ADVANCEFUEL

RES-Fuels in transport sector decarbonisation

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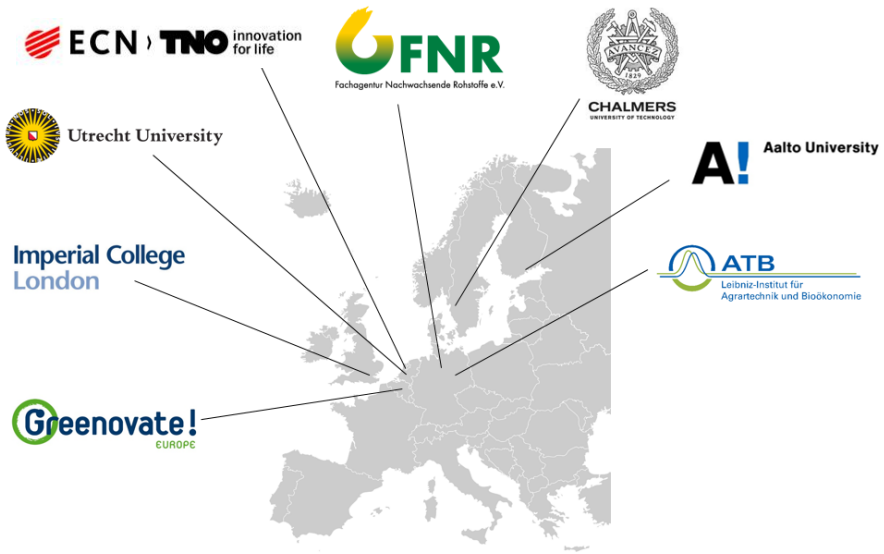
6th Plenary Meeting CA-RES3

Brussels, 27 November 2019

ADVANCEFUEL PROJECT

PROJECT INFORMATION



- 8 **partners** from 7 different countries
- **Duration**: 3 years (September 2017-August 2020)
- **Coordinated** by FNR, German Agency for Renewable Resources with the support of the Energy research Centre of the Netherlands (ECN part of TNO)
- **Funded** by the European Commission under the Horizon 2020 programme

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N.° 764799.

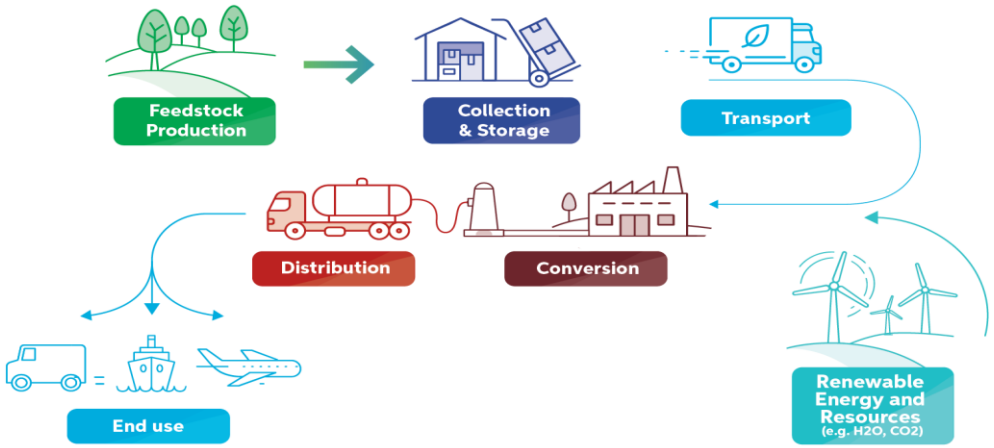
Introduction

ADVANCEFUEL – Facilitating market roll-out of RESfuels in the transport sector to 2030 and beyond

Goal: increasing the share of sustainable advanced liquid biofuels and renewable alternative fuels in the EU transport sector

ADVANCEFUEL's approach:

- Investigating the whole value chain and defining the main barriers to the market roll-out
- Closely investigating the identified gaps/deficiencies/ hurdles – always in close collaboration with the market players (e.g. workshops)



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Identified Barriers

The most prevailing barriers

- dedicated policy support & the stability/security for the industry
- structural financing mechanism to bridge the price gap between renewable and fossil-based fuels
- high production cost of RESfuel in comparison to fossil fuel costs
- costs of renewable hydrogen production

