Taking Action on Climate Change

AVL PDiM 2018

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Our journey from an oil refining company to the world's largest provider of renewable diesel

1948

Neste is founded with the purpose to secure Finland's oil supply

1996

Neste experiments to develop 100% renewable diesel and applies for a patent for NEXBTL refining technology

2007

1st renewable diesel plant in world

2015

Neste Oil → Neste

2017

Renewable Products make up 51% of the Neste's profit

2020-

TARGET BY 2020 Expansion outside road traffic fuels, 20% of our renewables' sales volume


CLIMATE CHANGE
DEFINES THE FUTURE
OF THE ENERGY SECTOR
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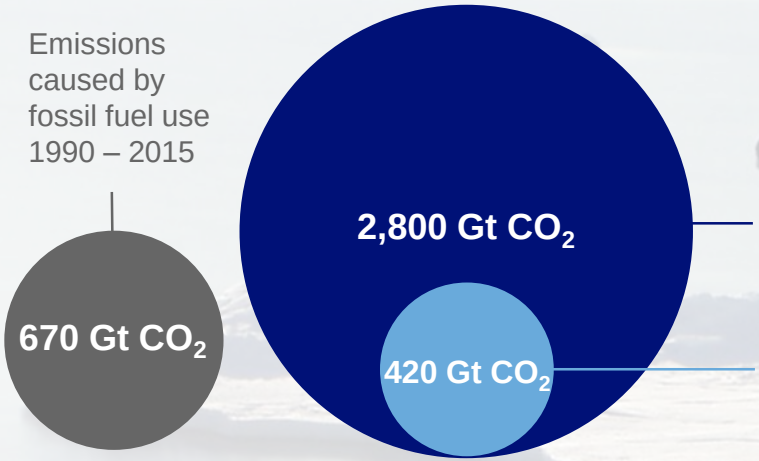
The Stone Age did not end for a lack of stones, and the same goes for the Oil Age!

The world is not running out of fossil fuel resources anytime soon.

But the environmental impact of CO_2 emissions means we cannot burn it all.

CO_2 emissions potential of fossil fuel reserves compared to the 2ºC global carbon budget until 2050

