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9 July 2021

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ElectroRoute Response to SEM-21-026 & SEM-21-027

We would like to avail of the opportunity to respond to some of the proposals detailed in SEM-21-026: Consultation on Dispatch, Redispatch and Compensation Pursuant to Regulation (EU) 2019/943 (the Clean Energy Package or "CEP") and the proposed decisions outlined in SEM-21-027: Proposed Decision on Treatment of New Renewable Units in the SEM.

1. Key Messages

- Decremental actions applied to dispatchable priority dispatch units can be dispatch or redispatch (energy and non-energy actions) rather than redispatch only (non-energy actions), and the flagging & tagging processes already in place in SEM are capable of identifying the actions as such and removing the relevant actions from pricing as required.
- Both Mod_10_19 and a change which would flag all priority dispatch actions out of pricing would lead to market price increases of approx. 4-10%, increased consumer cost of approx. €200-400 million per annum and increased curtailment of approx. 16%.
- We largely agree that the proposals on the operation of future renewable generators in the SEM follow what is mandated by the CEP.
- We disagree with the assertion that all redispatch actions on units with priority dispatch are non-market based, as actions taken on dispatchable units with priority dispatch will have been taken in an economic merit order using COD and TOD.
- There needs to be clarity on the future arrangements RES-E generators will be expected to follow when they entering the market in the near future, including any interim solutions put in place while the proposed decisions in SEM-21-027 are being implemented into the market systems to give these units certainty on their revenue streams.

2. SEM-21-026

2.1. Definition of Dispatch and Redispatch

SEM-21-026 proposes to define Dispatch as "*the scheduling and dispatch of units to meet the energy requirements of the market*" and aligns the concept of dispatch with energy balancing,

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which is "*energy used by the TSOs to perform balancing and provided by a balancing service provider*". Therefore, a "Dispatch Action" can be regarded as an action taken to meet the energy requirements of the market, aligning it to the definition of an "Energy Action" given in SEM-21-027: "*Energy actions in the balancing market are actions taken by the TSOs to address an overall imbalance between energy supply and demand*". **We fully agree with this interpretation of the concept of Dispatch and Dispatch actions**.

The CEP defined Redispatch as "*a measure, including curtailment, that is activated by one or more transmission system operators or distribution system operators by altering the generation, load pattern, or both, in order to change physical flows in the electricity system and relieve a physical congestion or otherwise ensure system security.*" SEM-21-026 proposes to define Redispatch as "*deviations from the market schedule for both local network and broader system reasons, including TSO-instructed reduction in generation due to localised network issues (constraints) and reduction in non-synchronous generation due to other system-wide reasons such as levels of System Non-Synchronous Penetration (curtailment).*" The concept of Redispatch is broadly aligned to the term "non-energy" in SEM, defined in SEM-15-026 as "*actions that are taken due to constraints (thermal, voltage, frequency and dynamic stability) on the system*". Therefore, a Redispatch action can be said to be an action taken either for operational constraints or for curtailment. **We believe this definition proposed accurately translates the definition given in the CEP to the SEM and fully agree with this interpretation of the concept of Redispatch and Redispatch actions.**

2.2. Dispatch and Redispatch actions applied to Priority Dispatch units

There are two issues at play in this section, which we will address while using the definitions of dispatch and redispatch as outlined above.

2.2.1. Should decremental actions on priority dispatch units be considered dispatch and redispatch or as forms of redispatch only?

Whether priority dispatch actions are solely redispatch should be considered based on the two different types of priority dispatch units. As outlined in Section 2.1 of SEM-21-026, non-dispatchable priority dispatch units, namely wind and solar units, cannot be dispatched down in systems for anything other than constraints or curtailment. Redispatch is defined as actions which are taken to address curtailment or operational constraints. Therefore, it is apparent that currently any decremental actions taken on non-dispatchable priority dispatch units must be redispatch actions. However, this would change in future if it became possible to dispatch down non-dispatchable priority dispatch units for energy balancing reasons – these would be dispatch actions.

