



EirGrid plc
The Oval
160 Shelbourne Road
Ballsbridge
Dublin 4, D04 FW28

Submitted by email to: DS3@eirgrid.com

Innogy Renewables Ireland Ltd
Contact: Sam Harden
M: +44 (0) 7468 713158
E: samuel.harden@innogy.com
W: www.innogy.com

11/05/2018

RE: DS3 System Services Consultation – Volume Capped Procurement

Innogy Renewables Ireland Ltd welcomes the opportunity to respond to this consultation on the DS3 System Services Volume Capped Competitive Procurement dated 29th March 2018.

By way of introduction, innogy is Germany's leading energy company, with revenue of around €44 billion (2016), more than 40,000 employees and activities in 16 countries across Europe. With its three business segments Renewables, Grid & Infrastructure and Retail, innogy addresses the requirements of a modern, decarbonised, decentralised and digital energy world.

innogy has considerable experience in developing, constructing and operating renewables assets both independently, and together with project partners and investors. We invest in a broad range of technologies and have experience with onshore and offshore wind, hydro power, solar, battery storage and R&D phase technologies.

Following the launch of its Initial Public Offering (IPO) in 2016, innogy outlined its intention to increase its renewables footprint by entering new markets and new technologies and took an important strategic decision to develop renewable activities in Ireland by founding its subsidiary Innogy Renewables Ireland Ltd in September 2016.

If you wish to follow up this response please get in touch,

Kind Regards,

Sam Harden
Senior Business Developer, Battery Storage & Hybrid Systems
Innogy Renewables Ireland Limited

Responses to the specific questions raised in the consultation are included below.

Question 1

Do you have any comments on the two options for service bundling proposed and the TSO's preferred option?

Innogy support the SO proposal that providing units be required to provide 5 DS3 system services (FFR, POR, SOR, TOR1 and TOR2) and all to the same contracted volume level.

Question 2

Do you have any view on the technical requirements proposed, including the requirement for over-frequency response?

Innogy generally supports the proposal that providing units are mandated to meet the technical requirements as outlined in the consultation document. However we would request clarity on what is intended by the term “trickle recharge”. Is there a particular MIC limit (presumably as a % of the requested MEC) that is defined as trickle re-charge. We have run a number of simulations in co-ordination with battery system suppliers, based on historic frequency data and the service delivery requirements for the 5 DS3 services. These simulations show that using a 9% MEC trickle recharge rate (as it is for Enhanced Frequency Response in the UK), this is sufficient for a system to provide 100% availability for the dynamic services. These simulations were run on the basis of symmetrical service for both under and over frequency.

We also note the proposal to make TOR1 and TOR2 dispatchable. Due to the additional cycles and degradation impact on a battery system, it is critical in order to design the correct sizing of the asset, that further clarification is given on the expected number of dispatch events per year. We would also wish to see details on the conditions in which a dispatch event would be called, the expected period of delivery and the % of MEC delivery requirement of such events.

We would also seek clarification on whether dispatch events could also be called for over frequency events.

We also seek confirmation that the time recharging by placing in the market, will not be counted against service availability after responding to a dispatch event.

The MIC will also drive the period of unavailability after a dispatch event. If only able to charge at 9% of total power capacity, this system could take 11 hours to fully recharge. The requirement for symmetrical over frequency delivery would overcome this issue. MIC would need to be equal to MEC and systems could recharge to the required state of charge in under 30 minutes.

We agree with Option 1, the TSO's proposal and rationale for Providing Units to provide over-frequency response. Although there is only a limited requirement to date, the need will most likely increase as SNSP levels are increased. The requirements future-proofs the TSO from issues related to over-frequency. The inherent nature of battery systems means that the MIC capability will be equal to the MEC. Any reduction in % of MEC, will be sub-optimal in terms of what a Providing Unit can deliver. We align on your consideration for the service to be fully symmetrical on under and over frequency requirements. The capital cost reductions are very limited. There would be less battery cells required, but costs for other equipment (inverters, transformers, BoP) and civil works are almost identical.

