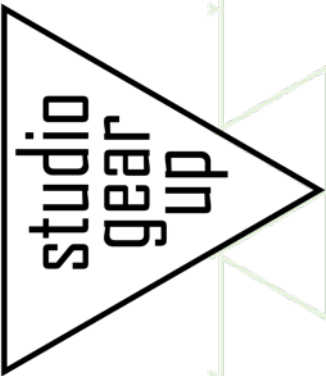


The inevitable role of renewable fuels

to mitigate the climate impact of transport



Platform
Duurzame
Biobrandstoffen

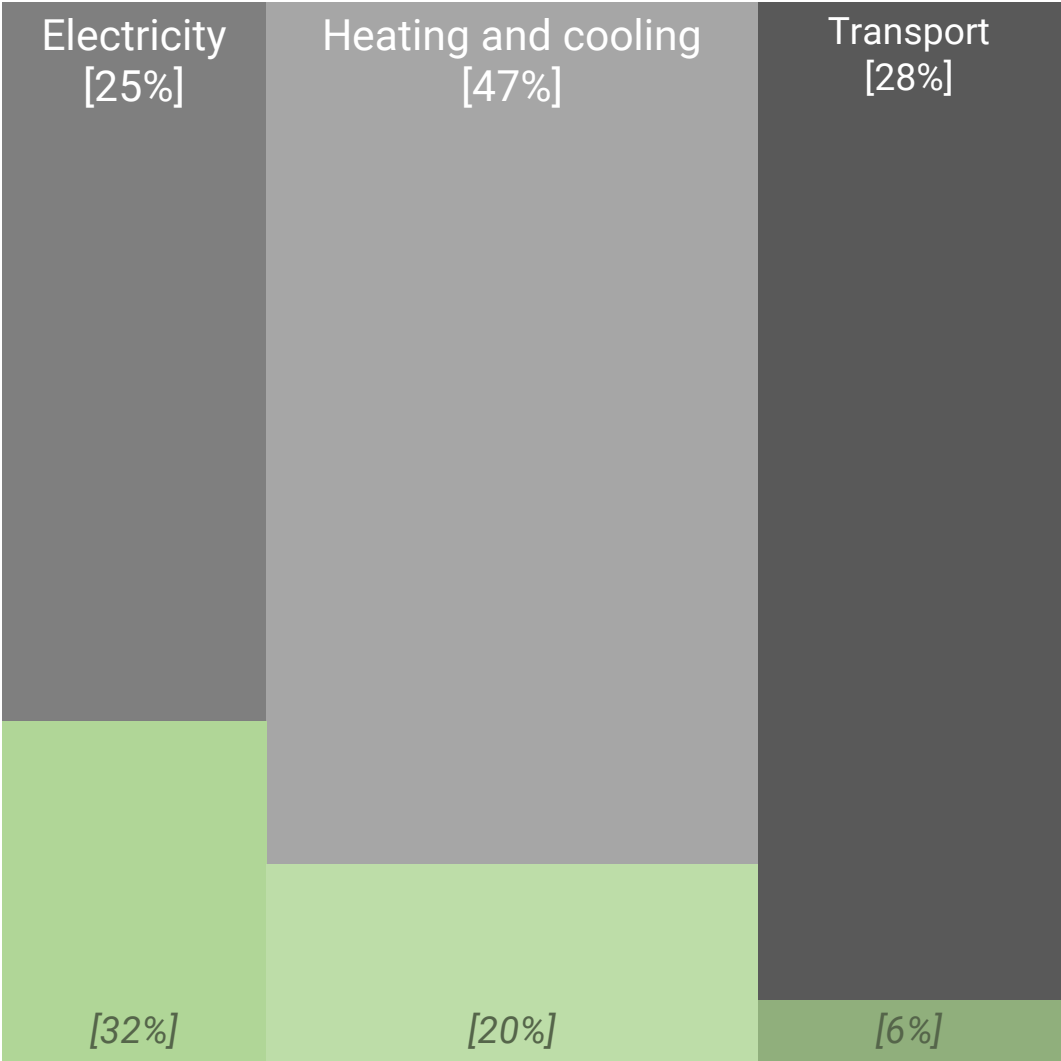
Eric van den Heuvel

studio Gear Up | Platform Sustainable Biofuels

Energy Days TU/e – 5 November 2020

28% of all energy consumed in EU28 is in transport, and transport is most dominated by fossil energy use

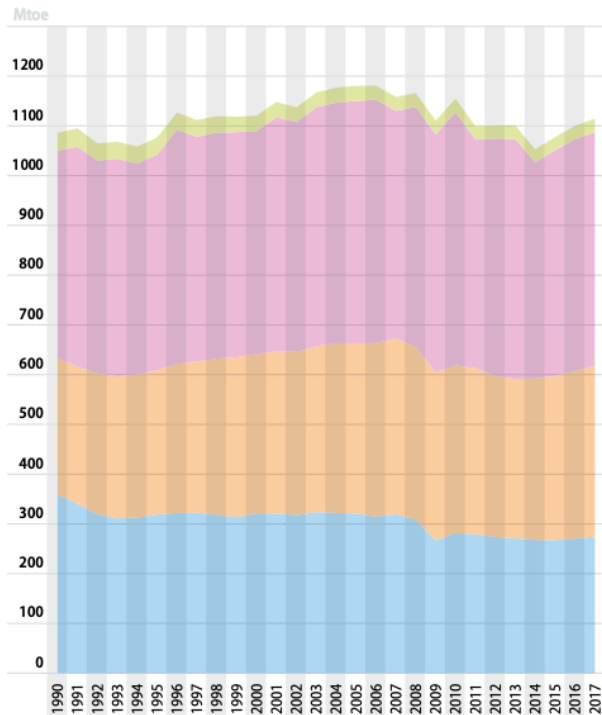
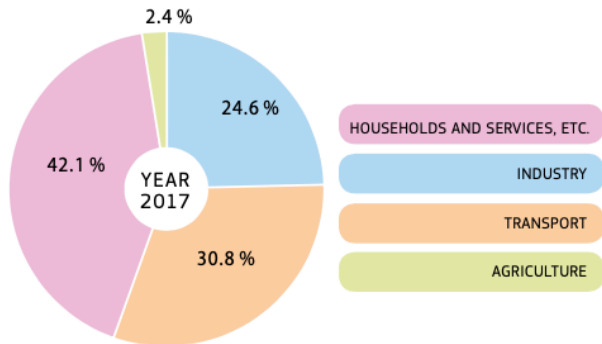
Year: 2018
Total energy consumption:
1117 Mtoe (eq. 46,8 EJ)



