NorthStandard

Biofuels

Driving the green transition

Glossary

B30 biofuel is a diesel blend containing **30% bio derived material (such as FAME or HVO)** mixed with **70% conventional petroleum diesel**. B50% is 50% biodiesel and so-on.

CIMAC – (International Council on Combustion Engines) is a global industry association that develops guidelines, standards, and knowledge-sharing platforms to improve efficiency, safety, and sustainability in large internal combustion engines, particularly for marine, power, and rail applications.

CNSL – Cashew Nut Shell Liquid is a bio-based, low sulphur fuel alternative derived from cashew nut shells offering reduced greenhouse gas emissions whilst supporting sustainable renewable fuels.

Ethanol (CH_3CH_2OH) is also known as ethyl alcohol. It is a colourless, volatile and flammable organic compound. It is commonly used as a fuel, solvent and in alcoholic beverages. It is also used as a biofuel (bioethanol), made from renewable resources like corn, sugarcane, or agricultural waste. It is mostly produced by fermenting sugars derived from crops like sugarcane, corn or another biomass.

Read more here

EREs (Emissiereductie-eenheden) – From 2026, the Netherlands is shifting from the renewable energy content-based system HBE (Hernieuwbare Brandstofeenheden) to EREs, a GHG emissions reduction system for biofuels driven by RED III. One ERE represents 1KG of CO2-equivalent emissions avoided compared to fossil fuels.

FAME – Fatty Acid Methyl Esters are esters formed from glycerides (from oils/ fats) and methanol. They are renewable, biodegradable, and used as a substitute or blend with conventional diesel fuel.

ISO – Fuel standards are internationally recognised specifications to ensure quality, safety and environmental compliance of fuels including maritime.

IMO ZNZ – This refers to global zero or near-zero greenhouse gas emission technologies, fuels, or energy sources. A decision on adoption was postponed for one year at an MEPC 83 extraordinary session in October 2025.

RED – EU Renewable Energy Directive (RED) is a regulatory framework that **promotes the use of renewable energy across the EU**, setting binding targets, sustainability criteria, and measures to accelerate the transition to a cleaner energy mix. It is progressive with RED I established in 2009 through to RED III which was established in 2023.

HVO (Hydrotreated Vegetable Oil) is a renewable diesel made by hydrotreating vegetable oils or waste fats, producing a high-quality, fossil-free fuel. It has similar chemical properties to fossil fuels.

The IMO LCA (Life Cycle Assessment) Guidelines provide a standardised framework to assess greenhouse gas emissions of marine fuels across their entire lifecycle, from production to end use, ensuring consistent comparisons of fuel sustainability.

The ISSC (International Sustainability and Carbon Certification) is a globally recognised certification system for sustainable supply chains of biomass and biofuels. It ensures fuels meet strict environmental, social, and greenhouse gas reduction criteria, providing traceability and proof of sustainability across the entire value chain.

PoS (Proof of Sustainability) – for marine fuel is a certification process that verifies a fuel's origin, production pathway, and compliance with environmental and social standards. It ensures the fuel truly delivers greenhouse gas reductions and meets regulatory or voluntary sustainability criteria.

RSB (Roundtable on Sustainable Biomaterials) is a global certification system that ensures fuels and bio-based products meet rigorous sustainability standards covering environmental, social, and climate impacts.

UDB – the Union Database for Biofuels is an EU-wide system under the Renewable Energy Directive (RED II/III) that ensures full traceability of liquid and gaseous renewable fuels (and their feedstocks) from origin through the supply chain, preventing double counting and fraud while ensuring sustainability and GHG criteria are met.

Introduction

Biofuel is presently the most used drop-in fuel for supporting maritime decarbonisation. It meets legislative requirements without major modification or capital expenditure from fossil fuels. At NorthStandard, we have already received our first batch of quality-related claims, along with several enquiries about proof of sustainability (PoS) and supporting documentation.