The issues as low barrier

- habits of current agriculture practices
- investments required for feedstock harvesting
- integration of conversion technologies into existing petrochemical assets
- experience with RESfuels in engines for cars ships and/or airplanes

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SCENARIO SETUP– Paris agreement

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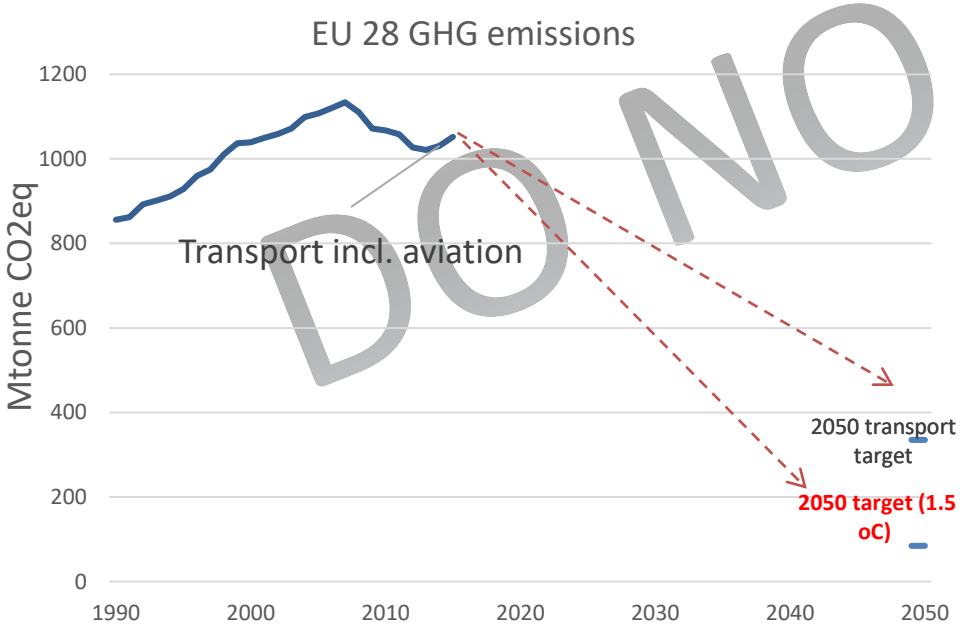
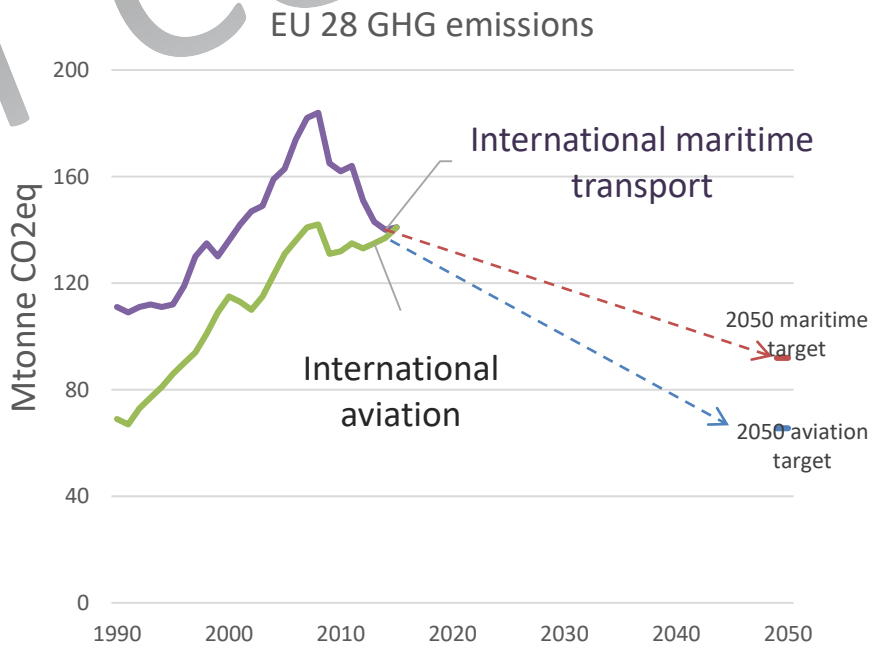
- The European Commission's 2017 European long term strategy document refers to **net zero by 2050 in achieving 1.5 ºC**
  - **89-90% reduction** in transport GHG emissions by 2050 compared to 1990 (excluding international maritime).
  - Aviation and maritime to reduce CO_2 emissions **50%** by 2050, compared to 2005/2008 .





