Objection to Proposed Shannon LNG Terminal Planning Application

By Not Here Not Anywhere **Date: 22nd October 2021**

To: An Bord Pleanála
Cc:
Minister for the Environment, Climate and Communications, Eamon Ryan TD
Ireland's Permanent Representation in Brussels
Minister for Enterprise, Trade and Employment, Leo Varadkar TD
Sustainable Energy Authority of Ireland

Submission in relation to: Proposed Shannon Technology and Energy Park consisting of power plant, floating storage and regasification unit, jetty, onshore receiving facilities at the Townlands of Kilcolgan Lower and Ralappane, Ballylongford, Co. Kerry (Reference number PA08.311233)

1. Background to the issue

To take meaningful action to mitigate the climate crisis and avoid lock-in to a dirty energy future, the Shannon Liquefied Natural Gas (LNG) terminal must not go ahead. Gas usage in Ireland needs to start reducing immediately if we are to meet our obligations under the Paris Agreement and maintain a safe climate (UCC 2050 Project, 2020; McMullin and Price, 2019). LNG onshore terminals or Floating Storage Regasification Units (FSRU) would create a "lock in" effect, guaranteeing high levels of gas consumption, obstructing investment in clean energy, and delaying the zero carbon energy transition.

Below we elaborate on the following reasons why An Bord Pleanála must reject this planning application:

- Scale of the global climate crisis
- Greenhouse Gas (GHG) emissions impact of the proposed terminal
- Irish climate targets and government policy
- Shannon LNG is not needed for energy security
- Impact on nature
- LNG impacts on communities
- Local and international opposition to LNG

New large scale fossil fuel infrastructure such as LNG terminals is incompatible with a 1.5C world (Smith et al, 2019). The government has clearly stated its opposition to LNG terminals and it would not be appropriate for An Bord Pleanála to approve this project which has no place in a sustainable future for Ireland.

2. Global Climate Crisis

Climate change is already having devastating impacts on people around the world. 2021 saw mass flooding across Northern Europe, wildfires and drought in Southern Europe, the US and Australia. The window of time in which we can prevent catastrophic climate change is rapidly closing and Ireland needs to immediately reduce dependence on the fossil fuels driving the crisis.

It is increasingly recognised that fossil gas cannot be regarded as a bridge fuel in the low carbon transition, used to "tide us over" until renewable energy meets demand (Howarth, 2014; Mutitt et al, 2016; Stockman et al, 2018; Nisbet et al, 2019; Cremonese et al, 2016; Stockman, 2018; Rainforest Action Network, 2019). Gas, and particularly LNG, emits high levels of methane at all stages of the supply chain (Alvarez et al, 2018). Methane is a potent greenhouse gas (GHG) which the Intergovernmental Panel on Climate Change (IPCC) has calculated as having 86 times more Global Warming Potential (GWP) than CO_2 over a 20 year period (Myhre et al, 2013:714, Table 8.7). Recent studies have shown that methane emissions from fossil fuel production have been significantly under-reported (Hmiel et al, 2020).

LNG is a particularly emissions-intensive form of gas, estimated to be 20% more emissions intensive than short-distance gas on a full life-cycle basis (Anderson and Broderick, 2017).

By 2035, the substantial use of all fossil fuels, including fossil gas, within the European Union's (EU) energy system, will be incompatible with our climate commitments (Anderson and Broderick, 2017). The EU has estimated that EU-wide fossil fuel use must drop by 90% by 2050 to stay under 1.5 degrees of warming (Global Witness, 2020), while gas production needs to drop by 40% globally in the next decade (Global Witness, 2019).

3. Emissions Impact of the terminal

Page 29 of the STEP EIAR Volume 1 NTS final.pdf submitted by the project promoter claims that "Direct emissions from the operation of the Proposed Development will equate to approximately 963kt CO2e (CO_2 equivalent) in 2030, around 2.1% of Ireland's carbon allowance". This claim requires clarification. Is 963kt the expected annual emissions for the year 2030 or is it the cumulative operational emissions figure for the terminal between now and 2030? Regardless, the figure drastically underestimates the emissions impact of the terminal.

Calculations by Not Here Not Anywhere (see Appendix 1) reveal that the proposed Shannon LNG terminal would have more CO2e emissions than 4 Moneypoint coal plants running at maximum capacity. The terminal proposed would have an import capacity of 8.2 bcm/a of natural gas, primarily consisting of methane. As Ireland's national gas demand is c. 5-6 bcm/a (Elliot, 2020) this terminal would import far more gas than Ireland currently uses, and flooding the market with gas in this way would counteract the government's stated aim to reduce our fossil fuel consumption to 2030 and beyond. When leaked, methane gas (CH_4) is 86 times more effective than carbon dioxide at trapping heat over a 20 year period (Myhre et al,

2013:714, Table 8.7) and when combusted it produces 0.0544 kg CO2e per cubic foot of CH_4 (US Environmental Protection Agency, 2020).