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The other type of priority dispatch unit is dispatchable generators, including CHP, Waste-to-Energy and Hydroelectricity units. These units behave exactly like any other conventional unit in SEM with the only extra caveat being they have priority in being dispatched. This means that, like any other dispatchable unit in SEM, actions taken on these units can either be to address the energy imbalance or to meet a system operational constraint, which implies that **decremental actions taken on dispatchable priority units can be either Dispatch or Redispatch.**

SEM-21-026 acknowledges this, but suggests that because these actions are taken on the basis of policy decisions to maximise output from priority dispatch units that these actions should be considered redispatch, as the actions would have been taken "*due to the constraint of priority dispatch.*" This is a very misleading statement. It is clear from the definitions of redispatch and non-energy actions defined in SEM-21-026 and SEM-15-026 respectively that the term "constraints" refers very specifically to operational measures to keep the system secure, encompassing "*localised network issues*" relating to operational limits on "*thermal, voltage, frequency and dynamic stability*." The definition of redispatch in the CEP agrees with this interpretation, stating that redispatch is an action used to "*relieve a physical congestion or otherwise ensure system security*.". **Regardless, the existence of the priority dispatch hierarchy is not a "constraint" that would qualify these actions as always being taken for redispatch.**

SEM-21-026 acknowledges this, but suggests that because these actions are taken on the basis of policy decisions to maximise output from priority dispatch units that these actions should be considered redispatch, as the actions would have been taken "*due to the constraint of priority dispatch.*" This is a very misleading statement. It is clear from the definitions of redispatch and non-energy actions defined in SEM-21-026 and SEM-15-026 respectively that the term "constraints" refers very specifically to operational measures to keep the system secure, encompassing "*localised network issues*" relating to operational limits on "*thermal, voltage, frequency and dynamic stability*." The definition of redispatch in the CEP agrees with this interpretation, stating that redispatch is an action used to "*relieve a physical congestion or otherwise ensure system security*.". **Regardless, the existence of the priority dispatch hierarchy is not a "constraint" that would qualify these actions as always being taken for redispatch.**

Obviously, there are some cases when decremental actions are taken on dispatchable priority dispatch units to meet an operational system constraint. Figure 1 shows the breakdown of these actions taken to meet system operational constraints in the SEM and shows that **the majority of actions are not taken to meet an operational constraint. These actions cannot be redispatch, so must be taken for energy reasons and are therefore dispatch.** The current flagging & tagging process in SEM is very much capable of identifying and removing dispatchable unit actions (regardless of priority status) from setting the imbalance price if the action was taken to meet an operational constraint, as required by the CEP. It is unclear then why the minded to position

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is to define *all* of these actions as redispatch and remove them all from setting the imbalance price when the SEM already has systems in place to appropriately identify the dispatch and redispatch actions and subsequently remove the redispatch actions from pricing.

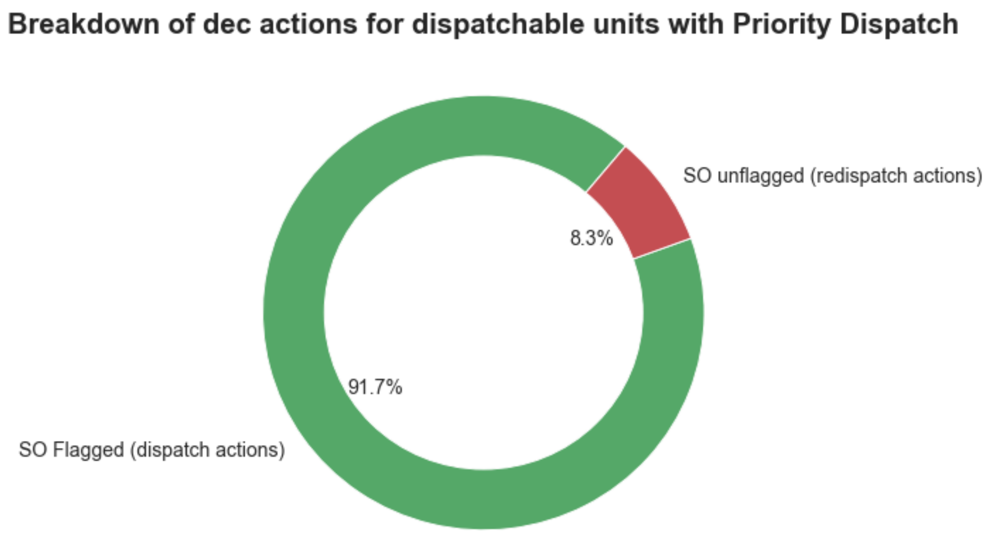

Figure 1: System Operator (SO) flagging of dec actions for dispatchable units with priority dispatch, data period 2020/06/01 - 2021/06/01