To address these issues, NorthStandard consulted industry experts from leading fuel testing agency Veritas Petroleum Services (VPS) and major fuel supplier World Fuel with thanks to Steve Bee and Michael Green as well as the World Fuel Marine Technical Team.

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The contributors' guidance and insights are presented across three papers, as outlined below.

Paper 1

Incoming regulations, Quality and Biofuel Chemistry

Incoming regulations

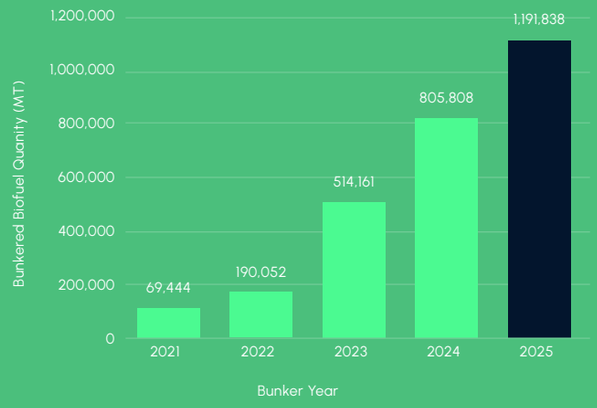
Q 1. How has the evolution of legislative regimes impacted the demand for biofuels?

The FuelEU Maritime, IMO ZNZ (subject to adoption), Green Balance Fund and various other renewable energy initiatives and Directives (RED I, II, and III) will all increase biofuel demand.

> "VPS tested samples representing 71,000mt of bunkered biofuel in 2021 compared to over 1,000,000mt of delivered biofuels in 2025 - **an increase by a factor of 12 over 4 years.**"

The quality of the biofuel blend will depend on the source of the bio-component. A lack of good quality bio-sources may lead to poorer quality bio-components.

Figure 1: VPS Tested Biofuel Volumes: Bunkered Quantity (MT) | Biofuels | 2021 - 2025



Included with permission of VPS

This is an interesting question as the different regulatory regimes have had a big, but diverse, impact on the way buyers consider biofuels for compliance.

Overall, we have seen an increase in demand across the board, whether that be to comply with IMO or EU requirements, or voluntary demand from the more 'consumer facing' sectors of the industry.

Prior to MEPC 83, buyer's strategies were largely shaped by the EU's regulatory framework – particularly FuelEU. Under this initiative, buyers are initially able to address compliance targets using lower percentage bio-blends (B5, B7 or B10). However, the proposed (but currently postponed) IMO NZF will change this considerably with the lower percentage bio-blends being unable to offer the mandated reduction in emissions subject to adoption.

> "When discussions surrounding the IMO NZF reconvene in a years' time buyers will potentially be faced with the **need to consider higher blend biofuels (B30, B50 and up to B100)** to achieve future compliance targets."

As demand increases, suppliers and buyers need to be aware of the challenges surrounding consistent supply which may be restricted by product availability. Therefore, robust and transparent development protocols, overseen by industry bodies such as ISO and CIMAC will be vital as new and different types of "bio" are used to fill the availability gap.

Quality and Biofuel Chemistry

Q 2. At NorthStandard (NS) we are seeing more frequent issues with biofuels in general. Does this tally with what you are seeing?

If by "issues" you mean quality issues, then from our perspective we have not.

However, it would be great to hear more regarding the commentary that you have received to gain a wider degree of understanding regarding experiences and perceived challenges.

When looking at "challenges" it is vitally important to address each concern individually. Biofuels are extremely diverse and simply labelling a fuel as "poor quality" or "problematic" offers little from an experience perspective or guidance for future consideration.

> "It is important to remember a **"good quality"** on-spec product can be problematic if not handled correctly."

