

Studies on the public perception of production and use of green liquid hydrogen as a maritime fuel in Norway

NORCE has conducted two separate studies, one based on interviews with decision-makers and stakeholders for the Aurora development, and one using the Norwegian citizen panel of the University of Bergen. The goal has been to gain insight into factors and opinions influencing public perception and acceptance of hydrogen as an energy carrier, in order to build social acceptance for implementing production and use of green liquid hydrogen as a maritime fuel in Norway.

Study 1

In a case-based interview study, they investigated which factors influence the acceptance of hydrogen as an energy carrier. In this study, they interviewed decision-makers and others who may be affected by the investment in hydrogen through the Aurora project. Three different groups were interviewed: a) decision-makers at county and municipal level, as well as port authorities, b) people working in areas that may be affected by hydrogen production, c) ferry passengers to a planned hydrogen ferry.

The data material has been systematically analyzed and the findings point to four main themes regarding factors that affect hydrogen acceptance, e.g., connected to barriers and opportunities, incentives, knowledge, and trust. The findings point to the importance of a holistic approach to future energy solutions. More specifically, they reveal that there are drives, incentives, and synergy effects that provide opportunities to achieve a green shift, even though the shift is challenging (Theme 1). They also reveal that transport preferences are governed by several needs and considerations, such as limitations associated with current hydrogen infrastructure and technology maturity (Theme 2). Furthermore, they find that perceptions of risks associated with hydrogen and trust in hydrogen stakeholders are closely linked to (hydrogen) knowledge levels (Theme 3). Finally, they find that key hydrogen stakeholders including international ones, have a special responsibility to elevate the current hydrogen investment (Theme 4).

Study 2

The second study is based on findings utilizing data from a representative sample of the Norwegian public and highlights public perceptions of hydrogen fuel and its different production methods (often labeled as grey, blue and green in public communication). Although several countries, including Norway, have strategies to increase the production of hydrogen fuel, NORCEs results indicate that hydrogen as an energy carrier, and its different production methods, is still unknown and unclear to a large part of the general public. A common misunderstanding seems to be confusing 'hydrogen fuel' in general with environmentally friendly 'green hydrogen'.

Results from the survey show that the production method is highly relevant for public acceptance; acceptance is high for green hydrogen, which is produced from renewable energy sources, but falls significantly for blue and grey hydrogen when respondents are informed that these are produced from coal, oil, or natural gas.

Public support for hydrogen fuel in general, as well as the different production methods, is related to their level of worry about climate change, gender, and political affiliation. Widespread misunderstandings regarding 'green' hydrogen production have the potential for reducing trust and fueling resistance as new 'blue' or 'grey' projects develop. The results indicate a need for clearer

communication from the government and developers regarding production methods to avoid possible 'backfire' effects in public acceptance.

NO: Vi har ønsket å undersøke hvilke faktorer som påvirker aksept for hydrogen som energibærer. Det er derfor gjennomført en intervjustudie av beslutningstakere og andre som kan bli berørt av satsningen på hydrogen gjennom Aurora-prosjektet.

Tre ulike grupper er intervjuet: a) beslutningstakere på fylkes- og kommunenivå, samt havnemyndigheter, b) personer som arbeider i områder som kan bli berørt av hydrogenproduksjon, c) ferjepassasjerer til en planlagt hydrogenferje.

Datamaterialet er systematisk analysert og funnene peker ut fire hovedtema for hva som påvirker aksept, f.eks. koblet til barrierer og muligheter, incentiv, kunnskap og tillit. Funnene peker på betydningen av en helhetlig tilnærming til fremtidige energiløsninger. Nærmere bestemt, vi avdekker at det finnes driv, incentiver og synergieffekter som gir muligheter for å oppnå et grønt skifte, selv om dette er utfordrende (Tema 1).

Vi avdekker også at preferanser for transportmiddel styres av en rekke behov og hensyn, så som begrensninger ved dagens hydrogen infrastruktur og teknologiens modningsnivå (Tema 2). Videre finner vi at opplevelser av risiko forbundet med hydrogen og tillitt til hydrogenaktører henger tett sammen med (hydrogen) kunnskapsnivå (Tema 3). Til slutt finner vi at sentrale hydrogenaktører og myndigheter inkludert internasjonalt har et særlig ansvar for å ta hydrogensatsingen videre (Tema 4).