
TECHNICAL NOTE

Project **DUB098/108/601**

Subject **Response To Submission From Colin Doyle**

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The enclosed technical note is a response to the issues raised in relation to the submission to An Bord Pleanála dated 28th May 2024 from Colin Doyle.

The submission from Colin Doyle focusses on the recently published EPA Report entitled “*Ireland’s Greenhouse Gas Emissions Projections - 2023-2050*” (EPA, May 2024). This response to the submission discusses the Proposed Development in the context of the relevant Carbon Budgets and the Electricity Sectoral Emission Ceilings, as outlined in Figure 4 and Table 1, respectively, of the EPA Report (EPA, May 2024) and in the context of Section 15 of the *Climate Action and Low Carbon Development (Amendment) Act 2021*.

Kind regards



Dr. Edward Porter
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Response To Submission From Colin Doyle Dated 28th May 2024

Introduction

1. Chapter 9 of the Environmental Impact Assessment (EIAR) undertook a detailed assessment of the predicted climatic impact of the Proposed Development and of the Overall Project (i.e. the Proposed Development and existing / permitted / potential future development on the wider landholding) in the context of the EU ETS (Emission Trading System). The Addendum to Chapter 9 submitted as part of the further information response built on Chapter 9 of the EIAR and was updated to incorporate the new IEMA Guidance - *Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, 2022). The Addendum also framed the impact of the Proposed Development and Overall Project in the context of the Sectoral Emission Ceilings. The addendum confirmed, as outlined in Section 7.2.4 of the addendum, that through a series of measures including project replacement, a reduction in residual emissions through best practice and the implementation of a series of adaptive design measures, the net impact of the Proposed Development and the Overall Project is not significant. Given that the use of electricity to power the facility will achieve net zero by 2050 and the commitment to offset all interim fossil fuel derived GHG emissions by the purchase of Corporate Power Purchase Agreements (CPPAs) the predicted impact to climate is deemed to be indirect, long-term, negative and minor adverse.
2. This technical note is a response to the issues raised in relation to the submission to An Bord Pleanála dated 28th May 2024 from Colin Doyle in which he raises some concerns in the context of the recently published EPA Report entitled "*Ireland's Greenhouse Gas Emissions Projections - 2023-2050*" (EPA, May 2024). This technical note is a discussion of the climate assessment in the context of the relevant Carbon Budgets and the Electricity Sectoral Emission Ceilings, as outlined in Figure 4 and Table 1, respectively, of the EPA Report (EPA, May 2024) and in the context of Section 15 of the Climate Action and Low Carbon Development (Amendment) Act 2021. The impact of the proposed development and associated proposed mitigation is also discussed using the relevant IEMA guidance (IEMA, 2022), *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) and *Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment* (European Commission, 2017).

Ireland's Greenhouse Gas Emissions Projections 2023 - 2050

3. The EPA Report¹ entitled "*Ireland's Greenhouse Gas Emissions Projections - 2023-2050*" (EPA, May 2024) outlined two scenarios to project into the future:
 - With Existing Measures (WEM) - a projection of future emissions based on currently implemented measures and actions committed by Government which are in place by the end of 2022.
 - With Additional Measures (WAM) - a projection of future emissions based on currently implemented measures and actions committed by Government including all WEM measures plus those included in Government plans but not yet implemented.
4. The EPA Report suggests that the 2021 – 2025 and 2026 – 2030 carbon budgets will be difficult to comply with, with the EPA Report stating:

¹ <https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-greenhouse-gas-emissions-projections-2023-2050.php>

“For Budget period 1 the latest EPA projections show that this is projected to be exceeded by 26 Mt CO_{2eq} in the WEM scenario and 19 Mt CO_{2eq} in the WAM scenario. Based on this assessment, Budget 2 from 2026-2030 is projected to be exceeded by 109 Mt CO_{2eq} in the WEM scenario and by 67 Mt CO_{2eq} in the WAM scenario. Budget 3 from 2031-2035 is projected to be exceeded by 143 Mt CO_{2eq} in the WEM scenario and by 86 Mt CO_{2eq} in the WAM scenario.” (Page 13, EPA, 2024)

Likewise the report suggests that the 2021 – 2025 and 2026 – 2030 sectoral emission ceilings (including the electricity sector) may also be challenging.

