

The Pros and Cons of HVO as
a transition fuel to Net Zero
Carbon: *a Scope of Works for
a Guidance Document*

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The Context

As part of their response to the climate crisis, most organisations have, or are in the process of setting targets for net zero carbon (NZC) and /or Science-based Targets (SBT).

In setting those targets, they must look across the value chain, at all three scopes. It is soon apparent that a key component of carbon emissions for many in the built environment is the fuel used in plant and equipment. In the majority of cases it is conventional diesel.

To give this some context, anywhere between 1% to 15% of a project's emissions could come from onsite diesel use in plant, with a further 5 - 10% coming from material deliveries to site. More widely, emissions from plant and equipment account for 1% of the UK's total GHG emissions.

As such there is a drive to move away from fossil fuels as soon as possible, not least because of the parallel impact on local air quality, and there are several target dates for this.

However we can't transition overnight to EV or hydrogen due to cost, availability, and the supporting infrastructure needed, as well as the 'sunk' embodied carbon of existing assets. Therefore, we need to keep using ICE vehicles and plant in the short-term as we transition.

HVO – hydrotreated vegetable oil – can be seen as a temporary solution – a transition fuel – to hit these targets on the route to low and zero carbon power including battery electric and hydrogen. However, it comes with benefits and risks.



What are some of the targets?

There are several drivers for reducing vehicle and plant emissions. Here is a selection of the many targets on just this – both GHG and air quality – some in line with and others going faster than the UK's Climate Change Act.

- [CLC](#): 78% reduction of diesel use across all sites by 2035
- [NRMM - Mayor of London](#): Zero emissions throughout London by 1st January 2040
- [National Highways](#): All construction plant and compounds zero emissions by 2030
- [HS2](#): All sites diesel-free by 2029

This is all set in the [context](#) of

- No new sales of ICE or PHEV cars and vans after 2032
- Almost 100% zero emission HGVs by 2040
- An almost fully-decarbonised national electricity network by 2035



MAYOR OF LONDON



HS2

So, what is the issue with HVO?

There are many proponents of HVO as a transition fuel. Likewise, there are other views that HVO doesn't come without its own set of problems. Some of the Pros and Cons are summarised below. Clearly, there is a risk profile for HVO, and any organisation considering its use must manage this within its own operations.

Key:

- AQ = Air quality
- ILUC = Indirect land-use change
- UCO = Use cooking oil
- WTT = Well-to-tank (life cycle emissions)

Pros	Cons
Can be made from waste materials, e.g. used cooking oil, rather than virgin biodiesel crops	More expensive than diesel
Drop-in replacement fuel for diesel, no flush needed and meets EN 15940, EN 590 and ASTM D975 standards	Availability/demand issues and competition, esp. with aviation and East Asian markets
Better cold-start properties than diesel and no mould/ fungal issues like FAME biodiesels	Evidence that reductions aren't significant, esp. tailpipe AQ emissions
Reported reductions in emissions: life-cycle (WTT) GHG -90%, and tailpipe NO _x (-20%) and PM ₁₀ (-65%)	Still need to report 'out of scopes' (biogenic) carbon emissions
Avoids waste oils becoming 'gutter' oils that can get into the human food chain	Risk of ILUC – more palm production – due to displacement and substitution, e.g. palm oil and its production by-products used either for animal feed, or to dilute UCO for HVO
Due diligence systems in place, e.g. ISCC, RFAS, (and RSPO if contains palm)	Long, opaque supply chains (small vendors such as restaurants) back as far as aggregators – reputational and due diligence risks

Why should the sector respond?

Organisations want to avoid and mitigate sustainability and other risks in the supply chains for the products and materials they procure. This includes direct fuel and power.

To be able to do this, they need solid market information on the different material sources, production methods, locations and routes to market for those products in order to make the most informed decision they can. All of which needs to be backed up by good supply chain due diligence.

Although HVO has been around for several years, it has only relatively recently garnered any serious attention as one of the routes to lower carbon emissions from equipment, due to the acceleration in setting reduction targets, mentioned above, as well as the red diesel rebate being rescinded.

As a consequence of this speed and desire to reduce emissions, we are at risk of choosing a solution that could cause as serious unintended impacts – ‘burden shifting’ – potentially negating the benefits that HVO can offer.

It is with all of this in mind that we propose collating and assessing existing research to produce a Best Practice Guidance Document on Procuring HVO, to help organisations manage the risk profile of HVO.



The Guidance will be co-branded between the School and the Partners sponsoring the work, and it will be made freely available in the School.

Our Proposed Approach

The Objective of the Work is to better understand the supply chain risks for HVO, in comparison to diesel.

The scope of our work encompasses feedstock sourcing, production, transport, and use, taking a life cycle approach, compared to conventional diesel.

Our approach will be to

- **Work with a Steering Group** to identify key pieces of information and the direction of the research
- **Gather and review published reports and research** on HVO, such as the Used Cooking Oil report by CE Delft
- **Collect and review unpublished information and reports from Partners**, anonymised where needed
- **Undertake interviews** with key stakeholders on the supply chain impacts from HVO production and use
- **Synthesise the information** collected and hold workshops with the Steering Group to identify gaps and next steps
- **Draft the information into a Guidance Document**, for review and revision, before **Publication**

At this stage it is expected that the Guidance Document will contain the following chapters, but this is open to alteration as the work proceeds.

- A summary of the situation with HVO, and why there is the need for this Guidance
- An overview of what HVO is, how it compares to diesel and other biofuels in terms of engine performance and emissions (renewable technologies such as EV and H₂ are out of scope)
- An explanation of the potential supply chain impacts from HVO production, unintentional or otherwise
- A review of HVO supply and demand
- Best practice guidance on how to identify and mitigate supply chain sustainability risks, if an organisation wants to procure HVO as part of its NZC / SBT targets, through:
 - Risk assessment and supply chain mapping
 - Supplier engagement and effective due diligence
 - Using certifications and chain of custody information
 - Peer collaboration
 - And how those risks can be compared to diesel

Why get involved?

We are seeking funding from industry to contribute to the development of this guidance.

Marketing and branding

Your business will receive formal recognition, logos from contributors will be included in the final publication and in all promotional materials and social media campaigns relating to its industry launch. This will include dissemination through the multi-award winning Supply Chain Sustainability School and its 60,000 members from across the built environment.

Thought leader

As well as being on the Steering Group for the work, your business will be positioned as a leader in responsible sourcing of HVO. You will play a key role in developing best practice procurement and supply chain advice.

Insights and collaboration

Your business will have a unique cross-industry perspective through involvement in discussion with other experts and a wider audience via the subsequent awareness events.

Investment model

Looking for 12 or more funding partners to provide £4,000 + VAT each

Funding contributes to...

- Research
- Stakeholder interviews
- Workshops to test and refine guidance
- Guidance document development
- Guidance document design and publication
- Promotion of guidance document

Funding benefits are...

- Participation in the project Steering Group
- Influencing the nature of the Guidance document
- Your logo in the Guidance document
- Part of any social media coverage and other communications

To discuss this opportunity,
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