



Not Here Not Anywhere
www.notherenotanywhere.com

T:@NHNAireland

I:@notherenotanywherenhna

F:@notherenotanywherenhna

For a fossil free future for Ireland

Fingal County Council - Planning Dept.,
Civic Offices,
Grove Road,
Blanchardstown,
Dublin 15
D15 W638

27 January 2022

Planning Application Reference: FW21A/0250

Applicant: Kilshane Energy Ltd.

Location: Kilshane Road, Kilshane, Finglas, Dublin 11.

This submission is made on behalf of Not Here Not Anywhere (NHNA), a nationwide, grassroots, non-partisan group campaigning to end fossil fuel exploration and the development of new fossil fuel infrastructure in Ireland and across the world. We advocate for fair society-wide energy usage and a just transition to renewable energy systems.

NHNA welcomes Ireland's commitment to transition to net zero by 2030 and the urgent adaptation of our energy supply. We recognise that the transition to renewables must be carried out in a way that guarantees nationwide energy security. However, we argue that the development of new fossil fuel infrastructure to facilitate this transition is not a viable solution.

Executive Summary

We urge Fingal County Council to reject the application made for the new gas power station proposed by Kilshane Energy Ltd. for the following reasons:

- The application provided is weak and lacks key operational information.
- The application does not meet the necessary planning regulations regarding environmental impact.

- New fossil fuel infrastructure, such as the proposed development at Kilshane Road, is not in line with Ireland’s international climate commitments.
- New fossil fuel infrastructure of this type threatens our national and local climate targets.
- The applicant has no track record of delivering energy projects and we would strongly question the competence of Kilshane Energy Ltd.
- High emissions impact from both the combustion and leakage of methane threaten Ireland and Fingal County Council’s ability to remain within planned carbon budgets/emissions targets.
- Adverse health impacts on the local community

International climate agreements

Merely a few weeks after COP26, it is extremely concerning to learn that seven new gas power plants are planned for construction in Ireland, including the plant proposed at Kilshane Road, Finglas. During the fortnight of negotiations in Glasgow, Ireland became a core member of the international Beyond Oil and Gas Alliance (BOGA), committing to align oil and gas production with the objectives of the Paris Agreement. In signing on to this international coalition, the government recognised that oil and natural gas demand need to decline by 75% and 55% respectively between 2020 and 2050 to achieve net zero, with nations of the global North pioneering this transition (Beyond Oil and Gas Alliance [BOGA], 2021; International Energy Agency, 2021). In this light, we urge Fingal County Council to reject the application made for a new gas power station proposed by Kilshane Energy Ltd.

COP26 also saw our government aligning with a global partnership to cut methane emissions by 30% by 2030. Methane is a potent greenhouse gas, with a Global Warming Potential 86 times that of CO2 over a 20 year period (Myhre et al., 2013, p714, Table 8.7). Natural gas is frequently portrayed as a ‘clean alternative’ to coal and oil, as burning it emits less CO2 than oil and coal. However, research emerging on the significant amount of methane leaked in the production and transport of natural gas disproves these claims (Borunda, 2020; Environmental Defence Fund, n.d).

Leakage is an inherent part of the natural gas system as highlighted in the below graph (The Conversation, 2018) adapted from the US Environmental Protection Agency’s 2018 inventory report on GHG emissions (EPA, 2018).

Where the natural gas industry is leaking methane

Methane leaks occur at every step and stage from production to distribution. These estimates are from 2016.

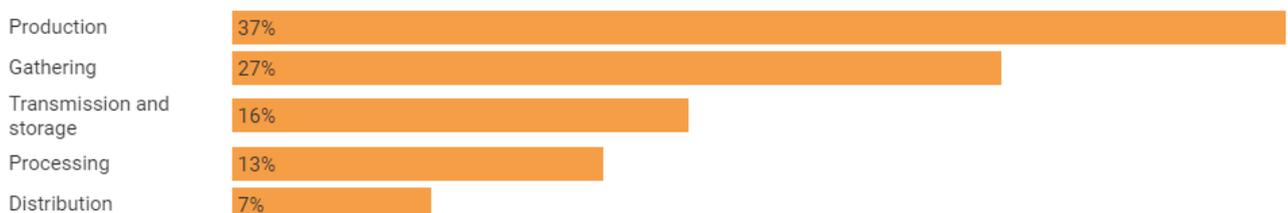


Chart: The Conversation, CC-BY-ND • Source: [Environmental Protection Agency](#) • [Get the data](#)

We cannot justify accompanying the transition to renewable energy with new gas-fueled power plants. McMullin and Price (2019, p. 6) emphasise the need for “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. Further, we restate that the current application is not made in isolation. When considering a new gas plant at Kilshane Road, the cumulative impact of seven potential new gas plants in Ireland must also be considered.

Contravention to planning regulations

The application declares that *“it is not considered that any appropriate assessment issues will arise or the proposed development would be likely to have any significant effects individually or in combination with other plans or projects, on a European site.”*

The application also states *“It is the considered opinion of CWPA Planning and Architecture that the proposed development is considered to be sub-threshold”* and therefore an EIAR isn’t required.

