



# NEOT

North European Oil Trade

Etanolix Göteborg -  
Why do we need advanced  
biofuels

Timo Huhtisaari

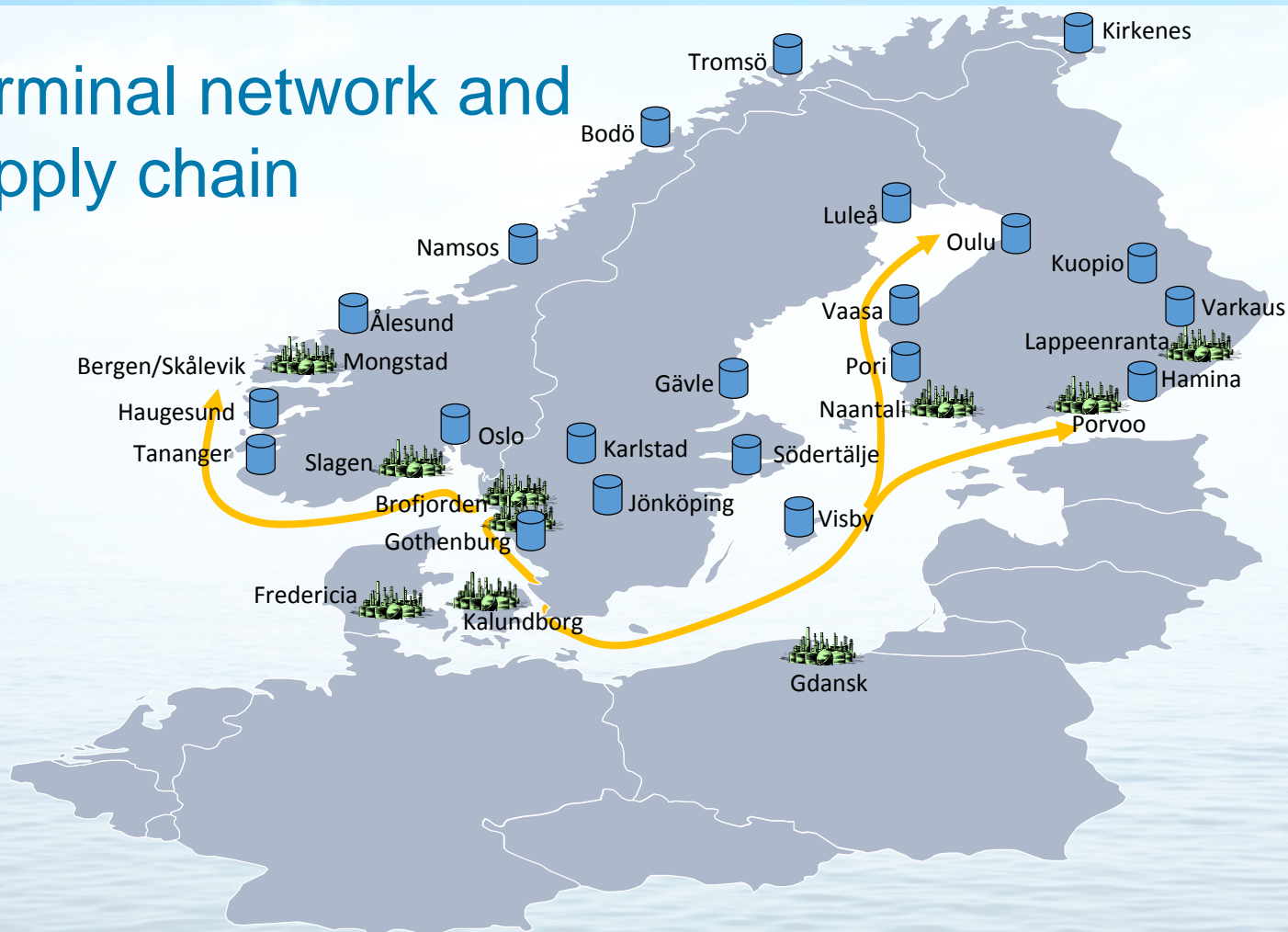


# North European Oil Trade Oy

- NEOT was established in January 2003 and operations started on the 1<sup>st</sup> of February 2004.
- NEOT is registered in Finland and is owned by two Finnish companies SOK and St1 Nordic Oy. SOK owns 50,8% of the company and St1 Nordic Oy 49,2%.
- NEOT is a significant independent fuel procurement company in the Baltic Sea region and actively operates on the global trading markets
- We offer high-quality sea transportation, road transportation and terminal services for third parties
- NEOT supply annually (2016 → ) approx. 8 billion liters of oil products
- Our market share of Finnish traffic fuel supply is approx. 43%



