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Friday, 10th November 2017

RESS Consultation
Electricity Policy Division
Department of Communications, Climate Action and Environment
29-31 Adelaide Road
Dublin D02X285

Submitted by email to: RESS@dccae.gov.ie

Re: IWEA Response to RESS Consultation

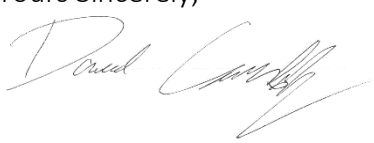
To whom it may concern,

The Irish Wind Energy Association welcomes the opportunity to make a submission in respect of the Renewable Electricity Support Scheme - Design Consultation.

IWEA is the leading renewable energy representative body in Ireland and as such has an active interest in the potential and capacity for renewable energy development, and in particular wind energy, in Ireland. Approximately 120 organisations are members of IWEA across all areas of the wind industry including community engagement, planning, grid development, market design, health & safety, and asset management. IWEA hosts two of Ireland's largest energy conferences each year and regularly engages with key stakeholders across policy, regulation, industry, and research. IWEA works in a proactive and engaging manner with all stakeholders and as such feels it is both appropriate and important to make this submission, which is attached to this cover letter.

RESS will be instrumental in delivering additional renewable electricity in Ireland and the consultation includes a number of complex and ambitious proposals. To ensure RESS can be implemented in an efficient and cost-effective manner, IWEA would welcome the opportunity to engage further with DCCAE on the final design of the RESS.

Yours Sincerely,



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IWEA Submission:

Response to Public Consultation on the Design of a new Renewable Electricity Support Scheme in Ireland

Submitted: November 10th 2017

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1 Introduction and Executive Summary

IWEA welcomes the opportunity to respond to the consultation on the Design of a new Renewable Electricity Support Scheme (RESS).

The existing support scheme, the Renewable Energy Feed in Tariff (REFIT), has been very effective in delivering wind energy projects in Ireland, with approximately 3150 MW of wind energy capacity installed in the Republic of Ireland to date. This has been achieved in a manner which does not place any additional burden on the consumer, because the support paid through the Public Service Obligation (PSO) is offset by the reduction in wholesale energy prices which is attributable to wind generation. This has been shown in a number of studies and publications, including a 2014 study by Pöyry[1] which shows that if Ireland deploys wind capacity to meet 2020 targets, it will not place a burden on the Irish consumer due to the net economic benefits of wind energy development especially the reduction in wholesale electricity prices. A Moody's Investor Services report published in June 2015 stated that an increase in the number of onshore wind farms in use, will contribute to a fall in the wholesale power price in Ireland over the next three years. Finally, the 2014 European Commission confirmed in its *Working Document on Energy Prices and Costs*[2] that "*for wind electricity in Spain and Ireland the benefits for electricity consumers in terms of reduction in whole-sale prices outweigh the costs of subsidies".* The true benefits of this will be even more evident in 2020, when assessing Ireland's 2020 energy targets. SEAI forecast that Ireland's 40% RES-E target will make up 9% of Ireland's overall 16% RES target. Wind energy is expected to account for the majority of RES-E, meaning Ireland's wind power will contribute ~8% RES, which is half of Ireland's 16% RES target. SEAI predict that each percentage point shortfall in these targets will result in non-compliance costs of ~€100 million[3], **meaning wind power in Ireland will have avoided non-compliance costs of ~€800 million in 2020, which highlights the success of REFIT**.

IWEA believes that the success of REFIT is strongly connected to the long-term certainty it provided for the renewable electricity industry, which has put Ireland on track to reach an ambitious 2020 renewable electricity target of 40% RES-E. However, IWEA believes it is unlikely that enough renewable electricity will be supported under REFIT to meet Ireland's 40% RES-E target and therefore, **it is essential that the first auctions under RESS can support additional renewable electricity projects for Ireland's 2020 targets**. IWEA is concerned about the timelines required to achieve this, as ideally

[1] http://www.iwea.com/index.cfm/page/industryreports?twfId=1467&download=true
[2] http://renews.biz/91036/irish-wind-to-blow-prices-down/
[3] "*Ireland avoiding the compliance costs associated with renewable energy and emissions reduction targets. In the case of renewable energy compliance, this amounts to between €65 million and €130 million per percentage shortfall on the overall binding target*", SEAI, Ireland's Energy Targets, 2016

the first RESS auctions would need to take place in 2018, so construction could begin in 2019 for these new projects, which would then be energised in 2020, to contribute towards Ireland's 2020 EU targets. Ideally, this could even facilitate renewable electricity overachieving the 40% RES-E target to compensate for the shortfall in RES-H & RES-T, which SEAI forecast will be ~3% RES and likely to cost ~€300 million (in total, Minister Naughten recently indicated that total compliance costs could rise to ~€1 billion[4]). An early implementation of RESS will also ensure that Ireland starts the 2020-2030 period on the best possible footing. This is made more important by the EU Clean Energy proposals which specify a linear target to 2030, potentially as high as 35%, with annual "financial contributions" to the extent renewables build out is off this trajectory.

These 2020 targets are not the end goal, but a milestone along a longer journey towards a low-carbon energy system. IWEA firmly believes that wind power can continue to grow in Ireland throughout the lifetime of the new RESS to accelerate the low-carbon transition, not only in the electricity sector, but in heat and transport also. **IWEA believes that Ireland can achieve a renewable electricity target of 70% by 2030 and that this can form the basis for more renewable energy other sectors also, such as heat and transport.** There is growing consensus that electricity will be essential in these sectors due to technologies such as heat pumps, electric vehicles, and 'power-to-fuels'. A renewable electricity system will thus form the basis of a future renewable energy system, so it is essential that Ireland continues to build on the success of renewable electricity to date by continuing to support further growth out to 2030 via the RESS.

IWEA acknowledges that there are many challenges ahead, like there was when introducing REFIT, many of which are addressed in the RESS consultation, but **IWEA strongly recommends that DCCAE engage with our members further to ensure that the proposals in the RESS consultation are implemented effectively**. For example, IWEA welcomes the focus on community engagement in the RESS consultation, so to ensure this can be implemented successfully by our members, would ask DCCAE to engage with us further about how the proposed solutions can be implemented. Similarly, there are a number of details in relation to auction design, payment structure, timelines, overlaps with grid/planning, and future targets which are discussed in the consultation that IWEA would welcome the opportunity to comment on further, to ensure RESS can be implemented in a cost-effective manner for the consumer. IWEA's members have demonstrated their capability over the last decade to deliver Irish energy policy, by successfully implementing the objectives of REFIT, so by engaging further with our members, IWEA believes that the intentions of RESS can also become reality by 2030.

[4] https://beta.oireachtas.ie/en/debates/debate/joint_committee_on_communications_climate_action_and_environment/2017-10-05/3/

2 Responses to Emerging Options & Public Consultation Questions

IWEA's response to the public consultation on the Design of a new Renewable Electricity Support Scheme (RESS) is provided in this document with an individual response for each question posed in the consultation, which are also in the same order as in the consultation.

2.1 Question 1.

1a: The emerging policy includes a measure whereby all capacity available under the new RESS (with the exception of small scale developments) should be allocated through a competitive bidding process via auctions. Do the respondents agree with the competitive auction based approach? If not, what alternative model would you propose and why?

As an industry, **IWEA agrees with the competitive bidding approach via auctions**. Notably, this aligns with the post 2020 approach drafted in the EU Clean Energy Package. It is welcome that the new RESS is designed to be fit for the 2020-2030 period. Such an approach has also been successfully used across several jurisdictions to deliver lower cost renewable energy, encourage innovation and ensure earlier alignment and involvement of long-term asset owners in the development cycle. Due to the international nature of our membership, IWEA knows of strong recent examples from other jurisdictions including the UK, France, Germany, South Africa and Chile.

Nonetheless, **IWEA cautions that the Irish Government needs to consider the specifics of the Irish electricity market** when designing the detail of a competitive auction based approach. Ireland has a relatively small electricity market compared to many other EU Member States. It is more challenging to create liquid competition in a relatively small market – policy tools to ensure this need to be considered carefully. IWEA is concerned that Ireland is limited not only by a relatively low demand base, but by the Government's low target, which is addressed fully in the response to Q10. IWEA is concerned that on top of the 'natural restriction' that Ireland has a relatively low demand base, Government are further limiting the opportunity by setting an unambitious RES-E target of 40% for 2030, which would require less than 1 GW[5] of additional onshore wind.

[5] IWEA estimates onshore wind would grow from 4300 MW in 2020 to 5125 MW in 2030. Assuming the same growth in electricity demand between 2026 and 2030 as EirGrid have forecast between 2016 and 2026, along with a constant wind power penetration of 37% and average capacity factor of 30%: http://www.eirgridgroup.com/site-files/library/EirGrid/4289_EirGrid_GenCapStatement_v9_web.pdf

It is important that Irish Government is very clear in the objectives of RESS auctions from the onset and selects an appropriate auction design to deliver on its goals. The Energy White Paper (2015) set the sector's expectations that these goals would include decarbonising Ireland's energy system while maintaining affordability:

- Security of supply
- Accelerate the development and diversification of renewable energy generation
- Placing citizens at the centre of Ireland's energy transition

Similarly, Irish, EU, and Global policies all have targets for deep decarbonisation by 2050, which will require reductions of approximately 80% or more compared to today[6,7,8]. The relatively low level of ambition for RES-E by 2030 in the consultation is not aligned with this position. Furthermore, when assessing the potential for additional RES-E in the future, IWEA would ask that DCCAE do not focus solely on the costs for the PSO[9], but instead consider the total cost to the consumer, which previous studies have indicated is lower overall with increasing shares of RES-E. Considering this, **IWEA recommends that Irish energy policy supports a more ambitious target of 70% RES-E in 2030**. By providing certainty for the growth in renewable electricity, Ireland will attract a lower cost of capital and enable a more consistent build out between 2020 and 2030, which will ultimately reduce the cost of decarbonisation for the Irish consumer. This is elaborated on in more detail in the response to Q10, which is supported by detailed modelling provided by Baringa.

Finally, IWEA would like more clarity on what defines a 'small-scale' development. EU State Aid proposes "electricity from wind energy where an installed electricity capacity of 3 MW or 3 generation units applies" (Article 125). Considering a typical wind turbine today exceeds 3 MW, 3 generation units are very likely to be larger than 6 MW. Therefore, will the 3 generation units also apply in RESS and be able to exceed 6 MW? IWEA would proposed that the 6 MW limit is enforced, to prevent market distortions and additional costs for the consumer. Allowing projects to exceed the 6 MW limit is likely to result in a lot of projects that are designed as 'small-scale developments' to take advantage of the 'exceptions' that are provided, which would undermine the purpose of this threshold and increase the cost of renewable electricity for the consumer.

[6] Irish Climate Action and Low Carbon Development Bill 2015: https://www.oireachtas.ie/documents/bills28/bills/2015/215/b215d.pdf
[7] EU Energy Roadmap: https://ec.europa.eu/clima/policies/strategies/2050_en
[8] Paris Agreement: http://bigpicture.unfccc.int/#content-the-paris-agreemen
[9] Cambridge Economic Policy Associates Ltd report supporting the RESS consultation, section 5.3, p77

IWEA believe that this same threshold is applied for both developer-led and community-led small-scale developments. Furthermore, could DCCAE specify the exceptions for "small-scale developments" in RESS. For example, EU State Aid exempts smaller developments from balancing responsibilities so will this be applied in RESS? Also, will there be a higher Floating FIP for "small-scale developments" and if so, what additional premium is envisaged?

1b. Do respondents agree with the use of Uniform-Price cost of support for RES-E projects in the main RESS capacity auctions, as a mechanism to keep costs to the consumer to a minimum?

IWEA agrees with the use of a 'pay as clear' cost of support for RES-E projects in the main RESS capacity auctions. Pay As Clear auctions are associated with lower risk of irrational bidding and subsequent 'winner's curse' and non-delivery. **Pay As Clear should drive market participants to bid at cost price and they are a more certain way of ensuring that the Government's carbon reduction objectives are met, in line with economic theory[10].** The details of how this should be governed should be both considered and clearly defined by the DCCAE.

2.2 Question 2.

The analysis suggests that a Floating Feed in Premium (FIP) is the primary financial support mechanism for the main RESS, as evidence indicates this is the most cost-effective approach.

Do you agree with this proposal versus the other mechanisms identified?

The paper has included five options for the form of support; Feed – in – Tariff (FIT), Floating Feed – in – premium (FIP), Fixed FIP, Quota and Grant. Given that a FIT is no longer compliant from an EU perspective and support must be provided through a competitive bidding process (except for small scale and demonstration project) thereby excluding a quota or grant system, IWEA believes there are two options for support; FIP either floating or fixed.

IWEA's view, based on the assessment carried out by CEPA is that the emerging approach towards a **floating FIP is the best option for the industry at this stage**. The dynamics of market pricing as the wholesale market changes as well as the introduction of further RES-E in the energy mix will create

[10] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.365.2514&rep=rep1&type=pdf

uncertainty for market participants which the Floating FIP should mitigate against. The model has also been adopted in other EU countries including the UK's CfD auction design.

The ability to forecast the level of support payments on an annual basis will also be made clearer through the introduction of a FIP although there will be a natural influx and exit of costs as the supported portfolio shifts with time.

However, a key detail that is not provided in the RESS consultation at present is the 'Reference Price' that will be used for the Floating FIP in the future. The reference price can be linked to any of I-SEM's electricity markets such as the Day-Ahead Market, Intraday Market, or Balancing Market as well as be a Blend between these. IWEA have assumed that the Reference Price will be based on I-SEM's Day-Ahead Market Price, but it is vital the DCCAE clarify this point.