LNG is composed of at least 95% methane (US Department of Energy, 2005), so the expected CO2e emissions resulting from the combustion of this gas can be calculated – 15,370kt CO2e (Table 1.1a). We can also use the high global warming potential of methane to calculate the additional CO2e impact from leaked gas, at an assumed downstream leakage rate of 2.5% - 12,000kt CO2e (Howarth et al, 2012) (Table 1.2a)[1]. Combined these impacts make up total emissions for the terminal of 27,731 kt CO2e (Table 1.3a).

Calculations:

Import/Regasification Capacity		Combustion Rate (assuming 2.5% leakage)	Natural gas to be burned (cubic feet/a)	Emissions Factor (kg CO2 per scf)	CO2 Emissions (kg/a)	CO2 Emissions from combustion (tonnes/a)
Natural Gas (bcm/a)	Natural Gas (cubic feet/a)					
8.2	289,580,540,000	97.5%	282,341,026,500	0.0544	15,370,645,483	15,370,645

Table 1.1a - CO2 Equivalent emissions from combustion of 97.5% of the imported methane (assuming a 2.5% leakage rate).

Import/ Regasification Capacity	Leakage Rate	Natural Gas leaked (m3/a)	% Methane	Methane leaked (m3/a)	Methane leaked (kg/a)	Methane leaked (tonnes/a)	GWP20 of Methane	CO2 Equivalent Emissions from leakage (tonnes/a)
Natural Gas (bcm/a)								
8.2	2.5%	205,000,000	95%	194,750,000	139,538,375	139,538	86	12,000,300

Table 1.2a - CO2 Equivalent emissions from uncombusted methane (assuming a 2.5% leakage rate and a GWP20 of 86).

CO2 Emissions from combustion (tonnes/a)	CO2 Equivalent Emissions from leakage (tonnes/a)	Total CO2 Equivalent emissions (tonnes/a)	Total CO2 Equivalent emissions (kt/a)
15,370,645	12,000,300	27,370,946	**27,371**

Table 1.3a - Total emissions impact (direct and indirect) from combustion and leakage of methane brought in through proposed Shannon LNG terminal.

The direct emissions figure of 963kt, quoted in Volume 1 of the EIA Report submitted by the applicant, **is only 4% of the likely emissions from 8.2bcm of natural gas**. At 28 times smaller than the above calculated figure of **27,371 kt CO2e**, this is a drastic underestimation. The EIAR states that emissions from the terminal would only account for 2.1% of Ireland's carbon allowance, but at 27,731 kt CO2e, emissions from the terminal would in fact account

[1] We have assumed a downstream leakage rate of 2.5%, but if we are to look at the full lifecycle emissions from gas right back to the well site then leakage rates as high as 10% have been reported (Hayhoe et al, 2002).

for 59.7% of Ireland's carbon allowance. Furthermore, even if direct emissions alone are considered, as we have done above, to ignore the enormous indirect emissions impact of this project is irresponsible given the country is in a climate emergency.

Moneypoint coal power plant, Ireland's largest electricity generation station, produces 6,833 kt CO2e/a when operating at full capacity. The proposed Shannon LNG terminal would have more CO2e emissions than 4 Moneypoint coal plants running at maximum capacity. A project with emissions potential of this level is fundamentally compatible with any transition towards a carbon neutral society.

For detailed calculations with sources please see Appendix A of this document.