If biofuels are tested and managed correctly, we do not envisage a high frequency of issues with FAME or HVO. However, other bio-components such as Cashew Nut Shell Liquid (CNSL) have in the past caused major operational issues including blocked filters and purifiers which can be labour intensive and could lead to intermittent fuel supply issues. However, recent improvements in CNSL refining and distillation techniques have improved this product.

Q 3. Are there any regions where you are seeing more problems than others?

Again, we have not seen specific challenges, so it is difficult to provide much by way of further comment. That said one key point that needs to be considered is, from a regional point of view, the overall maturity of supply chains differs substantially - Singapore, ARA, and some Mediterranean ports are well developed and capable of providing a consistent supply of product.

From a supply perspective, we are continuously working, both as a physical supplier and a trader, to join the dots and improve consistent supply logistics and increase availability.

No – as yet, we do not see regions with more problems than others.

Q 4. We have received most feedback from members over B100 biofuels and problems with fuel injectors reducing original equipment maker (OEM) service intervals and combustion characteristics worsening. Are you able to elaborate on this?

VPS have seen cases with B100 FAME, where it is not actually 100% FAME. Regularly a percentage of FAME-bottoms are present which are heavy by-product residues left over after FAME production. They can cause operational issues. We did have one case in early 2024 where a B100 FAME was found to be 40% FAME/10% FAME-bottoms and 50% CNSL. The vessel suffered with blocked filters, delayed ignition and abnormal exhaust temperatures.

Given we have not been party to such commentary it is difficult to elaborate further. That said if we were to see any products that suggested possible challenges, we would need to gather as much information regarding the specific nature of issues and definitive evidence to offer any comment.

Key considerations may include:

Type of combustion problems experienced?

Engine type and make?

What load and operating conditions were impacted?

Precise details following thorough investigations (including a comprehensive overview of pre bunkering quality) allow definitive conclusions to be drawn. Generalisations don't help with a wider understanding of possible issues and perpetuate perceived issues vs real challenges.

Q 5. I am aware that ISO 8217:2024 does not deal with microbial testing, and this additional test is worth considering for FAME. But is this additional test carried out as much as it should be by shipowners in your experience?

At VPS, we offer microbial testing as part of our APS-Bio package. However, note that to date, we have not seen any presence of microbial activity, mainly due to only small biofuel stems being delivered, which are burnt quickly and are not on board the vessel long enough for microbes to grow. Project LOTUS, which was run by GCMD with testing by VPS, monitored the long-term, day-to-day use of B24/FAME. The final paper can be found here

When looking at any additional analysis, the questions to be asked are, what value does it add, and if conducted, how often should it be carried out?

As far as bacteria is concerned it is important to note that it is present in all fuel and as such marine fuel is never sold with the guarantee of being sterile So, when we look at the potential for microbial analysis, we need to understand what the result will represent and its inherent value.

In our experience, testing for bacteria is often unnecessary.

> "The presence of bacteria alone is not a problem; it only becomes a concern when **conditions on board allow for microbial growth.**"

The recently published Marine-fuels containing FAME; A guideline for shipowners & operators from CIMAC provides specific guidance regarding the importance of onboard housekeeping routines. Untreated microbial activity can pose many different problems, one of which can be corrosion. However, with good housekeeping practices, such as regular draining of water, overall risk, and need for testing is reduced. Read more here

Q 6. Does the level of microbial activity also contribute to corrosive properties?

Untreated microbial activity may lead to corrosion. However, microbial content / bacteria type, concentration and location all have a bearing.

Yes, the combination of micro-organisms with water can result in filter plugging, clogged pipes and heat exchangers, malfunction of water separating equipment, injection fouling, plus corrosion of different parts of vessels, etc.

Paper 2

Types of Biofuels and Derivatives

Types of Biofuels and Derivatives

Q 7. Is there any significant use of ethanol as a component of bio-fuel blends in the maritime sector, and have you seen testing/supply taking place for this yet?

At this point in time, for shipping, no!