This decision is even more confusing given that there is no obligation in Article 12 or 13 of the CEP to define these kinds of actions as redispatch, and that in the first consultation on the CEP (SEM-20-028) the minded to position then was that actions taken on priority dispatch units were a form of dispatch (see Figure 2).

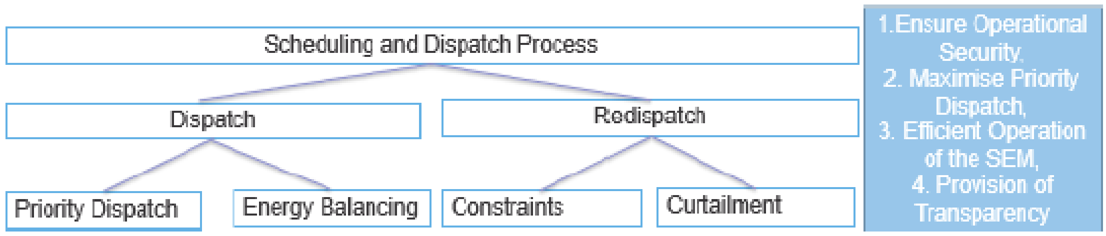

Figure 2: Regulatory Authorities' breakdown of Dispatch and Redispatch actions as applied to SEM, taken from Fig 3 of SEM-20-028

Therefore our position is that, categorically, decremental actions applied to dispatchable priority dispatch units can be both dispatch and redispatch actions, and that the flagging & tagging processes already in place in SEM are capable of identifying the actions as such and removing the relevant actions from pricing as required.

2.2.2. If these actions are a form of redispatch, how should they be removed from setting the imbalance price, as required by the CEP?

Our position is that there is no need for additional measures to be applied to the SEM to remove these actions from pricing. However, we have examined the impact of the two proposed changes regardless, namely the implementation of Mod_10_19 (which would replace the bid price of decremental actions applied to priority dispatch units with 0 €/MWh for the purposes of pricing) or the application of a new flag for priority dispatch to remove these units from setting the price.

From the outset, and while we don't agree that either change is required as outlined in 1.2.1, it is clear these changes are not even effective in removing decremental priority dispatch actions from pricing. Among the historic data (data period 2021/04/30 – 2021/06/01), in 22% of cases these actions are price setting. Our analysis shows that, rather than removing the actions from setting the price, Mod_10_19 would still allow these actions to set the price in **40% of cases** to an artificially administered price which is incompliant with the provisions outlined in Article 10 of the CEP. The new flag solution would still allow these actions to be involved in setting the price in **25% of cases**. In short, **neither change is effective in doing what it intends to do**.

2.2.2.1. Balancing market impact

We can explicitly model the proposed changes on the historic ranked sets as they are simple changes to the balancing market pricing mechanisms outlined in the Trading & Settlement Code. We calculated the imbalance price over the period 2020/01/01 to 2021/06/01 by applying each proposed change in the pricing mechanism to each historic 5-minute ranked set. The results are outlined in Table 1 and Figure 3

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	Original	Mod_10_19	Priority Dispatch dec flagging
Mean imbalance price (€/MWh)	**49.72**	**51.89**	**54.67**
Standard Deviation (€/MWh)	61.12	56.64	55.97
Min price (€/MWh)	-390.13	-304.75	-304.75
Max price (€/MWh)	1720.50	1720.50	1720.50
Number negative prices	1347.00	640.00	559.00
% negative prices	**5.45**	**2.59**	**2.26**

Table 1: Balancing market prices if proposed changes to balancing pricing mechanism implemented, data period 2020/01/01 - 2021/06/01

