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Hydrotreated Vegetable Oil ('HVO') Position Paper

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HVO Position Paper

Introduction

Glenveagh has placed sustainability and climate change at the heart of its new strategy, Building Better, to respond effectively to climate risks and opportunities. We have developed near-term greenhouse gas (GHG) emissions reduction targets and long-term net zero GHG emissions targets for Scopes 1, 2 and 3. These targets have been submitted to the Science Based Targets initiative for approval to ensure alignment with the goals of the Paris Climate Agreement to limit global warming to 1.5 degrees Celsius above pre-industrial levels. Our science-based targets, which are subject to validation, are as follows:

By 2031:

- 46% absolute reduction in Scope 1 and 2 GHG emissions.
- 55% reduction in Scope 3 GHG emissions intensity.

By 2050:

- Net zero across Scopes 1, 2 and 3.

To deliver on these targets, Glenveagh has developed a robust and comprehensive Net Zero Transition Plan that outlines our ambitions and the actions we need to take to achieve net zero by 2050. The report can be found **here.**

One of the first actions to be considered in the Net Zero Transition Plan focuses on transitioning sites to renewable fuel. Most of our Scope 1 emissions (85%) come from fossil fuels used on our sites to run generators, plant and non-road mobile machinery. This is an area where Glenveagh can make significant and direct impact in tackling its carbon emissions reductions. Our ambition, therefore, is to switch our onsite power generators and plant machinery to renewable fuel, namely Hydrotreated Vegetable Oil (HVO). Furthermore, we will engage and support our sub-contractors who use significant amounts of fuels on our sites to transition to less carbon intensive fuels, like HVO, also.

What is HVO?

HVO (EN 15940) is a low-carbon liquid drop-in[1] biofuel that works as a direct replacement for conventional diesel without the need for engine modifications and is derived from waste and residue streams. It is a renewable diesel that is produced from a variety of vegetable oils and fats that are treated thermo-chemically with hydrogen (Royal Academy of Engineering, 2017). It is a paraffinic diesel fuel that is FAME[2] free (crucial to avoid problems like fuel instability, premature degradation, poor cold weather performance, short shelf life and prone to microbial attack and contamination) and is Operational Equipment Manufacturer (OEM) approved.

[1] Drop in biofuels are alternatives to existing liquid fuels without any significant modification to engines and/or infrastructure (Nazimudheen, 2023).

[2] Fatty Acid Methyl Ester is a chemical term for the production of biodiesel derived from renewable sources that is created during transesterification of vegetable oils and animal fats (Crown Oil, 2023).

Environmental Benefits of HVO

When compared to standard diesel, HVO can significantly improve local air quality through the reduction of Nitrogen Oxides (NOx) by 29% and particulate matter by 85%. Furthermore, it can reduce carbon dioxide equivalents (CO2e) by up to 96% and greenhouse gases by 90%. It is one of the most prevalent low carbon biofuels in Europe and is tipped to overtake first generation biodiesel[3] usage in the long term.

HVO's source materials come from repurposing waste to maximise the planet's finite resources and because it is created from renewable waste resources, it is 100% biodegradable, odourless and non-toxic. From a safety perspective, one could argue that a HVO leak or spillage would have less of a detrimental impact to the environment than diesel or kersone would. Furthermore, HVO has a higher flash point than mineral diesel which reduces the risk of fire hazards (Tuffa, 2021).

The Biofuel Challenge

With increased demand for and production of biofuels comes increased risks associated with food pricing, direct/indirect land use change that arises from displaced production that uses land to produce biofuels that otherwise would have grown crops for food (NNFCC, 2019) and biodiversity loss such as land, forests, water resources and eco-systems degradation. Some of these issues, however, can be mitigated by using second-generation biofuels[4] or used cooking oils (UCO).

