NexSys (Next Generation Energy Systems)

Submission to Public Consultation on draft Renewable Transport Fuel Policy Statement 2025-2027

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Table of Contents

Table of Contents 1
Introduction 2
Use of Biofuels 2
Hydrogen in Transport End-Use 3
    Certification of Green Hydrogen 4
Air Quality 4
Summary of Policy Recommendations 5
    Incentives to Support Uptake of RFNBOs 5
    Certification of Renewable Fuels & Hydrogen 5
    Air Quality 5
References 6
Contributors 6

Introduction

NexSys (Next Generation Energy Systems) is an all-island, multidisciplinary energy research programme. Through this programme of research, 50 leading academics across 9 institutions are working to tackle the challenges of energy system decarbonisation, developing evidence-based pathways for a net zero energy system.

NexSys research encompasses 5 thematic strands, one of which is Transport. The purpose of this strand is to i) investigate the critical infrastructure, behavioural and policy challenges of transitioning to decarbonised multi-modal transport and renewable energy use in a fair way, and ii) identify tangible evidence-based solutions via engagement and collaboration of key stakeholders tasked with implementing them.

NexSys is committed to engaging with the Department of Transport as a key policy making organisation through its national policy processes in order to provide evidence based research and policy insights in support of a decarbonised transport system.

In this submission, our team has drawn from their own research and other evidence bases to make observations in respect of 3 areas in the Draft Renewable Transport Fuel Policy Statement: biofuels, the end-use of hydrogen in transport, and air quality considerations for renewable fuels. We welcome any questions or information requests the Department may have in these and related areas. For further information, the full scope of the NexSys research programme is available on our website.

Use of Biofuels

The draft Policy Statement envisages the continued use of biofuels to meet obligations under the revised Renewable Energy Directive (RED III). Research and data in this area raises questions as to the legitimacy and certification of these fuels.

According to a study conducted by the European Federation for Transport and Environment, 1.8 million tonnes of fraudulently certified palm oil entered European biofuels last year, with HVO suppliers claiming to use waste products that simply do not exist at that scale[1]. In Ireland, fuel retailers have argued based on data from NORA that fraud is present in 75% of the HVO supply chain and that 45% of Ireland's 2023 HVO supply "involved very high levels of mis-certified material"[2].

These issues raise difficult questions as to whether at present biofuels are contributing to meaningful climate action, and whether or not they are having major negative externalities impacting on biodiversity due to associated virgin palm oil production.

To address these questions, Ireland must ensure that any renewable fuels, but particularly biofuels and hydrogen, are sourced and certified to be sustainable or green respectively. It is

[1] 'Renewable diesel' sold by oil majors most likely contains... | T&E
[2] https://ipra.ie/forecourt-retail-news-may-2025/#flipbook-df_13582/23/

significantly easier to monitor and certify the production of indigenous biofuels, hydrogen and renewable fuels. Biomethane produced from waste biomass is also an indigenous biofuel that also has potential to be sustainable and play a role in the transition away from fossil fuels, but only if supported by Government[3] which is not currently happening.

We acknowledge and support the measures being taken in this regard to remove national incentives under the RTFO for POME-derived products. Ireland should continue to raise concerns and use its influence at an EU level to advocate for robust monitoring and certification of these fuels at their point of entry to the European market.

Hydrogen in Transport End-Use

The Renewable Energy Directive (RED) requires a combined target share of at least 5.5% by 2030 of advanced biofuel and renewable fuels of non-biological origin (such as green hydrogen, synthetic fuels, e-fuels, etc.). The target for renewable fuels of non-biological origin (RFNBO) is required to be at least 1% by 2030. 21st of May 2025 was the deadline for Ireland to transpose domestic measures under RED III into Irish national law.

In light of this deadline passing, we recommend swift remedial action to implement the necessary measures. Government departments should work with stakeholders to support the roll out of demonstrator projects in this area. Many hydrogen production sites across Ireland already have planning permission to produce green hydrogen for transport. These "energy valleys" or "hydrogen hubs" need support from the Government to scale up to achieve our 2030 share of at least 5.5% by 2030 of advanced biofuel and RFNBO. The RFNBO multiplier (x4) is helpful in this regard, and should be kept under review with a view to expanding incentives for the uptake of these fuels. A targeted levy on fossil fuels, with proceeds ringfenced to support the rollout and uptake of RFNBOs, should also be considered. This could be achieved through a further restructuring of the NORA levy. Proactive policy and support with respect to RNFBOs could sow the seeds for Ireland to take a leading position in Sustainable Aviation Fuel technologies and production, complimenting our already strong aviation sector.

Ireland's commercial transport fleet makes up just 3% of vehicles on the road nationwide, yet is responsible for approximately 20% of transport's carbon emissions. The haulage industry should therefore be targeted as a simple demand sector for early rollout of hydrogen vehicles.

Certification of Green Hydrogen

The draft Policy Statement highlights the growing importance of renewable fuels of non-biological origin, such as green hydrogen, to meet RED III decarbonisation targets.

[3] Biomethane should have been a no-brainer for Ireland. The road ahead is unclear | Irish Times

However, as referenced above in respect of biofuels, concerns remain regarding the credibility and transparency of certification systems necessary to verify sustainability and emissions reductions.

For Ireland, establishing a robust, technology-neutral green hydrogen certification framework is essential to support domestic production, ensure compliance with EU requirements, and facilitate market access. This framework should include comprehensive lifecycle emissions accounting, transparent renewable electricity sourcing, and strong governance with digital traceability. These measures will safeguard environmental integrity, build market confidence, and complement other sustainable fuels such as biomethane or biohydrogen from waste biomass.

