IOOA SUBMISSION

CLIMATE ACTION PLAN 2021

This submission was prepared by

IRISH OFFSHORE OPERATORS' ASSOCIATION

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IOOA Submission to the call for expert evidence in the preparation of the 2021 Climate Action Plan

1. INTRODUCTION

The Irish Offshore Operators' Association (IOOA) welcomes the invitation to share information to support the development of the Climate Action Plan 2021. We present two distinct but interlinked outline technical proposals that we consider should be supported in the Climate Action Plan: the Cork Net Zero Emissions Hub and the Corrib Critical Infrastructure Hub. These fall within the key area of policy development on '*adoption of known technologies*' referred to in the call for expert evidence. We also address a number of the questions posed in the '*Framework to assist inputting to Call for Expert Evidence*' guidance documentation.

Our vision for Ireland's decarbonisation transition is for a clear, realistic, costed and fully integrated plan, based on international experience and supported by robust evidence. Cognisant of the many challenges that will face Ireland on the transition journey, we believe our views are grounded in practical and pragmatic realism. We highlight a number of the challenges that must be addressed. The Government's decarbonisation plan and the targets for emissions reductions to 2030 are extraordinarily ambitious and challenging, with no modern economy ever having achieved such levels of reduction to date. Decarbonisation of the electricity system is advancing with the upscaling in wind and solar energy deployment. However, making further significant emissions reductions in this and especially in other areas, including agriculture, heating and transport, is recognised as being far more challenging. Achieving these in the timescale envisaged will require unprecedented levels of use and integration of all available low carbon technologies, together with the deployment at scale within the next decade, of new and next generation technologies, some of which are still at an early stage of development.

The overriding objective running through the implementation of the planned transition should be the achievement of a clean, reliable and affordable energy future where Ireland has control over our energy security and where Irish society will benefit both throughout the journey and at the destination of a climate-resilient country and a leader in clean energy generation.

2. SUMMARY OF KEY POINTS

(a) Members of Irish Offshore Operators' Association (IOOA) have a history of more than 40 years of contribution to Irish society and economy. We have provided uninterrupted and secure natural gas to Irish industries and homes, and are fully committed to the rapid transition to a low carbon future while ensuring Ireland's energy security and continuing economic health.

(b) Our industry is a leader in the implementation of renewable energy, playing a leading role in the deployment of offshore wind and in solar energy technology. We are leading in the innovation and development of new technologies including floating wind systems, carbon capture, utilisation and sequestration (CCUS) and direct air capture. Our industry can bring expertise in the scale of integration, planning and financing required to plan and implement large national-scale energy projects of the type required to meet Ireland's climate and emissions targets.

(c) Our industry is already involved in a number of major recently-announced offshore wind energy projects. For example, Equinor, one of our member companies, recently announced the Moneypoint Offshore Wind Project joint venture project with the ESB.

(d) Ireland's gas demand is projected to continue for the coming decades. It will not be possible to dispense entirely with natural gas for power generation and grid stability for the next two decades and a reliable natural gas supply is essential into the future. Indigenous natural gas, with very low emissions, can play a crucial role in the decarbonisation of the electricity system and in heating and transport.

(e) Energy security, complicated by the impact of Brexit, and detailed assessment of the associated economic costs of decarbonisation, are critical factors in planning and implementing realistic plans to achieve the extraordinarily ambition Government targets for emissions reductions. Meeting these targets in the timescale envisaged will require unprecedented levels of use of all available low carbon technologies, together with the deployment at scale within the next decade, of technologies that are still at an early stage of development.

(f) IOOA considers that CCUS, together with solar energy technology and offshore floating wind developments, can play a major role in meeting the targets, while hydrogen, especially 'blue' hydrogen, can grow in importance in the coming years with 'green' hydrogen unlikely to be developed at scale during the present decade.

(g) Two strategic proposals that IOOA believe can have a major impact on helping to meet the emissions targets are the Cork Net Zero Emissions Hub and the Corrib Critical Infrastructure Hub. These build upon existing infrastructure and utilise the integration of a range of technically proven technologies for which our industry is at the cutting edge. We believe that they should be supported in the 2021 Climate Action Plan.