# Terminal network and supply chain





# Etanolix® - Integration to oil refinery



## Production capacity

- Ethanol (as per 100% ETOH) 5.000 m<sup>3</sup>/a

## Feedstock

- Industrial bakery waste / industrial process residue
- Packed and unpacked out dated waste bread from shops and markets
- Approx 20.000 tn/a feedstock is required (bread)

## Products

- Anhydrous fuel grade ethanol
- Liquid animal feed for pig farms / feed for biogas plant (AD)

## Etanolix 2.0 LIFE+ project

Etanolix® concept further development & demonstration:

- New raw material handling.
- unique way of integrating the ethanol plant in a conventional refinery:
  - direct ethanol blending to vehicle fuels and in an effective way distribution to the consumers
  - utilize excess energy, cooling systems and wastewater treatment plant
- Refinery personnel's expertise and experience for safe and optimal operation.

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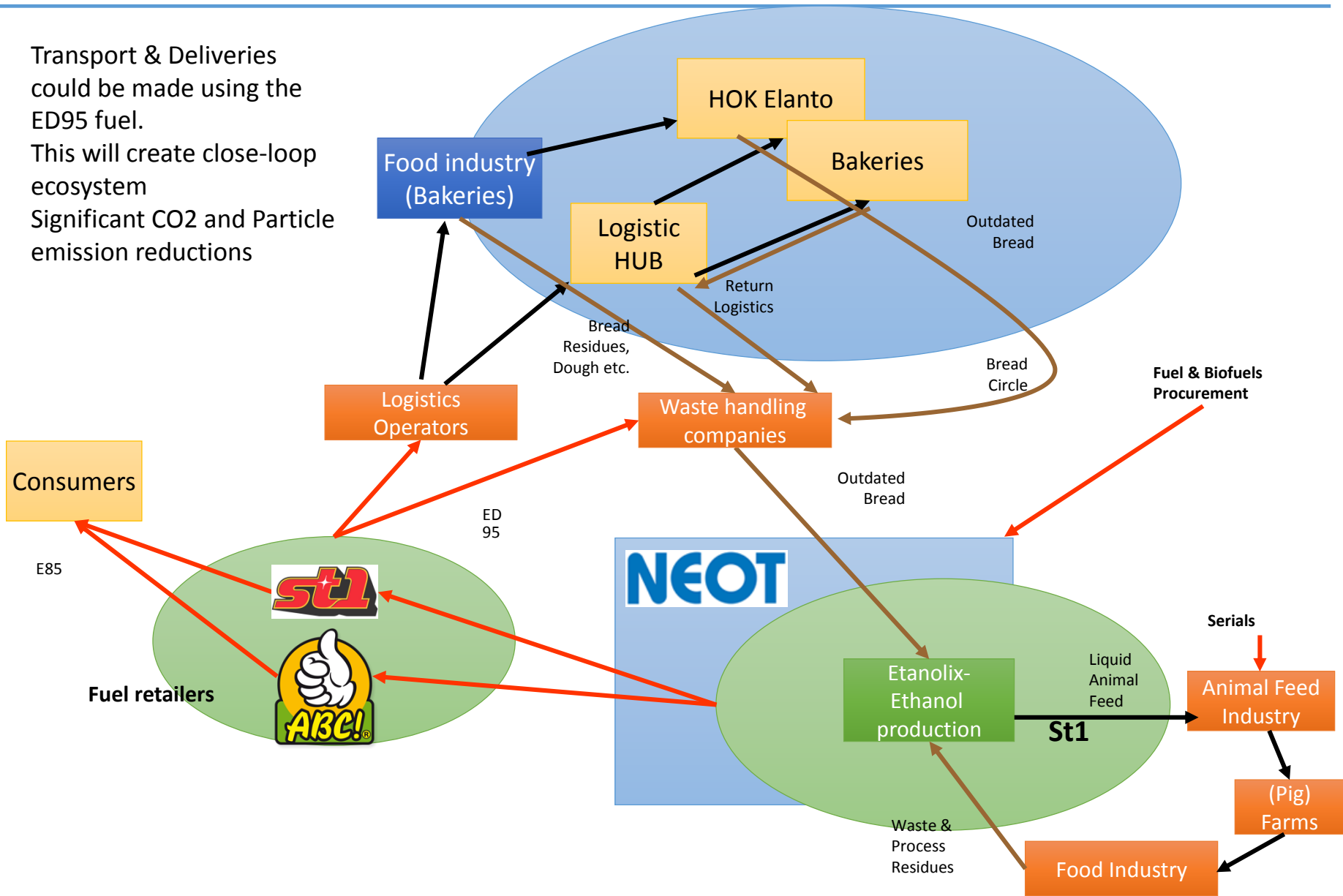
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# 2gen ethanol production & consumption eco-system