However, Article 103 (1) of the Planning and Development Regulations, 2001 states: *“Where a planning application for sub-threshold development is not accompanied by an EIS, and the planning authority considers that the development would be likely to have significant effects on the environment, it shall, by notice in writing, require the applicant to submit an EIS”* (Irish Statute Book, 2001).

In addition, Schedule 7 of the Planning and Development Regulations, 2001 states: *“Criteria for determining whether a development would or would not be likely to have significant effects on the environment*

1. Characteristics of proposed development

The characteristics of proposed development, in particular:

- *the size of the proposed development,*
- *the cumulation with other proposed development,*
- *the use of natural resources,*
- *the production of waste,*
- *pollution and nuisances,*
- *the risk of accidents, having regard to substances or technologies used”*

(Irish Statute Book, 2001).

We submit that it is clear that this planning application will certainly “have significant effects on the environment” and so, unless Fingal County Council are rejecting the application out of hand, it needs to require the applicant to submit an EIS.

On page 21 of the applicant's Planning Statement it is claimed that the project was deemed sub-threshold for an EIA yet there is no evidence that a proper screening was conducted. The only reason given is the expected heat output is below 300 MW yet even that is marginal at 293 MW.

CWPA
Planning & Architecture 

Planning Statement

8.0 EIAR and AA Screening Determinations

Having consideration for the mandatory and discretionary provisions of the Planning and Development Act, 2000 (as amended) and Schedule 5, Part 1, 2(a) of the Planning and Development Regulations, 2001, (as amended), the requirement for an Environmental Impact Assessment Report would be required for 'A thermal power station or other combustion installation with a heat output of 300 Megawatts or more'. However, the proposed development provides for heat output of 293 MW. It is the considered opinion of CWPA Planning and Architecture that the proposed development is considered to be sub-threshold¹.

Having regard to the reference to Schedule 5, Part 1, 2(a) of the Planning and Development Regulations 2001, (as amended) above, and the proximity to the nearest European site, it is not considered that any appropriate assessment issues will arise or that the proposed development would be likely to have any significant effects, individually or in combination with other plans or projects, on a European site.

We would argue that the proposed project needs a full screening under the EIA Directive and that the applicant has provided no evidence detailing how they reached their screening determination. Where an application for sub-threshold development is not accompanied by an EIAR, the competent authority shall carry out a preliminary examination taking account of the relevant criteria set out in Annex III of the EIA Directive 2014/52/EU.

Annex III of the 2014 Directive outlines the selection criteria referred to in Article 4(3) (criteria to determine whether the projects listed in Annex II should be subject to an Environmental Impact Assessment). These are:

“1. Characteristics of projects

The characteristics of projects must be considered, with particular regard to:

- (a) The size and design of the whole project;*
- (b) Cumulation with other existing and/or approved projects;*
- (c) The use of natural resources, in particular land, soil, water and biodiversity;*
- (d) The production of waste;*
- (e) Pollution and nuisances;*

- (f) The risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge;*
- (g) The risks to human health (for example due to water contamination or air pollution).*

2. Location of projects

The environmental sensitivity of geographical areas likely to be affected by projects must be considered, with particular regard to:

- (a) The existing and approved land use;*
- (b) The relative abundance, availability, quality and regenerative capacity of natural resources (including soil, land, water and biodiversity) in the area and its underground;*
- (c) The absorption capacity of the natural environment, paying particular attention to the following areas:*
 - (i) Wetlands, riparian areas, river mouths;*
 - (ii) Coastal zones and the marine environment;*
 - (iii) Mountain and forest areas;*
 - (iv) Nature reserves and parks;*
 - (v) Areas classified or protected under national legislation; Natura 2000 areas designated by Member States pursuant to Directive 92/43/EEC and Directive 2009/147/EC;*
 - (vi) Areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure;*
 - (vii) Densely populated areas;*
 - (viii) Landscapes and sites of historical, cultural or archaeological significance.*

3. Type and characteristics of the potential impact

The likely significant effects of projects on the environment must be considered in relation to criteria set out in points 1 and 2 of this Annex, with regard to the impact of the project on the factors specified in Article 3(1), taking into account:

- (a) The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);*
- (b) The nature of the impact;*
- (c) The transboundary nature of the impact;*
- (d) The intensity and complexity of the impact;*
- (e) The probability of the impact;*
- (f) The expected onset, duration, frequency and reversibility of the impact;*
- (g) The cumulation of the impact with the impact of other existing and/or approved projects;*
- (h) The possibility of effectively reducing the impact.*

Where the competent authority concludes, based on such preliminary examination, there is significant and realistic doubt in regard to the likelihood of significant effects on the environment arising from the proposed development, it shall require the applicant to submit to the authority the information specified in Annex II.A for the purposes of a screening determination.”