3. BACKGROUND

Our member companies have a long history of investment in the Irish offshore and have been providing uninterrupted secure and affordable gas to Irish industry and homes for more than 40 years. Our commitment to Ireland is demonstrated through the expenditure of more than €3 billion in offshore mapping, research and exploration during that time. Investment in development and production infrastructure associated with the Kinsale Head area and Corrib gas fields has been of multi-billion euro scale. This expenditure was at no financial exposure to the Irish State and has brought tangible benefits to local communities as well as to the national exchequer. More than €1 billion was spent directly with more than 300 Irish companies during the Corrib gas project, which sustained more than 1000 full-time jobs throughout the construction phase. Local infrastructure has been upgraded, with over €22 million invested in roads in north Mayo. Fibre optic cabling was installed in a 132 km stretch of the pipeline from Bellanaboy to Athenry at a cost of over €750,000. €13.5 million was invested in the community during the construction of the facility. Since commencing operations Corrib continues to invest over €300,000 annually through community development grants and education initiatives. The Corrib project is estimated to contribute €6 billion to Ireland's GDP over its lifecycle. The Kinsale Head area gas fields enabled major development of the Cork region as well as putting an average of approximately €25 million per annum into the local Cork region. Our two outline strategic proposals, the Cork Net Zero Emissions and Corrib Critical Infrastructure Hubs, build upon, and utilise, this critical national infrastructure in order to play a major role in lowering emissions and decarbonising our society while ensuring Ireland's energy security and national prosperity.

4. PROVEN INTERNATIONAL EXPERTISE IN ENERGY INNOVATION

Our industry has, at international and national level, embraced the transition to a low carbon society. In meeting the challenges of decarbonising the energy system the oil and gas industry is rapidly evolving into an integrated energy industry and is now a global leader in both innovation and implementation of renewable energy, in areas such as offshore wind and solar energy. In addition, our industry is a leader in the development of carbon capture, utilisation and storage (CCUS) as well as innovation in emerging technologies such as direct air capture. Our industry brings unique experience of decades of expertise in offshore exploration, site evaluation, sub-sea developments and construction of large structures, both fixed and floating, as well as the scale of integration and of financing required to plan and implement large national-scale energy projects.

In Ireland, our industry is involved in a number of major recently-announced offshore wind energy projects. For example, Equinor, one of our member companies, recently announced a joint venture project with the ESB. The Moneypoint Offshore Wind Project[1] plans to build Ireland's first floating wind development west of the Shannon estuary. Equinor already has significant experience in

[1] https://www.moneypointoffshorewind.ie/

offshore wind development[2], including in the North Sea where it has pioneered the world's first floating wind farm and is developing the world's largest offshore wind farm, due to start up in 2023.

5. NATURAL GAS AS AN ESSENTIAL TRANSITION FUEL

We believe that natural gas is essential as a low emissions fuel through the energy transition. It is necessary as a reliable backup to the intermittent renewable energy supplies of wind and solar and is likely to remain so for the foreseeable future. As such, it facilitates the increase in wind and solar energy deployment at scale. Natural gas also has a small emissions footprint. This is especially true for indigenous natural gas from the Corrib gas field and will likely to be the case for any future gas produced from the licensed areas near Corrib and elsewhere in the Irish offshore.

5.1. Natural gas as backup for intermittent renewable energy

The Irish Government has committed to achieving net zero carbon electricity by 2050, and has set a target of 70% of the annual Irish electricity production by 2030 mainly from wind and solar resources. This target will require an instantaneous renewables penetration which is likely to be considerably greater than the 70% figure on a regular basis. This, in turn, will require the installation of significantly more wind and solar generation capacity through the decade. However, wind and solar energy are inherently intermittent due to climatic and weather conditions.