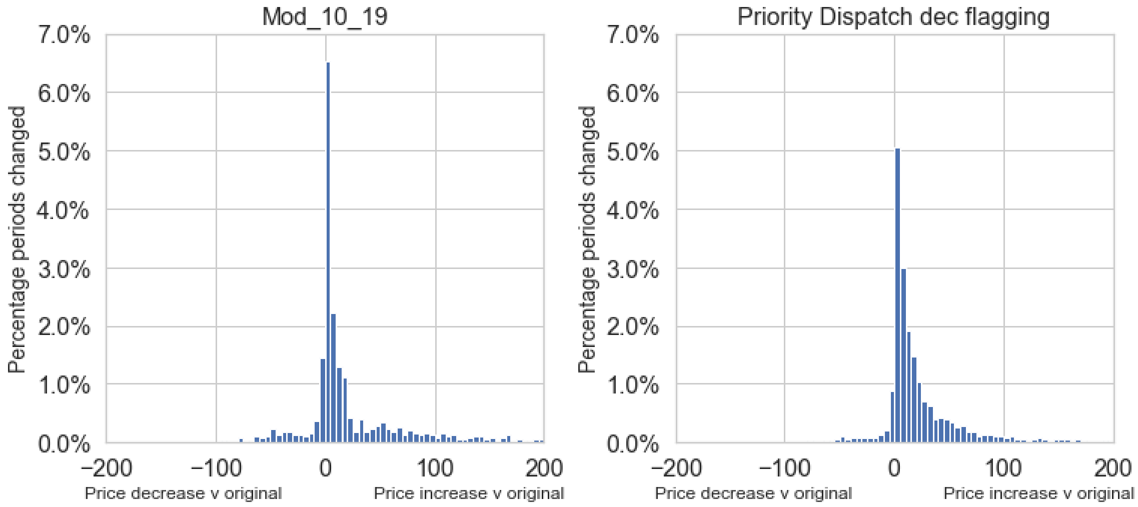

Figure 3: Proportional share of change in original balancing market price and recalculated balancing market price with respective change applied, data period 2020/01/01 - 2021/06/01

Mean imbalance prices rise with both changes by 4 to 10%. The number of negative prices more than halves in both cases. Negative prices are indicative features of a well-functioning energy market and are common features throughout markets in Europe – for example, in the data period 2020/01/01 to 2020/07/01, 26% of pricing periods in the German market were negative prices, compared to just 7% in the SEM. They also act as substantial investment signals for batteries and flexible generation who enter the market to capture the revenue available in these price periods, and ultimately this leads to a system which is able to securely accommodate a higher penetration of renewable generation. The TSOs are also obligated by

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Article 13 to ensure the system is sufficiently flexible to incorporate large shares of renewable electricity generation. Therefore, these changes would suppress the incentive that new batteries or other flexible units have to connect to the system.