It is not practical to hold a battery system at 100% state of charge ("SOC"). Degradation of the system begins to accelerate when SOC is held above 50%. A system that provides under-frequency services only, would need to be significantly oversized to account for SOC management, availability and additional degradation. Providing both under and over frequency response would also allow systems to re-charge naturally, resulting in greater availability.

For a short duration system providing only under-frequency response, there would also be the need for more expensive high power cells. Systems are effectively worked harder for the same power capacity, but less energy capacity. As well as additional degradation, cooling requirements are greater, adding further costs to both CapEx and OpEx.

The main downside to over-frequency requirements is the potential additional MIC charges, which can be substantial. It is very significant that clarification is provided on whether battery storage systems would be liable to pay full MIC grid charges.

All things considered based on our analysis, if you exclude the additional MIC charges, the requirement of an over-frequency symmetrical service would have little to no impact on the bid price we could put forwards for the services. A system sized to provide 20 minutes in both directions, will have more flexibility and functionality beyond the initial 6 years. The ability to consider value well beyond the initial 6 year contract will benefit the investment case and could further reduce the bid price requirement.

Question 3

Do you have any comments on the availability obligation proposed?

We agree in principle with the service availability obligation to be >97%, pending further clarification on recharging rates.

We seek clarity on over what periods will availability be measured. Will this be measured across a month, with performance scalar in table 4 applied each month? Will this then be reset each month?

We would propose 2 weeks scheduled maintenance is sufficient based on experience from previous projects.

Question 4

Do you have any comments on pre-requisites with respect to Connection Offers?

Innogy support either option 2 or option 3 with the following caveats:

Option 2-

1. Adherence to this requirement is a pre-requisite to the submission of auction bids.
2. The deadline for submission of bids must be aligned with offer issuance in the ECP-1 DS3 process to ensure that all ECP DS3 offers have been issued prior to the final deadline for Volume Capped Auction bids.

We believe this is necessary to ensure reasonable and fair competition in the auction process and to ensure that winning projects are capable of delivering services in a timely manner. We would also request that providers shouldn't be required to accept their connection offers until the auction result has been confirmed. This may require some flexibility in the standard timeline for offer acceptance but prevents locking in grid capacity for projects which may not be capable of delivering services.

Question 5

Do you have a view on the two options provided with respect to managing network limitations?

Innogy would in principle support Option 1 though we would request that Eirgrid clarify the process by which providers would secure the necessary confirmation from the TSO / DSO. Would this be clarified through the ECP-1 offer issue process?

Question 6

Do you have a view on the staged approach proposed for procurement under the volume capped arrangements?

Innogy notes that this is a surprisingly small volume to procure in the first auction given the overall volume of service required. As things stand a maximum of 100MW of storage will be connected by 2020 and so the remaining volume requirement for these services will need to be sourced elsewhere. Is Eirgrid able to clarify, at this time, whether the full 300MW needs to be procured in advance of moving to an SNSP of 75%? Given the anticipated build out of wind energy envisaged out to 2019 / 2020 we believe this is an important consideration. If the full 300MW is required we believe consideration should be given to increasing the capacity in the first round. At a minimum we would suggest that Eirgrid clarify a volume floor rather than cap for each round of the procurement process, in order to give developers an incentive to continue to invest in project development.

Question 7

Do you have a view on the proposed bid pricing requirements and the mechanism for assessing bids, determining price and remunerating providers?

Taking these points in turn:

- Proposal on contract start and end dates. Eirgrid supports the proposed dates, however we would ask that Eirgrid clarify that these dates apply only to the first round of the volume capped procurement and that the timelines will be extended on future rounds with the same time period being applied between the proposed contract execution date and service provision dates- i.e. a 2nd stage auction contract signed in May 2020 would need to be online by May 2022 for 6 years thereafter.

