Biofuels from WASTE TO ROAD transport

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Process Design Center, The Netherlands

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 818120.

Process Design Center

- Our mission is to help create better process industry with lower carbon footprint and more sustainable operations.
- We do this using disruptive PROSYN® technology, proving able to generate capital and operating cost savings of up to 50%!
- Our key expertise includes conceptual process design, process integration and optimization, and techno - economic analysis
- Currently more than half of our turnover is in biobased and circular process development

34 years in business

7726 kton of CO_2 savings

>1000 Energy projects

>1000 third-party reviews

210 million euros of R&D projects

75% doctorate degree holders

Process Design Center

- Originated in Germany & Netherlands PDC supports clients & partners around the world

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WASTE2ROAD Concept

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Feedstock supply → **Primary conversion** → **Upgrading & Refining** → **Validation**

Municipal waste

Fast Pyrolysis/HTL

co-HT & co-FCC

Engine & vehicle tests

Process modelling, value chain integration, risk assessment, TEA & LCC

The project aims to achieve to develop at least 4 viable value chains and pilot testing at TRL 5.

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WASTE2ROAD Objectives

1. To develop a representative and cost-effective waste supply and management system to reduce and optimise the supply costs while diversifying the (biomass) feedstock basis

2. To develop new biofuels production technology while increasing understanding and control of the whole value chain

3. To scale up materials and testing procedures to define scenarios for the best exploitation through implementation of process schemes in existing refineries

4. To develop solutions to answer key socio-economic & environmental challenges

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KPIs

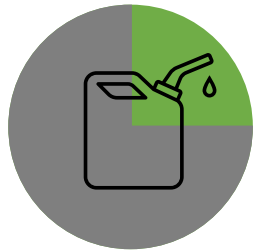
diesel < 0.9 €/L

gasoline < 1.0 €/L

Minimum Fuel Selling Price

> 80 %

GHG savings



5 – 20 % for co-FCC

> 10 % for co-HT

Bio-fuel share

Expected Impact

- Rapid deployment using existing refinery
- Valorization of diverse wastes in the same process
- Opportunities for municipalities to engage in circular economy

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Waste sorting in the City of Oslo

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Waste materials – screening bio-conversion tests to pick the best candidates for biofuel value chains

1. Brown, A.E., et al., *An assessment of road-verge grass as a feedstock for farm-fed anaerobic digestion plants.* Biomass and Bioenergy, 2020. **138**: p. 105570.

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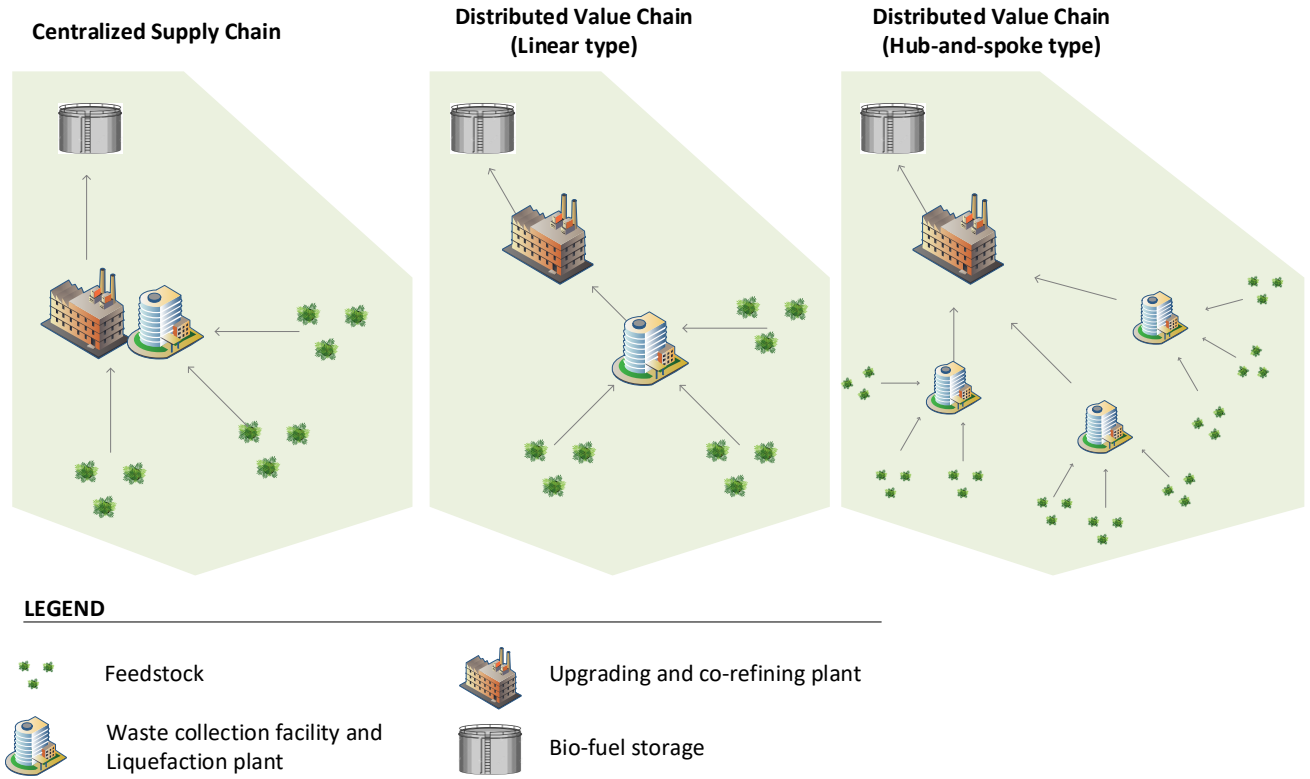
Aspects of value chain integration and optimization