Ethanol is widely used in other transport sectors – such as automotive. However, we have seen commentary regarding some very limited trials on ethanol alone (and methanol containing small percentage blends of ethanol) but nothing more substantial currently.

> "Developments with methanol as a standalone product gives us a **great blueprint for progression** and how to utilise pre-existing ethanol standards."

However, even with pre-existing quality specifications from other transportation sectors, the development of an ethanol specification for marine is a lengthy process.

The other key consideration for ethanol is the production pathway and how that fits in with legislative lifecycle assessment, as a large proportion of the ethanol produced currently comes from starch and sugar-based feedstocks.

We are currently working on a couple of ethanol projects for marine fuel applications, under NDA terms.

Please note, September 2025 saw the Global Ethanol Association (GEA) launched in Switzerland to build demand for Ethanol in shipping.

Q 8. Have you seen many issues recently with POME being used as a feedstock?

When referring to "POME" we need absolute clarity… is POME Palm Oil Methyl Ester or Palm Oil Mill Effluent (which is not a FAME product)? And when "issues" are cited do we mean ethical? Or technical / quality issues based on the use of Palm Oil as a feed for FAME production?

The ethical concerns have been well documented, and this is reflected in the carbon values attributed to palm oil derived products by legislators.

As noted previously, we've not seen any challenges with bio products in general, but from a technical perspective, we know different feedstocks give different quality end products (this has been documented in the recently published CIMAC Guideline – click here

High-quality FAME, which meets the relevant quality specifications can be produced irrespective of feedstock by close control of the FAME production process.

Declared EU demand for POME biodiesel exceeded the plausible global supply by up to a factor of two in 2023, signalling that some consignments may have been virgin palm in disguise. Until proof of a credible site of origin is available with appropriate supporting documents, we suggest buyers treat every POME shipment as high-risk or switch to used cooking oil, tallow or other waste fats which usually have shorter, auditable chemical chains.

Q 9. Do you agree that FAME and CNSL are less stable than HVO?

Yes, FAME and CNSL are less stable than HVO, but for different reasons. HVO is produced from the same feedstocks as FAME, but HVO undergoes a hydrogenation process which removes all the oxygen present in the feedstock, producing a saturated paraffinic compound. Whereas, FAME is produced by a different process called transesterification, which produces a mix of esters, with high oxygen content and a high degree of unsaturation. This means FAME is prone to oxidation and reduced stability. CNSL contains unsaturated phenolic compounds which are highly acidic and reactive and therefore chemically unstable. However, recent refining and distillation processes can reduce the high acidity and reactivity of CNSL.

When tackling this question, it may be pertinent to think specifically about the different products being examined. Given CNSL is not a specifically established, defined fuel product, the question to ask is, "is it appropriate to benchmark it alongside established products such as FAME and HVO?".

We know there are ongoing industry projects looking at the wider use of CNSL. However, CNSL is something of an umbrella term which includes raw as well as refined CNSL products. As such any assessment may be more appropriate once such studies have been completed, and their findings published.

In contrast both FAME and HVO have defined quality specs (EN14214 / ASTMD6751 and EN15940 respectively) which address the overall characteristics of the individual products. Part of those considerations are storage capabilities and experience has shown FAME products to have a limited shelf life due to its propensity to oxidise, but it's also important to remember onboard handling plays a substantial role in the longevity of different fuels.

Q 10. We hear that shipowners will look at Hydrogenated Vegetable Oil HVO as an option for dual fuelled vessels as opposed to FAME and CNSL because it has a longer shelf-life. This is relevant because the secondary fuel may be on board for longer periods. Does this tally with what you're seeing?

In an ideal world owners would use HVO given its similarities to traditional marine diesel fuels.

It is, by definition, a drop in fuel and doesn't pose many of the challenges seen with FAME. But from a supply perspective availability and overall cost are the two major challenges. HVO is used widely in other transport sectors and as such availability for marine is likely to be limited.