Source: Eurostat, SHARES database. Numbers for year 2018. 6% in transport is physical share, reported share is 8% (incl. double counting)

Transport in EU

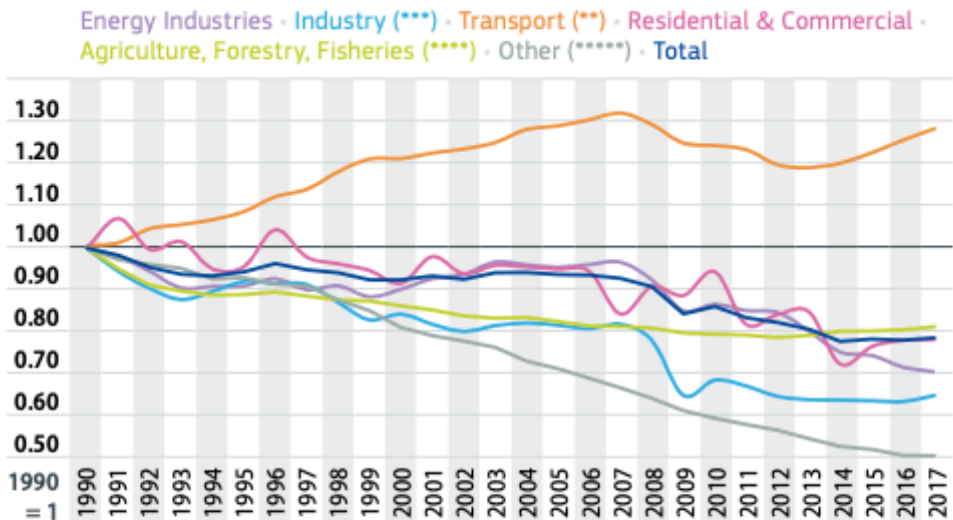
Energy consumption^{*)} (share and Mtoe):



Note: Transport excluding international aviation and maritime.

Source: EC, 2019, Pocketbook Transport in figures

GHG emissions development:



Notes: (*) Excluding LULUCF (Land Use, Land–Use Change and Forestry) emissions and international maritime, including international aviation and indirect CO₂.
 (**) Excluding international maritime (international traffic departing from the EU), including international aviation.
 (***) Emissions from Manufacturing and Construction, Industrial Processes and Product Use.
 (****) Emissions from Fuel Combustion and other Emissions from Agriculture.
 (*****) Emissions from Fuel Combustion in Other (Not elsewhere specified), Fugitive Emissions from Fuels, Waste, Indirect CO₂ and Other.

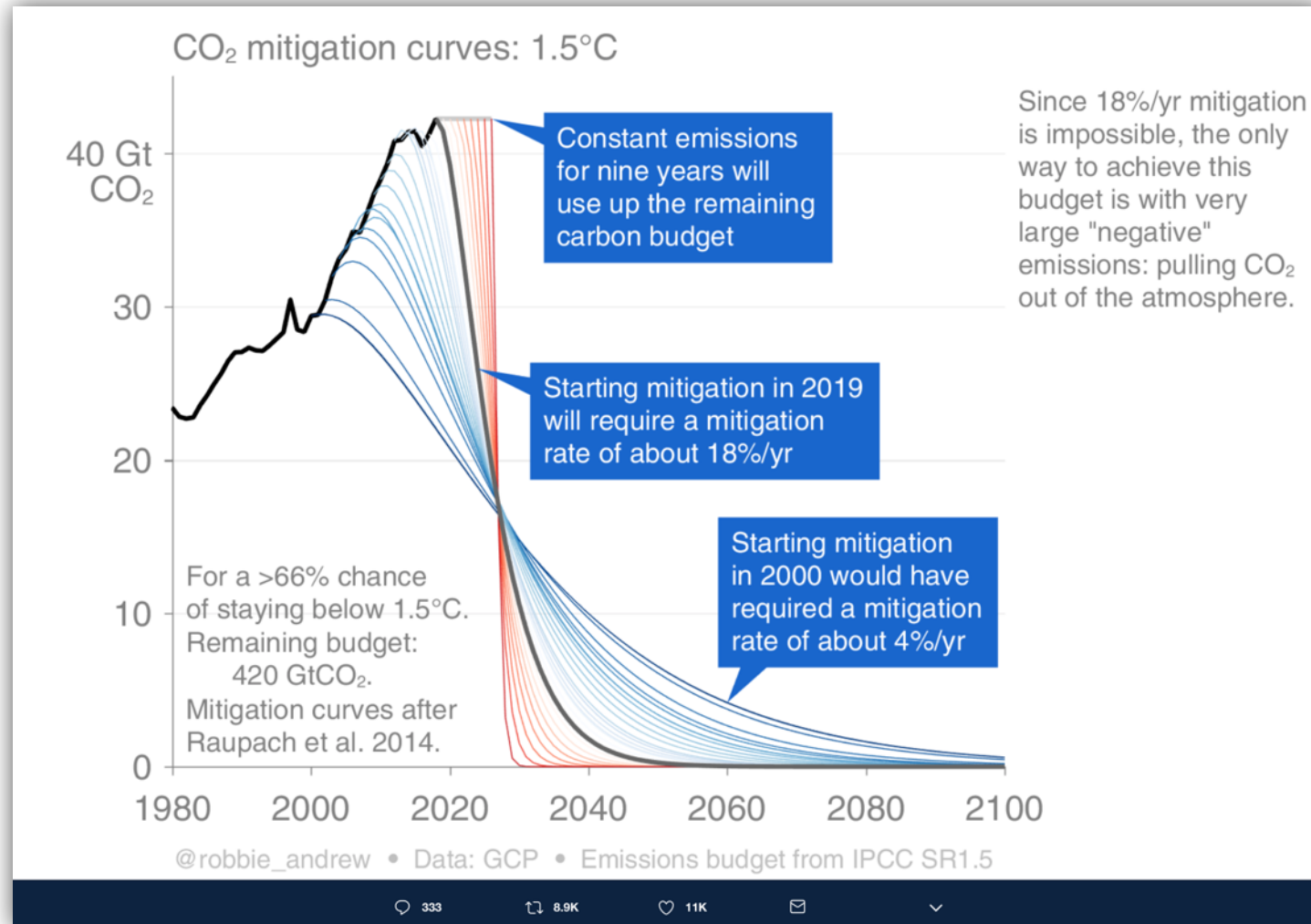
^{*)} please note that this is excluding the international bunkering fuels

