BC-SMART Low Carbon Fuels Consortium

Decarbonising Long-Distance Transport

Newsletter Issue No. 16, March 2026

BC-SMART Workshop: "How do we decarbonise refineries and produce low-CI jet/ biojet/ SAF?"

From the BC-SMART Secretariat

The BC-SMART Annual Workshop, held at UBC on 18 February 2026, brought together an engaged group of policy-makers, industry leaders and researchers to share progress and practical experience in decarbonizing long-distance transportation fuels. The workshop was held against a backdrop of global economic and geopolitical uncertainty with participants keenly aware of how global and U.S. conditions might influence investment decisions and, in particular, the pace of decarbonization. The group was well aware that the ongoing Middle Eastern "infractions" would have a significant impact on future decarbonisation efforts, particularly renewable transportation fuels, and specifically aviation.

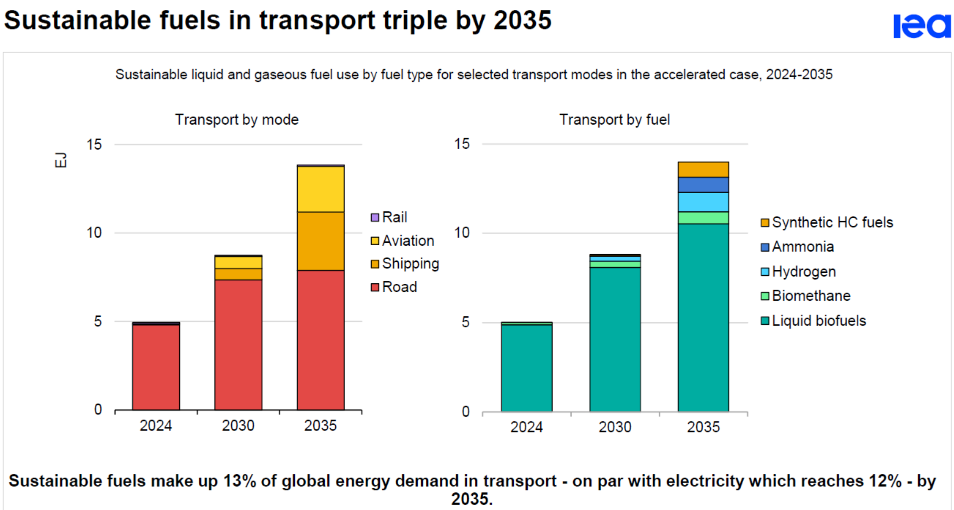
Opening perspectives from the International Energy Agency, the U.S. ASCENT program and ICF underscored the importance of better coordinating policies that are needed for long-term certainty, and to facilitate future investment-and-scale-up of low-carbon-intensity fuels. The general consensus of the workshop was that biojet/SAF production and use were developing much slower than expected, with production likely to fall short of the 2030 targets. Although there have been numerous announcements about building biojet/SAF facilities, to date, only about 30% have proceeded to Final Investment Decision (FID). It was clear that refineries will play important roles in reducing transport related emissions, either through coprocessing or "standalone" production of low carbon intensity fuels (LCIF).

A critical takeaway from the workshop was that enabling policies will be essential if SAF production and use are to expand. British Columbia/Canada have developed several policies to promote LCIF production, with both of BC's refineries "*walking-the-talk*" and several of Canada's other refineries likely to also invest in LCIF production. One of Canada's strengths is the production of the lipid or biomass feedstocks that will be needed to produce LCIF. As will be described in this issue of the BC-SMART newsletter, the use of Canola derived lipids to make fuels has continued to increase, becoming a substantial component of the lipid market. The combination of innovative oil refiners, airlines/airports, feedstock providers and "enabling" policy providers resulted in very informative presentations. The discussions also helped better define progress in decarbonising the long-distance transport sector, particularly during these unsettling times. The 2026 BC-SMART workshop was another success, showing that key stakeholders remain fully engaged in developing low-CI transportation fuels.

