Chambers Ireland

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# Chambers Ireland submission to the Department of the Environment, Climate and Communications on Developing an Electricity Storage Policy Framework for Ireland

January 2023

## About Chambers Ireland

Chambers Ireland is an all-island business organisation with a unique geographical reach. Our members are the Chambers of Commerce in the cities and towns throughout the country – active in every constituency. Each of our member Chambers are central to their local business community and all seek to promote thriving local economies that can support sustainable cities and communities.

Our Network has pledged to advocate for and support the advancement of the United Nations Sustainable Development Goals (SDGs). Accordingly, we use the Goals as a framework to identify policy priorities and communicate our recommendations. We have a particular focus on five of the goals encompassing decent work and economic growth (SDG 8), sustainable cities and communities (SDG 11), Gender Equality (SDG 5), Industry, Innovation and Infrastructure (SDG 9) and climate action (SDG 13).[1]

In the context of the current consultation, the most relevant Goals are Climate Action (SDG 13), Affordable and Clean Energy (SDG 7) Decent work and Economic Growth (SDG 8), and Industry, Innovation and Infrastructure (SDG 9). Regarding renewable energy, our Network prioritises the security of supply, sustainability, and affordability of the energy which is generated. Our position and recommendations are therefore formulated with these in mind.

We strongly believe that Ireland is in a unique position to benefit from the Green Transition and the shift to offshore renewables. Given our extensive Exclusive Economic Area, our sea territory offers us access to enormous volumes of renewable energy. It is however variable which suggests that projects that would link us to the EU grid will be limited in utility – not

[1] The Chambers Ireland SDGs. Available at: https://www.chambers.ie/policy/sustainable-development-goals/chambers-ireland-sdgs/

least because much of that grid infrastructure will not be needed except for during peak periods. Therefore, the potential to use electricity storage mediums to store this renewably derived energy will be key to smoothing out our energy supply and demand curves. In particular, we see the enormous untapped potential of green hydrogen for long electricity storage, as fixing our renewable electricity in chemistry offers us a way to commercialise our energy potential and will allow us to smooth out our electricity supply to suit our highly variable daily demand curve, and annual supply curve.

Ireland has long been navigating its course in an increasingly shock-prone world and there is an enormous need to build resilient energy supply and storage networks that can continue to deliver regardless of the circumstances we encounter. Our long-term Security of Supply will involve a combination of renewables and a connected network of efficient and viable short, medium and long term storage.

Key points:

- Ireland needs to overhaul our national energy policy to ensure that we maximise the renewably sourced energy that is available
- Ireland has the opportunity to become a key part of the internationally traded energy sector given our enormous offshore renewable energy resources
- Our existing ambition is far lower than it ought to be both in terms of the quantity of renewable energy we are planning to connect to our infrastructure, and the pace at which we intend to facilitate these connections
- A successful energy transition will require that energy generation, demand and storage must be optimised, but demand side management approaches should only be implemented in a limited capacity to avoid restricting or limiting an ambitious national approach to renewable generation and storage.
- At the current pace of change we will not only miss out on our Climate goals, but also the economic opportunities offered by our renewable energy potential
- A new national energy storage policy requires that we consider storage over multiple timescales, some technologies are suitable for storage windows that are measured in hours, others in days and some others in months, each has a role to play
- Our regulatory framework for generation, storage, and transmission capacity will need to adapt to facilitate the storage that will be needed, as unlike fossil fuels, which are their own storage media, renewably derived energy must be integrated with energy storage capacity
- Our electricity grid is not equipped to allow the swift onboarding of new generation and storage technologies
- Our transmission network is not capable of moving sufficient electricity from parts of the grid where it is abundant to where it is needed, however large scale storage will remedy this deficit
- Our current regulatory and auction regime is built around the servicing of demand using gas fired thermal plants, the timelines for developing such plants are different to energy storage technologies, some will take far more time to deliver than a thermal plant (such as

undersea gas storage) others can be introduced to the grid far more quickly (such as batteries) these technologies may need auction processes tailored to their timelines

- The “overriding public interest” provision under REPowerEU must be utilised to accelerate the upgrade and reinforcement of our grid infrastructure and ensure that the extra funding which is available for storage projects is used

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## Consultation Questions

### Q1. In broad terms, what future role do you see for electricity storage in the energy sector?

Electricity storage is crucial for two reasons:

i. Ensuring security of energy supply for the future.
ii. Harnessing our renewable power potential as an economic opportunity for Ireland.

In the wake of Russia's invasion of Ukraine, we are more aware than ever before about the importance of energy independence and self-sufficiency. Security of supply creates certainty for consumers that the lights will stay on and that productivity will be uninterrupted. It will also result in a reduction of energy costs, because greater storage capacity will allow us to make better use of volatile renewable sources. As we trend towards more energy exports the storage medium will be important and we will greatly benefit from having a high-capacity energy storage industry active in Ireland to feed into demand abroad.