In March 2021 the Irish Academy of Engineering (IAE) published a comprehensive analysis of the challenges of power system reliability associated with renewable energy sources[3]. It highlights that during the five week period from mid-November to end-December 2010 wind output at peak demand period was 10% of installed wind generation capacity. A more recent example of the potential variability in wind power output was illustrated in the IAE 2021 review by the wind generation profile for the 24 hours of 6th December 2020. At the time the All-Island installed wind generation capacity exceeded 4,000 MW. However, at 14.15 hrs the power output from the national wind portfolio was 1 MW while the average output for the day was 145 MW, just under 4% of the rated capacity. During periods comparable to the cold spell of November-December 2010, it is unlikely that a significant wind-generate energy infeed could be imported from either the UK or France as similar cold, windless climatic conditions are also likely to prevail over these areas of NW Europe. Solar energy, while generally more predictable than wind energy, is also very variable. There will be zero production at night and little production during short winter days. Additionally, solar energy output will also be influenced significantly by weather patterns. Current energy storage technologies (battery or pump storage capacity), while capable of dealing with short (daily) intermittency shortages, cannot provide sufficient backup to deal with longer period (days or weeks) shortfalls in wind or solar electricity generation.

The IAE 2021 report states that it is essential that Ireland has a reliable natural gas supply for the next two decades for the purposes of power generation and grid stability, and that it will not be

[2] https://www.equinor.com/en/what-we-do/wind.html

[3] Irish Academy of Engineering. 2020. National Energy and Climate Plan: The Challenge of High Levels of Renewable Generation in Ireland's Electricity System. 36 pp. http://iae.ie/publications/national-energy-and-climate-plan/

possible to dispense entirely with natural gas for power generation. IOOA agrees with this assessment. Without further indigenous gas discoveries, Ireland will be entirely reliant on imported gas. Unless this comes through LNG imports, they will come from mainland Europe and further afield, and will transit through the UK to the interconnectors at Moffat in Scotland. By this time, the UK will itself be importing 75% of its gas needs while the EU will be importing approximately one third of its gas needs from LNG imports. This points to the vulnerability to interruptions of gas supply without an indigenous replacement for the Corrib gas field. The Corrib field will continue to decline and by 2025 will only supply 15% of Ireland's natural gas demand and less than 10% of maximum daily supply.

5.2. Natural gas as a low emissions transition fuel

Ireland uses both indigenous and imported natural gas, with the latter increasing and projected to rise further unless there is another gas discovery in the Irish offshore to replace the depleting Corrib gas field. However, with the recent ban on the granting of new licences for gas exploration and development, it is highly likely that Ireland will become increasingly reliant on imports of natural gas either through the twinned pipelines from Scotland or from imported LNG.

The natural gas imported into Ireland comes from a variety of sources including the UK, Norway, Russia and Algeria while most of Europe's LNG comes from Qatar. Europe imports 50% of its gas requirements (IOGP, 2018)[4] and this figure will rise in the coming years. In 2016, 76% of the EU's gas imports came from two countries: Russia (with 33% of Europe's gas coming from Russia) and Norway. A further 13% was in the form of LNG (mostly from Qatar), while the remaining 11% came from Algeria and Libya.

Natural gas contains less than half the emissions of coal and has negligible particulate matter emissions. IOGP data and analysis (2017)[5] indicate that petroleum (oil and gas) imported from outside Europe has emissions up to 30% higher than that produced within Europe. A recent OGA (2020) report[6] also shows that the emission intensity of natural gas produced in the UK average 22 $kgCO_2e$/boe while LNG imported into the UK from Qatar has an emissions intensity of 59 $kgCO_2e$/boe which is more than double that of gas produced from the UK Continental Shelf. LNG imports from Algeria and the USA have emissions intensities that are significantly higher still. In sharp contrast, natural gas produced from Corrib has an emission intensity of approximately only 4.5 $kgCO_2e$/boe (Figure 1). It therefore makes sense to use indigenous natural gas and to encourage the exploration and development of gas prospects on existing licences. Indigenous natural gas can play a crucial role in lowering the carbon footprint of the electricity system and in heating and transport.