The section on Greenhouse Gas Emissions below highlights the obvious environmental impacts of the proposed gas plant and how they relate to the above criteria. Again, no comparable assessment appears to have been conducted by either the applicant or Fingal County Council to properly assess the environmental impact of this project and planning must not be granted as a result.

Greenhouse gas emissions

As there was no Environmental Impact Assessment conducted for the proposed gas plant we have taken the liberty to calculate a reasonable assumption of what the operational emissions impact of the proposed plant may be.

The applicant has not provided any information about how much gas will be burned at the plant each year. They have estimated the output of the plant to be 293MW of electricity per year. To estimate the volume of gas needed to generate this level of electricity we will compare it to the recent application to Galway County Council (Ref No. 212192) by EP Energy Developments for a similarly-sized 299MW open cycle gas turbine power plant. The EIAR for this development stated that 83,527,397m³ of natural gas would be burned to generate the 299MW per year. As the 293MW plant proposed in Fingal is approximately 2% less than the plant proposed for Galway, we will take an approximate annual volume of gas as 98% or 81,851,262m³.

Natural gas largely comprises methane, a greenhouse gas with a global warming potential 86 times greater than carbon dioxide over a 20-year period (Myhre et al., 2013, p. 714, Table 8.7). Since methane leakage is inherent to all gas systems, in order to understand the true emissions impact of this plant we must also take into account the impact of leaked methane. Table A below proposes three different leakage scenarios (Howarth et al., 2012, p2, Table 1; Hayhoe et al., 2002) and calculates the volume of leaked gas and the volume of gas that would actually be combusted under each scenario.

Table A - Volumes of gas to be combusted (accounting for leakage)

| Variable | Low Estimate | Best Estimate | High Estimate |
|---------------------------------------------|---------------------|----------------------|----------------------|
| Leakage rates | 0.2% | 2.5% | 10% |
| Volume of gas (m3 per year) | 81,851,262 | 81,851,262 | 81,851,262 |
| Volume of gas leaked (m3 per year) | 163,703 | 2,046,282 | 8,185,126 |
| Volume of gas to be combusted (m3 per year) | 81,687,559 | 79,804,980 | 73,666,136 |

Once the likely volumes of gas to be conducted each year have been estimated, Table B uses an emissions factor of 0.0544 kg (EPA, 2020, p1, Table 1) to calculate the tonnes of CO₂ produced from combustion.

Table B - Annual emissions from combustion

| Variable | Low Estimate | Best Estimate | High Estimate |
|-------------------------------------------------------------------|---------------------|----------------------|----------------------|
| Volume of gas to be combusted (m3 per year) | 81,687,559 | 79,804,980 | 73,666,136 |
| Conversion rate from m3 - ft3 | 35.3147 | 35.3147 | 35.3147 |
| Volume of gas to be combusted (ft3 per year) | 2,884,771,657 | 2,818,288,943 | 2,601,497,486 |
| Emissions Factor (kg CO ₂ per ft3) | 0.05444 | 0.05444 | 0.05444 |
| CO ₂ Emissions from combustion (kg per year) | 157,046,969 | 153,427,650 | 141,625,523 |
| CO₂ Emissions from combustion (tonnes per year) | 157,047 | 153,428 | 141,626 |

Table C takes the volume of gas leaked, assumes it contains 85% methane (Britannica, 2019), and calculates the emissions from this leaked gas in tCO₂e by applying the Global Warming Potential of methane over a 20 year period. Please note that 85% is somewhat conservative and it's not uncommon for natural gas to comprise 95% methane.

Table C - Annual emissions from methane leakage

| Variable | Low Estimate | Best Estimate | High Estimate |
|-----------------------------------------------------------------|---------------------|----------------------|----------------------|
| Volume of gas leaked (m3 per year) | 163,703 | 2,046,282 | 8,185,126 |
| % Methane of natural gas | 85% | 85% | 85% |
| Methane leaked (m3 per year) | 139,147 | 1,739,339 | 6,957,357 |
| <i>Density of methane gas at STP (kg/m3)</i> | <i>0.7165</i> | <i>0.7165</i> | <i>0.7165</i> |
| <i>Methane leaked (kg per year)</i> | <i>99,699</i> | <i>1,246,237</i> | <i>4,984,946</i> |
| <i>Methane leaked (tonnes per year)</i> | <i>100</i> | <i>1,246</i> | <i>4,985</i> |
| <i>GWP20 of methane</i> | <i>86</i> | <i>86</i> | <i>86</i> |
| Total Emissions from leakage (tCO₂e per year) | 8,574 | 107,176 | 428,705 |

The estimated annual emissions from combustion and leakage at each of the three leakage rates are combined and shown below in Table D.

Table D - Annual project emissions from both combustion and methane leakage

| Variable | Low Estimate | Best Estimate | High Estimate |
|-----------------------------------------------------------------------------|----------------|----------------|----------------|
| CO2 Emissions from combustion (tonnes per year) | 157,047 | 153,428 | 141,626 |
| Total Emissions from leakage (tCO2e per year) | 8,574 | 107,176 | 428,705 |
| Total Project Emissions from combustion and leakage (tCO2e per year) | 165,621 | 260,604 | 570,331 |

To estimate the overall emissions impact from operations over the lifecycle of the project we've taken the reported life expectancy of the plant recently proposed for Galway which is 25 years. This is then applied to the annual emissions values.