The UK hydrogen strategy[4] similarly emphasizes the need for robust certification to support its ambitious hydrogen strategy, which aims to scale up low-carbon hydrogen production and use across multiple sectors including transport. The UK Low Carbon Hydrogen Standard (LCHS)[5] sets emission intensity thresholds aligned with EU and global frameworks, reinforcing the importance of harmonised certification schemes to facilitate trade and investment. Ireland's certification framework may benefit from considering alignment with the UK's approach to enhance cross-border market integration and regulatory coherence within the British-Irish energy market.

Air Quality

In relation to the relative air quality impacts of renewable transport fuels, the draft Policy Statement says that there *"is insufficient data to determine that renewable transport fuels or biofuels perform either better or worse than fossil fuels in terms of air quality and public health"*. However, several studies of alternative transport fuels have provided evidence on this subject (Candaleresi et al., 2021; Deniz and Zincir, 2016; Gilbert et al., 2018; O'Malley and Searle, 2021; Tessum et al., 2014).

This evidence shows that there is a clear hierarchy in renewable transport fuels when it comes to life cycle emissions, with biomethane and renewable hydrogen performing better than biofuels, and 2nd-generation (lignocellulosic or waste-based) biofuels performing better than 1st-generation (food crop-based) biofuels. Furthermore, the emissions performance depends on the conventional fuel displaced, with replacement of heavy fuel oil (mainly used in marine transport) contributing to the highest emissions savings. Finally, the impact of propulsion technology is highly influential on emissions, with battery electric vehicles and fuel cell electric vehicles being the only options resulting in zero tailpipe emissions.

It is therefore not advisable to consider renewable transport fuels as a single group with the same environmental impacts. We suggest rephrasing this as "The impacts of renewable transport fuels on air quality and public health depend on several factors including the means of production, vehicle type, and conventional fuel displaced." We agree with the document's

[4] UK hydrogen strategy - GOV.UK
[5] UK Low Carbon Hydrogen Standard: Greenhouse Gas Emissions Methodology and Conditions of Standard Compliance

recommendation of establishing an expert group to monitor real-world emissions but believe this should be expanded to include total life cycle emissions.

Summary of Recommendations

Incentives to Support Uptake of RFNBOs

1. Introduce a fossil fuel levy with proceeds ringfenced to incentivise the update of sustainable renewable fuels.
2. Utilise the RFNBO multiplier as an incentive to enhance the uptake of renewable fuels.

Certification of Renewable Fuels & Hydrogen

3. Recognising the growing importance of RFNBO, the Policy Statement should emphasise the need to prioritise the establishment of a green hydrogen certification scheme, with the following considerations:
    a. Establish Ireland's national hydrogen emission threshold, aligned with EU and global standards.
    b. Adopt a flexible, technology-neutral certification framework that promotes innovation and market inclusivity.
    c. Invest in digital traceability infrastructure and governance systems for robust certification management.
    d. Facilitate collaboration between government, industry, and academia to support hydrogen certification readiness and market integration.
    e. Integrate certification frameworks with transport policy to maximize decarbonisation impact, particularly targeting commercial transport sectors with high emissions intensity.
4. In light of significant concerns in relation to the origin and certification of HVOs in Ireland, we support action at the national level to exclude POME from the award of additional certificates under the RTFO, and within legal provision further steps as necessary to limit the supply of POME-derived biofuel.

Air Quality

5. When assessing air quality impact of renewable fuels, the mode of propulsion should be considered, as battery EVs & Hydrogen Fuel Cell EVs do not combust fuel and therefore have no tailpipe emissions.
6. The final Policy Statement should recognise the clear hierarchy in renewable transport fuels when it comes to life cycle emissions.
7. Expand the remit of any relevant working groups under the Policy Statement to consider total-lifecycle emissions in addition to roadside emissions.

References

- Candelaresi, D., Valente, A., Iribarren, D., Dufour, J., Spazzafumo, G., 2021. Comparative life cycle assessment of hydrogen-fuelled passenger cars. International Journal of Hydrogen Energy 46, pp. 35961-35973. https://doi.org/10.1016/j.ijhydene.2021.01.034
- Deniz, C., Zincir, B., 2016. Environmental and economical assessment of alternative marine fuels. Journal of Cleaner Production 113, pp. 438-449. http://dx.doi.org/10.1016/j.jclepro.2015.11.089
- Gilbert, P., Walsh, C., Traut, M., Kesieme, U., Pazouki, K., Murphy, A., 2018. Assessment of full life-cycle air emissions of alternative shipping fuels. Journal of Cleaner Production 172, pp. 855-866. https://doi.org/10.1016/j.jclepro.2017.10.165
- O'Malley, J., Searle, S., 2021. Air Quality Impacts of Biodiesel in the United States [White Paper]. The International Council on Clean Transportation. https://theicct.org/wp-content/uploads/2021/06/US-biodiesel-impacts-mar2021.pdf
- T&E, 2025. Palm oil in disguise? How recent import trends of palm residues raise concerns over a key feedstock for biofuels . https://www.transportenvironment.org/articles/palm-oil-in-disguise
- Tessum, C. W., Hill, J. D., Marshall, J. D., 2014. Life cycle air quality impacts of conventional and alternative light-duty transportation in the United States. PNAS 111(52), pp. 18490-18495. https://doi.org/10.1073/pnas.1406853111

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NexSys welcomes further engagement with the Department on this submission and related matters. Any information requests can be sent to john.doody@ucd.ie.