The focus on energy security has also brought into sharp focus the abundance of natural resources available to Ireland. Chambers Ireland have been advocating for years about the economic and environmental opportunities of Ireland's renewable energy potential. We should be harnessing this potential through a dynamic, ambitious and integrated framework of policies, supported by the necessary investment in research and development, and infrastructure. However, a decarbonised, renewable energy system is volatile and storage has a critical role to play in smoothing out our electricity supply and demand, across a variety of timescales.

If we can successfully store and transport the renewable energy we generate, we can also create international export opportunities and Ireland has the potential to produce orders of magnitude more electricity than we will ever need, but to exploit it, we need to smooth out the intertemporal volatility of our production by creating effective storage options.

## Q2. What barriers exist that might prevent electricity storage from fulfilling this role or roles?

One of the greatest obstacles that may hinder our achievement of energy security is lack of ambition. We ought to have reached a turning point in terms of our outlook on an Irish energy framework. The Russian aggression in Ukraine has demonstrated that our over-reliance on imported energy has left us vulnerable to geopolitical instability.

Our decarbonisation commitments have yet to lead to the substantial and sustained action we need to deliver on a significant scale. This is, in part, hampered by our lack of ambition regarding our offshore energy generation, particularly relating to floating offshore opportunities e.g. Scotland is, by 2033, increasing their offshore energy capacity from 15GW to almost 40GW and including 17GW of floating offshore wind, our national objective is 7GW by 2030 (including 0GW of floating offshore wind)[2]. We need to be scaling up our plans and fast-tracking the development of necessary renewable infrastructure, which should include a focus on storage. Storing excess renewable energy can ensure energy independence while creating export opportunities.

The focus on demand side response to manage the balance of supply is too limiting and narrow-sighted. It puts the emphasis on meeting domestic demand when we should be thinking bigger and being more aspirational with our energy policy framework.

Finally, we need to have a longer-term focus on equipping the national grid to meet our renewable generation potential. If we sufficiently scale up our renewable infrastructure, we will need large-scale upgrading of the grid network to ensure it is capable of accepting the volume of energy we have access to and it will need the capacity to move this energy to a storage medium that will make it available when it is needed.

We should be simultaneously investing in generation, storage and grid infrastructure in tandem, as they all go hand in hand in creating a robust electricity network that can meet the

[2] https://www.chambers.ie/wp-content/uploads/2022/10/Chambers-Ireland-Submission-to-the-Department-of-Environment-and-Climate-and-Communications-regarding-the-Review-of-the-Security-of-Energy-Supply.pdf

needs of potential consumers, both in the domestic market and the international export market.

### Q3. What regulatory and policy measures are needed now to ensure that electricity storage does fulfil its optimum role in the energy system?

We need to address shortcomings and current obstacles being faced by generators under the auction processes. As it stands, the current auction timelines are proving to be too inflexible for facilitating projects that rely on emerging technologies. The auction processes were created to add new thermal generation to the grid, but if we are to encourage more innovation and onboarding of a diverse range of storage sources, there needs to be recognition of the fact that some projects will take less time to implement, while others may take much longer to become operational. As a result, the auction process needs to be adjusted to reflect this or we will risk limiting our potential and failing to explore new technologies.

We should utilise the REPowerEU 'overriding public interest' clauses to fast track the grid upgrades that are needed to make our electricity networks more resilient and effective. The REPowerEU chapters in member states' recovery and resilience plans provide the opportunity to include new reforms and investments. The enhanced scope will include energy storage projects and this potential opportunity should be exploited.

- Definition of Electricity Storage and Current Technology

### Q4. Do you believe there is a saturation point for battery storage, whereby adding further battery capacity provides limited benefit to the system? If so, how would you define that saturation point? Please provide evidence to support your argument

Chambers Ireland does not have a view on the saturation point for battery storage, but we do wish to reiterate how crucial it is to develop, implement and maintain an integrated electricity system.

Our current stage of storage development suggests that we are extremely far from having to be seriously concerned at what the likely saturation point of battery storage will be on our network.

We need to consider energy system integration "as a whole" involving multiple energy carriers, infrastructures, and consumption sectors with the objective of delivering low-carbon, reliable and resource-efficient energy services, at the least possible cost for society[3]

We also need to ensure diversity of storage options to avoid over-reliance on any particular form of electricity storage medium, different technologies have different strengths and it is likely that all of them will find use cases in Ireland.

### Q5. What technologies for electricity storage are currently in use internationally? What are their main characteristics and which ones should be considered for use in Ireland?

In our view, the consultation document contains a good overview of currently available and emerging electricity storage technologies that are being employed or developed internationally, as well as their main characteristics. These technologies include:

i. Pumped Hydro Storage
ii. Lithium-ion batteries

[3] https://ec.europa.eu/commission/presscorner/detail/en/qanda_20_1258

iii. Flow Batteries
iv. Compressed Air Energy Storage (CAES)
v. Thermal Storage
vi. Liquid Air Energy Storage
vii. Green Hydrogen/Power-to-Gas
viii. Synchronous Condensers
ix. Flywheels

Ireland currently has a combined storage capacity of approximately 792MW connected to the grid. This consists of lithium-ion batteries, with a total charging and discharging capacity of approximately 500MW, and the pumped hydro storage station at Turlough Hill, with a capacity to absorb or generate electricity at a rate of 292MW. This is an extremely limited storage framework at present and there is much scope in which to adopt and develop new storage technologies.