Furthermore, it is not clear if the Reference Price will be 'Demand Weighted' or 'Production Weighted'. For example, the 'Demand Weighted' price is the final 'market price' from I-SEM and it is based on the total demand that was required during that trading period. The 'Production Weighted' price is the average price based on the electricity produced from a specific resource. Wind or solar have very low marginal electricity costs and therefore reduce the market price of electricity when they are producing electricity. As a result, the 'production-weighted' market price for wind and solar is lower than the 'demand-weighted price'. If the RESS reference price is based on a 'demand-weighted price', then an additional premium will need to be included in the 'bid price' for an auction to account for the shortfall in 'top-up' between the 'deemed revenue' of a demand-weighted price and the 'actual revenue' of a production-weighted price. Furthermore, a demand-weighted price will create more risk since a renewable energy project will need to account for variations in the electricity market itself as well as in the specific project.

Similarly, is the reference price based on a 'System Level' or a 'project level' price. In other words, a single wind farm will have a different profile to the aggregated production of all wind farms.

The type of reference price has significant implications on the level of risk associated with the auction design and it also impacts the level of diversification that is likely in the RESS scheme. Therefore, could DCCAE clarify:

1. What is the aim of the reference price i.e. to estimate a 'Deemed Revenue' or 'Actual Revenue' for the renewable electricity project?
2. Explain how the reference price is defined. For example, is it demand-weighted or production-weighted, at system level or project level, and how is it linked to I-SEM's electricity markets?

IWEA recommends that the reference price should represent Actual Market Revenues as close as possible for the renewable electricity project, since this will reduce the risk and thereby the cost for

the consumer. To do so **the reference price should be 'production-weighted' at 'project level' similar to the approached that is currently used under REFIT**.

2.3 Question 3.

What are respondents views on a proposed price cap (maximum €/MWh) within the uniform price proposal? What alternative approach would you propose and why?

There is no prima facie argument against the principle of including a price cap in an auction design. Auction price caps, particularly in a regulatory context, are frequently imposed in bidders as policy-makers seek to achieve different competing objectives of, inter alia, incentivising new investment and controlling the overall budget. However, a number of issues and concerns arise with respect to the current proposal that must be addressed in the context of the preferred uniform price proposal.

First, it is unclear what role a price cap would have in the principal uniform price auction currently preferred in the consultation paper. Assuming each auction has sufficient competition – a key feature of the auction design – then a price cap should not be binding at the clearing price of the auction. Second, a price cap in this context may administratively restrict certain technologies from participating in the auction that may have otherwise taken part in. Such a restriction, in the context of a competitive outcome, would seem overly restrictive. Third, should the DCCAE decide on smaller auctions for different technologies, it is unclear what role a price cap would play in these auctions, provided they were correctly designed to being about a competitive outcome. Fourth, these concerns are further exacerbated by the proposed form of the price cap. The viability gap analysis contained in the consultation paper, primarily the LCoE data, is deeply flawed. An auction price cap based on viability gaps would be tantamount to the DCCAE 'picking winners' in terms of the eligible technologies for the principal auctions, which is typically an inefficient outcome. It would also administratively bar certain technologies from competing in the auction on the basis of flawed or out-dated data.

In summary, while there is very little supporting information or justification contained in the consultation paper on including a price cap in the auction design, IWEA accepts that there can be some role for these measures where the DCCAE is looking to balance competing objectives. However, a binding price cap in the principal auction would indicate fundamental auction design problems. Price caps based on the estimated viability gap would be both a flawed approach and administratively restrict competition in the principle auction. Should the DCCAE choose to run smaller auctions wherein they effectively seek to 'pick winners' a price cap is potentially a tool by which this further objective could be achieved. For the foregoing reasons, any price cap proposal should be fully justified

and, at a minimum, should be set at a multiple of the estimated cost of new investment to ensure that the risk of unintended consequences that harm competition and the efficiency of the auction design, and consequently consumers and Government's wider objectives, are minimised.

2.4 Question 4.

4a. In order to keep costs to the consumer to a minimum, a Principal Category, encompassing all viable technology options leading to the most cost-effective projects, is provided for. The outcome of this initial auction will inform the design of future auctions. Do you agree with this approach? What alternatives would you propose to this approach and why?

For auctions, as with any other instrument, the typical principles of good policy making apply: a strong, long-term policy framework is beneficial, with predictable developments. Auctions are now supporting the deployment of renewable energy all over Europe whilst keeping electricity costs competitive for consumers. **IWEA agrees with the spirit of setting up a Principal Category, encompassing all viable technology options leading to the most cost-effective projects in auctions**. A technology-neutral approach will support the deployment of renewable energy, lead to the lowest generation costs being utilised first (such as onshore wind), it is in accordance with EU State Aid Guidelines and will support Ireland in reaching it's 2020 and 2030 targets in the most cost-efficient way. Onshore wind is currently the lowest-cost renewable electricity technology in Ireland, which is evident from the installed capacity achieved to date, but other renewable electricity options are becoming more competitive, particularly offshore wind and solar. As documented in the RESS consultation, prices for these technologies are falling and will continue to do so over the period from 2020-2030, which will enable these to compete with onshore wind in technology neutral auctions. Onshore wind typically has lower grid costs, but offshore wind can benefit from larger economies of scale, while solar can offer a very different production profile. Technology neutral pots will enable the pros and cons of each renewable electricity technology to compete equally, with the lowest cost to the consumer ultimately prevailing. Therefore, diversity will be delivered by this system, as the relative pricing or available volumes of permitted projects of each technology change over time.

4b. Would you support separate technology specific auctions for emerging technologies, at a greater cost to the PSO, and if so what percentage of the overall scheme capacity (MWh) would you allocate to this category?

IWEA supports technology neutral auctions as these will ensure that the cheapest renewable electricity is supported under RESS. IWEA also recognises that in order to reach the Paris Agreement objectives, Ireland needs large-scale renewable projects such as offshore wind farms. Hence, the RESS auction mechanism design needs to ensure that Ireland can utilise these RES potentials.

IWEA would like to highlight the strong link between Ireland's 2030 target for RES-E and the need for technology specific auctions. IWEA predicts that Ireland will require approximately 4300 MW of onshore wind to meet Ireland's 2020 RES-E target of 40% (assuming onshore wind will supply ~37% RES-E). If a 40% RES-E target in maintained in 2030 and onshore wind continues to provide 37% RES-E in 2030, then this will result in an additional 825 MW of onshore wind, bringing the total fleet to 5125 MW. This is much less than the onshore wind resource available in Ireland and therefore, it will mean that Ireland is not maximising the renewable resources available. For example, if all onshore wind projects that were given grid connection offers in Gate 3 were developed, then there would be approximately 5800 MW of onshore wind. IWEA strongly believes that this could be easily delivered by 2030 especially with the increased focus on community engagement in the RESS consultation, which is supported by IWEA's members.

However, if Ireland sets a more ambitious renewable electricity target for 2030, such as the 70% RES-E that IWEA proposes (see response to Q10 for more details), then there will be a demand for much larger renewable electricity capacities. For example, if wind power is used to supply the additional 30% RES-E, then the wind capacity in Ireland will need to be ~4200 MW higher than in the 40% RES-E by 2030 scenario[11], resulting in a total wind capacity of ~9300 MW. In this scenario, the benefits of diversity may be more than just the cost, since diversity may enable more renewable electricity capacity to be delivered at greater scale (e.g. offshore wind) or via different methods (e.g. solar). The volume of activity in the planning system clearly shows that these resources exist. Similarly, numerous studies have highlighted that Ireland has more than sufficient onshore wind, offshore wind, and solar to cover all of Ireland's electricity demand[12]. **IWEA believes that if DCCAE set a high level of ambition for RES-E in 2030, then the value of diversity is increased and IWEA supports the flexibility included in the RESS consultation for the auction design to respond to this over the period from 2020-2030**.

Furthermore, IWEA would encourage DCCAE to consider Ireland's 2030 RES-E target in the context of Ireland's longer-term ambitions. IWEA recognises that in order to reach the Paris Agreement

[11] Assuming a wind power penetration of 67% in 2030 and average capacity factor of 30%
[12] p27 http://vbn.aau.dk/files/66664679/David_Connolly_PhD_2010_Updated_Journal_Appendices_2012_.pdf

objectives, Ireland will need a range of renewable electricity technologies, from smaller wind/solar farms to very large-scale renewable projects such as onshore/offshore wind farms. Hence, the RESS auction mechanism design needs to ensure that Ireland can utilise these RES potentials.

It is also difficult for IWEA to comment on the exact level of diversification that can be expected under RESS without knowing the 'Reference Price' in the electricity market that will be used to determine the 'top-up' for the Floating FIP, since this will define if different renewable electricity technologies can take advantage of market price variations. However, if DCCAE would like to introduce more diversification into Ireland's renewable electricity mix, then there must be a clear added value for the consumer from this diversity. The electricity market price should reflect this opportunity as more wind power will reduce the price of electricity prices during windy periods, leaving higher price periods for other renewable electricity technologies. **Therefore, IWEA would support an approach to diversity that accounts for the cost benefits in the electricity market so there is clear added value of this diversity for the consumer.** IWEA would also support very small technology specific pots for research and pilot projects, where these technologies are clearly innovative and have the potential to develop at a scale that could bring significant public benefit in due course.

2.5 Question 5.

Separate to the Principal Category RESS, a dedicated Community Category volume of renewable capacity (MWh) allocated for community-led renewable projects is envisaged in the preferred approach. The initial proposal is that between 10-20% of the total capacity (of new MWhs) of each auction is ring-fenced for community-led projects. *Do you agree with this proposal? What changes would you propose to this proposal including reference to the viable level of ambition for community-led projects?*

Yes, IWEA is in support of the proposal to accommodate a dedicated Community Category for community-led renewable projects. IWEA advises that the Community Category should be designed so that it can operate as intended and deliver genuine community-led projects at value to the consumer in the necessary timeframe. IWEA would recommend that the detailed design incorporates the following key elements:

a) **Genuinely Community-led:** IWEA notes that in results of an auction in Germany in May 2017, a single developer, UKA Group, was behind 70% of community-led projects successful at

auction. IWEA recommends that community-led projects benefitting from protection in a separate Community Category are monitored to ensure they are genuinely community led.

b) **Recycling Unused Capacity:** IWEA recommends that if capacity remains unused in the Community Category, this is recycled into the Principal Auction.

c) **Value to the Consumer:** IWEA recommends a cap is placed on the clearing price in the Community Category relative to the Principal Auction in order to protect the consumer. For example, the clearing price could be limited so as not to exceed a percentage of the clearing price in the Principal Auction.

d) **Viable Projects:** To ensure only viable projects are awarded contracts, IWEA recommends that pre-qualification criteria should be the same across both the Community Category and the Principal Category. In the same auction in Germany in May 2017, 65 of 70 successful projects were community-led, facilitated by relaxations for planning and grid permits. Many of these projects do not have full permits and as a result there are concerns as to whether these projects will be delivered successfully[13]. In the Irish context, the detailed design of the RESS should ensure that community-led projects participating at auction are fully permitted and do not have relaxations that allow speculative bidding at auction.

2.6 Question 6.

Do you agree with the proposal to further develop opportunities for micro-generation, outside of the main RESS? Respondents are asked for their views on how best to support micro-generation.

IWEA believes that microgeneration has the potential to make a real contribution to Ireland's decarbonisation. Addressing the residential sector in a meaningful way should decrease overall energy demand and see consumers becoming more engaged in their energy usage.

In order to progress the RESS auction and to kick start large-scale development **IWEA agrees with the proposal to provide for microgeneration separately**. However, to effectively incorporate microgeneration, a review of the tariff methodology is required. Looking to the approach in other EU states, a net metering scheme has also proven an effective catalyst for microgeneration at least in the short to medium term. In addition, and in line with Government strategy the electrification of heat and transport could have a mutually beneficial relationship with microgeneration.

[13] https://www.windpowermonthly.com/article/1442146/single-developer-wins-68-second-german-tender

2.7 Question 7.

Do you agree with capping the amount of support received by each RES-E project that clears in a RES-E auction? What changes would you make to the proposal to set this cap by the level of support (€/MWh) determined in the auction and the cleared volume of the project (MWh).

Through a meeting between IWEA and DCCAE we have gained a clearer understanding of the budget control mechanism for the auction design. Effectively, under this mechanism bidders would be required to submit the level of support (€/MWh) required for a project, as is the norm with a standard price auction, but would also be required to submit the overall level of support (€m = €/MWh x MWh) for each project. This approach is designed to ensure that no project receives financial support, funded by the consumer, in excess of the amount of support the project was estimated to require at the time of the auction. As a principle, having regard to the different objectives of the DCCAE in designing this new RESS, **IWEA has no issue with applying a budget control mechanism that provides certainty for both the developer and customers**. This certainty is clearly preferable to the ex-post budgetary adjustments seen in certain RES-E support schemes in other Member States. However, as proposed, **IWEA has material concerns that the approach to capping project revenue is overly-simplistic and open to gaming**.

Simple auction designs are based on bidders competing over price, with quantity usually fixed and budget caps typically determined by the bidders. In this type of regulatory auction, there remains competition over price but there is an external, overall budget constraint for the auction imposed by Government, and that constraint is met through a combination of price times quantity. Nevertheless, competition in the auction is still over price. Therefore, without any further controls, bidders face no incentive to correctly identify the expected output of their project, thus allowing for the overall cleared volume bid into the auction to act as a quasi-insurance policy against market risk for greater than expected generation, or to put it another way, to incentivise capacity hoarding in the auction. The design of such a mechanism is complex and requires far greater consideration than is provided for in the consultation paper. While the overall objective being pursued is reasonable, the proposed mechanism for achieving the objective overly simplifies the problem and is open to abuse with potentially serious implications for developers, consumers and the Government.

