

# BIO4 FUELS

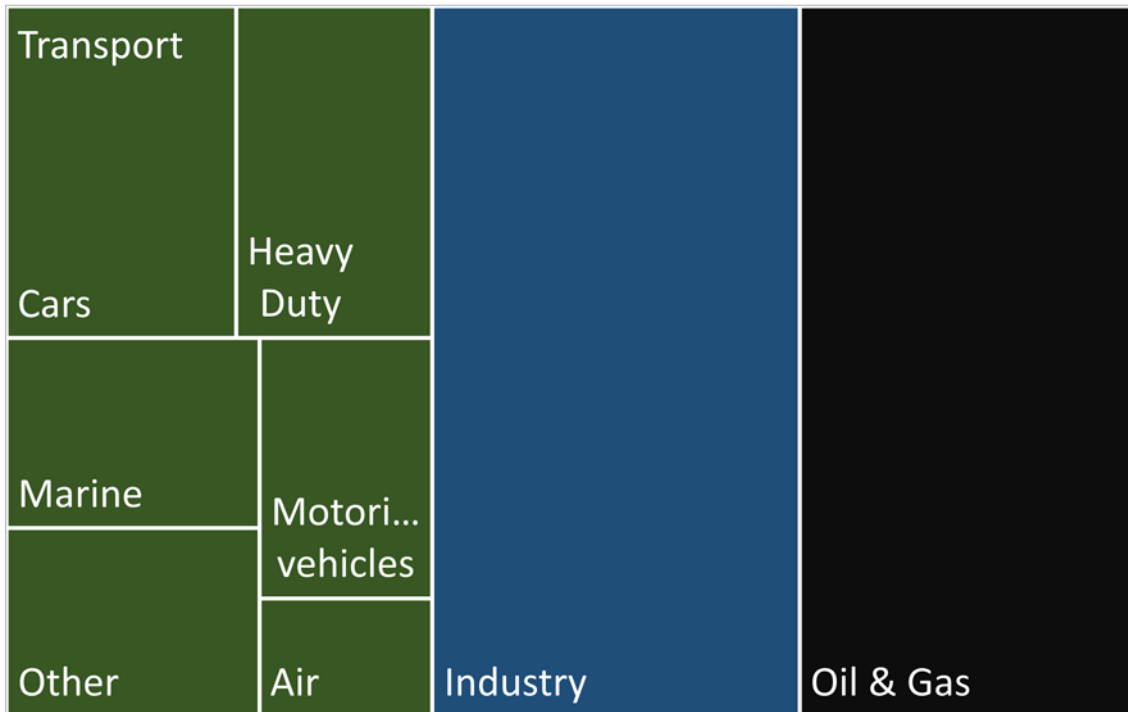
## Norwegian Centre for Sustainable Bio-based Fuels and Energy

Duncan Akporiaye, SINTEF



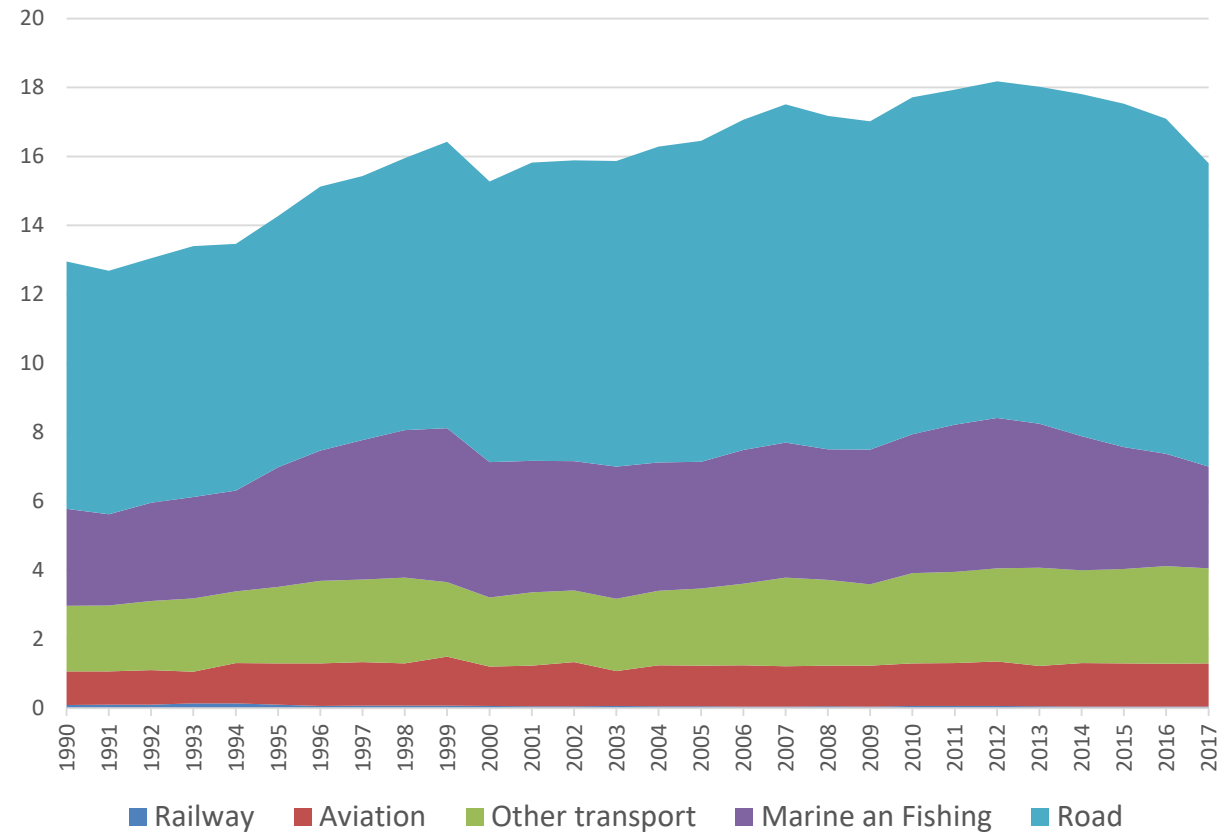
# Source of CO<sub>2</sub> emissions in Norway