HVO whilst being more stable and of a higher energy content than FAME and CNSL, is not as widely available and cost is much higher. Where VPS has seen HVO being used, it is as a pilot fuel for LNG and methanol powered vessels. It is more stable, lasts longer and has higher energy content, so less fuel is needed, which also makes it more cost-effective.

Q 11. Where do you expect to see the biggest quality concerns over the next two years and how do you see fatty acid methyl ester (FAME), cashew nutshell liquid (CNSL), hydrogenated vegetable oil (HVO) playing out?

CNSL presently causes the greatest concern. However, production processes are improving and resulting in higher quality CNSL being produced by certain suppliers. Refining and improved distillation techniques are reducing the acid concentrations (cardol and anacardric) which helps improve the quality.

We would expect to see a much greater diversity in the mix of products available such as FAME Distillation Residues, Pyrolysis oils and products derived from CNSL, so practical challenges observed as part of a robust research and development program are inevitable to a certain extent.

> "Traditional values and industry accepted practices, such as **fuel segregation, (onboard vessels and within the supply chain) are going to be even more important**. A clear understanding of the physical characteristics of individual products and what that means in a practical sense will also be important."

FAME, HVO and CNSL

Q 12. Do you have a table which provides overview of FAME, HVO and CNSL?

Please see the table below for comparison

Figure 2: Overview of FAME, HVO and CNSL

100% Bio	FAME	HVO	CNSL
Stability	Unsaturation causes instability. Plus, storage time, temp, light. Measure Ox.Stab, Iodine Value, PUFA content.	Hydrogenation removes O2 from fatty-acid feedstock. HVOs more stable than FAME.	Good Ox Stability, but Unsaturated Phenolic compound, with high Iodine-value, very reactive & unstable.
Energy Content	Low at around 37MJ/kg	High at up to 44MJ/kg	Avg at around 39-40MJ/kg
Cold-Flow Properties	Poor Cold-Flow.	Superior to FAME.	Good Cold-Flow properties.
Corrosivity	Acid Number Avg of 0.5mgKOH/g, but increases upon Oxidation. Can be corrosive to Copper.	Not corrosive to Copper or Steel.	Very High Acid Number. Not corrosive to Copper or Steel.
Microbiological Activity	Prone to microbial growth over time when water present and warm temperatures.	Little chance of microbial activity.	Little chance of microbial growth. Inherent ainti-micrbial properties.

Included with permission of VPS

Cashew Nut Shell Liquid (CNSL)

Q 13. CNSL is in lower demand than FAME but is still a potential option for blends. Could you please elaborate over the concerns identified by GCMS testing and regarding high cardanol content?

CNSL has certainly divided opinion as a bio-component for marine biofuels. Its natural high level of acidity and reactivity, along with its potential to polymerise, raise concerns. Polymerisation means that compounds can react and harden over time, which may lead to storage instability, handling difficulties and reduced quality. Potential users should ensure the CNSL product is double-distilled, which produces a higher quality CNSL with lower acidity and reactivity.

> **"Data indicates that using 100% CNSL as a fuel should be avoided.** We would also caution against blending CNSL with HSFO fuels. Vessel operational issues, due to the presence of high levels of CNSL have caused damage to fuel systems, engines and exhaust systems."

For the purposes of ISO 8217:2024 and all preceding versions, CNSL is not recognised as a standard fuel component. Accordingly, its presence in a marine fuel may be considered a contaminant and potentially classified as off-specification when assessed against the ISO 8217 standard.

However, in instances where CNSL is intentionally used as a blending component and does not fully conform to any of the defined categories within ISO 8217, the fuel may still be deemed acceptable provided that its characteristics and specification limits are mutually agreed upon by the buyer and seller. In such cases, the fuel shall be classified under an appropriate category defined in ISO 8217, accompanied by any necessary deviations or additional parameters required to adequately characterise the fuel's properties.

