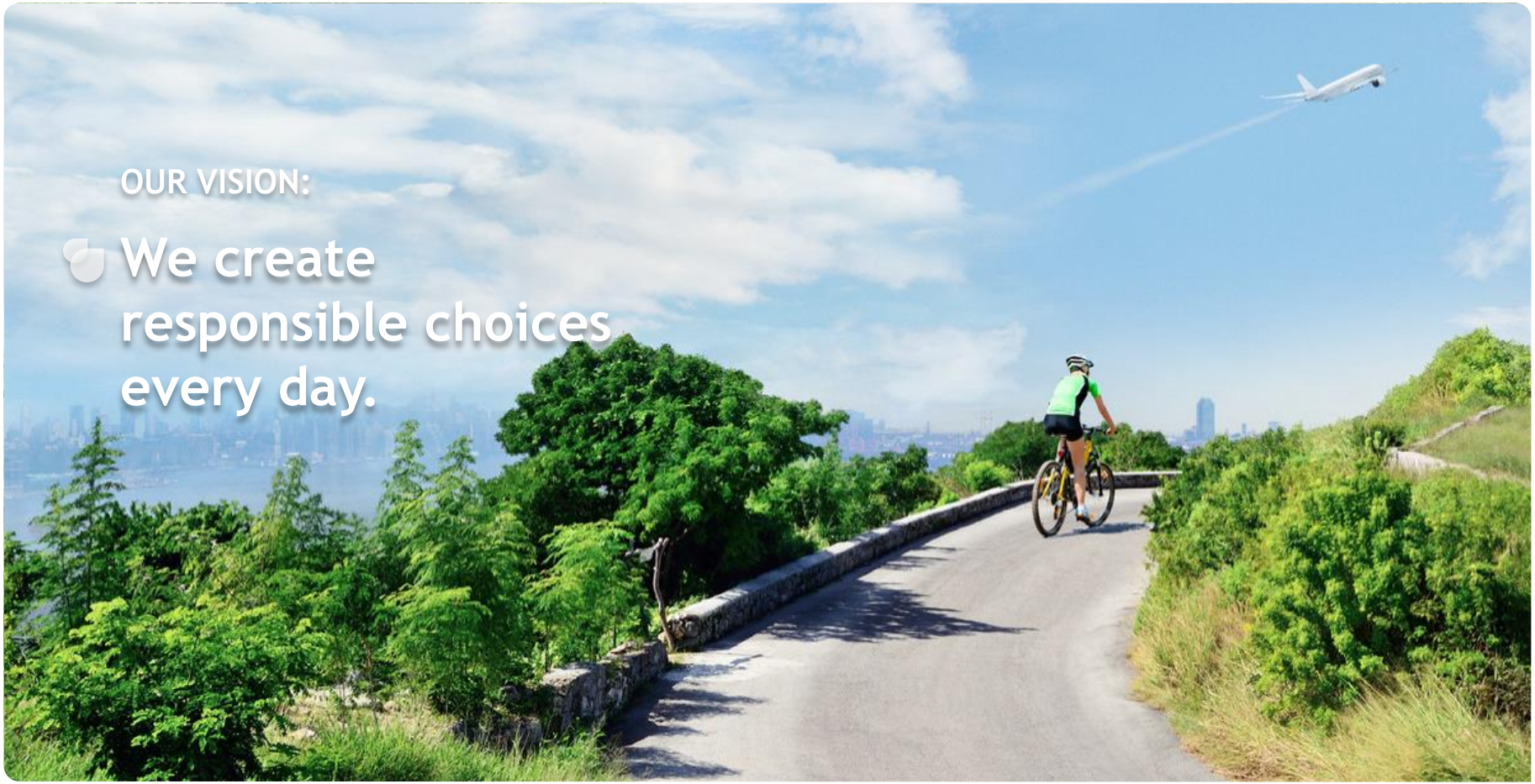
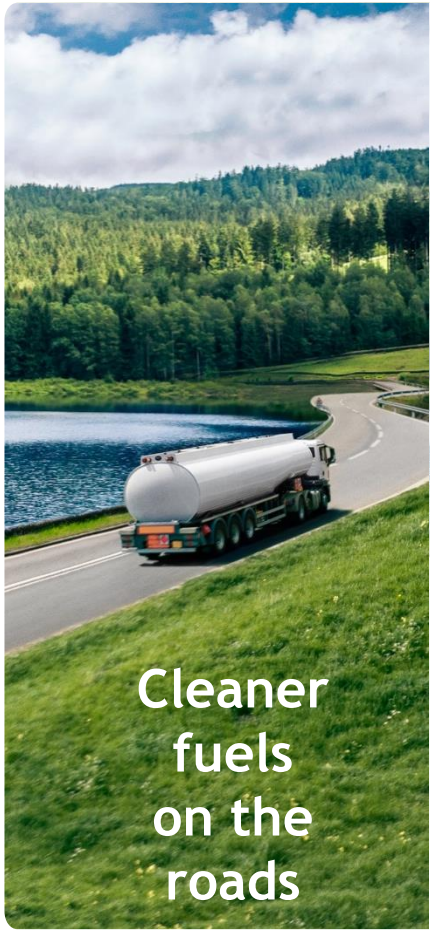
Neste