Diversification of our storage network across short, medium and long-term storage options will be needed and we should also ensure additional capacity is available for trialing and adopting new technologies as and when they emerge.

We are supportive of the Department's proposal to nominate Silvermines as part of the EU's Projects of Common Interest under the TransEuropean Networks for Energy (TEN-E) programme. We would like to see this project expedited as it promises up to 1.8 GWh of storage with 360MW export capacity. The Turlough Hill pumped hydro station has proven its value and effectiveness and an additional pumped hydro station would be a useful addition to the network.

Cost should be given special consideration in the context of lithium-ion batteries, as they are often the preferred choice for grid storage. As lithium is the backbone of lithium-ion batteries (among many others), future cost reductions will depend on critical mineral prices, less so on technological advancements. The supply of lithium therefore remains one of the most crucial elements in decarbonising our energy storage. Russia's invasion of Ukraine has also impacted the battery metals market and caused costs of critical materials to increase on the global

market. The supply, and consequently the cost of Cathode (nickel and cobalt) and anode (graphite) materials, as well as battery-grade Class 1 nickel have been notably affected by the war.

## Q6. What emerging technologies for electricity storage should be considered for future use in Ireland?

We see green hydrogen as the emerging storage technology with the most potential to transform our energy market.

Hydrogen storage is the fundamental element to our national Green Hydrogen industry. Storage is the only reason why we should be considering the development of Green Hydrogen. Hydrogen is a storage medium, it allows us to take unused electricity and bring it to that place and point in time when it is useful. We believe that Hydrogen storage will be the foundation that Ireland's post-carbon economy will be founded on.

In terms of hydrogen storage, the easiest to deliver means will ultimately be pipelines, however we will need to wait until Russia can be trusted not to gray-zone that infrastructure before we will be able to commit to it. In the medium-term floating terminals, which would allow ships to dock, load and facilitate trans-shipments from vessel to vessel, without meeting the same planning challenges that large landbased storage units might face are likely to be the quickest option to deliver. Landbased storage will be cheaper, but enormous planning permission challenges will exist for such projects. Undersea storage is also likely to be necessary as, even if liquified, a tonne of Hydrogen needs 15 $m^2$ of storage. With a huge volume of space required  much of the Hydrogen we will generate will need geological storage.

In line with our submission regarding ORESS 1,[4] green energy derived hydrogen and ammonia will also have the secondary benefit of reducing the carbon emissions of domestic industries

[4] https://www.chambers.ie/wp-content/uploads/2021/12/Chambers-Ireland-ORESS-1-submission.pdf

such as farming through offering clean alternatives to fossil fuel derived fertilisers, while also helping other states decarbonise through the substitution of green energy alternatives for industries such as aviation, shipping, transport, steel production, etc. which require energy dense alternatives to the fossil fuels which they have a dependence on.

In terms of developing a viable hydrogen strategy for Ireland and adopting hydrogen as a long-term electricity storage medium, there are likely to be be considerable scare stories and lobbying by fossil fuel and battery storage agents which the state will need to prepare for, both through rebuttals and through an early active programme that seeks to win hearts and minds. There is however likely to be considerable resistance to creating new pipelines that are dedicated to Hydrogen, so usage of the existing gas infrastructure will need to be optimised to minimise the need to create new infrastructure.

If we are to build momentum and garner public support for the development of hydrogen infrastructure, we should look to what other nations are doing for its evidential value. For example, the US Department of Energy is financing a $500m project to store 300 GWh of Hydrogen. This can help support the development of a robust hydrogen network in Ireland, as we can prove that the science of hydrogen is settled and it has the backing on an international scale, therefore, it's an opportunity we should make the most of.

### Q7. What are the main characteristics of these emerging technologies?

The key driver of developing and implementing a robust national hydrogen strategy is the fact that hydrogen represents one of the only long-term storage mechanisms available. This is crucial if we are to move to a zero-carbon electricity system that is dependent on renewable power. The issue with renewables is the seasonal fluctuations in available resources.

Last year, there were six weeks of no wind. This is to be expected. Hydrogen mitigates against the risk of system blackouts or Dunkelflaute in these scenarios. It means we can store excess renewable energy during periods of abundant resources to compensate for potential downturns in output.

However, if we are to expand our hydrogen potential and to explore export opportunities, we will need to develop an effective transport network. In the short run, for this may be the development of hydrogen-ready terminals but in the long run, this may require the conversion of existing gas pipelines and the building of new ones.

**Q.8 In terms of creating a balanced portfolio of technologies, how do you see the relationship between storage and demand-side response, alongside other flexibility measures, developing if Ireland is to meet its decarbonisation objectives?**

Ireland has the potential to become an international source of renewable energy, with enormous export potential to other markets.

Domestic demand from within Ireland should be much less than the potential demand from overseas. If that is the case, finessing a demand-side response will mean that we miss out on a huge economic opportunity.

