SEM Committee when formulating this proposed decision.

Option 1 – Grandfathering with reference to FAQ

Grandfathering involves creating a merit order list on the basis of appropriate criteria, which the TSOs can follow in determining which plant should be turned down first in a curtailment event. Grandfathering can take a number of forms, e.g. 'last-on first off', where the last plant connected would be the first to be turned down, or grandfathering with reference to FAQ or connection Gate or some other distinguishing characteristic.

SEM-12-028 detailed a grandfathering approach to curtailment, with reference to FAQ of the generator. *The SEM Committee is not proposing to implement Option 1 and the reasons for this are now outlined.*

1. Impact on the consumer and Dispatch Balancing Costs

SEM-12-028 states that with a certain sets of assumptions, it is likely that the grandfathering of curtailment with reference to FAQ will be cheaper for the all-island customer. This is due to firm wind generators that are curtailed, being eligible under the SEM Trading and Settlement Code to receive market price compensation in the form of constraints payments, while non-firm generators are not eligible for these payments. Essentially if firm generators are constrained or curtailed down they are financially compensated (kept whole). Non-firm generators in such a scenario are not.

Grandfathering with reference to FAQ reduces the level of curtailment faced by firm generators, thereby reducing the level of DBC paid by the all-island consumer. The risk of curtailment under grandfathering with reference to FAQ is borne mostly by non-firm generators. Consumers only face this risk if firm generators are required to be curtailed, which is less likely under grandfathering with reference to FAQ than pro rata.

Based on TSO Modelling, which is detailed in the accompanying paper (SEM-12-090a), a grandfathering with reference to FAQ option when compared with a pro-rata option, would reduce DBC by approx. €1.8 million, if implemented now. It should be noted that this is within the margin of error for these studies, as the results compare production costs of the order of €1 - €2 billion. By 2020 a grandfathering with reference to FAQ

approach reduces DBC by up to €9 million (i.e. figure 2 in SEM-12-090a), again when compared to using the pro-rata option, if non-firm generation builds out, i.e. assuming the same level of wind is connected under each option.

The report states this saving is not overly significant in the context of the predicted DBC budget, and is expected to represent less than 6% of total the DBC pot in 2020. In addition, savings are smaller if one assumes less non-firm build out, which the SEM Committee considers likely, as discussed below.

This analysis bears out the SEM Committee's view that grandfathering with reference to FAQ, if all else is equal (i.e. same portfolio of wind connected) will result in lower DBC than pro-rata. The TSO modelling shows that a grandfathering with reference to FAQ option would reduce DBC in 2020. However, the SEM Committee concurs with the TSOs and consider that this saving, when compared against a pro-rata approach, to be only marginal in nature.

However, the SEM Committee does not consider the modelled savings in DBC, resulting from the adoption of grandfathering with reference to FAQ, can be used solely to justify this option over any of the others. This is because modelled savings are based on the assumption that windfarms will connect on a non-firm basis under grandfathering with reference to FAQ approach. This may or may not be the case. In that sense, the effect on DBC resulting from adoption of either grandfathering with reference to FAQ or the pro-rata of curtailment is largely comparable.

2. Facilitation of Ireland and Northern Ireland 2020 Renewable Targets

SEM-12-028 stated that grandfathering of transmission access rights on the basis of firmness may lead to a more reliable and efficient achievement of the Ireland and Northern Ireland 2020 renewable targets, than alternative approaches. It was suggested that a grandfathered approach with reference to FAQ would help the viability of those generators with firm connection offers or who are earlier in the connection queue.

It was further suggested that such a grandfathering approach favours the financial viability of those projects where investments have already been made as opposed to potentially speculative projects. It also favours those projects looking to invest in the short-term, where the project is located in a favourable location on the network (i.e. where firm access is available) or where the project can connect and export on a firm basis (i.e. '*guaranteed* MWhrs') sooner.

On 15 June 2012 EirGrid published its response to SEM-12-028. That response included a table which indicated level of Full Firm Access by 2017/2018 for Ireland, based on current assumed network build and levels of full firm access for Northern Ireland by 2016, again based on current network build assumptions. The response shows that 4,056 MWs of wind projects in Ireland will have full firm access by 2017/2018. It is expected that by 2016 there will be 724 MWs of wind projects in Northern Ireland with full firm access.

This leaves total full firm access of wind generation on the island by 2018 at 4,780 MWs (if one assumes no new firm access is added to the Northern Ireland network in 2017 or 2018). As per SEM-12-028, taking a median approach to all-island demand in 2020 would imply a total all-Island need of circa 5000 MWs of renewable generation (including sources other than wind) to reach the 2020 renewables targets.

On first view, it would appear that based on these estimates the island could reach its 2020 renewable target by 2018. However, there are a number of crucial assumptions that must be made with respect to this conclusion. The SEM Committee considers some of these assumptions to be implausible.

(a) The conclusion assumes that all wind generation (including all Gate 3 offers) on the island that is set to be granted full firm access up to 2018 will actually energise. When issues around planning permission and financial difficulties are taken into account, the SEM Committee considers this assumption improbable. It is further noted that the Gate 3 Liaison Group in November 2011 discussed the possibility of a large-scale attrition rate to Gate 3 take-up when modelling levels of constraints.[11]

(b) The conclusion also assumes that transmission network infrastructure will roll-out as per the TSOs assumptions, e.g. the construction of 440 kilometers of new transmission build, including the new North-South 400kV interconnector (by 2016). Difficulties are always present in transmission network build, e.g. landowner consents, and these difficulties can severely impact on timelines for delivery. Also, in Ireland the CER has, in conjunction with the TSO and TAO, developed a detailed transmission capex monitoring programme.[12] Since Q1 2011 (i.e. submission of the first chart), the CER has noticed a trend of delays in expected energisation dates of transmission network build. This indicates to the SEM Committee that a degree of caution must be taken to the TSO assumed expected network delivery dates and FAQ levels.

The conclusion drawn by the SEM Committee is that expected levels of connected firm wind generation in 2018 will not materialise until later, possibly even after the year 2020. The SEM Committee is not in a position to risk the achievement of this criterion on the delivery by the TSOs of sufficient firm capacity by 2020 given the real and potential delays to key transmission infrastructure projects (e.g. the second North-South Interconnector).

The point has made to the SEM Committee by a majority of respondents that grandfathering of curtailment with reference to FAQ will result in projects waiting until they are fully firm before construction. This is because it is not financially viable for non-firm windfarms to build because curtailment levels of non-firm generation under grandfathering with reference to FAQ are extremely high. Even one of those

[11] Please refer to the Gate 3 Liaison Group Meeting #28 which can be found here.
[12] Please refer to the Quarterly Transmission Project Charts published on the CER website which can be found here.

respondents supporting grandfathering of curtailment with reference to FAQ has admitted that 'waiting for firmness' is a consequence of such an option.

The accompanying TSO modelling (SEM-12-090a), shows that if grandfathering with reference to FAQ were to be applied in the 2012/2013 tariff year, non-firm windfarms would see curtailment levels of approx. 10%[13] (compared to 2% under pro-rata). By 2020, under grandfathering with reference to FAQ, curtailment levels for non-firm wind rise considerably. The figure depends on the proportion of non-firm wind installed, but can be up to 24%, compared to 4% under the pro-rata option. Many respondents have quoted curtailment levels of in the region of 5% as being the threshold for viability for many projects. While this may be the case, the SEM Committee also considers that other factors such as levels of equity available to a project, site capacity factors and levels of out of market supports (REFIT in Ireland and ROCs in Northern Ireland) are also key determinants of project viability.

It is the view of the SEM Committee that such modelling supports the assertion that windfarms will wait until they are firm before construction. This, in combination with expected delay in FAQ delivery dates, would put severe pressure on the island's ability to meet the 2020 renewable targets if a grandfathering with reference to FAQ approach was applied to curtailment.

Respondents against grandfathering of curtailment with reference to FAQ have also pointed out that the SEM High Level Design clearly allows for the market to facilitate a generator to connect prior to the completion of deep reinforcements. The facilitation of non-firm connection has been a definite feature of the SEM to date where, for example, over 90% of all windfarms offers in Ireland have been made on a non-firm basis.

