SEM Committee

23 July 2021

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RE: Imperfections Charge October 2021 – September 2022

Energy Storage Ireland (ESI) is an industry representative association comprised of members who are active in the development of energy storage in Ireland and Northern Ireland. Our aims are to promote the benefits of energy storage in meeting our future decarbonisation goals and to work with policy makers in facilitating the development of energy storage on the island of Ireland. We have over 30 members from across the energy storage supply chain.

We would like to thank the SEM Committee for offering us the opportunity to respond to this consultation. Energy storage technologies are a key enabler to a decarbonised electricity system, and their deployment supports climate action and energy security goals by providing a multitude of valuable services. Storage systems can act in the energy, capacity and system services markets to deliver a wide range of benefits such as wholesale energy price reductions, reduced CO2 emissions and flexible system support services to help manage the grid with higher levels of renewables.

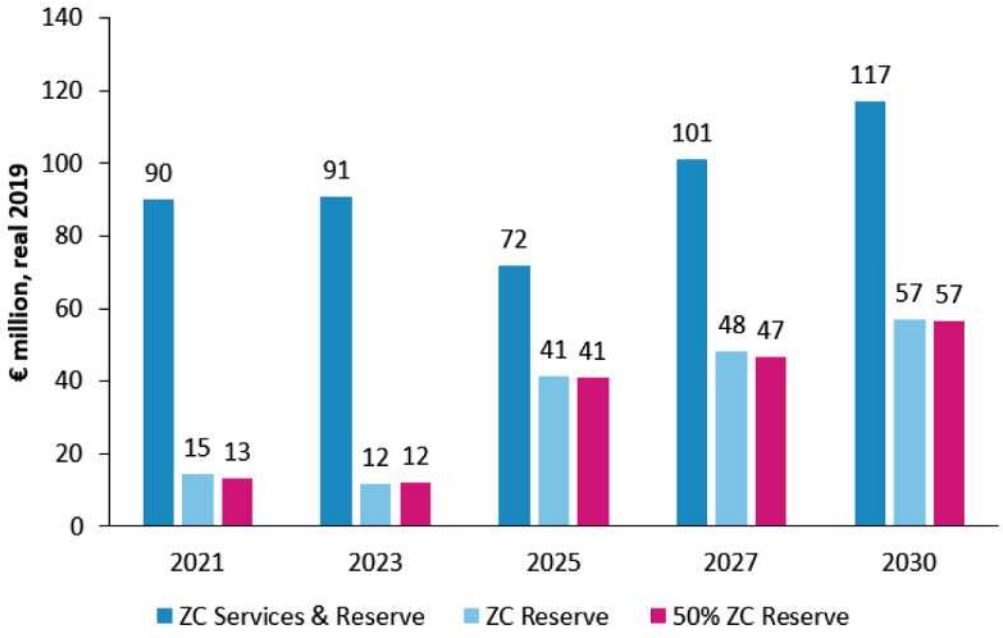
What stands out from this consultation is the substantial increase in imperfections charges over the last 6 years and the fact that the TSOs have forecast an Imperfections Revenue Requirement of €473.09 million for the 2021/22 tariff year, this increase being mainly driven by increased fuel and carbon costs. However, there is no plan put forward or analysis on the mitigation measures to reduce these costs, which will increasingly head in the same direction unless action is taken to remove system operational constraints by decarbonising system services, using proven technologies that exist today, and removing network constraints through grid reinforcements or alternative network solutions including energy storage.

The TSOs currently dispatch down large volumes of renewable generation, and consequently constrain on or redispatch fossil fuel generation while these system and network constraints exist. The cost of these actions is picked up in the DBC but there is no parallel consideration of the emissions impact of these TSO actions. ESI has highlighted on multiple occasions that this is an area that needs to be tracked and reported on in line with our national decarbonisation policy aims.

We believe much more focus and urgency is needed on delivering a system that is capable of operating with full zero-carbon system services and no minimum generation constraint. This would essentially mean that the system is capable of operating with 100% of demand being met by renewables at any one time and all system service requirements being met at these times by zero-carbon technologies.

Baringa's Store, Respond and Save report[1], shows that already today the consumer would benefit to the tune of €90 million per annum if the system were transitioned to one where zero-carbon sources can meet all system service requirements at any one time. This value increases to €117 million per annum by 2030 as shown below. That is because the System Operators would no longer have to constrain on conventional plant and pay the associated fuel and carbon costs for them to provide these services. Given increased fuel and carbon costs assumed in the TSOs' imperfections forecast for the upcoming period, these cost savings would be even higher under the zero-carbon services model.