IWEA has a number of proposals that could provide budget certainty without imposing constraints that would drive up bid prices unnecessarily, and we would welcome the opportunity to engage further with the DCCAE on this point.

2.8 Question 8.

Do respondents agree with the proposal to hold periodic auctions e.g. every two years, over the course of the lifetime of the scheme, to take advantage to falling costs and reduce the impact on the electricity consumer? What changes if any would you make to this proposal?

Yes, IWEA fully supports initiatives to deliver renewable electricity at lowest cost to the consumer and agrees with the proposal to hold periodic auctions over the lifetime of the scheme. However, IWEA also believes that it is essential to be aware of the strong relationship between investment certainty and the costs of electricity.

Renewable projects take 5 to 10 years to develop to financial close. Without adequate investment signals, risk premia will increase to cover unknown or higher risk of investments not providing a return. In the worst-case scenario, without any forward signals, investment may decrease thereby reducing competition at auction and creating upward pressure on clearing prices.

Reliable investment signals should extend over a 10-year timeframe to create an environment where greenfield investment can continue to deliver a sufficient volume of low cost projects ready to compete at auction. **IWEA recommend that DCCAE provide clear forward signals on auction technologies, volumes and dates to deliver renewable electricity at lowest cost to the consumer.** This could be connected to Ireland's overall renewable electricity target in 2030, which IWEA believes should be 70% RES-E rather than 40% RES-E as discussed in detail in Q10.

2.9 Question 9.

Do you agree that planning approval, grid connection, bid bonds/penalties and community participation criteria should be met before projects can apply for support under the new RESS? What other pre-qualification criteria would you like to see introduced?

IWEA agrees in principle and subject to caveat, that planning approval, grid connection, bid bonds/penalties and community participation criteria should be met before projects can apply for support under the new RESS, since this approach should prevent unrealistic and/or speculative projects bidding for RESS-E capacity. IWEA is firmly of the view that pre-qualification criteria should be clearly defined and unambiguous. In this regard, IWEA would suggest that for example a "Final Grant of Planning Permission" be specified as opposed to just "planning approval". The same criteria

should be applied to both large and small projects, and community or developer led. This principle is important to achieve fairness, and to ensure that less mature projects do not hold capacity contracts at the expense of fully developed and viable projects.

IWEA believes that the Enduring Grid Policy needs to be developed in tandem and with strong reflection of the move to the RESS scheme. Note the grouped grid policy approach, a more unique feature of the Irish electricity market, has special implications for auction based support. Project costs are more financially intertwined than in other countries where projects' grid arrangements are more independent.

Another concern is that requesting full consent for grid application clashes with the timelines of RESS auctions. If IWEA considers the sequential application process - it is possible that years can be lost from the planning consent's validity while a grid application is being processed to completeness. This would place project developers in a poor position, potentially leading to a single auction window being available before planning consents expire. This could in turn negatively impact on investment in renewable energy projects in Ireland.

In general, DCCAE needs to have special consideration of the 'gated connection process' when it comes to the design of the RESS. This clustered grid development strategy is a unique feature of Ireland - and therefore will not lend itself to off the shelf solutions learned from other countries. (e.g. what are the implications of different projects in a cluster bidding for different delivery years - or the implications of only 30% of projects in a cluster securing a RESS contract?).

2.10 Question 10.

DCCAE welcome the respondents' views on the PSO levy supporting a baseline 40% RES-E. Do you think the PSO should support higher levels of ambition?

IWEA believes that consideration should be given to the PSO supporting RES-E ambition levels well beyond the 40% currently proposed. The primary evidence put forward in the Cambridge Economic Policy Associates Ltd. (CEPA) analysis that would militate against high targets, is that PSO costs start to increase significantly once ambition levels beyond 40% are modelled. IWEA is of the view that this result is predicated on a very narrow view of the potential development of the electricity system out to 2030. In addition, while it is acknowledged in the report that the impact on PSO costs is partially offset by the merit order effect of variable renewables on wholesale energy prices, this point is not addressed in sufficient detail. The cost / benefit analysis on behalf of consumers should consider all

aspects of wholesale energy costs, including wholesale energy prices, capacity payments, system services payments and the PSO, and in addition should incorporate a risk assessment, examining a range of future fossil fuel and carbon price scenarios.

IWEA highlights that while existing wholesale markets are very effective at minimising short run marginal cost of electricity generation to the benefit of consumers, this consumer protection is provided over very short time horizons. It is IWEA's contention that the existing market designs are not effective at protecting consumers from high costs over medium to longer term time horizons. In this respect it is perhaps inappropriate to classify the proposed new RESS auctions as a support scheme, rather it is a necessary extension of competitive electricity markets to provide this missing protection, i.e. a hedge against future fossil fuel price spikes. The extent of this protection is very much linked to the RES-E % target selected, and this should be an important consideration when determining the appropriate level of ambition. This risk assessment and hedging benefit was missing from the Cambridge analysis.

IWEA would also like to highlight the close relationships that exist between the LCOE's of potential RES-E technologies and national energy policy and regulations. With effective regulation and policy, the costs of delivering a deeply decarbonised electricity system can be minimised.

These points are outlined in more detail below under the following broad headings.

- IWEA's technical modelling indicates that variable RES-E Curtailment in 2030 will be much less than calculated in the RESS Consultation.
- IWEA's economic analysis concluded that lower curtailment levels reduce the impact on the PSO; the cost for the consumer is significantly reduced when the cost reductions in the wholesale market are considered; and based on auction prices in other EU markets there is potentially no additional cost to the consumer for higher RES-E targets.
- Finally, IWEA would like to highlight that a high RES-E penetration can provide a foundation for higher RES-H and RES-T contributions.

2.10.1 IWEA Technical Modelling of 2030

IWEA's technical modelling indicates that variable RES-E Curtailment in 2030 will be much less than calculated in the RESS Consultation.

IWEA have commissioned Mullan Grid Consulting to prepare an analysis replicating the curtailment findings noted in the Cambridge report. Following validation of the model, the input assumptions driving these high curtailment levels are then challenged and curtailment levels for a range of realistic alternative scenarios / assumptions were determined.

The Mullan Grid analysis makes the following high-level observations in relation to the Cambridge Report:

- No reference was made to how the existing interconnector operation might change following the introduction of I-SEM and no reference was made to any additional installed Interconnector capacity, so for the purposes of the replication analysis no changes were assumed to existing interconnector operation.
- The SNSP limit is assumed at 75% in 2030 but all other system constraints included in EirGrid's Operational Constraints update October 2016[14], would remain unchanged over this period. The effect of these operational constraints is to effectively constrain on, existing conventional plants for system stability / security reasons. This is known within industry as minimum generation constraints or min gen and it reduces the space available for more renewable generation on the system.
- No additional storage capacity was referenced in the study
- No additional demand flexibility measures were referenced in the study.

The assumptions used are therefore broadly representative of the expected system status in 2020 rather than 2030 and as such more likely represent a worst-case curtailment prediction rather than a base case. Mullan Grid replicated the above assumptions in their analysis, and within the narrow confines of the input assumptions used, the curtailment calculations were in agreement with those identified in the RESS consultation.

Mullan Grid then examined a range of system developments considered reasonable over a time horizon expanding out to 2030 and examined the impact of these developments on curtailment for the 45%, 50% and 55% RES-E targets, which included:

- **Adding Additional interconnection capacity:** Two additional interconnectors, with a total additional capacity of 1450 MW were added to the mix. This figure was selected from the low carbon living scenario included in the recently published EirGrid Scenario's Report[15]. While low carbon living was the most ambitious scenario presented in this report, 3 of the 4 scenarios considered significant additional interconnection. To lend further weight to this assumption it is also worth noting that there are active plans in place for the development of additional interconnectors to GB (Greenlink) and France (Celtic). Additionally, the EU has set a target that each country should have a minimum of 10% of installed electricity generation capacity as interconnection by 2020, and is considering a proposal to increase this target to 15% by 2030. With over 12 GW of generation capacity forecast to be on the system in ROI by 2020, this would translate into a minimum required interconnector capacity of over 1800 MW by 2030 before considering any additional generation plant required to meet predicted rising demand.

[14] http://www.eirgridgroup.com/site-files/library/EirGrid/OperationalConstraintsUpdateVersion1_44_October_2016.pdf
[15] http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Tomorrows-Energy-Scenarios-Report-2017.pdf

- **Reducing Min Gen and increasing SNSP to 80%:** It should be noted that a relatively small reduction in Min Gen would have the same curtailment mitigation effect as large pumped hydro storage project. To support the proposed min gen and SNSP changes, IWEA would point to several recent studies and developments. In August 2015, EirGrid published a report by DNV GL[16] in which alternative solutions to increased Rate of Change of Frequency (RoCoF) limits were considered. This report found that the following technologies could be particularly effective at limiting the frequency disturbances on the system at lower levels of conventional generation;
    - Synchronous compensators
    - Rotating stabilisers
    - Enhancing the conventional fleet to reduce their minimum operating levels
    - Adding new pumped hydro capacity (i.e. this would have benefits beyond simply storing surplus power)
    - Adding flexible thermal power plants

  In addition to this study, EirGrid have recently been awarded €20m Horizon 2020 funding for their EU-Sysflex project[17]. This project will run for 4 years out to 2021 and can potentially identify significant improvements in system flexibility to facilitate greater penetration of renewable technologies. In awarding the lead role on this project to EirGrid, a project in which almost every country in Europe has sought to be represented, the EU is recognising Ireland's leading role globally in this space. This world-leading competence should be matched by world leading RES-E ambition.
- **Adding an additional 360 MW of PHES:** This assumption is also taken from the EirGrid Low Carbon Living scenario. It is worth noting that there are several developers actively working on the development of new PHES projects, some well publicised, and so this is not an unrealistic assumption for a 2030 system.
- **Adding new flexible demand from heat pumps and Electric Vehicles (EV's):** Again, this is taken from EirGrid's low carbon living scenario in which it is envisaged that by 2030 there will be 426,000 new EV's on the roads and 279,000 new domestic heat pumps installed. With recent announcements on EV's across Europe this level of EV penetration should be considered realistic. Also given that electrification of heat through the use of heat pumps can be of considerable benefit to Ireland in meeting non-ETS emissions reduction targets, incentivisation of this level of heat pump installations would also seem to be a reasonable assumption.

When these measures are considered, combined variable RES-E curtailment levels reduce from 20.0% to 4.3% for a 55% RES-E target. A detailed analysis of EirGrid's complete low carbon living scenario would indicate that 75% RES-E is achievable at curtailment levels of only 6.1%.

[16] http://www.eirgridgroup.com/site-files/library/EirGrid/RoCoF-Alternative-Solutions-Technology-Assessment-Phase-1-DNV-GL-Report_.pdf

[17] http://www.eirgridgroup.com/newsroom/horizon-2020-funding/

IWEA would also highlight the importance of aligning the development of these measures with planned decommissioning of the conventional fleet. It is critical that appropriate market and system service incentives / signals are in place such that new capacity being added to the system, as old plants come offline, are appropriate for an efficient highly decarbonised system. Additional RES-E capacity is likely to be added gradually out to 2030 and it is important that this, the natural decommissioning of conventional plant and the roll out of the various mitigation / integration measures are reasonably aligned.

2.10.2 IWEA Economic Modelling of 2030

IWEA's economic analysis concluded that lower curtailment levels reduce the impact on the PSO; the cost for the consumer is significantly reduced when the cost reductions in the wholesale market are considered; and based on auction prices in other EU markets there is potentially no additional cost to the consumer for higher RES-E targets.

Cast in the light of this broader view of the electricity system outlined above, IWEA believes that far from being an ambitious target as stated in the DCCAE paper, the RES-E 55% level is completely lacking in ambition and vision. It is also misleading in reporting that a 55% RES-E target would mean "*6 times higher consumer costs*". It is important to recognise that the world is on a path to total decarbonisation. In time, heat and electricity will be electrified, so a low or zero carbon electricity system is a key foundation for any country serious about weaning itself off fossil fuels. Decisions made this year which guides plant and investment over a 20-year lifetime will still have an effect in 2040. Ireland will by then only have a decade to fully decarbonise. If Ireland is to avoid the cost of stranded investment in fossil fuel and conventional technologies, we must ensure we are building mainly renewable technologies throughout the 2020-2030 period. However, any rational policy maker would surely struggle to move away from the 40% RES-E target, let alone the 55% level, based on the figures Table 4.8 of the "Cambridge Economic Policy Associates (CEPA)" report that accompanied the RESS Consultation, which shows the viability gap (or PSO cost) of a 55% RES-E target rising to €6.1 billion over the 2020-2030 period.

To demonstrate how higher levels of RES-E are in fact technically feasible and economically preferable, IWEA commissioned Baringa to model the cost implications of higher RES-E penetrations for Ireland by 2030 (**more details are provided in Appendix 1**). To evaluate the costs in detail, Baringa modelled following scenarios:

- **55% RES-E Badly Balanced:** replicates the CEPA 'Target 55%' scenario as close as possible based on the data and assumptions available in from the Consultation

- **55% RES-E Well Balanced:** Introduces flexibility measures listed in EirGrid's Low Carbon Living Scenario in the "Tomorrow's Energy Scenarios" report, which was published earlier this year.
- **75% RES-E Well Balanced:** Increase the RES-E and all other input parameters up to EirGrid's Low Carbon Living Scenario.