[4] IOGP Global Production Report 2018. International Association of Oil & Gas Producers. 33 pp. https://www.iogp.org.

[5] IOGP Report 2016e. 2017. Environmental performance indicators -2016 data. International Association of Oil & Gas Producers. 83 pp. https://www.iogp.org

[6] Oil & Gas Authority, 2020. UKCS Natural Gas Footprint Analysis. OGA Publication, May 2020. https://www.ogauthority.co.uk/news-publications/publications/2020/ukcs-natural-gas-carbon-footprint-analysis/

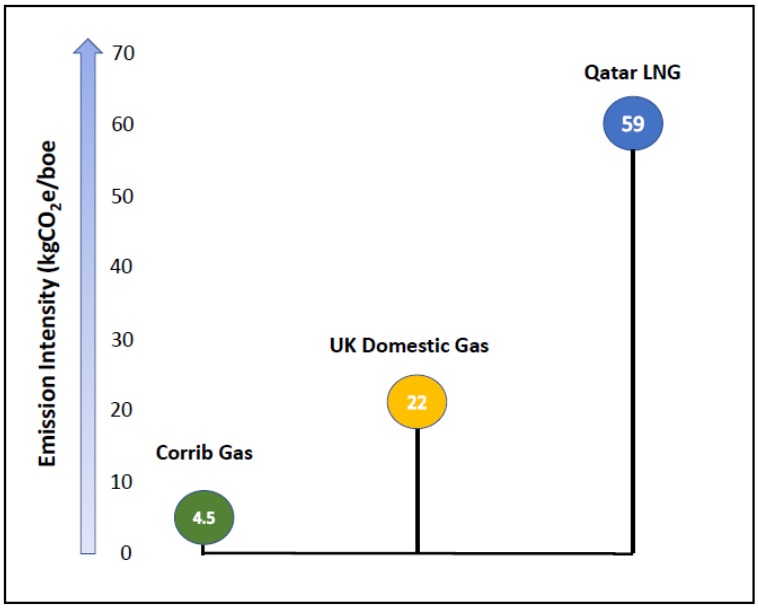

Figure 1. *Emission intensity comparison of Corrib gas with UK domestically produced gas and imported Qatar LNG. The UK and Qatar data are taken from OGA (2020).*

6. ENERGY SECURITY AND ECONOMIC CONSIDERATIONS

The latest SEAI 'low demand' forecast for gas in 2030[7] is only slightly lower than the present demand, indicating the continued need for gas into the future. Ireland is increasingly dependent on the interconnectors from Moffat in Scotland. The International Energy Agency (IEA) Ireland review of 2019[8] commented on the risk of reliance on the Moffat interconnector and concluded that "*there is high reliance on a limited amount of gas infrastructure, raising concerns for security of gas supply in Ireland*".

Brexit poses a number of energy-related challenges for Ireland. Despite the basic EU-UK Trade and Cooperation Agreement of December 2020 containing provisions regarding energy cooperation, a number of uncertainties remain regarding energy and energy security issues resulting from the

[7] SEAI. (2020). *Energy Security in Ireland. 2020 Report.* 93 pages. https://www.seai.ie/publications/Energy-Security-in-Ireland-2020-.pdf

[8] International Energy Agency. (2019). *Energy Policies of IEA Countries: Ireland 2019 Review.* 170 pages. https://webstore.iea.org/energy-policies-of-iea-countries-ireland-2019-review

withdrawal of the UK from the EU's internal energy market and its withdrawal from the EU's Emissions Trading System.

While a gas disruption scenario is not anticipated, it clearly cannot be ruled out as the UK ultimately controls the supply of gas through the interconnectors from Scotland to Ireland and the UK is increasingly reliant on imported energy, currently only producing only 46% of its gas supply[6]. The EU-UK Trade and Cooperation Agreement of December 2020 promises to ensure the security of energy supply, particularly to Ireland. However, as the UK has gone close in recent times to being unable to meet its own gas demand, the question of an interruption to supplies to Ireland in the event of future extreme events cannot be ruled out. In a worrying development, in May 2020 the UK gas regulator (Ofgem) refused to grant an Ireland Security Discount and disagreed with the argument that the Moffat interconnector was built specifically to end the isolation of EU member states, including part of the UK[9].