Our renewable energy potential greatly exceeds the amount of energy we will ever need to service Irish consumer demand. We should be ambitious and have an international export strategy to sell our excess renewable power to third countries.

Hydrogen as a Medium for Electricity Storage

**Q9. What role do you see for green hydrogen storage in helping to decarbonise the electricity sector vis-à-vis other long-duration storage technologies?**

There is no form of renewable energy capacity that will not be useful when it comes to our decarbonisation efforts, but our approach will need to be flexible to ensure that, as we encounter the novel problems that will emerge over the next fifteen years, we will have access to all the tools that can address those challenges best.

Hydrogen will be a key part of the solution to the highly variable availability of renewable energy in Ireland, and the wider EU.

The opportunity for Ireland will not simply be in local usage (although there are numerous benefits to using Green Hydrogen vs fossil fuels) it is as an exporter of energy that we will reap the greatest benefits. Foreign capital will facilitate the creation of our Green Hydrogen infrastructure, meanwhile international demand will reduce the share of the overheads which Irish consumers will pay. Greater supply, with lower transportation costs, should see the cost of energy decline. Executed effectively, Ireland has the opportunity to become one of the most energy secure countries on the globe.

### Q10. How do you see the hydrogen storage industry developing in Ireland over the next ten to fifteen years and do you think green hydrogen storage is likely to dominate the long duration storage sector as we reach 2050?

Green hydrogen storage represents the future of the long duration storage sector. We have the potential to become a key hub of the European energy network through the supply of compressed Hydrogen and Ammonia to that market. We should be implementing plans now to ensure that this industry can be facilitated going forward, so that we don't miss out on a potentially hugely significant economic opportunity for the country. Our long-term Security of Supply will involve a combination of renewables and hydrogen storage.

In the long run, the principal barriers to delivery of this hydrogen ambition are institutional and regulatory. We urgently need to upgrade our state decision making apparatus to ensure that we can deliver these enormous projects. To demonstrate the scale, we should be looking at using offshore salt caverns as reservoirs for storing Green Hydrogen with exploration and preparatory licences granted as soon as is feasible. There is also likely to be considerable resistance to creating new pipelines that are dedicated to Hydrogen, so usage of the existing gas infrastructure will need to be optimised to minimise the need to create new infrastructure.

This is not a quick fix or easily implemented measure. Action will be needed now if we are to see progress in the coming years. It is only through developing a longer-term storage strategy for hydrogen that we will maximise its potential.

In the short run, we need to take a maximalist approach to integrated new sources of renewable energy into our electricity system and the electricity storage system. Every watt that we use that is not coming from an off-island or fossil fuel source will make us more secure.

## Thermal Storage

**Q 11. What role do you see for thermal storage in terms of its ability to support the decarbonisation of the electricity/industry sector? What advantages/disadvantages does it pose vis-à-vis other storage technologies and what changes, regulatory or other, would be required? What role do you see for thermal storage as a long-term (e.g., seasonal) energy storage in Ireland?**

The key advantage of thermal energy is its potential to provide large scale storage at relatively low costs.

Thermal energy storage will be most useful to commercial and industrial sites that have significant heat demand but may have limited uses beyond this due to the significant energy losses that can occur due to waste heat.

There are two types of storage to consider, cold storage and heat storage: Phase Cooling storage has been used in Ireland in office projects and benefits from night rate electricity costs. This has the benefit of distributing the energy load on the grid over time allowing more efficient use of assets, and given the correlation of night time usage and available renewable wind energy generation this has environmental benefits. The same arguments hold for heat storage. However, a thermal storage system that is reliant on using domestic thermal storage is only likely to have a very marginal effect in the Irish context, while such a system is both an

efficient use of resources, and technically feasible, it requires large scale behavioral change if it is to be effective – in most circumstances, delivering social and behavioural change is far more difficult than solving large scale technological problems – an approach that transforms the technical challenge of storing excess energy into the sociological challenge of allowing energy providers to manage when domestic immersions are active as a viable solution fundamentally misunderstands the Irish energy market.

## Current Role of Electricity Storage

### Q12. Do the current arrangements for the procurement of system services provide an effective marketplace for electricity storage units to offer these services to the TSO?

While the current arrangements for the procurement of system services have delivered successes to date in facilitating electricity storage units to offer services to the TSO, Chambers Ireland would like to see more resources being made available.

At present, the scope of electricity storage options in Ireland have been limited to batteries and the Turlough Hill pumped hydro station. We should be adopting more diversified technologies and creating enhanced access opportunities for providers.

Financing of electricity generation and electricity storage options will need to be finely balanced, however, the potential of green hydrogen will require increased spending if we are to be ambitious in exploring this option.

The DS3 programme has so far successfully delivered the tools, policies and system services needed to allow the current SNSP11 operational limit to be increased to 75% as of March 2022, an increase from the 50% limit when the programme began in 2011. This is positive progress and showcases the potential within the system. However, the reduction of ten per cent last December in the regulated tariffs on the DS3's 'fast five' services has led to reduced

revenues for the storage projects that provide such services. This will reduce the competitiveness of this sector and may stifle potential.