2.2.2.2. What happens if balancing market prices increase?

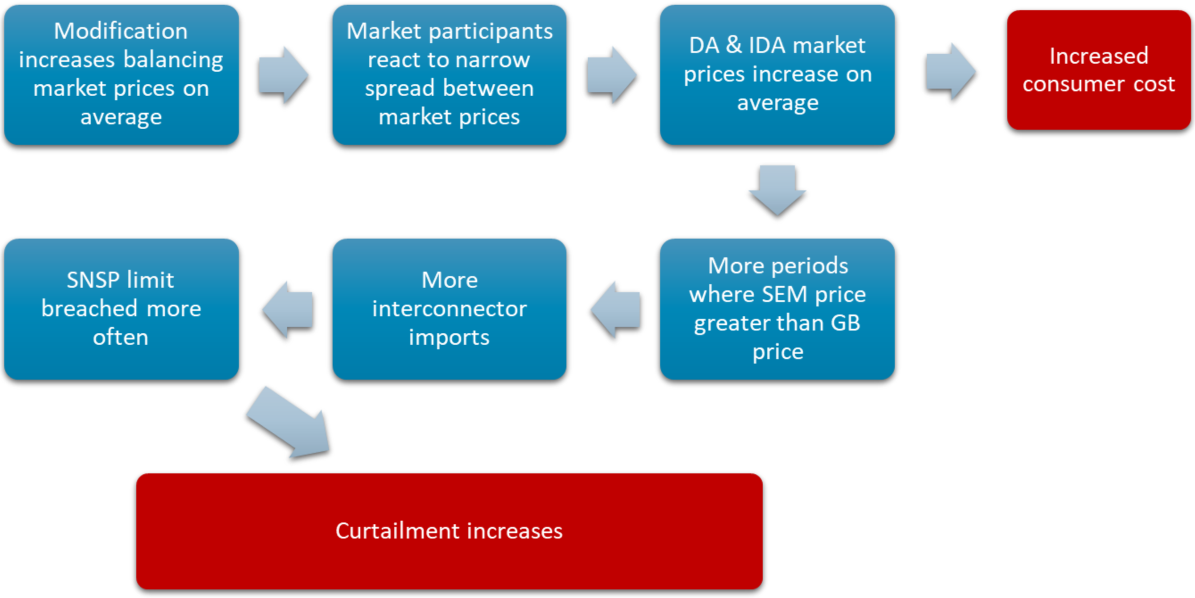

Figure 4: Flow diagram depicting impact to wider SEM market from increase in balancing market prices caused by Regulatory change

According to good economic principle, an increase in balancing market prices should prompt market participants to reactively change their bidding behaviour and narrow the price spreads between the day-ahead market and the balancing market. This has two major impacts. Firstly, increased market prices directly lead to an increased cost for the consumer to bear, which is contradictory to the principles of the SEM market which strives to minimise electricity costs for the consumer. Secondly, there will be more periods when the SEM market price is higher than the GB market price, and as that interconnector flows are set off the price spread between the two zones , this will lead to more interconnector imports. Increased interconnector imports would see the SNSP limit being breached more often, and the way to alleviate this problem is to

increase curtailment of non-synchronous renewable electricity generators.
Increasing curtailment is evidently not a good thing, particularly if it was caused by an unnecessary regulatory decision in a consultation ensuring compliance with the CEP, which is striving to increase renewable electricity shares across Europe.

2.2.2.3. Modelling of day-ahead market impact and effect on interconnector flows

While the logic outlined above is certainly solid, it is very difficult to numerically quantify the

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effect it might have on the market, as it is uncertain how exactly market participants would react to the changing balancing prices and mathematically difficult to model a "re-trading" of the entire market. Nonetheless, we have approximated the change to day-ahead market prices using the following principles:

- The great reduction in negative balancing prices would mean day-ahead market participants would no longer feel threatened by the balancing price being set negative. As a result, they would not bid negatively in the day-ahead market, and therefore **the day-ahead market price would no longer be set below 0 €/MWh**
- Market participants would trade to **narrow the price spreads** between the markets (in the original data period, the price spread between the day-ahead and imbalance markets was only 0.12 €/MWh)

Applying these principles, we modelled new day-ahead market price curves, the results of which are given in Table 2.

	Original	Mod_10_19	Priority Dispatch dec flagging
Mean DA price (€/MWh)	49.59	52.09	54.87
Cost consumer (M€/annum)	**0.00**	**204.48**	**437.50**
Mean spread GB-IE DA prices (€/MWh)	0.54	-1.97	-4.76
% import periods	**46.20**	**61.65**	**77.78**
% export periods	**53.68**	**38.31**	**22.18**
% equal price periods	0.12	0.04	0.04

Table 2: Modelled day-ahead market prices if proposed changes to balancing pricing mechanism implemented, data period 2020/01/01 - 2021/06/01

Day-ahead prices increase on average by around 5 to 11%. This has a direct impact on the consumer, approximately an extra €200 – 440 million extra per year to bear, depending on the change implemented.

The proposed changes would also see Ireland change from a net exporter on the interconnectors to a net importer over the data period, shown in Figure 6. This would see the SNSP limit being breached more often.

