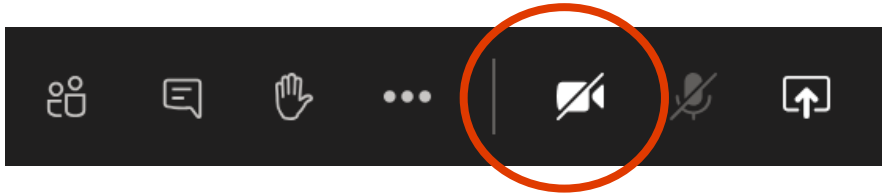
NORA
NATIONAL OIL RESERVES AGENCY
AN GHNÍOMHAIREACHT CHÚLTACA OLA NÁISIÚNTA

BOS - Briefing Session

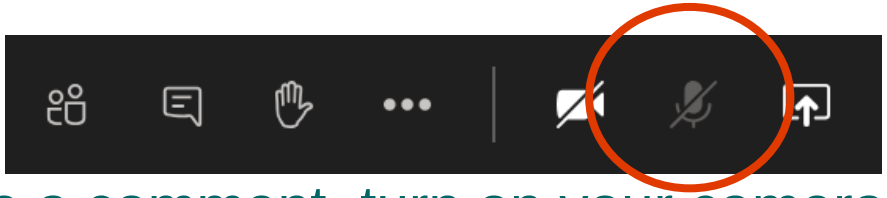
20th Oct 2021

(Ref: 457-21P1042)

- Turn video camera <u>off</u>



- When not talking, mute yourself



- To raise a query / provide a comment, turn on your camera (if you wish), unmute yourself, and introduce yourself

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Smith & Williamson

TODAY'S AGENDA

- Performance so far in 2021
- DoT update
- New fuels in BOS
- Aviation & other biofuels
- Determinations
- RED II
- EU Database
- RED III
- Discussion

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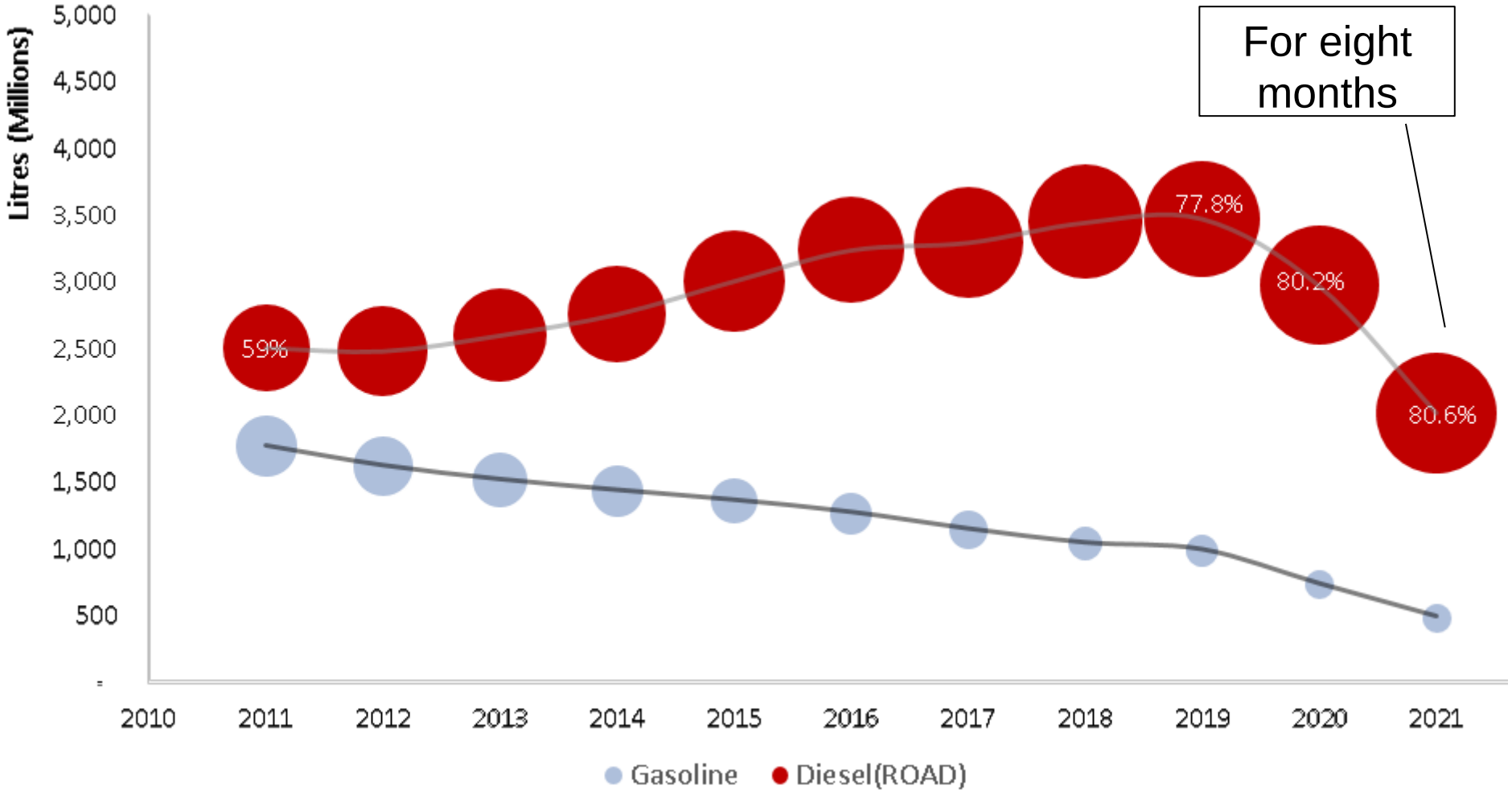
2021 – FOSSIL FUEL



