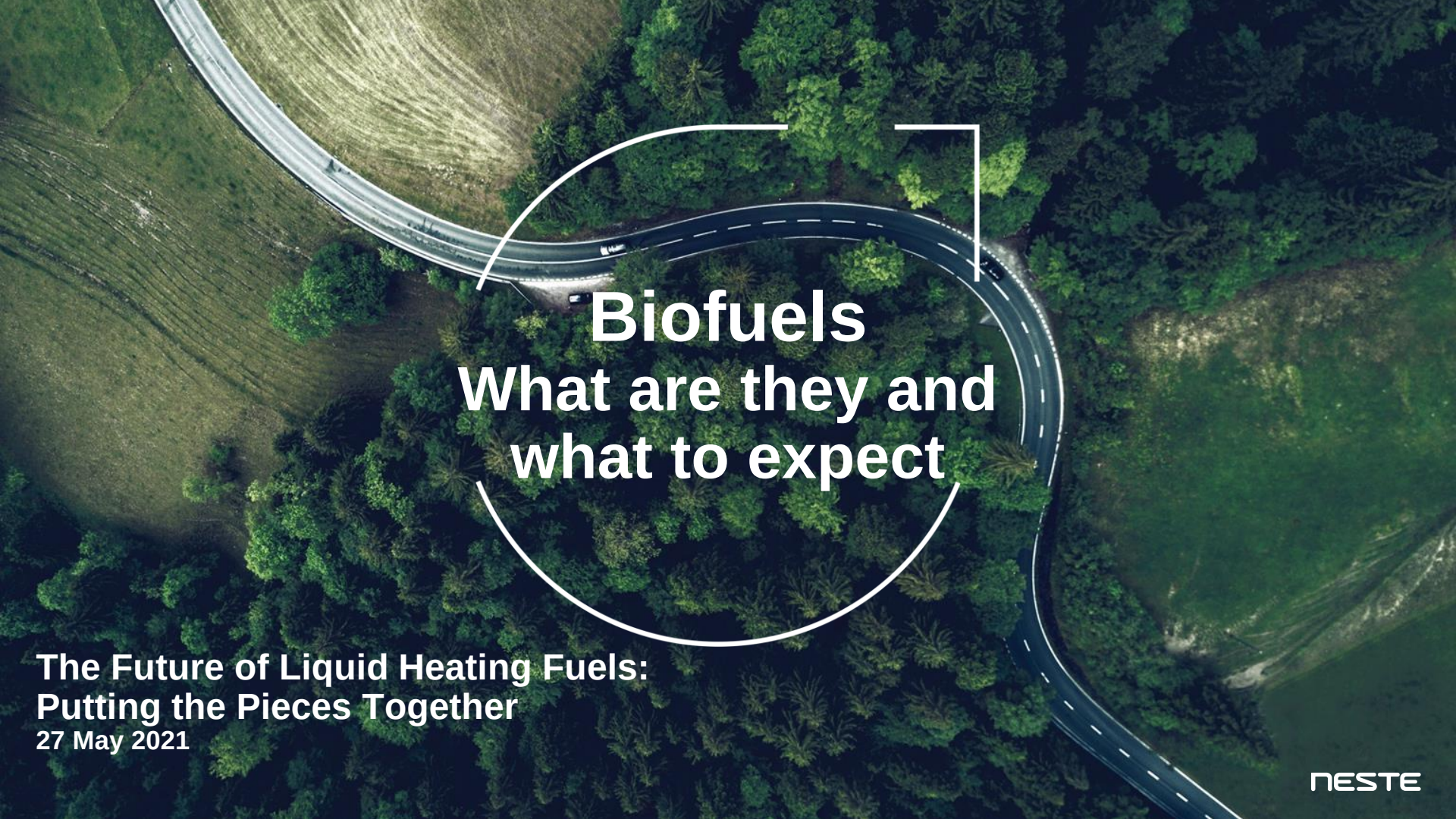


Biofuels
What are they and what to expect

The Future of Liquid Heating Fuels:
Putting the Pieces Together
27 May 2021

NESTE

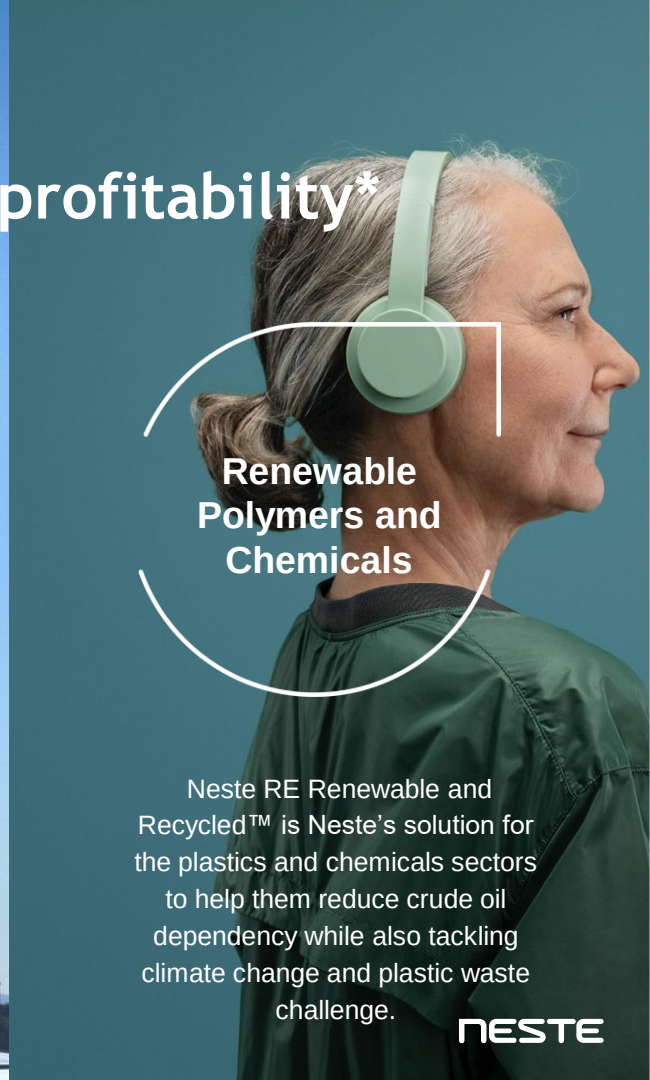
Renewables: more than 90% of Neste's profitability*

Renewable Road Transportation

Over the life-cycle, Neste MY Renewable Diesel reduces greenhouse gas (GHG) emissions by up to 90% compared to fossil diesel.

Renewable Aviation

Over the life-cycle, Neste MY Sustainable Aviation Fuel has up to 80% smaller carbon footprint compared to fossil jet fuel.