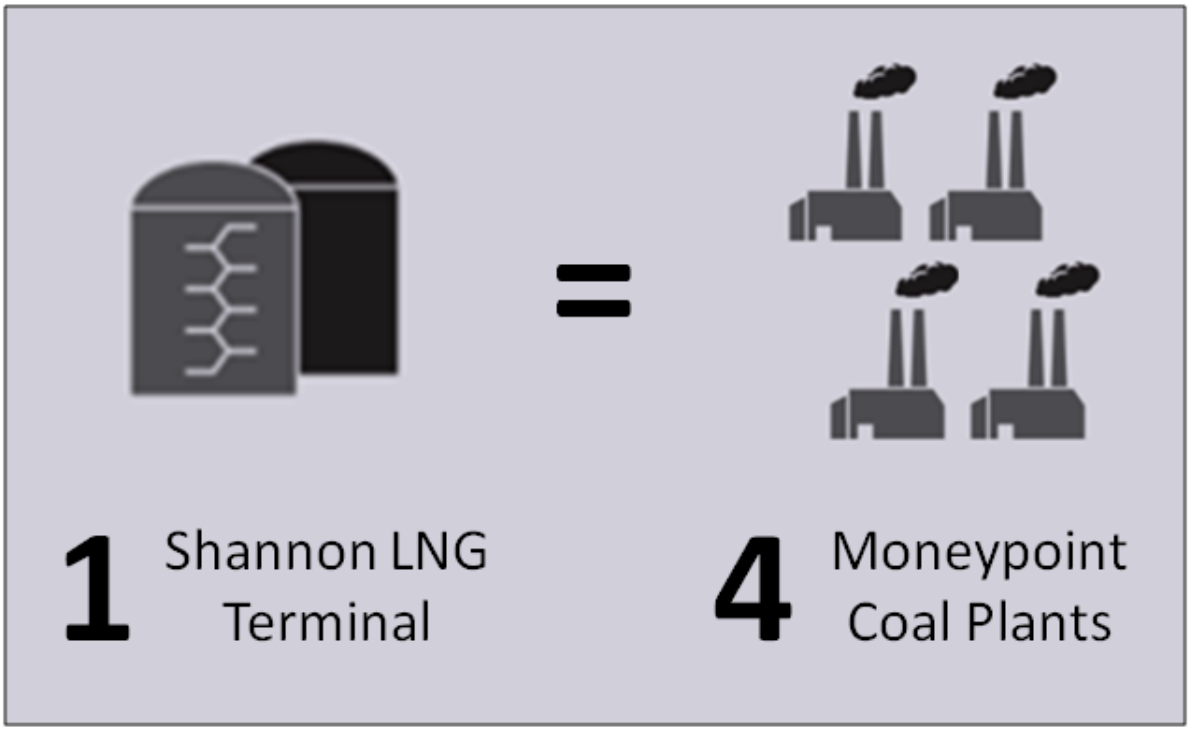

Figure 1: Comparison between LNG and Moneypoint (CO2e)

In addition, the EIA Report suggests that hydrogen or biomethane could potentially be partially incorporated to reduce overall emissions. This claim is made despite the company having no operating hydrogen projects. New Fortress Energy CEO, Wes Edens, said in an earnings call in May 2021 that "Green hydrogen businesses today, in my opinion, are not commercially viable" (Argus Media, 2021). Thus, this large-scale fossil fuel infrastructure project cannot be allowed to proceed based on a claim that it may at some stage be used with renewable fuels, which the company itself does not deem to be viable.

While there has recently been a focus on the climate impacts of fracked gas, LNG from conventional gas still has no climate benefit over coal or oil due to methane leakage throughout the supply chain (Howarth, 2015:49, see figure 2), along with the additional energy required to liquefy, transport and regasify the LNG. LNG is estimated to be 20% more emissions intensive than short-distance gas on a full life-cycle basis (Anderson and Broderick, 2017). A 2014 study from the US Department of Energy calculated that, even using conservative

methane leakage estimates, the methane leaks and energy used in the process of liquefying and transporting LNG from the US to China would have a greater climate impact than simply building a new coal plant in China and burning the coal there (Department of Energy, 2014).

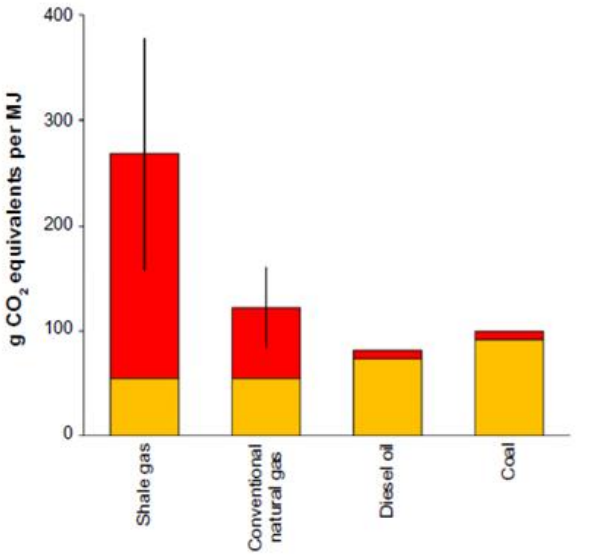

Figure 2 The greenhouse gas footprints of shale gas, conventional natural gas, oil, and coal expressed as g CO_2 equivalents per MJ of heat produced.
Notes: Yellow indicates direct and indirect emissions of carbon dioxide. Red indicates methane emissions expressed as CO_2 equivalents using a global warming potential of 86. Vertical lines for shale gas and conventional natural gas indicate the range of likely methane emissions. Emissions for carbon dioxide for all fuels and for methane from conventional natural gas, oil, and coal are as in Howarth et al.[11] Mean methane emission estimate of shale gas is taken as 12% based on Schneising et al[26] as discussed in the text.

Figure 2: Howarth et al, 2015:49

4. Government Climate Targets and Policy

The proposed terminal on the Shannon Estuary is highly likely to involve the importation of fracked gas. The Board must therefore have regard to the Government Policy Statement on the Importation of Fracked Gas under Section 34 of the Planning & Development Act. In this May 2021 policy statement, the Department of Environment, Climate and Communications said that "it would not be appropriate for the development of any LNG terminals in Ireland to be permitted or proceeded with" until the ongoing independent review of energy security is concluded. The energy security review remains ongoing. All three Government parties are opposed to LNG terminals; Fianna Fáil and Fine Gael stated in April 2020 that "as we move towards carbon neutrality, it does not make sense to build new large-scale fossil fuel infrastructure such as liquid natural gas import terminals" (Fianna Fáil and Fine Gael, 2020).