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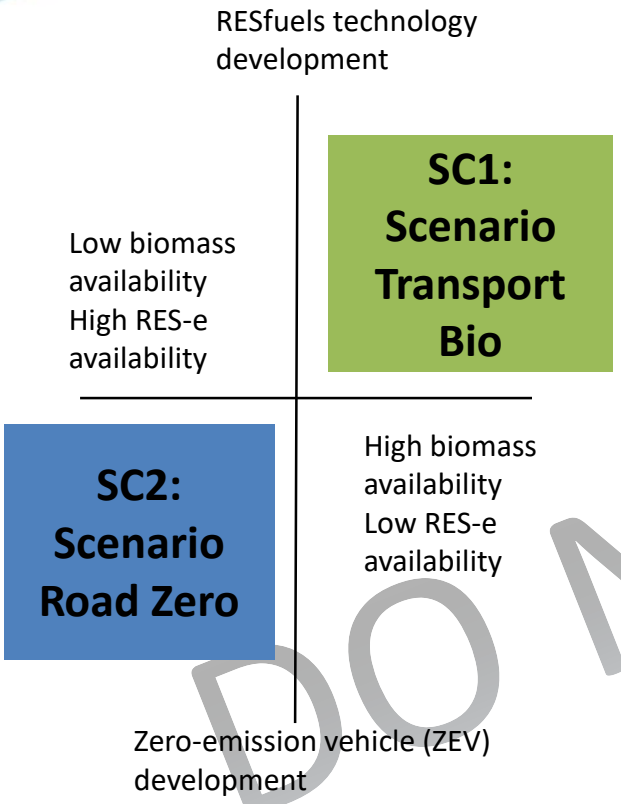
SCENARIO SET UP-main elements



	Transport Bio	Road Zero
Conversion step	More optimistic learning	More pessimistic learning
Feedstock potential	IEE Biomass Policies domestic supply &import potential Will be updated with FP7 S2Biom	25% reduction in forestry feedstocks Import from the US set to zero
Demand sectors	Electricity, H&C and biobased products	
ZEVs	Reference	Massive electrification
PtX	Electricity price 65 €/MW in 2030 60 €/MW in 2050	Electricity price 45 €/MW in 2030 40 €/MWh in 205
Caps	1.7% cap to UCO based diesel/HVO 6% cap to food crop based biofuels No palm oil import beyond 2030	

REFERENCE scenario : Assumes policies for 2030 are implemented, no further policy objectives

- **REDII & EE**
- **CO_2 standards light duty and HDVs**

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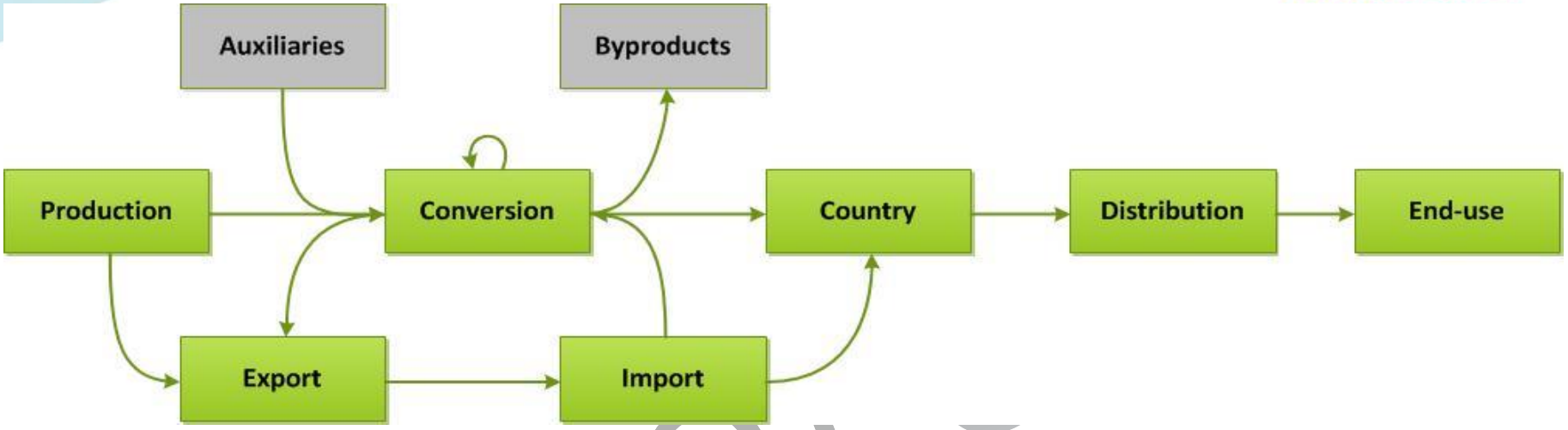
RESolve-Biomass the modeling tool