■ Transport ■ Oil & Gas ■ Industry



~30%

Norway - Emissions from Transport



# Nordic Bio-resources

## Technologies

- Biochemical
- Thermochemical
- Chemical

## Stakeholders

- Resource owners
- R&D institutes
- Industry
- Authorities
- NGOs

Bio-resource,  
Environment, Climate

Primary Biomass  
Conversion

Secondary Conversion and  
upgrading

Process design and  
End Use

SUSTAINABILITY

*Enabling sustainable  
biofuels production  
in Norway*

## Markets

Aviation fuel • Heavy Diesel • Biogas • Valorised Side Streams

# Bio4Fuels Stakeholders

## Bioresources



## Norwegian Technology



## International

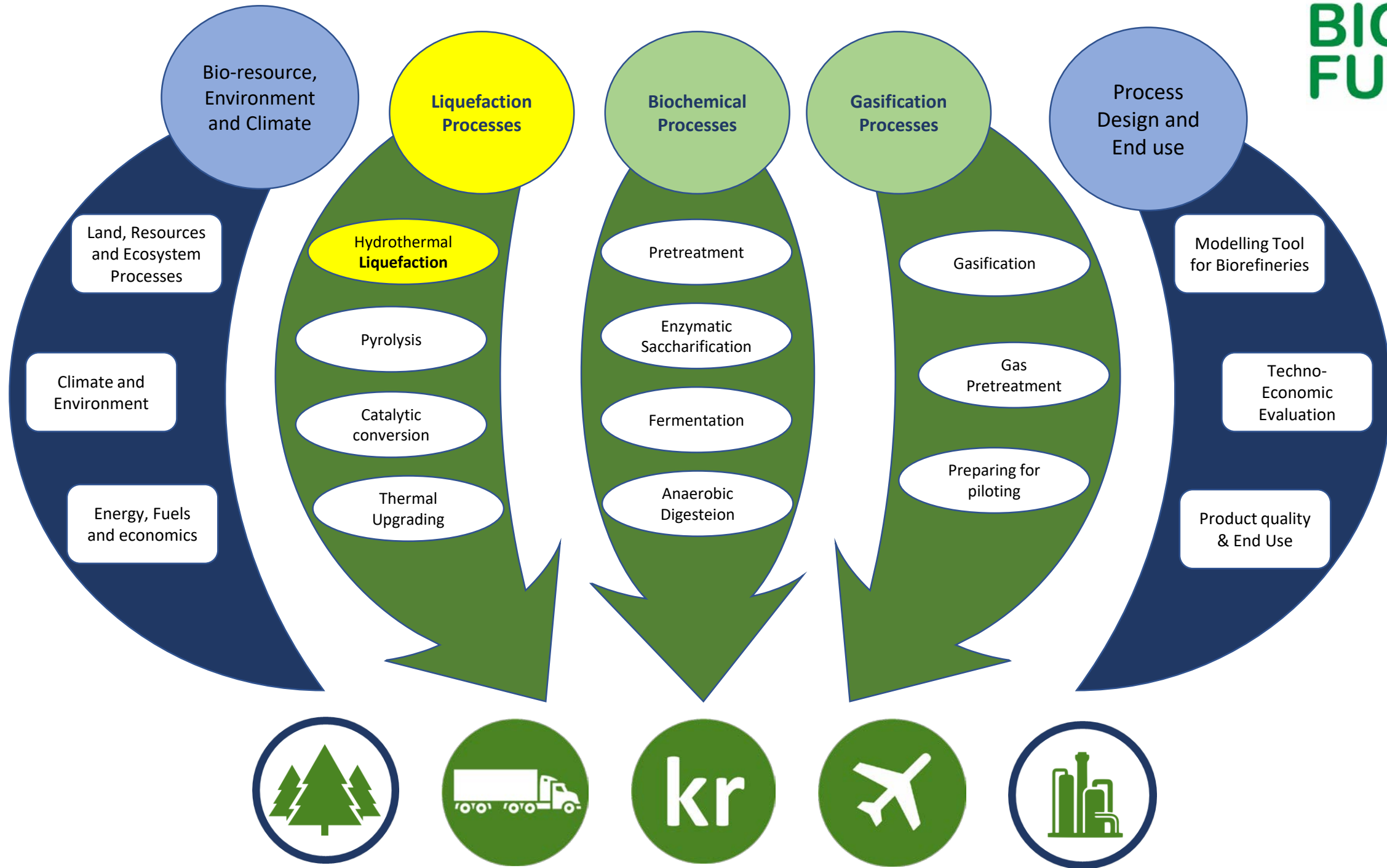


## End Users



## Government and State





# Overall objectives of the HTL work in Bio4Fuels

Liquefaction  
Processes

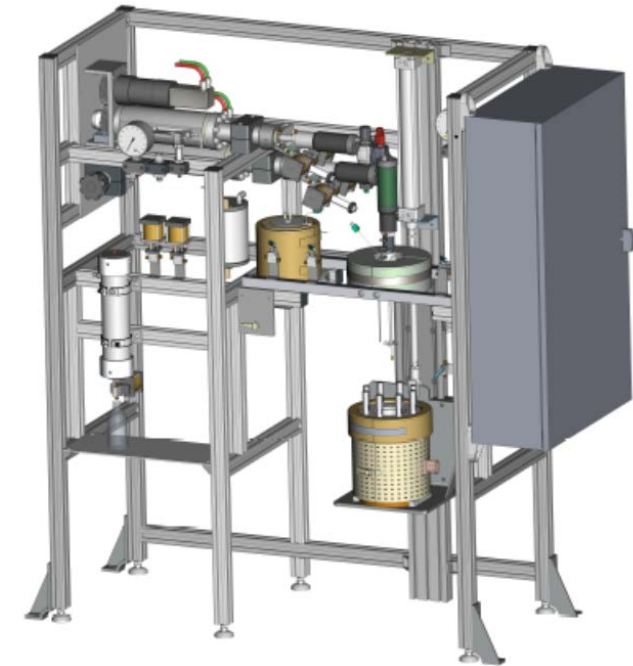
Hydrothermal  
Liquefaction

Pyrolysis

Catalytic  
conversion

Thermal  