Therefore, it is the view of the SEM Committee that if a grandfathering with reference to FAQ approach was adopted then there would be a risk that a feature of the SEM High Level Design would be ended *de-facto,* without explicit consultation on the matter. This is because grandfathering with reference to FAQ would hamper windfarms connecting on a non-firm basis, because they are essentially 'waiting for firmness'. This could in turn threaten the attainment of the 2020 renewables targets with consequential knock-on impacts on consumer welfare (e.g. higher SMP, reduced diversity of generation).

This is the primary reason why the SEM Committee is proposing not to adopt Option 1.

3. Efficiency of Entry Signal

The following argument was presented in SEM-12-028. From an economic theory perspective, grandfathering of curtailment should provide a signal to the marginal renewable plant in future years of whether it is financially viable to connect to the system. With the level of renewable generation looking for connection to the system far exceeding that required to meet the 2020 renewable targets grandfathering of curtailment provides an efficient entry signal for those in the connection queue.

[13] This figure would be in addition to episodes of constraints experienced by windfarms.

The SEM Committee considers that while FAQ acts as an efficient locational and timing signal, there are other factors such as technology and wind speeds which FAQ does not take into account. Grandfathering of curtailment with reference to FAQ may result in an efficient entry of windfarms with full firm access, but this does not necessarily mean such windfarms are the most technologically advanced and/or are located in areas with strong wind speeds.

In essence grandfathering of curtailment with reference to FAQ allocates the risks and cost of curtailment onto the 'marginal' wind generator, i.e. the non-firm wind generator connecting to the system in the long-term. As has been argued above, the SEM Committee considers that windfarms will wait until they are firm before constructing because of the levels of curtailment under grandfathering with reference to FAQ. Yes grandfathering of curtailment with reference to FAQ does provide a signal to the marginal non-firm renewable plant in future years, but it is suggested that given the arguments presented above, such a signal is not the most efficient entry signal.

4. Stable Investment Environment

The financeability of SEM investments is an important consideration for the SEM Committee. It is clear that grandfathering of curtailment with reference to FAQ will provide predictable and stable cash-flows for firm generators already connected to the system. As more windfarms connect and the occurrence and level of curtailment becomes greater, grandfathering of curtailment with reference to FAQ provides these generators who have firm access with a continued stable environment.

However, it is a fact that grandfathering of curtailment with reference to FAQ would expose existing non-firm projects to high levels of curtailment (including partially firm, non-firm and temporary connections). The argument could be made that applying grandfathering on these non-firm/temporary connections could be considered 'retrospective' in nature, the same way that a pro-rata approach could be considered retrospective regulatory action on connected firm generators.

A stable investment environment should not only protect those firm windfarms connected to the system, but also try best to promote the ability of future generation to finance itself in the SEM. A situation where non-firm windfarms cannot finance themselves until they are firm due to high levels of curtailment is not considered by the SEM Committee to be a stable investment environment for the SEM. This is especially the case where there is a significant level of uncertainty around when such windfarms will actually receive full firm capacity.

The SEM Committee considers that grandfathering of curtailment with reference to FAQ will not provide a stable investment environment for the non-firm generators to build because of the prohibitive levels of curtailment of plus 10% as detailed in SEM-12-090a.

This will then impact on firm generators as the level of curtailment which firm generators will see, will be impacted by the non-take-up of non-firm offers. While modeling by the

TSOs on levels of curtailment under grandfathering with reference to FAQ can be used to indicate levels of curtailment for each plant, these results will be heavily reliant on assumed levels of non-firm build. If the non-firm build is lower than the TSOs assume then the modelling results will be obviously different.

5. Consistency of treatment for constraints and curtailment

Curtailment is not associated with network-specific issues, in that no amount of grid roll-out will alleviate times when there is too much intermittent wind generation on the system. Therefore it is clear that constraints and curtailment are two different situations with differing characteristics. The concern present in SEM-12-028 was that the TSOs would not be able to clearly differentiate between the two events, which could lead to various issues associated with market payments.

The operational issue is proposed to be addressed by the introduction of a proposed rule-set, which is discussed below.

Option 2 – Pro Rata

The pro-rata treatment of curtailment means that all wind generators, irrespective of allocated FAQ, will be turned down by the TSOs by an equal percentage in order to ensure system security. Option 2 essentially allows for an open-ended timeframe for the pro-rata treatment of curtailment and DBC compensation for same. All wind generators connected and who subsequently connect will be curtailed by the exact same level.

The SEM Committee is not proposing to implement Option 2 and the reasons for this are now outlined. However the SEM Committee is proposing to implement a modified version of Option 2 which seeks to control the level of expenditure (cost) paid by the all-island customer on DBC for curtailment, as the level of wind generation increases to 2020. This option and its rationale are outlined in the next section of the paper.

1. Impact on the consumer and Dispatch Balancing Costs

Based on TSO Modelling, which is detailed in the accompanying paper (SEM-12-090a), a pro-rata option to curtailment, when compared with grandfathering by reference to FAQ, would increase DBC by approx. €1.8 million, if implemented now. It should be noted that this is within the margin of error for these studies as the results compare production costs of the order of €1 - €2 billion. By 2020 the pro-rata option to curtailment increases DBC by up to €9 million, again when compared to using the grandfathering by reference to FAQ, if non-firm generation builds out.

The report states that this saving is not considered to be overly significant in the context of the predicted DBC budget, and is expected to represent less than 6% of total the DBC pot in 2020. However, savings are smaller if one assumes less non-firm build out, which the SEM Committee considers likely as discussed above.

The TSO modelling clearly shows that a pro-rata option would increase DBC in 2020. However, the SEM Committee concurs with the TSOs and consider that this increase, when compared against the grandfathering by reference to FAQ, to be only marginal in nature. As no modelling can have perfect foresight and there are uncertainties in respect of assumptions used (e.g. wind generation, demand, generator outages etc), these results must allow for a margin or error. Nevertheless, it is also clear from the studies that the perceived costs of pro-rata over grandfathering by reference to FAQ of curtailment by FAQ are not significant. In that sense the SEM Committee does not consider the pro-rata of curtailment to be at a clear disadvantage in terms of DBC savings, when compared against grandfathering by reference to FAQ.

However the modelling does show that there is a definite ongoing cost to consumers from continuing to pay DBC costs to firm generators for curtailment. This cost is estimated by the TSOs in their report (SEM-12-090a) to be in the region of €13 million in 2020[14]. While the TSOs have not modelled the annual figure between now and 2020, there is likely to be an annual increase between now and 2020 as more wind connects to the system (the TSOs have modelled the 2013 figure to be €4 million). It is the view of the SEM Committee that this expenditure on curtailment is not sustainable and needs to be reduced as further wind connects to the system between now and 2020. The SEM Committee's mechanism to achieve this is outlined in the next section of the paper.

2. Facilitation of Ireland and Northern Ireland 2020 Renewable Targets

It was suggested in SEM-12-028 that if pro-rata was adopted non-firm projects would carry a lesser proportion of curtailment. This in turn would improve their financial viability and could be said to promote the attainment of the 2020 renewable targets. A pro-rata approach to curtailment will provide certainty of equal burden sharing across all wind generators, irrespective of the level of firmness / market access which the generator enjoys. While this may impact or increase curtailment levels for existing generators, it should not do this to the extent that the viability of these projects is compromised.

As expressed above, the SEM Committee considers that windfarms will wait until they have firm access before construction, under grandfathering by reference to FAQ. This, in combination with expected delay in FAQ delivery dates, would put severe pressure on the island's ability to meet the 2020 renewable targets if grandfathering by reference to FAQ was adopted.

The accompanying report (SEM-12-090a) indicated that if a pro-rata approach was adopted now, all wind generation including connected non-firm, would experience curtailment levels of 2%. With respect to 2020, the report states that all wind generation, including connected non-firm, would experience curtailment levels of 4% if a pro-rata approach was adopted. The report shows curtailment levels of up to 24% for non-firm

[14] The TSOs modelling indicates a potential saving to consumers in 2020 of €13 million if Option 4 was implemented.

wind in 2020 if a grandfathering by reference to FAQ approach was adopted, when only a small proportion of wind is non-firm.

It should be noted that report assumes an asynchronous generation penetration limit of 70% by 2020. A number of measures are required in order to achieve this, as outlined in EirGrid's Facilitation of Renewables report.[15] Should the limit be lower than 70%, higher levels of curtailment would be observed by all connected generation (both firm and non-firm) and this would be irrespective of whether curtailment was subject to grandfathering by reference to FAQ or to pro-rata.