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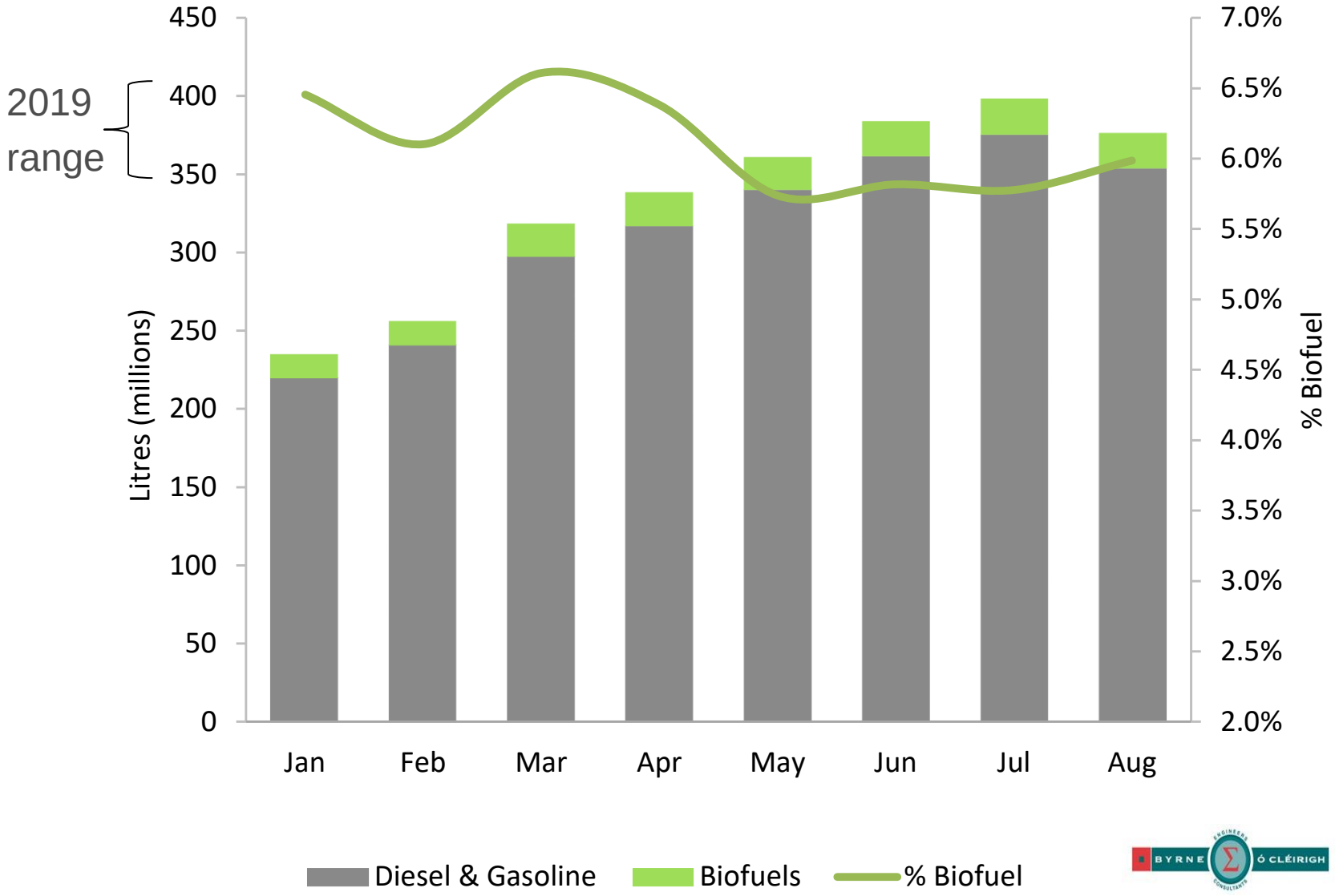
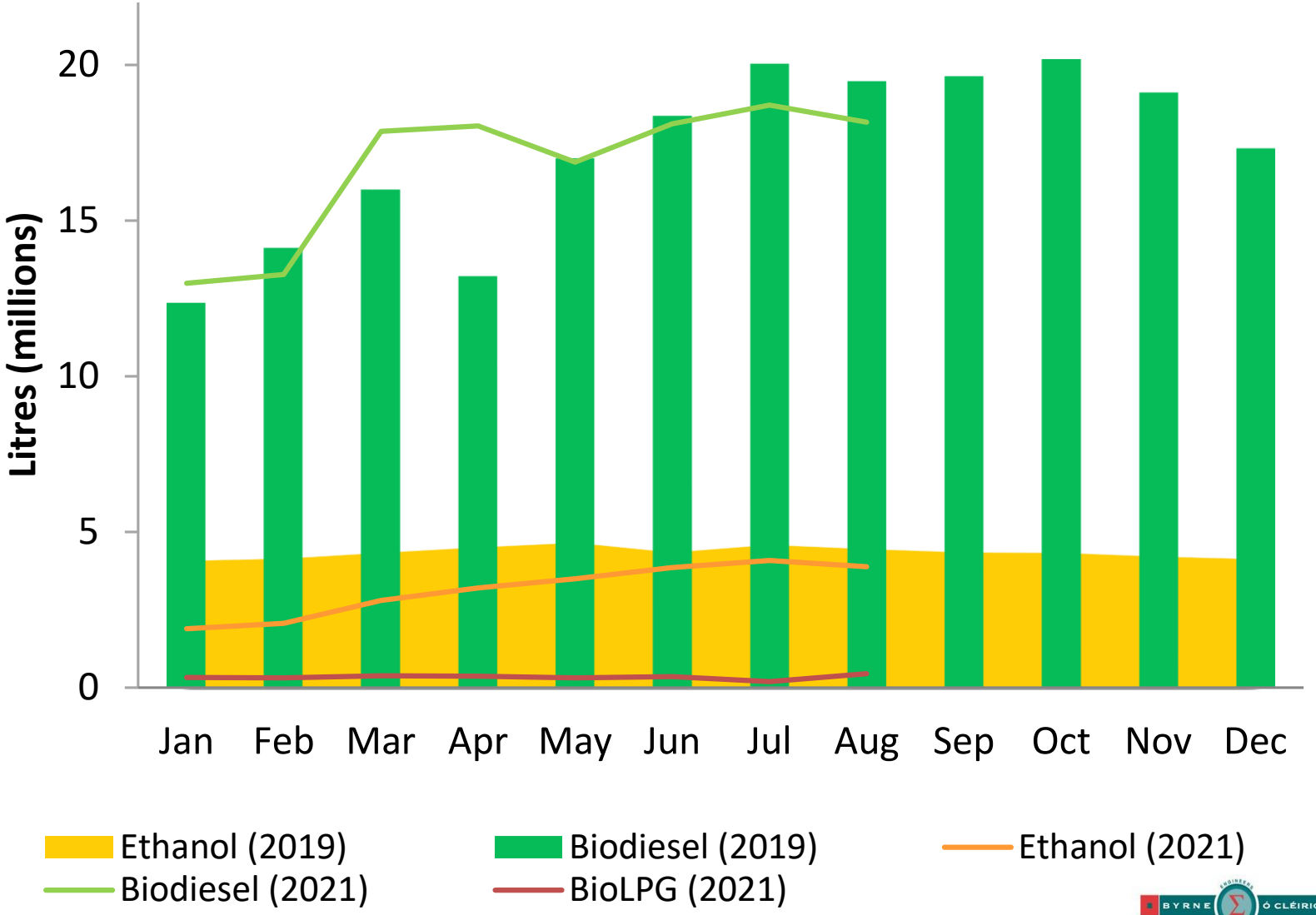
2021 PERIOD – FOSSIL & BIO