5. In relation to electricity, the 2018 emissions from this sector amounted to 10.3 Mt CO_{2eq}. The sectoral emission ceiling target for 2030 is a 75% reduction relative to 2018 which amounts to a target of 3.5 Mt CO_{2eq} in 2030. The current projection from the EPA, based on the WAM scenario, is that there will be a 66% reduction between 2018 and 2030 (EPA, 2024).
6. As shown in Table 1, for the first sectoral emission ceiling period between 2021 – 2025 the projected emissions from electricity are likely be very close to target (41 Mt CO_{2eq} vs 40 Mt CO_{2eq}). This period has a much lower degree of uncertainty associated with it than any future period.

Sector	Project Emissions 2021 – 2025 (Mt CO _{2eq})	Sectoral Ceiling 2021 – 2025 (Mt CO _{2eq})	Project Emissions 2026 – 2030 (Mt CO _{2eq})	Sectoral Ceiling 2026 – 2030 (Mt CO _{2eq})
Electricity	41	40	24	20

Table 1 Projected Emissions vs Sectoral Ceiling 2021-2025 and 2026-2030 (EPA, 2024) Based on the WAM Scenario

7. For the second sectoral emission ceiling period between 2026 – 2030, the projected emissions from electricity are predicted to fall short of target (24 Mt CO_{2eq} vs 20 Mt CO_{2eq}). However, by its nature, this period up to 2030 will have a higher degree of uncertainty associated with this prediction than the period 2021 - 2025.
8. Furthermore, in relation to electricity, it should be noted that there are number of measures which have been excluded from the EPA projection (EPA, 2024) including:
 - CAP24 has projected 9 GW onshore wind, 5 GW offshore wind and 8 GW solar PV by 2030 whilst the EPA has assumed in their projections that, by 2030, there will be 7.2 GW onshore wind, 3.5 GW offshore wind and 6 GW solar PV.
 - The EPA assumed new gas fired generation of 1.4GW by 2030 compared to 2 GW in CAP24.
 - The CAP24 policy of 2 GW offshore wind for green hydrogen post-2030 is also not included in the EPA projections.
9. Although the EPA has excluded these measures for the following reason, as stated in the report:

“there are a number of exceptions where policies and measures were not included as the EPA could not see an implementation pathway to merit their inclusion at this point in time”. (EPA, 2024)

it is possible that subsequent EPA projection reports will include them prior to 2030 on the basis that an implementation pathway becomes apparent.

10. Thus, in projecting forward to 2030 when compliance with the electricity emission ceiling for the period 2026 – 2030 is determined, there is a range of possible GHG projections depending on whether some or all of the proposed measures included in CAP24 are implemented in a timely manner.
11. There are also several governmental strategies currently being developed which will be published over the next few years which will have a direct bearing on the trajectory towards net zero GHG emissions in Ireland. For example, in May 2024, “*Ireland’s National Biomethane Strategy*” (DAFM / DECC, 2024) was published which charts a detailed pathway towards producing 5.7 TWh of biomethane by 2030 and which forms part of the WAM scenario in the EPA Report (EPA, 2024).
12. The EPA (EPA, 2024) also notes in relation to possible future measures which could help to reduce emissions but have not been included in the analysis, including for the period post-2030 – 2050:

“Overall

- *Climate Action Plan 2023 identified unallocated emissions savings of up to 26 Mt CO_{2eq} in the second carbon budget period from 2026 to 2030. These savings are not modelled in these projections. It is noted that the Climate Action Plan 2024 addresses the issue of unallocated emissions savings and identifies five themes that could deliver savings.*
- *Further Measures post-2030 detailed in the electricity, industry, built environment, transport and agriculture sectors where no specific measures or emissions savings have been identified are not modelled.*

These savings combined are estimated to provide a conservative additional abatement of 8.75 Mt CO_{2eq} in 2030, based on the modelling used to prepare the Climate Action Plan 2024” (EPA, 2024 (page 8)).”

Thus, these measures will help to bridge the gap between the emission shortfall highlighted in Paragraph 4 above between the projected emissions in 2030 and the 2030 Carbon Budget target.

13. Projecting further ahead to the period post-2030 to 2050 will lead to greater uncertainty in GHG emissions particularly in circumstances where future technologies and strategies will likely become apparent, but which currently have not been taken into account.
14. The Government in CAP24 has recently reiterated their commitment to the goal of achieving net-zero GHG emissions by 2050:

“Under the Climate Action and Low Carbon Development (Amendment) Act 2021, Ireland’s national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy.”