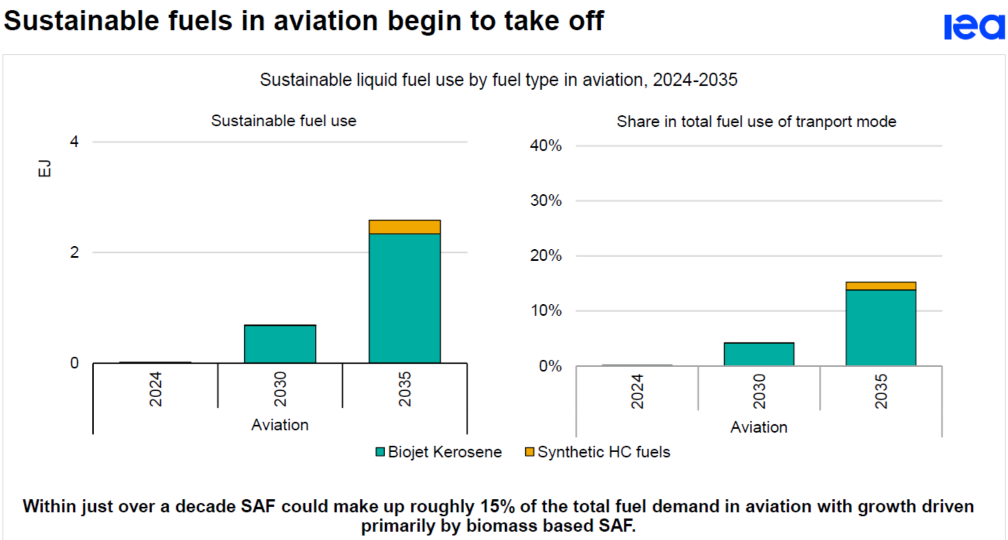
Supported by BC Bioenergy Network PARTNERING FOR A GREENER FUTURE — BRITISH COLUMBIA Ministry of Energy, Mines and Low Carbon Innovation

IEA’s Global assessment of Sustainable fuels development, and projections for 2035

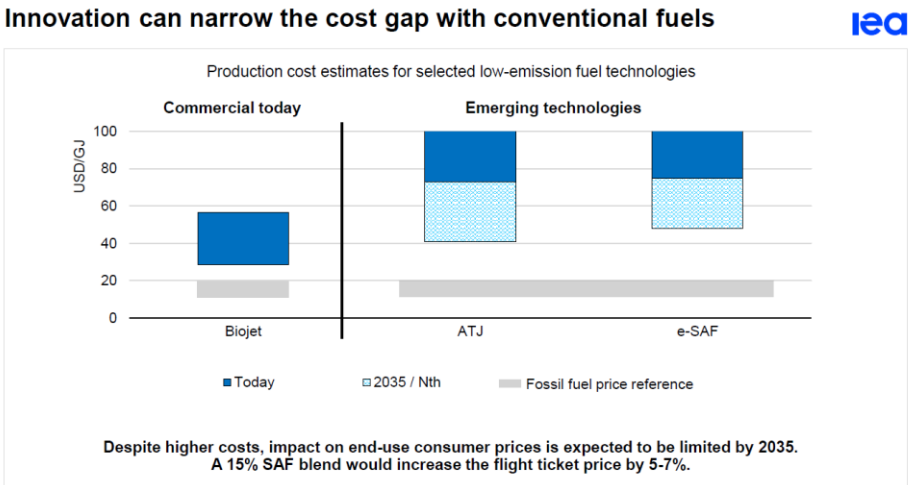
We were fortuate to have Andrew Klain, Energy Analyst from the Renewable Energy Division of the International Energy Agency (IEA) summarise the recent IEA report on *Delivering Sustainable Fuels, Pathways to 2035*. According to the IEA, the use of sustainable fuels by transport is projected to triple by 2035 (See figure below). However, while “green” electrification will make a substantial contribution to transport, it is very likely that aviation (and other long-distance sectors) will remain highly reliant on liquid transportation fuels.



For aviation, optimistic projections indicate that “sustainable” fuels could make up about 15% of the total fuel demand by 2035 (figure below).



Although the high-cost differential between conventional jet fuel and biojet/SAF remains a significant challenge, the IEA projects that the current high production costs will decline as multiple (Nth) facilities come online. However, despite projected production cost improvements, parity with conventional jet fuel price will likely not be achieved in this timeframe (see figure below).



The essential role of “enabling” policies in the development of biojet/SAF was emphasised. As well as developing a core, policy, framework, targeted measures for new and emerging fuels will also be required to reduce the substantial risk associated with the commercialisation of new, low-carbon-intensive fuels.