The 'remaining carbon budget' concept

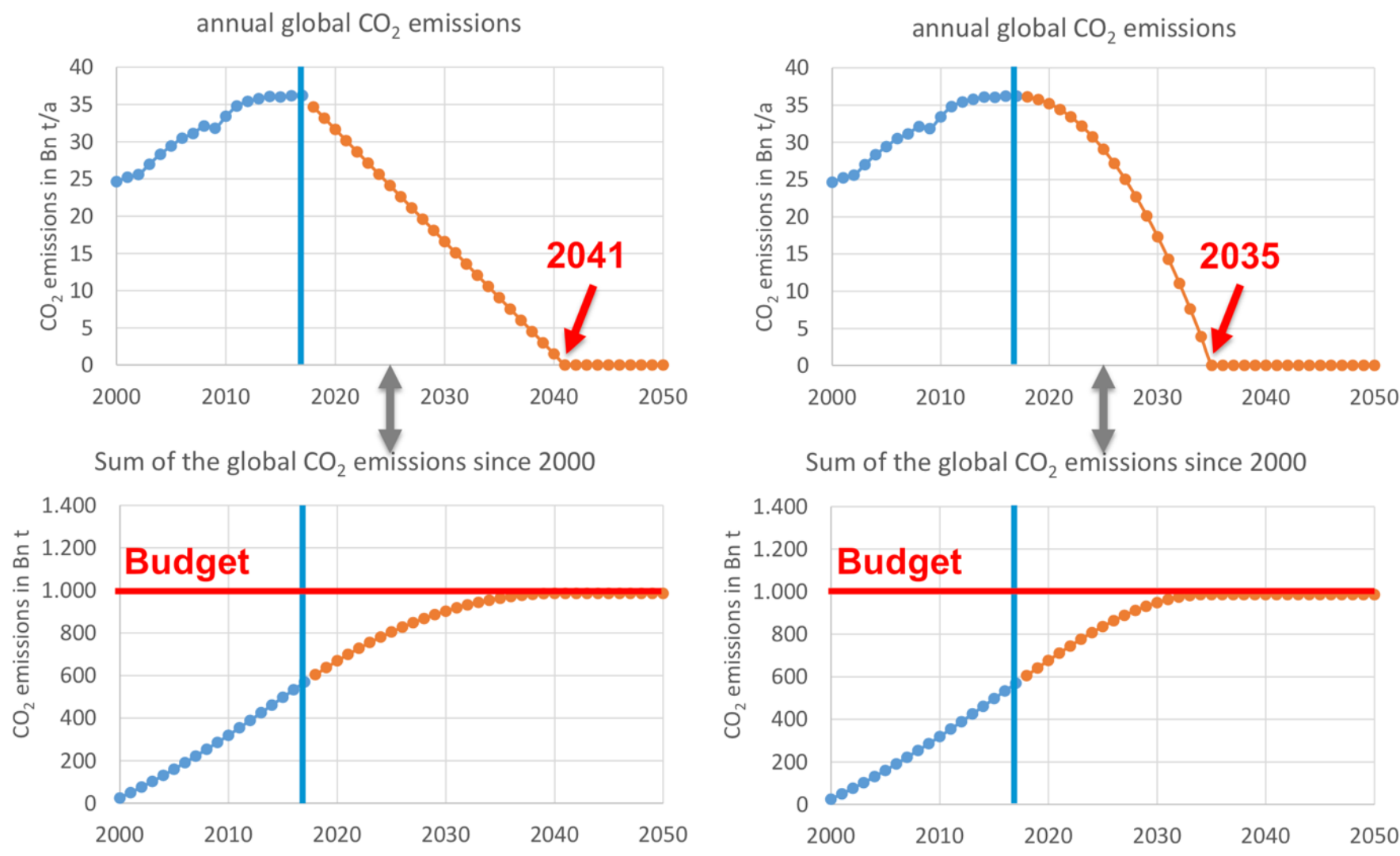
Concept is relevant to understand the need for urgent action in lowering the climate impact:

How much carbon can still be emitted to the atmosphere to stay below 1.5°C?