The SEM Committee considers that a pro-rata approach to curtailment will greater facilitate non-firm wind connection to the system, which will help achieve the 2020 renewables targets, over and above a grandfathering by reference to FAQ approach.

3. Efficiency of Entry Signal

It was suggested in SEM-12-028 that in an unconstrained power system, where renewable market entry is supported by non-market mechanisms there is no priority given to existing wind generators ahead of new entrants. It was noted that regulatory structures should incentivise efficient market entry. Similarly, it should not dis-incentivise a more technologically-advanced wind generator, or one with better wind resources, from entering the market and providing an exit signal for older, less technologically-advanced windfarms (or one with poor wind resources).

Under a pro-rata approach all new entrants are effectively on a level playing field irrespective of FAQ, which as noted above should promote the most technologically advanced, best resourced windfarms actually commissioning. As levels of curtailment increase with further wind connections, only the more efficient new wind projects should remain viable, i.e. those that can accept 4 – 5%+ curtailment.

That said, an 'uncapped' or open-ended timeframe approach to curtailment may result in a situation of over-entry, resulting in excess curtailment, which ultimately is an inefficient cost to the whole electricity system and in particular to those projects which were more genuinely viable. Over-entry may also cause excessive network build to provide firm access for this 'surplus' generation. The point made in the previous section that REFIT 2 has the potential to incentivise nearly double what is required for Ireland to meet its 2020 targets is pertinent. As a result, the SEM Committee is not convinced that out-of-market support mechanisms will act as a 'natural protection' against overbuild, certainly in the case of Ireland.

Therefore, the SEM Committee is of the opinion that the any potential over-incentivisation costs, beyond that required to meet the 2020 renewables target should not be faced by the all-island consumer.

[15] Please see the following page on the EirGrid website here

This is one of the reasons why the SEM Committee is proposing not to adopt Option 2. It is the view of the SEM Committee that the option ultimately adopted should contain some mechanism to protect the all-island consumer against inefficient over-entry.

4. Stable Investment Environment

It was noted in SEM-12-028 that a pro-rata approach to curtailment equitably manages curtailment by turning down all generation equally to meet system stability limits and this establishes a reasonable principal by which risk can be assessed by potential investors. It has been stated to the SEM Committee during the consultation process of SEM-12-028 that an independent publication from the TSOs would be extremely helpful in the investment decision-making process. This has now been carried out, as per the accompanying document SEM-12-090a.

How individual windfarms and their respective financiers account for this publication in their financing arrangements (e.g. specific gearing levels or required equity return) is not a concern for the SEM Committee. Promoting the establishment of a stable investment environment for all wind generation, firm and non-firm, to proceed to completion of financing arrangements is.

The SEM Committee consider that a pro-rata approach to curtailment, in combination with the information contained in SEM-12-090a, helps creates a more stable investment for wind generation (both non-firm and firm wind) to move to financial close, than a grandfathering by reference to FAQ approach would. This is because all projects will know their forecast level of curtailment for a number of years, which will not be impacted by the key variables of levels of firm capacity on the network or number of non-firm connections.

5. Consistency of treatment for constraints and curtailment

Curtailment is not associated with network-specific issues, in that no amount of grid roll-out will alleviate times when there is too much intermittent wind generation on the system. Therefore it is clear that constraints and curtailment are two different situations with differing characteristics.

Even in a tie-breaks situation, it is not necessarily appropriate to treat the two separate events, with differing characteristics and net effects on stakeholders, in the same fashion unless this approach is shown to be the fairest way of dealing with both events. The concern present in SEM-12-028 was that the TSOs would not be able to clearly differentiate between the two events, which could lead to various issues associated with market payments.

The operational issue is proposed to be addressed by the introduction a TSO rule-set for differentiating between constraint and curtailment. This proposed rule-set, which was submitted by the TSOs to the SEM Committee, is included as a separate annex for consultation with stakeholders. Please see SEM-12-090b.

Option 3 – Temporary Pro Rata

This option was basically a mix between option 1 and option 2. To take account of concerns associated with incentivisation of over-build, Option 3 proposed the pro-rata treatment of curtailment up to the 40% all-island target and then moving to a grandfathering with reference to FAQ approach. All generators firm and non-firm would be turned down on a pro-rata basis up until the renewable targets are reached, or in advance of a certain date, e.g. 1 January 2018. After this point, non-firm generation would be turned down ahead of firm generation, with no reference to Gate.

The SEM Committee is not proposing to implement Option 3 and the reasons for this are now outlined.

1. Impact on the consumer and Dispatch Balancing Costs

Based on TSO Modelling, which is detailed in the accompanying paper (SEM-12-090a), a pro-rata approach to curtailment, when compared with grandfathering with reference to FAQ, would increase DBC by approx. €1.8 million, if implemented now. It should be noted that this is within the margin of error for these studies as the results compare production costs of the order of €1 - €2 billion. By 2020 the pro-rata option increases DBC by up to €9 million, again when compared against a grandfathering with reference to FAQ, if non-firm generation builds out.

Costs are smaller if one assumes less non-firm build out, which the SEM Committee considers likely, as discussed above. In addition, the report states that this saving is not considered to be overly significant in the context of the predicted DBC budget, and is expected to represent less than 6% of total the DBC pot in 2020.

The TSO modelling clearly shows that a pro-rata option would increase DBC in 2020. However, the SEM Committee concurs with the TSOs and consider that this increase, when compared against the grandfathering of curtailment with reference to FAQ, to be only marginal in nature. Nevertheless, it is also clear from the studies that the perceived costs of a pro-rata approach over grandfathering with reference to FAQ are not significant. In that sense the SEM Committee does not consider pro-rata to be at a clear disadvantage in terms of DBC savings, when compared against grandfathering with reference to FAQ.

It could be argued that under this approach (Option 3) savings from DBC will begin to accrue after the cut-off date of say 1 January 2018. However the SEM Committee consider that it is likely that generators will not build until firm under this option and therefore the linkage between FAQ and the cut-off date weakens Option 3. This is because many of those generators who do not have a firm date until after 2018 will not take the risk of significantly higher levels of curtailment under grandfathering post 2018 (until they are firm). Therefore, the net effect on DBC of Option 3 is essentially the same as Option 1, if one was to assume similar unlikely levels of non-firm build out.

It should be noted with Option 3, similar to Option 2 (and indeed Option 1) that the modeling undertaken by the TSOs does show that there is a definite ongoing cost to consumers from continuing to pay DBC costs to firm generators for curtailment. This cost is estimated by the TSOs in their report (SEM-12-090a) to be in the region of €13 million in 2020.[16] While the TSOs have not modelled the annual figure between now and 2020, there is likely to be an annual increase between now and 2020 as more wind connects to the system (the TSOs have modelled the 2013 figure to be €4 million).

It is the view of the SEM Committee that this expenditure on curtailment is not sustainable and needs to be reduced as further wind connects to the system between now and 2020. The SEM Committee's mechanism to achieve this is outlined in the next section of the paper.

2. Facilitation of Ireland and Northern Ireland 2020 Renewable Targets

It was suggested in SEM-12-028 that if pro-rata was adopted non-firm projects would carry a lesser proportion of curtailment, which would improve their financial viability and could be said to promote the renewable development. A pro-rata approach to curtailment will provide certainty of equal burden sharing across all wind generators, irrespective of the level of firmness / market access which the generator enjoys.

As expressed above, the SEM Committee considers that under this option, many windfarms will wait until they have firm access before construction. This, in combination with expected delay in FAQ delivery dates, would put severe pressure on the island's ability to meet the 2020 renewable targets if a grandfathering of curtailment by reference to FAQ was adopted.

The accompanying report by the TSOs (SEM-12-090a) indicates that if a pro-rata approach was adopted now, all wind generation including connected non-firm would experience curtailment levels of 2%. With respect to 2020, the report states that all wind generation, including connected non-firm, would experience curtailment levels of 4% if a pro-rata approach was adopted. The report shows curtailment levels of up to 24% for non-firm wind in 2020 if grandfathering of curtailment by reference to FAQ was adopted, when only a small proportion of wind is non-firm.