In Table 1.2: NPWS DAU and Table 7A-3 NPWS DAU of the Natura Impact Statement (NIS), the applicant claims that fracked gas will not be used in the terminal but provides no evidence of where the gas will be sourced. The NIS reads: "sources of liquefied natural gas (LNG) are varied and, although not possible to identify, will all be located outside of the State and almost all will be located outside of the European Union". This suggests that some of the sources will be from within the European Union yet no further detail is provided. When no sources have

been provided, we cannot assume the gas will not be fracked. The application cites the Marcellus shale formation in Pennsylvania, an area where New Fortress Energy is proposing to build an LNG export terminal. It is likely that gas destined for import at Shannon LNG will be sourced from here. Ahead of the pending energy security review and adhering to the Government Policy Statement on the Importation of Fracked Gas, An Bord Pleanála should not allow for gas to be imported from Pennsylvania, especially given that 98.23% (5,360bcf / 5,456.5bcf) of all gas produced in Pennsylvania in 2017 was fracked (Pennsylvania Department of Environmental Protection, 2017).

Furthermore, It is crucial in the context of the new Climate Act that Ireland does not, through allowing the development of LNG terminals, become locked in to an energy systems configuration incompatible with 1.5C. The latest research indicates that we must rapidly phase gas out of the energy mix in Ireland. Modelling by University College Cork's (UCC) MaREI Centre for Energy, Climate and Marine research showed that gas demand must reduce consistently from 2020 onwards, by at least 11% by 2030 and 37% by 2040 compared to 2020 figures, if we are to achieve 2050 decarbonisation targets (UCC 2050 Project, 2020). McMullin and Price (2019) recommend "extremely rapid and immediate absolute reductions in near-term fossil fuel usage, at a year-on-year rate of c. 20%, falling effectively to zero within 10-15 years (c. 2030-2035)" to achieve Paris-aligned climate targets.

5. Energy Security

Multiple factors including Ireland's ability to withstand a disruption in gas supply, reductions in gas demand due to decarbonisation measures and the global oversupply of gas, means that LNG terminals are not required for energy security. Fundamentally, the climate risks of locking Ireland into new large-scale fossil fuel infrastructure far outweigh any potential energy security risks related to gas supply.

A number of studies have examined Ireland's resilience to a disruption in gas supply, taking the impact of Brexit into account. In a 2018 Long Term Resilience study, Gas Networks Ireland (GNI) and EirGrid found that Ireland meets, and for the foreseeable future is expected to meet, the EU's security of "supply standard". This standard requires member states to meet the energy needs of protected customers such as homeowners for 30 days in the case of disruption to the largest single piece of infrastructure in average winter conditions (SEAI, 2020:37-40). MAREI analysis for the year 2030 showed that Ireland could sustain an interruption period of up to 10 months without the need for LNG infrastructure (Deane et al, 2017).

Historically, the UK has provided most of Ireland's gas supply, and Ervia states that in the UK "there is ample import capacity over and above demand" (Ervia, 2018). Demand for gas in the UK has decreased by a fifth since 2004 and gas-fired electricity generation is expected to drop by 40% by 2025 (Evans, 2019). Several studies have also found existing EU gas infrastructure to be sufficiently capable of meeting future demand, even in the event of extreme supply disruption (ENTSO-G, 2017; Artelys, 2020). Contrary to the common misconception, Ireland is not dependent on Russian gas (Dezem & Khrennikova, 2020), and at the EU level, gas is sourced from a diverse range of countries, including Norway, Russia, Turkey, Central Asia and North Africa.

Across the EU, gas infrastructure is already well in excess of what's required, with an import capacity 200% higher than what Europe currently imports (Gaventa et al., 2016). In light of existing capacities, investment in projects that would allow additional gas imports into the EU would be useless. While the gas industry often predicts increases in gas demand, the reality is that these projections are invariably overestimated. Between 2015 to 2019, the gas demand estimates proposed by ENTSOG, the European body of which Gas Networks Ireland is a member, were between 6% and 17% higher than actual demand (Global Witness, 2020). Latest projections show that LNG demand is forecast to fall 11% by 2030 (Witkop, 2021).

The global oversupply of gas means that LNG terminals and other large fossil fuel infrastructure projects are at a high risk of becoming stranded assets, which must be retired well before the end of their useful life. For example, in 2019, General Electric closed a gas-fired power plant after 10 years, 20 years before the end of its useful life, as it was no longer economically sustainable. Currently, most LNG terminals are used at extremely low capacity; between January 2012 and December 2020, EU and UK terminals were used at less than one third of their full capacity (Food and Water Action Europe, 2020). Arguments are sometimes made by the industry that LNG Floating and Regasification and Storage Units (FSRUs) are more cost-effective than fixed onshore terminals, but in fact FRSUs have higher operating costs and are more susceptible to extreme weather (Plante et al., 2020).

Any investment in new fossil fuel infrastructure, or providing a market for such infrastructure, will displace investment in clean energy (Shearer et al., 2014). It is also directly contrary to market signals; renewable energy portfolios consistently outperform fossil fuel investments, with a new study showing that renewable power portfolios generate triple the returns of fossil fuel portfolios and have proven more resilient to the pandemic (IEA and Imperial, 2021). Numerous studies highlight that renewable energy with storage is cleaner and cheaper than fossil fuels (Hainsch et al, 2020; Solar Power Europe, 2020; CAN Europe and EEB, 2020; Inman, 2020).