**Q13. Do the current arrangements adequately compensate electricity storage units for the services that they to the grid? Are there any services which storage provides to the grid that are not currently adequately compensated?**

**Q14. Do the current arrangements for the advance procurement of generation capacity services provide an effective marketplace for electricity storage units to offer these services?**

**Q15. Are there any changes to the current arrangements that would allow a more effective use of electricity storage to provide capacity to the electricity market?**

**Q16. Do the current and in-development arrangements for the procurement of flexibility services, including from storage, provide an effective marketplace for electricity storage units to offer these services?**

To avoid duplication within the responses we are answering these questions as one.

No, current arrangements do not adequately compensate electricity storage units for the services they provide to the grid. It is pivotal that the State fundamentally rethinks the current arrangements.

How the market is currently structured has meant that it is distorted and does not account for all technologies in the same way. In line with our earlier point, this is not conducive to an integrated grid which deploys a range of storage technologies. Security of supply is paramount and developers require the assurance regarding their revenue streams; therefore the market needs to compensate for energy when it is both needed and not needed.

There needs to be a market for storage capacity that incentivises operators and developers to invest in storage capacity at the scale we need. If storage is adequately remunerated, this will

result in full benefits for the consumer through investment in transmission, operational flexibility and, ultimately, carbon reduction and energy security in the long run.

The current arrangements for the advance procurement of generation capacity services do not provide a fully effective marketplace for electricity storage units to offer these services.

Chambers Ireland is not in a position to comment on the technical specifications of the current arrangements, but we would like to emphasise the point that the most effective change we could enact would be to invest in the national grid infrastructure. We should prioritise a grid that is reinforced and upgraded to accommodate new connections and effective transmissions.

### Q17. Are there any changes to the current or proposed arrangements that would allow a more effective use of electricity storage to provide localised flexibility on the electricity distribution system?

Localised flexibility has a role to play in the short term, however, it must be balanced with an intensive focus on upgrading and reinforcing the national grid for the longer term successful management of our electricity generation, transmission and storage network.

We need an efficient and effective transmission network to be able to bring electricity from where it is generated to where it is needed, both in terms of direct usage by consumers and in terms of electricity storage. A holistic, national vision will be a more effective and ambitious long-term view that can be optimised and adapted over time but, as a starting point, localised flexibility offers some opportunities. There are particular areas in the country where this approach can be very effective, however, there are others with a supply and demand mismatch. In these instances, the grid infrastructure needs to be adequately equipped to transfer energy across the country from where it is available to where it is required.

The potential exists to fast-track grid upgrades under REPowerEU and we should make effective use of this to make our electricity networks more resilient and effective.

### Q18. Do the current RESS arrangements allow project promoters to combine renewable generation with electricity storage in a way that would contribute to the efficient and reliable production and use of renewable electricity?

No – storage capacity is not dealt with sufficiently. In our submission on the third Onshore Renewable Electricity Support Scheme (RESS 3) auction design and implementation, we highlighted that consideration should be given to the usefulness of pairing existing transmission grid infrastructure - such as the transmission lines servicing thermal plants - with offshore energy projects. The hybrid model would be useful in adding to the energy mix as these are likely to be anti-correlated in terms of usage and load i.e., those times when offshore energy projects are delivering generation will be those times when there will be the least demand for energy production from thermal plants. Similarly, using hydrogen technology for storage allows us to take unused electricity and bring it to a place and point in time when it is useful. Currently, it is unclear if this will be considered in RESS arrangements.

### Q19. Are there any changes to the current arrangements for subsidising new renewable generation projects through RESS that would allow a more effective and beneficial use of electricity storage in hybrid projects that combine renewable generation with storage?

Ultimately, it would be hugely damaging for our green transition if renewables were to be viewed as unreliable. The State needs to subsidise the provision with storage capacity and ensure that energy is available when it is needed. This will involve increasing capacity for renewable generation and adequate storage that will be available to rely on when it is needed.

We should look to international examples to incentivise new projects. For example, in Germany, the deployment of storage is encouraged through 'innovation auctions'.[5] These

[5] https://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2022/20220512_Ausschreibungen.html

reward the pairing of renewables with storage. In 2021 and 2022 all successful bids, - representing over 1 GW of installed capacity - were projects which combined solar PV with battery storage.

## Future Role of Electricity Storage

### Q20. What electricity storage technologies exist that can provide Long Duration Storage to balance supply and demand in an electricity system that relies heavily on renewable power?

### Q21. Do any emerging technologies have the potential to provide Long Duration Storage in the future?

If we are to fully decarbonise our electricity system through the accelerated development of renewable energy projects, we must find solutions for periods of low wind or solar power.

Green hydrogen or power-to-gas has the greatest potential to provide long duration storage that can help balance supply and demand.

The great benefit of hydrogen storage is its potential to mitigate against the impact of seasonal fluctuations in renewable resources.