CNSL quality depends on the supplier and production process - higher cardanol content (>98%) with low cardol and anacardic acid make it less reactive. CNSL requires more careful fuel management than other fuels, and VPS has specialist expertise in its use and in detecting it as a contaminant.

We know from experience that CNSL derived products are already in the market, especially in ARA, due to low carbon feedstock demand. We also know it has been present for quite some time with products derived from CNSL being supplied to vessels with no serious effects being seen; rather, vessels have used the fuel without difficulties. It is also important to note concerns are not specifically identified by GCMS testing – GCMS analysis

highlights the presence of specific components within the fuel but does not identify challenges. The most important test equipment used to identify challenges are a vessel's engine and systems but, again, these are not the sole tools available, with a range of other considerations playing a large part in the overall situation.

In fact, routine GCMS analysis will no doubt highlight just how prevalent CNSL derived products are in the ARA region and how, for most cases, those fuels are consumed without issue.

Q 14. Do you agree that shipowners should avoid using 100 % CNSL as a marine fuel?

At this time, we are aware of several high-profile trials being conducted by fuel buyers and OEMs using CNSL derived products and until we see publication of their findings it would be prudent to withhold judgment. Adoption of new fuels will depend on the buyer's needs, as well as capabilities, and should be done on a case-by-case basis, with agreements in place between supplier and customer, and in full cooperation with OEMs and class.

Yes, absolutely.

Q 15. Feedback from members suggests that the following operational concerns have been experienced when using CNSL. Is there anything you would add to this:

- High acidity – corrosion and seal damage
- Engine wear and injector fouling
- Filter clogging and gum formation
- Fuel sludging
- Fuel instability
- Damage to SCR units
- Corrosion of engine parts
- Poor Ignition and engine knocking
- Low sulphur content can lead to change in cylinder oil needs for lower TBN

We agree with all of this, but it is highly dependent upon the quality of the CNSL used.

Unfortunately, we do not have any direct experience, so specific comment is difficult. That said, the list as provided does propose a significant number of areas to be more widely examined. Whether they represent more significant concerns than HFO/VLSFO is up for discussion.

When bringing any product to market, VLSFO being an excellent example, it is not simply introduced to the market without homework being done first or appropriate follow up over time based on experience. The same is true of new low carbon feedstocks.

In looking to address questions tackling CNSL there are several key considerations the first being what is meant by CNSL?

As noted above, in the same way we differentiate between types of Bio (and types of FAME) we also need to note that CNSL is a generic term and does not address whether it is raw CNSL or whether it is processed and if so to what extent?

Furthermore, it is easy to point the finger at certain compounds when issues are seen, but we also must consider instances where fuels have been found to contain such compounds and issues have not been seen.

We also know the push for decarbonisation is prompting projects which look at the viability of other novel fuel components (e.g. Tyre Pyrolysis Oil) which have previously been deemed problematic.

The use of any material or blend component in an uncontrolled manner can lead to challenges where the overall concentration of the blend component, rather than the actual component itself, causes the problem. A prime example occurred with the issues seen in using very high percentages of Estonian Shale Oil derived cutter stocks in the early 2000s.

As such it would be more pertinent to consider the potential merits / pitfalls of CNSL once such studies have been completed and their findings published.

HVO

Q **16. Research also shows that HVO is far more expensive than FAME. CNSL also has some availability issues and there are concerns over lubricity. Are there many other problems you have noted?**

No. HVO is excellent fuel. It is like MGO, but with the added benefits of GHG/CO2 reduction.

Overall, HVO quality is "too good" for marine and future costs are likely to be prohibitive. Demand for HVO, particularly from aviation, means availability for marine is likely to be limited.

Paper 3

Sustainability Documentation

Sustainability Documentation

Q 17. What is your take on proof of sustainability (PoS) for biofuels in general and what can shipowners do to avoid some of the pitfalls?

- Fraud avoidance: PoS should be co-signed by an independent assurance firm. There should be a contractual provision to audit the plant named on certificate.
- Contracts should also list at least one RED approved back-up-scheme and state that a scheme-delisted event lets the buyer refuse the fuel with valid reason.