While gas is required as back up for renewable power in the very near-term, it is crucial from a climate risk perspective that Ireland achieves fast and reliable elimination of GHG emissions in the energy sector. The best way to achieve this is through developing a diverse energy mix, combined with demand-side measures to reduce gas use, such as retrofitting of housing stock. It would be hugely counter-productive to increase our reliance on a single energy source by allowing the construction of LNG terminals. The Sustainable Energy Authority of Ireland (SEAI) has suggested that energy security can be strengthened by increasing energy efficiency and indigenous renewable energy supply (SEAI, 2020:3). This will simultaneously reduce the energy sector's emissions and the cost to the State of importing fossil energy.

Research has shown that investment in gas actually displaces investment in clean energy (Shearer et al, 2014). Furthermore, numerous European-based studies highlight that renewable energy with storage is cleaner and cheaper than fossil fuels for decarbonisation (Hainsch et al, 2020; Solar Power Europe, 2020; CAN Europe and EEB, 2020; Inman, 2020). In a 2019 study, US-based Rocky Mountain Institute (RMI) concluded that clean energy portfolios (CEPs) - optimized combinations of demand-side management and wind, solar, and storage technologies - would be cheaper than 90% of proposed gas-fired power units on a

project by project basis (Teplin et al. 2019). Energy security and energy sustainability go hand in hand, and any discussion on energy security for Ireland must reflect this.

6. Impact on Nature

Article 10 of the Habitats Directive requires member states to protect landscape features that are of major importance for wild flora and fauna, where necessary, through land use planning and development policies. In the Application Form for Permission, the applicant has indicated that the terminal will be within and/or adjacent to the Lower Shannon cSAC and the Shannon Fergus Estuary SPA.

Under Article 6.3 of the Habitats Directive, An Bord Pleanála ust be sure beyond reasonable doubt that "any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public".

We concur with the recommendations of the National Parks and Wildlife Service's (NPWS) "*that if blasting is required, then impacts on fauna including birds and dolphins be assessed*" (Table 1-1, section 1.6). "*The area proposed for the jetty and FSRU infrastructure is within the area mapped as critical habitat for the bottle-nosed dolphin (Map 16, Conservation Objectives). The conservation target for these areas is that they 'should be maintained in a natural condition'. The NIS will need to address the compatibility of the Proposed Development with the conservation objective for this species within the cSAC, and provide sufficient data and expert opinion to satisfy reasonable scientific doubt that the proposal will not adversely affect the integrity of the Lower River Shannon cSAC*" (Section 7A-3-6 table 7A-3). The estuary in the vicinity of the proposed LNG development is an important commuter corridor for bottlenose dolphins. There is a risk that noise and disturbance caused during the construction and operation of the terminal will impact the population of bottlenose dolphins by limiting their ability to commute between areas of favourable habitat to the east and west of the site and result in displacement. Even short-term interruptions of normal activity could have long-term adverse effects on a population of dolphins, through reductions in the time available for foraging or resting, abandonment of favoured habitats, disruption of social bonds, or through physiological effects of stress and such long-term effects are most likely to take the form of subtle decreases in reproductive success and survival (Sini et al 2005). We feel that any such behavioural impacts have not been assessed and that the low numbers within this important population of dolphins make them highly vulnerable to impacts such as this one which threatens their reproductive success.

We agree with the NPWS' recommendation in relation to further analysis spanning two years (section 7A.3.6, Table 7A-2) i.e "a two-year survey of bird use of the estuary within 2 km of the proposed jetty and FSRU infrastructure is recommended, with a year being the minimum

requirement". At present it appears that data from only one summer season has been included in the survey.

We also agree with the NPWS's call for further information "on potential impacts on birds offshore and within shipping routes" (Section 1.6, Table 1.1). As the survey was only carried out in the vicinity of the proposed development site no data was provided with consideration to the impact on birds along the shipping route.

Permission for a proposed 26-kilometer pipeline from Tarbert to Foynes expired in 2014, contrary to what is stated by both An Bord Pleanála in its pre consultation meetings with the developer and by the developer itself (see, for example, EIA Volume 1 page 9, Volume 2 page 1-18). The developer makes certain assumptions based on the pipeline being permitted but this should be brought into question, e.g. in Volume 2 page 1-18: "The necessary cumulative and in combination assessments have been completed, on the basis that the permitted pipeline is built in accordance with its existing approval". Considering the "in combination" assessment under the Habitats Directive and, as suggested by the Department of Planning in the pre application observations, a revised assessment of the pipeline should be conducted.

7. LNG Impacts on Communities

Liquefied Natural Gas export and import terminals consist of large, disruptive and dangerous infrastructure components, with safety risks for local communities, as illustrated by several serious incidents (Concerned Health Professionals of NY, 2019). In 2014, an explosion in an LNG storage tank in Washington forced hundreds to evacuate a two-mile zone around the facility (RAN, 2016). European transportation researchers have identified potential risks to public safety from LNG transport on inland waterways, including the possibility of collision with other ships or with stationary objects such as bridges, as well as the threats of vapor release, flash and jet fires (Galieriková et al, 2017). The Shannon Estuary is an example of such a waterway in Ireland.