Carbon budget: the later we start reduction, the sooner we need to reach net zero emission



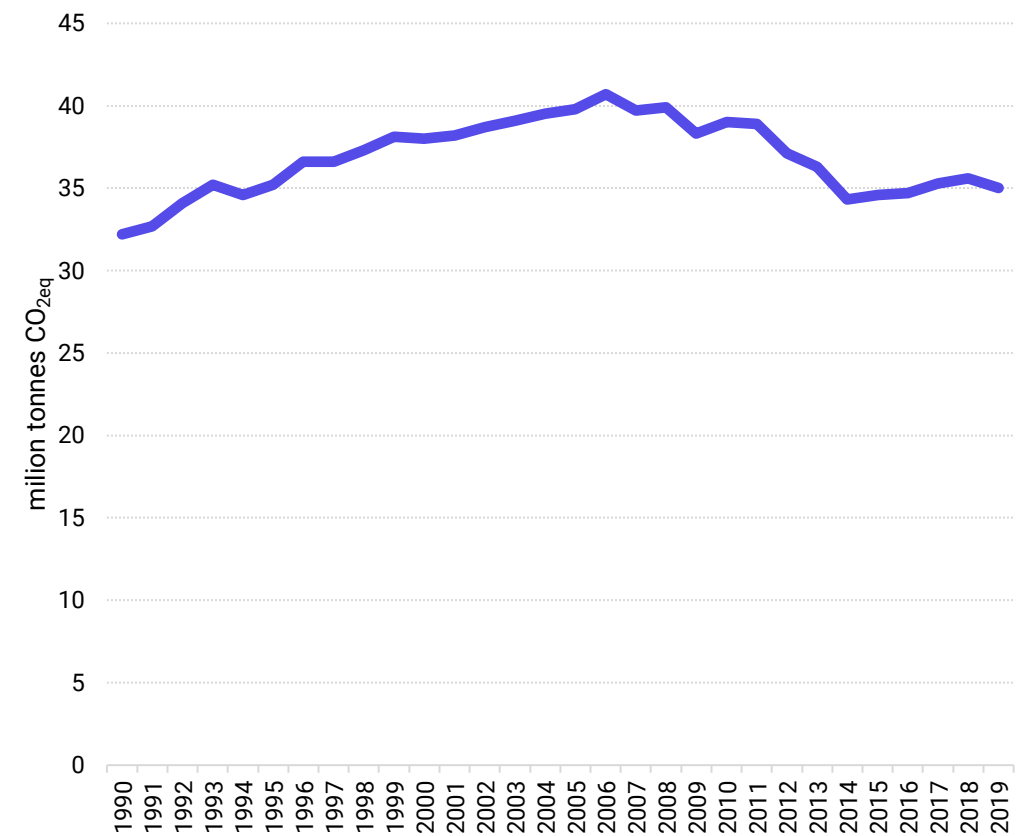
To illustrate the urgency: Netherlands and EU are aiming at climate neutrality by 2050..., but at least EU has indicated higher targets for 2030: -55%/-60%



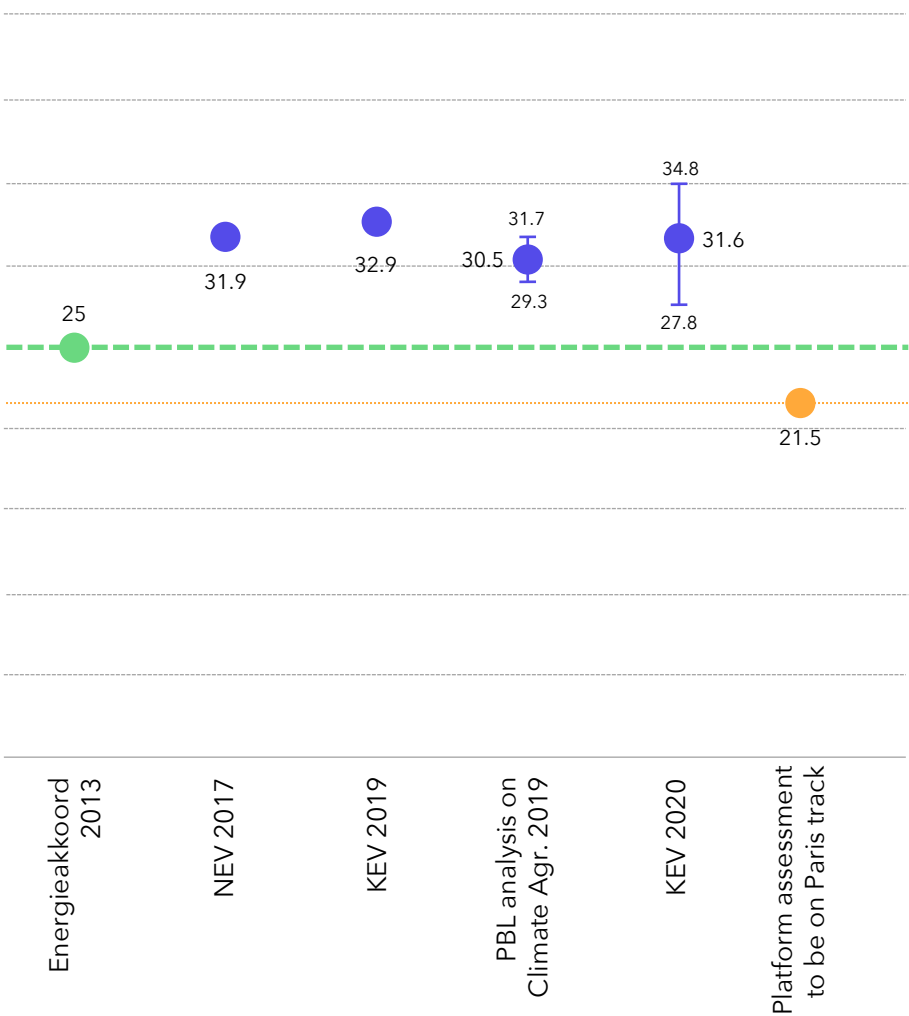
Source: Willner, 2018, HAW Hamburg, fuels of the Future conference 2018