- Transport & Deliveries could be made using the ED95 fuel.
- This will create close-loop ecosystem
- Significant CO2 and Particle emission reductions



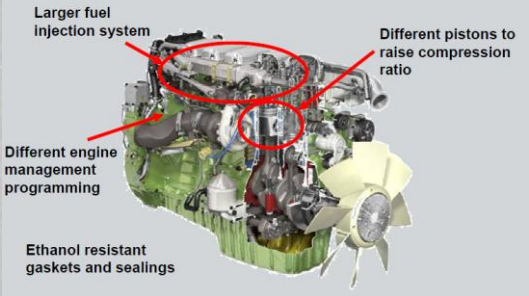


# ED95 ecosystem in Finland



**Ethanol**

+ water  
+ additive



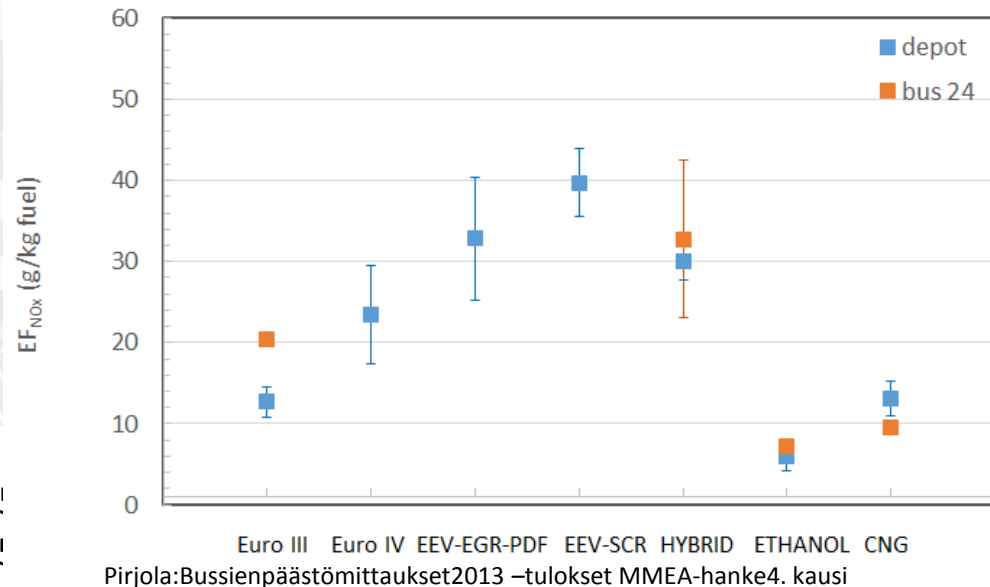
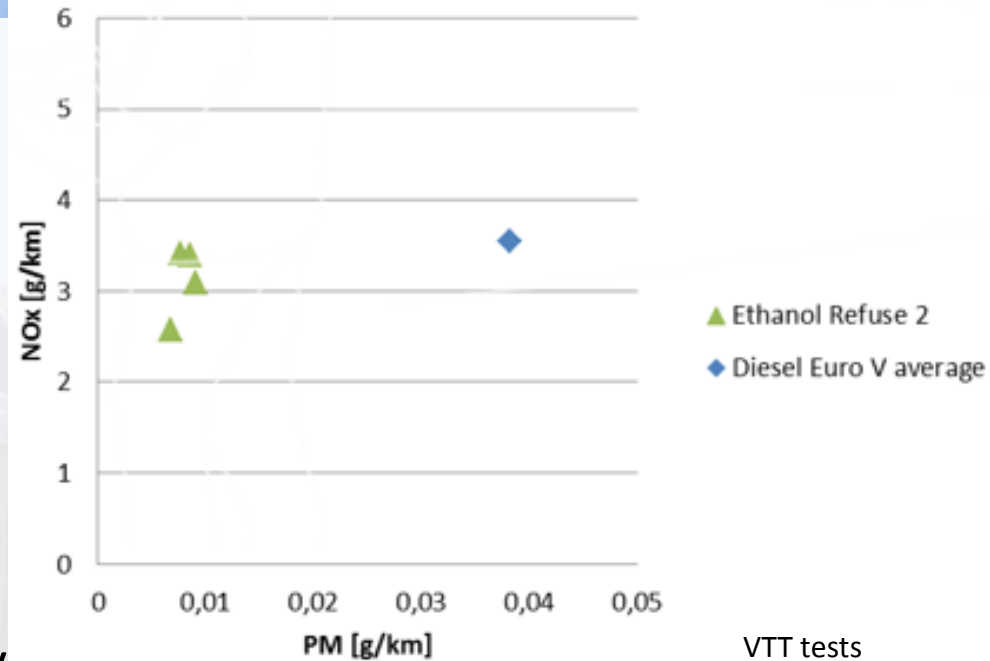
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# ED 95-proven fuel in Stockholm and Helsinki

