

November 14th, 2023  
Brussels, Belgium



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# PUBLIC PERCEPTION AND BUSINESS MODELS JOINT EVENT

Organised by the Carbon Capture,  
Utilisation and Storage (CCUS) &  
Alternative Fuels Horizon 2020/  
Horizon Europe CLUSTER projects

Supported by CINEA - European Climate,  
Infrastructure and Environment Executive Agency

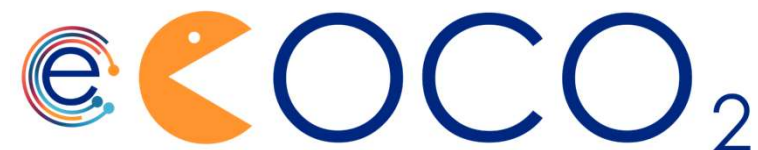
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# Closing the loop: From CO<sub>2</sub> to fuel

Linda Engelmann

# Baseline

 **eCOCO<sub>2</sub>** – *Direct electrocatalytic conversion of CO<sub>2</sub> into chemical energy carriers in a co-ionic membrane reactor*

*Empirical assessment of **societal perception and acceptance** of the eCOCO<sub>2</sub> technology for CO<sub>2</sub> conversion*

- *technical infrastructure and production processes*
- *CO<sub>2</sub>-based fuel obtained as end-product*

*Previous scientific research on the **public perception of Carbon Capture and Utilization (CCU)***

- *CCU is generally perceived to be beneficial and useful (Arning et al., 2018)*
- *Perceived benefits: e.g., reduction of fossil resource use and CO<sub>2</sub> emissions (Offermann-van Heek et al., 2018)*
- *Perceived barriers: e.g., moral hazard of continuous emissions (Arning et al., 2018b)*

*Previous scientific research on the **public perception and acceptance of CO<sub>2</sub>-based jet fuel***

- *In comparison with other potential CCU products (fertilizers, etc.) (Arning et al., 2018b)*

➤ *More multi-faceted, in-depth analysis of CO<sub>2</sub>-based jet fuel perception*

	Evaluation	<i>positive</i>	
<b>Approval</b> passive acceptance		<b>Support</b> active acceptance	<i>Action</i>
<i>passive</i>			<i>active</i>
<b>Rejection</b> passive opposition		<b>Resistance</b> active protest	<i>negative</i>

# Methodology

## **Research questions, e.g.:**

- *How is the conversion of CO<sub>2</sub> into jet fuel perceived?*
- *Which factors impact the acceptance of CO<sub>2</sub>-based jet fuel?*
- *How are the production steps of CO<sub>2</sub>-based jet fuel perceived?*

## **Target groups**

- *Laypeople / general public*
- *End-consumers / potential (passive) fuel users*
- *Technical experts*

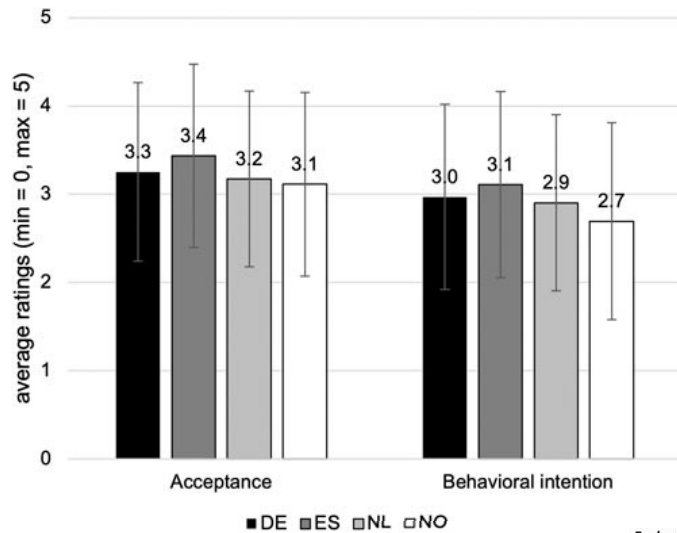
## **Engagement with target groups**

- *Qualitative methods: interviews*
- *Quantitative methods: online surveys*

# Summary

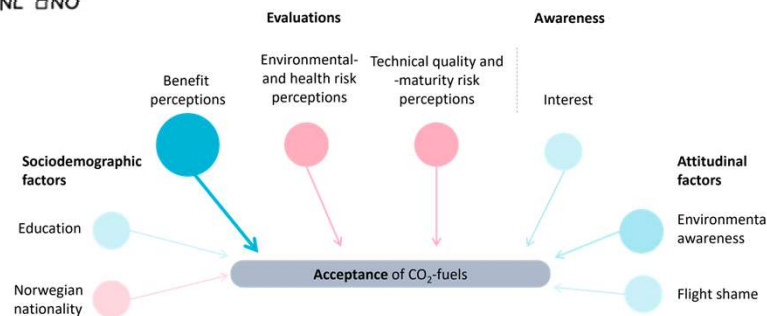
## Average ratings of CO<sub>2</sub>-based fuel readiness

Arning et al., 2023



➤ Acceptance & behavioral intention towards CO<sub>2</sub>-based jet fuel rather high.