- Siting of the value chain (feedstock availability and existing infrastructure)
- Logistics (centralized or distributed value chain, transport distances and storage)



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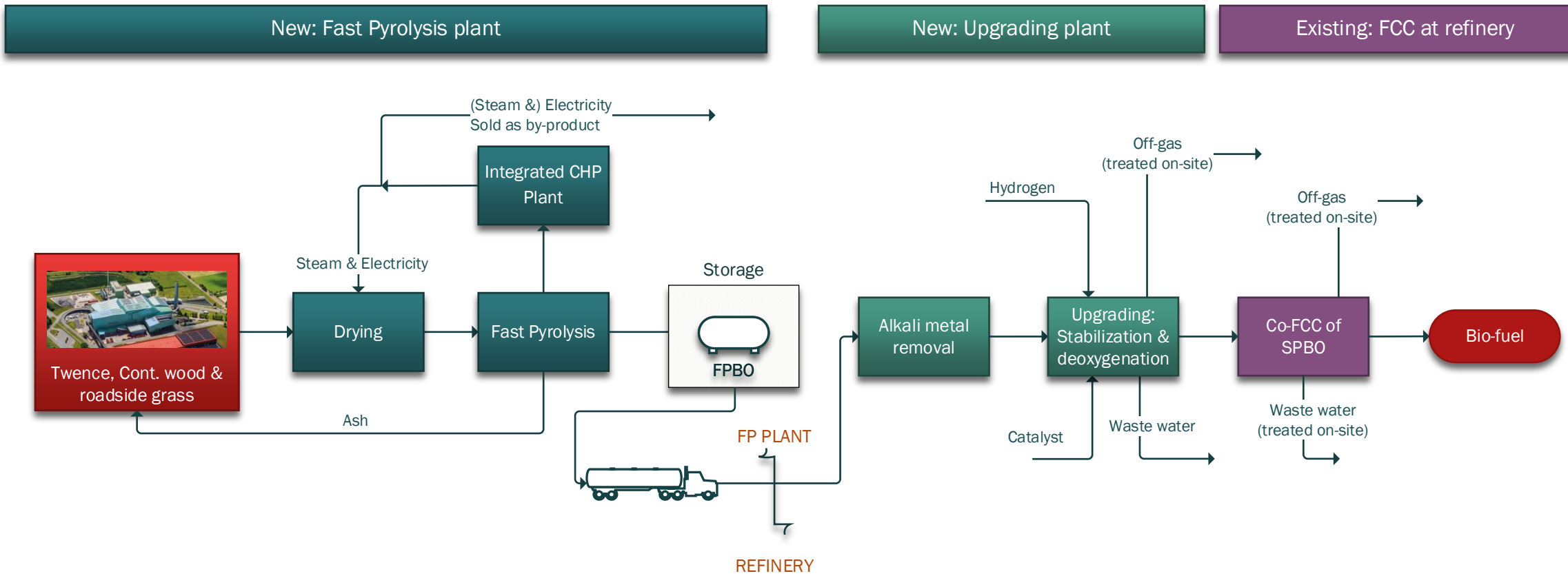
Example of a block flow diagram for one complete value chain showing the process streams and processing steps