2021 PERIOD – BIOFUEL



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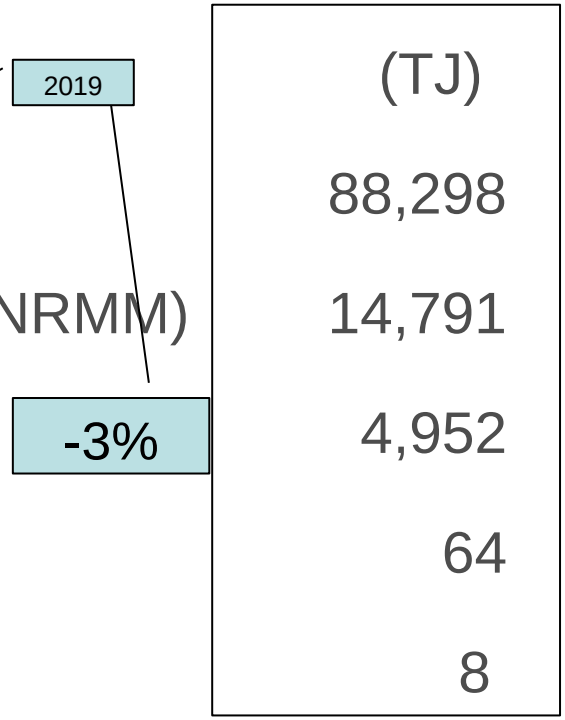
2021 PERIOD

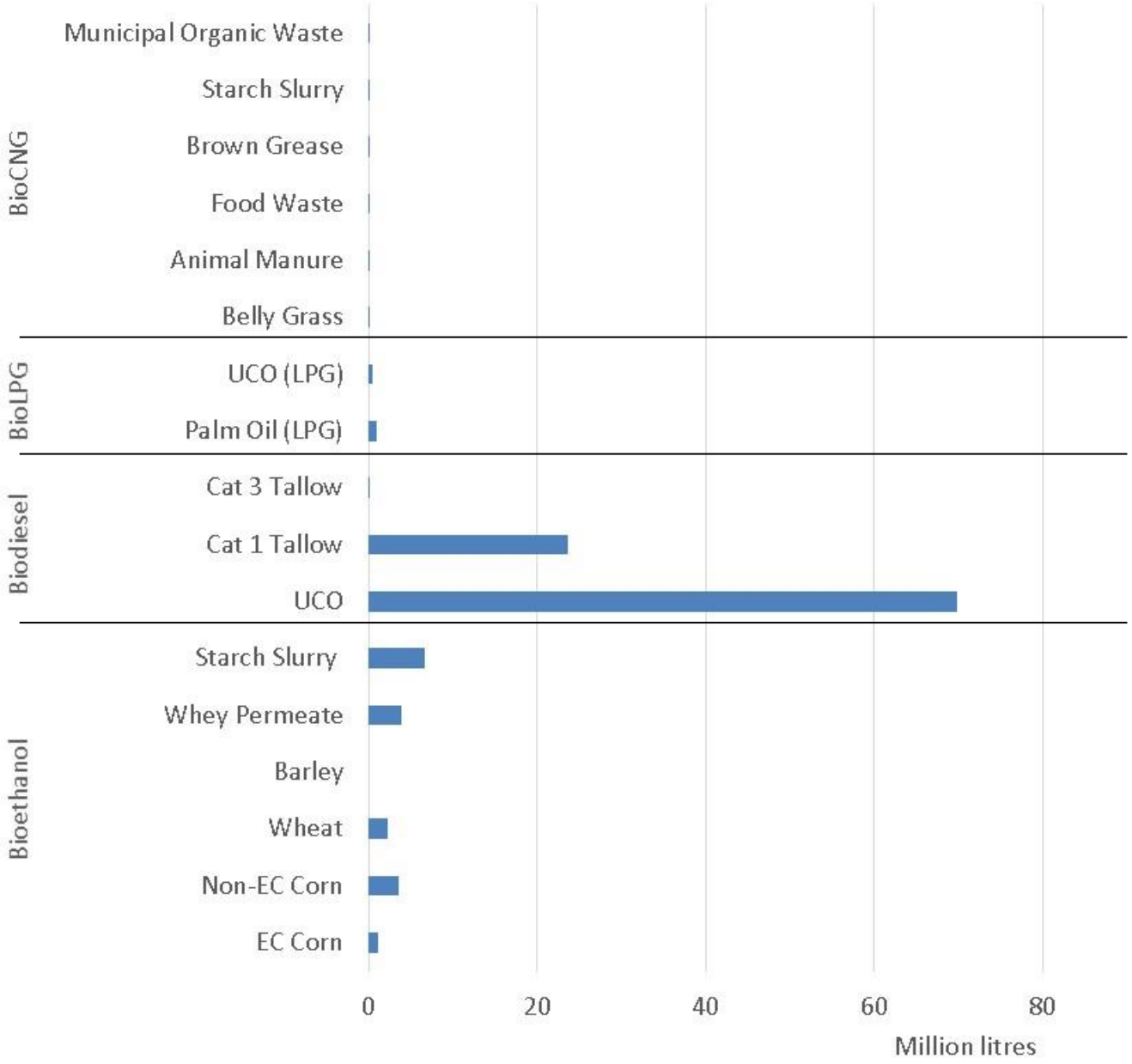
- The numbers (litres):
  - 2.5 billion BOS fossil (+ 5%)
  - 409 million additional SI 160 (road,rail & NRMM)
  - 159 million biodiesel & bioethanol (+ 2%)
  - 2.6 million bioLPG,
  - 0.2 million **Nm³** bioCNG