In the first scenario, "55% RES-E Badly Balanced", Baringa completed a full market study to replicate the CEPA methodology using the same inputs, including fossil fuel prices, carbon price assumptions, the generation mix and the levelised costs of technology for each renewable energy source as estimated by PB Powers report in the Consultation. The Baringa modelling team were able to fairly closely replicate the €6.1 billion viability gap found by the CEPA study, as well as the 20% curtailment levels reported. **In contrast to the CEPA published results, the Baringa study reported not just the impact on the PSO (c.f. the "viability gap") but also the effect on total cost to consumers.** This is important because as zero marginal cost generation, such as wind, is added to a power market, prices are reduced for all consumers. **The better way to evaluate a policy is to look not just at the PSO, but the overall impact on cost to consumers.** When this is taken into account, the actual consumer cost of the "55% RES-E Badly Balanced" scenario is in fact €4.7 billion (see Figure 1). IWEA is firmly of the view that this scenario is however entirely unrealistic. In practice, any well-functioning market would attract investment in additional flexibility measures such as such as batteries, demand side flexibility, interconnection and pumped hydro) based on the increased price volatility resulting from higher wind levels. In addition, technologies such as electric vehicles are likely to increase the flexibility on the demand side.

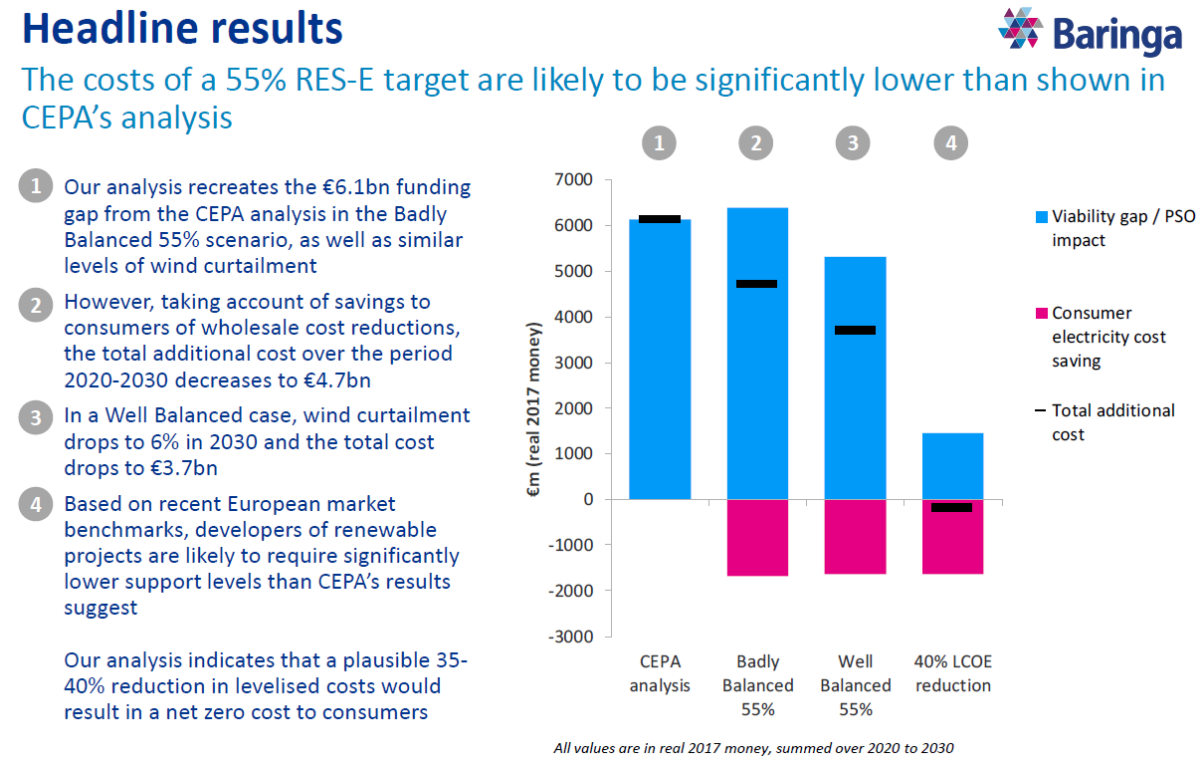
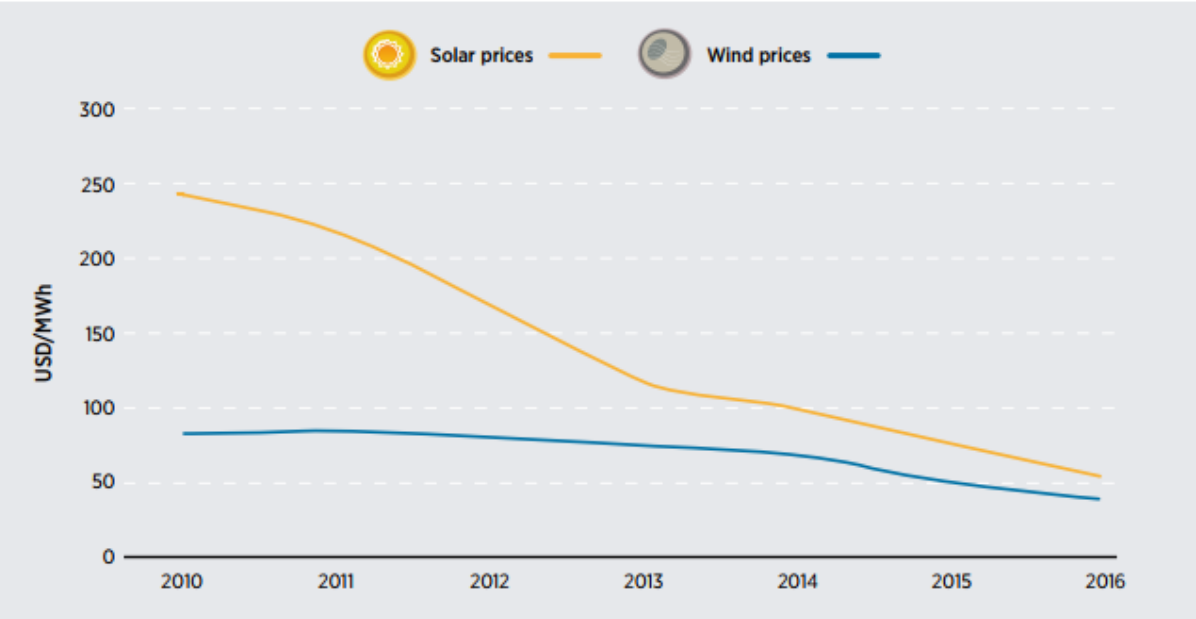


Figure 1: Headline results from the economic analysis carried out by Baringa.

In order to demonstrate this impact, Baringa then modelled the "Well Balanced 55% scenario", with all the flexibility measures identified in EirGrid's Low Carbon Living Scenario (storage, flexible demand, EVs, heat pumps and additional interconnection and higher SNSP levels). This further reduced the cost to consumers to €3.7 billion. The savings accrue because wind captures a higher share of market revenues, reducing the viability gap required. In addition, **this system exhibits much lower curtailment than the Badly Balanced scenario, with levels falling from 20% down to around 6% in 2030**. It is important to note that this model was using exactly the same inputs as the CEPA modelling figures, including the PB Power levelised cost estimates. It is IWEA's view that those prices are higher than market levels seen in auctions around Europe. During the 2030, our modelling (and that of CEPA) is based on the assumption that fossil fuel prices will increase, but that renewable energy levelised costs will be decreasing. On average over the 10-year period the LCOE of the marginal technology assumed by CEPA is €110/MWh. For comparison, a typical REFIT PPA earns around €75/MWh. Baringa has calculated that if the average LCOE turned out to be 35-40% lower than CEPA/PB Power estimated, i.e. **with an average price of €66/MWh, then the net cost to consumers of running the RES-E 55% target would actually be zero**. In fact, such a reduction would seem possible, or even likely, given that

recent auction prices for onshore wind, offshore wind and solar have cleared at approximately €40-60/MWh[18,19,20] (see Figure 2).

It is clear that at those sorts of levelised costs, Ireland should not even limit its ambition to 55% RES-E. Baringa went on to estimate that **if the average price of renewables was to be 50% lower than assumed by CEPA, i.e. around €55/MWh, then Ireland could move to a 75% RES-E power system by 2030, and still zero increase in costs for consumers**. This is a completely different conclusion to the one proposed based on the €6 billion cost identified in the CEPA modelling and DCCAE paper.



Source: IRENA, 2017.

Figure 2: Average prices resulting from auctions, 2010-16. IRENA: "Renewable Energy Auctions: Analysing 2016", 2017

2.10.3 Higher RES-E for Higher RES-H and RES-T

IWEA would like to highlight that a high RES-E penetration can provide a foundation for higher RES-H and RES-T contributions.

Electrification will be the foundation of a low carbon energy system in Ireland in the future. Heat pumps are taken here as an example to demonstrate the benefits of electrification, not only for RES-E penetrations, but also in terms of increasing RES-H also.

[18] http://www.irena.org/DocumentDownloads/Publications/IRENA_REAuctions_summary_2017.pdf
[19] €42.8/MWh Onshore: https://www.ecofys.com/en/news/second-onshore-wind-auction-in-germany-costs-decrease-further-and-citizen-g/
[20] €49.9/MWh Offshore: https://corporate.vattenfall.com/press-and-media/press-releases/2016/vattenfall-wins-tender-to-build-the-largest-wind-farm-in-the-nordics/

A heat pump uses electricity to recover renewable heat from the environment. Typically, a heat pump will produce 3 units of heat output for every unit of electrical input i.e. it has a Coefficient of Performance (COP) of 3. When a building switches from a fossil fuel boiler to a heat pump, the entire heat usage of the home is removed from the Non-ETS sector and hence supports National Non-ETS emissions targets, while the energy demand drops by a third and becomes electricity in the ETS. This means that there is an efficiency gain of 300% with a typical heat pump and a major boost for RES-H targets. If the power required to run these pumps is substantially renewable, this further amplifies the benefit in supporting the cross-sectoral renewable energy targets. To put this in context, the heat demand in Ireland is currently ~50 TWh, made up of:

- ~24 TWh residential
- ~10 TWh commercial
- ~16 TWh industry

If all heat in the residential sector comes from heat pumps (i.e. the 24 TWh), then with a COP of 3 it would mean that one-third would move to the electricity sector (8 TWh) and two-thirds would stay in heating and be defined as renewable heat (16 TWh). Therefore, the new 'heat demand' would be reduced to 42 TWh (i.e. 50-8) and the renewable heat penetration due to heat pumps in the residential sector would be 38% (i.e. 16/42).

Based on this, electrification via heat pumps can make a very strong impact on the non-ETS sector i.e. since they remove one-third of the demand/CO2 over to electricity (ETS) and they make the other two-thirds completely renewable. To maximise the benefit from this transition, it is essential that Ireland has a high RES-E penetration also, so the new electricity demand is also from a sustainable resource. Therefore, **IWEA strongly supports a high RES-E target, not only for the decarbonisation of electricity, but to facilitate the decarbonisation of heat and transport also**.

2.10.4 Conclusions

- With appropriate sensible measures, most of which are actively being progressed, Variable RES-E Curtailment in 2030 will be much less than calculated in the RESS Consultation
- Lower curtailment levels reduce the impact on the PSO; the cost for the consumer is significantly reduced when the cost reductions in the wholesale market are considered; and based on auction prices in other EU markets there is potentially no additional cost to the consumer for higher RES-E targets.
- With improved consultation and co-operation between, Government, Regulators, System operators and Industry, smarter innovative policies and regulation, can deliver more commercially efficient risk allocation resulting in maximum savings for consumers.

- A high RES-E penetration can provide the foundations for higher RES-H and RES-T penetrations
- Increasing renewable electricity offers a clear pathway for Ireland to aggressively move to wean ourselves off fossil fuels. It is enabled by the great natural resources of wind, solar and biomass available on the island of Ireland, along with recent advances in the respective technologies and ground-breaking approach of the Irish system operator. This prize is there for the taking. The RESS scheme has the potential to be the foundation for achieving this prize.

In summary IWEA rejects the premise in the consultation paper that 2030 RES-E targets should be in the range 40% to 55%. Baringa has shown that higher targets need not imply higher costs to consumers. If auction prices clear around EUR55/MWh, **then in fact Ireland can and should aim for a 75% RES-E target or 2030, because this would not increase costs for consumers over the do-nothing (c40%) scenario.**

2.11 Question 11.

It is proposed that highly efficient CHP plants may be able to avail of financial support under a renewable electricity support scheme (RESS) for electricity generated (through the technology neutral competitive auction process described) and under a renewable heat incentive (RHI) for the heat produced. Under this approach, issues related to the accumulation of aid (in order to exclude overcompensation) would need to be addressed. Do respondents agree with this approach? What are respondents' views on an alternative approach whereby renewable energy CHP plants receive support from the RESS or the proposed RHI but not both, and that the project promoter should decide which support scheme best suits the proposed development.

IWEA has no issue with highly efficient CHP plants availing of RESS for electricity generated and RHI for heat generated subject to the following: The heat generated is only eligible for RHI support where it serves real **third-party** heat demand **not associated with the renewable electricity or heat installations themselves.** (This would exclude for example the drying of biomass for the CHP unit.) The CHP units' bid into the RESS auction process should encompass the **full** cost of **any** fuel drying.

IWEA believes this is a reasonable approach which would safe-guard from over-compensation and would be in line with the principle laid out in Section 6.6 of the RHI Consultation published in January 2017 states:

"It is possible that renewable heat supported through the RHI will not always be used in the most efficient way, but will still receive payments. It is important to discourage bad practice and inefficient use of heat, where possible.

Minimum energy efficiency criteria, as described in section 6.4, will prevent some instances of poor heat use, but additional criteria may be required to prevent misuse of the scheme. In some circumstances, for example, the heat produced from a CHP unit is greater than the on-site heat demand, and there is a risk that the heat will not usefully meet any existing demand. The application of deemed heat use (rather than metered heat use) could help mitigate this issue (see section 6.13 on metering).