It should be noted that report assumes an asynchronous generation penetration limit of 70% by 2020. A number of measures are required in order to achieve this, as outlined in EirGrid's Facilitation of Renewables report.[17] Should the limit be lower than 70%, higher levels of curtailment would be observed by all connected generation (both firm and non-firm) and this would be irrespective of whether curtailment was subject to grandfathering with reference to FAQ or to pro-rata.

The SEM Committee considers that a pro-rata approach to curtailment will greater facilitate non-firm wind connection to the system, which will help achieve the 2020

[16] The TSOs modelling indicates a potential saving to consumers in 2020 of €13 million if Option 4 was implemented.
[17] Please see the following page on the EirGrid website here.

renewables targets, over and above grandfathering of curtailment with reference to FAQ. However, the SEM Committee has argued above that generators will only build once firmness is achieved under grandfathering with reference to FAQ. Therefore it is considered generators will not make the decision to construct pre-2018 under Option 3 (as proposed in SEM-12-028), even under this option. This is because of the linkage to FAQ, with the corresponding financial risks after the move to grandfathering of curtailment with reference to FAQ in 2018 (and associated uncertainty).

This is a key reason why the SEM Committee is proposing not to adopt Option 3.

3. Efficiency of Entry Signal

It was argued in SEM-12-028 that Option 3 treats curtailment in a manner which allows generation, irrespective of firmness, to connect and contribute to the achievement of the targets, yet limits the exposure of customers post achievement of the targets is an appropriate way. Only efficient levels of entry will be encouraged as generators will know that curtailment is treated differently once the 40% targets are reached and therefore those non-firm generators who are not viable post achievement of the targets will not connect. Over-incentivisation of connection beyond the 40% renewables target may have a direct impact on consumers in terms inefficient grid roll-out and the Public Service Obligation levy.

As noted above, under a pro-rata approach all new entrants are effectively on a level playing field irrespective of FAQ, which should promote the most technologically advanced, best resourced windfarms actually commissioning. However, the SEM Committee has argued above that generators will only build once firmness is achieved under Option 3. The net result being that, like under grandfathering of curtailment by with reference to FAQ, the firm access date becomes the *de-facto* entry signal.

It is considered by the SEM Committee that this linkage to FAQ post-2018 for non-firm generators connected pre-2018 weakens the 'level playing field' effect for new entrants, and as a result weakens the efficiency of the entry signal under Option 3.

4. Stable Investment Environment

It was noted in SEM-12-028 that a pro-rata approach to curtailment equitably manages curtailment by turning down all generation equally to meet system stability limits and this establishes a reasonable principal by which risk can be assessed by potential investors. It has been stated to the SEM Committee during the consultation process of SEM-12-028 that an independent publication from the TSOs would be extremely helpful in the investment decision-making process. This has now been carried out, as per the accompanying document SEM-12-090a. In addition, following on from a decision on this workstream, EirGrid will be required by the CER to prepare constraint and curtailment reports for each individual generator in Gate 3 in Ireland.

The SEM Committee considers that a pro-rata approach to curtailment, in combination with the information contained in SEM-12-090a, helps creates a more stable investment for wind generation (both non-firm and firm wind) to move to financial close, than grandfathering with reference to FAQ. However, the SEM Committee has argued above that generators will only build under Option 3 once firmness is achieved. Therefore it is considered many generators will not make the decision to construct pre-2018 under Option 3 (as proposed in SEM-12-028). This is because of the linkage to FAQ, with the corresponding financial risks after the move to grandfathering of curtailment with reference to FAQ in 2018. The uncertainty over the level of curtailment which these generators would see post-2018, under Option 3, would be a significant risk for generators, even when taking account of the pro-rata certainty pre-2018.

It is considered by the SEM Committee that this linkage to FAQ post-2018 for non-firm generators connected pre-2018, would not promote a stable investment environment for these non-firm generators looking to connect over the coming years.

5. Consistency of treatment for constraints and curtailment

Curtailment is not associated with network-specific issues, in that no amount of grid roll-out will alleviate times when there is too much intermittent wind generation on the system. Therefore it is clear that constraints and curtailment are two different situations with differing characteristics.

Even in a tie-breaks situation, it is not necessarily appropriate to treat the two separate events, with differing characteristics and net effects on stakeholders, in the same fashion unless this approach is shown to be the fairest way of dealing with both events. The concern present in SEM-12-028 was that the TSOs would not be able to clearly differentiate between the two events, which could lead to various issues associated with market payments.

The operational issue is proposed to be addressed by the introduction a TSO rule-set for differentiating between constraint and curtailment. This proposed rule-set, which was submitted by the TSOs to the SEM Committee, is included as a separate annex for consultation with stakeholders. Please see SEM-12-090b.

Option 4 – Pro-rata with generators taking the risk

Firm wind generators turned down by the TSO in a curtailment situation are currently entitled to market compensation under the Trading and Settlement Code. This compensation is paid for by electricity customers on the island through DBC.

This option which would see the risk of curtailment borne by wind generators only, with no impact on DBC and no direct cost to the all-island electricity customer. Under this option, wind generators would be turned down on a pro-rata basis in a curtailment event. Wind curtailment events would be treated differently in terms of market compensation compared to other events where wind generation is turned down by the

TSO (e.g. constraint events). Wind generators would not receive market compensation when turned down in a curtailment event.

The SEM Committee is not proposing to implement Option 4 and the reasons for this are now outlined. However the SEM Committee's proposed decision outlined in the next section of the paper does involve reducing and eliminating DBC payments for curtailment over a period of time.

1. Impact on the consumer and Dispatch Balancing Costs

It is clear that the impact on DBC would be positive under this option as firm wind generators would no longer be entitled to market compensation through DBC. This should lead to a reduction in the DBC pot and a reduced burden on electricity customers on the island. Since publication of SEM-12-028 the SEM Committee has asked the TSOs to model the potential DBC savings from implementation of this option.

It should be noted that the modelling tool utilised by the TSOs has perfect foresight of wind generation, demand, and generator outages. In reality and in all cases of modelling, this would not be the case for the TSOs as actual dispatch will be less optimal. Please refer to the accompanying TSO document, SEM-12-090a, for more information on study limitations. The results of the modelling are as follows:

a) 2012/13 DBC savings

This study examined both scenarios using the latest DBC forecast model covering 1 October 2012 to 30 September 2013. The studies showed that applying Option 4 would reduce DBC by €4 million. The total amount of wind curtailed was 96 GWh, equating to a curtailment level of 2%.

b) 2020 RES-E Wind DBC savings

This study calculated DBC savings in 2020 due to Option 4, with enough wind installed to meet the 40% renewable target on the island (approx. 5,500 MWs). The studies showed that applying Option 4 would reduce DBC by approx. €13 million. The total amount of wind curtailed was 638 GWh, equating to a curtailment level of 4%.

c) 2020 Low Wind DBC savings

This study calculated DBC savings in 2020 due to Option 4, with wind levels frozen as at the end of 2013. The studies showed a negligible amount of wind curtailment (0.4 GWh) and as such the choice of tie-break option is immaterial.

The savings envisaged in scenario (b) of €13 million assume that wind generation will build under option 4, with enough to meet the 2020 renewable targets on the island. The SEM Committee considers that many wind generators will not build if market compensation for firm generators is ceased immediately. Therefore, the savings

outlined in scenario (b) would be less likely to be achieved. This is because such savings are dependent upon high levels of wind connecting between now and 2020, which would result in higher levels of curtailment.

In this context, it is the view of the SEM Committee that continued compensation for curtailment, at this time, is reasonable as an efficient expenditure in order to ensure that windfarms build. Such build will allow for the release of benefits to consumers on the island, such as lower SMP, fuel diversity and reduced reliance on imported fossil fuels, which would not be possible, were this efficient 'investment' immediately ceased.

However, the SEM Committee consider that compensation for curtailment should not be an indefinite feature of the SEM. Such an action would place an undue and inappropriate long-term burden on the all-island consumer. The SEM Committee addresses this issue in its proposed decision in the following section of the paper.

2. Facilitation of Ireland and Northern Ireland 2020 Renewable Targets

The SEM Committee notes that no respondents supported the implementation of this option, including those who favoured grandfathering with reference to FAQ or a pro-rata treatment to curtailment. One of the main reasons highlighted was that it would send a negative signal for renewable generation build out (both firm and non-firm).