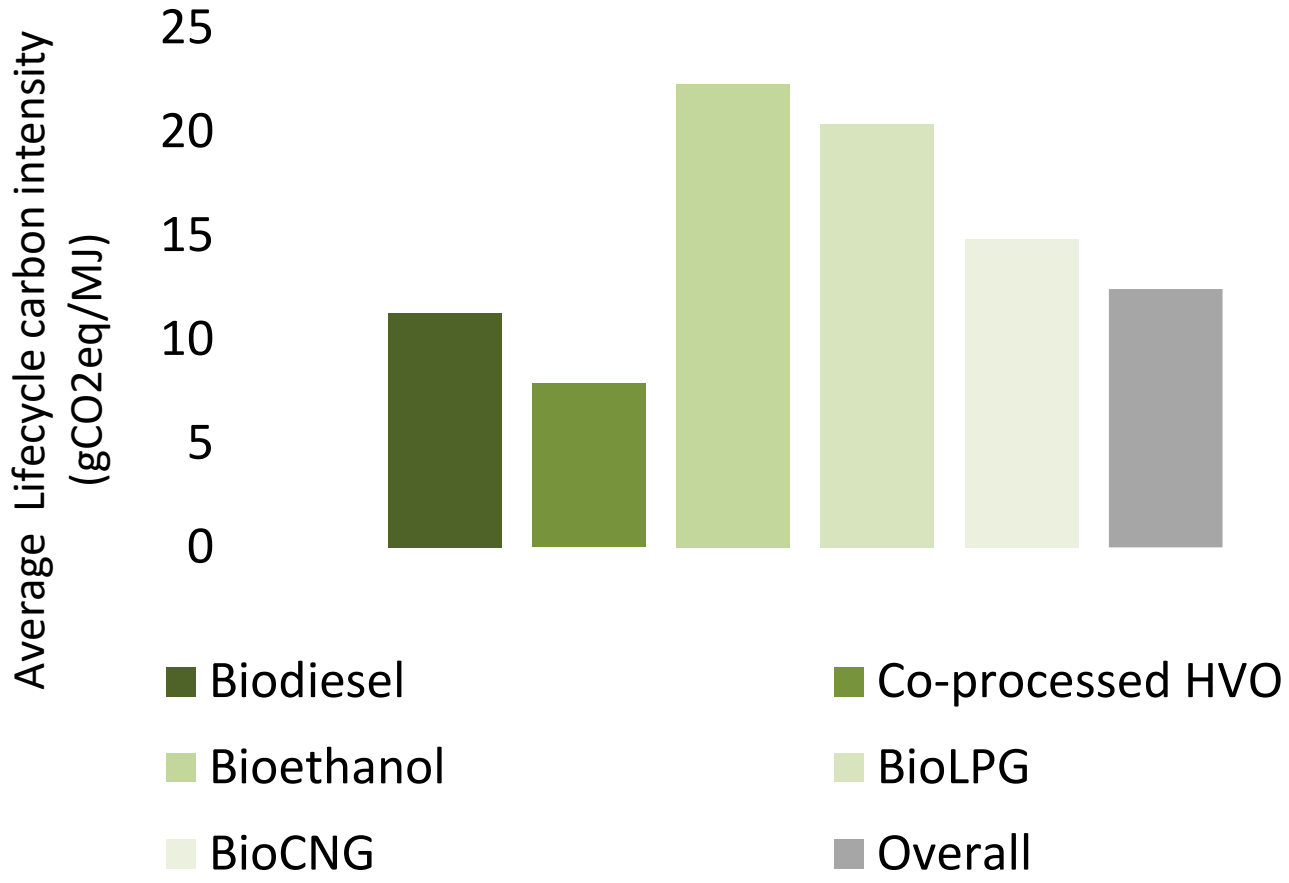
- Obligation 12.359% vs c.12.4%* achieved (ex ’19 &’20 Certs)
- 54.9 million BOS Cert carried forward to 2021

*Estimate

FEEDSTOCKS


BioCNG
Municipal Organic Waste
Starch Slurry
Brown Grease
Food Waste
Animal Manure
Belly Grass
BioLPG
UCO (LPG)
Palm Oil (LPG)
Biodiesel
Cat 3 Tallow
Cat 1 Tallow
UCO
Bioethanol
Starch Slurry
Whey Permeate
Barley
Wheat
Non-EC Corn
EC Corn
0
20
40
60
80
Million litres

CARBON INTENSITY (PRELIMINARY DATA)



SI 160 COMPLIANCE

- Requires designated fuel suppliers to reduce the carbon intensity of fuels by 6%, relative to FBS (94.1 gCO_{2eq}/MJ)
- For H1 2021, 3.4% CI saving achieved, in aggregate

Fossil Fuel	Carbon Savings ($ktCO_{2eq}$)[1]
Gasoline	13
Diesel	(73)
LPG	<1
Gasoil	(14)
Rail Diesel	(1)
CNG	1
Total	(73)

1 Eight months data

Biofuel	Est'd Carbon Savings ($ktCO_{2eq}$)[2]
Bioethanol	38
Biodiesel	366
BioLPG	5
Electricity	Assessed in early 2022
UERs	0
BioCNG	1
Total	410

2 Six months data

- Shortfall of 190 $ktCO_{2eq}$ for H1

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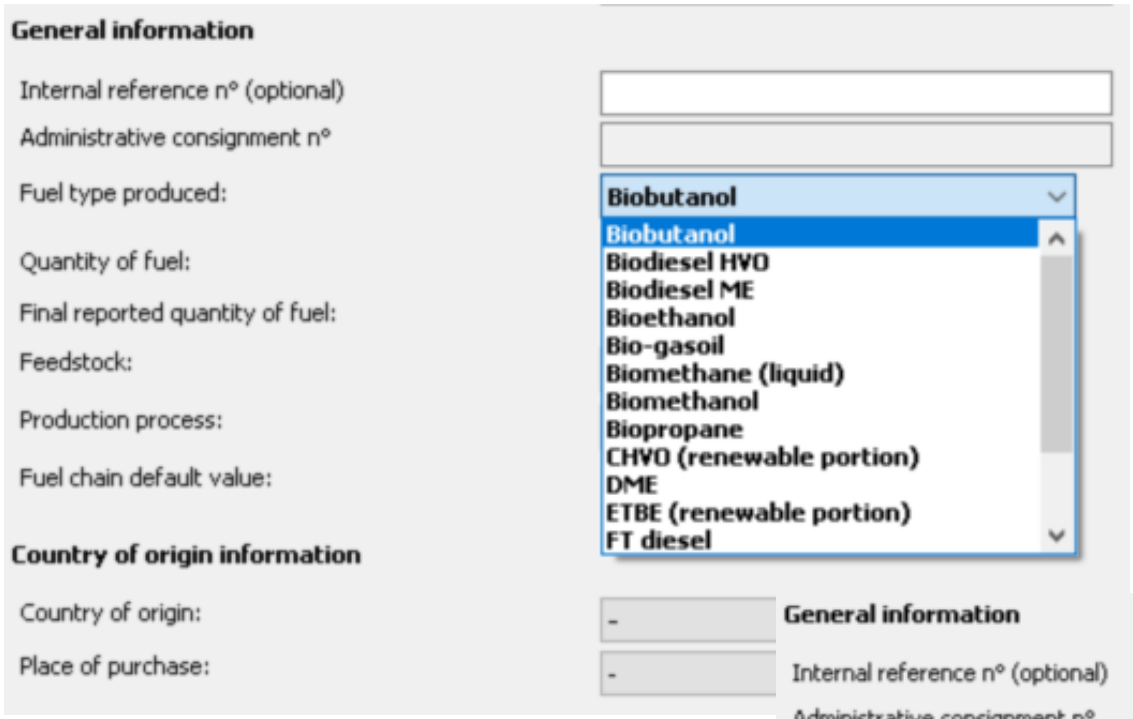
BOS ADMINISTRATION - OLA