Typically, less than 50% of announced biojet/SAF facilities are fully commercialised

Prof Mike Wolcott, Director of the FAA Centre of Excellence (ASCENT), and from Washington State University, presented results from the ASCENT U.S. SAF Producer Database. This database tracks publicly announced-and-operating facilities that make renewable diesel and SAF. As part of this work, the group developed a Technology Implementation Ratio (TIR) to track US SAF projects that have proceeded, relative to projects that were initially announced. An assessment of the announcements related to all technologies indicated that less than 50% moved to commercial operation, with 70% being HEFA projects, 60% AtJ projects, but only 10-30% of FT-biomass projects finally implemented

Montana Renewables is one of the worlds largest biojet/SAF producers

Bruce Fleming presented Montana Renewables achievements, as well as their plans for 2026 when their MaxSAF™150 comes online. With this expansion, Montana Renewables will produce 120-150 million gallons per year, up from 30 million gallons per year in 2023. As shown below, the current and projected production volumes will increase substantially in 2026.

Yields, MM gpy	2023 at runrate	2026 MaxSAF™ project online
Renewable Diesel	180	40-60
Renewable Jet (100%)[1]	30	120-150
Renewable Naphtha	10	20

[1] 100% Renewable SPK, ASTM D-7566

However, globally, Fleming showed that, currently, biojet/SAF supply is well short of meeting the world’s mandates (voluntary in the USA and legislated in jurisdictions such as the EU and UK) with biojet/SAF production being even further from meeting mandates by 2030.

Globally, about 30% of announced SAF facilities proceed to Final Investment Decisions (FID)

Susan van Dyk used the ICAO SAF Tracker to describe progress in SAF development, in terms of production, distribution at airports, signed offtake agreements and feasibility studies carried out in multiple countries. Susan’s breakdown of facilities at a global level painted a similar picture to Mike Wolcott’s analysis, that the number of facilities that had proceeded to construction and actual SAF production was much smaller than the original number of announcements.[1] (see below)

Facilities Capacity overview

Status	Projected Capacity (kt)	SAF capacity (kt)	Num facilities
0 - cancelled project	7,096	355	33
0 - dormant project	9,411	131	88
1 - Initial Announcement	54,856	25,923	272
2 - Front End Engineering Design (FEED)	6,638	2,980	30
3 - Under construction	3,372	1,822	21
4 - In service - producing other renewable fuels	11,553	0	50
5 - In service - producing SAF	1,323	140	27
6 - Producing CORSIA SAF	13,630	5,665	41
Total	*107,879*	*37,016*	*562*

Several independent studies have also concluded that, globally, only about 30% of projects proceed to FID[2], despite SAF production steadily increasing. Unfortunately, production is falling well short of projections! It seems that most announcements create overoptimistic expectations, with companies overstating the TRL level of their process, resulting in unrealistic timelines for scale-up and commercialisation. Risk, specifically feedstock supply chain and feedstock quality issues were also underestimated, impacting the likelihood of success.

Building a domestic biojet/SAF supply chain will benefit Canada

Geoff Tauvette, from the Canadian Council on Sustainable Aviation Fuel (C-SAF), outlined the benefits of developing a Canadian Biojet/SAF sector. In the future, as it is likely that Canada will become more reliant on imports of jet fuel, establishing a “made-in-Canada” biojet/SAF supply chain will benefit the country. Factors, such as imports resulting in a lost economic activity, all contribute

[1] https://www.icao.int/SAF/SAF-production-facilities

[2] https://www.nature.com/articles/s41467-025-66686-9; https://impact-on-sustainable-aviation.org/shared-files/3905/?SAF%20-%20Global%20production%20capacity%20outlook%20to%202030%20&%20realization%20gap%20-%20Update%20Feb%202026.pdf; https://www.bcg.com/publications/2025/sustainable-aviation-fuels-need-a-faster-takeoff

However, establishing a national SAF supply chain will likely prove to be a logistical and economic challenge, including the need to integrate blending, transport and distribution within existing refinery, terminal, pipeline, and airport infrastructure. Geoff stated that he thought that the price premium for SAF should not be borne solely by airlines or passengers. However, without policy intervention, uptake will remain limited.