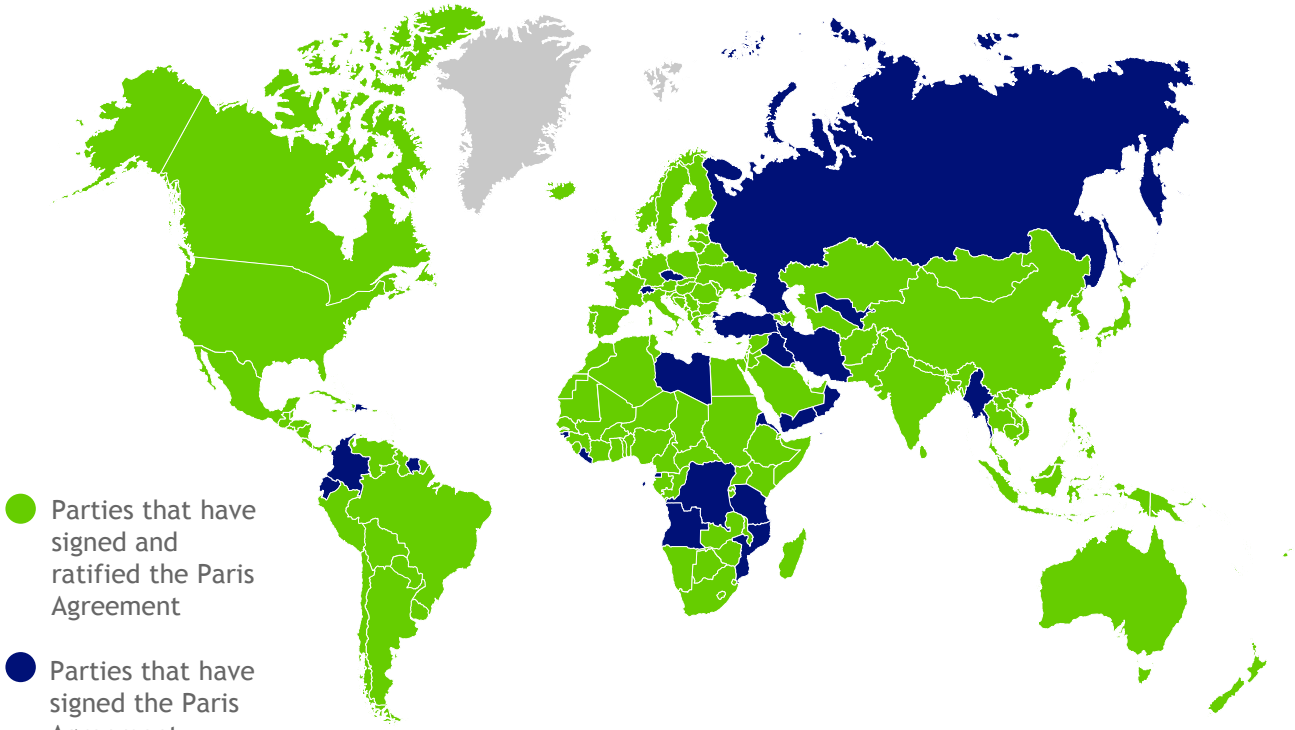


Source: IEA, *World energy-related CO_2 emissions*, 2016; Carbon Tracker Initiative, *Unburnable Carbon – Are the world's financial markets carrying a carbon bubble?*, 2014

The grey area represents world's oil consumption (4200 Mt/a), still growing

The decarbonization challenge is huge! Every solution is needed and should be exploited to the maximum!

Global commitment to tackle climate change creates need for low-carbon solutions



Parties that have signed and ratified the Paris Agreement

Parties that have signed the Paris Agreement

Paris Agreement ratification

195 countries signed the agreement

170 countries ratified

88% of global emissions covered[1]

NOTE: 1) Without the US 68% of global emissions would be covered. SOURCE: climateanalytics.org/hot-topics/ratification-tracker.html

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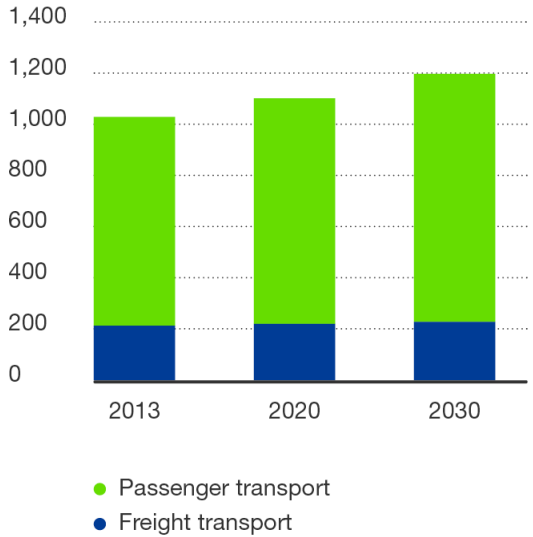
Progressive regions blaze the trail
CALIFORNIA
-20% carbon intensity
ITALY
17-19%
SWEDEN
30-40%
FRANCE
15%
NORWAY
40%*
FINLAND
30%
CANADA
-30 Mt CO_2 Clean Fuels Standard under development
Selected countries' envisioned renewable fuel targets 2030
*indicative target

Cities take a major role in the battle against CO_2 and air pollution

Urban transport energy demand (Mtoe)



NOTE: Mtoe = million tons oil equivalent
SOURCE: www.c40.org; JRC (2016), Covenant of Mayors; Neste based on IEA data from the Energy Technology Perspectives 2016 © OECD/IEA 2016. Licence: www.iea.org/t&c; as modified by Neste

Selected cities' CO_2 emission reduction targets

-20% CO_2 emission by 2020
EU Covenant of mayors (6,200 cities)

Carbon neutral by 2030
Oslo, Norway

-80% CO_2 emission by 2050
New York City (US), San Francisco (US), Washington DC (US), Vancouver (CAN), London (UK)

Carbon neutral by 2050
Helsinki, Finland
Stockholm, Sweden

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Progressive companies lead the way towards sustainable solutions in transport and beyond

Reduce greenhouse gas emissions 20% by 2020. Long-term goal to achieve a 60 to 80% reduction by 2050.

Reduce absolute greenhouse gas emissions from core business operations by 50% by 2020.

Long-term vision to reduce environmental footprint to zero, including 90% emissions reduction by 2050.

Strategy to substantially reduce their carbon emissions.

Reduce greenhouse gas emissions from facilities and logistics operations by 50% by 2020.

By 2020, reduce specific CO_2 emissions by 25% compared to 2006.

SOURCE: http://sciencebasedtargets.org/case-studies/

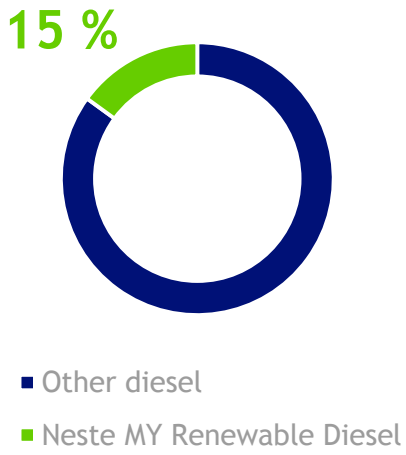
Consumers increasingly demand low-carbon products and services

75%

of consumers would buy more environmental products, if performing as well or better than the products they usually buy.