Brexit also poses challenges for Ireland in terms of EU Regulation 2017/1938 relating to the N-1 infrastructure standard. Prior to Brexit, Ireland was able to comply with the standard as the Regulation permitted it to be treated regionally alongside the UK. With Brexit, Ireland will fail to comply with the standard and may be liable to being fined by the EU. Furthermore, although the EU-UK Trade and Cooperation Agreement of December 2020 contains a provision to ensure the security of energy supply, the UK will no longer be legally bound by the measures encompassed in the solidarity principle in the Regulation and hence Ireland's gas supply vulnerability will be increased.

A recent (November 2020) MaREI report[10] provided a preliminary estimate of €32 billion for the investment required up to 2030 in the power system alone. A further comparable sum of approximately €31 billion was estimated to be required for the roll out of Electric Vehicle (EV) charging points, the introduction of heat pumps on a wide scale for space heating, and other consumer side investments.

7. STRATEGIC PROPOSALS TOWARDS THE 2020 CLIMATE ACTION PLAN

Achieving decarbonisation and emissions reduction targets across all sectors of Irish industry and society requires the use and integration of all possible technologies. Some are proven, others are at demonstration and development stages while many are still in their infancy and, even if successful, may not be deployed at scale during this decade. The strategies and technologies employed to meet the 2030 targets are therefore likely to be primarily those that are currently proven, and will mirror those used in other countries. These are a combination of zero and low carbon technologies, efficiency improvement and sequestration technologies. Two strategic proposals are the Cork Net Zero Emissions Hub and the Corrib Critical Infrastructure Hub. These build upon existing infrastructure and utilise the integration of a range of technically proven technologies for which our

[9] Ofgem. (2020). *Uniform Network Code 678A – Amendments to Gas Transmission Charging Regime. 33* pages. https://www.ofgem.gov.uk/system/files/docs/2020/05/unc678_-_decision_0.pdf

[10] MaREI and the Electricity Association of Ireland. 2020. Our Zero Mission Future. 59 pages. https://eaireland.com/wp-content/uploads/2020/11/Our-Zero-e-Mission-Future-Report.pdf

industry is at the cutting edge. We believe that by working together these proposals could successfully be developed and that they should be supported in the 2021 Climate Action Plan.

7.1. Cork Net Zero Emissions Hub

The Cork region has benefitted for more than four decades from the development and production of natural gas from the Kinsale Head, Ballycotton and Seven Heads fields. New, sustainable businesses grew on the back of contracts during the development phase. The reliable and uninterrupted supply of affordable and natural gas through the national gas grid contributed to the growth of the large pharmaceutical, biopharma and medical technology industry sector, together with other industries in the Cork region. The undeveloped Barryroe oil and gas field has the potential to make a significant contribution to Ireland's and Cork's continuing requirements for petroleum during the transition towards low and zero carbon emissions.

The Cork Net Zero Emissions Hub envisages the use of technologically proven carbon capture, utilisation and sequestration (CCUS) technology, combined with offshore wind and hydrogen production to achieve a net zero emissions sustainable regional economy that will be attractive to inward green investment. The CO_2 emissions from the oil and gas usage in the industrial base in the Cork region have the potential to be captured and safely sequestered in the reservoir rocks of the nearby depleted offshore Kinsale Head gas field, that is currently being decommissioned. Additionally, a 'blue' hydrogen industry, using natural gas as a feedstock, could be developed with CO_2 captured and sequestered in the offshore reservoirs. Furthermore, the Celtic Sea region offshore Cork has the potential for the development of offshore wind generation, with the Emerald project[11] proposing to install a floating wind farm in the Celtic Sea, in the vicinity of the Kinsale Head gas fields. The first phase of the project plans between 15 and 25 wind turbines with a combined capacity of 300 MW, and with the potential to scale up to 1GW. Excess wind energy generated could be used in the electrolytic production of green hydrogen as an alternative to 'blue' hydrogen production as the developing technology develops in the coming decades.