### Q22. What policy and market arrangements, if any, are needed to facilitate investment in Long Duration Storage?

In the short to medium term, the State will need to accommodate a long duration storage market by lowering costs, by mobilising the necessary investment capital, this is an area where significant European funds are available to effect these investments. Creating a market which enables investors to make an attractive return on the technologies they invest in will be essential if we are to deliver the energy transition in a timely way. This ties in with our point elsewhere in our submission regarding giving developers the necessary certainty by introducing flexible timelines for projects.

The potential of hydrogen to be a long duration storage medium is inhibited by the fact that it is yet to be demonstrated at scale or reach commercialisation in Ireland. It may be subject to lengthy periods delay in development as a result of our planning system, and the technology's novelty. It is also currently not facilitated for under the auction process. This is why the hydrogen-specific goal of 2GW in the updated Climate Action Plan is so important, urgent action is needed if that capacity is to be delivered by 2030.

The opportunity for Ireland will not be in local usage (although there are numerous benefits to using Green Hydrogen vs fossil fuels) it is as an exporter of energy that we will reap the greatest benefits. Foreign capital will facilitate the creation of our Green Hydrogen infrastructure, meanwhile international demand will reduce the share of the overheads which Irish consumers will pay.

Significant capital investments are needed to create geological storage facilities that large volumes of green hydrogen will need. This will require significant capital investment and therefore government support.

### Q23. Are there other ways in which Government can support the acceleration of long duration storage in terms of promoting research and development?

The key driver in accelerating long duration storage is through substantial investment in developing and delivering the infrastructure needed to serve these projects.

Research and development will have an important role to play in supplementing the delivery of long duration storage projects but the scale and magnitude of their impact will be small when compared with the investment required to initiate the necessary infrastructure development.

Ireland, with its late entry into the Hydrogen conversation, will be small player in the field of hydrogen research in the short-term. Where we do have a natural competitive advantage is in the relationship between our potential renewable energy supply, and our low absolute

demand. This will facilitate us in becoming a key link in the hydrogen chain as it will allow us to fix renewable energy in stable chemistry that can be exploited elsewhere.

Just as Ireland is not a research powerhouse when it comes to the development of new pharmaceuticals, we can still carve out a space for ourselves in the broader industry. In pharmaceuticals our specialism is in manufacturing, in Hydrogen – having abundant supplies of Green Hydrogen will make Ireland a natural locus for research in the technologies that concentrate, store and ship Hydrogen and downstream products (such as Green Ammonia).

Furthermore, having a large supply of Green Hydrogen feeding the EU will mean that Ireland will have a very low domestic price for Hydrogen and this will facilitate investment in usage cases.

Greater resources should be given to the National Support Network to facilitate a strategy which helps applicants specialising in renewable energy to obtain Horizon funding for research.[6]

**Q24. Do you agree with the barriers to long-duration storage as outlined above? Are there other barriers not included here that need to be considered? Please provide supporting evidence if possible.**

We agree with the barriers outlined in the consultation document, which are considered and relevant. However, we have some considerations relating to each particular barrier:

[6] https://horizoneurope.ie/

## Barrier 1: Planning risk and construction delays

As outlined in our submission last year regarding security of energy supply[7], Government needs to deliver a planning system that has the capacity to process planning applications in a timely fashion, and a court system that can hear challenges without delay.

This institutional and regulatory risk is likely to be the biggest factor when it comes to the failure to deliver long-term energy storage projects regardless of their particular technologies. There will be significant public resistance to projects such as Silvermines or Kinsale.

These delays will hinder construction and create setbacks for developers that are beyond their control. Government bodies must make the planning permission process more effective at delivering projects of all kinds in a timely and fair way. We must also make better use of the RePowerEU mechanisms to accelerate the planning process for energy and associated grid projects given the 'overriding public interest' involved.

## Barrier 2: High Capital Expenditure costs

Interest rate volatility is increasing CapEx costs of all projects. This is having the knock-on effect of requiring projects to have a higher return on investment to compensate for the same level of risk.

There is a serious risk that market failure will result in Ireland being unable to build the infrastructure we need to deliver if we are to attain out Climate Action targets. The State will need to intervene if it becomes unviable for private businesses to acquire the capital that is needed to deliver the necessary green transition infrastructure, or if that is priced such that necessary projects are commercially unviable. To account for this, Ireland's revised recovery

[7] https://www.chambers.ie/wp-content/uploads/2022/10/Chambers-Ireland-Submission-to-the-Department-of-Environment-and-Climate-and-Communications-regarding-the-Review-of-the-Security-of-Energy-Supply.pdf

and resilience plans should make better use RePowerEU to gear up the spending that the state is going to need to provide for new energy generation and storage projects.

**Barrier 3: Regulatory mechanisms may not suit new and emerging technologies**

Our regulatory system is familiar with the implementation timelines and requirements for a narrow set or projects, it is likely that the rules which have been useful for delivering some classes of projects are not going to be effective at delivering other projects. We have already seen this effect in the thermal gas plants where the existing regime wasn't capable of financing gas fired thermal plants which would only be active during peak hours. This has led to us have to rely on legacy, more polluting, technologies over recent years. The regulatory system needs to account for the fact that the new technologies that are needs, may need to have tailored auctions or pathways to delivery because they cannot be delivered under the existing frameworks.