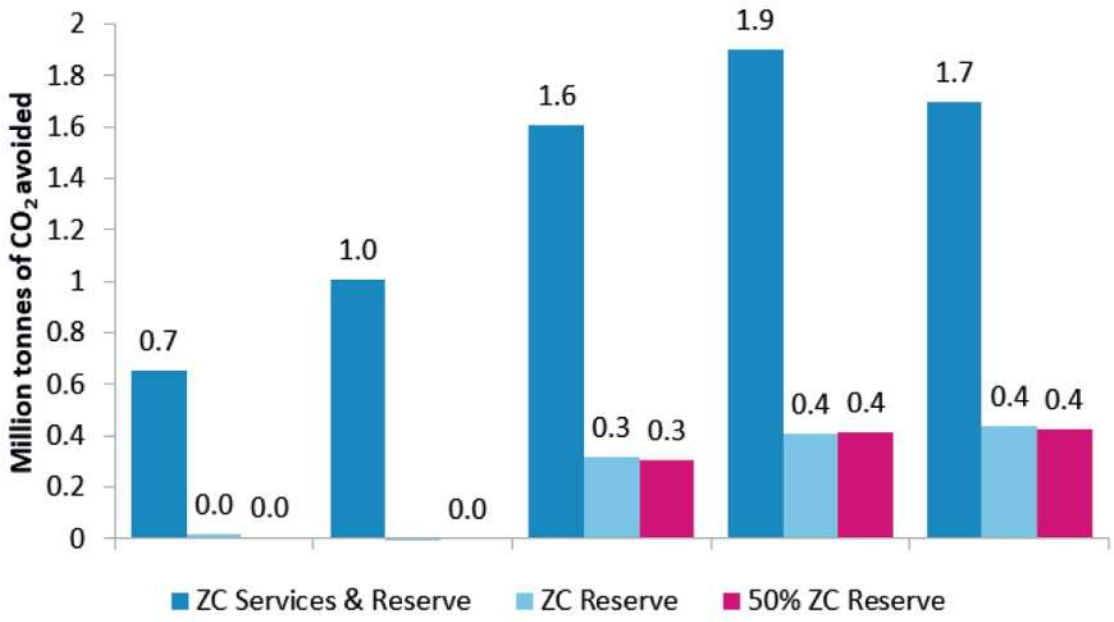
Figure 2 Annual operational cost savings generated by using zero-carbon technologies to meet reserve and system services



In addition to cost savings, the early transition to zero-carbon system services will have a huge impact on renewable curtailment and on emissions. Already today, we could avoid 700,000 tonnes of CO2 emissions by transitioning to zero-carbon services as shown below. The avoided emissions tally increases to close to 2 million tonnes per annum in 2030.

[1] https://www.energystorageireland.com/wp-content/uploads/2020/02/Energy-Storage-Ireland-Baringa-Store-Respond-Save-Report.pdf

Figure 4 Annual avoided SEM CO_2 emissions from zero-carbon system services



The technologies to deliver these services exist today. To deliver this clear investment signals in terms of service design, volume needs and procurement timelines are needed. Below we have outlined potential volumes required for 2030 and existing zero-carbon technologies that can provide these services.

Table 3 Zero-carbon system service providers and potential capacities required in a 2030 70% RES-E power system

System Service	Potential Capacity Required	Example zero-carbon technologies
Reserve	700-1,000MW of Reserves – 500ms to 1 hour	Battery storage, domestic and large energy user demand-side response, renewables
Inertia	20,000 MWs	Synchronous condensers
Reactive Power	±3,600 Mvar	STATCOMs, renewables, battery storage
Ramping	1,500 MW – 1 hour, 3000 MW – 3 hours, 4,000 MW – 8 hour	Long-duration storage, pumped hydro, demand-side response

The key learning from this analysis is that the full cost savings and emissions reductions can only be realised when **all** system services requirements are met by zero-carbon service providers such as those listed above. The DS3 system services market, primarily the fast acting reserve services, has driven the development of battery storage with over 250 MW commercially operational today and many more projects in construction. The consultation does provide some high-level detail on the impact of batteries on imperfections costs, but the reality is that the full benefits of these battery projects cannot be realised yet while other system constraints, such as inertia and volage, exist which mean fossil fuel plant are constrained on and much of the reserve requirement is met as a by product of these TSO

actions. The SEM Committee has signalled the intention to procure zero-carbon forms of inertia and we welcome the rollout of this procurement process as soon as possible to begin to access the wider system and consumer benefits from battery storage and other zero-carbon technologies.

This is clear from the graphs above which show that only part of the system cost and emissions benefits are unlocked from zero-carbon reserve provision alone. Once all other system operational constraints are met then the full benefits are unlocked. This also works the other way whereby procuring zero-carbon inertia technologies alone would not deliver the full savings without contribution from zero-carbon reserve providers like battery storage.

Recent developments in relation to potential DS3 expenditure control mechanisms on the part of the TSOs put this needed investment at risk unless longer-term investment certainty and stability is provided for developers. ESI has recently written to the Regulatory Authorities highlighting these risks and pushing for a review of the current DS3 system services expenditure cap, which is no longer fit for purpose, and that a long-term roadmap is needed to drive new investment in the context of developing system needs and consumer value, and overall volume requirements going forward.

In conclusion we would like to thank the SEM Committee for offering us the opportunity to respond to this consultation and we are available to discuss any of these points if you wish.

Yours sincerely

Bobby Smith
Energy Storage Ireland