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Main Results…so far

- Conversion of a number of different types of residues and waste
- Production of sufficient amounts of bio-liquids for development of viable value chains via FP and HTL
- Suitable gasoline blending components can be produced by FCC co-processing of 5% and 10% SPO/SDPO from clean wood (reference)

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Dissemination/communication activities

Life cycle costing

In the movie "Back to the future" by Steven Spielberg and Robert Zemeckis, the futuristic DeLorean car was fuelled by a banana skin and other waste/refuse. This futuristic vision can be a reality through the WASTE2ROAD project – where a new generation of biofuels are developed from a carefully selected range of low cost and abundant biogenic residues and waste fractions. These waste fractions are processed by two key technologies, fast pyrolysis and hydrothermal liquefaction, followed by upgrading and co-processing steps.

The WASTE2ROAD project investigates and is busy demonstrating (at TRL 5) the whole value chain from i) biogenic residues and wastes to high quality biofuels, having started from the waste feedstocks, ii) the optimization and upgrading of primary conversion and secondary refining processes, and iii) the analysis of various business cases for a successful exploitation in the EU markets. This is done using Life Cycle Costing (LCC), where the technical, economic and environ-mental aspects are taken into consideration.

For more information:

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SPEAKERS

During this workshop industry experts will share their knowledge and experience on Life cycle costing and LCC elements of techno-economic assessment and life cycle assessment for value chains in the biobased industry. The workshop will end with a panel discussion on life cycle costing.

Matthias Stratmann
Head of sustainability
Nova- Institut

Marcos Latorre
Innovation Project Manager
PERSEO Biotechnology SL

Hank Vleeming
Chief Technology Officer
Process Design Center (PDC)

Fabio de Menna
Researcher
University of Bologna

WASTE2ROAD

Go Net-Zero Carbon Energy

Energy transition in the oil & gas. What are the opportunities?

The EU funded research project Waste2Road, its' concept, partners and achievements to-date will be presented at the 2nd business summit "Go Net-Zero Carbon Energy" by Wolfgang Vollnhofer from OMV Downstream.

The "Go Net-Zero Carbon Energy" summit will be a 2day virtual event, held on 26-27th January 2021 and focus on practical actions the oil & gas industry can take to rise to the challenge of energy transition.

The event will gather major oil & gas and energy players, cleantech innovators and everyone who is interested in the what, how and when of the low carbon transition in the oil & gas industry.

Training webinars
LCC workshop
Co-processing workshop

Conferences & Workshops
Publications

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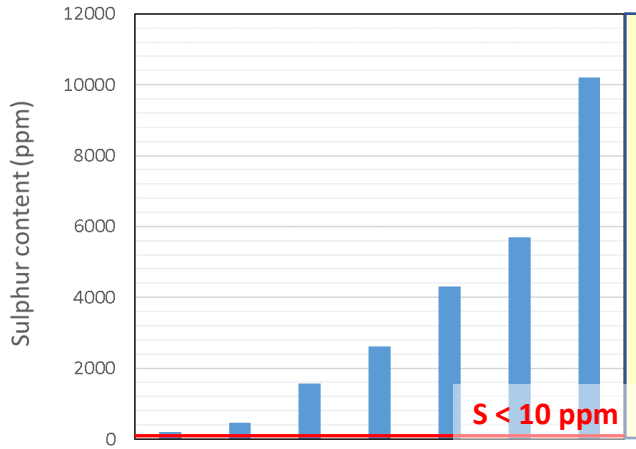
Challenges and obstacles



- Level of contaminants in pyrolysis oil above limits for co-refining

- Upgrading steps and co-refining of HTL liquids

Potential ideas for collaboration with other projects

- Development of technical specifications and standards for bio-oils for refineries
- Certification of Biofuels from co-processing
- Public Awareness

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WASTE2ROAD

Thank you for your attention!

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