It is acknowledged that a pro-rata approach to curtailment is not in itself a perfect solution to the treatment of curtailment and is not a curtailment mitigant; rather it is a sharing mechanism. Minimisation steps such as implementation of the DS3 programme are required and are being actioned by the SEM Committee to deliver an overall goal of reducing the total level of curtailment on the system.

A pro-rata treatment of curtailment, with expected levels of 4% curtailment in 2020 (as outlined in SEM-12-090a) may make some non-firm generators who are looking to connect financially unviable over the operational lifetime of the plant. This is on the basis that levels of curtailment in the absence of compensation would be too high for these plants to remain financially viable. If compensation was stopped immediately, then some firm generators may also be forced into a difficult financial situation.

While the characteristics of individual windfarms, in terms of viability and financeability, will be different depending, the SEM Committee is of the view that to cease DBC payments for curtailment immediately would impact on the viability of a significant number of windfarms, when compared to taking a more measured approach. This would likely mean that the achievement of the 2020 renewable targets on the island would be under threat.

The likelihood that significantly less numbers of windfarms will be in a financially viable position to connect if compensation for curtailment is ceased immediately (for firm generation) is the primary reason why the SEM Committee is proposing not to adopt Option 4.

3. Efficiency of Entry Signal

This option would provide an efficient entry signal to viable generation. Only wind generation which is viable in the continued absence of being paid compensation for being turned down in curtailment situations would proceed to connecting. The viability of wind generation in this option would be heavily linked to the actual electricity output of the project. Therefore those projects located in the best wind locations or using better technology would be provided with a stronger entry signal, ahead of less good wind sites or less technologically advanced windfarms.

However, as noted above this category of project may not provide enough MWs to reach the 2020 renewable targets on the island. It is considered that a more measured and gradual approach needs to be taken to reducing compensation for curtailment.

4. Stable Investment Environment

While this option would treat all wind projects on an equal basis (irrespective of firmness) the SEM Committee recognise that it would be a significant and sudden change in SEM policy. It is a fact that to date firm wind generation has received market compensation when turned down in curtailment events. It is considered that a change to this policy at this point would represent a significant adjustment to one of the key assumptions which investors would have taken account of when considering their project.

That said the SEM Committee has a primary duty to protect the interests of electricity consumers of the island of Ireland. While investors may have legitimate expectations of a stable investment environment and no sudden or dramatic change to SEM policy, it is nonetheless true that the SEM Committee's duty to protect consumers from the adverse impacts of compensation for curtailment over the longer term, outweighs any investor expectations of this compensation continuing.

It is the view of the SEM Committee that providing a signal now to investors that DBC compensation for curtailment will be discontinued, according to the timescale and mechanism outlined in the next section of the paper, allows for investors to consider their position and make their investment decisions with a high level of information available to them.

While the SEM Committee notes that indefinite compensation for curtailment is not sustainable in the longer term, it is considered that continued compensation, at this time in line with the mechanism outlined in the following section is a legitimate and efficient expenditure in order to promote renewable development. It is also noted that introducing Option 4 (i.e. ceasing compensation immediately) would represent retrospective action on existing connected firm generation. This would, without equal compensation elsewhere in the market, detrimentally effect their financing arrangements and would harm regulatory and investment stability in the SEM.

5. Consistency of treatment for constraints and curtailment

Curtailment is not associated with network-specific issues, in that no amount of grid roll-out will alleviate times when there is too much intermittent wind generation on the system. Therefore it is clear that constraints and curtailment are two different situations with differing characteristics. This recognition, as highlighted above, is in part the justification for proposing option 4 in SEM-12-028.

Even in a tie-breaks situation, it is not necessarily appropriate to treat the two separate events, with differing characteristics and net effects on stakeholders, in the same fashion unless this approach is shown to be the fairest way of dealing with both events. The concern present in SEM-12-028 was that the TSOs would not be able to clearly differentiate between the two events, which could lead to various issues associated with market payments.

The operational issue is proposed to be addressed by the introduction a TSO rule-set for differentiating between constraint and curtailment. This proposed rule-set, which was submitted by the TSOs to the SEM Committee, is included as a separate annex for consultation with stakeholders. Please see SEM-12-090b.

5 SEM COMMITTEE PROPOSED DECISION – PRO-RATA WITH DEFINED CURTAILMENT LIMIT

The above section has outlined a critique of each of the four options identified in SEM-12-028, with reference to the five criteria. These criteria have not been viewed in isolation of one another as there is a significant degree of interaction between them. For example, the financial viability of windfarms projects directly affects the attainment of the 2020 renewable targets.

The SEM Committee acknowledges that the proposed position below differs from that taken in section 3.5 of the decision paper SEM-11-105. As noted in section 2 above in March 2012 the SEM Committee determined that further consultation on curtailment in tie-breaks was considered necessary to provide an additional opportunity for all members of the industry and the public to comment. This decision was taken in order to ensure that a full and transparent consultation process was undertaken prior to a final decision on this matter. The SEM Committee believed that on reflection aspects of its consultation process, which led to the decision outlined in Section 3.5 of SEM-11-105, were deficient.

As a result, the SEM Committee decided that its decision to treat curtailment issues in a tie-break situation on a firm access quantity basis (as set out in Section 3.5 of the SEM-11-105) was to be withdrawn.

Throughout this process the SEM Committee has attempted to make the best decision, on the whole, taking into account various factors for consideration, including the impact on the all-island consumer, the facilitation of the 2020 renewables target and the need to promote a stable investment environment. In addition the SEM Committee has considered the importance of reducing or minimizing overall curtailment levels in line with the requirements of Article 16 of Directive 2009/28/EC and is addressing this issue primarily through other SEM Committee workstreams (e.g. the DS3 programme).

The proposed position below is based on an examination of the evidence presented to the SEM Committee to date and the SEM Committee's weighing up of its duties under statute, primarily to protect the interests of electricity consumers on the island of Ireland.

After the withdrawal of section 3.5 of SEM-11-105 the SEM Committee considered the substantial additional evidence provided. That evidence, some collected by the SEM Committee and the TSOs, some provided by stakeholders etc, points to a movement away from that decided upon in section 3.5 of SEM-11-105The SEM Committee is of the view that greater regulatory instability and a greater lack of confidence in SEM Committee decision-making would result from the SEM Committee continuing to adopt a regulatory position which went against the available evidence which has now come to the fore.

There are two key reasons why the SEM Committee has decided to move away from grandfathering of curtailment by reference to FAQ.

On the evidence presented, the SEM Committee now believes that wind generation will not connect on a non-firm basis under grandfathering by reference to FAQ (leading to pro-rata curtailment of firm generation by default). Secondly, the SEM Committee is not confident that there will be sufficient firm capacity delivered on the transmission system by 2020 in order that wind can connect on a firm basis. These two factors, in combination, mean that grandfathering of curtailment with reference to FAQ no longer delivers against the SEM Committee's five criteria (e.g. protection of consumer, achievement of 2020 targets, stable investment environment etc).

Based on the examination carried out above, the SEM Committee has now arrived at a proposed decision for implementation which is now outlined.

Proposed Decision

Pro-rata with defined curtailment limit

The SEM Committee has sought to design a mechanism which treats all wind generators equally (pro-rata) and which protects consumers from the continued adverse financial impact of paying compensation to firm generators for curtailment. It is considered that this option takes into account the views expressed by a number of respondents with regard to the practicality of ceasing DBC payments for curtailment immediately (as would have occurred under Option 4) and provides a reasonable lead-in time for the cessation of such payments. It is further considered that notifying stakeholders of this now reduces regulatory uncertainty. The proposed decision outlined in this section delivers what the SEM Committee believes is the most effective option for the treatment of curtailment against the SEM Committee's five criteria.

Design of Pro-rata with defined curtailment limit

This option involves the pro-rata treatment for curtailment of all operational windfarms in dispatch and the imposition of a cap / threshold for the payment of DBC compensation for curtailment. It is the SEM Committee's intention that by 2020, there would no longer be DBC compensation available for curtailment of wind.

The features of this option are as follows:

- On the dispatch side curtailment for all operational windfarms will be treated on a pro-rata basis, i.e. all operational windfarms (firm and non-firm) will be turned down on an equal basis by the TSO in a curtailment situation.

- On the market side, as per current SEM rules, firm projects will be paid market revenues through DBC when curtailed. However this full compensation of

curtailment for firm and partially firm generators (0.1% to 99.9%) will only continue up to a fixed point – *the defined curtailment limit*.