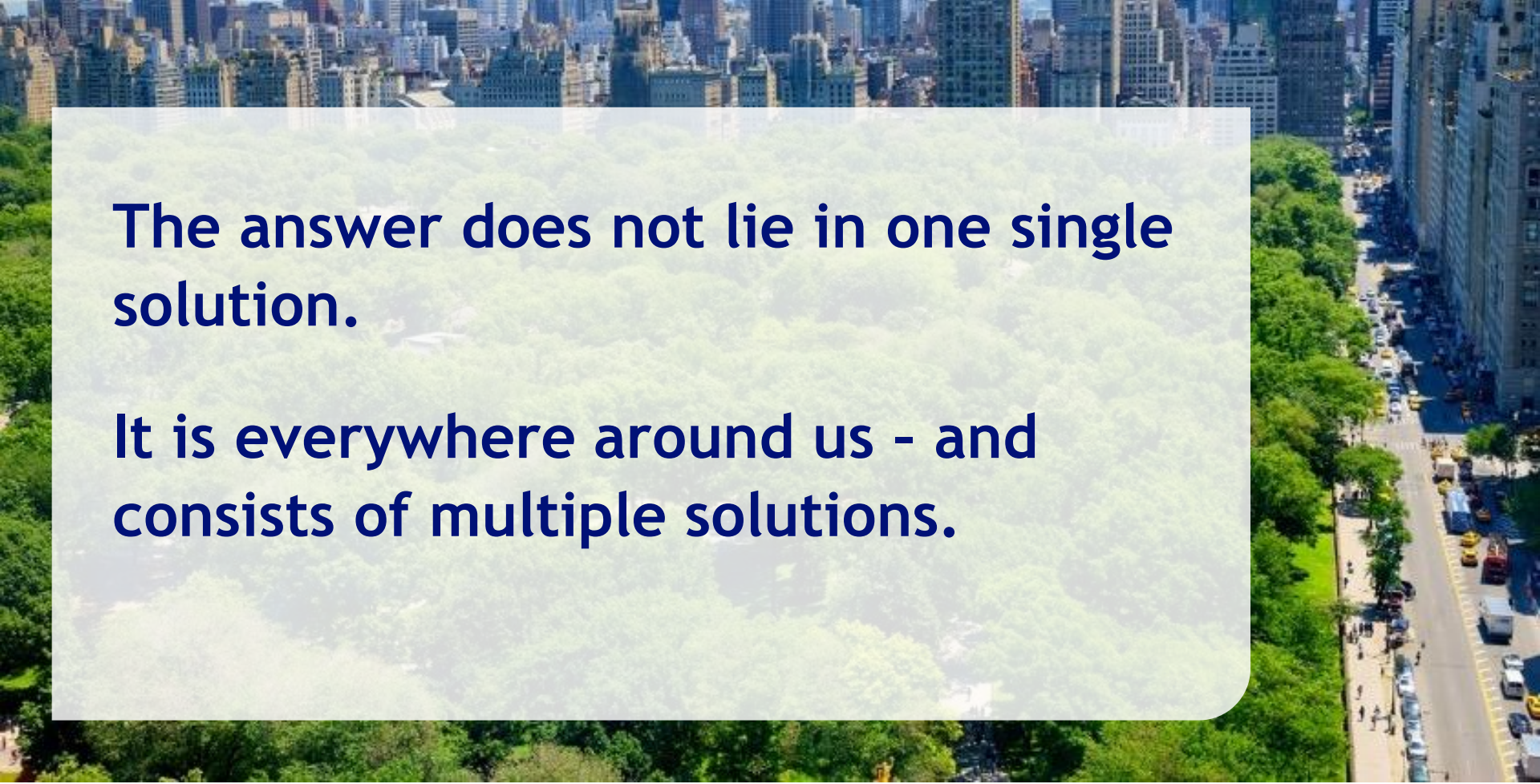
NOTE: Developing markets surveyed are Brazil, China, India. Developed markets are Germany, UK, US. SOURCE: Globescan (2012), Re:Thinking Consumption. Consumers and the Future of Sustainability.