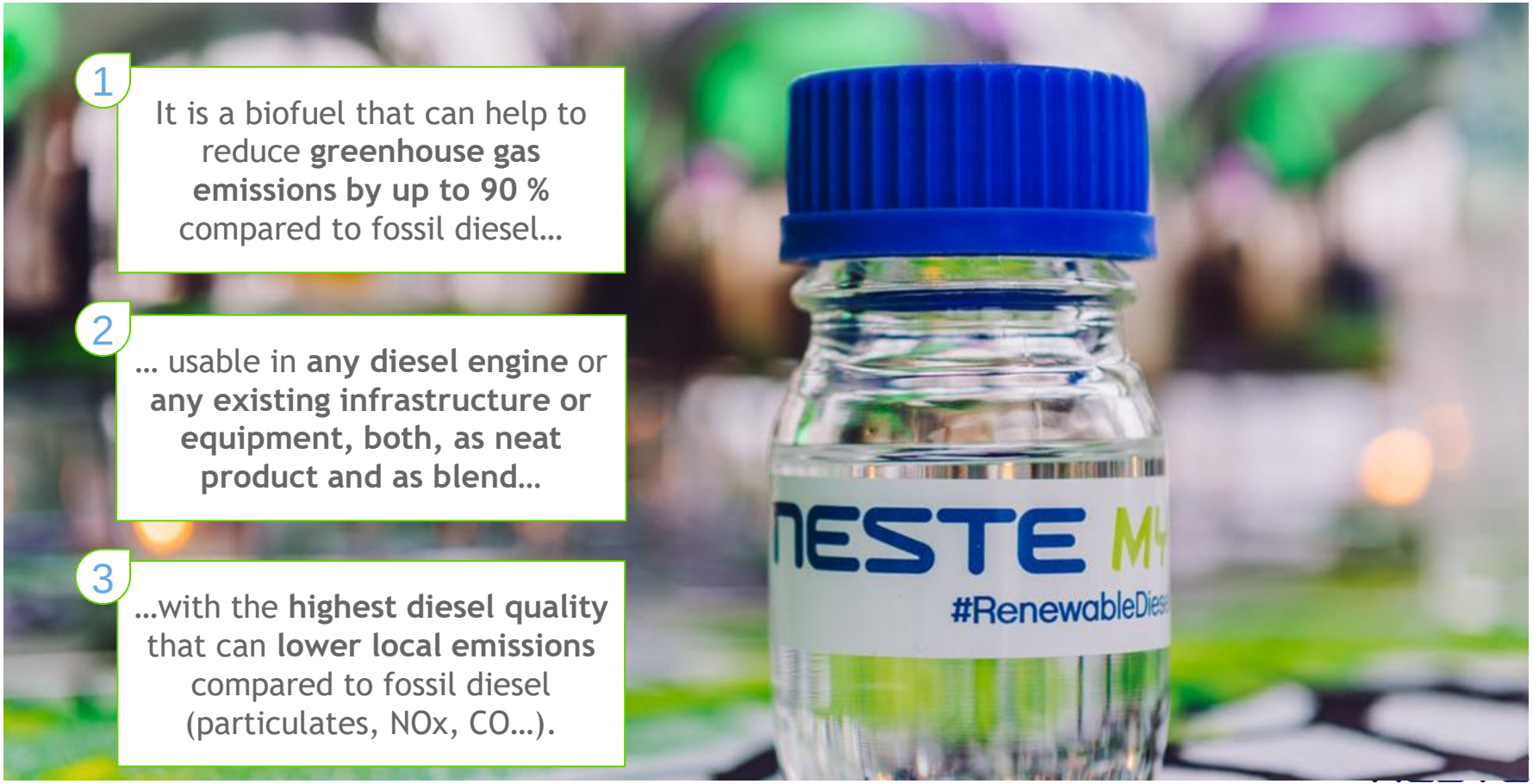


Renewable Polymers and Chemicals

Neste RE Renewable and Recycled™ is Neste's solution for the plastics and chemicals sectors to help them reduce crude oil dependency while also tackling climate change and plastic waste challenge.

*Comparable operating profit

Our solution: Neste MY Renewable Diesel



Renewable Diesel and Biodiesel

	Conventional fossil diesel	Renewable Diesel HVO100	Biodiesel (FAME / RME / UCOME)
Raw material	Crude oil	Waste and residue vegetable oil	Waste and residue vegetable oil
Chemical composition	C_nH_{2n+2} + aromatics	C_nH_{2n+2}	O II $H_3C\text{-}O\text{-}C\text{-}R$
Oxygen (wt-%)	≈ 1 (in B7)	0	≈ 11
Cetane number	> 46	> 70	> 51
Aromatics (vol-%)	< 4.8	0	0

Chemical composition → compatibility with all engine and infrastructure

Oxygen →
bad impact on long storage time, water absorption…

Cetane →
quicker combustion, reducing the formation of NOx, better combustion

Aromatics →
Increase engine-out emissions, toxic, bad smell…

FAME /RME /UCOME = Fatty Acid Methyl Ester/Rapeseed Methyl Ester/Used-cooking-oil Methyl Ester

Neste Renewable Diesel is compatible with all applications :

Commercial and municipal bus fleets

Truck fleets

Construction, mining

Agricultural machinery

Utility (cleaning, waste, snow grooming etc.)