Production	Domestic biomass supply in NUTS2 level Import potential	Cost supply curves for different feedstock types (IEE Biomass Policies , FR7 S2Biom)
Conversion	Several conversion technologies covering all sectors	Techno-economic performances, learning effects, economies of scale
End use	Electricity, heating and cooling, Biobased products & Transport sector	Transport sector: Road and rail transport, maritime and aviation
Regulatory framework	Biofuel targets, caps/multipliers, CO_2 emission reduction targets	

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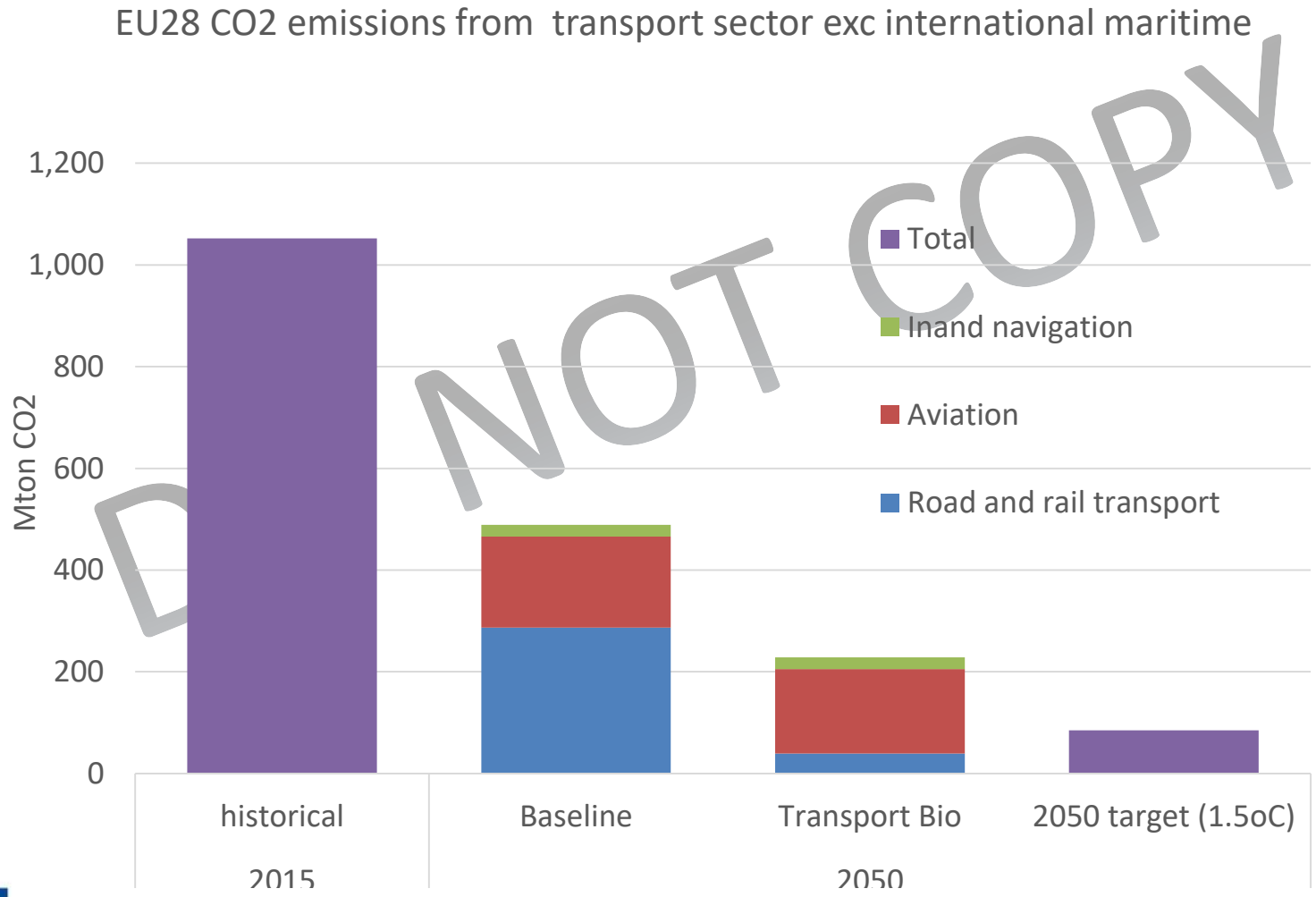
Scenario assessment-initial results