**Barrier 4: Lack of revenue certainty in the Capacity Remuneration Mechanism**

To secure a contract in the Capacity Remuneration Mechanism T-4 auction, a unit must be able to deliver capacity within four years:

Auction timelines should be extended or more flexibility should be incorporated into the process. The current timelines were initiated to accelerate growth and development in the renewable sector and to ensure that projects given the green light didn't fall behind schedule and fail to deliver. However, as we move towards more cutting-edge technology and exploring new opportunities, there should be acknowledgement that not all projects are technologically similar and some will require more time to become operational. An additional auction could also be facilitated that would be specifically for Long Duration Storage projects, with specific terms and conditions drawn up to suit such a process.

**Barrier 5: Externality pricing**

Market signals that fail to capture the full value of Long Duration Storage projects given the emphasis currently placed on short-duration storage. Additionally, carbon emissions are not fully valued in flexibility markets, meaning low-carbon projects may be outcompeted by high-emitting assets for equivalent system services.

Market signals will need to change if this is the case, as we need a mix of short, medium and long term storage options if we are to ensure security of electricity supply into the future and a supply which prioritises low or no carbon projects.

## Q 25. Are specific incentives or regulatory changes needed to address these barriers?

We should change the terms and conditions of the auction process to include more flexibility in the timeline component.

The stipulated fixed timelines are too short and, in our view, timelines for projects should be determined on a case-by-case basis. A one-size-fits-all approach is not conducive to an integrated storage policy. Each technology has different characteristics and, by extension, this necessitates different timelines for completion.

Ultimately, the fixed timelines are not conducive to a storage policy which accounts for this fact. This in turn runs the risk of excluding different forms of storage because it will discourage developers from investing in the market. They will price the extra costs and time into each plan and likely decide to not enter the market if it does not account for reasonable timeframes. Making the timelines more flexible should therefore be prioritised.

## Grid Connection

### Q26. Discuss how the current network tariff structure affects the business case for storage in Ireland. What changes, if any, do you propose?

As an organisation, Chambers Ireland is not in a position to suggest the appropriate way to adjust the network tariff structure but we appreciate the significant impact that this can have and is having on the slow pace of development for renewable infrastructure.

The current system has yielded low levels of exploitation of renewable resources with extremely limited storage capacity. Currently, the majority of relevant projects are only at a pilot stage and have not reached an industrial scale. This limited storage capacity does not facilitate the full onboarding of our renewable energy potential. It is also not reflective of the ambition required to meet our Climate goals and for the State to become a global player in the renewable energy market.

### Q 27. Are changes needed to the way that applications for new grid connections for storage units are considered under the CRU's Enduring Connection Policy? Are there additional opportunities to connect behind-the-meter storage at generator sites or demand-customer sites that would not involve the need for additional grid construction?

Behind the meter storage at generator sites would be a positive inclusion but it is likely to be small scale in nature and we believe that it will not be of sufficient capacity to have a meaningful impact on our security of electricity supply into the future.

## Spatial Planning

### Q28. What policy changes might be needed to help set standards, regulate construction and monitor operations of electricity storage units and related planning issues?

It is Chambers Ireland's position that imposing standards, regulating construction and monitoring operations of electricity storage units and related planning issues would be an ineffective and unduly restrictive measure.

The availability of electricity is only one factor in investment decision-making. Developers are more likely to consider the availability of suitably skilled individuals in an area, as well as the adequacy of local infrastructure to meet their needs. Often this will mean that developments will progress where they are close to an urban hub. This may be in contrast with areas where there is abundance of renewable power.

By focusing on regulating the location of construction, we may only serve to disincentivise new electricity storage developments and risk turning an engineering problem into a planning problem. The planning process in Ireland is already complicated enough without trying to use it to find a perfect balance between electricity supply and demand.

We should be encouraging electricity storage investment and development and working with the developers to progress opportunities that will result in more electricity storage being brought to the grid.

## Safety

### Q29. How should Government communicate and engage with the public regarding the critical role of electricity storage in supporting the energy transition, and the safety measures which are in place?

Electricity storage should be presented as forming a fundamental part of Ireland's energy policy and, ultimately, an important contributor in meeting our decarbonisation objectives.

There should be no need to differentiate storage from generation and supply.

Ultimately consumers, including business consumers, are concerned with the security of electricity supply and what this may mean for pricing, as well as the environmental benefits derived from divesting in fossil fuels and investing in renewable power. However, messaging around safety measures should be incorporated in the overall communications strategy surrounding our national energy policy.

The location of certain storage facilities may be a local issue that will need to be dealt with sensitively and on a case-by-case basis in different local authority areas and according to the technologies involved. Some technologies (Green Ammonia/gas pipelines etc.) are likely to have significant local resistance, while others are likely to be close to invisible and may need no planning permission at all (Li+ batteries). The people best suited to understanding the difficulties a technology is likely to have in a given area will be the developers that have experience in delivering these projects.

## Small-Scale, Grouped & Aggregated Electricity Storage

### Q30. What role do you see for small-scale aggregated storage over the next ten years in supporting the decarbonisation of the electricity sector and how do you see the area developing?