Marine

Power generators

NESTE

Neste Renewable diesel offers an immediate solution to achieve emission reductions in the heating sector

It can be used as a **drop-in fuel** in the existing infrastructure, including existing oil burning heating systems, sometimes with a minor modification

In addition to a smaller carbon footprint, the use of renewable diesel **reduces local emissions**

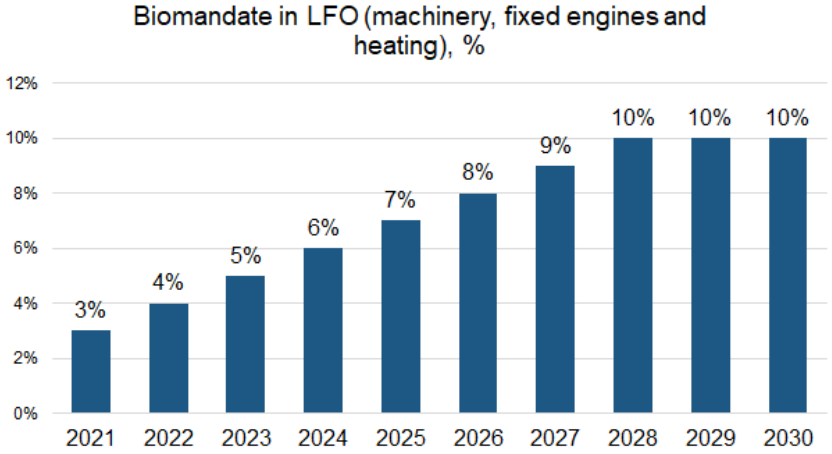
It is **an immediate solution** for buildings that are insufficiently insulated for the use of a heat pump and/or are not connected to the gas network

Renewable Diesel in different blending ratios has already been successfully tested in heating installations in Germany and Belgium

Informazout, the Belgian information centre, set up a field test with a blend of 80% heating oil and 20% renewable diesel.
The test was carried out on a low temperature oil boiler (ACV) used for central heating and domestic hot water.
After the consumption of 2400 liters of the blend, not a single problem occurred. Gas flue measurements also indicated that the boiler performs perfectly in accordance with the local environmental legislation

It is important that the local legislation supports not only low-emission mobility but also lower-emissions in the off-road sectors such as heating

The bio mandate for biofuels in Finland has been extended to fuel oil. The aim is to promote the use of biofuel oil to replace light fuel oil in heavy equipment, stationary motors and heating



Ambition level to reduce transport emissions remains high in both Europe and North America

NORTH AMERICA

Carbon intensity reductions		2020	2030
	British Columbia	9.1%	20%
	Oregon	2.5%	20%
	California	7.5%	20%
	Canada		13% *Proposal
	United States	Ongoing initiatives in Washington State and New York to pass Clean Fuels Programs in the near term	

1) Volumetric mandate. 2) GHG reduction mandate for diesel. 3) Energy content based mandate. 4) 2030 ambition for renewables share for road and rail

NORDICS

Mandate obligations		2020	2030
	Norway [1]	20%	40% *Ambition
	Sweden [2]	21%	66% *Proposal
	Finland [3]	20%	30%

REST OF EUROPE

Carbon intensity reductions		2020 Mandate	2030 Ambition
	France [3,4]	8%	15%
	Italy [3,4]	9%	22%
	Netherlands [3]	16.4%	27.1%
	Spain [3,4]	8.5%	28%
	EU RED II [4]		14%
	EU Green Deal		Carbon-neutrality 2050

NESTE

Our renewable raw materials

Neste's renewable raw material portfolio consists of over 10 different waste and residue oils and fats and vegetable oils.

Waste and residues account for 83% of Neste's total renewable raw material inputs globally (in 2020).

All renewable raw materials Neste uses are sustainably produced* and traceable to the point of origin.

We are expanding our raw material portfolio and capabilities with a focus on scalable and sustainable raw materials and required technologies.

*Meeting or exceeding e.g. EU RED requirements

NESTE


Thank you