Upgrading

- Focus on the inorganic chemistry – modelling and experimental
  - Feedstock flexibility – How to eliminate or reduce the feedstock effect on the biocrude quality
  - Reduced costs and climate impact through enabling a more robust process
  - Processing: Feeding, reactor design, separation
- Other activities
  - HTL as a pretreatment for biological routes
  - Support to other activities such as techno-economics and process/reactor modelling
  - International cooperation



# Bio4Fuels KPIs



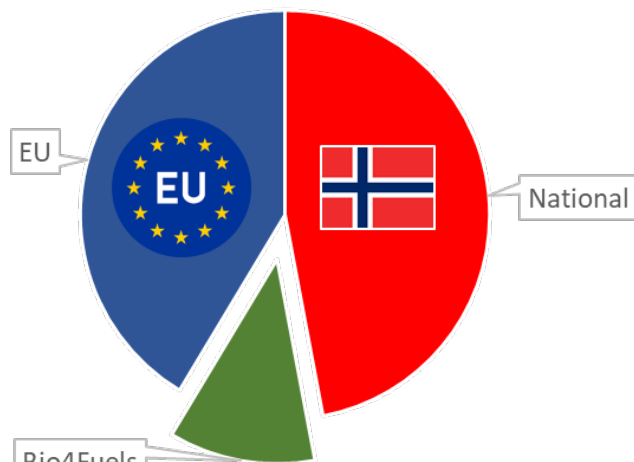
> 20 %

Increase overall  
yield

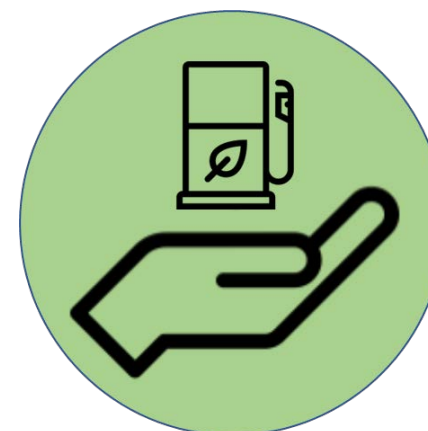


< 30 %

Processing  
Costs



International Cooperation



~ 2

Sustainable  
Value Chains



Thank you for your attention!



[www.nmbu.no/bio4fuels](http://www.nmbu.no/bio4fuels)



[bio4fuels@nmbu.no](mailto:bio4fuels@nmbu.no)



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