Share of Neste MY Renewable Diesel sales to customers in Finland at participating light network fuel stations



NOTE: Number of stations offering Neste MY RD as of October 2017: 20.
SOURCE: Neste Marketing and Services own data

NESTE MY Renewable Diesel

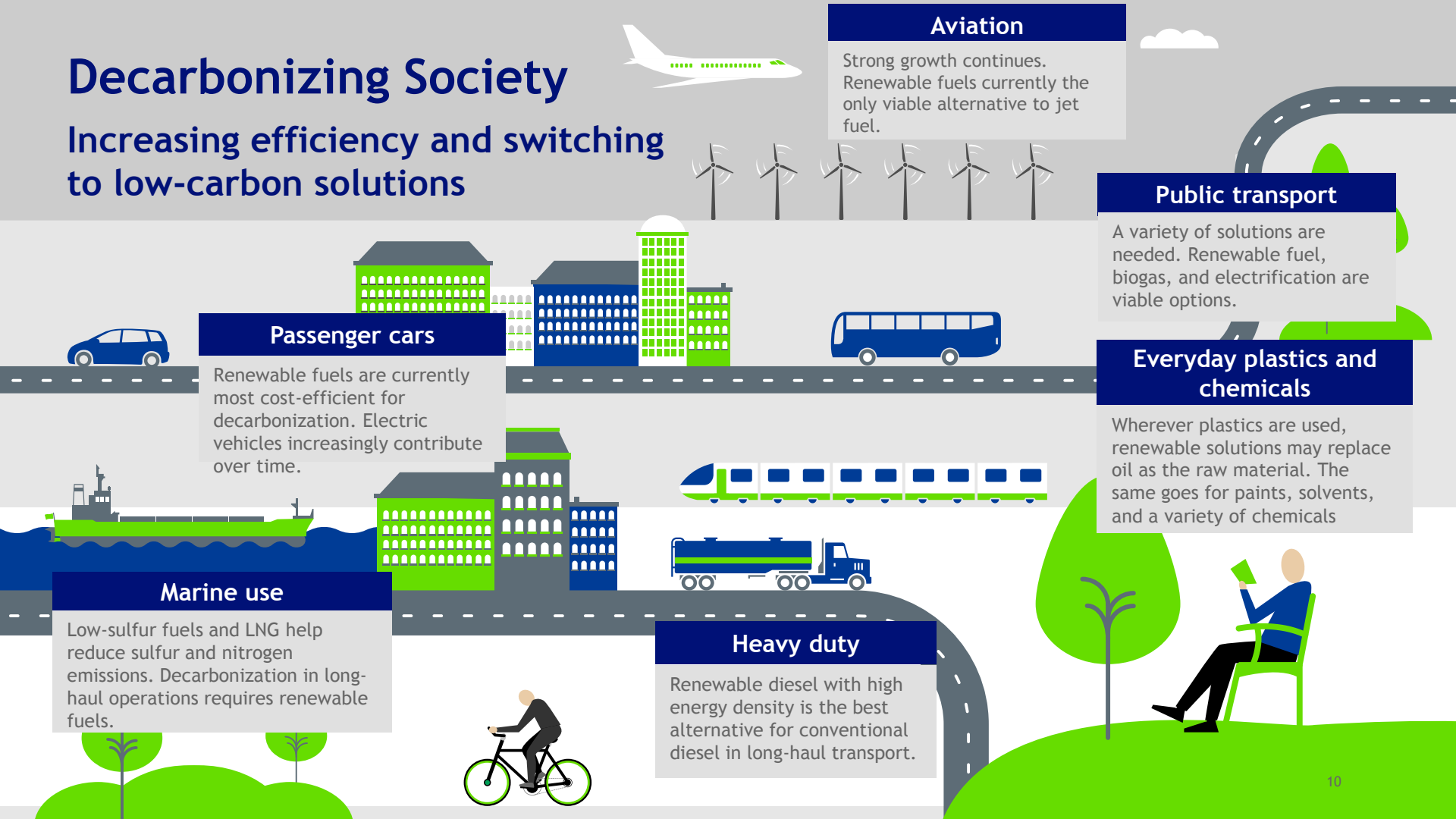


The answer does not lie in one single solution.

It is everywhere around us - and consists of multiple solutions.

Decarbonizing Society

Increasing efficiency and switching to low-carbon solutions



Aviation

Strong growth continues. Renewable fuels currently the only viable alternative to jet fuel.

Public transport

A variety of solutions are needed. Renewable fuel, biogas, and electrification are viable options.

Passenger cars

Renewable fuels are currently most cost-efficient for decarbonization. Electric vehicles increasingly contribute over time.