Proposed Development Mitigation Measures

15. As detailed in “*Appendix 3 – Technical Response to Third Part Appeals*” (Dated November 2023), AWS are committed to implementing a range of mitigation measures which will be applied in line with “*best practice*” as outlined in IEMA (IEMA, 2022).

16. The following mitigations have been qualitatively assessed as mitigations to GHG emissions as outlined in the in “Appendix 3 – Technical Response to Third Part Appeals” (Dated November 2023):

- The Proposed Development is designed to fully comply with the Climate Neutral Data Centre Pact as outlined on Page 24 of the Appeal. The Proposed Development has an annualised design Power Usage Effectiveness (PUE) of 1.12 and has a design water usage effectiveness (WUE) of 0.075 L/kWh as compared to the 0.4 L/kWh set under the Climate Neutral Data Centre Pact. PUE is the most commonly used metric to determine the energy efficiency of a data centre. Data centres need a range of auxiliary services, including cooling, to support the main ‘work’ of the IT systems, PUE measures the size of this ‘overhead’ energy used as a ratio to the energy used to power the computing equipment. Since PUE is a ratio, the closer the number is to 1.0, the more energy efficient the data centre. A survey of European data centres by 451 Research found “*European enterprises cited on average a PUE of 2.1*”² as compared to a PUE of 1.3 set by the Climate Neutral Data Centre Pact and an annualised design PUE of 1.12 for the Proposed Development.
- AWS signed a supply agreement in March 2023 with Certa to supply renewable HVO to their Dublin operations including the existing permitted development and the Proposed Development. AWS’s supply agreement with Certa means that the backup generators for the Proposed Development will be supplied with HVO from the date of commissioning along with any subsequent refills due to generator use. In fact, all refills of AWS’s existing generators in Dublin have been with HVO since October 2022
- A PV array is proposed on each building E and F and will consist of 285 PV modules, each of 300Wp, yielding a total peak power generated of 85.5kWp to match the lighting and IT electrical power requirements during the peak summer months for the administration & office of each building.
- A rainwater harvesting system will be used to ensure non-potable process water for cooling needs for the operational development are met with no reliance on the public water mains. The proposed buildings are designed to harvest rainwater for up to 100% of the annual process water requirements and includes 2170m³ of onsite water storage designed to maximise the storage and utilisation of rainwater, significantly reducing the annual water demand from the local supply.
- Facilitating district heating to a local user for heat or a future heat network – the Proposed Development incorporates design provisions to facilitate district heating including heat distribution pipework up to the site boundary.
- Internal lighting shall be provided by highly efficient, low energy LED luminaires combined with presence detection controls or local switching where appropriate.
- The external lighting will make use of high efficiency, low energy LED luminaires. The lighting design has been optimized to reduce glare, spillage or other light nuisance to adjacent sites and/or public road.
- The data storage rooms are supplied with fresh air which is sufficient to cool the space for the majority of the annual running hours. For a small number of hours during the peak cooling season, adiabatic cooling is required. The system utilises fans to supply air directly from outside to the data storage rooms. The air is warmed as it passes across the IT servers located in the data storage rooms, and subject to external ambient conditions, the air is either recirculated or returned to atmosphere.

² 451 Research - [Improving datacenter efficiency in Europe - the role of PUE](#)

- The mechanical system has various modes of operation to provide efficient and reliable cooling to the data processing area. The mechanical system is monitored and controlled by an electronic building management system (BMS). The system monitors conditions and responds to reduce fan speeds and pump speed to maintain the operating point at the minimum necessary to meet the data storage room environmental conditions.
- All air supply and extract systems serving the data storage rooms are provided with high efficiency direct drive fans. The EC direct drive fan is the most efficient fan solution available to facilitate demand control.