CO₂-emissions in Netherlands mobility sector don't go down quickly enough

Development GHG-emission in mobility NL:

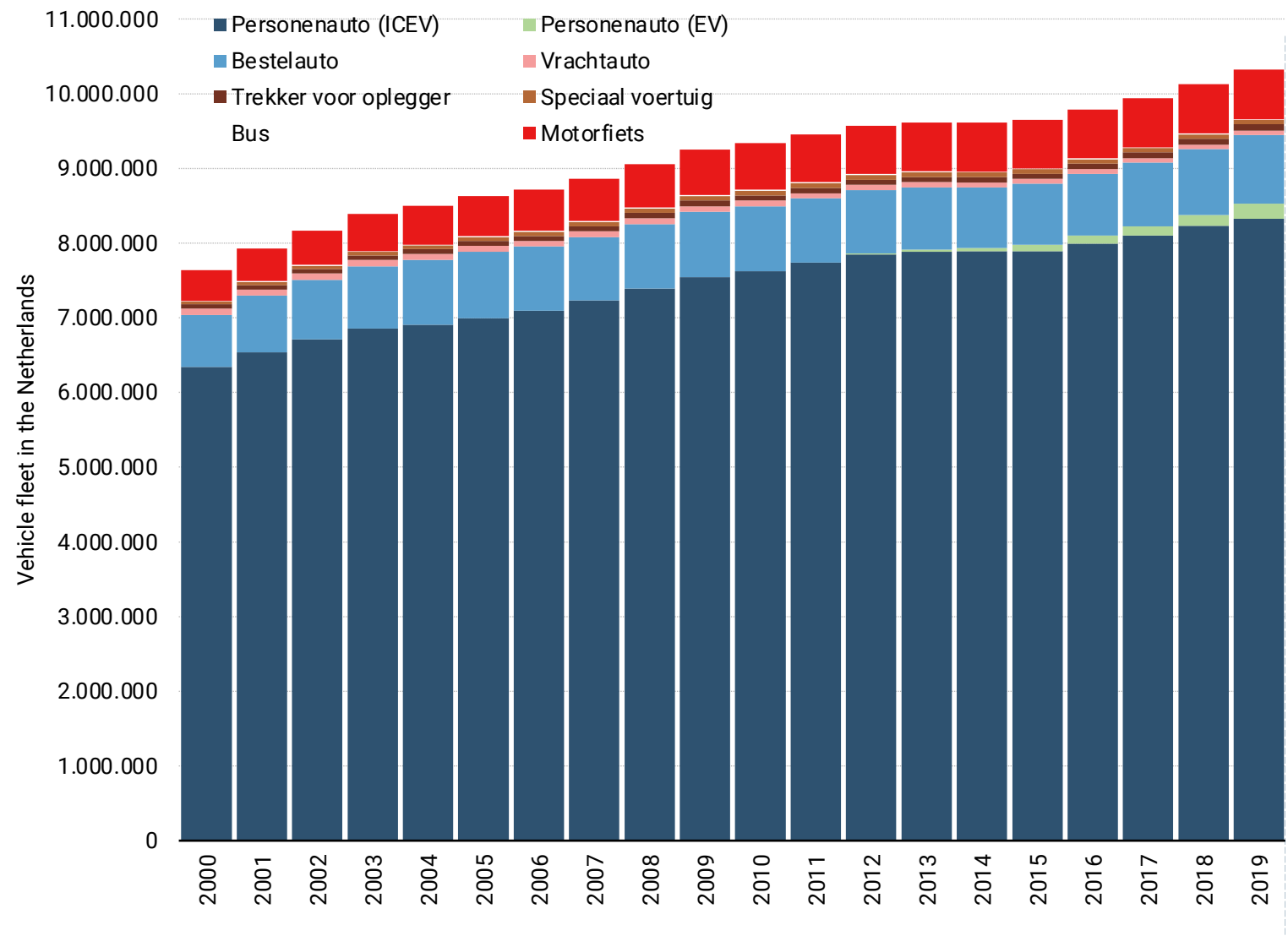


2030-targets and projections:



Source: CBS, SER, 2013, Energieakkoord voor duurzame groei; PBL, NEV2017, PBL, KEV2019; PBL, 2019, het Klimaatakkoord, effecten en aandachtspunten, PBL, KEV2020