1. Usability as good as conventional Diesel Engines
2. Energy consumption is the same as conventional diesel engines. Volume is 1,7 times higher due to ethanol's lower energy intensity.
3. Local emissions are significantly lower
  1. Particle Matter (PM) -80 %.
  2. Very low NO2/NO ratio. NO2 defines the air quality limit
4. ED95-fuel can reduce up to 90 % fossil Greenhouse Gases.

Refuse ethanol 1 - Emissions Delivery cycle - Half Load



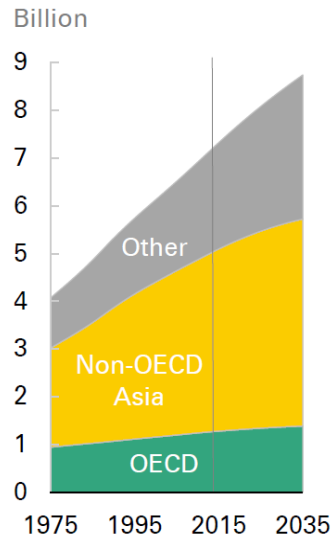
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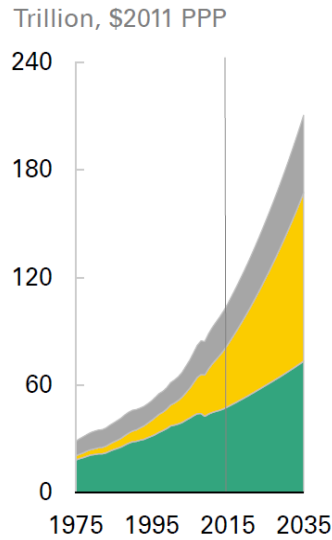


# Global Energy trends

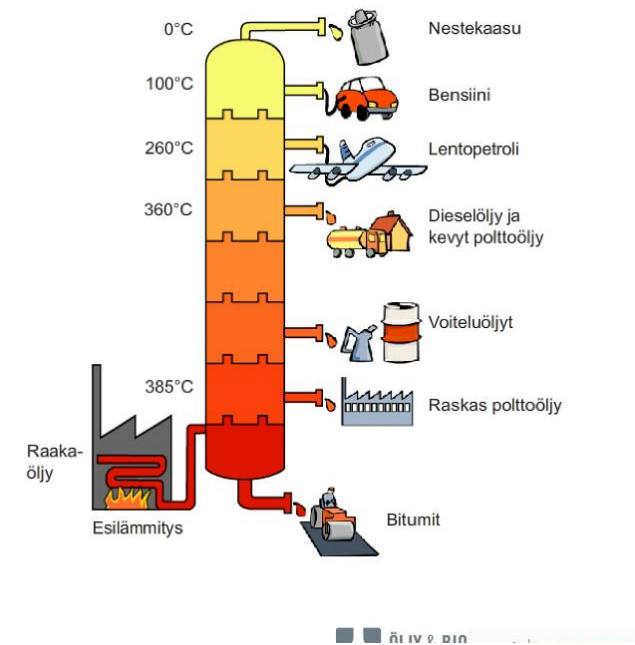
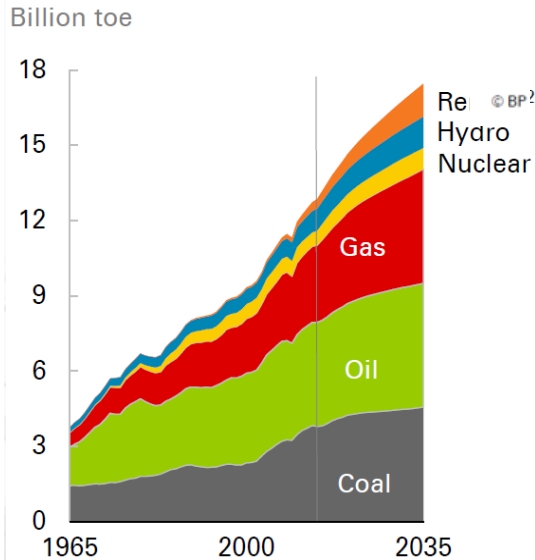
Population