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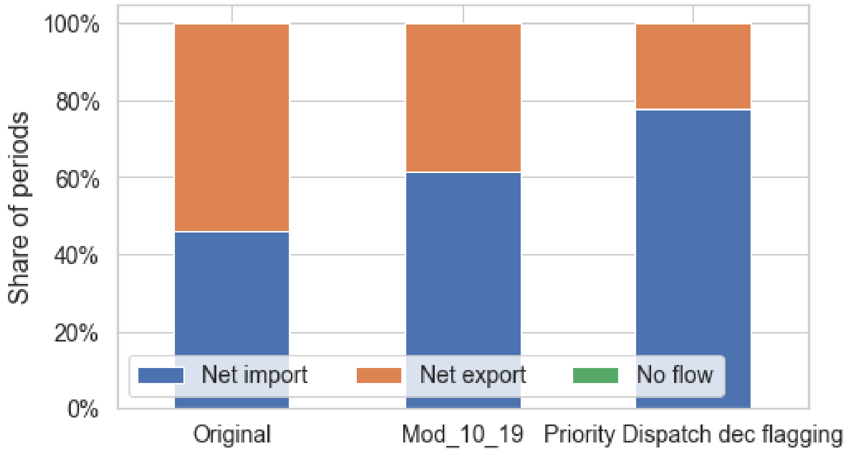

Figure 6: Interconnector imports and exports for proposed change, data period 2020/01/01 - 2021/06/01

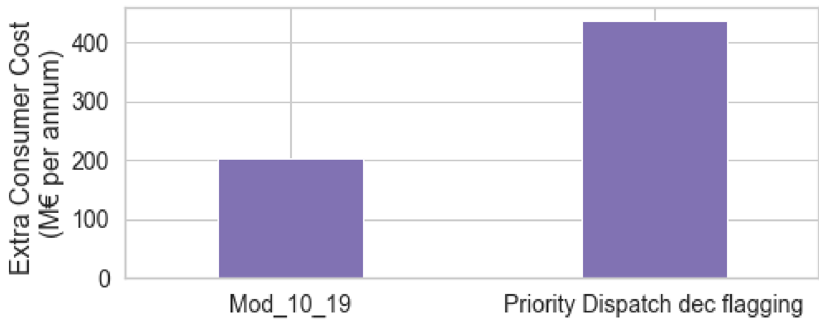

Figure 5: Extra consumer cost associated with proposed change, data period 2020/01/01 - 2021/06/01

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2.2.2.4. Impact on dispatch down

The increased imports lead to the need for increased curtailment due to the interconnector flow's impact with the SNSP limit. Based on current SNSP limits, we estimate that dispatch down could **increase by 16%.**

	Original	Mod_10_19	Priority Dispatch dec flagging
Data period Dispatch Down (GWh)	2100.38	2444.68	2433.02

Table 3: Impact of each proposed change on dispatch down of non-synchronous renewable generators, data period 2020/01/01 - 2021/06/01

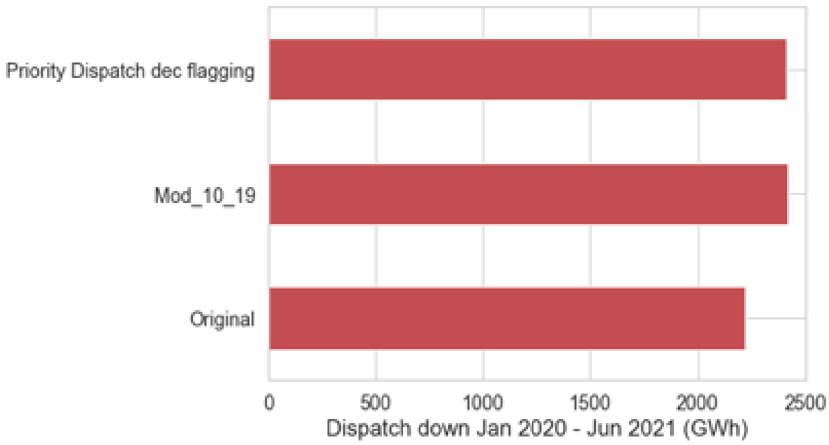

Figure 7: Level of dispatch down associated with each proposed change, data period 2020/01/01 - 2021/06/01