He concluded his remarks by outlining C-SAF’s priorities. They include, advancing a national biojet/SAF policy framework, addressing the SAF–fossil jet price gap, stimulating domestic production and investment, accelerating advanced feedstocks and conversion pathways and aligning Canadian feedstock strategies with CORSIA requirements. This should ensure Canada remains competitive in global SAF markets while supporting domestic economic development.

Boeing is committed to biojet/SAF production in Canada

Chris Lohmann emphasised Boeing’s commitment to Canada. As examples, Boeing has invested in Alder Renewables (Quebec project), Dimensional Energy in Richmond, BC and the Expandex hub in Calgary. Chris suggested that Boeing sees the military as having a big impact on SAF development, with their expertise likely to prove quite influential.

Biojet/SAF is at a competitive disadvantage versus renewable diesel (RD), making SAF production economically unfavourable unless “enabling” policies are developed

The clear message from the workshop was that enabling policies are absolutely critical for SAF development. Zach Schofield, from ICF, described how renewable diesel (RD) is often “more desirable” than biojet/SAF, based on the higher energy density of renewable diesel and its lower cost of production. When a low carbon fuel standard is in place, the higher value of RD also lies in its ability to avoid deficits. Under these circumstances, producing SAF is not economically favourable.

Typically, when the HEFA production pathway is used, the refinery has the flexibility to produce only renewable diesel, or renewable diesel plus SAF. The percentage of the SAF fraction typically depends on the desired product slate. Currently, most HEFA facilities only produce renewable diesel, as that is the higher value product. However, “targeted” policies can ensure that some of the capacity is shifted towards SAF production, rapidly increasing SAF availability at a global level. Although RD and SAF prices can fluctuate, this relationship between RD and SAF usually remains the same. However, “targeted” policy interventions can address this relationship and increase the value of SAF relative to RD, resulting in greater SAF production. British Columbia provides an example of a policy that address the competitive disadvantage for SAF, through the inclusion of jet fuel as an obligated fuel category in the LCFS. Other policies include the Illinois SAF credit.

Although the original text of Section 45Z, within the Inflation Reduction Act, provided a higher incentive for SAF, this was amended. Currently, RD and SAF earn the same incentive, putting SAF at a disadvantage compared to RD.

Regulatory changes in the EU resulted in disruptions within North American SAF markets

Zach, from ICF, also described the global picture and how the impact of regulatory changes in one jurisdiction impacts other jurisdictions. He described how SAF production in the US is rising, partially in response to the EU's ReFuelEU Aviation mandates that came into effect in Q1/2025. Currently, some of the US biojet/SAF production is exported to Europe and, as the EU Aviation mandate explicitly excludes any crop-based SAF, there is increasing competition between North America and Europe for "waste", lipid feedstocks such as used cooking oil (UCO). Although e-SAF is not being pursued extensively in North American markets, if it is produced commercially, it is highly likely that any e-SAF produced in North America will be exported to the EU.

If biojet/SAF is not worth more than RD, why make SAF?

Michael Rensing echoed the competitive disadvantage of renewable jet (SAF) versus renewable diesel (RD). As renewable jet fuel (SAF) typically requires more refining, costs more to produce, results in lower yields with the carbon intensity (CI) of the fuel higher than RD, why would refiners produce it? Bruce Fleming also addressed this issue, indicating that only three HEFA facilities in the USA actually make SAF. Most other HEFA based facilities make only RD, and will likely continue to do so until policy changes are made.

BC's inclusion of low-CI jet fuel in its Low Carbon Fuels Standard (LCFS) should have a significant impact

Sean LeRoy from the BC Ministry of Energy and Climate Solutions presented an overview of BC's low carbon fuel standard (LCFS), showing how successful this policy has been since its original implementation. More recently, the BC LCFS pioneered the inclusion of jet fuel as an obligated category, adding volumetric mandate for biojet/SAF (see figure below).