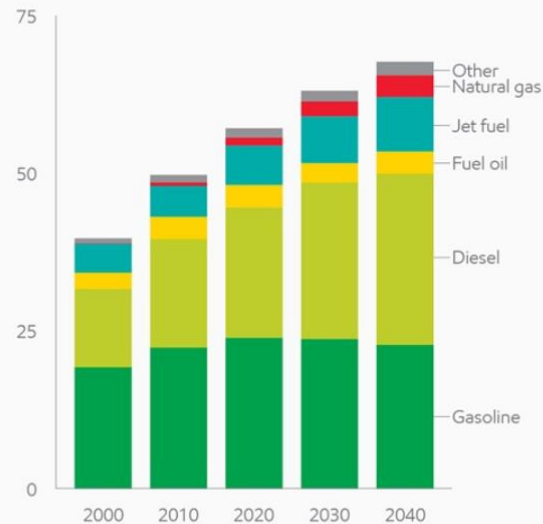
GDP



Consumption by fuel

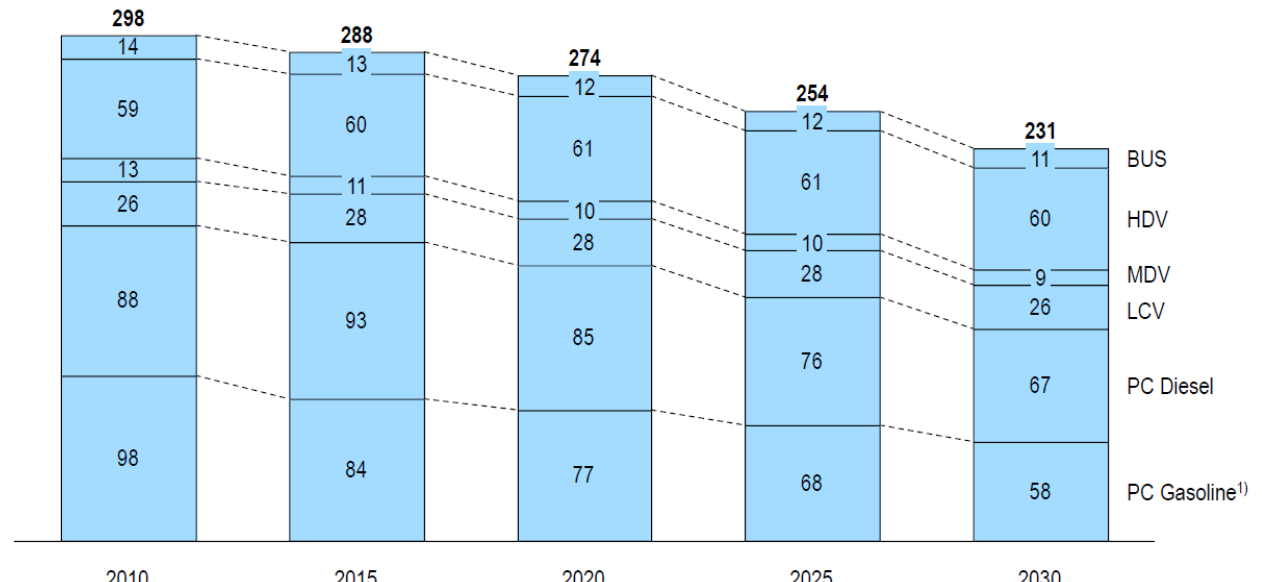


Global transportation demand by fuel



Road transport sector energy demand, EU 28, 2010-2030 [Mtoe]