When the full life-cycle of LNG is taken into consideration, there are numerous human rights and health implications along the journey (Physicians for Social Responsibility, 2019). In addition to the fracking process itself, LNG terminals also emit ozone, contributing to severe respiratory problems, and the toxic air pollutant carbon monoxide through the loading and unloading of tankers (Afon and Ervin, 2008). The 2015 Aliso Canyon gas leak in California left residents with nausea, respiratory problems and skin rashes (RAN, 2016). There is also a racial and environmental justice dimension to LNG exports. The majority of planned LNG facilities in the US are located in predominantly African American, Native American, and Hispanic communities of lower socioeconomic status (Physicians for Social Responsibility, 2019). These historically marginalized and oppressed communities will bear the brunt of the environmental and health risks associated with LNG infrastructure. The health impacts of burning of fossil fuels in terms of air pollution and disease are significant and well-documented (Tong, 2019). The community surrounding the planned site should not be subjected to such health and safety risks. Additionally, investment in fossil fuels rather than clean energy could result in higher energy bills for customers and increase energy poverty (Carbon Tracker, 2021).

8. Local and International opposition to LNG

Opposition to LNG projects is growing rapidly in Ireland and globally. In Ireland, over 6,500 people have signed petitions against Shannon or Cork LNG, and in 2019 over 40 civil society organisations signed a letter against Cork LNG (Uplift, 2019; NHNA, 2019). In November 2019, a resolution against Cork LNG was passed almost unanimously by Cork City and Cork County Council, while in 2020 Dun Laoghaire-Rathdown County Council passed a motion against the importation of fracked gas. The Shannon LNG terminal, first proposed in 2006, has a long history of delay and resistance; local opposition groups were established in 2007 and the project has been the subject of several court cases on environmental grounds. In February 2019, the High Court referred the case to the European Courts, with the European Court of Justice ruling in September 2020 that the project should be subject to a new environmental assessment under the EU Habitats Directive. On the basis of this decision, the High Court rejected Shannon LNG planning permission (Carolan, 2020). In November 2019 in the Dáil, the Youth Assembly on Climate called for a ban on fracked gas imports. Prior to the 2020 Irish General Election, there was cross-party support, including from Fianna Fáil and the Green Party, for the *One Future* pledge, which incorporated a commitment to stop the construction of new fossil fuel infrastructure. Similarly, 64 sitting TDs in the 33rd Dáil signed the Not Here Not Anywhere Fossil Free Election Pledge.

Globally, LNG projects are facing similar opposition and delays as governments begin to recognise that they are incompatible with climate action targets. In 2019, the Swedish government, under pressure from climate campaigners, withdrew support for the proposed Gothenburg LNG Terminal and removed it from the EU's Projects of Common Interest list (350.org, 2019). In France, the government stepped in to stop a deal between energy firm Engie and a US LNG company, citing climate and environmental impacts among other concerns (Reuters, 2020).

There is a growing list of abandoned major fossil fuel infrastructure projects, including the MidCat pipeline in Spain/France and the Atlantic Coast pipeline in the US. Several US jurisdictions have passed legislation banning new major fossil fuel infrastructure, including Portland and King County, Washington. Fossil fuel extraction has been stopped in Portugal, France, Costa Rica, New Zealand and Belize, and the Irish government is no longer issuing new licences for offshore oil or gas exploration. LNG terminals are at particular risk of becoming stranded assets, essentially a waste of money (Perez, 2018). Since 2014, 61% of proposed LNG projects have been cancelled or abandoned (Plante et al, 2020). In 2020, the oil and gas price crash saw LNG prices plummet. This further undermined already waning investor confidence and led to high profile withdrawals from projects such as Shell's exit from the Lake Charles LNG terminal and Berkshire Hathaway's withdrawal of €3 billion from the Energie Saguenay LNG Terminal in Canada (Plante et al., 2020). In July 2020, then Vice President of the European Investment Bank, Andrew McDowell, stated that "investing in new fossil fuel infrastructure like liquefied natural gas (LNG) terminals is increasingly an economically unsound decision" (Reuters, 2020).

9. Conclusion and Summary

As this submission has outlined, planning permission for PA08.311233 should not be granted for the following reasons:

1. The government is opposed to LNG terminals.

2. New research on the warming effects of methane mean that gas can no longer be viewed as a cleaner, transition fuel.
3. The emissions impact, both direct and indirect, from the proposed LNG terminal would be 28 times greater than what is quoted in the application and would account for up to 59.7% of Ireland's carbon allowance.
4. Building LNG infrastructure is incompatible with Ireland's climate targets.
5. Major developments in renewable energy mean that reliance on imported LNG is no longer necessary as a source of energy or guarantee of energy security.
6. Global trends against the fossil fuel industry show that investors are prioritising green development and turning away from ties with fossil fuel infrastructure.
7. The independent energy security review has not yet been completed.
8. An LNG terminal would have a devastating effect on the biodiversity of what is now a Special Protected Area.
9. There is a high likelihood that the gas imported will be fracked which contradicts the Government Policy Statement on the Importation of Fracked Gas.
10. Permission for the connecting pipeline expired in 2014 and needs to be reassessed.
11. No information on where the gas would be sourced has been provided and there is a serious risk of the Irish people being made complicit in the exploitation of communities abroad by the fracking industry.