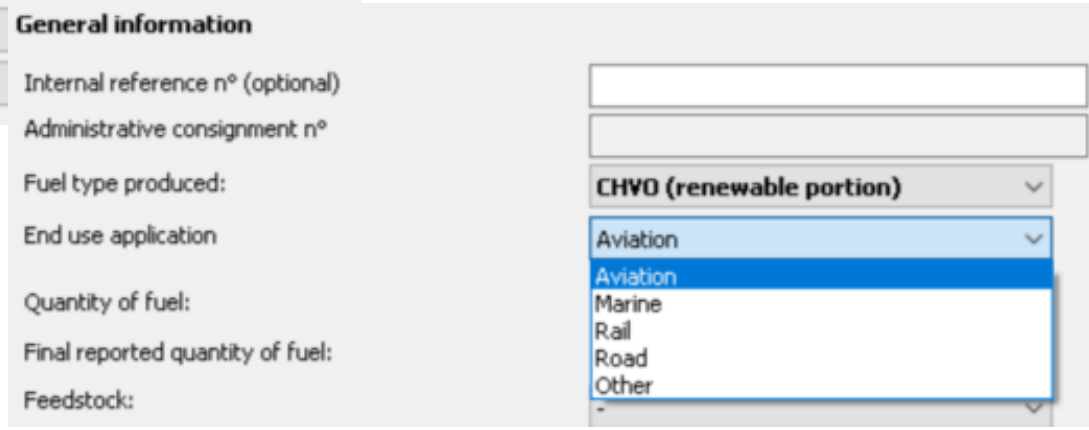
Fuel	Fuel Type	End Use	Descriptor	State	Units
Bio	HVO	Road	Hydrogenated vegetable oil used in road vehicles	Liquid	Litres
Bio	HVO	Rail	Hydrogenated vegetable oil used in trains	Liquid	Litres
Bio	HVO	Aviation	Hydrogenated vegetable oil used in planes	Liquid	Litres
Bio	HVO	Marine	Hydrogenated vegetable oil used in water-based craft	Liquid	Litres
Bio	HVO	Other	Hydrogenated vegetable oil used in other forms of transport, e.g. NRMM	Liquid	Litres
Bio	CHVO	Road	Co-processed hydrogenated vegetable oil used in road vehicles	Liquid	Litres
Bio	CHVO	Rail	Co-processed hydrogenated vegetable oil used in trains	Liquid	Litres
Bio	CHVO	Aviation	Co-processed hydrogenated vegetable oil used in planes	Liquid	Litres
Bio	CHVO	Marine	Co-processed hydrogenated vegetable oil used in water-based craft	Liquid	Litres
Bio	CHVO	Other	Co-processed hydrogenated vegetable oil used in other forms of transport, e.g. NRMM	Liquid	Litres
Bio	Biogasoil	Off-road	Biogasoil (biodiesel) used in NRMM	Liquid	Litres
Bio	Biogasoil	Marine	Biogasoil (biodiesel) used in water-based craft	Liquid	Litres
Bio	Renewable Hydrogen	Road	Renewable hydrogen used in fuel cell road vehicles (gaseous)	Gas	Nm^3
Bio	BioLNG	Road	Bio-liquified natural gas (biomethane) used in road vehicles	Liquid	Litres
Fossil	LNG	Road	Liquified natural gas used in transport (assume road at present)	Liquid	Litres
Fossil	Hydrogen	Road	Non-renewable hydrogen used in transport (assume road at present) (gaseous)	Gas	Nm^3

BOS ADMINISTRATION – OLA

- Current assumptions:
  - HVO potentially for all transport sub-sectors
  - Biogasoil (biodiesel) for marine and NRMM
  - H_2 road only
  - CNG, LNG & biomethane road only
- Can be modified for new fuels and fuels being used in other transport sub-sectors
- If considering new fuels and alternative end-uses, please contact us

BOS ADMINISTRATION – CARBON CALCULATOR





BOS ADMINISTRATION – BOSOS

NORA NATIONAL OIL RESERVES AGENCY

Carbon Savings:

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2018 | 2019 | 2020 | 2021

Savings Achieved (%)

7.9%

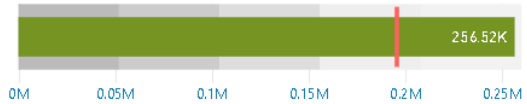
Goal: 6.00%

Savings Achieved(tCO2eq)

256,516

Goal: 195,609

Carbon Savings Achieved and Carbon Savings Target



34,645,579,205	3,003,633	256,516	0.00	0	0	86.70
Total Energy (MJ)	Total CO2eq emissions (t)	Bio & fossil CO2eq saving...	Electricity CO2eq savings (t)	UER CO2eq savings (t)	Transfer CO2eq savings (t)	Carbon Intensity (gCO2eq / ...