In our submission for the Support Scheme on Small Scale Generation, we are supportive of the proposals aimed at empowering and engaging citizens, and crucially the business community, in the generation of their own renewable electricity. We are supportive of the proposals to introduce a Small Scale Generation scheme in Ireland in 2023.

However, small-scale aggregated storage is not sufficient for the delivery of a national electricity storage strategy, the scale will be too small to be significant in contributing to the national electricity storage framework.

Small scale aggregated storage provides valuable security and continuity of energy provision for certain SMEs, farmers and energy intensive businesses that rely on consistent connections but, beyond this, the scope of application to the national grid will be marginal.

Small-scale aggregated storage is being explored through a stakeholder consultation on the viability of a designated support scheme but this is where the focus should begin and end. It does not have a significant enough role to play in the development of a national electricity storage strategy.

The impact of small-scale aggregated storage, behind the meter storage and EV storage is too insignificant and lacks ambition for a strategy that should be embracing high-impact, high-tech and long duration storage options that can transform our electricity system and ensure security of supply into the future.

### Q31. What are the biggest challenges/barriers to ensuring small-scale and EV storage are deployed effectively to support the grid?

We support the use of small-scale and EV storage to support the grid along with other technologies, however the State cannot afford to be over-reliant on this as a storage option. In line with our points elsewhere in our submission, a range of technologies will need to be deployed to create a more resilient energy infrastructure. However, the impact of EV storage is, like distributed thermal storage, likely to be marginal. This is because it relies on a lot of people altering their behaviour so that our energy systems as a whole can operate more efficiently. One of the principal benefits of owning your own car is that it is available whenever you need it. Should someone need the full charge to urgently visit a family member and they discover that the battery not full when they need it, it will be a public relations nightmare for all involved. To mitigate that risk individuals are likely to require a very high level of compensation to account for the added risk they are taking on, they will also want compensation for the number of discharge cycles on their batteries that storage systems of this kind will induce. Chambers Ireland expects that this will be a system that helps expand supply capacity at peak hours, but we also expect that it will not have a large capacity.

The Climate Action Plan 2021 set a target to have up to one million electric vehicles on Irish roads by 2030 and, although we are falling short of meeting this target, in the last year electric and hybrid cars accounted for 42.4% of all new car sales, outselling both petrol and diesel rivals. This offers some potential, however, the first challenge is that vehicle to grid technologies are not currently active in most car models and home charging units but new technologies are being developed to facilitate this and some EV drivers may see the benefits in opting in to future schemes. A national communications campaign will be required to explain the potential opportunities and encourage uptake. This could also be accompanied by an increased Electric Vehicle Supply Equipment grant

The second barrier or challenge relates to inadequate grid infrastructure and the potential viability gap that exists regarding small-scale and EV storage. In our submission on small-scale generation, we noted that until adequate grid infrastructure exists to transmit generated electricity from where it is generated to where it is needed, small-scale and EV

batteries can help provide an interim solution for storage and should be considered to encourage self-consumption. We believe this should be considered in the policy design, however, installations with storage options in many cases have higher viability gaps than those with no storage, and therefore may not be financially viable solutions. This is because self-consumption creates savings for the installation by minimising the amount of generated PV energy that is exported to the grid and, therefore, is not remunerated to the owner of the installation. It also entails more costs for the system, making the viability gap greater than it would be otherwise.

### Q32. What information or resources would be required to assist prosumers to engage in demand side flexibility and services to the DSO in relation to their storage technologies?

The real target of demand side flexibility and services should be businesses, however, this will only have an impact where it accompanied by real financial incentives.

Where programmes offer cost-savings for businesses in terms of their electricity bills, some change can be enacted as the businesses may recognise the opportunity they have to improve their bottom line. The ESB's Beat the Peak Commercial Active is one such scheme that rewards eligible businesses that achieve a reduction in their usage relative to their baseline. In such scenarios, the business is eligible to receive a payment of €0.444 per reduced kWh and, importantly, there are also no penalties where a business is unable to reduce their demand.

We would like to see more schemes like this implemented, as businesses will only invest in demand side flexibility and services where it makes economic sense.

### Q33. Time of Use Tariffs and Smart meters are widely available in Ireland. What other technical, market, regulatory and/ or digital arrangements need to be put into place to support prosumers to engage in demand side flexibility and services to the DSO in relation to their storage technologies?

Consumers that engage with demand side flexibility campaigns are generally particular consumers that have day-to-day flexibility in their schedule and may be particularly alert to and concerned about the cost of their electricity bills. For those consumers, they may be able to change and alter their daily electricity consumption, thereby reducing their bills and benefitting from time of use tariffs or similar incentives.

For many consumers, this flexibility is not an option and they may be unable to deliver significant demand side responses in their day to day routine. In such scenarios, we need to be mindful that some consumers may be unable to adjust consumption and so may struggle to pay their electricity bills.

Demand side flexibility initiatives can be very positive tools for affecting small-scale change for some consumers but, overall, the impact will be nominal.