# Overview

Based on the climate action plan 2021, by 2030, Ireland targets to achieve at least 5 GW of offshore, up to 8 GW of onshore wind farm installed capacity, and between 1.5 to 2.5 GW[[1]](#footnote-1) of solar PV. In addition, micro and small generation will lead to 760 MW of renewable energy capacity that may be accompanied by behind-the-meter Battery Energy Storage Systems (BESSs). These renewable energy targets make Ireland a world leader in renewable energy utilization and simultaneously increase the country’s reliance on the power system flexible resources.

Most of the planned interconnections (except the Celtic project) will link Ireland’s power system to Great Britain, which has similar renewable ambitions and a highly correlated wind regime with the Island of Ireland. Due to the geographical characteristics of Ireland, namely the limited potential of interconnections to the European member states, and a very limited potential to deploy Pumped Storage Hydroelectric power plants (PSHs) as a promising flexible resource, our flexibility requirements should be met by alternative domestic flexible resources such as green fuelled gas power plants or energy storage technologies, unless the operational problems (such as dispatch down of the renewables) will prohibit our electricity end-user to capture the whole economical benefits of a high renewable penetrated electricity system. Flexible resources such as BESSs require promising revenue streams to be developed in the electricity sector, especially in the technology transition phase.

In our “Energy Storage in Ireland: Barriers and Policy Interventions” report we have addressed a variety of barriers that are currently facing and will be faced in future by the BESSs in Ireland. The International Energy Research Centre (IERC) is seeking evidence and information to identify the existing barriers and determine the opportunities that BESSs bring to Ireland’s energy system, enabling these to cost-effectively meet the decarbonization targets. This call for evidence will support the development of a peer-reviewed report/paper that will be published to deliver empirical-evidence-based suggestions for policy considerations in relation to BESSs development, to the Department of Environment, Climate, and Communications.

Information that we receive through this call for evidence will help us to:

* Support the development of **BESSs** in Ireland;
* Collect evidence on the challenges and opportunities associated with thedevelopment of **BESSs** in the electricity sector;
* Collect evidence on the challenges and opportunities associated with the **integration of BESSs to the electricity market** in Ireland;
* Collect evidence on the challenges and opportunities associated with the **provision of long-duration energy storage services**.
* Provide feedback on the current draft document titled “Energy Storage in Ireland: Barriers and Policy Interventions”.

The call for evidence below is divided into 8 sections addressing the future policy and roles of BESSs as per above and feedback on the draft document. The responses to each of the questions below can be filled into this document and the document should be returned by e-mail to info@ierc.ie.

Responses ***may not*** cover ***all sections*** or even ***an entire section***. This is a broad call for evidence, and we acknowledge that not all stakeholders will have time to complete all sections. ***Please feel free to provide us with your valuable feedback on the draft version of the policy report***.

**About IERC**

The International Energy Research Centre at Tyndall National Institute is Ireland’s leading not-for-profit professional energy research centre, our work is independent and is free of any expressed technological bias, ideology or political position.

This study is funded by the Department of the Environment, Climate, and Communications (DECC) Research & Development (R&D) Programme and is prepared under International Energy Research Centre’s (IERC) Energy Policy Insights for Climate Action (EPICA) Project.

# Section 1: Capacity Markets Participation[[2]](#footnote-2)

1. What are the reasons that, in the capacity auctions, existing BESSs are not participating and only small new BESSs have participated?

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1. Should the capacity auction’s revenues support the financing of new BESS projects?

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1. Under the current regime there are no energy payments for capacity-providing units when they are called to provide the required capacity. Is this a barrier for the engagement of BESSs? How this potential barrier could be most appropriately mitigated?

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# Section 2: Balancing Market Participation

1. What would be the most cost-effective and efficient way to engage the BESSs in the BM while preserving the reliability of supply?

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# Section 3: Ex-ante Markets Participation

1. Should BESSs be actively participating in the Ex-ante markets (doing energy arbitrage)[[3]](#footnote-3)?

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1. What are the barriers (regulatory, technology, economic, etc.) preventing the BESSs from the provision of capacity firming for the renewables via a market-based approach?

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1. What would be the best approach to engage the utility-size BESSs in the ex-ante markets for charging, while maintaining efficiency and managing the system security issues [[4]](#footnote-4)?

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# Section 4: Grid Services[[5]](#footnote-5)

1. Could competitive markets, rather than bilateral contracts with TSOs, be more effective (in terms of cost and security) in order to provide the required system services and flexibility resources in the process of power system development toward 2030 targets?

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1. Do we need new services that could be delivered by the BESSs, especially in the charging/real power import mode?

*N.B. Current DS3 system services to support higher levels of SNSP[[6]](#footnote-6) are focussed on the discharge/real power export mode of operation of providing units.*

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1. What are the barriers preventing the participation of residential and demand side unit’s BESSs in the grid services via aggregation[[7]](#footnote-7)?

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1. How should utility-scale BESSs be used the provision of black-start and system restoration services[[8]](#footnote-8)?

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**Section 5. Energy Storage Mix**

1. Should there be a definition of long duration energy storage? Why? What should this be while considering the power system requirements for 2030 and beyond[[9]](#footnote-9)?

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1. Should Ireland develop a policy regarding the development of long-duration low carbon energy storage resources[[10]](#footnote-10)?

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1. Should Flow and NaS batteries be considered to meet Ireland’s long-duration energy storage needs[[11]](#footnote-11)?

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1. Could the aggregation of BESSs contribute to meet long-duration energy storage requirements in Ireland by 2030 and beyond? If yes, to which extent[[12]](#footnote-12)?