Everyday plastics and chemicals

Wherever plastics are used, renewable solutions may replace oil as the raw material. The same goes for paints, solvents, and a variety of chemicals

Marine use

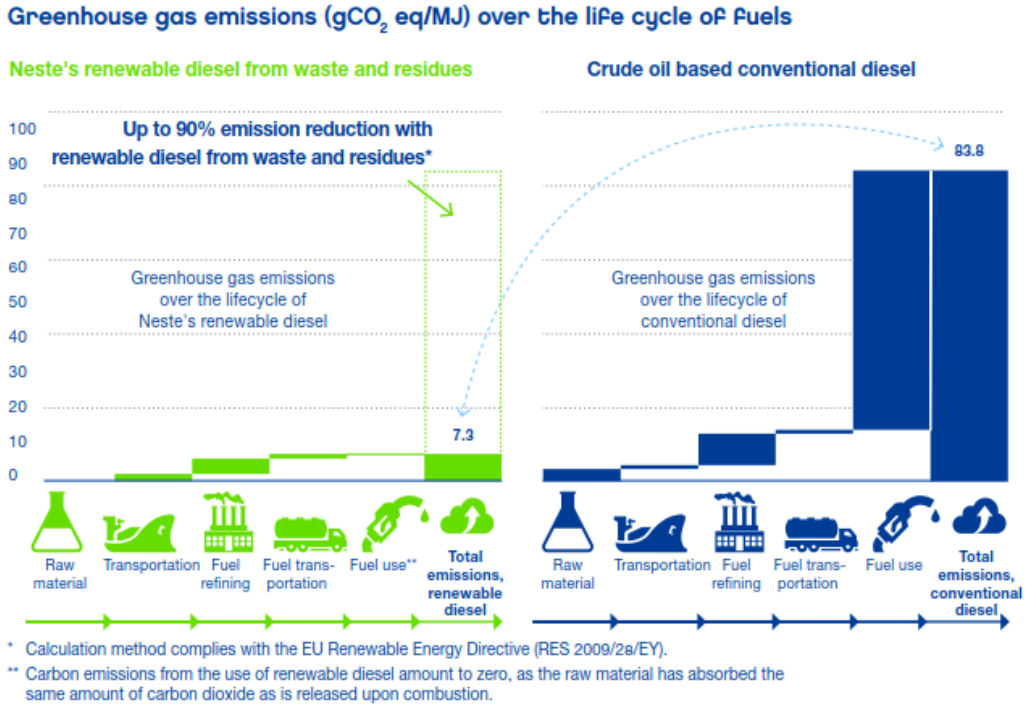
Low-sulfur fuels and LNG help reduce sulfur and nitrogen emissions. Decarbonization in long-haul operations requires renewable fuels.

Heavy duty

Renewable diesel with high energy density is the best alternative for conventional diesel in long-haul transport.

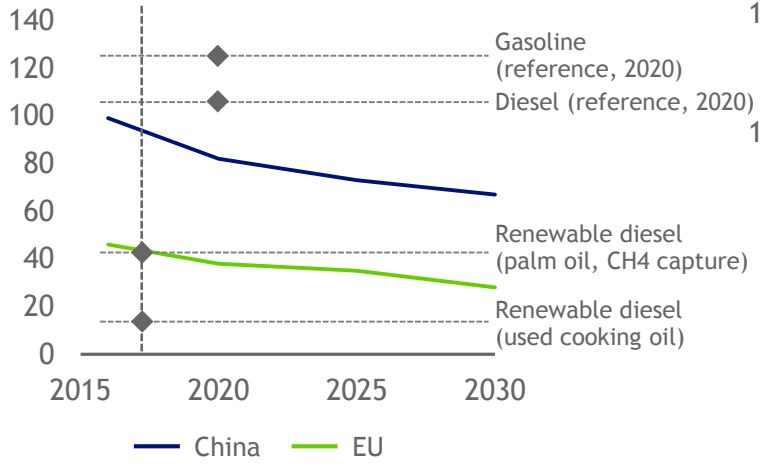
Life cycle approach on CO2 emissions

- Well-to-Wheel (WtW)
  - Takes account full life cycle of fuel / energy source
- Tank-to-Wheel (TtW)
  - Takes only account the emission from end use
- The end use CO2 emission of renewable diesel is zero, since the raw material of fuel has absorbed the same amount while growing.