Corporate Power Purchase Agreements (CPPA) As Offsets

17. As set out in the JSA Response To Third Party Appeals document (dated November 2023), under Amazon's publicly available Renewable Energy Methodology³, Amazon works with energy companies around the globe to develop **new** renewable projects dedicated to serving their load, which is aligned with the CPPA Roadmap which states: *“Additionality and Avoiding Greenwashing: If CPPAs simply purchase certificates from projects that would have existed anyway, especially those that have already been funded under schemes supported by the PSO levy (REFIT schemes or the RESS), they may not contribute to additional decarbonisation, which would not achieve the benefits of such contracts for all electricity users and harm public trust. CPPAs for **new** non-subsidised or repowered projects should be prioritised.”* [Emphasis added]
18. The CPPA Roadmap itself notes that *“keeping RESS and CPPAs separate leads to clearer additionality for CPPAs”*. The stipulation that any CPPA related to the Proposed Development would not be subject to any direct government financial subsidy, consumer, or public subsidy ensures that any renewable development subject to such a CPPA does not benefit from receipt of subsidy under the Renewable Electricity Support Scheme (RESS), in line with the CPPA Roadmap. Condition 13(a) of the Fingal County Council decision captures the requirements set out in the CPPA Roadmap, requiring that:
- “The new renewable energy projects shall not be supported by government, consumer or other public subsidies”*
19. The Institute of Environmental Management and Assessment (IEMA) guidance document – *Pathways to Net Zero - Using the IEMA GHG Management Hierarchy* (Nov 2020) revised the IEMA GHG Management Hierarchy as shown in Figure 1 below to include CPPAs under the category of *“substitution”* within the Hierarchy:

³ <https://sustainability.aboutamazon.com/renewable-energy-methodology.pdf>

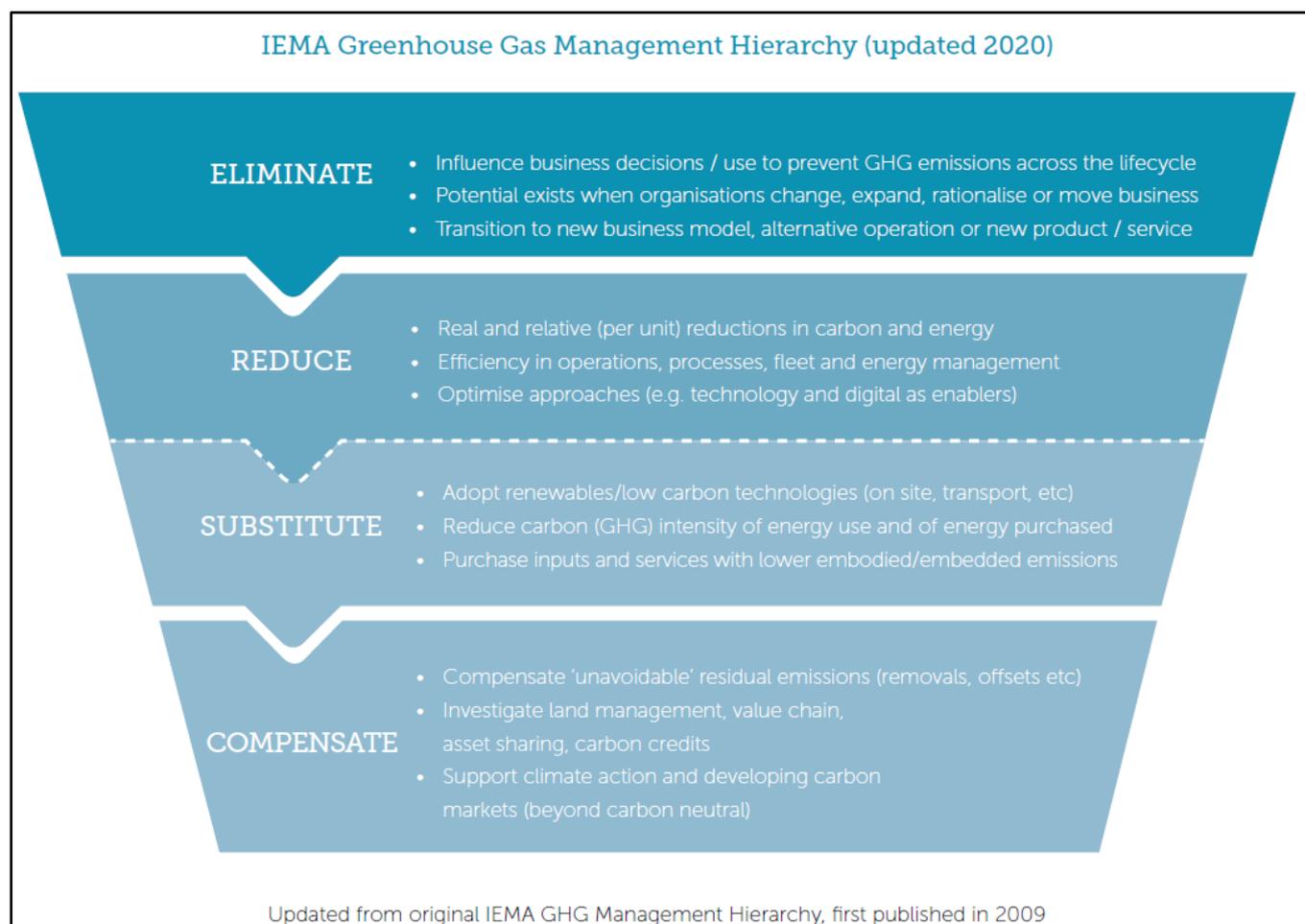


Figure 1 IEMA Greenhouse Gas Management Hierarchy (IEMA, 2020)

20. In relation to the use of CPPAs, the IEMA 2020 guidance states, on Page 5, the following (bold added):

*“Purchased green electricity tariffs (also green gas) are increasingly being considered within net-zero approaches. In earlier versions of the Hierarchy these tariffs only appeared within COMPENSATE. This is still the case for market-based approaches that use certificates where additionality or quality thresholds are poor, or hard to substantiate. The hierarchy does now allow for higher quality energy tariff purchases within the SUBSTITUTE line, reflecting developing practice and some improved purchasing arrangements (e.g. **higher quality procurement or quasi-investments via power purchase agreements**).”*

21. Thus, CPPAs are now recommended by IEMA (IEMA, 2020) as an appropriate project-specific “*substitution*” mitigation measure alongside measures such as adopting renewable technologies and reducing the carbon intensity of energy used.

22. For further clarity on the position of IEMA regarding CPPAs and mitigation, the *IEMA Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition* (IEMA, Feb 2022) has recently stated, on Page 9, that:

“GHG mitigation is best achieved by taking a planned and focused approach following the IEMA GHG management hierarchy principles.”

23. When projecting into the future, there is associated uncertainty as to the penetration of renewable energy in the national grid. However, the use of CPPAs can be viewed

as allowing for this inherent uncertainty in future years as the CPPA will match the actual GHG emissions regardless of the quantity of emissions in any one year and the time period in which they occur whilst the operation of both indirect electricity and direct emissions will continue to operate within the ETS which has committed to achieving net zero by 2050. Thus, even if the national renewable targets are not achieved on time, the facility will ensure that the CPPAs match the GHG emissions from the electricity used to power the Proposed Development on an annual basis to ensure the facility remains net-zero in terms of operational GHG emissions.

24. In relation to the ETS, as outlined in 1.2.1 of the Addendum to the EIAR, under Section 13.3.5 EU Emission Trading System, CAP23 states:

“The EU ETS is an important measure for reducing industry GHG emissions. The Fit for 55 proposals for the reformed EU ETS will increase emissions reductions in this sector from the current 43% to 61%, in the period 2005 to 2030. Changes include a steeper annual reduction in the emissions ceiling and reductions in free allowances, alongside the corresponding introduction of a carbon border adjustment mechanism.” (2023 CAP, page 155).

Summary

25. In summary, the climatic assessment of the Proposed Development has taken into account best practice in accordance with the relevant guidance (IEMA (2022)) as summarized below:
26. A Corporate Purchase Power Agreement(s) will be entered into, as proposed by Condition 13 of the planning decision from Fingal County Council, which demonstrates that the energy consumed by the development on site is met by new renewable energy generation in line with the Government Statement on the Role of Data Centres in Ireland’s Enterprise Strategy (2022). The CPPA will match the actual GHG emissions in terms of quantity of emissions on an annualized basis.
27. The indirect electricity emissions, from the national grid, will come from a range of electricity generating power stations, each of which hold a GHG permit. In addition, the direct emissions from backup generators will be a variation to GHG permit GHG197-02 when in operation. Thus, both indirect and direct GHG emissions will operate within the ETS and thus the GHG emissions associated with the Proposed Development will be in line with CAP24 which stresses the importance of the EU ETS in reducing industry GHG emissions.
28. The electricity from the national grid, used to power the Proposed Development, will be supported by new renewable energy pursuant to a CPPA, and the development itself is therefore clearly in accordance with the aim of achieving the emissions reduction targets of the Sectoral Emissions Ceilings and the policies of CAP24 and the Government Statement on Data Centres. The continued use of CPPAs and the operation of the facility within the EU ETS will ensure that GHG emissions from the facility will be fully mitigated throughout its lifetime with the facility having a net zero operational impact in terms of GHG emissions.