Table E - Total emissions from both combustion and methane leakage over project lifecycle

| Variable | Low Estimate | Best Estimate | High Estimate |
|--------------------------------------------------------------------------|------------------|------------------|-------------------|
| Total Operational Emissions from combustion and leakage (tCO2e per year) | 165,621 | 260,604 | 570,331 |
| Expected Lifetime of project (years) | 25 | 25 | 25 |
| Total Operational Emissions over 25 years (tCO2e) | 4,140,527 | 6,515,100 | 14,258,273 |

Finally, Table F takes the annual operational emissions over a 5-year period and compares them with Ireland's next 5-year carbon budget.

Table F - Total emissions from operations (combustion & leakage) as a percentage of Ireland's next carbon budget

| Variable | Low Estimate | Best Estimate | High Estimate |
|------------------------------------------------------|--------------|---------------|---------------|
| Annual emissions from leakage & combustion (tCO2e) | 165,621 | 260,604 | 570,331 |
| Total emissions over a 5-year period (tCO2e) | 828,105 | 1,303,020 | 2,851,655 |
| Ireland's Carbon Budget 2026-2030 (tCO2e) | 200,000,000 | | |
| Total emissions over 5 years as a % of carbon budget | 0.41% | 0.65% | 1.43% |

National and regional climate targets

The expansion of fossil fuel infrastructure inevitably leads to economic reliance on these dirty energy sources, and a 'lock-in' effect to fossil fuels (Borunda, 2020; McMullin & Price, 2019). It is crucial that Ireland does not further lock-in its

dependence on fossil fuels if we are to meet our climate targets under the Paris Agreement and the Climate Action and Low Carbon Development (Amendment) Bill 2021 - which legally obliges us to achieve a 51% reduction of our 2018 emissions levels by 2030 and net-zero by no later than 2050.

Fundamentally, the climate risks of locking Ireland into new fossil fuel infrastructure far outweigh any potential energy security risks related to gas supply. Both Fingal County Council's Development Plan and Climate Action Plan express the council's commitment to transitioning to a low carbon society and economy (Fingal County Council, 2021; Fingal County Council, 2019). Both documents identify a reduction in private car use through improved public transport, walking and cycling infrastructure as ways of achieving the target reductions. Yet the annual operational emissions alone from the proposed gas plant at Kilshane, Finglas would have the same CO₂ equivalent impact as an additional 86,868 cars on the road (taking best estimate values from Greenhouse Gas Emissions section above).

Operational Emissions

equivalent to

86,868* cars

*assuming the average Irish car produces 3 tCo₂e per year (O'Riordan & Daly, 2020).

Data centres and energy security

This application emphasises the contribution of the proposed gas plant to energy security, but we must acknowledge that Ireland's energy security is greatly undermined by the recent and rapid growth of data centres in Ireland. Eirgrid (2020) estimates that data centres may account for up to 27% of Ireland's electricity demand by 2028.

Currently, many companies claim to operate data centres powered by 100% renewable energy. However, the energy is largely sourced indirectly through Renewable Energy Certificates or Purchase Power Agreements (Chernicoff, 2016). If we continue to allow companies to virtually purchase clean energy where it is cheapest to create, while actually using and increasing demand for dirty energy in Ireland, we allow them to profit while our real emissions continue to rise. We cannot continue to increase Ireland's energy demand so dramatically, only to continue building fossil fuel infrastructure to cater to this demand.

As outlined in our policy briefing, a moratorium on data centre development is imperative until an appropriate regulatory framework is in place (Not Here Not Anywhere, n.d.). We ask Fingal County Council to be cognisant of data centre growth in Ireland when considering Ireland's energy demand, and to prioritise our climate targets and commitments over the continued expansion of the data centre industry.

In fact P.17 of the Planning Statement submitted by Kilshane Energy Ltd. cites powering data centres as a primary justification for building the proposed gas plant because of data centres.

This site at Kilshane Road, Finglas has been acquired by Kilshane Energy Ltd. as the location is key in terms of access to the grid but it is also in an area of planned high growth whether in terms of Data Centres, Commercial, Industrial and Heavy Industry. The concern of power outages has been highlighted recently in the media and is obviously a significant concern in terms of not stagnating growth in Ireland's growing economy.

This justification no longer holds as Eirgrid, who are clearly concerned by the issue, have announced that no new data centre grid connections will be permitted in Dublin for the foreseeable future (RTE, 2022).