We hereby call on the Board to refuse planning permission for PA08.311233. In particular, we re-emphasise that the Environmental Impact Assessment Report is misleading and has drastically understated the emissions impact of the terminal in relation to Ireland's Climate Targets. We also highlight the Board's obligation under Section 34 of the Planning & Development Act to align with the Government Policy Statement on the Importation of Fracked Gas, which states that "it would not be appropriate for the development of any LNG terminals in Ireland to be permitted or proceeded with" until the ongoing independent review of energy security is concluded, which it is not.

Yours respectfully,

Not Here, Not Anywhere

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Appendix A:

Comparison between LNG and Moneypoint

Carbon dioxide equivalent CO2e emissions from the proposed LNG terminals (Cork LNG, Shannon LNG and Predator LNG Cork, Mayo & Louth) were compared with the estimated maximum emissions from Ireland's largest electricity generation station, Moneypoint Coal Power Station.
All variables used are captured in Table 1.4 below.

Approach

The methane import capacity of each of the terminals was taken (Shannon 8.2 bcm, Cork 3.85 bcm and Predator 12 bcm) and the CO2 that would be produced from burning this methane was calculated, assuming a leakage rate of 2.5% (see Table 1.1 below).
The Global Warming Potential over a 20 year period (GWP_{20}) of methane was used to calculate the CO2 equivalent emissions from the uncombusted gas (see Table 1.2 below).

The total CO2 equivalent emissions from the LNG terminals were compared to the estimated maximum emissions from Moneypoint (see Table 1.3 below).

Project	Import/Regasification Capacity		Combustion Rate	Natural gas to be burned (cubic feet/a)	Emissions Factor (kg CO2 per scf)	CO2 Emissions (kg/a)	CO2 Emissions from combustion (tonnes/a)
	Natural Gas (bcm/a)	Natural Gas (cubic feet/a)					
Cork LNG	3.85	135,961,595,000	97.5%	132,562,555,125	0.0544	7,216,705,501	7,216,706
Shannon LNG	8.2	289,580,540,000	97.5%	282,341,026,500	0.0544	15,370,645,483	15,370,645
Predator LNG	12	423,776,400,000	97.5%	413,181,990,000	0.0544	22,493,627,536	22,493,628
Total	**24.05**	**849,318,535,000**					**45,080,979**

Table 1.1 - CO2 Equivalent emissions from combustion of 97.5% of the imported methane (assuming a 2.5% leakage rate).

Project	Import/ Regasification Capacity	Leakage Rate	Natural Gas leaked (m3/a)	% Methane	Methane leaked (m3/a)	Methane leaked (kg/a)	Methane leaked (tonnes/a)	GWP20 of Methane	CO2 Equivalent Emissions from leakage (tonnes/a)
	Natural Gas (bcm/a)								
Cork LNG	3.85	2.5%	96,250,000	95%	91,437,500	65,514,969	65,515	86	5,634,287
Shannon LNG	8.2	2.5%	205,000,000	95%	194,750,000	139,538,375	139,538	86	12,000,300
Predator LNG	12	2.5%	300,000,000	95%	285,000,000	204,202,500	204,203	86	17,561,415
Total	**24.05**						**409,256**		**35,196,003**

Table 1.2 - CO2 Equivalent emissions from uncombusted methane (assuming a 2.5% leakage rate and a GWP20 of 86).

Project	CO2 Emissions from combustion (tonnes/a)	CO2 Equivalent Emissions from leakage (tonnes/a)	Total CO2 Equivalent emissions (tonnes/a)	No. of Moneypoints
Cork LNG	7,216,706	5,634,287	12,850,993	1.88
Shannon LNG	15,370,645	12,000,300	27,370,946	4.01
Predator LNG	22,493,628	17,561,415	40,055,043	5.86
Total	**45,080,979**	**35,196,003**	**80,276,981**	**11.75**

Table 1.3 - Total CO2 equivalent emissions from the LNG terminals when compared to the estimated maximum emissions from Moneypoint.