LCFS requirements

BRITISH COLUMBIA | Ministry of Energy and Climate Solutions

Compliance Period	Renewable Content (% volume from Canada)			Carbon Intensity Reduction (%) (relative to 2010)	
	Diesel	Gasoline	Jet	Diesel & Gasoline	Jet
2025	8%	5%	0%	18.3%	0%
2026	8%	5%	0%	20.6%	2%
2027	8%	5%	0%	23%	4%
2028	8%	5%	1%	25.3%	6%
2029	8%	5%	2%	27.7%	8%
2030 +	8%	5%	3%	30%	10%

Although BC currently imports 70% of its jet fuel, the long-term vision is that, *domestic SAF production can replace imported fossil jet fuel, to strengthen energy security and enable innovation and investment*. The Ministry also plans to support coprocessing, where feasible, and establish BC as an international biojet/SAF hub. BC plans to continue to support the LCFS jet fuel requirements, which will remain in place to provide a consistent demand signal for investors, while working at a federal level to advocate for national SAF policies.

The Vancouver Airport (YVR) Low Carbon Jet Fuel Incentive Program is enhancing SAF production and use.

Sean LeRoy also highlighted the Ministry's support for SAF via Vancouver Airports (YVR) Low Carbon Jet Fuel Incentive Program. This incentive is available to commercial airlines operating in BC and encourages early market uptake ahead of the LCFS jet fuel requirements. As such, it supports supply-chain readiness and learning prior to the regulations coming into effect. In 2024, over 22,000 credits were supplied to airlines and in 2025, $12 million in cash incentives were awarded.

The Vancouver Airport (YVR) SAF study highlighted how incentives and different policy frameworks might work

Wendy Avis, from YVR, provided an overview of Vancouver Airports comprehensive SAF strategy (e.g. the Low Carbon Jet Fuel Incentive program), which facilitates SAF production (e.g., through feedstock and blending analysis) and advocates for the SAF market through government and industry engagement. The airport commisioned ICF to carry out a SAF study, which resulted in several key takeaways. It was apparent that, despite cost reductions (in SAF production), in order to meet the BC LCFS carbon reduction obligations, it will likely be cheaper to purchase LCFS credits than purchasing biojet/SAF! Consequently, policies will be needed to make SAF more competitive. Other challenges were highlighted, such as a possible increase in the price of canola, or a possible decrease in the price of imported SAF leading to imports being the cheapest option. If an open market policy is pursued, a blender's tax credit could be used to lower cost, but this would likely require a higher reliance on imports. Although a BC-focused policy approach could use a producer's tax credit and capital grants to promote domestic production, this would come at a higher cost. It was suggested that a balanced policy approach, which supports domestic production as well as affordability, would likely include a producer tax credit and an off-taker incentive.

The Parkland/Sunoco/Burnaby refinery plays a critical role in supplying low-CI fuels, via its coprocessing activities

It was apparent that oil refineries will play a key role, either through coprocessing or "stand-alone" strategies, These approaches reduce the cost of infrastructure, result in relatively rapid deployment (as compared to building new facilities) while harnessing the expertise and skills of existing employees. The Sunoco Burnaby refinery (previously Parkland) produced over 100 million litres of low-CI fuels, via coprocessing in 2024, which was the equivalent of removing

125,000 cars off BC roads. Although the refinery mainly coprocessed at the fluid catalytic cracker (FCC), the refinery has also coprocessed canola in the distillate hydrotreater to produce on-spec low-CI jet fuel. While the main fuels resulting from the refineries coprocessing activities are low-CI gasoline and low-CI diesel, low-CI jet fuel can be produced on demand. As indicated within the table below, the amount of low-CI fuels produced by the Burnaby refinery has increased significantly (apart from the impact of CoVid) since 2019.

Year	Total Feed (bbl)	Renewable Fuels Produced (L)
2019	114,000	14 M
2020	272,000	36 M
2021	545,000	72 M
2022	701,000	92 M
2023	574,000	74 M
2024	771,000	100 M
2025 (Forecast)	1,129,000	145 M

However, key challenges for the Burnaby refinery is that ASTM D1655 limits low-CI jet production to blends of less than 5% renewables while FCC coprocessing is currently not used to make low-CI jet fuel. Jonathan (Tyler) indicated that the refinery has been working with ASTM to try to increase the blending ratios and obtain approval for FCC coprocessing to make low-CI jet fuel.