Applicant's reputation

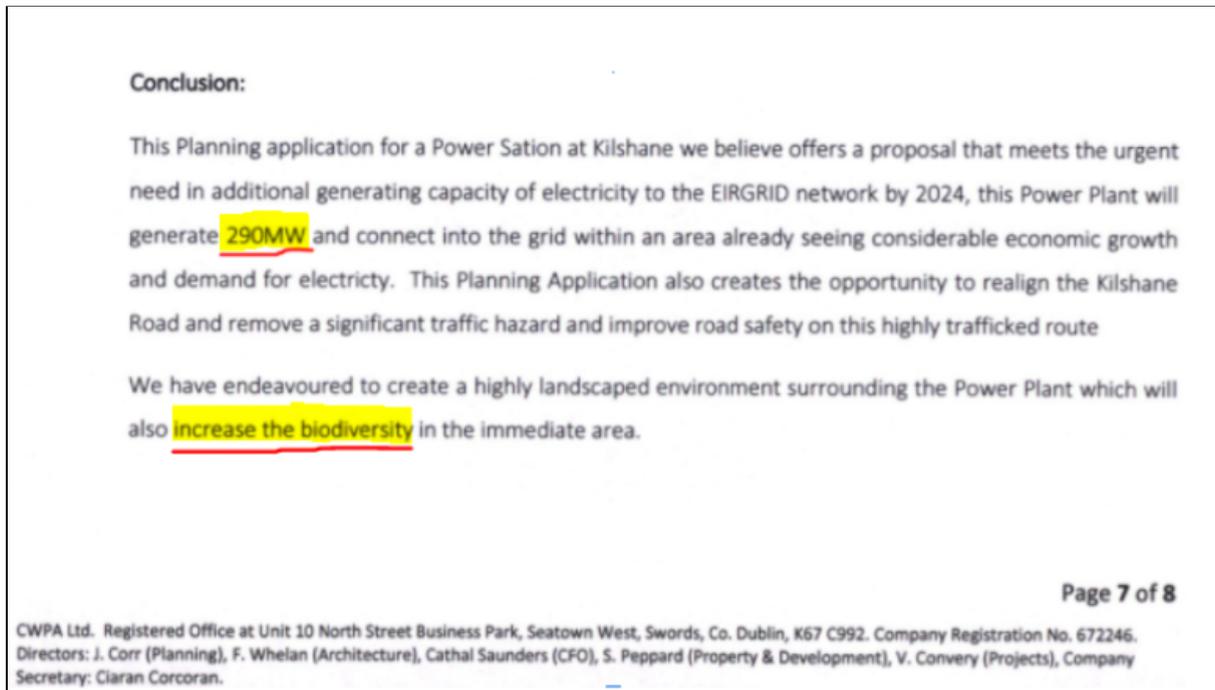
Kilshane Energy Ltd. was newly-formed 5 months ago. The company has never undertaken a project of any type. Never. The only publicly-noted employee is the Director Stuart Draffin. Mr Draffin's professional history involves Car Parks, Outdoor Advertising and Real Estate. No experience whatsoever in the energy industry. Kilshane Energy Ltd. has no track record of competence.

It is worth noting that their original planning application for construction of this power station was deemed invalid by Fingal County Council for failing to correctly plan for wastewater treatment. They also had an application rejected by An Bórd Pleanála because they did not meet the requirements for strategic infrastructure.

In Kilshane's current application, received by Fingal County Council on 16th December, the conclusion section on p.7 states that the plant will generate 290 MW of electricity. This differs from the 293 MW figure used in other areas of the application.

While this is likely a typo, 3 MW is a significant difference and the generating capacity is a key element in Kilshane's purpose for building this plant. If their attention to detail is so low that they can't even confirm how much energy will be produced then we must call into question their ability to safely and efficiently develop

and operate such a significant piece of infrastructure. How can we even be sure any of the other figures they've provided are correct? How can we be sure the plant won't produce 300 MW and require an Environmental Impact Assessment Report? While a backup volume of gas oil is mentioned in the application, at no point in any of the documents does Kilshane say what volume of gas is likely required in order to generate the electricity. The omission of such an important figure also suggests incompetence.



Furthermore, the final sentence on p.7 is an obvious attempt to assuage the council's concerns about biodiversity loss, but it is ridiculous to claim that taking a currently vacant site and building a gas power plant on it will **increase** the biodiversity of the site. This line was clearly added as an afterthought. Environmental Impact Assessments were designed with the aim of preventing poorly planned and damaging developments like this from being realised. A proper and thorough Environmental Impact Assessment, if conducted, would no doubt highlight the harm a site like this would cause.