- Proposal on performance bond requirements. Innogy supports the proposal to apply a performance bond that would be chargeable in the event of non-delivery. However, we would highlight that this bond looks particularly low. This would increase the risk of bids submitted that are potentially unfeasible and are not completed, with limited downside to the bidder. We would expect that where delays occur as a result of non-contestable grid delivery issues, then these should not impact on bonds and provision to extend deadlines by the amount of delay should be included in the final contract arrangements
- Proposal to require an individual price per service. Innogy is indifferent to this proposal.
- Proposal for assessment of prices. Innogy supports option 2, whereby bids are assessed based on an overall bundled price with ongoing remuneration based on a typical wind year. We assume this would take the form of a published hourly SNSP profile for a typical wind year that would be applied to determine the number of hours in which the various temporal scarcity scalars would apply. We would request that this “typical year” SNSP data be made available to Industry with the publication of the decision on this consultation.
- Proposal on tariff caps. Innogy is supportive of this proposal.
- Proposal on Price determination. Given the limited number of applications, there could be a scenario in where there are tactical bids, priced higher than their required hurdle rates due to lack of competition. Pay-As-Clear ensures all participants bid their lowest possible price as there is no tactical incentive to bid above for further gain.
- Proposal on Acceptance of last tenderer. Innogy would suggest that Eirgrid consider awarding contracts to the nearest provider above the proposed procurement volume as this would limit the risk of exposure to non-delivery of projects.

Question 8

Do you agree with the proposed maximum contract volume proposed per separate grid connection?

Innogy supports the proposed 30MW cap per connection point. This figure would strike the right balance between benefiting from economies of scale and ensuring service provision operational risk is not limited to 1 or 2 sites. There are significant economies of scale that can be gained from 1 MW to 30 MW. The

€/MW benefit to cost of system is then much less significant as you begin to increase beyond 30 MW to 100 MW.

We would ask that EirGrid clarify whether this applies only in the 1st procurement round. i.e. Would a project that secures a larger grid offer in ECP-1 be eligible to bid into a 2nd procurement round with a 2nd 30MW or greater capacity phase of the project.

We would also ask EirGrid to clarify whether bids must be submitted as a whole MW. Due to certain constraints on the grid for smaller projects, rounding max possible capacity down to the nearest MW for service provision can have a significant impact on overall returns and bid price submitted into the auction. We would suggest the solution that bids can be submitted to the nearest 0.5 MW.

Question 9

Do you have a view on the proposed application of performance, scarcity, product and locational scalars?

Taking these points in turn:

- **Scarcity Scalar.** As noted above Innogy supports the approach whereby the ongoing remuneration for the duration of the contract are based on a typical wind year (published hourly SNSP profile). This will provide greater certainty for developers reducing the cost of capital in project delivery to the benefit of consumers and also removes the risk of over compensation and over-expenditure in the event that higher than expected SNSP's occur.
- **Performance Scalar:** Innogy supports the proposed performance scalars relating to availability included in the consultation. We would however request clarity as to how the performance scalars provided for in the volume uncapped arrangements might apply. Is it the intention to apply the performance scalars relating to technical compliance during events in addition to the above availability scalar? We would also ask for clarity on the time period for the measurement of availability and suggest it makes more sense to apply this as an annual as opposed to a monthly metric. **Product Scalar for Faster response.** Innogy would suggest that if there is a system benefit in encouraging response times up to 0.15 seconds then option 2 would appear to be the most sensible approach. If option 1 is selected then there would be no incentive for faster service provision, and it is unclear how option 3 would work in practise. We wish to highlight that it is non-trivial to measure, test and monitor speed of response well – and whether the

assets can deliver may depend on how exactly how the test, detection & monitoring is defined.

We request that EirGrid clarify how response time will be measured.

- **Product Scalar for Continuous Provision.** Innogy does not support the removal of the continuous provision scalar on the basis that the application of this scalar was considered when determining the proposed tariff caps. As such removing this scalar is an erosion of the viability gap at the regulated tariff level.
- **Locational Scalar.** Innogy support the proposal not to apply a locational scalar in the 1st round of the volume capped procurement process
- **Minimum Volume per jurisdiction.** Innogy support the proposal not to apply a minimum volume per jurisdiction

Question 10

Do you have a view on the market interactions outlined here and the proposed mechanism for mitigating?