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**Section 6. The Key Actors & Stakeholders**

1. Who are the key stakeholders of BESSs in Ireland and how they can play an effective role in the development of BESSs (other than those which are mentioned in the report)[[13]](#footnote-13)?

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1. Should Ireland play an active role to meet the National and European targets for manufacturing BESS technologies such as flow batteries, NaS batteries, and others? How could this be achieved?

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1. What research and innovation activities should Ireland engage in to support the development, manufacture, and improvement of the long-duration BESS technologies to meet the future power system’s requirements?

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1. Are there enouph skilled workers/specialists or recruitment in Ireland to manage the increasing demand for deploying BESSs ?

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**Section 7. Grid connection/costs, Investment Incentives,**

1. What role should BESS take in decarbonising data centres connected to the Irish power system [[14]](#footnote-14) ?

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1. Do the size requirements for aggregation impose a barrier for the deployment of BESSs for the provision of grid services? How can the policy help the regulatory authority to remove such a barrier [[15]](#footnote-15)?

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1. Does the current transmission network charge allocation (the CRU’s interim solution) affect the development of BESSs solutions for the grid [[16]](#footnote-16)?

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1. How does the current connection policy of grid connection affect the deployment of BESSs in Ireland[[17]](#footnote-17)?

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**Section 8. BESSs at the distribution level[[18]](#footnote-18)**

1. What opportunities can residential BESS present for electricity suppliers?

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1. What opportunities can residential BESS present for customers/prosumers?

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1. What opportunities can residential BESS present for the DSO and TSO?

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1. Currently the connection of BESS in the distribution network is processed in a similar fashion to generation, how this could impact the mass deployment of BESSs in the distribution network?

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Real-life demonstrations of future innovation application of BESS will require some regulatory permission. Are “regulatory sandboxes” important to enable this? How can policy be developed support to creation of regulatory sandboxes?

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1. What should be the roles of aggregators and suppliers in promoting the deployment of non-utility size BESSs in Ireland at the distribution level?

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1. Should BESSs be deployed on MV/LV distributrion systems for managing different localized peaks?

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1. How should BESSs be best deployed to optimize the use of distribution level upgrading budgets and to enable investment deferral?

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1. Considering the the significant penetrations of (50%) of renewable-based distributed energy generation by 2030 connected to the distribution system, what role should BESSs have in maintaining the reliability of supply for MV and LV connected customers?

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1. What role should BESSs play in the development of local flexibility markets in Ireland?

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What are the barriers in deploying BESS at the low voltage residential distribution network?

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1. How could BESSs contribute to the reliability and automation of the MV distribution level and also enhance the reliability of the LV level?

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1. How could a community-owned BESS, which is installed in the MV level, leverage the participation of residential demand in the local, and DSO-TSO markets?

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1. How could a community-owned BESS, which is installed in the MV level, promote the reliability and resiliency of supply for the residential customers?

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1. How can a BESS connected to the MV or LV distribution system improve the management of network congestion or mitigate the network contingencies in Ireland?

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1. What are the best approaches for using BESSs connected to the distribution network to resolve the thermal, voltage, short-circuit level issues, and preserve the dynamic stability of the network?

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1. What requirements should the BESSs meet to increase their visibility at the LV networks? How could neglecting these requirements act as a barrier for achieving cost-effectively and efficiently the distribution system development goals?

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1. Do the DSOs receive enough incentives to make the connections of BESS compatible with future networks requirements such as smart meters, increased demand level, and two-way information/ power flows?

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1. Should the DSOs define provide new customer contracts enabling BESSs to support delay or avoidance off infrastructure reinforcement? What would be the best approach to do so?

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1. How the competitive/conflicting behaviour[[19]](#footnote-19)/services by different actors (electricity end-users, prosumers, energy communities) can be managed in the distribution level to avoid system overloading and guarantee the deleivery of the required services?

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1. Ireland, Government of Ireland, Climate Action Plan 2021, Securing Our Future. 2021 [Available from: https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/. [↑](#footnote-ref-1)
2. Please see sections 4.8 and 4.10.3 of the report for more information [↑](#footnote-ref-2)
3. Please see sections 4.10.10 and 9.1 of the report for more information [↑](#footnote-ref-3)
4. Please see sections 4.10.12 and 9.3 of the report for more information [↑](#footnote-ref-4)
5. Please see sections 4.6 and 9.4 of the report for more information [↑](#footnote-ref-5)
6. System non-synchronous penetration [↑](#footnote-ref-6)
7. Please see sections 4.10.20 and 9.12 of the report for more information [↑](#footnote-ref-7)
8. Please see sections 5.1.2 and 9.5 of the report for more information [↑](#footnote-ref-8)
9. Please see sections 8.7 and 10.2.1 of the report for more information [↑](#footnote-ref-9)
10. Please see sections 8.7 and 10.2.1 of the report for more information [↑](#footnote-ref-10)
11. Please see sections 8.7 and 10.2.1 of the report for more information [↑](#footnote-ref-11)
12. Please see section 9.12 of the report for more information [↑](#footnote-ref-12)
13. Please see section 5.2 of the report for more information [↑](#footnote-ref-13)
14. Please see section 5.1.3.1 of the report for more information (Page 94) [↑](#footnote-ref-14)
15. Please see section 9.12 of the report for more information [↑](#footnote-ref-15)
16. Please see sections 4.10.17 and 9.8 of the report for more information [↑](#footnote-ref-16)
17. Please see sections 4.10.19 and 9.9 of the report for more information [↑](#footnote-ref-17)
18. Please see sections 4.10.24, 9.11, 9.18, and 10.3.4 of the report for more information [↑](#footnote-ref-18)
19. Consumption, production, storing, and production of electricity [↑](#footnote-ref-19)