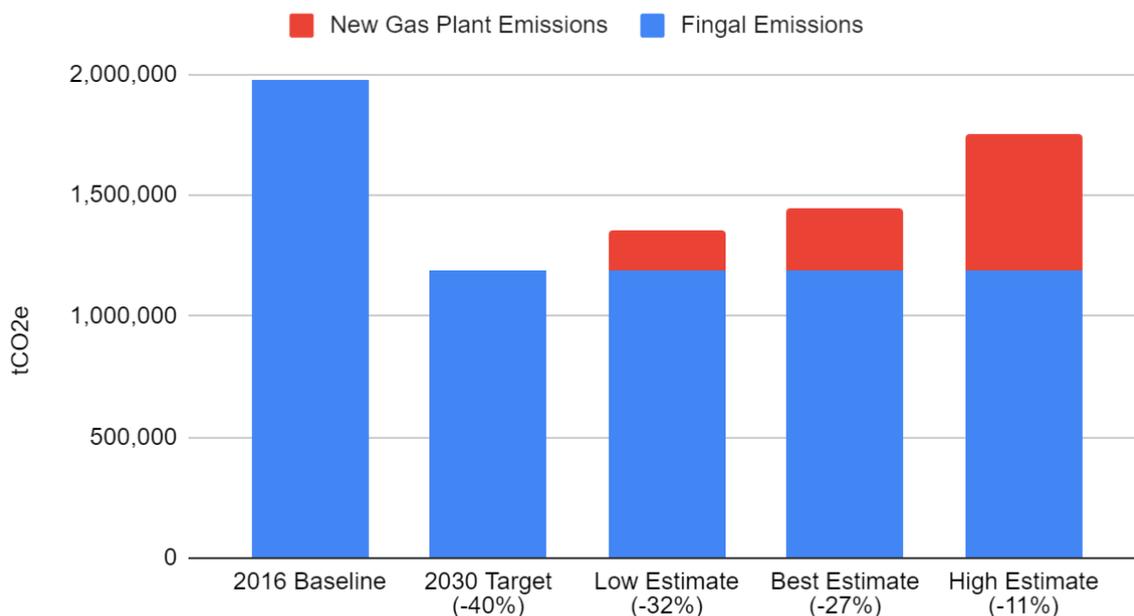
Kilshane Energy Ltd. are very clearly inexperienced in this sector. From a safety perspective alone they do not seem fit to construct and operate a large gas power plant and granting them permission to do so would be irresponsible. In addition to this, their current application is weak and lacks vital operational information. Not enough information has been provided to gauge the true impact of the project and we urge Fingal County Council to reject it.

Local climate commitments and considerations

We recognise that implementing a complete transition to renewables does not come without challenges. But, in the context of the climate emergency, increasing our use of and reliance on fossil gas cannot be the solution to Ireland’s energy security. We encourage Fingal County Council to review current energy use within their district, and consider the adaptations possible in order to bring about more efficient and more sustainable energy demand and consumption. Rather than focusing solely on sufficient infrastructure to guarantee energy security, there is an onus on all individuals and all communities to reflect on and readjust our energy demand. City and County Councils play an integral role in bringing about this transition.

Furthermore, we commend Fingal County Council for its commitment to a 40% reduction in emissions by 2030 as part of the Covenant of Mayors for Climate & Energy Europe (Codema, 2018). However, to put the impact of this gas plant into perspective, the below chart shows how approving the construction and operation of the proposed plant at Kilshane would compare to the target emissions reduction of Fingal County Council.

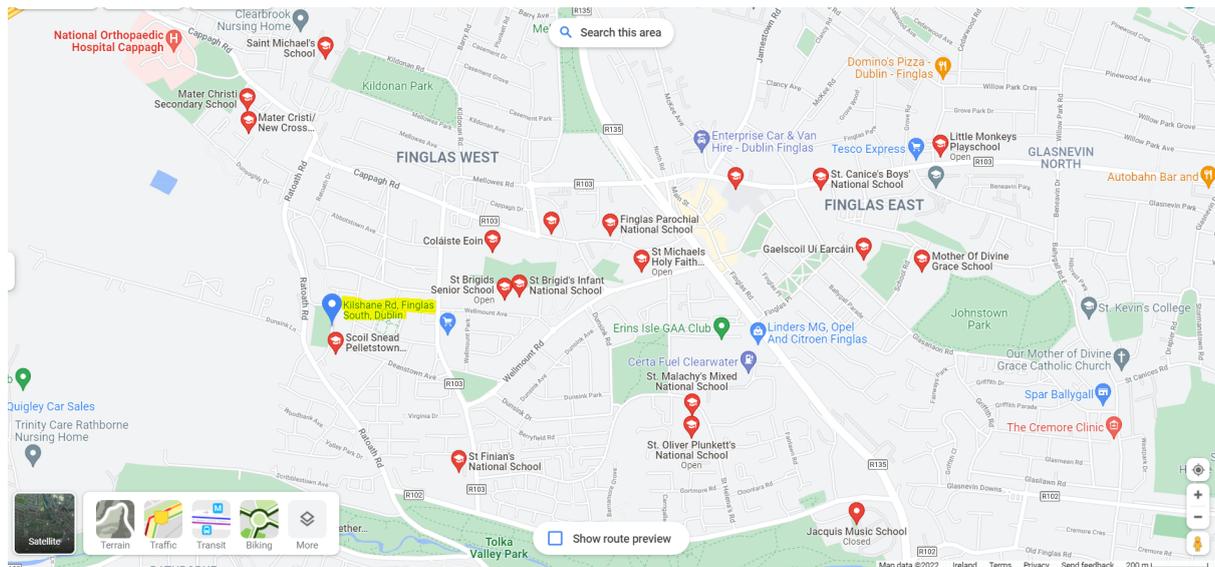
Fingal 2030 Emissions Target incl. impact from Gas Plant



As Fingal County Council has recognised the Climate Emergency declared by the Dáil in 2019 we now urge the Council to demonstrate their commitment to this goal by prohibiting the development of new fossil fuel infrastructure and locking us into a carbon system for the coming decades. It’s imperative that we instead achieve energy security through efficient and sustainable energy demand and the expansion of indigenous renewable energy supply.