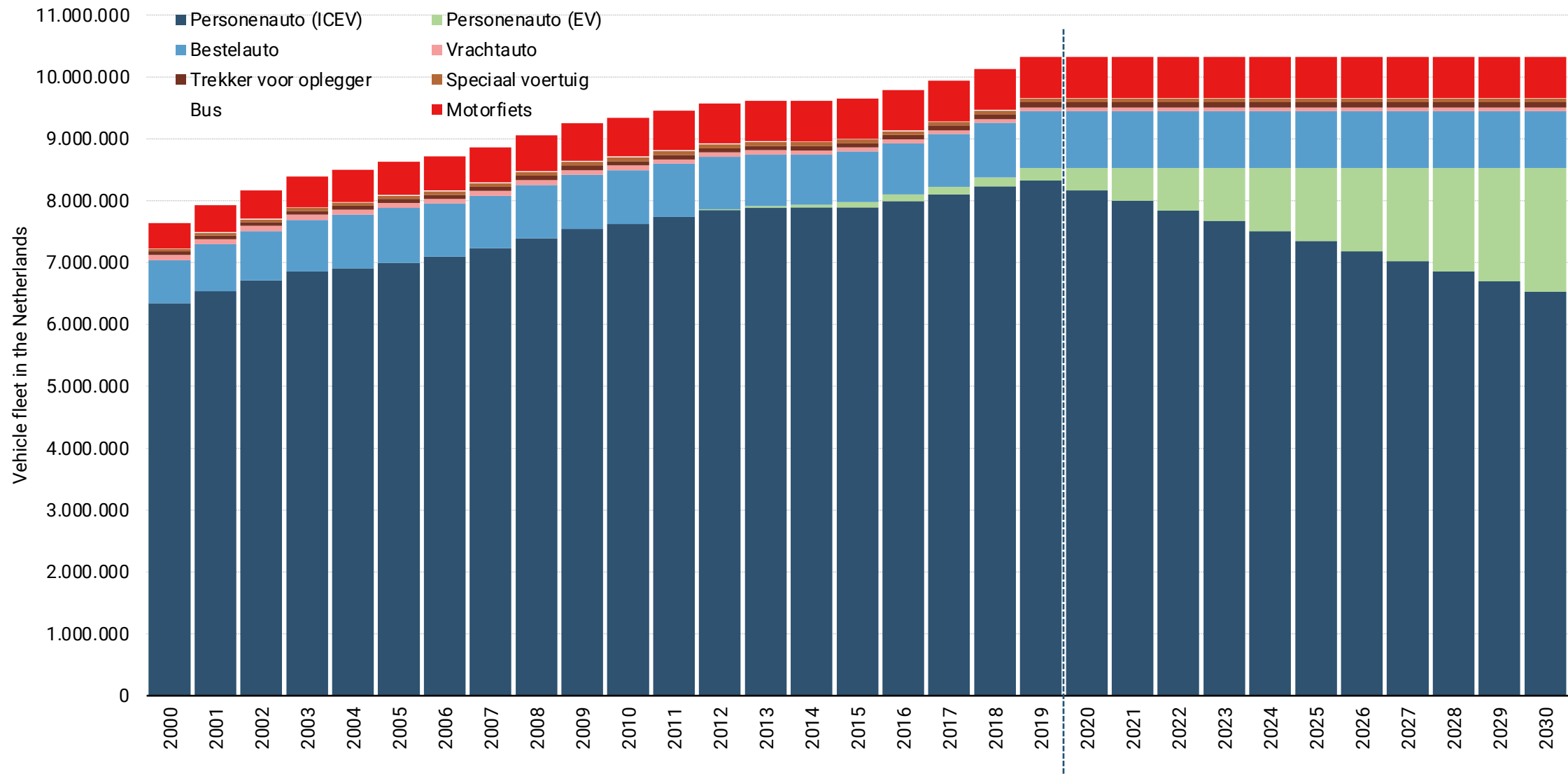
And also the necessary and planned inflow of battery and fuel cell electric vehicles takes time...



Source: CBS



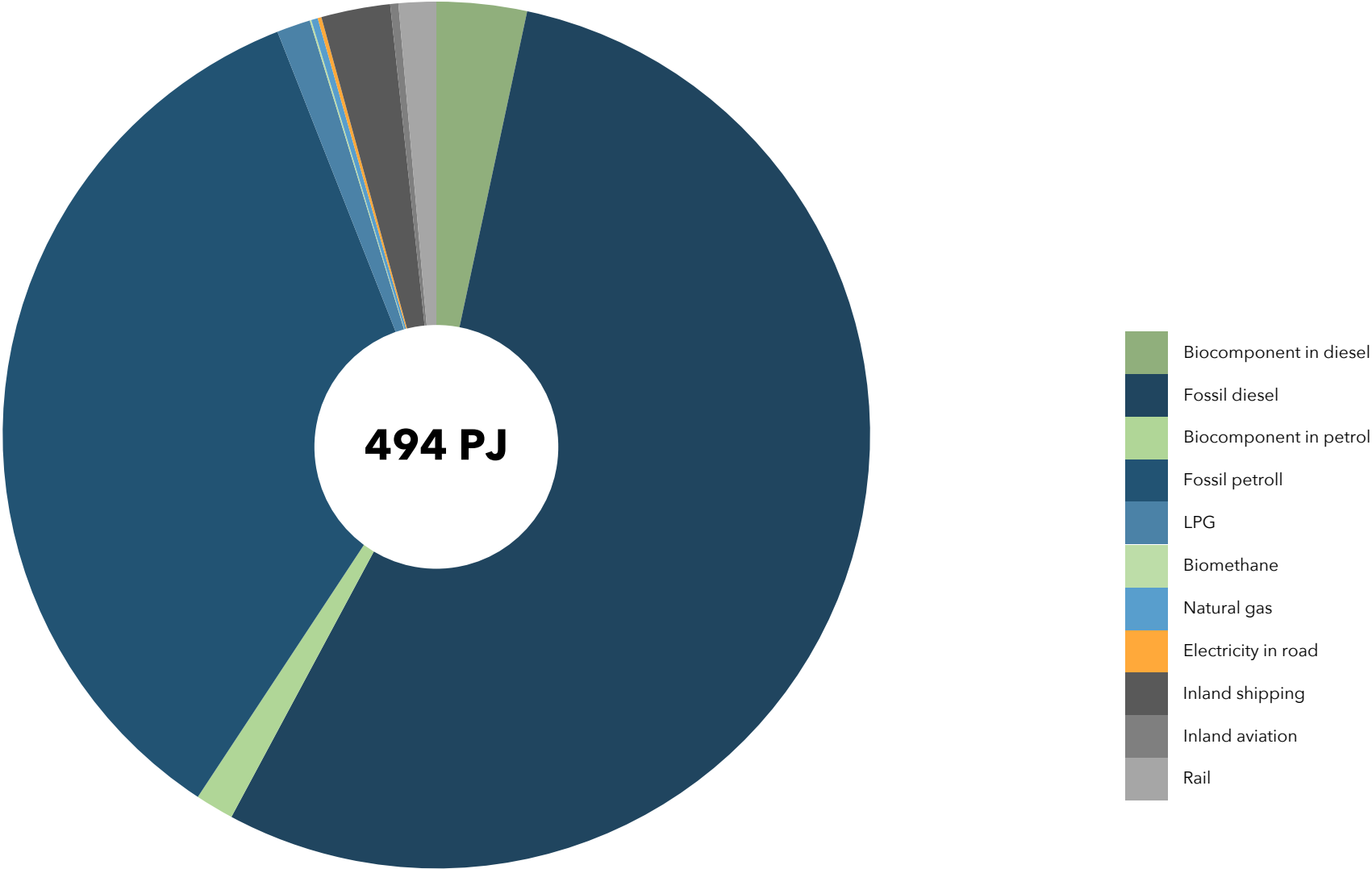
... even with 2 million BEV's by 2030 the majority of vehicles depend on liquid and gaseous fuels: renewable fuels much needed!