There are a number of broadly similar initiatives in the UK, notably the Net Zero Teesside (NZT)[12]) and the Zero Carbon Humber (ZCH)[13] projects. These aim to establish decarbonised industrial clusters in Teesside and Humberside through a combination of CCUS offshore in a large-scale saline aquifer in the nearby North Sea, hydrogen and fuel-switching. In these projects, hydrogen, produced by autothermal reforming of natural gas with carbon capture, would be delivered to nearby industry. Both projects aim to be commissioned by 2026 with realistic pathways to achieve net zero as early as 2030. NZT plans to deliver an annual gross benefit of up to £450 million for the Teesside region and directly support up to 5,500 jobs. The Net Zero Teesside CCUS project has been awarded more than £52 million in funding to accelerate the development of onshore and offshore low-carbon and hydrogen infrastructure. Additionally, the UK Government has announced a new CCS Infrastructure

[11] https://simplyblueenergy.com/emerald/
[12] https://www.netzeroteesside.co.uk/project/
[13] https://www.zerocarbonhumber.co.uk/

Fund of at least £800 million reflecting the UK's commitment to use CCS to decarbonise heavy industry and power to achieve net zero emission targets.

IOOA considers that CCUS offers significant potential as a technologically-proven methodology for safely storing captured CO_2 emissions and that it can play a major role in reducing emissions, especially for those sectors where it will be difficult to decarbonise in the coming decade. The IEA recognises CCUS as an important emissions reduction technology that can be applied across the energy system[14]. The IPCC 2018 report[15] demonstrates that the potential of CO_2 capture and storage is considerable and that carbon capture and storage (CCS) "*has the potential to reduce overall mitigation costs and increase flexibility in achieving greenhouse gas* emission reductions".

7.2. Corrib Critical Infrastructure Hub

The Corrib gas field is currently the only indigenous source of natural gas being produced in Ireland. The field has now passed its peak production and will continue to decline. The gas is produced through a subsea facility and is brought to shore through an 83 km pipeline to the Bellanaboy Bridge gas terminal and from there it enters the national gas grid.

The subsea production system, combined with the short distance to the national grid, means that the Corrib gas has an extremely low emission intensity of approximately one fifth of the natural gas produced in the UK North Sea and one thirteenth of that from LNG imported from Qatar (see Figure 1 and section 4.2 above). This makes a compelling argument for the continued use of indigenous natural gas from the Corrib region rather than relying on imported gas. Further unexplored gas potential in the vicinity of the Corrib gas field holds out the hope that further discoveries could utilise the Corrib infrastructure to provide a secure source of clean natural gas to supplement or replace the Corrib field, thereby displacing the foreign imports that will be necessary to backup the intermittent renewable energy sources of wind and solar in the energy transition. The gas could also be used as source of 'blue' hydrogen with a smaller carbon footprint than European or other gas sources. It is unlikely that 'green' hydrogen can be produced by electrolysis at scale or at economic costs during the present decade. Therefore, using indigenous low emissions natural gas as a feedstock for thermal/steam reforming to produce 'blue' hydrogen could be used as a means of helping to achieve Ireland's emission reduction targets in the more immediate future.

The IAE (2021) report[3] concluded that hydrogen will make little contribution to the decarbonisation of Ireland's electricity supply by 2030. While it is likely to play a role in the longer term energy future, it cannot be relied upon as a major clean energy source in the short term, and is likely to be limited to a contribution to the transport and domestic gas sectors. Therefore, the Corrib infrastructure is likely to remain as a critical hub for the production and distribution of Irish natural gas from the Corrib field and from any future discoveries made in the region, and which could be brought onstream rapidly, continuing to make a contribution to replacing imported gas with higher emission intensities.

[14] https://www.iea.org/fuels-and-technologies/carbon-capture-utilisation-and-storage
[15] https://www.ipcc.ch/site/assets/uploads/2018/03/srccs_wholereport-1.pdf