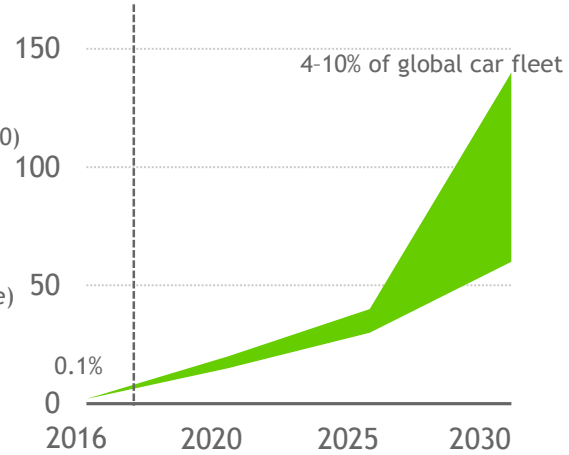


Electric vehicles will increasingly decarbonize the passenger car segment as renewable power surges

Well-to-wheel CO_2 emissions of electric vehicles with respective electricity mix in EU and China (gCO_2/km)



Projected development of global electric vehicle fleet (million cars)



NOTES: EV fleet data include plug-in hybrid and battery electric vehicles. WTW data assessed based on standard VW Golf size car, refer to 2020 powertrain performance. In case of EV, a 35 kWh short-range vehicles is used to calculate values.
SOURCE: Based on IEA data from the World Energy Outlook 2016 © OECD/IEA 2016. Licence: www.iea.org/t&c; as modified by Neste; Exxon Mobil (2016); BNEF (2016), JEC (2014), Roland Berger (2015)

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Liquid biofuels deliver cost-efficient CO_2 emission reductions in transport

Average cost to society (EUR) to reduce 1 ton of CO_2 emissions in passenger cars and heavy duty vehicles

Notes: Data shown here reflect the median of the cost range and refer to situation in 2030. Oil price range of 70-113 USD/bbl. Expected 2030 cost for alternative powertrains. Includes required investments into infrastructure. EU average projected power mix (IEA). **Source**: Neste, based on Roland Berger, *Integrated Fuels and Vehicles Roadmap to 2030*, 2016