Energy recovery from waste and residues can save significant GHG emissions without requiring additional land use (UNEP, 2009). UCO is classified as a waste in the EU and has been established as a key biodiesel feedstock, which is used as a source material in HVO production. As demand increases in Europe, there is a requirement to source UCO from outside the EU, however, the feedstock quality, traceability and robustness of some market's supply chains and associated sustainability practices may not be comparable to EU-sourced UCO. Issues include the addition of non-wastes (virgin palm oil) into the UCO waste stream, which can be driven by the redirection of high-quality waste vegetable oils into animal feed thus causing indirect land use change (NNFCC, 2019).

What is Glenveagh's position on HVO?

Firstly, HVO is not a long-term solution for Glenveagh, but a key transitional technology that enables the business to move towards net zero while alternative energy pathways, such as hydrogen, are developed and brought to market.

Secondly, Glenveagh acknowledges potential environmental and social issues around the production of HVO and is researching and monitoring developments closely in this area. As such, this position paper will be regularly reviewed and updated to account for any changes or new developments in the biofuel sector. Furthermore, Glenveagh has established a robust due

[3] Also referred to as conventional biofuels are fuels that are produced from food or animal feed crops and produced by transesterification which uses methanol to produce the biodiesel (Royal Academy of Engineering, 2017).
[4] Also referred to as advanced fuels are biofuels derived from dedicated energy crops, agricultural residues, and waste materials like used cooking oil and a key characteristic is that these feedstocks cannot be used for food (Royal Academy of Engineering, 2017).

diligence process to find transparent and trusted HVO suppliers that can back up their sustainability and carbon reduction claims related to HVO fuel usage as not all HVO is created equal. To ensure HVO is sourced ethically and responsibly, Glenveagh will take the following actions:

- Supplier engagement to gain visibility of the fuel's upstream supply chain.
- Glenveagh will only purchase certified and audited HVO. The preferred certification schemes are the **International Sustainability and Carbon Certification (ISCC)** or **Roundtable on Sustainable Biomaterials (RSB) standard.** These schemes can verify environmental performance of fuels throughout all stages of the product life cycle, including feedstock production, fuel production and end use. They are both recognised by the EU commission to ensure compliance to the EU sustainability criteria for biofuels under the revised Renewable Energy Directive II, which includes certifying low indirect land use change-risk biofuels.
- In addition to third party certification and to provide an added layer of certainty when purchasing HVO, assurance shall be required from either the **ZEMO Partnership's Renewable Fuels Assurance Scheme** that provides additional independent assurance of the GHG emission and sustainability performance of biofuel supply chains as well as the provision of Renewable Fuel Declarations, or **ISEAL**, who ensure that the certification systems are well designed and applied with rigour down to the field level.
- A remediation process will be established.

Finally, trying to navigate the biofuel industry can be complex and challenging at times, but complexity is not an excuse for inaction - urgent action is needed to produce rapid and deep cuts to carbon emissions to limit global warming to within 1.5 degrees.

Bibliography

Royal Academy of Engineering. (2017) *Sustainability of liquid biofuels.* Available at: raeng-biofuels-report-1-1.pdf [Accessed: 24 April 2023]

Tuffa. (2021) *Expert guide to HVO fuel tanks.* Available at: Everything you should know about HVO including how it's made, benefits of HVO, differences with diesel & FAME, storage types & regulations - Tuffa Tanks [Accessed: 25 April 2023]

Nazimudheen, G. (2023) A glance at drop-in fuels. *Bioenergy Consult.* 19 February. Available at: A Glance at Drop-in Biofuels | BioEnergy Consult [Accessed: 28 April 2023]

Crown Oil. (2023) *HVO Fuel FAQ: Learn more about FAME-Free Renewable Fuel.* Available at: HVO Fuel FAQ - Your Questions Answered | Crown Oil [Accessed: 28 April 2023].

NNFCC. (2019) *Implications of Imported Used Cooking Oil (UCO) as a Biodiesel Foodstock.* Available at: UCO Report.pdf (nnfcc.co.uk) [Accessed 27 April 2023].

UNEP. (2009) *Towards sustainable production and use of resources: assessing biofuels*. Available at: Maquette Glossy Summary36.pdf, page 14 @ Preflight (Maquette Glossy Summary36.indd) (unep.org) [Accessed: April 25 2023]