Tidewater renewables will expand to a 6,500 bpd, standalone biojet/SAF facility while Imperial is Canada’s largest renewable diesel producer, at 1 billion litres per year

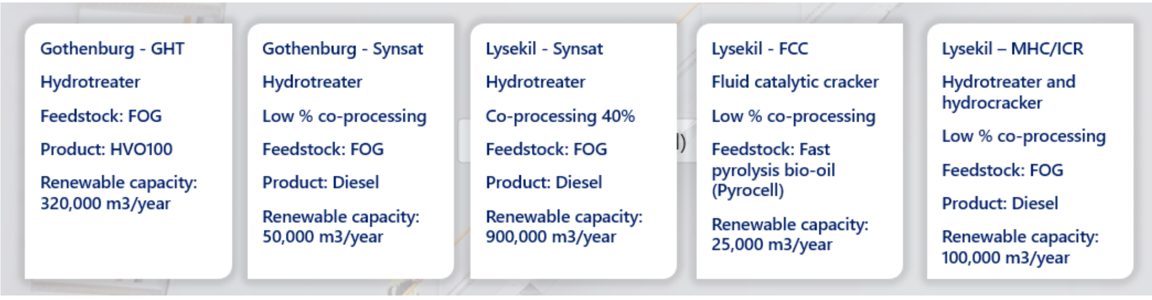
The Tidewater refinery is another BC-based company that is making substantial volumes of renewable fuels, both through coprocessing (at Tidewater Midstream) and in a standalone facility (Tidewater Renewables). Coprocessing has been implemented at the refinery’s bulk hydrotreater and FCC units while several lipid feedstocks, such as canola, UCO, pork & beef tallow and tall oil have all been processed. To date, the total coprocessing throughput has been about 40 million liters, with further expansion planned for 2026 and 2028.

The company successfully initiated a standalone renewable facility (November 2023), on a site adjacent to the petroleum refinery. After nearly two and a half years of operation, 280 million litres of renewable diesel has been produced. Tidewater is undergoing further expansion to a standalone 6,500 bpd SAF facility adjacent to existing operations. FEED Engineering and Class III cost estimates were completed in Q2/2025 with construction targeted to start in 2027 with commercial operations anticipated in late 2029.

Jason MacDonald, from Esso/Imperial, described the companies current renewable diesel production at the Strathcona plant, which has a capacity of 20,000 bpd (~1 billion litres per year) of renewable diesel from canola.

VaroPreem (Sweden) has been a pioneer in coprocessing fats and oil and is actively assessing the potential of coprocessing biomass-derived-biocrudes.

The Swedish company, Preem (now VaroPreem), has been a pioneer in the coprocessing of lipids. The company has several facilities (see figure below) where coprocessing is carried out, with current low-CI fuel production capacity at 1,400,000 m^3 per year (~1,4 billion litres per year). Although one of the earliest coprocessing feedstocks used by the company was tall oil, VaroPreem is currently assessing the potential of coprocessing fast pyrolysis biocrudes at their FCC. While coprocessing of biocrudes will likely be much more complex, it would provide access a wider variety of biomass feedstocks, used for the production of low-CI fuels.



Unlocking the potential of canola used for low-CI fuel production

Canada is a major producer and exporter of canola oil that can be used to produce low-CI fuels. Canola oil is already used by the Burnaby, Tidewater and Imperial refineries, but, as described by Chris Vervaet, there is still considerable potential to increase the use of this feedstock.

In 2025, more than 20 million tonnes of canola was produced and while, in the past, significant volumes of canola seed was exported, Canadian crush capacity has increased significantly. Oil output from crushing was about 3.5 million tonnes in 2024, increasing to a forecasted volume of about 6 million tonnes in 2026. This sets Canada up for greater utilisation of canola oil for renewable fuels production. As described by Chris, the biofuel market has increased in importance for the canola industry, increasing opportunities at home during these unsettling international times. The demand for low-CI fuels presents an opportunity for canola farmers, from providing a possible, new revenue source, market diversification while making use of various national and provincial sustainability incentives.

Canadian canola oil has several advantages, including ISCC EU and CORSIA certification, low carbon farm practices (e.g. SOC accumulation) and sustainable intensification without any land-use change. Chris emphasised that the Canadian canola sector should benefit from these types of policies, which will support the growing demand for low-CI fuels as well as prioritising local feedstocks for biofuel production.