Biofuel Carbon Performance

Fuel Type	Quantity	Units	Lower Calorific Value (MJ/l or MJ/Nm³)	Energy (MJ)	Avg of Carbon Intensity (gCO2eq /MJ)	Carbon Emissions (tCO2eq)	Carbon Savings (tCO2eq)
Biogasoil (marine)	**11,000,000**	**Litres**	**36.0**	**396,000,000**	**10.9**	**4320**	**32944**
PALM	1,000,000	Litres	36.0	36,000,000	20.0	720	2668
UCO	10,000,000	Litres	36.0	360,000,000	10.0	3600	30276
CHVO (marine)	**9,000,000**	**Litres**	**36.0**	**324,000,000**	**8.6**	**2786**	**27702**
UCO	9,000,000	Litres	36.0	324,000,000	8.6	2786	27702
CHVO (other)	**10,000,000**	**Litres**	**36.0**	**360,000,000**	**8.6**	**3096**	**30780**
UCO	10,000,000	Litres	36.0	360,000,000	8.6	3096	30780
CHVO (rail)	**7,000,000**	**Litres**	**36.0**	**252,000,000**	**8.6**	**2167**	**21546**
UCO	7,000,000	Litres	36.0	252,000,000	8.6	2167	21546
CHVO (road)	**6,000,000**	**Litres**	**36.0**	**216,000,000**	**8.6**	**1858**	**18468**
UCO	6,000,000	Litres	36.0	216,000,000	8.6	1858	18468
HVO (aviation)	**3,000,000**	**Litres**	**34.0**	**102,000,000**	**8.6**	**877**	**8721**
PALM	1,000,000	Litres	34.0	34,000,000	8.6	292	2907
UCO	2,000,000	Litres	34.0	68,000,000	8.6	585	5814
HVO (marine)	**4,000,000**	**Litres**	**34.0**	**136,000,000**	**8.6**	**1170**	**11628**
PALM	3,000,000	Litres	34.0	102,000,000	8.6	877	8721
UCO	1,000,000	Litres	34.0	34,000,000	8.6	292	2907
HVO (other)	**5,000,000**	**Litres**	**34.0**	**170,000,000**	**8.6**	**1462**	**14535**
UCO	5,000,000	Litres	34.0	170,000,000	8.6	1462	14535
Total	**101,838,248**			**2,980,575,224**		**20186**	**260286**

Fossil Fuel Carbon Performance

Fossil Fuels	Quantity	Units	Lower calorific Value (MJ/l or MJ/Nm³)	Energy (MJ)	Carbon Intensity (gCO2eq/MJ)	Carbon Emissions (tCO2eq)	Carbon Savings (tCO2eq)
Road Diesel	589,265,563	Litres	36.0	21,213,560,268	95.1	2,017,410	-21,214
Gasoil	154,373,597	Litres	36.0	5,557,449,492	95.1	528,513	-5,557
Gasoline	121,693,607	Litres	32.0	3,894,195,424	93.3	363,328	3,115
Rail Diesel	7,769,364	Litres	36.0	279,697,104	95.1	26,599	-280
Hydrogen	12,050,000	Litres	34.0	409,700,000	60.0	24,582	13,971
LNG	14,000,000	Litres	20.3	284,200,000	74.5	21,173	5,570
CNG	567,623	Nm^3	35.7	20,264,141	69.3	1,404	503
LPG	247,398	Litres	24.0	5,937,552	73.6	437	122
Methanol	0	Litres	16.0	0	73.6	0	0
Total	**899,967,152**			**31,665,003,981**		**2,983,447**	**-3,770**

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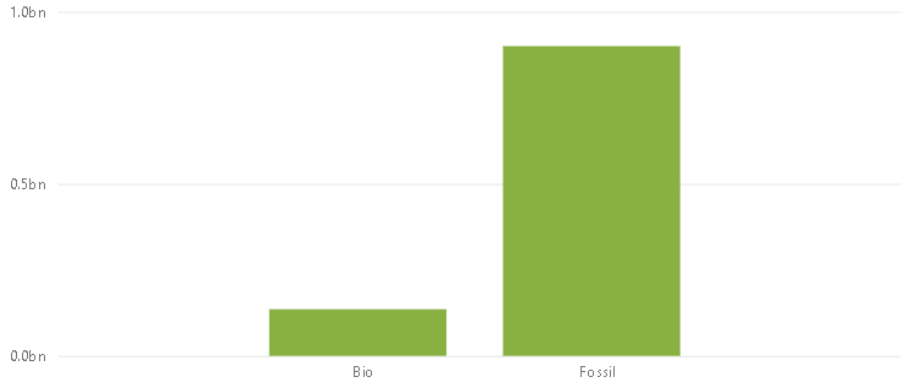
BOS ADMINISTRATION – BOSOS

NORA NATIONAL OIL RESERVES AGENCY

OLA Data as Reported to DECC:

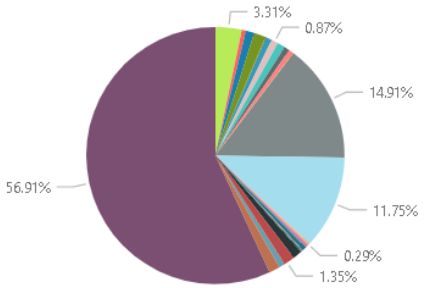
Last Updated: 02-Sep-21 11:46

Fuel Quantity by fuelcategoryname_cc



2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021

Fuels Value by Fuel Type



Fueltype	January	February	March	Total
BioCNG-Nm3	0	0	0	0
Biodiesel-Litres	10,017,180	10,297,232	13,941,996	34,256,408
Bioethanol-Litres	1,486,493	1,628,558	2,159,912	5,274,963
Biogasoil (marine)-Litres	0	0	11,000,000	11,000,000
Biogasoil-Litres	0	0	0	0
BioLNG-Litres	0	0	15,000,000	15,000,000
Biomethanol-Litres	0	0	0	0
CHVO (Aviation)-Litres	0	8,000,000	0	8,000,000
CHVO (Marine)-Litres	0	9,000,000	0	9,000,000
CHVO (Other)-Litres	0	10,000,000	0	10,000,000
CHVO (Rail)-Litres	0	7,000,000	0	7,000,000
CHVO (Road)-Litres	0	6,000,000	0	6,000,000
Gasoil-Litres	37,666,070	51,322,541	65,384,986	154,373,597
Gasoline-Litres	28,406,751	40,082,169	53,204,687	121,693,607
HVO (Aviation)-Litres	3,000,000	0	0	3,000,000
HVO (Marine)-Litres	4,000,000	0	0	4,000,000
HVO (Other)-Litres	5,000,000	0	0	5,000,000
HVO (Rail)-Litres	2,000,000	0	0	2,000,000
HVO (Road)-Litres	1,000,000	0	0	1,000,000
Hydrogen-Nm3	0	0	12,050,000	12,050,000

‘OTHER’ BIOFUELS

- Biofuels (liquid or gaseous produced from biomass) consumed in transport eligible for BOS Certs & carbon savings, e.g.:
  - H_2 from gasification of biomass (biohydrogen)
  - Biomethane for BioCNG or BioLNG
- Biojet/SAF/HVO/CHVO supplied to planes eligible for Certs only
- RFNBOs not yet eligible for BOS Certs (e.g. H_2 produced using renewable electricity)
- H_2 from renewable elec and recycled waste plastic eligible for carbon savings

AVIATION

- ASTM D7566 provides for blends between 10 & 50% for biojet (SAF) produced from seven production routes
- Once it meets ASTM D7566, can be recertified as standard ASTM D1655
- Norway currently mandates (0.5% in 2020)
- Finland (2023), France (2022), Germany, Netherlands (2023), Sweden (2022? – emission reduction target)
- ReFuel EU proposal: SAF 2% blend in 2025, 5% in 2030