It will also be important to consider which heat uses should be eligible for the RHI. For example, an AD CHP plant typically uses a proportion of the heat produced in the AD process itself. Renewable heat might also be used for drying biomass to improve the biomass fuel quality or for drying digestate before it can be used as a fertiliser. These uses of the heat are not replacing any counterfactual (since the heat demand is associated with the renewable heating installation itself), and as such may be deemed ineligible. The U.K. RHI has some important 'exemptions' which relate to the drying of biomass carried out on a commercial basis (which may be assessed for eligibility on a case by case basis) and for and AD digestate pre-treatment. For anaerobic digestion plants, the pasteurisation of feedstock before they enter the digester, and the digestate, is regarded as eligible processes. These different uses will be considered as part of the RHI in Ireland."

In terms of the alternative proposal, IWEA believes that the principle should be to implement a structure where a CHP unit is not disadvantaged in terms of the supports it is eligible for relative to 2 separate units producing the same heat and power output. Equally important, for State Aid purposes it is essential that for each biomass CHP applicant the regulator ensures that the total sum of RESS and RHI funding does not amount to over-compensation.

Community Engagement

The remaining questions in the RESS consultation relate to various aspects of Community Engagement that are proposed. As an introduction to these questions, IWEA would like to point out that our members strongly support best practice in community engagement since it benefits everyone when there is a strong social acceptance for more wind farm development. IWEA is committed to working with policymakers on clear achievable changes that bring about trust, confidence and empowerment for communities. With this in mind, IWEA has developed a range of 'Best Practice' guides for our members in relation to Community Engagement, including:

- An Irish Energy: Perspectives and Policy Recommendations on the Shared Ownership of Irish Renewable Energy Developments, 2016[21]: proposes a number of policies that could facilitate Shared Ownership in wind energy in the future.
- Good Neighbour: IWEA Best Practice Principles in Community Engagement & Community Commitment, 2013[22]: includes a minimum recommendation for community benefit schemes equivalent to a value of at least €1000/MW of installed capacity per annum, which is index linked for the lifetime of the project. For a modern turbine, which is typically ~3 MW and has a lifetime of at least 20 years, this would equate to at least €60,000 per turbine.
- Best Practice Guidelines for the Irish Wind Energy Industry (Chapter 11: Community Engagement), 2012: provides recommendations on how and when to engage with communities.

Therefore, IWEA's member are currently leaders in community engagement compared to all other forms of electricity generation and compared to many other forms of infrastructure in Ireland. IWEA is always trying to improve the social acceptance of wind farms and supports the intentions of the DCCAE related to Community Engagement in the RESS consultation. However, IWEA would like to highlight that the proposals by the DCCAE are extremely ambitious so there are significant challenges ahead in successfully delivering these. To maximise the potential success of these proposals, IWEA strongly recommends that going forward some important principles are considered by DCCAE when finalising the design of community engagement in future renewable electricity projects, which are:

1. **Additional community engagement should not reduce the competitiveness of a renewable electricity project:** when additional methods of community engagement are introduced, then these should not reduce the prospects of the project being successful in an auction. For example, **IWEA supports a standard €/MWh community benefit contribution across all renewable electricity projects so all projects have the same costs implications when bidding in an auction**. Similarly, it is essential that higher levels of community ownership do not add additional costs to a project. For example, if DCCAE proceed with a minimum 20%

[21] http://www.iwea.com/index.cfm/page/iweapolicydocuments?twfId=2389&download=true
[22] http://www.iwea.com/iweabestpracticeprinciplesinco

offering for community ownership, then **projects that achieve a higher take-up of this offering should not have additional costs compared to a project with a lower take-up**. To ensure this, DCCAE could offer an incentive to renewable electricity projects that meet the minimum take-up, for example, by providing an additional contribution of €0.50/MWh to projects that exceed 10% community ownership and €1/MWh to those that reach 20%. In this way, community engagement via community ownership will increase the competitiveness of projects that successfully implement it. (Please note these are arbitrary figures rather than figures put forward by industry – IWEA members would seek the opportunity to work with DCCAE in establishing suitable numbers).

2. **The Community Benefit contribution should provide flexibility for different communities:** if a community benefit contribution is required with RESS, then IWEA requests that this can be provided using a variety of options so that the needs of different communities can be accommodated. Some examples are presented in responses to Q18 such as discounted electricity and sustainable energy grants, which when combined would sum to the total community benefit required e.g. €2/MWh. Communities vary considerably in size, demographics, and needs, so this flexibility would enable renewable electricity projects to accommodate the specific needs within the surrounding area.
3. **Community engagement criteria should only be applied when it is possible for developers to meet the criteria: the RESS consultation presents a very extensive and ambitious set of community engagement proposals**. As mentioned previously, IWEA supports the intent of these initiatives, but cautions that if community engagement criteria will be required to enter the RESS auctions, then it will be essential that the supporting structures from other institutions are in place to facilitate this, such as the Trusted Intermediary. If not, then the community criteria could prevent future renewable electricity projects from being built in the short-term which will have a negative impact on Irish electricity consumers. For example, IWEA believe it is unlikely that REFIT will support sufficient renewable electricity capacity for Ireland to meet its 2020 RES-E target of 40%, so some projects will need to be developed under RESS to achieve this, which means the first auction for RESS must be in place in 2018, which leaves a very short timeframe for the community proposals in the RESS to be established.
4. **It is important to balance the needs of local communities with the cost of electricity for Irish society:** Social acceptance for wind energy across all of society is very strong at present, with ESRI research from 2017 suggesting that over 75% of Irish people are positive about wind energy development (see Figure 3). Community engagement in the RESS consultation is primarily benefiting those that live near a renewable energy project, which is understandable since these are the people who are most affected by renewable energy infrastructure. However, there is an important balance that must be considered between local communities and broader society. Additional community benefit for local renewable energy communities will increase the cost of developing renewable energy projects, which will increase the cost of electricity for Irish society. This will make renewable electricity less competitive compared to other forms of electricity generation and it may result in less social acceptance for renewable energy in Ireland. Therefore, it is essential that any new

community engagement proposals are implemented in a cost-effective manner, to minimise the impact on electricity bills across Irish society.

5. **The RESS consultation is missing a number of important details that will impact the success and cost of the proposals:** At present there are a number of details that still need to be clarified in relation to community engagement in the RESS consultation, which are outlined in more detail later in this response when replying to specific questions: for example, it is not clear how to define a legitimate 'offering' for local investment, the value of a share, and the options available under community benefit. The final design will impact how successfully these community engagement initiatives can be implemented and they will impact on the overall cost of doing so. Therefore, to maximise their success and minimise the costs of implementing these proposals, IWEA requests that DCCAE engage with communities and industry when finalising the design of the community engagement initiatives. A joined-up and integrated approach, that involves the public sector at national, regional and local level, will be necessary to address existing legitimate community concerns that might hinder the prospect of further renewable energy development. In summary, IWEA acknowledges the importance of engaging with local communities where renewable energy projects are developed, but in doing so, it is important to maintain Ireland's wider social acceptance for renewable energy and to create solutions which can be implemented successfully. Specific responses to the individual questions in the RESS consultation are addressed in the remainder of this document.

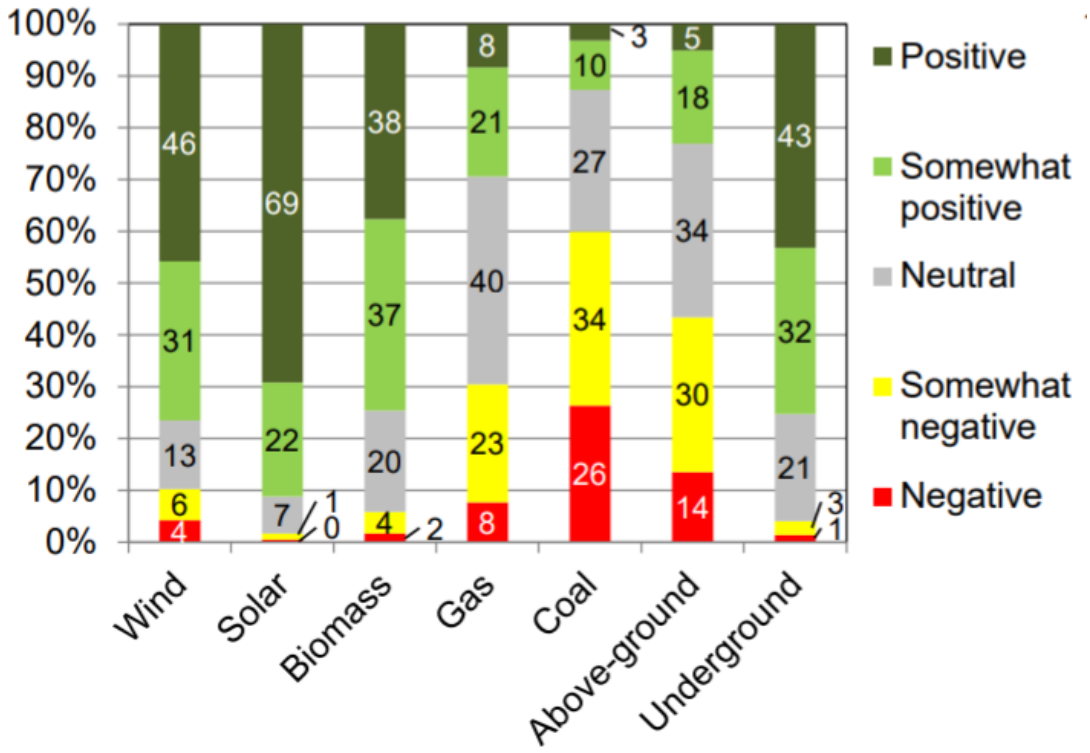


Figure 3: Irish Residents Views of Energy-Related Technologies (Bertsch et al., ESRI, Journal of Energy Policy 2017[23])

[23] http://dx.doi.org/10.1016/j.enpol.2017.04.008

2.12 Question 12.

12a. What should the minimum size of a project be, below which a community investment offer does not need to be made (e.g. 100kW, 500kW, 1MW)?

The most reasonable scenario in IWEA's view, is one where the threshold would be the same as the threshold required to receive a FIP. This ensures that there is fair competition for all projects in receipt of RESS.

12b. What minimum share should be offered to the community for investment (e.g. 20%) and should there be a maximum amount any one individual can purchase?

IWEA strongly supports best practice in community engagement and believes that local ownership has a key role to play in community acceptance of wind energy projects, something that was highlighted in IWEA's 2016 publication "An Irish Energy: Perspectives and Policy Recommendations on the Shared Ownership of Irish Renewable Energy Developments". IWEA members are willing to embrace and implement the requirements of policy in relation to community ownership, including any minimum share that should be offered. However, in order for the offering to be equal for all projects (in a competitive auction setting) we would suggest that the investment terms should be standardized – e.g. Danish model and that this standard model is compatible with / does not over-complicate the financing of projects.

In relation to the second part of the question, IWEA would support a cap on the number of shares an individual could purchase since it will likely facilitate access to the investment opportunity to a wider cohort of the local community. IWEA would welcome the opportunity to engage with DCCAE in the final design of the ownership model to ensure it is fit for purpose to serve both community and project.

12c. What is the appropriate distance from the project for the initial offer (e.g. 5km)? Views are welcome on subsequent offers to DED then neighbouring DEDs etc.

In principle, IWEA agrees that priority to invest should be given to those living closest to the wind farm (i.e. within the first 5 km), similar to the system in Denmark. However, IWEA would suggest the scheme have a single offering to avoid complexity. For example, the investment opportunity is advertised and open to all residents within a 10 km radius but those living within 5 km have first refusal. All expressions of interest are made and if the offering is not fully subscribed by those within the 5 km zone it is offered to the residents within the 10km zone. IWEA would echo the above statement that

we are willing to engage constructively with the DCCAE to produce a scheme that will work for the community.

12d. What are respondents' views on whether additional financial supports are necessary in order to enable mandatory investment opportunities for citizens and communities?

IWEA believes that while additional financial supports may be necessary to enable mandatory investment opportunities for citizens and communities, that this is a policy matter for the department. It may be useful to look at what the practice in other jurisdictions is – for e.g. in Denmark no additional subvention is provided by the government to enable investment. IWEA would suggest that the scope of the financial support system should not be overly defined at this stage, until a level of experience has been acquired in Ireland.

12e. Other comments on the mandatory investment offer requirement are welcome.

As mentioned above, the IWEA membership welcomes the mandatory investment offer requirement but recognises that this area is complicated and the model will need to be standardised so as to be equal to all projects entering into it against the backdrop of competitive auctions. The core IWEA principles are:

1. Investment terms to be standardised for the industry – 'level playing field'
2. Investment terms should not disadvantage one project over another (as a result of varying levels of uptake)
3. The legal structure must be precise to avoid complicating project financing

While experiences from other jurisdictions can be cited, there will be the need to design a model that works for Irish communities and Irish project development. IWEA would welcome further clarity from the DCCAE on how the mechanism for the mandatory investment offer requirement might work and furthermore, on what, specifically is being proposed by the DCCAE. For example, some flexibility may be required within the standard approach to account for the different needs of communities. Due to the complex nature of this issue, IWEA would suggest that the DCCAE engages with our members to identify what degree of standardisation would maximise the success of this proposal. Again, IWEA would like to make the offer of giving input to the DCCAE on the design of this model.

2.13 Question 13.

13a. Do you agree with the emerging proposal that a Floating FIP is made available for smaller community projects?

IWEA broadly supports the proposal that a Floating FIP would be made available for smaller community-led projects, since there will generally be a larger cost per unit of energy delivered for these projects. However, to prevent excessive costs for the wider consumer and potential for market distortions, IWEA strongly suggests there is a limit on the capacity that is supported for this project. In the RESS consultation, a 6 MW MEC project cap is proposed which IWEA believes is appropriate.