Conclusions

As in past years, the 2026 BC-SMART workshop drew on an exceptional group of participants. What distinguished this year’s discussions was a greater degree of realism about both the pace and the challenges of low-CI fuel development and the competition between making low-CI jet or low-CI diesel. Currently, oil refineries supply most of today’s transportation fuels. They are increasingly emerging as the primary way in which low-carbon-intensity fuels can be deployed, at meaningful scale, in the near, medium and likely long term. The workshop highlighted a more sobering reality than in previous years as biojet/SAF production is falling well short of expectations and targets. The participants reflected on the constraints and challenges of biojet/SAF deployment, including technical challenges, pace of scale-up, economics, feedstock availability, investment risk and what policies will be required. As covered within the workshop, announced capacity does not necessarily translate into delivered fuel. Without enabling policies, low-CI fuels and SAF in particular, will have an uphill battle. For example, the competition between renewable diesel and biojet/SAF favours renewable diesel and only policy can address this challenge. Consequently, although Canada has the feedstocks and innovative companies, the right policies need to be in place.

If you would like to be part of the **"Coalition of the Willing"** and continue to receive our newsletter and occasional updates about BC-SMART consortium, please contact us at:

The BC-SMART secretariat (***www.BC-SMART.ca***)

Appendix - BC-SMART Workshop Agenda-18th February 2026

8.00-8.30	**Arrival, coffee + networking**	
	Session theme – Introduction/General background/ International endeavors	**Moderator: Jack Saddler (BC-SMART)**
8.30-8.45	BC-SMART workshop: “The production of low-carbon-intensity (CI)-fuels and biojet /Sustainable Aviation Fuels (SAF) in particular?”	Jack Saddler (UBC, BC-SMART)
8.45-9.05	IEA’s perspective on “The production of low-carbon-intensity (CI)-fuels and biojet/SAF in particular?”	Andrew Klain (IEA Paris)
9.05-9.25	The US’s ASCENT program and predictions of SAF production/use by 2030	Mike Wolcott (ASCENT/WSU)
9.25-9.45	North American Biofuels Policy and its Implications for a growing SAF industry	Zach Schofield (ICF)
9.45-10.05	Driving market transformation: how B.C. policies are advancing low carbon fuel production and supply	Sean LeRoy (BC Ministry of Energy and Climate Solutions)
10.05-10.25	Montana Renewables decarbonisation, production and distribution of low-CI fuels	Bruce Fleming/ Mark Wilson (Montana Renewables)
10.25-10.55	**Coffee/health break**	
	Session theme – Decarbonisation of refineries and the production of low-CI fuels	**Moderator: Dave Schick (Canadian Fuels Assoc.)**
10.55-11.15	Tidewater’s decarbonisation and production of low-CI fuels	Matt Millard (Tidewater)
11.15-11.35	Parkland’s decarbonisation and production of low-CI fuels	Jonathan Tyler (Parkland/Sunoco)
11.35-11.55	Lower carbon intensity fuel production at Esso’s Alberta refinery.	Jason Macdonald (Esso/Imperial)
11.55-12.15	C-SAF and Canada’s strategy for implementing biojet/SAF production and use	Geoff Tauvette (C-SAF)
12.15-13.15	**Lunch**	
	Session theme – Progress in the production and use of Low-CI biofuels/jet/Biojet/SAF	**Moderator: Geoff Tauvette (C-SAF)**
13.15-13.45	Global progress and projections for low-CI jet/SAF/Biojet use	Susan van Dyk (BC-SMART/UBC)
13.45-14.05	Challenges with the cost of biojet/SAF and its increasing use	Chris Lohmann (Boeing)
14:05-14:25	Vancouver airports biojet/SAF Opportunity Study	Wendy Avis (Vancouver Airport)
14.25-14.45	Decarbonisation of PREEM’s refineries and their production of low-CI fuels	Olov Öhrman (PREEM)
14.45- 15.15	**Afternoon coffee break**	
	Session theme- Feedstocks and assessing the decarbonisation of refineries and the fuels they produce	**Moderator: Jack Saddler (UBC, BC-SMART)**
15.15-15.35	How do refineries decarbonise and how do we determine the CI of fuels?	Don O’Connor (S&T2)
15.35-15.55	Can policies such as the LCFS encourage the use of low-CI fuels?	Michael Rensing (Consultant)
15.55-16.15	The potential and challenges for Canada’s lipid producers	Chris Vervaet (Bjornson associates)
16:15-17:00	General DISCUSSION	All, plus panel of Chris Vervaet, Mike Wolcott and Olov Öhrman
17.00	Close of session, thank you	Jack Saddler