Fingal resident considerations

As a Fingal resident myself, I am opposed to the granting of planning permission to Kilshane Energy Ltd. for the building of a natural gas power plant. The proposed gas plant would affect the communities residing in its immediate proximity. Aside from its local climate implications, the burning of natural gas can also contribute to or cause respiratory and cardiovascular problems (Buonocore et al., 2021). Fingal residents have determined that c.23,000 children live within a 3km-radius of the proposed development. A cursory glance at Google maps shows that the Kilshane Road site is in the vicinity of at least 17 schools. (All 📍 icons indicate schools)



| School Name | Distance from Proposed Plant |
|----------------------------------------------|------------------------------|
| Scoil Snead Pelletstown National School | Less than 1 km |
| Pelletstown Educate Together National School | Less than 1 km |
| St Finian's National School | Less than 1 km |
| St Brigid's Infant National School | Less than 1 km |
| St Brigid's Senior School | Less than 1 km |
| Coláiste Eoin | Less than 1 km |
| Mater Cristi/New Cross Secondary School | Less than 1 km |
| St Fergal's Boys National School | Less than 2 km |
| Finglas Parochial National School | Less than 2 km |
| St Michael's Holy Faith Secondary School | Less than 2 km |
| St Malachy's Mixed National School | Less than 2 km |

| | |
|--------------------------------------|----------------|
| St Oliver Plunkett's National School | Less than 2 km |
| St Canice's Girls National School | Less than 2 km |
| St Canice's Boys National School | Less than 2 km |
| Mother of Divine Grace School | Less than 3 km |
| Gaeilscoil Uí Earcáin | Less than 3 km |
| St Kevin's College | Less than 3 km |

In addition, the community already hosts the existing power station at Huntstown which is 3km from the proposed plant at Kilshane Road. Allowing this to go ahead would place a further undue burden of emissions and health implications on the local community.

Conclusion

We urge Fingal County Council to reject the application made for the new gas power station proposed by Kilshane Energy Ltd. for the following reasons:

- The application provided is weak and lacks key operational information.
- The application does not meet the necessary planning regulations regarding environmental impact.
- New fossil fuel infrastructure, such as the proposed development at Kilshane Road, is not in line with Ireland's international climate commitments.
- New fossil fuel infrastructure of this type threatens our national and local climate targets.
- The applicant has no track record of delivering energy projects and we would strongly question the competence of Kilshane Energy Ltd.
- High emissions impact from both the combustion and leakage of methane threaten Ireland and Fingal County Council's ability to remain within planned carbon budgets/emissions targets.
- Adverse health impacts on the local community

Yours sincerely,

Name:

Address:

References

- Beyond Oil and Gas Alliance [BOGA] (2021). The Beyond Oil and Gas Alliance Declaration. Accessed on 13 December 2021 from:
<https://drive.google.com/file/d/176fTn0z5aNr-vhUecAsLOD8Jg110dQMF/view>
- Borunda A. (2020). Natural gas is a much 'dirtier' energy source than we thought. *National Geographic*. Accessed on 13 December 2021 from:
<https://www.nationalgeographic.com/science/article/super-potent-methane-in-atmosphere-oil-gas-drilling-ice-cores>
- Britannica. (2019). Composition and properties of natural gas. Accessed on 05 January 2022, from:
<https://www.britannica.com/science/natural-gas/Composition-and-properties-of-natural-gas>
- Buonocore, J. J., Salimifard, P., Michanowicz, D. R., & Allen, J. G. (2021). A decade of the US energy mix transitioning away from coal: historical reconstruction of the reductions in the public health burden of energy. *Environmental Research Letters*, 16(5), 054030. Accessed on 27 January 2022 from:
https://legacy-assets.eenews.net/open_files/assets/2021/05/05/document_gw_01.pdf
- Černoch, F., Osička, J., & Mariňák, S. (2021). The “coal villain” of the European Union? Path dependence, profiteering and the role of the Energetický a průmyslový holding (EPH) company in the energy transition. *Energy Research & Social Science*, 76, Article 102066. Accessed on 28 December 2021 from:
<https://www.sciencedirect.com/science/article/abs/pii/S2214629621001596>
- Chernicoff, D. (2016). How data centers pay for renewable energy. *Data Centre Dynamics Ltd*. Accessed on 22 September, 2019 from:
<https://www.datacenterdynamics.com/analysis/how-data-centers-pay-for-renewable-energy>
- Codema. (2018). Fingal Baseline Emissions Report 2016. Accessed on 16 January, 2022, from:
https://mycovenant.eumayors.eu/storage/web/mc_covenant/documents/9/LG-M5tKCxJYtLMoI591Q2SaOev6uQyqQ.pdf
- Eirgrid (2020). All Ireland Generation Capacity Statement. Dublin: Eirgrid. Accessed on 16 May 2021 from:
<https://www.eirgridgroup.com/site-files/library/EirGrid/All-Island-Generation-Capacity-Statement-2020-2029.pdf>