2.2.3. Conclusions on decremental actions applied to priority dispatch units

Our analysis has highlighted how the two proposed changes have unintended negative impacts right across the SEM market. It has also shown that these actions are not always redispatch actions, they are a clear mix of dispatch and redispatch actions, and that Article 12 & 13 of the CEP does not mandate in any way that SEM must define these actions as redispatch. **On this issue then, we propose that the Regulatory Authorities consider decremental actions taken on priority dispatch units as being for either dispatch or redispatch (energy and non-energy actions) rather than redispatch only (non-energy actions), and recommend that the current flagging & tagging process continue to be used to identify these actions as such and remove the relevant actions from pricing.**

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2.3. Definition of Non-Market Based Redispatch & Financial Compensation

Firstly, our reading of Article 12 & 13 of the CEP is that it mandates the following:

- Renewable generators should become active market participants, and as far as possible behave as conventional, dispatchable units currently do
- The markets should be used to dispatch these units as far as possible. Non-market based redispatch should only occur as a last resort
- Units which have to be redispatched for system operational reasons should be financially compensated to at least equal to the higher of the additional operating cost caused by redispatching or the net revenue of sales of electricity in the day-ahead market (including subsidy) that would have been received had the generator not been redispatched, except for non-firm capacity which is redispatched using non-market measures, and provided the compensation is not unjustifiably high or low
- The TSOs and DSOs must take grid & market related measures to minimise downward redispatching of electricity produced from RES and ensure the system is suitably flexible and secure to accommodate large shares of renewable electricity generation

In this context, we believe the proposals made by the Regulatory Authorities are broadly in-line with what is mandated by the CEP.

2.3.1. Consideration of curtailment and constraints as market based

We agree with the assessment that curtailment in SEM is currently a form of non-market based redispatch if it continues to be applied pro-rata across all units and units have no ability to indicate economically their willingness to be curtailed.

We agree that constraints as applied to all non-priority dispatch units are a form of market based redispatch if these units are able to submit COD, TOD and FPNs to economically indicate their willingness to turn down.

We disagree that constraints applied to *all* priority dispatch units are a form of non-market based redispatch. Where units cannot submit COD, TOD or FPNs, such as for current non-dispatchable renewable generators with priority dispatch, these actions should be designated as non-market based dispatch, as actions taken will not have been based on an economic merit order. However, for units which can submit COD, TOD and FPNs, such as dispatchable units with priority dispatch, these actions should be designated as market based, as there is a clear economic merit order involved in making the decision to redispatch units. If these dispatchable priority dispatch units are designated as non-market based because they are not dispatched according to an exact minimisation of costs, then under the same logic the other actions on units involved in these constraints should also be designated non-market based.

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Regardless though, as all these actions are redispatch, they should not be setting the imbalance price, as per Article 13(2). The dispatch actions taken on priority dispatch units should however still be price setting. The CEP *does not* mandate that non-market based actions be removed from imbalance pricing. Logically speaking, non-market based actions should theoretically not be in the imbalance market ranked sets if they were truly taken outside of the market. That they do appear in the ranked set indicates that they are in fact market based.