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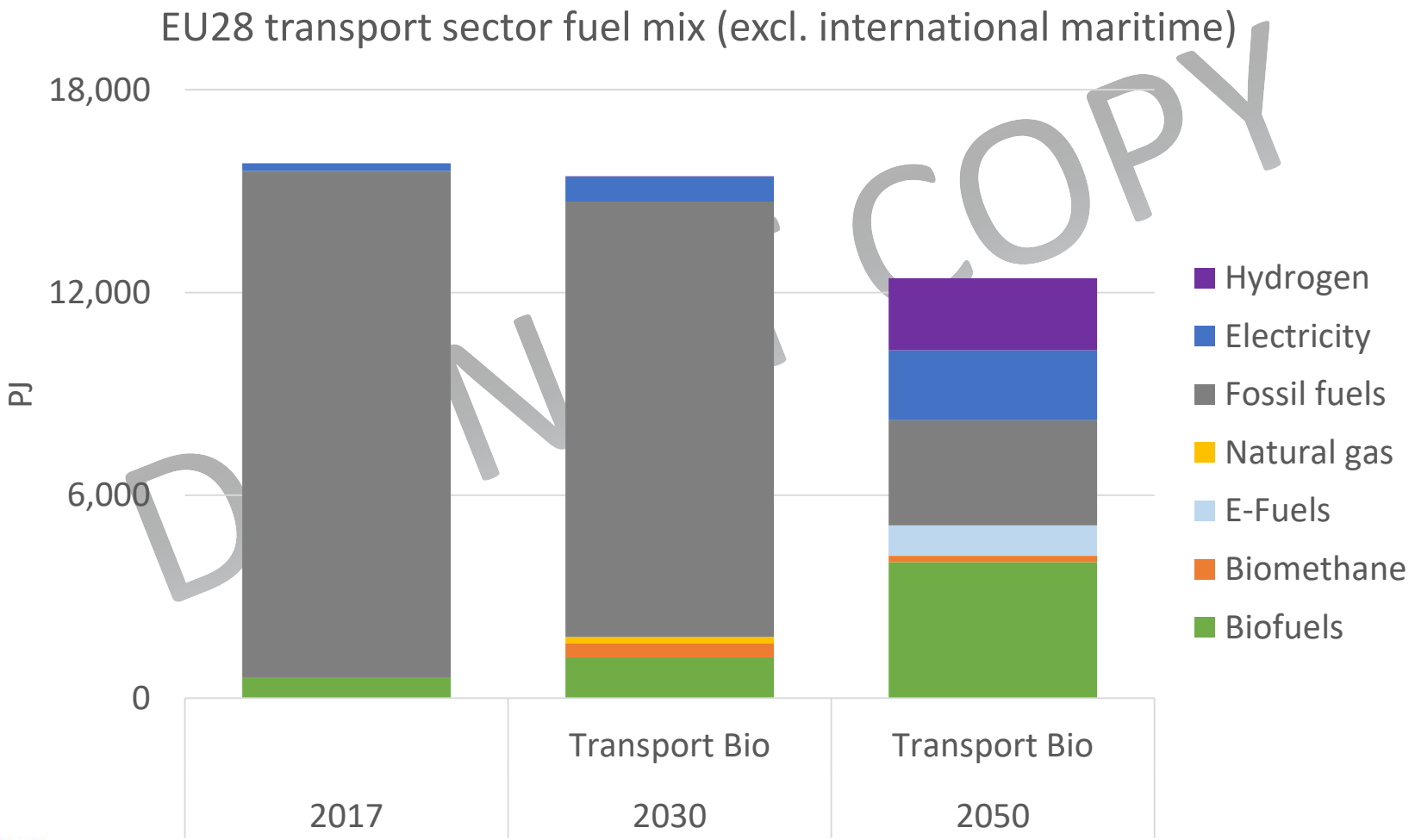
Scenario assessment-initial results