DETERMINATION PROCESS

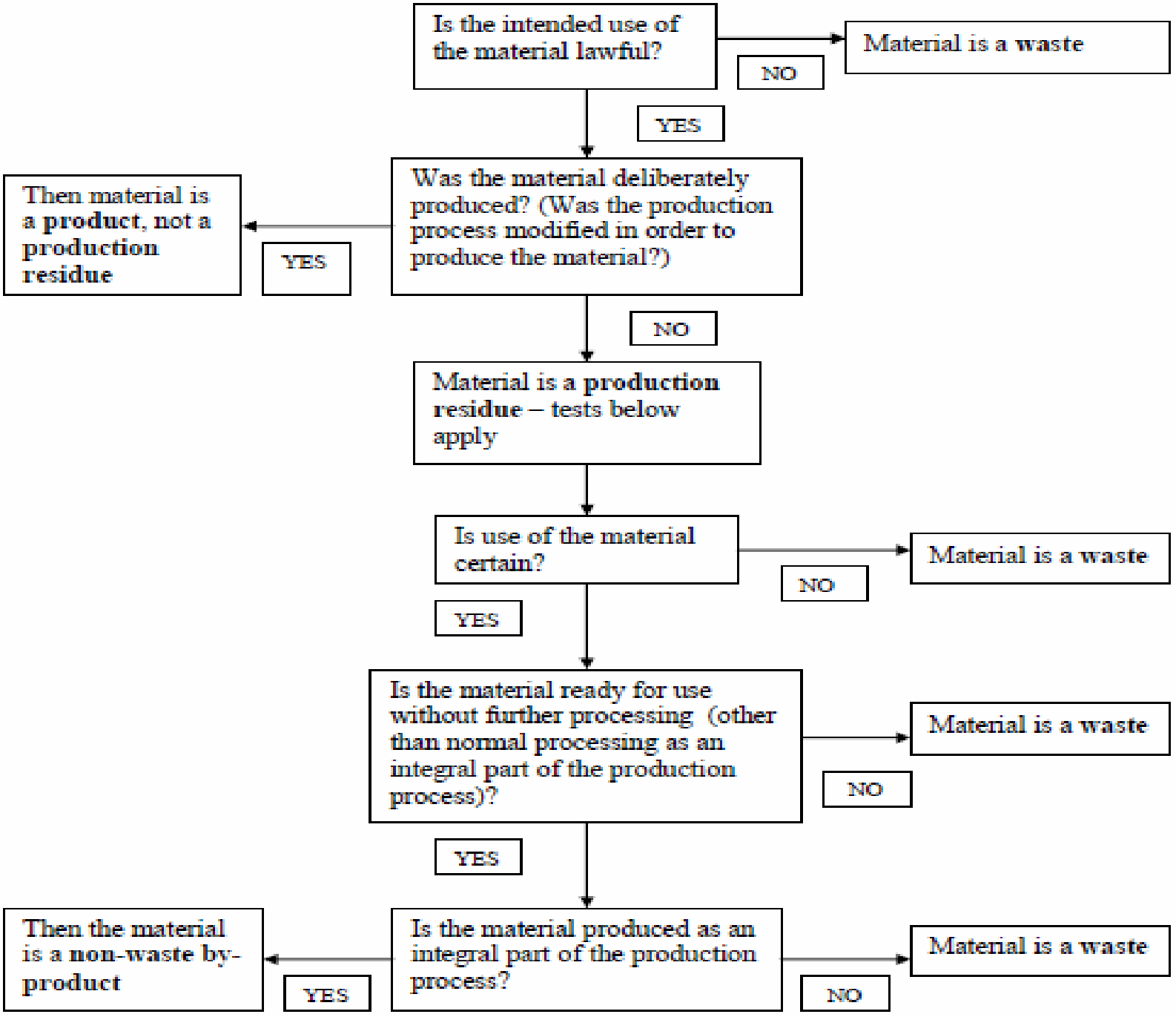
- Determination required for feedstocks for which two BOS Certs per litre (or three BOS Certs per Nm^3) are being sought and determination not previously carried out
- Biofuel must be placed on the market – advise a small volume initially
- Determinations listed for:
  - UCO, Cat 1 tallow, POME, SBE, Whey permeate, sewage sludge, waste starch slurry, brewer's spent yeast (link)
  - All determined to be wastes/residues

DETERMINATION PROCESS

- Advise the BOS Team you intend to apply for multiple BOS Certs for a feedstock not previously determined
- Application submitted as normal on the BOSOS, but additional information needs to be submitted by email:
  - How is the feedstock produced?
  - What happens to the feedstock if it is not used to produce biofuel?
  - Are there alternative uses for the feedstock?
  - How is the feedstock converted into a biofuel?
  - What laws / regulations govern the disposal / management of the feedstock?

DETERMINATION PROCESS

- Required (under BOS Act) to consult with:
  - SEAI
  - NSAI
  - EPA
  - DoT
  - And others we consider appropriate
- Examine position of other Member States
- Review data gathered (from applicant, from consultees, from BOS Team research, from applying WFD decision tree)

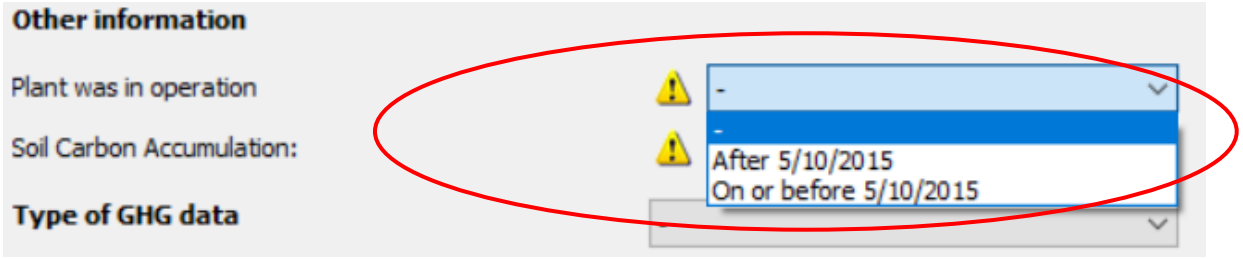

Is the intended use of the material lawful?
NO
Material is a waste
YES
Was the material deliberately produced? (Was the production process modified in order to produce the material?)
YES
Then material is a product, not a production residue
NO
Material is a production residue – tests below apply
Is use of the material certain?
NO
Material is a waste
YES
Is the material ready for use without further processing (other than normal processing as an integral part of the production process)?
NO
Material is a waste
YES
Is the material produced as an integral part of the production process?
YES
Then the material is a non-waste by-product
NO
Material is a waste