Taking these in turn:

- **Grid Code requirements.** Innogy support the proposal that providers must comply with the applicable Grid Code or Distribution Code requirements for their connection, however we would ask that the TSO / DSO clarify how future grid code changes will be addressed with battery providers. In the scenario where retrospective application of grid code changes would have hardware implications for installed systems we ask EirGrid to confirm that derogations would be available to contracted service providers and that these would be processed in a timely manner. We also request clarification from the SOs that Grid Code takes precedence over DS3 service provision where any conflict occurs.
- **Proposal on Network Charges.** Innogy have no objection to this in principle but would note that it is critically important that the applicable charges are clearly communicated to industry well in advance of the first auction. We would also note that these charges will be factored into the bid prices in the auctions so it is important that these are reasonable and proportionate in order to ensure that projects remain viable at the regulated tariff cap level. As already noted, consideration should be given to the impact of MIC charging on the cost of provision of over frequency response services.

- Proposal on management of positions in the energy market. Innogy have no objections to this in principle, however we would ask that Eirgrid / CRU confirm that, in circumstances where providers respond to a system frequency event, they would not be subjected to uninstructed imbalance charges. We would also ask that the SO's clarify that where a service provider is less than 10MW do they need to be registered in the balancing market in order to be eligible to enter into a DS3 contract. In addition, Innogy recommend that Eirgrid/SONI explore the ABSVD¹ mechanism used within GB to protect frequency response providers from imbalance price exposure, to see if this might be transferrable to the Island of Ireland context.
- Proposals for re-charge after activation. Innogy support the TSO proposal but as already noted, we would ask for a clarification in relation to precisely what is meant by trickle re-charge. Our understanding is that there is no need for positioning in the balance market if recharging under the 'trickle recharge rate'. Clarification needed on how units can recharge by positioning in the market and how this will be considered against availability. This is particularly important after dispatch events. We would envision one of the three solutions listed below:
 1. On positioning in the balance market, time to re-charge is not considered to impact availability (It must be noted after a dispatch event, if the trickle recharge rate is similar to that of EFR in the UK, e.g. 9%, then the system will require ~11 hours to fully recharge)
 2. Limitation of the total capacity that can be delivered for a period of time. For example on a 10 MW project, the unit will for an amount of time only be available to provide 9 MW of response. The 1 MW headroom is used to charge the battery. (For this option, clarification would be needed on how a reduced service capacity be counted against availability)
 3. There is an obligation to oversize capacity by 20% of the capacity submitted to provide DS3. I.e. a 10 MW contract, must have a system capable of 12 MW capacity. The additional 20% allows for re-charging and SOC management. This is the option chosen in ENTSO-E.
- Proposal on management of positions in the capacity market: We would note that this appears counter to the approach adopted in the GB market. In order to ensure revenue stackability, we would ask that DS3 service providers are not penalised in relation to availability requirements when they are responding to a capacity event. There is a certain logic to this approach in that

¹ Applicable Balancing Services Volume Data.

capacity events are unlikely to occur at times of high SNSP (high wind availability) and Eirgrid have clearly indicated through the temporal scarcity scalar framework that the service need from these providers will be greatest at these times. Adopting this approach should ensure greater plant utilisation to the benefit of the system.

In the GB market, batteries offering Enhanced Frequency Response (EFR) are recognised as enabling conventional plant to operate at their full output rather than being part-loaded to provide frequency response. 100 MW of EFR thus enable 100 MW of permanent response, subject to fuel availability etc. and so EFR batteries were allowed full capacity market revenue and stackable revenue while offering the EFR service.

Question 11

Do you agree with the proposed mechanism for assessing applications?

Innogy agree with the proposed assessment mechanism subject to the deadline for submission of applications being extended to align with the issue of DS3 offers under ECP-1, and we would again request that the cut-off point should be at the first project over 100MW.