Variables Used		Description
Cork LNG Import Capacity	3.85 bcm	Import/regasification capacity of Cork LNG Source: Next-Decade.com https://web.archive.org/web/20180131043244/http://next-decade.com/2017/07/nd-cork-mou/
Shannon LNG Import Capacity	8.20 bcm	Import/regasification capacity of Shannon LNG Source: European Network of Transmission System Operators for Gas (ENTSOG) https://www.entsog.eu/sites/default/files/2019-11/__TYNDP%202020_Annex%20A%20-%20Projects%20Tables.xlsx
Predator LNG Import Capacity	12.00 bcm	Import/regasification capacity of Predator LNG (Cork, Mayo & Louth) Source: AIE request from DCCAE https://drive.google.com/file/d/1A2Reyo4NycKU5W_NEdl1g9mE4nbCXWc1/view?usp=sharing
bcm - cf	35,314,700,000	Conversion Rate
Emissions Factor	0.0544	Multiplier for CO2 produced from burning CH4 Source: US Environmental Protection Agency 2020 https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf
kg - tonnes	1,000	Conversion Rate
Moneypoint (tonnes CO2)	6,833,081	Estimated Maximum CO2 emissions from Moneypoint (not including CO2e from Nitrogen Oxide, Sulphur Dioxide or Sulphur Hexafluoride) Source: See Moneypoint Calculation below
% Methane	95%	Percentage of LNG likely to be methane Source: US Dept of Energy https://www.energy.gov/sites/prod/files/2013/04/f0/LNG_primerupd.pdf
Leakage Rate	2.5%	% of gas successfully burned Source: Howarth et al, 2012 http://www.eeb.cornell.edu/howarth/publications/Howarth_et_al_2012_National_Climate_Assessment.pdf
GWP20 of Methane	86	Global Warming Potential of CH4 over 20 years Source: Working Group I's contribution to the IPCC's Fifth Assessment Report (2013) https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf
cubic feet to m3	0.02832	Conversion Rate
Density of CH4 (kg/m3)	0.71650	Density of methane gas at STP

Table 1.4 - Variables used in calculation along with relevant sources.

Moneypoint Calculation

The ESB Archives gives an approximate maximum throughput rate for Moneypoint of approximately 7,000 tonnes of coal per day[1].

Assuming Moneypoint operated at this maximum throughput rate for 365 consecutive days a year would give a max throughput of 2,555,000 tonnes of coal per annum.

The Sustainable Energy Authority of Ireland (SEAI) provides breakdowns of the different types of coal burned at Moneypoint since 1990[2]. On average Bituminous Coal accounts for 96.27%, Lignite accounts for 1.03% and Anthracite & Manufactured Ovoids accounts for 2.70% as per Table 2.1 below.

Type of Coal	**%**	**Mass of coal (tonnes)**
Bituminous Coal	96.27%	2,459,758
Lignite	1.03%	26,321
Anthracite + Manufactured Ovoids	2.70%	68,920
Total	**100%**	**2,555,000**

Table 2.1 - Breakdown of the types of coal burned at Moneypoint as per SEAI data.

The US Energy Information Administration (EIA) shows that when burned 1 Million BTU of Bituminous Coal, Lignite and Anthracite produces 205.7lbs, 215.4lbs and 228.6lbs of CO2 respectively[3].

Coal Type	**lbs CO2 produced per Million BTU**
Bituminous Coal	205.7
Lignite	215.4
Anthracite	228.6

Table 2.2 - lbs of CO2 produced per Million BTU for each type of coal burned at Moneypoint as per the US EIA.

[1] ESB Archives 'Moneypoint' Retrieved from: https://esbarchives.ie/portfolio/moneypoint/#:~:text=Moneypoint%20is%20one%20of%20Ireland's,7%

20million%20MW%20hours%2Fyear

[2] Sustainable Energy Authority Ireland (SEAI) 'Energy Data Portal – Primary Energy'. Retrieved from: https://www.seai.ie/data-and-insights/seai-statistics/energy-data/

[3] U.S. Energy Information Administration (EIA) 'FAQ'. Retrieved from: https://www.eia.gov/tools/faqs/faq.php?id=73&t=11

Taking mean heat content values for Bituminous Coal, Lignite and Anthracite (13,000 BTU/lb, 6,150 BTU/lb and 14,000 BTU/lb respectively[4]) it was estimated that for every tonne of Bituminous Coal, Lignite and Anthracite burned there would be approximately 2.67 tonnes, 1.32 tonnes and 3.20 tonnes of CO2 produced respectively.
Applying this to the estimated mass of each type of coal burned when Moneypoint operates at maximum capacity provides the maximum estimated value for CO2 (excluding estimated CO2e values for Nitrogen Oxide, Sulphur Dioxide and Sulphur Hexafluoride).

Coal Type	**Mass of coal (tonnes)**	**Tonnes of CO2 produced per tonne of coal burned**	**Tonnes of CO2 produced by Moneypoint at Max Capacity**
Bituminous Coal	2,459,758	2.67410	6,577,640
Lignite	26,321	1.32471	34,868
Anthracite	68,920	3.20040	220,573
Total	**2,555,000**		**6,833,081**

Table 2.3 - Maximum estimated CO2 emissions from Moneypoint from burning coal.

This comparison assumes that Moneypoint is operating at 100% capacity for 365 days in a row. A lower estimate for Moneypoint's emissions would result in an even more dramatic comparison with LNG terminals. For example, we also calculated approximate CO2 emissions for Moneypoint using actual operational data and found that the highest recorded output since 1990 was c.5.5 Million tonnes of CO2. 6,833,081 is c.25% higher than the peak actual emissions in 1990.

[4] The Energy Center - Purdue University 'COAL CHARACTERISTICS - CCTR Basic Facts File # 8.' Retrieved from: https://www.purdue.edu/discoverypark/energy/assets/pdfs/cctr/outreach/Basics8-CoalCharacteristics-Oct08.pdf