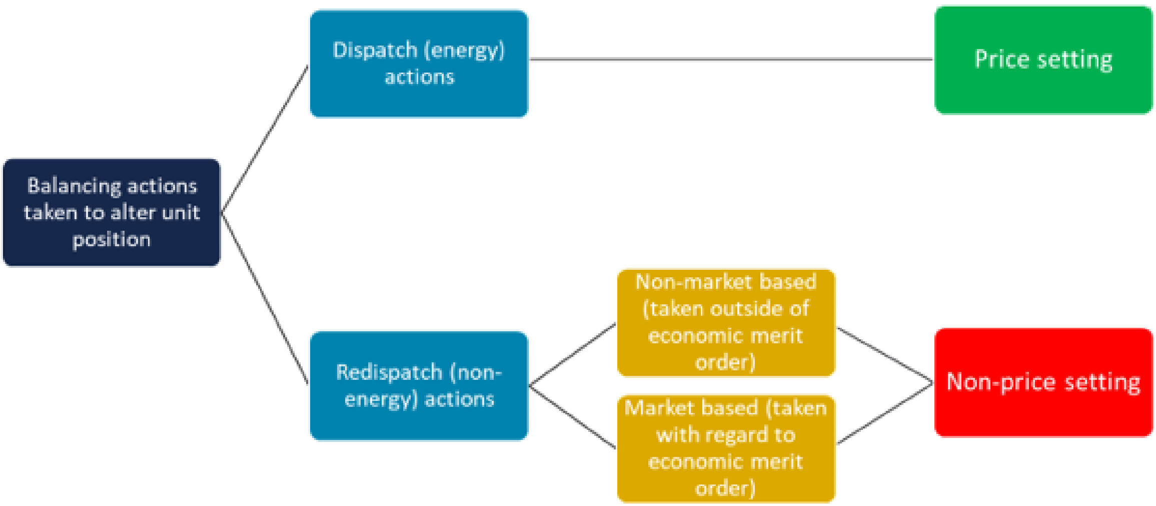

Figure 8: Flow diagram of balancing actions which the CEP deems should be included and excluded from setting the balancing market price

2.3.2. Compensation for non-market based redispatch

We agree that the best way to remunerate units for redispatch due to constraints is through the current existing remuneration in the SEM market based on the decremental prices submitted by non-priority units and the deemed prices for priority units.

We agree that the Regulatory Authorities proposal to compensate priority dispatch units for curtailment up to the level of their additional operating costs caused by redispatching is acceptable with what is required by the CEP. Also, it provides incentive for these units to give up their priority dispatch status, as required by the CEP.

We partially agree with the compensation plan outlined for curtailment of non-priority units. We believe that this compensation value should be revised from "*up to the level of the DAM price at the time they are curtailed*" to "*up to the level of the better of the DAM price at the time they are curtailed, , or the value of their additional opportunity costs caused by redispatching*." This is more in line with the compensation plan outlined in the CEP and removes the exposure of this compensation to negative pricing periods in the day-ahead market.

We don't believe that a limit should be imposed on the level of compensation that must be paid out under Article 13(7). Increasing compensation should be additional motivation for TSOs and DSOs to improve the flexibility and operational security of the system as required by Articles 12 & 13, that will deter the TSOs from curtailing generation and incentivise the system to increase its SNSP and operational limits more quickly. In this context, if the amount of available non-synchronous generation available exceeds 100% of the energy requirement, generation should be dispatched down to *meet the energy requirement* first, and then any curtailment below the energy requirement to meet SNSP limits should be regarded as curtailment and financially compensated.

3. SEM-21-027

We agree that all of the proposed decisions outlined in SEM-21-027 follow what is required by the CEP. Our primary interest here is with the speed of implementation and the interim solution until the new systems can be put in place. We understand that it could be October 2023 before the new operation of non-priority renewable generators can be implemented in the SEM. It is important that any projects that come online before this date have clarity on the arrangements they will be expected to follow when they participate in the market, and units which enter the market after this date should also have full knowledge as soon as possible of their operation in the market.

We would also note that any rules put in place for tolerance levels of submitted Physical Notifications of wind are mindful of the forecast uncertainty of wind. Even at gate closure there can be times when forecast errors are quite high. For example, when wind is due to ramp up sharply due to the arrival of a weather system onshore the exact timing of the arrival of this system would have a significant bearing on the absolute level of wind production in a particular half hour period. The steeper the ramp is the higher the absolute uncertainty would be in each trading period.

4. Summary

In summary:

- We propose that the Regulatory Authorities consider decremental actions taken on priority dispatch units as being for either dispatch or redispatch (energy and non-energy actions) rather than redispatch only (non-energy actions), and recommend that the current flagging & tagging process continue to be used to identify these actions as such and remove the relevant actions from pricing

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- Mod_10_19 and and a change which would flag all priority dispatch actions out of pricing would lead to increased market prices, increased consumer cost and increased curtailment, all of which negatively impact on the efficient operation of the SEM

- In our view there are still some small details which are out-of-line between the proposals on the operation of future renewable generators in the SEM and the CEP, but largely we are satisfied that the proposals are moving the SEM in the right direction and are in line with what is mandated by the CEP

If you would like further information on any of the positions or analysis we have set out in our response, please contact Patrick Larkin at patrick.larkin@electroroute.com. We look forward to engaging with you further on this very important topic.

Yours sincerely,

Caoimhe Giblin
Director