Fuel mix Transport BIO



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Scenario assessment-initial results

Renewable fuels in baseline and Transport Bio

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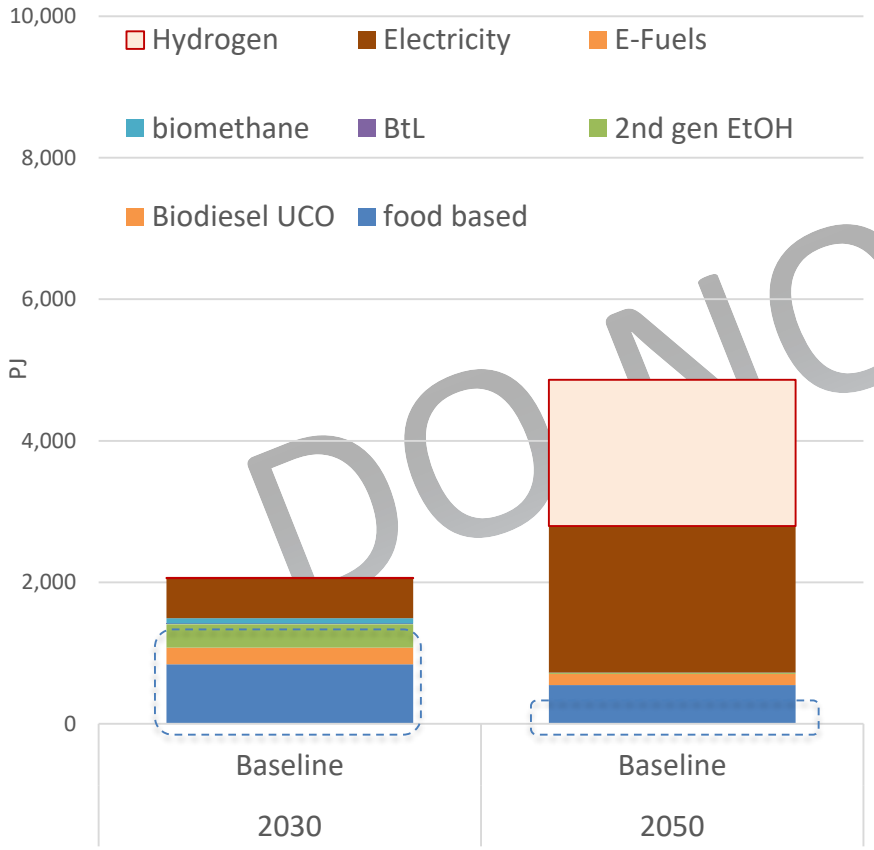
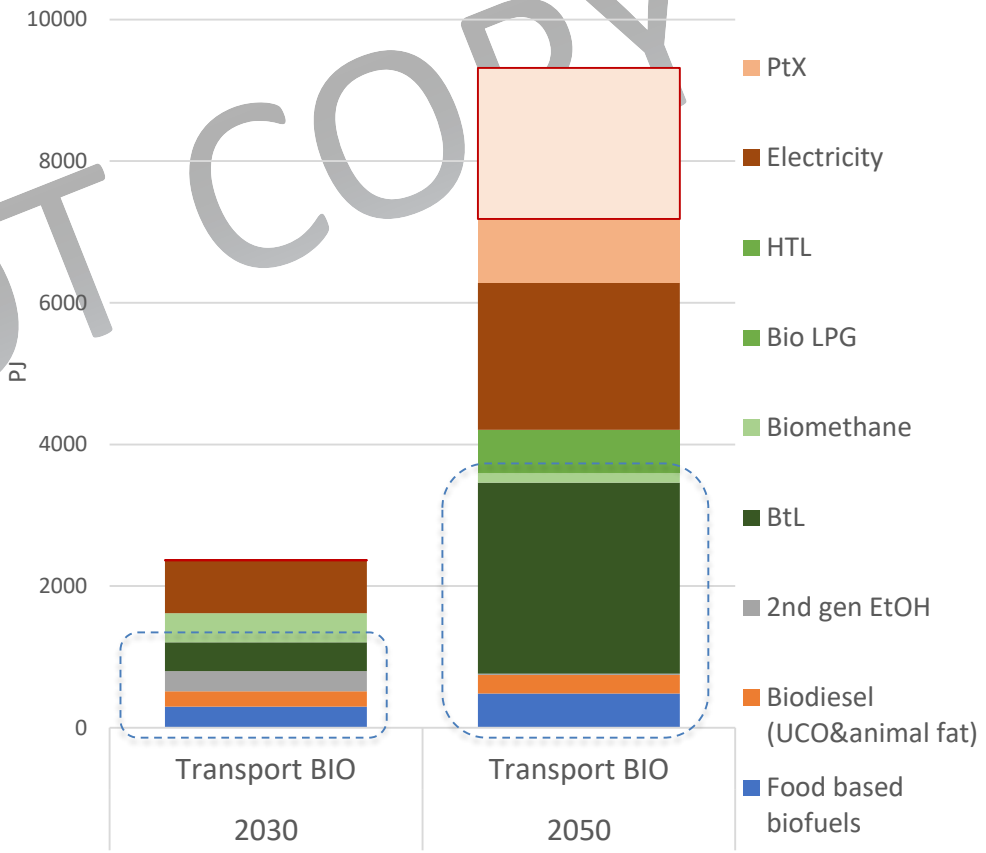
(Renewable)fuel mix in EU28 transport (incl aviation)