13b. What should the minimum size project be below which the FIP will not be available?

IWEA remains neutral in regard to the minimum size for projects below which the FIP will not be available.

2.14 Question 14.

14a. Do you agree with the emerging proposal to support community-led projects with grants and soft loans through various stages of a projects development?

IWEA support the proposal to offer development grants in the region of €20,000 to help community-led projects through the initial high-risk stages of projects such as start-up costs, feasibility studies etc. IWEA believe this will help promote community awareness, engagement and ownership of renewable energy developments. IWEA have concerns about the proposal to make soft loans available to community-led projects for the development but more particularly for the construction stages of projects. These stages are capital intensive and the rigorous and thorough assessment and management of risk is essential to ensure project debt is successfully repaid. IWEA strongly believe this is best carried out by regular lending institutions with the requisite skills and experience in lending to energy projects and on standard commercial and legal terms. Soft-loans with generous terms carry higher risks of unpaid debt which has potential to burden the taxpayer and attract negative sentiment to the RESS and the renewable industry in general.

14b. What size of loans for development and construction would you consider to be appropriate to support?

Please see above comments on the risks associated with development and construction soft-loans.

2.15 Question 15.

In respect of Grid Access, DCCAE and SEAI are keen to receive feedback on the policy proposal to facilitate grid access for community-led renewable electricity projects.

IWEA fundamentally disagrees with this proposal as it could lead to significant distortions in the development of renewable energy projects here. IWEA support the improvement of grid access procedures for all participants wishing to connect projects to the system, but recent renewable electricity auction experiences in Germany have highlighted the danger of giving a competitive benefit to one project over another based on its labelling. In that case, two developers used the definition for 'community projects' to capture the majority of auction capacity in the first two onshore wind auctions held earlier this year. In Denmark their proposal for the new auction system (due in late 2018) is for a technology neutral auction where no class of project is advantaged. i.e. no benefit for small or community wind over other competing technologies.

2.16 Question 16.

DCCAE and SEAI welcome feedback on the role of the proposed Trusted Intermediary.

IWEA broadly agrees with the concept of a Trusted Intermediary to act between developer and communities, however, it is essential that the roles of the Trusted Intermediary are clearly defined. IWEA would welcome a set of guidelines on the scope and role of the Trusted Intermediary. As suggested above (at 12e) IWEA see the absolute necessity (in a competitive auction setting) for a standardised approach to a community investment model. Therefore, the role of the Trusted Intermediary could be focused on the communities' approach to administering the community benefit flowing from the project. IWEA suggests that the Trusted Intermediary should not hold a dual role in terms of both facilitating increased community ownership and also certifying whether community related prequalification criteria have been met. The role of monitoring auction eligibility criteria could potentially lie with the Auctioneer or contracting counterparty. Finally, a key factor to consider is the question of who finances the activities of the Trusted Intermediary on behalf of the communities.

2.17 Question 17.

DCCAE and SEAI welcome feedback on the proposed Framework for Trusted Advisors.

IWEA broadly supports this and recommends that a clearly defined framework is established for Trusted Advisors to operate. As per the previous question, the roles of the Trusted Advisors should to

be defined in more detail. For example, what services to they provide, how to ensure they are a credible service provider, and who should finance their involvement? IWEA would emphasise the need for highly qualified experts to provide the services required in the development of a wind farm.

2.18 Question 18.

18a. Do you agree with the proposal that community benefit payment be based on best practice principles?

IWEA suggests that the development of best practice principles, supported by a community benefits register and the level of community benefit at 18b (below) is the ideal mix.

18b. Do you agree with the proposed €2/MWh level of community benefit?

IWEA agree with and welcome the proposed €2/MWh level of community benefit under RESS. IWEA see this €2/MWh as a considerable and targeted initiative to communities hosting wind energy projects which benefit the wider nation by reducing electricity prices and increasing our energy independence. IWEA believes that this should be mandated for all projects, including community-led projects as not everyone in a community will be able to take on direct investment.

IWEA is assuming that the community benefit is payable only for the term of the support under RESS (c.15 years or while the project is in receipt of PSO support), but this should be confirmed in the final scheme design. IWEA also assumes this would not be mandatory for generators (renewable or otherwise) which are not supported by RESS. Finally, IWEA assumes that the total community benefit required must add up to €2/MWh, including any community benefit contributions required under other policies, such as requirements that may be made by Local Authorities.

Do you have any other comments on the proposed community benefit good practice principles?

IWEA wishes to highlight the importance of flexibility in relation to community benefit for both communities and project developers, since both projects and communities can vary significantly. IWEA proposes that a 'menu' approach is adopted where various options for community benefit can be chosen from to make up the €2/MWh total – many of these examples are in practice today.

- Community benefit scheme for common / not for profit projects such as playgrounds, sports and local school facilities
- Electricity discount scheme for nearby houses
- Educational supports
- Broadband provision
- Seed money for an SEAI grant which could be used for energy efficiency options, heat pump, house insulation, etc.

IWEA would propose that the options for this 'menu approach' should not be limited to the above list. IWEA see the Trusted Intermediary as having a key role here in advising communities around the possible options.

2.19 Question 19.

What are your views on the definition of 'community renewable electricity projects', 'community-led community projects' and 'developer-led community projects'?

The definitions for 'community-led' and 'developer-led' community projects are appropriate, however we can find no definition in the texts for 'community renewable electricity projects': IWEA assumes this is encompassed by the 'community led' category (and do not see a need for a third definition). IWEA would caution against market distortions that may be possible if these terms are not very carefully defined in the RESS scheme (refer to German example above).

2.20 Question 20.

What are your views on proposing additional financial measures to enable citizens to invest in projects (e.g. tax incentives, green bonds etc.).

IWEA supports community ownership, however the decision to provide additional financial measures for citizens to invest in projects is more a policy decision for the DCCAE. In Denmark no subsidies are provided to enable citizens to invest in projects.

3 Additional proposals

Although not specifically posed by the questions, IWEA has a short number of additional observations and proposals that we believe merit considering as part of the RESS scheme.

3.1 Opening up RESS scheme to NI projects

The Clean Energy Package provides that 10-15% of national renewable energy support schemes should be open to other Member States. This is to encourage renewables to be built in the most cost-effective jurisdictions. Practically it's hard to see how a solar farm in Romania could participate in RESS, but a wind farm in NI is certainly more credible, given both would operate in the I-SEM market, so calculations around a Floating FIP with respect to reference prices would appear to be relatively straight-forward. There may be some currency and tax differences, but these are probably manageable.

Clearly for ROI to make some of its RESS available to NI, it would need to be made whole on any additional PSO costs created. Presumably this could be achieved with some form of intergovernmental agreement. It would also be necessary that ROI would procure more volumes, to make sure that there is still sufficient capacity procured to reach ROI targets, but that is entirely within the gift of the scheme operators. For many reasons it would be preferable if NI matched the level of wind installed in ROI approximately (for example to justify a pro-rata sharing of DS3 costs, network costs, curtailment costs and interconnector funding).

On the strict proviso that introducing such a scheme would not negatively impact on ROI projects, volumes, targets or consumer costs, IWEA believes that opening up the RESS scheme to NI has a lot of merit.

3.2 Issuance of Guarantees of Origin for RESS Projects

There is an increasing demand from large energy users such as data centres to demonstrate that they are 100% powered by green energy. The Guarantees of Origin (GoO) certificate system is used throughout the EU to achieve this. Under the REFIT scheme these GoOs were not created (essentially remaining the property of the government). **IWEA proposes that under RESS, Guarantees of Origin are permitted to be sold from supported projects**. To the extent that these attract any commercial value, under the competitive pressure of the auctions, this value will taken into account in project bid prices, thus lowering costs for all consumers. This approach will also make it simpler and more transparent for demand customers to demonstrate their green credentials.

3.3 Policy/Regulation Certainty is Essential to Prevent Additional Costs for Renewable Electricity in Ireland

To date, it has been the case that the impact of many national policy and regulatory decisions have been to a large extent hidden by the FiT support schemes. Where policy and regulation have increased underlying costs directly and indirectly on the delivering of renewable projects, these have been absorbed by developers or asset owners resulting in reduced profitability / viability. **In the future, where projects are being procured under competitive processes, all of these decisions will feed directly into the auction bid prices and so will impact directly on the PSO cost for consumers.** Given that PSO costs are to some extent being put forward as a reason to keep targets low, it is perhaps worthwhile to consider other measures that are within the control of various national bodies to reduce these costs. Below, a number of areas are highlighted that are worthy of consideration.

3.3.1 Cost of Capital / Discount rates / risk premiums.

In June 2017, Agora Energiewende published a report entitled "The Cost of Renewable Energy: A critical assessment of the impact assessments underlying the new clean energy for all Europeans package" [24]. This document highlights the importance of appropriate regulation and policy in ensuring low cost delivery of renewable energy technologies. Of particular interest is another study referenced in this document, prepared by Diacore and co funded by the Intelligent Energy Europe Program of the European Union, entitled "The impact of risks in renewable energy investments and the role of smart policies" [25]. Figure 4 below is taken from this report and highlights the variations in cost of capital across Europe.

[24] https://www.agora-energiewende.de/fileadmin/Projekte/2016/De-Risking/Agora_Cost-of-RES_WEB.PDF
[25] https://www.ecofys.com/files/files/diacore-2016-impact-of-risk-in-res-investments.pdf

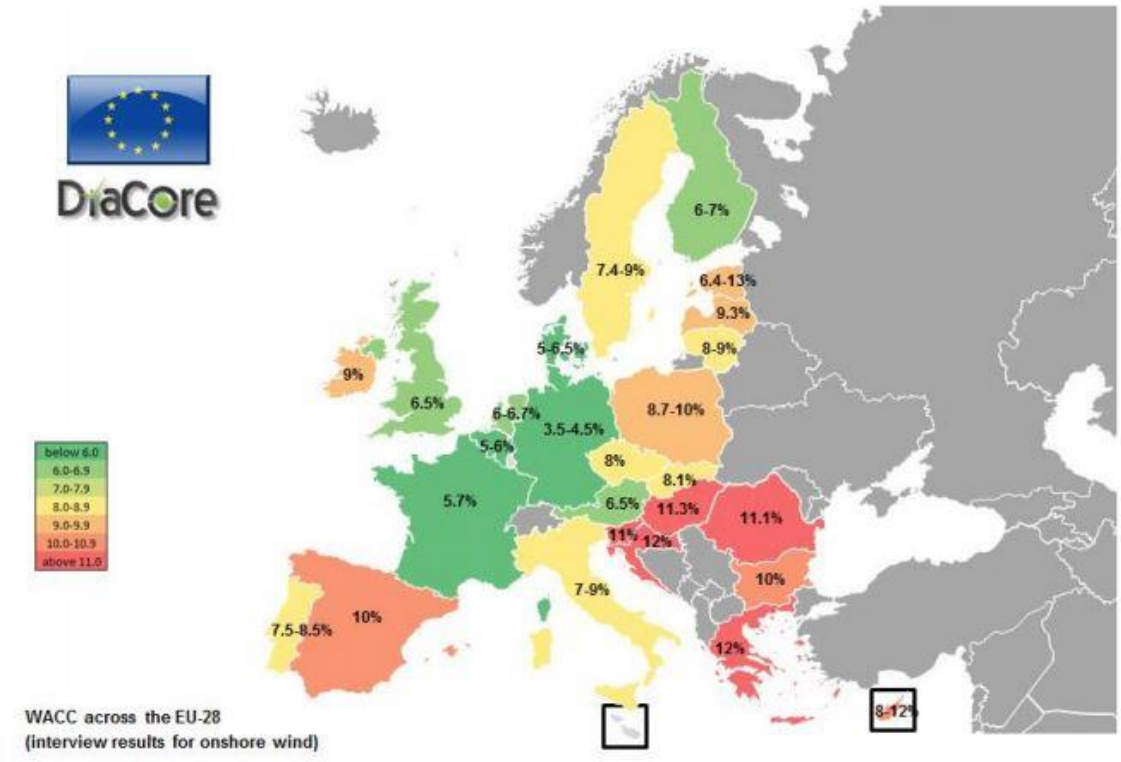


Figure 4: Weighted Average Cost of Capital (WACC) across EU-28, results for on-shore wind.

The LCOE for zero marginal cost renewable technologies , are very sensitive to the WACC, given that almost all of the costs associated with these projects relate to the initial capital investment. This is highlighted in the Cambridge analysis in which the central LCOE for onshore wind based on 10% WACC was €89/MWh while the tailored discount rate of 6.6% resulted in a reduction in LCOE of €12/MWh to €77/MWh.

While recognising that WACC figures will have changed since this study was completed, the differential between cost of capital in Germany and Ireland highlighted in this study is quite extreme. While general country risk would certainly have played a part in this, (Government 10-year bond in the years preceding this study would indicate that general perceptions of country risk would account for in the region of 1.5-2% of this spread; The Cambridge study notes that this has since closed to 0.65%), lower policy and regulatory risks in Germany would seem to be a significant factor. For example, IWEA members currently operating in Germany report that:

- There have been no cases of significant changes in rates charges for wind farms post construction.
- There is little if any volatility in grid 'Use of System' charges and loss adjustment factors post construction (recognising that constructed RES-E projects cannot respond to locational price signals).

- Perceived future curtailment risks would be relatively low (see more on this below)

To put the impact of this difference into context, a crude estimate utilising the CEPA analysis noted above would indicate that each 1% increase in WACC would result in approximately €3.5/MWh increase in the LCOE. This would add almost €10 million every year to the PSO cost for every 1 GW of additional wind capacity that is required[26].

IWEA would therefore clearly highlight the impact of energy policy and regulation on future costs, as an area worthy of particular focus and attention from the DCCAE and CRU.