Scenario A

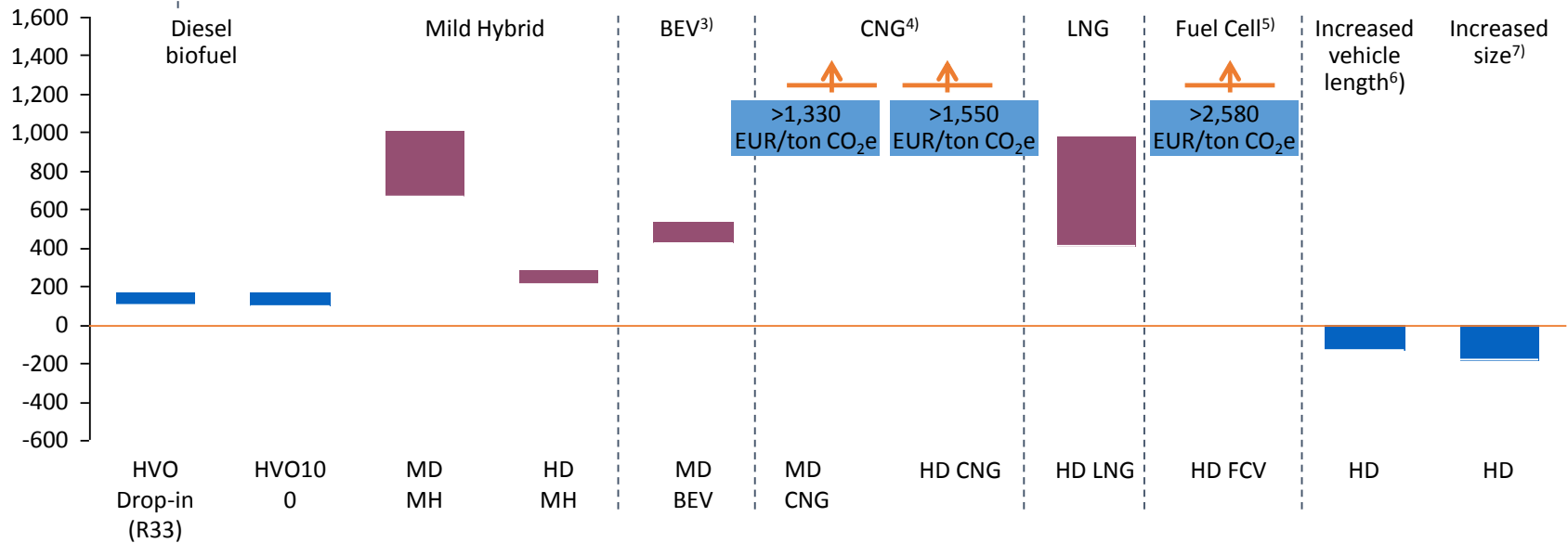


### 3 Additional cost-efficient GHG emission reduction and supporting policies until 2030

In trucks, pathway technology high biofuel drop-ins is cost efficient – Larger trucks could have negative abatement cost

WTW GHG abatement costs of MD<sup>1)</sup> and HD<sup>2)</sup> commercial vehicle 2030 [EUR/ton CO<sub>2</sub>e]

#### Abatement costs [EUR/ton CO<sub>2</sub>e]



Recommended until 2030  
 Not cost efficient until 2030  
 @70 USD/bbl  
 @113 USD/bbl

1) Medium duty 2) Heavy duty 3) Exclusion of HD BEV due to incompatibility of BEV range with long haul requirements 4) High CO<sub>2</sub> abatement costs for CNG and LNG within MD/HD/City Bus s result from low quantities of vehicles (missing economies of scale) and CO<sub>2</sub> abatement potential compared to Diesel is small (<5% savings/km) 5) High system cost and low lifetime mileage in medium duty trucks causes very high abatement cost , therefore incompatibility 6) Increased efficiency due to aerodynamic measures to reduce drag 7) Length and gross vehicle weight increase, increased transport efficiency by 10%



# Summary

1. Smart Utilization of waste resources into advanced biofuels increases energy independence
2. Ecosystem thinking creates win-win situations
3. Advanced biofuels are most cost-effective and readily available way to fulfil the ambitious EU targets for decarbonization of transport