- *The defined curtailment limit* is a renewable penetration threshold / date threshold. It is proposed that this limit is set as ***the earlier of*** the confirmed achievement of **75% of the 40% renewable target on the island of Ireland** (**i.e. 30%)** or the date of **1 January 2016**.

- Once the renewable penetration / date threshold has been confirmed as being reached, the 'curtailment DBC pot' (*the level of DBC compensation which was paid out to wind generators for curtailment in that year*) is reduced by one quarter (or 25%) each year over the following years until a point is reached where no DBC compensation is available for curtailment.

- To be clear DBC compensation for curtailment is reduced for all wind generators (firm and partially firm) when **either threshold** is reached; one can happen before the other.

- Furthermore the renewable penetration cap will be defined as the achievement of three quarters of the all-island renewable penetration target of 40% consumption of electricity (i.e. 30%) over the course of any one year.[18]

- The TSOs shall record annual renewable penetration on a calendar year basis and compile data for all-island renewable penetration. The TSOs shall then report the level of renewable penetration as a percentage of electricity consumption on an all-island basis to the SEM Committee by the end of Q1 of the following year.

- Where the three quarters threshold has been reached and confirmed to the SEM Committee by end Q1 of any year (that is, 30% renewable penetration on the island as a percentage of electricity consumption), the SEM Committee shall apply the curtailment DBC reduction mechanism commencing in the **next** calendar year. Equally too, if the date of 1 January 2016 is passed before the renewable penetration threshold has been reached, then the SEM Committee shall apply the curtailment DBC reduction mechanism commencing in the **next** calendar year (2017).

- The defined curtailment limit shall be based upon the *ex-post* level of DBC paid out for curtailment in the calendar year in which the defined limit has been confirmed. For example if the renewable penetration threshold has been reached and confirmed to the SEM Committee by Q1 2015, then the DBC compensation available for curtailment will be capped at the level which is paid out in 2015. In

[18] As highlighted in SEM-12-028 there is the distinct problem of identifying when 75% of the 40% target (i.e. 30%) has been met. In respect of the 40% 2020 target Member States will not know if they have reached the target until electricity consumption data is collected over three years is central to this. For this proposed threshold the data will be taken over the course of one calendar year.

the case of the date of 1 January 2016 being reached, the DBC available for curtailment will be capped at the level which is paid out over the calendar year 2016. This ensures that at the latest, DBC payments for curtailment will be ceased (reach €0) by 2020.

- Windfarms which connect (and are firm) after the threshold / date cap has been reached will be eligible for their share of the reduced DBC compensation pot until the point where the pot is reduced to €0.

- The TSOs shall be tasked with proposing and developing the necessary mechanisms to implement this proposed decision (subject to it becoming a final decision).

- The SEM Committee is aware that DBC is currently forecast and recovered from customers on a tariff year basis (i.e. 1 October to 30 September). However it is proposed that this mechanism shall work on a calendar basis. The SEM Committee does not see this as a difficulty as the TSOs / SEMO will continually monitor the level of DBC paid out on an *ex-post* basis for curtailment and apply the sliding scale mechanism as appropriate in accordance with the rule set out above.

In their response to the previous SEM Committee consultation (SEM-12-028) EirGrid and SONI (as TSOs) indicated that 'while some options were easier to implement than others there is no option outlined by the SEM Committee in the paper that, with the necessary rule-sets defined and system changes implemented, is not capable of being implemented. However any alternative option or combinations of options may not be implementable and would need to be further considered'.

The current option as outlined in this paper is effectively a hybrid and combination of the options included in the previous consultation paper. The SEM Committee has asked the TSOs whether they see anything which would mean that the option as outlined, in this paper, could not be implemented.

The TSOs have indicated that: *'while there is additional complexity in the option as proposed, and a number of clarifications as to the SEM Committee's intent would be required and/ or a number of simplifying assumptions potentially need to be made, and the necessary timeframes be provided to enable such systems changes as it may be necessary to make, EirGrid and SONI believe that from a systems perspective, and with such necessary clarifications and/ or simplifying assumptions as would ultimately be required, we see nothing at this time which would indicate that the proposed decision as outlined would not be capable of being implemented'*.

Therefore if this proposed decision becomes a final decision, the SEM Committee will request that the TSOs develop the mechanisms to give effect to this decision in the most efficient, transparent and cost effective manner. This mechanism will be

recommended to the SEM Committee by the TSOs and will be approved by the SEM Committee, following review.

The SEM Committee is proposing to implement Pro-rata with defined curtailment limit and the reasons for this are now outlined.

1. Impact on the consumer and Dispatch Balancing Costs

Based on TSO Modelling, which is detailed in the accompanying paper (SEM-12-090a), the estimated saving in DBC costs by not paying DBC for curtailment in 2020 would be approx. €13 million. This assumes a curtailment level of 4% with a System Non-Synchronous Penetration (SNSP) limit of 70%. It is noted that if the levels of curtailment in 2020 (and indeed in the years both preceding 2020 and post 2020) were higher than those modelled by the TSOs, then there would be a greater saving to consumers from ceasing DBC payments for curtailment by 2020.

Costs are smaller if one assumes either less overall build out or indeed less wind is connected on a firm basis by 2020. Nonetheless, there will be a benefit to consumers' post 2020 (or indeed post implementation of the 'sliding scale mechanism') as increasing numbers of non-firm wind connections become firm, in line with network build out.

The SEM Committee considers that compensation of curtailment should not be an indefinite feature of the SEM. Such an action would place an undue and inappropriate burden on the all-island consumer. The modelling undertaken by the TSOs has given an indication of what this burden would be on a year-by-year basis. The SEM Committee is of the view that it is not sustainable to continue to pay compensation to wind generators for curtailment beyond 2020. The SEM Committee must be mindful of its primary objective; that is to protect the interests of consumers on the island.

As levels of wind generation increase, leading to an increase in total curtailment levels, it is considered that there comes a point at which it is no longer appropriate for compensation to be provided for curtailment through the SEM arrangements. The SEM Committee is proposing that this point should be the year 2020 at the latest. In order to prepare for this point, the SEM Committee's proposal allows for curtailment compensation levels to reduce in line with increasing levels of wind connection under the 'sliding scale mechanism'.

It is also noted by the SEM Committee that reducing and eventually eliminating DBC compensation for curtailment should be done in line with the implementation of curtailment minimisation measures. This is considered appropriate as wind generators do not have any control over curtailment and are reliant on external minimisation measures in order to reduce the total level of curtailment. The SEM Committee and the RAs have endorsed the TSOs DS3 programme and are involved both in monitoring the programme and in making key decisions on key workstreams (e.g. System Services Review and Grid Code).

It is expected by the SEM Committee, based on the TSOs programme, that the DS3 programme will be fully implemented by 2020 allowing for an SNSP level of up to 75%. This will be the single most important factor in reducing curtailment levels and thereby minimising curtailment to the greatest extent possible. Indeed as aspects of the programme are rolled out between now and 2020, the SEM Committee expects that there will be an incremental increase in the SNSP level, which will allow total curtailment levels to be controlled.

The SEM Committee believes that given these expected developments, it is appropriate to signal now that the burden of compensation for curtailment will only be carried by consumers up to a defined point (2020 at the latest).

2. Facilitation of Ireland and Northern Ireland 2020 Renewable Targets

It was suggested in SEM-12-028 that if pro-rata was adopted non-firm projects would carry a lesser proportion of curtailment, which in turn would improve their financial viability and could promote the attainment of the 2020 renewable targets. A pro-rata approach to curtailment will provide certainty of equal burden sharing across all wind generators, irrespective of the level of firmness / market access which the generator enjoys.

The accompanying report (SEM-12-090a) indicated that if a pro-rata approach was adopted now, all wind generation including connected non-firm would experience curtailment levels of 2%. With respect to 2020, the report states that all wind generation, including connected non-firm, would experience curtailment levels of 4% if a pro-rata approach was adopted. The report shows curtailment levels of up to 24% for non-firm wind in 2020 if a grandfathering with reference to FAQ approach was adopted, where only a small proportion of connected wind is non-firm.

It should be noted that the report assumes an SNSP limit of 70% by 2020. A number of measures are required in order to achieve this, as outlined in EirGrid's Facilitation of Renewables report.[19] Should the limit be lower than 70%, higher levels of curtailment would be observed by all connected generation (both firm and non-firm) and this would be irrespective of whether curtailment was subject to grandfathering with reference FAQ or by pro-rata.