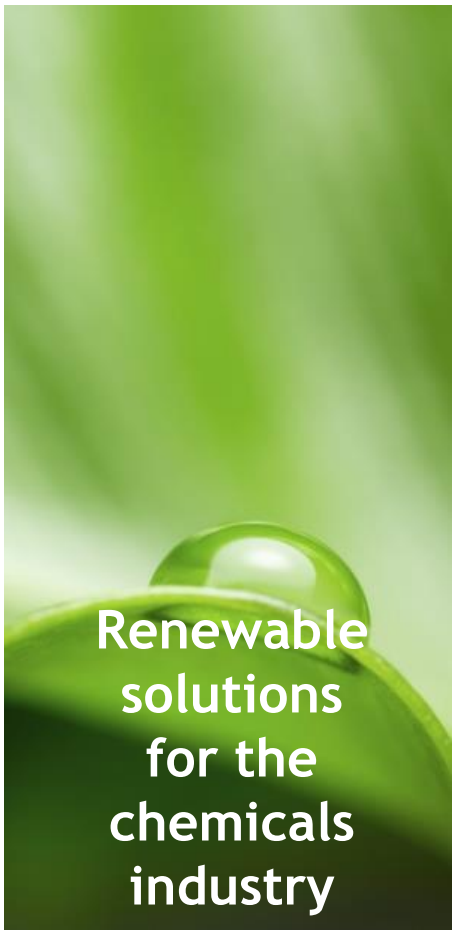
The Only Way is Forward

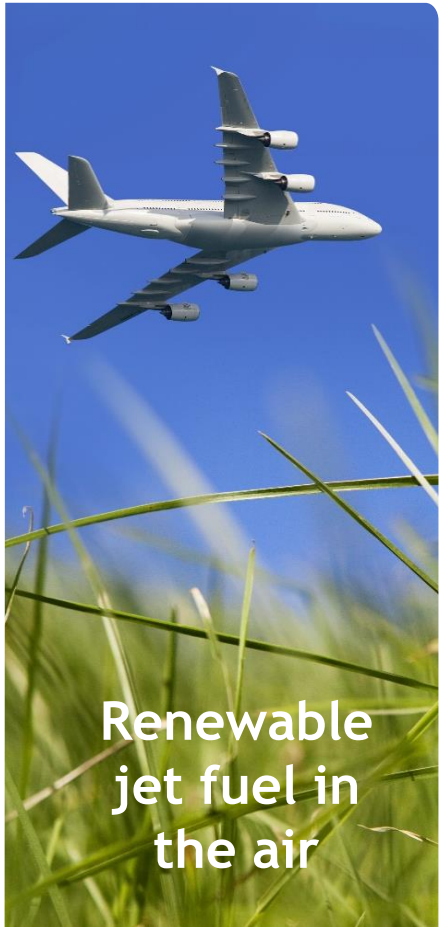
17.5.2019
Outi Teräs


OUR VISION:
We create responsible choices every day.