Traceability criteria:

- Biofuel should not be transferred until the Union Database (UDB) transaction ID is provided. The ID should be digitally linked to the Bunker Delivery Note (BDN) when it becomes visible.
- Double counting: RED's mass-balance rules allow sustainability benefits to be claimed twice if records are not reconciled. To reduce this risk a single ledger that ties every UDB movement to the same BDN and PoS which is double checked by your verifier under EU MRV, DCS and EU ETS is suggested.
- Treat the figures printed on PoS with caution. It may be prudent to re-run the lifecycle calculation against FuelEU Annex II boundaries or demand the supplier's worksheet, and release payment when the recalculated value falls within a tight tolerance.

Feedstock risk:

- Palm and Soy may be re-classified as high - Indirect Land Use Change (ILUC) at short notice with phase out of EU support as early as 2025. We suggest maintaining an ILUC watch-list and being ready to pivot to waste, residue or renewable fuels of non-biological origin (RFNBO) alternatives before any formal cut-off.

> "The shipowner should **ensure that its contractual counterparty can provide a PoS, and is certified to provide such PoS**. Anyone can validate a supplier's certificate, free of charge, using the ISCC's online Certificate Database."

From a certification point of view it's also important that certification bodies and regulators ensure procedures relate directly to shipping / marine processes and aren't simply a copy and paste of processes used in other industry sectors. Shipping / marine is very different from land and aviation-based processes, for example, and as such appropriate regimes need to be established that are sympathetic to the specific needs of the marine / bunkering sectors.

Q 18. Our members report that Dutch Emissions Authorities are retiring the PoS, which means it can't be passed to the bunker buyer. Are there are any solutions for this? Have you seen any other PoS issues across the globe?

The retirement of a PoS by fuel suppliers against national low carbon fuel mandates is a practice which is becoming increasingly common, especially in Europe where these policies are widespread.

> "Where a PoS is retired, the Proof of Compliance (PoC) can instead be issued by the fuel supplier to the customer, **allowing information on the environmental attributes to be transferred to the customer.**"

The PoC serves the same purpose as a PoS and details the environmental attributes associated with the product, assuming all proper protocols are followed as per ISCC guidelines. In particular, a party issuing a PoC must be certified against the ISCC EU certification system and have the PoC Trader designation listed on their certificate. Without this, a PoC will not be valid. PoCs are widely accepted by end users, and the expectation is that more countries will introduce new mandates or incentives where the PoS will need to be retired by suppliers.

Dutch suppliers currently need to surrender their PoS to the emissions authority to earn Hernieuwbare Brandstof Eenheden (HBE) renewable energy units* so the certificate never reaches the buyer. We suggest asking for the electronic UDB record plus the international sustainability and carbon certification (ISCC) backed Proof of Compliance which Dutch suppliers now issue and archive with the BDN for the verifier. There are similar paperwork gaps in China. Origin biodiesel imports are under EU review for double counting with fuels bunkered outside of EU at risk of not having recognisable sustainability credits.

**At ARACON – Oct 2025, Finco Energies delivered a paper explaining a transition from HBE to ERE in 2026 for ARA.*

Q 19. ISCC closely followed by RSB appear to be the certification schemes with the biggest global reach. Do you agree with this and have any observations?

ISCC certifies the majority of marine Biofuels, RSB issues far fewer marine certificates. However the World Wildlife Fund (WWF) and IUCN (International Union for Conservation of Nature) recognise it as the most robust of the EU recognised schemes. Several national authorities including but not limited to the Netherlands, explicitly accept RSB as proof of low ILUC risk.

ISCC and RSB are the most widely EU recognised schemes, with ISCC seemingly at the forefront. However, the EU also recognises 12 other schemes such as REDcert, Bonscuro and RBSA. Each scheme caters for specific sectors, regions and commodities. Having several certified schemes is vital to so all producers regardless of size or location have access to at least one from the list.