(Renewable)fuel mix in EU28 transport (incl aviation)



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Main conclusions from modelling task

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- 2030 RES **targets** for transport are a good way forward but **not sufficient** to pave the way to deep CO_2 reductions needed
- Deep CO_2 reductions in transport sector requires **all renewable options** to be deployed
- **Aviation** sector appears very **challenging**.
- Results show **significant demand for biomass** resources to be met by all demand sectors
- Neither other demand sectors for PtX nor for electricity are included to this assessment
- **Increasing the efficiency** of the transport system and shifts towards more energy efficient transport modes appears as equally important

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Main conclusions from feedstock & technology assessment

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- **Bioenergy demand** in the EU could still **grow** substantially in the future, in particular lignocellulosic (solid) biomass demand
- Many **biomass sources** are potentially **still available**, but require substantial efforts before they can be used (e.g. infrastructure, farmers' experience, regulatory compliance…)
- **Feedstock cost** is a large share of total production cost – important implications on policy measures
  - Increased use of biomass in several sectors => raise of biomass prices
  - The cost to use fossil fuels must be higher than the cost to use biofuels
- Increasing debate over biomass/forests and climate – transparent **implementation of sustainability criteria** for biomass use is very important– implications on financial risk
- Implementation at a **large industrial scale** if to be able to **bring down cost** to reasonable levels

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Main conclusions & first policy recommendations

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- High capital cost = **high financial risk**
- **Limited technical learning** with respect to investment cost can be expected
  - To ensure high full-load hours important – require experience
  - Major **reductions investment costs** which can be expected lie not in the capital cost but in **"assembling" of plants**
- At initial market development: targets and policy must be **discussed with all stakeholders** and ensure wide acceptance and endorsement.
- At early market stage: all relevant policy mechanisms and financing should be **tailored to fit the national value chains** and available infrastructures.
- For further development: **policy** needs to ensure **consistency**, provide high clarity of strategic messages and secure **long-term industrial commitment**

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Thank you for your attention

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