The SEM Committee considers that a pro-rata approach to curtailment will greater facilitate non-firm wind connection to the system, which will help achieve the 2020 renewables targets on the island, over and above grandfathering with reference to FAQ. Under option 4, the SEM Committee expressed the view that removing compensation for curtailment now would run the risk of a significant number of otherwise viable projects not proceeding. However the SEM Committee is of the view that pro-rata with a defined curtailment limit strikes the appropriate balance.

[19] Please see the following page on the EirGrid website here.

All operational windfarms will be dispatched on a pro-rata basis with regard to treatment of curtailment thereby meaning equal treatment for new connections. In addition all firm wind generators will have equal access to the available DBC up to the point at which DBC compensation for curtailment is reduced to €0. This allows these windfarms to receive compensation in their earlier years of operation (if firm) with a 'weaning-off' period up to the point where compensation is no longer available. For non-firm generators, no compensation for curtailment was available anyway. As a result, investment decisions will need to be made purely on the basis of the ability to pay off debts and obligations and make a profit in the continued absence of compensation for curtailment.

The SEM Committee believes that it is worth exploring the potential impact of this proposed decision on windfarms. The TSOs report indicates that a total saving of €13 million would be achievable in 2020 if DBC payments for curtailment were not available. This is against a total volume of curtailment of 638 GWh (or 4%). This equates to a curtailment value of approx. €20 per MWh.

The impact on each individual windfarm will be different if this DBC compensation is not paid in 2020, depending on the characteristics of each windfarm such as size, capacity factor, turbine specification and availability. However for a 10MW windfarm with a capacity factor of 30% which is available 100%[20] of the year, the estimated impact is approx. €21k. This assumes 4% curtailment of the output of this windfarm and a DBC compensation price of approx. €20 per MWh.

It is the view of the SEM Committee that this impact cannot be considered sufficiently large to prevent this windfarm from building or indeed to impact to any great degree on the investment decisions of investors. While this figure and its equivalents for larger or smaller projects are naturally heavily dependent on the actual level of curtailment (4% in this case), the SEM Committee does not consider that a case exists on the basis of windfarm viability to maintain DBC payments beyond 2020. Indeed the more critical consideration for investors with regard to viability or not of windfarms relates to the actual level of curtailment.

If curtailment levels in 2020 are significantly higher than the forecast figure used above (for example because the DS3 programme has not been successfully delivered or there is much higher renewable penetration than forecast), then the impact of ceasing DBC payments for curtailment will be much greater. On the other hand if curtailment levels are lower than forecast (for example because there is lower renewable penetration, or significant levels of export on the interconnectors) then the impact of ceasing DBC payments will be lower than the figures outlined above.

It is up to each individual windfarm to make an investment decision taking account of its view of the level of curtailment which it will experience under a pro-rata approach to

[20] This is a hypothetical situation to illustrate the maximum potential impact on this windfarm. Requirements for outages and the windfarms location relative to any network constraints could significantly reduce this availability figure.

curtailment. The windfarm will also have to consider whether the proposed cessation of DBC compensation for curtailment impacts on the business case of that windfarm. However, based on the figures outlined above, the SEM Committee does not expect that reducing and eliminating DBC payments under this 'sliding scale' mechanism will have a negative impact, of a significant nature, on the majority of proposed windfarm developments.

Above all, it is considered that a pro-rata approach to curtailment in dispatch, even with the defined curtailment limit, will facilitate the achievement of the island's 2020 renewable targets.

3. Efficiency of Entry Signal

It was argued in SEM-12-028 that pro-rata treats curtailment in a manner which allows generation, irrespective of firmness, to connect and contribute to the achievement of the targets. Efficient entry is encouraged beyond 2020 as increasing levels of wind generation will impose higher curtailment, therefore only the more efficient plant which can accommodate higher levels of curtailment would connect.

However, it was also argued that pro-rata treatment of curtailment without some form of cap or control mechanism could result in over-build. Over-incentivisation of connection beyond the 40% renewables targets may have a direct impact on consumers in terms inefficient grid roll-out and obligations to serve out-of-market levies.

As noted above, under a pro-rata approach all new entrants are effectively on a level playing field irrespective of FAQ, which should promote the most technologically advanced, best resourced windfarms actually commissioning. As levels of curtailment increase (i.e. up from 2% on average in 2013 to 4 – 5% by 2020), this creates an automatic signal for only the more efficient plant to connect. The SEM Committee considers that a pro-rata approach to curtailment will greater facilitate non-firm wind connection to the system, which will help achieve the 2020 renewables targets, over and above a grandfathering with reference to FAQ approach.

In addition, the SEM Committee is of the view that the proposed mechanism to reduce and eliminate DBC compensation for curtailment by 2020 at the latest, will serve to promote efficiency. Inefficient windfarms with a business case which are dependent upon the indefinite continuation of DBC compensation will not connect. This will have two benefits; firstly a signal is sent that only efficient windfarms which are viable in the absence of continuous DBC compensation for curtailment are promoted. Secondly if non or less viable plant do not connect (e.g. a plant which requires curtailment compensation for its entire operational lifetime), the total level of curtailment is reduced which is of benefit to those windfarms which are connected and operating efficiently.

It is the view of the SEM Committee that pro-rata with a defined curtailment limit sends both a very strong entry signal based on both dispatch efficiency (most efficient

windfarms are promoted) and market efficiency (viability in the absence of indefinite DBC compensation for curtailment).

4. Stable Investment Environment

It was noted in SEM-12-028 that a pro-rata approach to curtailment equitably manages curtailment by turning down all generation equally to meet system stability limits and this establishes a reasonable principal by which risk can be assessed by potential investors. It has been stated to the SEM Committee during the consultation process of SEM-12-028 that an independent publication from the TSOs would be helpful in the investment decision-making process. This has now been carried out, as per the accompanying document SEM-12-090a. In addition, following on from a decision on this workstream, EirGrid will be required by the CER to prepare constraint and curtailment reports for each individual generator in Gate 3.

The SEM Committee consider that a pro-rata approach to curtailment, in combination with the information contained in SEM-12-090a and specific constraint and curtailment reports for generators, helps creates a more stable investment for wind generation (both non-firm and firm needed to meet the 2020 renewable targets) to move to financial close, than grandfathering with reference to FAQ.

While the SEM Committee acknowledges that its proposed mechanism to reduce and eliminate DBC compensation for curtailment is a revision of existing policy (which allowed for such compensation), the mechanism as proposed puts in place a stable and certain environment for investment. If this proposed decision is implemented, investors will be clear that DBC payments for curtailment will cease to be available by 2020, at the latest, and so investment decisions should not be made based on a requirement for DBC compensation beyond that point.

Furthermore, by providing this clarity now in advance of investment decisions for Gate 3 in Ireland, the SEM Committee considers that it is also promoting clarity for investors with regard to the investment environment in the coming years.

5. Consistency of treatment for constraints and curtailment

Curtailment is not associated with network-specific issues, in that no amount of grid roll-out will alleviate times when there is too much intermittent wind generation on the system. Therefore it is clear that constraints and curtailment are two different situations with differing characteristics.

Even in a tie-breaks situation, it is not necessarily appropriate to treat the two separate events, with differing characteristics and net effects on stakeholders, in the same fashion unless this approach is shown to be the fairest way of dealing with both events. The concern present in SEM-12-028 was that the TSOs would not be able to clearly differentiate between the two events, which could lead to various issues associated with market payments.

The operational issue is proposed to be addressed by the introduction a TSO rule-set for differentiating between constraint and curtailment. This proposed rule-set, which was submitted by the TSOs to the SEM Committee, is included as a separate annex for consultation with stakeholders. Please see SEM-12-090b.

The SEM Committee considers that for the implementation of its proposed decision on the treatment of curtailment in tie-breaks (pro-rata with a defined curtailment limit) there will be a need to distinguish clearly between curtailment and constraint events to the greatest extent possible. This is because curtailment events will, once the defined curtailment limit is reached, be treated differently with regard to DBC compensation.

Secondly to give effect to this proposed decision (if implemented) there may be a need for a change to the treatment of curtailment events in the Trading & Settlement Code. It is considered that changes may also be required to the SEM market system. These changes will need to be implemented once the defined curtailment limit has been reached and will require further consultation with the TSOs and industry before final implementation. This consultation process will take course over calendar year 2013 (and most likely into 2014).