3.3.2 Curtailment compensation

In moving to a competitive auction system, it should be recognised that the PSO will be paying curtailment compensation either directly or indirectly. This was not the case for REFIT projects, where investor curtailment assumptions had no impact on the REFIT tariff. If the existing policy persists, in which direct curtailment compensation is not considered, policy makers are in effect asking individual projects to estimate what curtailment levels will be over the full life of the project. This estimate will then be factored into the auction bid price along with an associated risk premium. Commercially optimal outcomes usually result when risk is placed with those best placed to manage them. While highlighting that low curtailment levels are fully achievable at high RES-E penetration levels, it is nevertheless the case that individual projects have almost no control over these levels over such a long-time horizon. As such, asking individual projects to provide for this in a financial model stretching over 20 years would seem to be extremely commercially inefficient, and would likely result in higher than necessary PSO costs irrespective of RES-E ambition levels. If curtailment compensation was made directly, DCCAE supported by regulatory authorities and system operators, would be able to manage curtailment at commercially acceptable levels through ongoing monitoring of demand, roll out of mitigation measures and sizing future RES-E auctions appropriately.

3.3.3 Commercial rates

The on-going rates re-valuation process, in which the commercial rates of constructed wind farms are being increased by approximately 300%, is likely to have a significant impact on risk premiums attached to future projects. For constructed wind farms this is an unavoidable charge. DCCAE should therefore realise, that irrespective of the reasons provided for the increase, this can only be interpreted by existing asset owners / investors as a retrospective diminution of a support scheme. This needs to be urgently addressed as it has the potential to damage Irelands reputation as a place

[26] Assuming a 30% capacity factor

to do business. It should also be noted that in addition to the indirect impact of higher risk premiums, this also adds directly to PSO costs associated with auction schemes. Also given that this increase has been applied to renewable generation and not to conventional generation, it could be argued that it constitutes illegal state aid to conventional generators.

3.3.4 Grid connection costs and timelines

IWEA members operating in other jurisdictions have a considerably different experience when it comes to grid connection costs and timelines. As an example, developers operating in Germany and Finland have reported that 96% of their recently constructed projects in these jurisdictions were built and connected to the grid within 15months of receiving a planning permission for their projects. In Ireland this is typically 2.5 to 3 years and there are extreme examples of developers who missed Gate 3 waiting over 10 years without even receiving a connection offer. IWEA understands that the CRU has been working with the system operators to develop a transitional grid access policy ahead of its planned enduring grid access policy. This is urgently required to give clarity and confidence to developers, to allow them to continue to invest in the development of their project pipelines.

3.3.5 Development costs and Risks

As a result of increasing complexity, and various legal uncertainties such as O'Grianna, the development costs have increased, the risk of failure has increased, leading to much higher development cost. At the same time, technology prices and cost of capital have fallen, so development costs are making up a much larger share of the levelised cost of energy from wind. IWEA has separately highlighted the various shortcomings of the current planning system, and we will not go into these in detail here. In summary a fair, transparent and robust planning system, with clear national and regional spatial guidance is vital to keeping development cost and risk under control. Only if this is achieved can the cost of renewables continue to fall.

3.4 Other Policy Options Exist to Stimulate Renewable Electricity

RESS is a subsidy that provides an 'out-of-market' additional payment (i.e. PSO) to renewable electricity producers via the Irish government. However, IWEA would like to highlight that there are numerous other policy options available that could also stimulate additional growth in renewable electricity in Ireland.

In particular, IWEA would advocate that the primary benefit of renewable electricity is that it replaces fossil fuels: coal, oil, and gas. There are numerous benefits for Ireland when this occurs including lower carbon emissions, more local investment, and a more secure energy system due to lower energy

imports. In addition to subsidising renewable electricity, another option for policymakers is to tax the problem i.e. fossil fuels. By adding a tax to fossil fuels, the Irish government would be highlighting the 'problem' in Irelands sustainable energy transition and allocating a cost to this problem. In IWEA's view, the most appropriate tax that could be applied to fossil fuels is an additional 'Carbon Tax', since the objective of Irish[27] , EU[28], and Global[29] energy policy at present is to reduce carbon emissions significantly, to prevent catastrophic climate change. Alternatively, a tax could be added to the various fossil fuels based on the end-user that is impacted, for example across the various sectors such as domestic, commercial, and industry. The Floating FIP in the RESS consultation provides a 'top-up' between a 'Reference Price' and the 'Strike Price'. Applying a tax to fossil fuels will increase the 'Reference Price' in the electricity market which will make renewable electricity more competitive and reduce the 'top-up' burden on the PSO, potentially even eliminating it.

Similarly, policy could evaluate how the electricity market itself could drive investment in renewable electricity rather than the 'out-of-market' (i.e. PSO) that is currently used. Historically, electricity markets have been designed based on dispatchable power plants and as a result, they are not very suitable for non-dispatchable renewable electricity such as wind and solar. Ireland's new electricity market, I-SEM, will be introduced in 2018, but IWEA would encourage policy to consider how further market improvements could be implemented beyond I-SEM which are more appropriate for non-dispatchable renewable electricity. If designed successfully, the electricity market could potentially finance future renewable electricity projects directly rather than policy providing 'out-of-market' subsidies where the market has failed to deliver the changes desired.

4 Conclusion

IWEA welcomes the opportunity to make this submission on the Consultation. IWEA recommends that DCCAE engage further with industry and our members on the support scheme before the design is finalised due to a number of complex issues that still need to be resolved such as the payment structure, the overlaps with the recently released Enduring Connection Policy draft decision, and the implementation of the community engagement proposals. **IWEA looks forward to continued engagement with the DCCAE in relation to the development of the new support scheme and remains at your disposal should you have any questions in relation to this response**.

[27] Irish Climate Action and Low Carbon Development Bill 2015: https://www.oireachtas.ie/documents/bills28/bills/2015/215/b215d.pdf
[28] EU Energy Roadmap: https://ec.europa.eu/clima/policies/strategies/2050_en
[29] Paris Agreement: http://bigpicture.unfccc.int/#content-the-paris-agreemen

Appendix: Summary of IWEA Economic Modelling by Baringa

Cost of RES-E support levels in Ireland

Analysis for response to the RESS consultation

IWEA and the Renewable Energy Consumers and Producers (RECAP)

10/11/2017

Context: CEPA analysis for DCCAE

CEPA economic analysis on RESS design options had limitations which contributed to a surprisingly high 'funding gap' estimate of over €6bn over 2020-30 for a 55% RES-E target

- CEPA analysis aimed to compare the relative costs of different support schemes to cover expressed in terms of the 'viability gap' for renewable generation
  - Viability gap: shortfall between the estimated Levelised Cost of Electricity (LCOE) and projected revenues from wholesale market
  - Based on an hourly dispatch model of the I-SEM market
  - Several scenarios analyse with different RES-E targets, RES-E mix and sensitivities (demand, technology costs, etc.)
- Results imply a significantly higher cost for higher renewable penetration, rising to over €6bn over 2020-30 for a 55% RES-E 2030

Table 4.8: RES-e target funding gap estimates, 2020-2030 (€m 2017 prices)

Funding gap	FIT	Floating FIP	Fixed FIP	Quota scheme	Grant
1. Baseline	488	560	640	734	501
6. Target 45%	1,408	1,531	1,647	1,776	1,434
7. Target 50%	3,158	3,288	3,415	3,556	3,186
8. Target 55%	6,003	6,134	6,258	6,396	6,031

Source: CEPA

- Based on our review of the published materials, we believe there are a number of limitations to the analysis:
  - Scope: cost savings to consumers derived from the reduced electricity price under higher renewable target scenarios have not been quantified
  - Market assumptions: no market / system reaction to increased renewable build, for example additional battery energy storage and flexible demand (electric vehicles, heat pumps) has not been considered,
  - LCOE assumptions: Based on recent European market benchmarks, developers of renewable projects are likely to require significantly lower support levels than the LCOEs used in the study (sourced from WSP|Parsons Brinckerhoff)
  - Modelling: the simplified dispatch model does not take into account the flexibility provided by interconnection and pumped storage, for example

Our approach

We have been asked to undertake analysis to assess end-user costs of 55% RES-E levels by 2030, using a more complete approach

How Baringa approached the analysis

- First, we looked to reproduce the scenario analysed by CEPA, as far as possible using the same assumptions, to benchmark our modelling of the 55% RES-e target scenario – which we refer to as a **'Badly Balanced' 55%** RES-E scenario
- Second, we applied EirGrid's view of reasonable flexibility measures which could emerge using its 'Low Carbon Living' scenario from the recent 'Tomorrow's Energy Scenarios' publication to analyse a **'Well Balanced' 55%** RES-E scenario – the measures include:
  - Battery energy storage
  - Electric vehicles able to shift demand to lower price hours
  - Heat pumps able to shift demand to lower price hours
  - Further electricity interconnectors with GB and France
- The analysis utilised our sophisticated and fully optimised I-SEM / GB market model, and our constrained model to project wind curtailment levels

Key outputs

- Quantification of the viability gap under the both the Badly Balanced and Well Balanced 55% scenarios
- Quantification of the wholesale electricity cost savings to consumers driven by RES-E deployment – a key benefit which was omitted in the CEPA analysis
- The analysis covers the period 2020 to 2030

Status

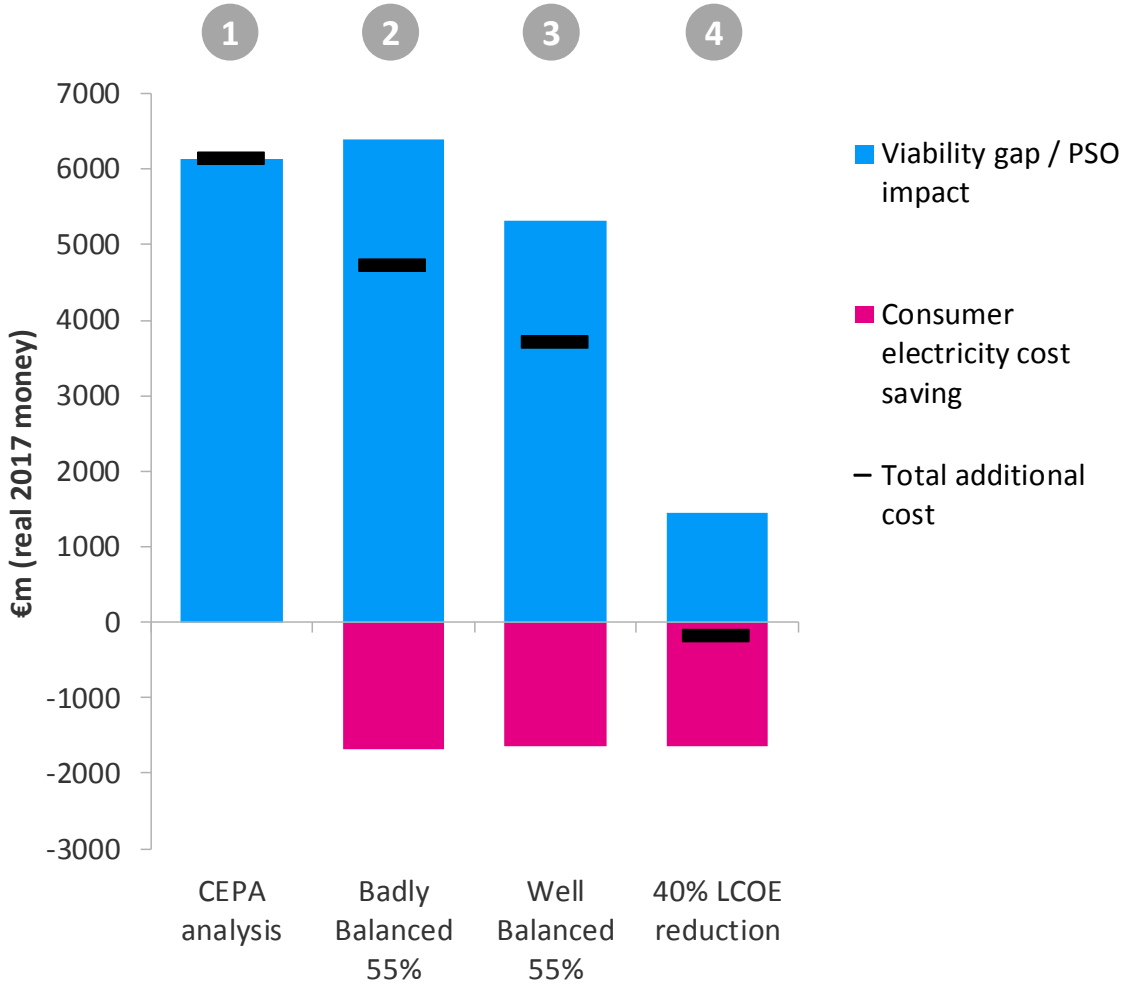
- This slide pack provides a summary of our ongoing work for IWEA / RECAP to understand the cost of RES-E support levels in Ireland

Headline results

The costs of a 55% RES-E target are likely to be significantly lower than shown in CEPA's analysis

1. Our analysis recreates the €6.1bn funding gap from the CEPA analysis in the Badly Balanced 55% scenario, as well as similar levels of wind curtailment
2. However, taking account of savings to consumers of wholesale cost reductions, the total additional cost over the period 2020-2030 decreases to €4.7bn
3. In a Well Balanced case, wind curtailment drops to 6% in 2030 and the total cost drops to €3.7bn
4. Based on recent European market benchmarks, developers of renewable projects are likely to require significantly lower support levels than CEPA's results suggest