Heavy duty vehicle

Passenger car

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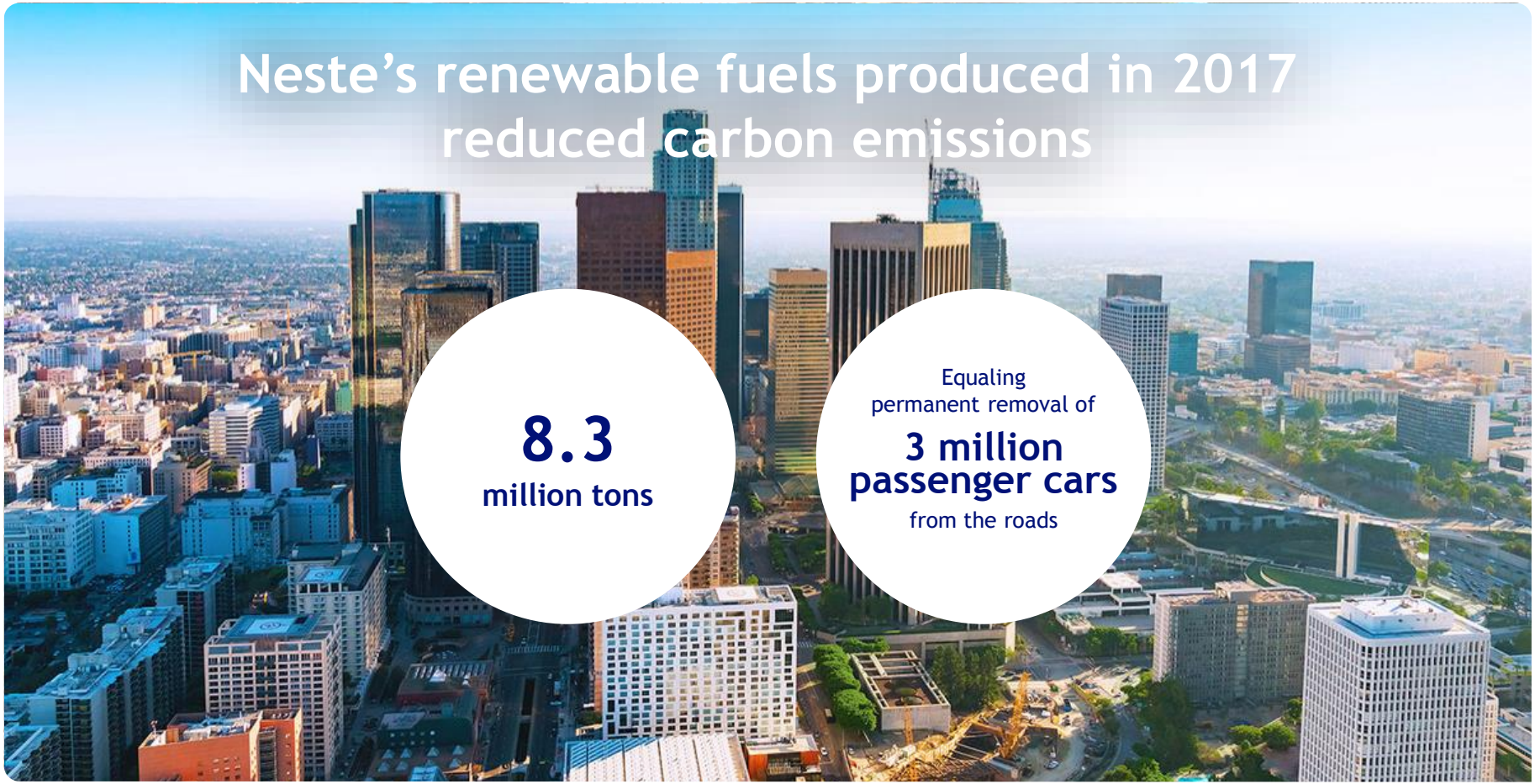
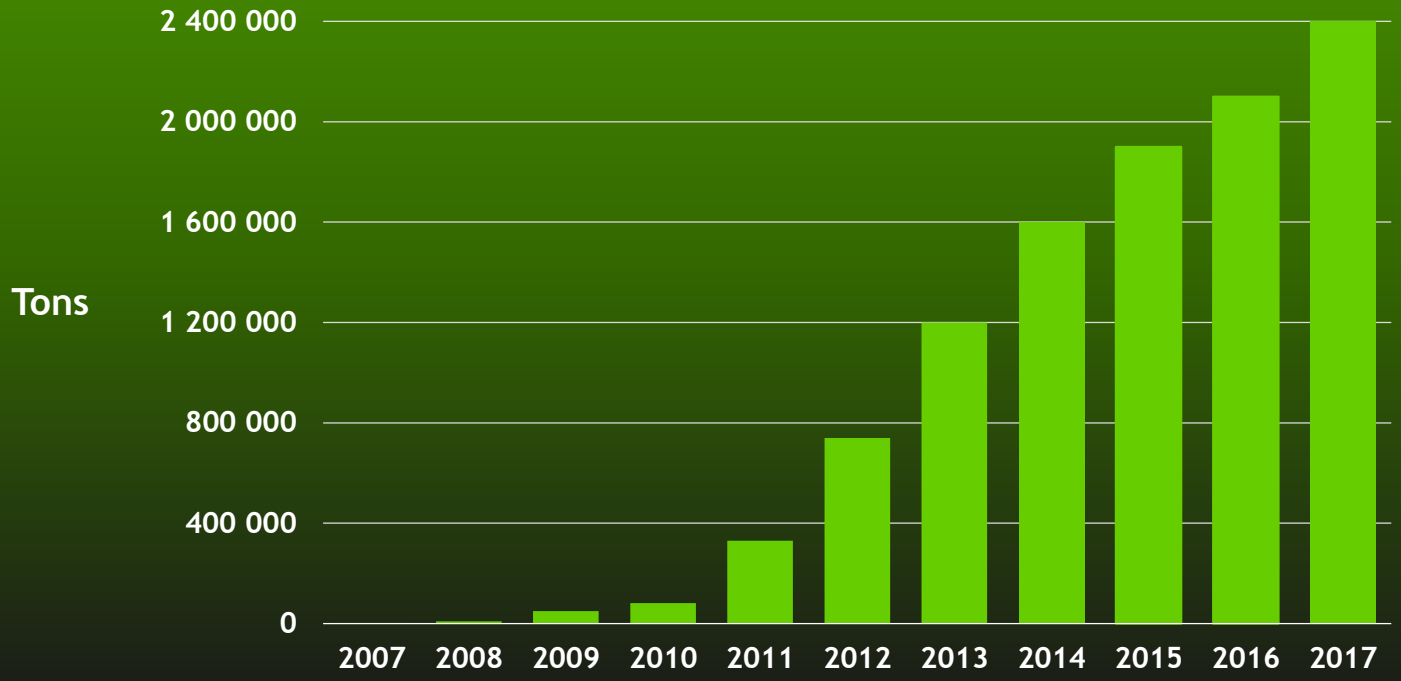
Two key rationales in our renewable fuel development

Neste's renewable fuels produced in 2017 reduced carbon emissions



Significant increase in waste and residue use



Flexibility - Building a global sustainable feedstock pool

75-80%
waste and residues

20-25%
vegetable oils

All our feedstock comply with EU RED and/or US EPA / CARB sustainability requirements