Q 20. Is it important to request PoS including identification number and issuance date so it can be verified on ISCC RSB or other certification platform?

It is extremely important! PoS documents the complete supply chain and allows the buyer to define the well to wake footprint. As such an accurate PoS with complete traceability, including ID number, issuance date and, not least, a connection to the BDN is paramount for the verifier.

A PoS without mandatory identification number and issuance date within the voyage file cannot be looked up in the public registers of ISCC, RSB or any other RED-approved scheme, so it is impossible for verifiers or VPS to validate certificates when cross-checking bunker samples.

Under the latest EU MRV / IMO DCS verifier guidance, every biofuel bunkering must be documented by two inseparable items: the BDN and PoS.

The verifier treats the PoS as the authoritative source for below items with values copied into BDN. The BDN then becomes the sole reference for the mass (t) and energy (Mj) of bio-component declared in the annual emissions report. Single voyage recalculation is forbidden.

Audit trail dictates that the Unique BDN number must appear in every consumption line of the voyage (noon report) ledger, so the verifier can match the time-stamped biofuel in the following areas against the supply of the bunkers:

- **Main engine**
- **Auxiliary engines**
- **Oil fired boilers**
- **Feedstock type**
- **Quantity**
- **Well-to-tank GHG intensity**
- **Lower-heating value**

Q 21. What would you suggest to owners who are ordering biofuels from the fuel supply side as well as the fuel testing side?

- Primarily the supplier should show the UDB transaction number which registers the batch of fuel being provided.
- The draft BDN and matching PoS must list the following:
  - Feedstock and its origin
  - Mass and energy content of bio and fossil shares
  - Lower calorific value of bio portion
  - A RED II mass-balance chain of custody line quoting the same UDB ID, and the emission factors (WTW and TTW) for bio-fraction and finished blend
  - Supplier's ISCC certificate must cover bunkering tasks under a mass-balance scope, otherwise the fuel is re-certified under RSB, REDcert EU or equivalent to avoid deal being cancelled.

Payment is held until an accredited laboratory such as VPS confirms that any FAME meets EN 14214 before blending and ISO 8217:2024 after blending, plus any neat or blended HVO meets EN 15940. Contracts give the buyer five years to audit the supplier's mass-balance ledger, push any compliance penalties back to the seller via indemnity, and allow rejection or re-certification if the certification scheme is delisted.

> "Buyers need to **clearly define their needs for product** and **blend components** and what they are **willing to accept.**"

From our perspective, World Fuel also like to understand from the buyer the following:

- What is the objective for the use of the biofuel – a trial, voluntary use of for compliance purposes?
- What quantity of "bio" is needed (e.g. B10, B24, B30 etc…) as well as the fuel type for the base product (distillate, VLSFO, HSFO etc.) and the grade (DMA, RMD 80, RMG 380 etc.).
- Is a PoS required?
- Preferred min GHG percentage reduction or max carbon intensity (gCO2e/MJ) of the final blend
- Specific feedstock requirement (if any)
- Quality spec for the bio component – EN14214, ASTM D6751 etc, or an alternative as defined by the buyer.

Overall Conclusion

> Biofuels will remain the leading short-term decarbonisation pathway for shipping, but **Regulatory tightening, Rapid demand growth, and Increasingly diverse feedstocks** mean that buyers must implement stronger due diligence, technical controls, and documentation checks.

FAME and HVO have mature specifications and generally predictable performance; CNSL and other novel feedstocks require caution. The quality of certification and chain-of-custody documentation is now a critical compliance factor and must be integrated into contracts, audits, and onboard reporting systems.

If you have any questions on any of the above, on decarbonisation or biofuels, please reach out to NorthStandard via email to nsdecarbonisation@north-standard.com or mark.smith@north-standard.com

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NorthStandard

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