- Environmental Defense Fund (n.d.) Methane: A crucial opportunity in the climate fight. *Environmental Defense Fund*. Accessed on 02 January 2022 from: <https://www.edf.org/climate/methane-crucial-opportunity-climate-fight>
- EPA. (2018). Inventory U.S. of Greenhouse Gas Emissions and Sinks (1990 - 2016). Accessed on 05 January, 2022, from: https://www.epa.gov/sites/default/files/2018-01/documents/2018_complete_report.pdf
- EPA. (2020). Emission Factors for Greenhouse Gas Inventories. Accessed on 16 January 2022, from: <https://www.epa.gov/sites/default/files/2020-04/documents/ghg-emission-factors-hub.pdf>
- Fingal County Council. (2019). Climate Change Action Plan 2019 - 2024. Accessed on 16 January, 2022, from: https://www.fingal.ie/sites/default/files/2019-08/20190812_fcc_climate_change_action_plan_final_0.pdf
- Fingal County Council. (2021). Fingal Development Plan 2023-2029. Accessed on 16 January, 2022, from: <https://www.fingal.ie/sites/default/files/2021-07/ce-report-final-02.07.2021.pdf>
- Forbes Slovakia (2020) Patrik Tkáč returns to Křetínský EPH. The Slovak millionaire will own 44 percent. *Forbes*. Accessed on 28 December 2021 from: <https://www.forbes.sk/patrik-tkac-sa-vracia-do-kretinskeho-eph-slovensky-milardar-bude-vlastnit-44-percent/>
- Hayhoe K, Kheshgi HS, Jain AK, Wuebbles DJ (2002). Substitution of natural gas for coal: Climatic effects of utility sector emissions. *Climatic Change* 54: 107-139. Accessed on 05 January 2022 from: http://isam.atmos.uiuc.edu/atuljain/publications/HayhoeEtAl_CC_2002.pdf
- Howarth, R., Shindell, D., Santoro, R., Ingraffea, A., Phillips, N., & Townsend-Small, A. (2012). Methane Emissions from Natural Gas Systems. Ithica: Cornell University, NASA Goddard Space Institute, Boston University, University of Cincinnati. Accessed on 05 January 2022 from: http://www.eeb.cornell.edu/howarth/publications/Howarth_et_al_2012_National_Climate_Assessment.pdf
- International Energy Agency (2021). Net zero by 2050: A roadmap for the global energy sector. Accessed on 19 December 2021 from: <https://iea.blob.core.windows.net/assets/ad0d4830-bd7e-47b6-838c-40d115733c13/NetZeroBy2050-ARoadmapfortheGlobalEnergySector.pdf>

McMullin, B. and Price, P. (2019) Investigating the role of negative emissions technologies in deep decarbonisation pathways for the Irish energy system. *IE-NETs Work Package 4Report*. Working Paper, Dublin City University. Accessed on 19 December 2021 from <http://tinyurl.com/IE-NETs-WP4-Report-PDF>.

Myhre, G., D. Shindell, F.-M. Bréon, W. Collins, J. Fuglestedt, J. Huang, D. Koch, J.-F. Lamarque, D. Lee, B. Mendoza, T. Nakajima, A. Robock, G. Stephens, T. Takemura and H. Zhang, (2013): Anthropogenic and Natural Radiative Forcing. In: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. *Cambridge University Press*, Cambridge, United Kingdom and New York, NY, USA. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf

Not Here Not Anywhere (n.d.). Data Centres and the Energy Transition. Briefing, September 2021. *Not Here Not Anywhere*. Accessed on 04 January 2022 from: https://drive.google.com/file/d/1P72ncJuEiOy_lemXYmVaLAheGicc_32G/view

O'Riordan, V., & Daly, H. (2020). No traffic on the roads means carbon emissions have 'plummeted'. Accessed on 16 January 2022, from: <https://www.rte.ie/brainstorm/2020/0423/1134330-traffic-carbon-emissions-climate-change-ireland-coronavirus/>

RTE. (2022). No new data centres for the capital for the foreseeable future, greater Dublin area "constrained". Accessed 18 January, 2022, from: <https://www.rte.ie/news/dublin/2022/0110/1272869-eirgrid-datacentres-dublin/>

The Conversation. (2018, July 02). The US natural gas industry is leaking way more methane than previously thought. Here's why that matters. Accessed on 05 January 2022 from: <https://theconversation.com/the-us-natural-gas-industry-is-leaking-way-more-methane-than-previously-thought-heres-why-that-matters-98918>