Expanding the feedstock portfolio further

Short term

Waste animal fats, waste oils, residue and side streams

Biological pathways

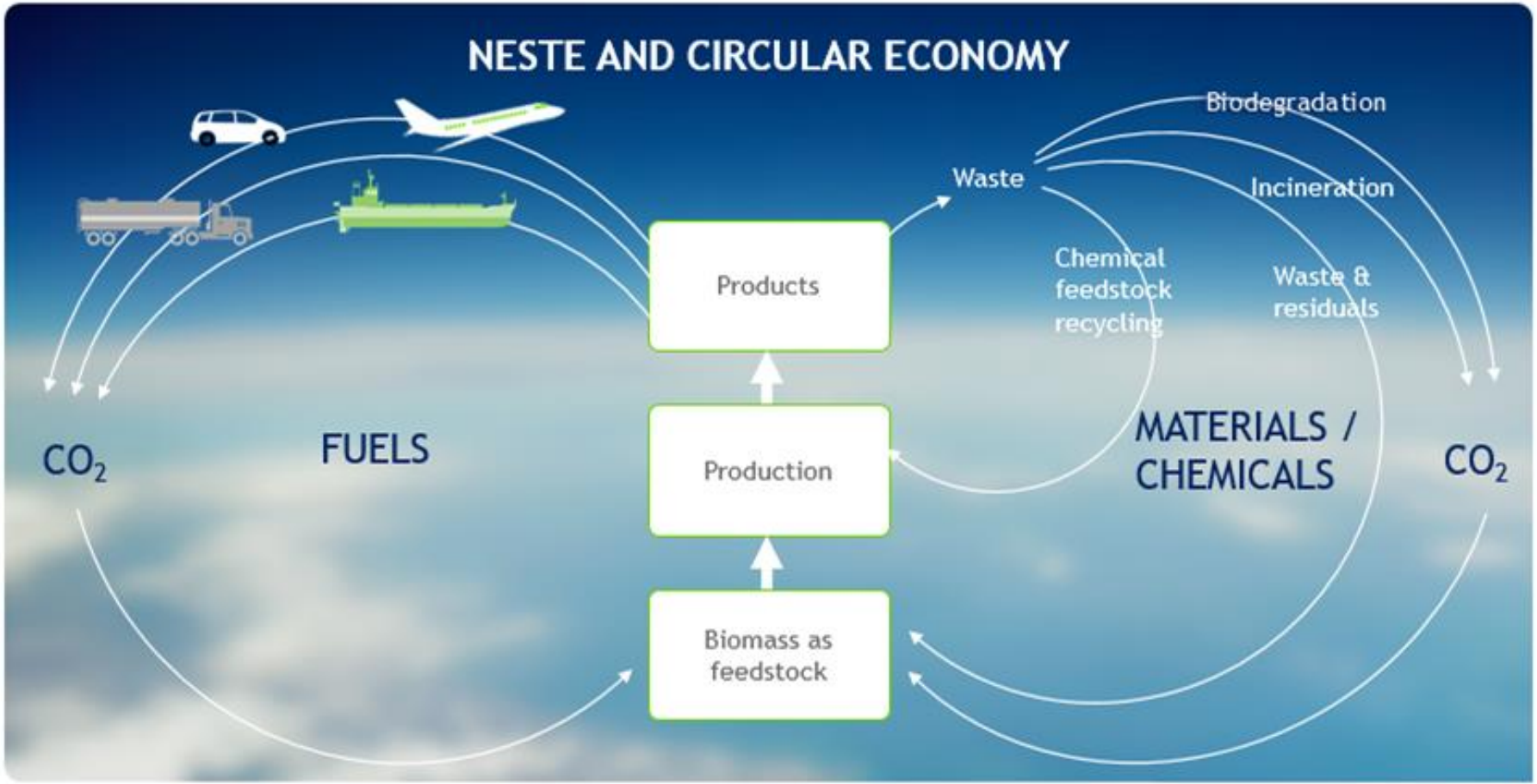
Long term

Thermo-catalytic pathways

Photo-synthesis

Fossil waste liquefaction


Neste’s ambition is to process
>1 Mt/a
waste plastic feedstock by 2030
Partly substituting crude oil as feedstock for a variety of products
Plastics
Chemicals
Jet fuel
Transport fuels
Marine fuels


NESTE AND CIRCULAR ECONOMY
Biodegradation
Waste
Incineration
Products
Chemical feedstock recycling
Waste & residuals
CO_2
FUELS
Production
MATERIALS / CHEMICALS
CO_2
Biomass as feedstock


OUR VISION
Creating responsible choices every day