Cleaner
fuels
on the
roads

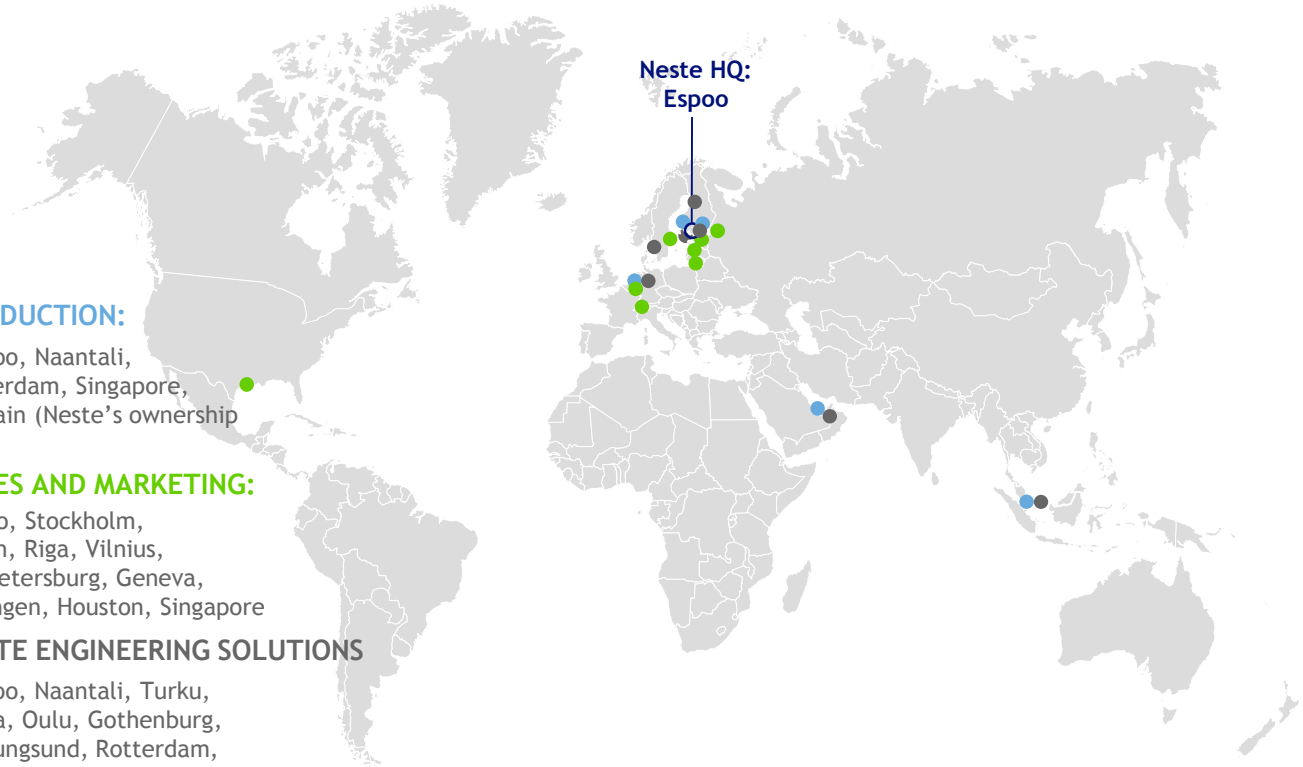

Low-sulfur
bunker
fuel
at seas


Renewable
solutions
for the
chemicals
industry


Renewable
jet fuel in
the air

NESTE

Global leader with a strong presence in the Baltic Sea area



PRODUCTION:

Porvoo, Naantali, Rotterdam, Singapore, Bahrain (Neste's ownership 45%)

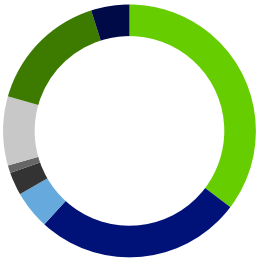
SALES AND MARKETING:

Espoo, Stockholm, Tallin, Riga, Vilnius, St. Petersburg, Geneva, Beringen, Houston, Singapore

NESTE ENGINEERING SOLUTIONS

Porvoo, Naantali, Turku, Kotka, Oulu, Gothenburg, Stenungsund, Rotterdam, Singapore, Abu Dhabi

Sales by product from in-house production, %



- Diesel 36%
- Motor gasoline and gasoline components 27%
- Jet fuel 5%
- Base oils 3%
- Heating oil 1%
- Heavy fuel oils 9%
- Renewable fuels 14%
- Other products 5%