Source: CBS



How does that work out for the energy consumption in transport on Dutch territory^{*)}? (2018 data)



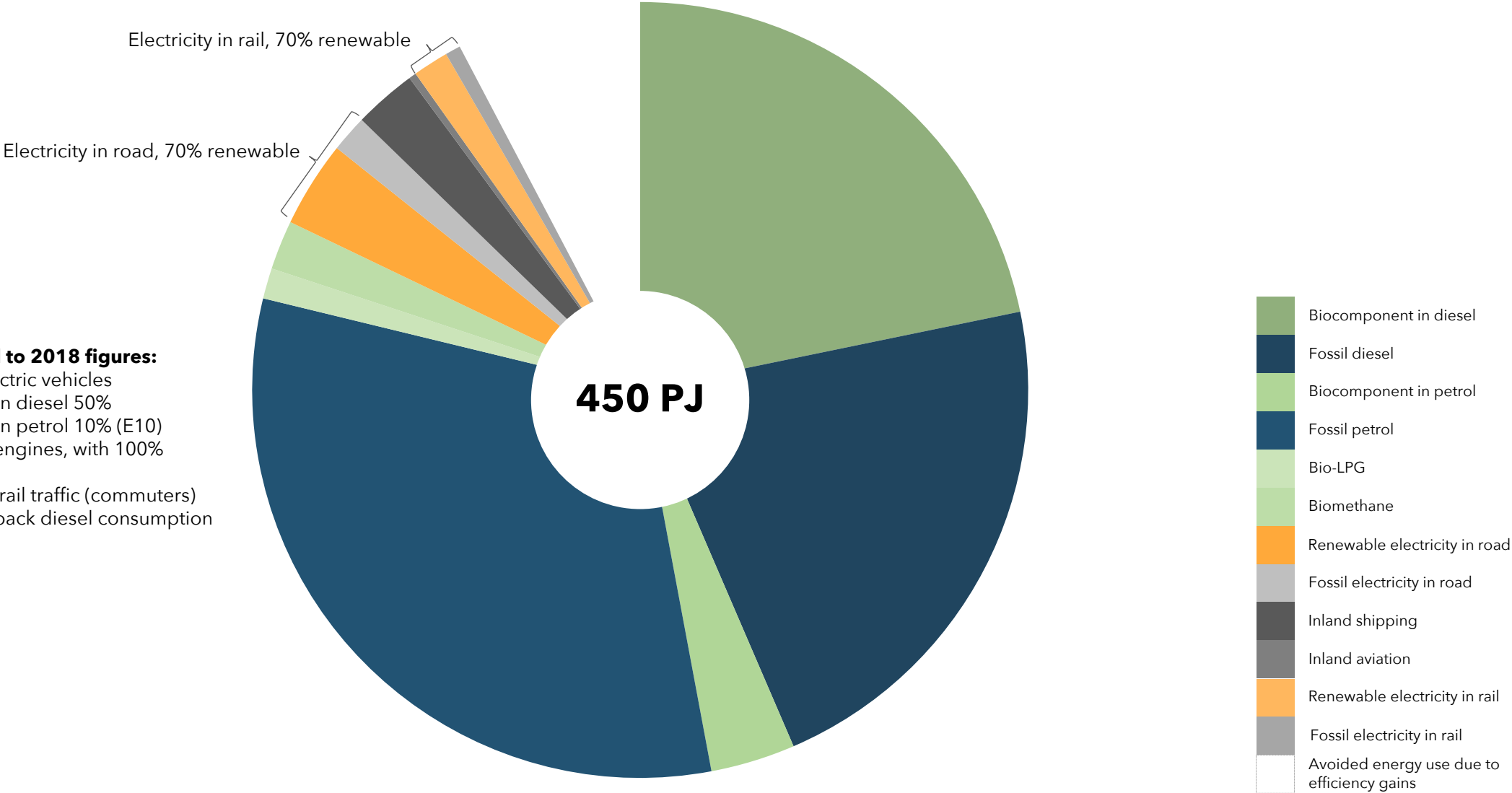
^{*)} please note that this is excluding the international bunkering fuels

Source: CBS, Netherlands Emission Authority

If all 494 PJ were liquid fuels, how much storage would it require?



How to get below 25 million ton CO₂-emissions in transport on Dutch territory in 2030? – a possible scenario



Assumptions , compared to 2018 figures:

- 25 PJ voor 2 million electric vehicles
- Share renewable fuels in diesel 50%
- Share renewable fuels in petrol 10% (E10)
- Increased used of gas engines, with 100% greengas (10 PJ)
- Modal shift: 50% more rail traffic (commuters)
- EV and methane push back diesel consumption

How much fossil would be replaced in 2030 in that scenario?