Proposed Rule set for differentiation

As noted above, there was an operational concern present in SEM-12-028 with respect to differentiation between constraints and curtailment. Such differentiation is required if one is to allocate these events differently, because there is a direct impact on market payments. This rule-set is included as a separate annex for consultation with stakeholders. Please see SEM-12-090b.

It should be noted by stakeholders that this rule-set will not provide a perfect differentiation, it is essentially a proxy. Stakeholders are requested to answer whether such a proxy is amenable to them and/or provide additions/modifications that could be made to the rule-set for improving its ability to differentiate between constraints and curtailment.

6 SUMMARY & NEXT STEPS

The SEM Committee has been dealing with considerations associated with the increasing penetration of intermittent generation, mostly wind, on the SEM and on the all-island electricity system for the past number of years. This process commenced in February 2008 with the publication of the discussion paper SEM-08-002,[21] and evolved into the workstream known as *Scheduling and Dispatch*. One of the key issues which emerged over the course of this workstream, and the various consultations held by the Regulatory Authorities, has been how to treat the curtailment of wind energy in the SEM.

The most recent SEM publication discussing this issue, SEM-12-028, outlined four potential options for implementation. Respondents to SEM-12-028 were specifically asked to provide supporting factual / impact based data, which clearly demonstrated the net effects of any ultimate decision on curtailment on five criteria.

SEM-12-028 stated that list of criteria was non-exhaustive and that the SEM Committee would welcome any other supporting factual/ impact based data which could inform its decision-making. Respondents were also welcome to put forward alternative approaches to dealing with matter.

This paper has examined each of those options outlined in SEM-12-028 in detail against the identified criteria and has come a proposed position on each. A summary is as follows.

- Option 1 – This option involves a grandfathering approach to curtailment, with reference to FAQ of the generator. The SEM Committee is not proposing to implement this option primarily because it is suggested that non-firm wind will not connect under this type of grandfathering and therefore the key basis for this approach is removed. This would lead to higher costs for consumers (only firm wind being curtailed and higher SMP due to less non-firm wind on system) and such an approach would threaten the attainment of the 2020 renewables targets.

- Option 2 – This option involves the pro-rata treatment of curtailment which essentially means that all wind generators, irrespective of allocated FAQ will be turned down by the TSOs by an equal percentage in order to ensure system security. The SEM Committee is not proposing to implement Option 2 primarily because it could lead to over-incentivisation of renewable build, which will increase costs to consumers, increase curtailment levels and therefore impact negatively on all connected wind plant in the longer run. In addition it would maintain DBC compensation for curtailment indefinitely, which would also impact negatively on consumers.

[21] Please refer to '*Wind Generation in the SEM: Policy for Large-Scale, Intermittent Non-Diverse Generation*', which can be found here.

- Option 3 – The option involves the pro-rata treatment of curtailment up to the 40% all-island target and then moving to grandfathering, with reference to FAQ. The SEM Committee is not proposing to implement this option primarily because it is suggested that such an approach would not promote efficient levels of renewable build and does not provide a stable investment environment. In addition, it is considered that this would threaten the attainment of the 2020 renewables targets. This approach would also maintain DBC compensation for curtailment indefinitely, which in turn would impact negatively on consumers.

- Option 4 – This option involves wind generators being turned down on a pro-rata basis in a curtailment event, however these generators (both firm and non-firm) would not be compensated for that curtailment event. The SEM Committee is not proposing to implement this option primarily because it is suggested that a lead-in time is required before DBC payments can be fully eliminated for curtailment. Were this lead-in time not allowed and some compensation not available in the short term, there is a significant risk to the attainment of the 2020 renewable targets on the island.

Based on this examination the SEM Committee has now arrived at a proposed position for implementation - pro-rata with a defined curtailment limits.

The features of this option are as follows:

- On the dispatch side curtailment for all operational windfarms will be treated on a pro-rata basis, i.e. all operational windfarms (firm and non-firm) will be turned down on an equal basis by the TSO in a curtailment situation.

- On the market side, as per current SEM rules, firm projects will be paid market revenues through DBC when curtailed. However this full compensation of curtailment for firm and partially firm generators will only continue up to a fixed point – *the defined curtailment limit*.

- *The defined curtailment limit* is a renewable penetration threshold / date threshold. It is proposed that this limit is set as ***the earlier of*** the confirmed achievement of **75% of the 40% renewable target on the island of Ireland** (**i.e. 30%)** or the date of **1 January 2016**.

- Once the renewable penetration / date threshold has been confirmed as being reached, the 'curtailment DBC pot' (*the level of DBC compensation which was paid out to wind generators for curtailment in that year*) is reduced by one quarter (or 25%) each year over the following years until a point is reached where no DBC compensation is available for curtailment.

- To be clear DBC compensation for curtailment is reduced for all wind generators (firm and partially firm) when **either threshold** is reached; one can happen before the other.

- Furthermore the renewable penetration cap will be defined as the achievement of three quarters of the all-island renewable penetration target of 40% consumption of electricity (i.e. 30%) over the course of any one year.[22]

- The TSOs shall record annual renewable penetration on a calendar year basis and compile data for all-island renewable penetration. The TSOs shall then report the level of renewable penetration as a percentage of electricity consumption on an all-island basis to the SEM Committee by the end of Q1 of the following year.

- Where the three quarters threshold has been reached and confirmed to the SEM Committee by end Q1 of any year (that is, 30% renewable penetration on the island as a percentage of electricity consumption), the SEM Committee shall apply the curtailment DBC reduction mechanism commencing in the **next** calendar year. Equally too, if the date of 1 January 2016 is passed before the renewable penetration threshold has been reached, then the SEM Committee shall apply the curtailment DBC reduction mechanism commencing in the **next** calendar year (2017).

- The defined curtailment limit shall be based upon the *ex-post* level of DBC paid out for curtailment in the calendar year in which the defined limit has been confirmed. For example if the renewable penetration threshold has been reached and confirmed to the SEM Committee by Q1 2015, then the DBC compensation available for curtailment will be capped at the level which is paid out in 2015. In the case of the date of 1 January 2016 being reached, the DBC available for curtailment will be capped at the level which is paid out over the calendar year 2016. This ensures that at the latest, DBC payments for curtailment will be ceased (reach €0) by 2020.

- Windfarms which connect (and are firm) after the threshold / date cap has been reached will be eligible for their share of the reduced DBC compensation pot until the point where the pot is reduced to €0.

- The TSOs shall be tasked with proposing and developing the necessary mechanisms to implement this proposed decision (subject to it becoming a final decision).

- The SEM Committee is aware that DBC is currently forecast and recovered from customers on a tariff year basis (i.e. 1 October to 30 September). However it is proposed that this mechanism shall work on a calendar basis. The SEM Committee does not see this as a difficulty as the TSOs / SEMO will continually

[22] As highlighted in SEM-12-028 there is the distinct problem of identifying when 75% of the 40% target (i.e. 30%) has been met. In respect of the 40% 2020 target Member States will not know if they have reached the target until electricity consumption data is collected over three years is central to this. For this proposed threshold the data will be taken over the course of one calendar year.

monitor the level of DBC paid out on an *ex-post* basis for curtailment and apply the sliding scale mechanism as appropriate in accordance with the rule set out above.

The SEM Committee welcomes views from stakeholders on this proposed option for implementation and the proposed operational rule set for distinguishing episodes of constraints from those of curtailment, contained in the annex SEM-12-090b.

Questions for stakeholders

4. Do you agree with the proposed decision of the SEM Committee? If not, please set out your reasons why and with reference to the five criteria identified above.

5. Do you consider that the proposed decision has been clearly defined? If not, could you please provide comment on how this could be addressed, including the outline of the *defined curtailment limit.*

6. Do you find the proposed rule-set for the differentiation of curtailment events from those of constraints amenable? If not, please set out why. In addition, could you please provide additions/modifications that could be made to the rule-set for to facilitate differentiation.

Responses to this paper

All responses should be sent in electronic format to Jamie Burke (jburke@cer.ie) at the Commission for Energy Regulation. Responses are due by close of business (5pm) Friday 2 November 2012.

The SEM Committee will consider all responses received and will then publish a decision on this matter.