Neste in numbers

Revenue
€ 13.2 billion

Comparable operating profit
€ 1.1 billion

Largest owner the Finnish State (**49.74%**)

~ 5,000
employees in 15 countries

World's
#1
producer of renewable diesel

The 2nd most sustainable company in the world

In 2018, Neste was ranked

#2

on the Global 100 list for Most Sustainable Corporations in the World

NESTE


Creating our own path with R&D and technology
44 M€
invested annually into R&D, 70% into sustainable raw material research
Over
1,000
dedicated experts working every day to find responsible choices

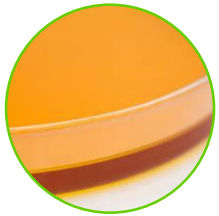
Neste has proven ability to process demanding feedstocks

Animal fat from food industry waste

Fish fat from fish processing waste

Vegetable oil processing waste and residues
(e.g. PFAD, PES, SBEO)

Used cooking oil



Technical corn oil

Crude palm oil

Rapeseed oil

Soybean oil

Camelina oil

Jatropha oil

Committed to growth through sustainable solutions

Neste's ambition is to process by 2030

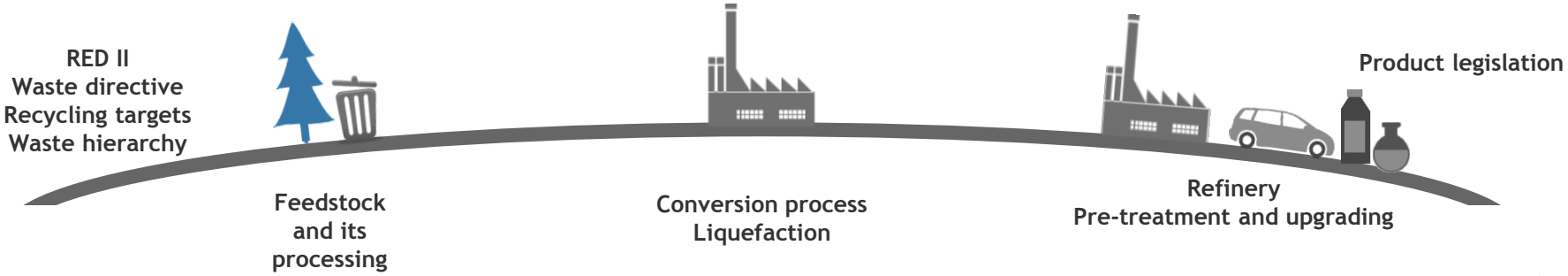
>3 Mt/a

low carbon feedstocks in its fossil refineries

NESTE

Neste aims to find renewable and fossil-based low carbon refinery feedstocks

- Neste has started a project to study new low carbon feedstocks also for the traditional fossil refinery units
- Target is to replace crude oil as feedstock with low carbon sources, such as fossil waste and wood based liquid streams
- Neste's core is in the processing of the liquid stream (purification and upgrading). Partners are sought for the upstream: liquefaction and waste collection



SRF derived liquids have challenging properties, which need to be addressed prior to or during refining operations

- Liquefied plastic (PE, PP, PS) hydrocarbons can be used to replace crude oil as refinery feedstock
  - However, PET and PVC decomposition products are challenging
- Biomass based components have a different chemical composition and therefore different needs in processing
  - Oxygen content a specific challenge
- Detrimental impurities carried by both plastic and bio components
  - Material related issues, such as corrosion due to organic acids and halogens (Cl, Br)
  - Formation of problematic side products (HCl, H_2O, CO, CO_2)
  - Fouling and deposit issues due to highly reactive components
  - Increased catalyst deactivation due to metals and other contaminants
  - Undesired properties in products, e.g. presence of unconverted oxygenates and inorganic components

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SRF is an interesting, yet challenging feedstock for an oil refinery

- SRF availability, current low value and biocontent make it an interesting long term research topic
  - Biomass component could contribute toward production of renewable fuels
- Liquefied SRF samples are of really varying quality
  - Impact of technology choice not fully understood
  - Difficult to say anything definitive at this stage on feedstock feasibility
- More research is needed to determine, if traffic fuels can be produced out of SRF


NESTE
The only way is forward