➤ National differences: highest ratings by Spanish respondents, lowest by Norwegians.



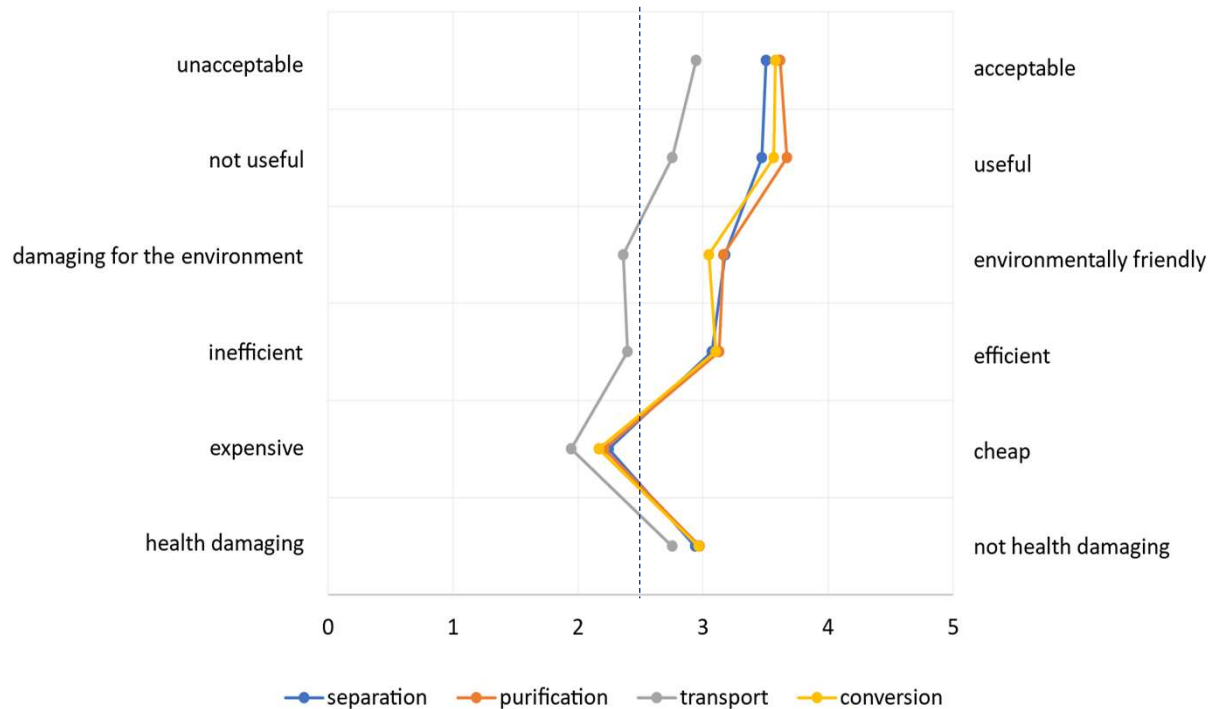
➤ Benefit perception is by far the strongest predictor of acceptance.

➤ Smaller predictors: environmental awareness, risk perceptions, interest, flight shame, and Norwegian residency.

# Summary

## Average ratings of attitude towards production steps

Engelmann et al., 2023 (under review)



➤ *Transport is the least positively perceived production step.*

➤ *Overall, evaluation of production steps tends to be positive – rather acceptable, useful, environmentally friendly, efficient, not health damaging – except for costs.*

# Policy impact

## *Take-aways for policymakers*

- ***International differences:*** Variations in acceptance among different countries suggest that policy efforts need to be tailored to specific countries or regions. Understanding cultural and social factors driving these differences can help shape policies and communication strategies.
- ***Emphasis on perceived benefits:*** Strong influence of benefit perception on acceptance indicates that policies and communication should focus on the advantages of CO<sub>2</sub>-based jet fuels.
- ***Risk Management:*** Addressing risk perceptions is important as well. Policies should ensure that safety and environmental risks associated with the production and use of CO<sub>2</sub>-based jet fuel are minimized and communicated effectively to build public trust.




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# Thank You

## For Your Attention

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