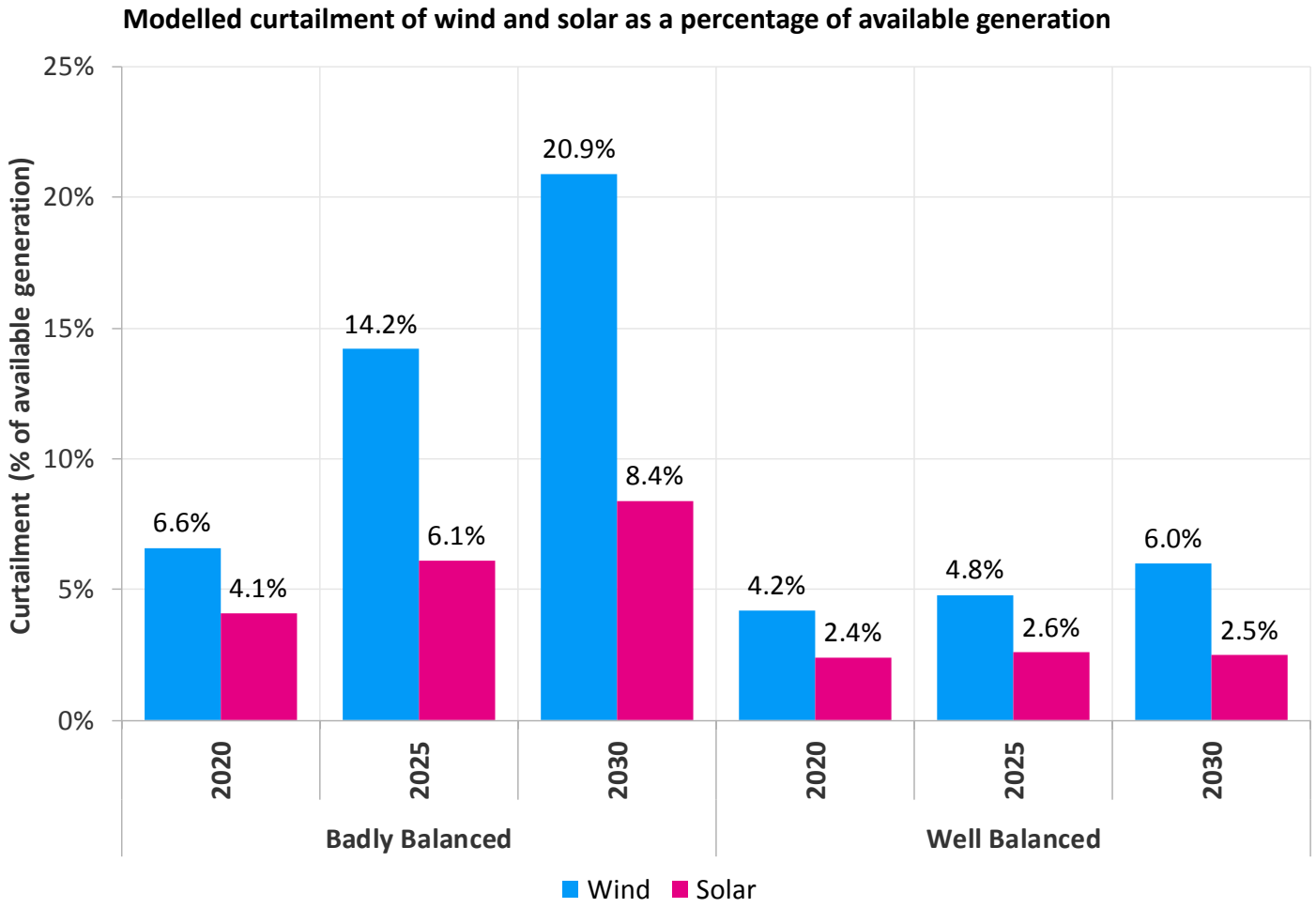
Our analysis indicates that a plausible 35-40% reduction in levelised costs would result in a net zero cost to consumers



All values are in real 2017 money, summed over 2020 to 2030

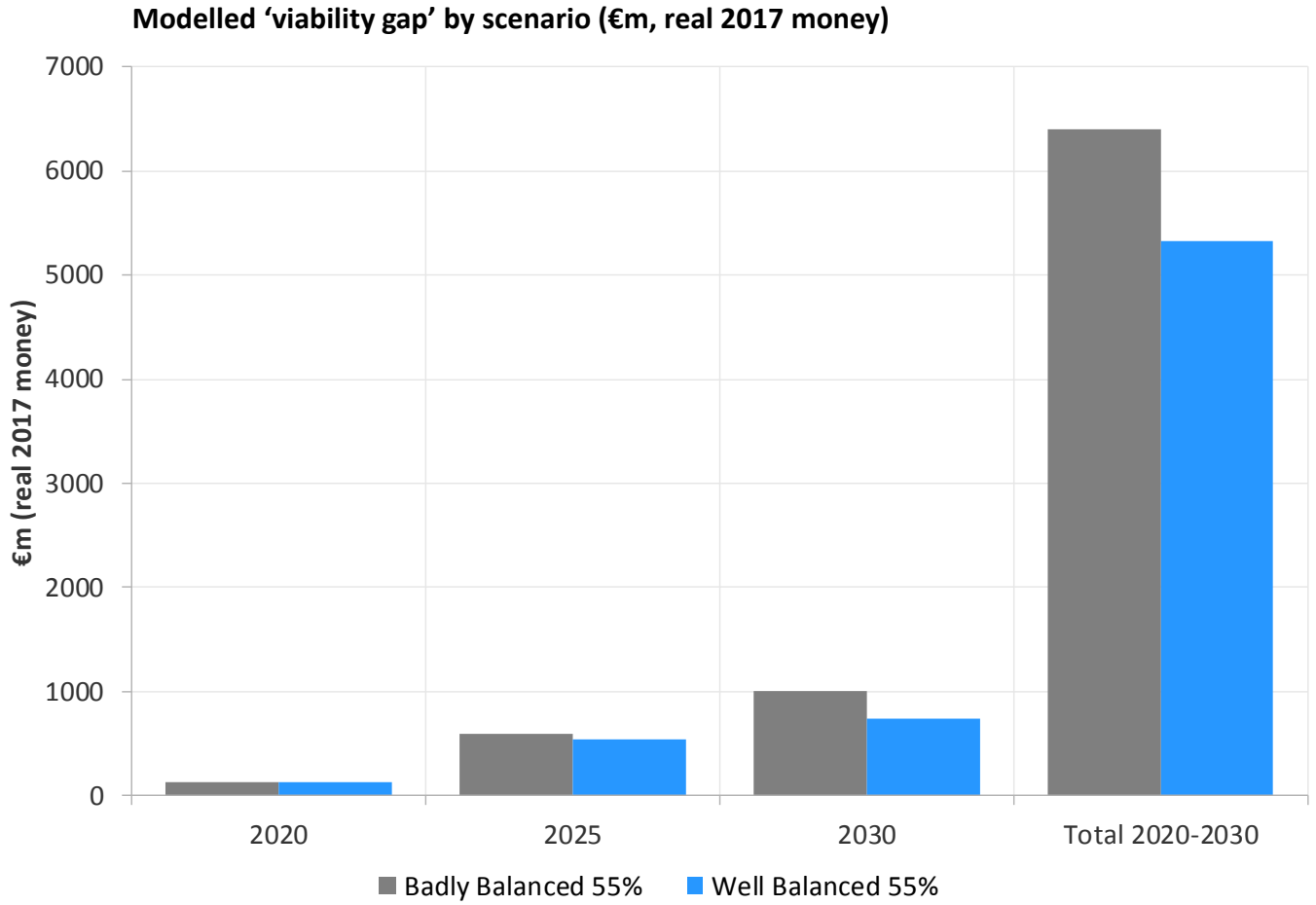
Results: curtailment analysis

The Well Balanced 55% scenario leads to wind curtailment levels which do not rise significantly over the modelled period



Results: viability gap

The Well Balanced 55% scenario has a lower viability gap since capture prices for supported renewables are higher

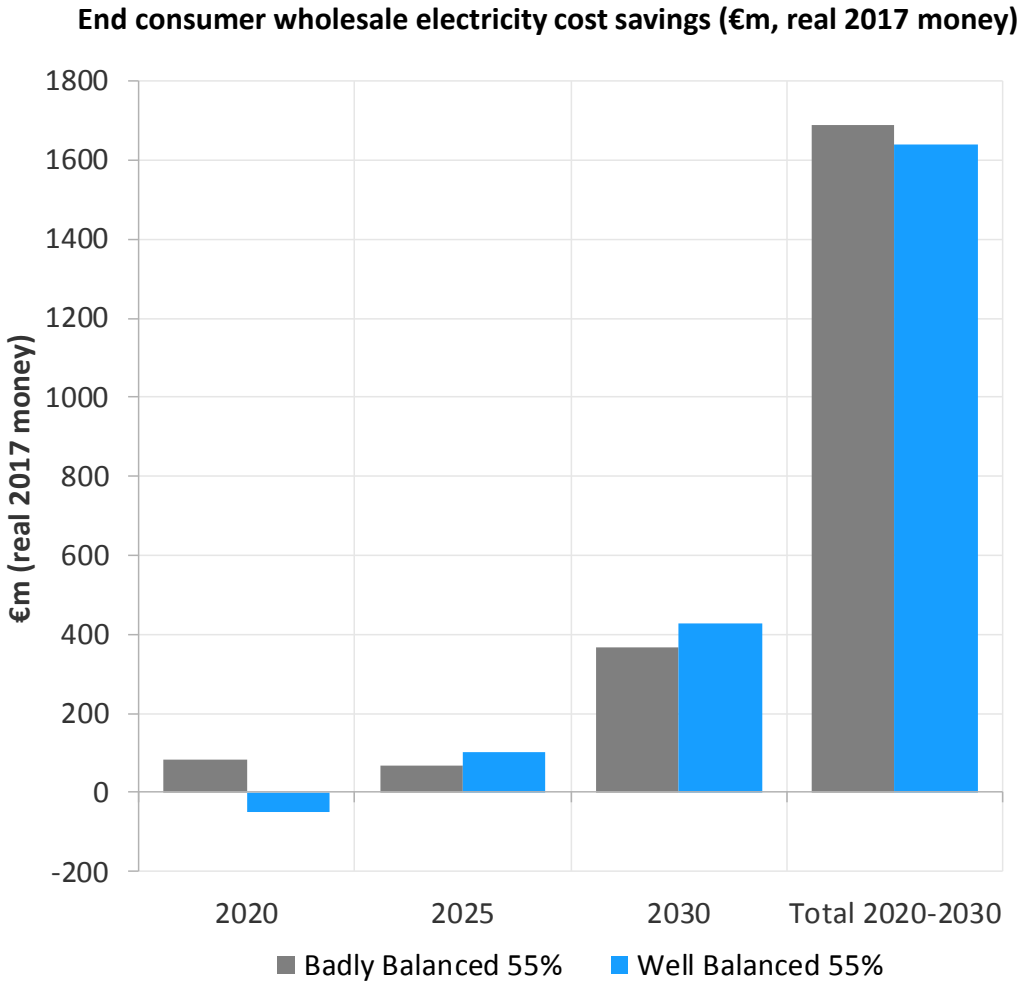


All values are real 2017. Totals are stated as the sum of values across 2020 -2030, without discounting (this aligns with CEPA's approach)

Results: consumer electricity cost savings

Consumer electricity cost savings are significant in both Badly Balanced 55% and Well Balanced 55% scenarios

- Reduction in wholesale electricity prices is due to the 'merit order effect' of low marginal cost renewables
- Savings are significant from 2025 onwards
- The additional flexibility in Well Balanced 55% scenario will reduce the shape and volatility of hourly prices, but does not necessarily lead to lower prices on average since troughs may be 'filled in' (and hence prices increased) as much as peaks are reduced



Results: total additional cost

The costs of a 55% target are likely to be significantly lower than shown in CEPA's analysis

	Badly Balanced 55%	Well Balanced 55%	40% LCOE reduction
2030 wind curtailment (%)	21%	6%	6%
Funding gap 2020-2030 (€bn)	**6.4**	**5.3**	**1.2**
End consumer electricity costs saving 2020-2030 (€bn)	**1.7**	**1.6**	**1.6**
Total additional cost of renewables 2020-2030 (€bn)	**4.7**	**3.7**	**-0.2**

All values are in real 2017 money

Notes on the analysis:

- A simple sum across 2020 to 2030 is not strictly correct, but matches CEPA's approach. An NPV analysis based on a social discount rate would be more appropriate.
- Although the analysis does not account for the additional cost of the flexibility measures in the Well Balanced 55% scenario, previous analysis suggests that measures such as additional interconnection could be self-financing – particularly at higher levels of renewable deployment

Conclusions

We can conclude that CEPA's analysis overstates the cost of meeting a 55% renewables target for Ireland in 2030

Consumer benefit

1. The reduction in wholesale energy costs (not modelled by CEPA) considerably decreases the net cost to the consumer – this is an important factor to consider and should be included in any consumer welfare analysis
2. A Well Balanced case shows that the funding gap is likely to be about half the level that CEPA estimated for a 55% RES-E 2030 target, even using the WSP|Parsons Brinckerhoff levelised cost of electricity (LCOE) values

Levelised cost impact

3. Although our scope did not include a review of the LCOE values used by CEPA, it is clear to us based on recent market benchmarks that developers of renewable projects are likely to accept significantly lower support levels than CEPA's results suggest
4. On average, over the ten year period, the assumed LCOE of the marginal technology* is €110/MWh – our analysis indicates that a plausible reduction of 35-40% in average LCOEs, to €66/MWh, reduces the net consumer cost to zero in a Well Balanced 55% RES-E scenario
5. Emerging results indicate that a reduction in average LCOEs to around €55/MWh results in zero net consumer cost even for a 75% RES-E 2030 target, under a Well Balanced scenario

*Based on our review of the LCOEs used by CEPA, we assume the marginal (large scale) technology to be Solar PV

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