RED II – FOSSIL FUEL COMPARATOR

- Current fossil fuel comparator: 83.8 gCO_{2eq}/MJ
  - Installations operating prior to Oct ‘15, 50% GHG savings required = CI of 41.9 gCO_{2eq}/MJ
  - Installations starting operation after Oct ‘15, 60% GHG savings required = CI of 33.5 gCO_{2eq}/MJ
- RED II will change the fossil fuel comparator to 94 gCO_{2eq}/MJ
  - Installations operating prior to Oct ‘15, 50% GHG savings required = CI of 47 gCO_{2eq}/MJ
  - Installations in operation after Oct ‘15, 60% GHG savings required = CI of 37.6 gCO_{2eq}/MJ

RED II – FOSSIL FUEL COMPARATOR

- RED II also introduces new category:
  - installations in operation after Jan '21, 65% GHG savings required = CI of 32.9 gCO_{2eq}/MJ
- Carbon calculator currently:



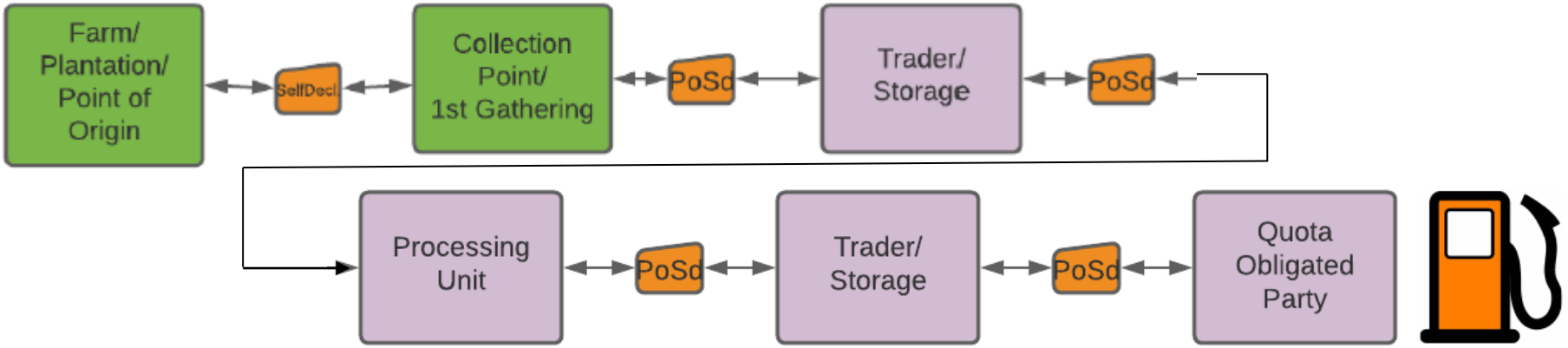
- Calculator will be modified to enable third option, once RED II transposed
- Envisage Red/Orange/Green Certs in play, once RED II transposed

RED II – UNION DATABASE

- Article 28 (2) and (4):
  - *The Commission shall ensure that a Union database is put in place to enable the tracing of liquid and gaseous transport fuels that are eligible for being counted towards the numerator… Member States shall require the relevant economic operators to enter into that database.. sustainability characteristics… including life-cycle greenhouse gas emissions…*
- Scoping study carried out by consultants (link to report)
- Commission preparing pilot database
- Draft Implementing Regulation (link) published. Deals with certification and rules for Voluntary Schemes to support DB – stipulates legal obligations for economic operators, certification bodies, voluntary schemes and Member States

RED II – UNION DATABASE

Possible Scope



Indicative schedule

July 2021

Phase 1 Develop Pilot

- Focus on Low Risk Value Chain
- MVP system development

Oct. 2021

Phase 1 – Pilot testing

- Complete Pilot Testing with focus group for Low Risk Value Chain
- Start populating the UDB (from Collection point)

Feb. 2022

Phase 2 Pilot for high risk value chain

- Evaluate & expand to High Risk Value chain

July 2022

Phase 2 Testing of high risk value chain

- Expand the data population(from Point of Origin

Dec. 2022

Union Database Live

DRAFT IMPLEMENTING REGULATION – ANNEX I

DATA TO BE TRANSMITTED THROUGH THE WHOLE SUPPLY CHAIN AND TRANSACTION DATA

1. Data to be transmitted through the whole supply chain

(a) name of the voluntary or national scheme;

(b) proof of sustainability number;

(c) sustainability and GHG emission savings characteristics, including:

(i) statement on whether the raw material or fuel complies with the criteria set out in Article 29(2) to (7) of Directive (EU) 2018/2001;

(ii) GHG emission data calculated according to the methodology set out in Annexes V and VI to Directive (EU) 2018/2011 or Delegated Regulation (EU) 2019/807;

(iii) description of when the installation started operation (for fuels only);

(d) name of raw material or name of raw material that the fuel is produced from;

(e) waste or animal by-product permit number (if applicable);

(f) fuel type (for fuels only);

(g) country of origin of raw material;

(h) country of fuel production;

(i) statement on whether the raw material or fuel complies with the criteria set out for low indirect land-use change-risk biofuels;

(j) information on whether support has been provided for the production of that consignment, and if so, the type of support scheme.

2. Transaction data

(a) supplier company name and address;

(b) buyer company name and address;

(c) date of (physical) loading;

(d) place of (physical) loading or biomethane entry point;

(e) place of (physical) delivery or biomethane exit point;

(f) volume: For fuels, the energy quantity of the fuel must also be included. For the calculation of the energy quantity, conversion factors in Annex III to Directive (EU) 2018/2001 must be used.

Not clear on level of granularity

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RED III PROPOSAL – PART OF 'FIT FOR 55'

- Replace blending obligation with carbon intensity reduction requirement of 13% (similar to SI 160 methodology)
- Delete Article 7a of FQD (SI 160 transposes)
- Increases scope of obligation to all transport fuels (road, rail, NRMM, marine? aviation?)
- Multiple counting removed, except for aviation & marine, and electricity for EVs (but need clarity on this)
- RFNBO sub-target 2.6% in 2030 (70% GHG savings)
- Advanced biofuel sub-target 0.2% in 2022, 0.5% in 2025, 2.2% in 2030
- Crap cap and Annex IX Part B limit remain

NEXT UP

-- Thank you for your attention --