And international bunkering still out of scope...

Situation in 2018:

Fuel consumption at national territory:



494 PJ

Fuel bunkered fo international shipping:



498 PJ

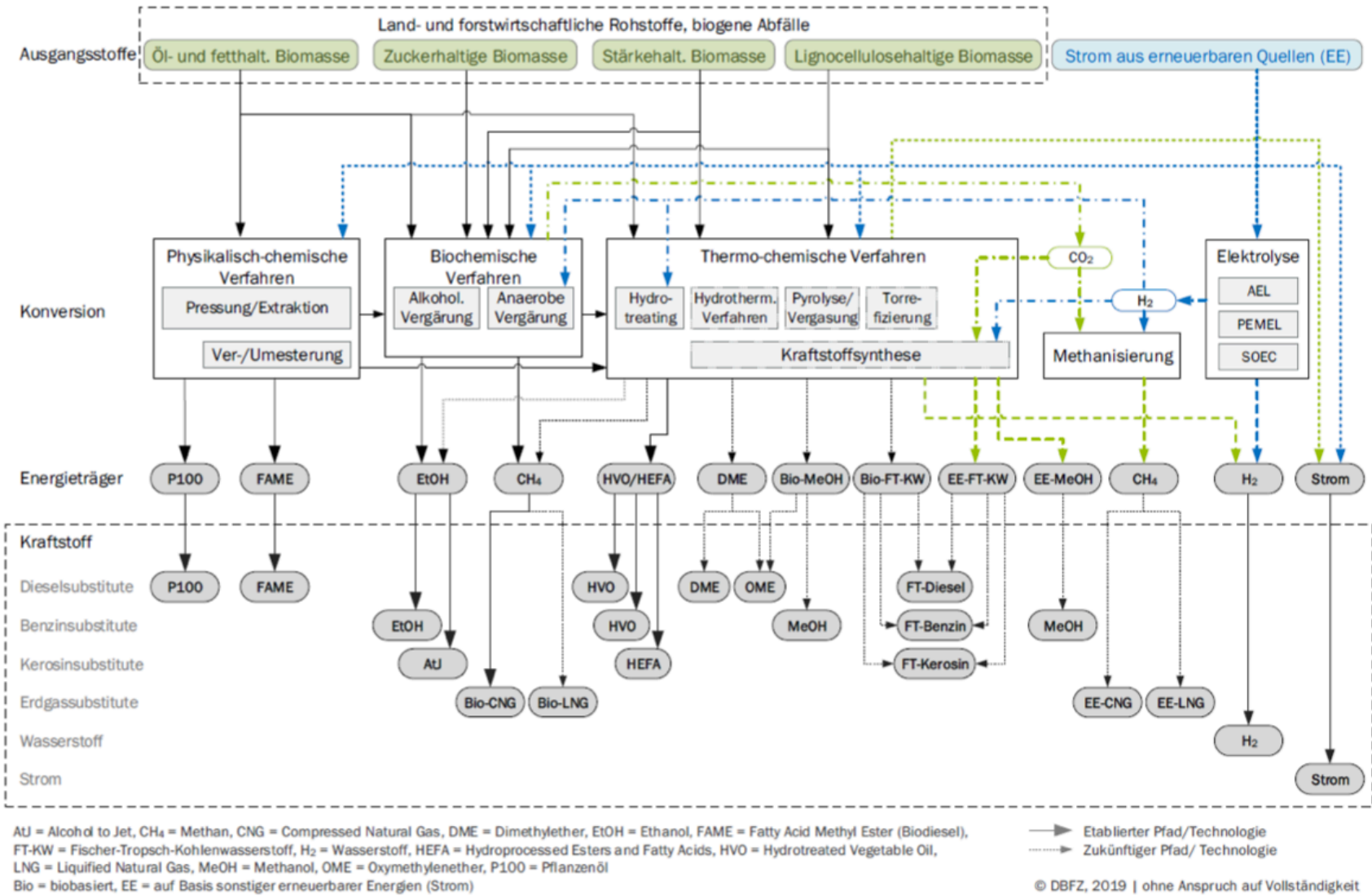
Fuel bunkered for international aviation:



163 PJ

**So, if renewable fuels are necessary,
how to make them?**

Many biobased and Power-to-X pathways exist available



Source: DBFZ, 2019, Monitoring Biokraftstoffsektor 4. Auflage

European regulation is in place to enable deployment of renewable fuels, in co-existence to electric mobility

- Policy has set the market to use waste-based biofuels
- Regulation is enabling the use of renewable power-to-x fuels
- The remaining carbon budget leaves no choice than to exit fossil fuels as soon as possible:
 - Reducing the use of energy essential:
 - Higher efficiencies, design lighter vehicles, logistical optimisations, new design challenges for transport of goods etc.
 - Accelerate the share of EV's
 - Renew the fuels

Innovation and development of renewable fuels should focus on, a.o.:

- Enlarging the sustainable feedstock base, in the context of the transition to a biobased and circular society
- Develop 'drop in' fuels to overcome existing blend wall barriers
- Develop dedicated engines that operate in clean modus on renewable fuels
- Educate of a new pool of future experts highly needed

Wrap up

- Future mobility must be based on renewable energy
- Take a technology agnostic approach: innovate
 - drivetrains for electric mobility and
 - develop new renewable fuels/engine-systems
- The remaining carbon budget leaves no choice:
 - We need to act now to bring down climate impact
 - Start in road transport, and over time shift renewable fuels to maritime and shipping
- Train young experts in both fields

More information:

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