BalticSeaH2

Cross-border Hydrogen Valley around the Baltic Sea

D2.6. Evaluation report of the development of public awareness and acceptance

WP2 – Vision, social transformation, and engagement

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Contents

Executive summary

This document is the first evaluation report of the development of public awareness and acceptance of hydrogen transition in the Baltic Sea Region (BSR). The purpose of this report is two-fold; Firstly, to introduce a mixed-method approach for monitoring the development of public awareness and acceptance for the project duration, consisting of various data collected in tasks across the BalticSeaH2 project. Secondly, based on the first phase of monitoring data collection, this document provides a baseline understanding of the current state of public awareness and acceptance of hydrogen transition in the BSR, elaborates on the drivers and barriers for public awareness and acceptance, and identifies gaps and needs for further action.

While hydrogen technologies enjoy strong public acceptance on a broader level due to their potential to facilitate energy security and decarbonization, on a community-level, hydrogen-related infrastructure is facing some opposition from local populations. The degree of public awareness also varies in the BSR, indicating a need for further public awareness activities. Most literature and knowledge available are concentrated on the public awareness and acceptance of single hydrogen technologies, and consequently, while less focus has been placed on the public awareness and acceptance of the hydrogen transition, constituting the whole hydrogen value chain. Thus, this report recommends that forthcoming awareness and engagement activities focus on understanding the needs, concerns, and perceptions of both the public and host communities, and that focus is placed on perceptions and awareness regarding the hydrogen transition as a whole in the BSR.

1. Introduction

The socially sustainable and just implementation of socio-technical transitions, such as the clean hydrogen transition, relies heavily on social acceptance. Social acceptance is commonly defined and studied through the intersection of three types of acceptance: 1) socio-political acceptance (public, policymakers), 2) market acceptance (key industry stakeholders, investors, end-users), and 3) community acceptance (host communities) (Kojo et al., 2022) (see Figure 1). Social acceptance, in turn, is detrimentally linked with public awareness: the degree to which the public is aware of the existence, purposes, impacts and implications of a technology. Both social acceptance and public awareness are key considerations to mitigate resistance and respond to needs and concerns related to the adoption of new technologies, and in ensuring that related burdens and benefits are distributed evenly within the society.

Achieving social acceptance is not solely about convincing society to accept new technologies but also about adapting our actions and strategies to meet the needs and expectations of society. This means engaging with the public, understanding their concerns and needs, and integrating these insights into the development and deployment processes. It requires a multi-level and way of interaction where all actors throughout the hydrogen value chain are responsive and accountable to societal values and priorities, ensuring that the transition is inclusive and beneficial for all stakeholders.

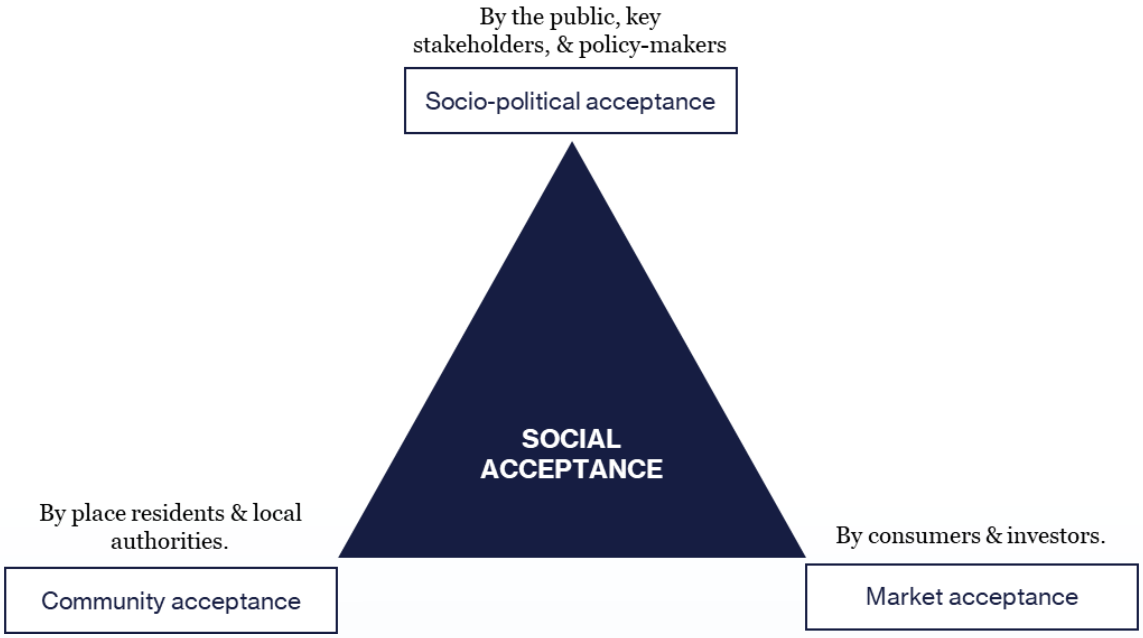

Figure 1 The triangle of social acceptance (adapted from Wustenhagen et al., 2007).

This document presents an overview of the current state of social awareness and acceptance of hydrogen transition in the Baltic Sea Region (BSR), focusing specifically on public sentiments and knowledge regarding the hydrogen transition (section 3). Additionally, this document offers a synopsis of potential drivers and barriers for acceptance and awareness (section 4) and outlines the methodology for monitoring the development of public acceptance and awareness in the BSR for the duration of the project (section 2).

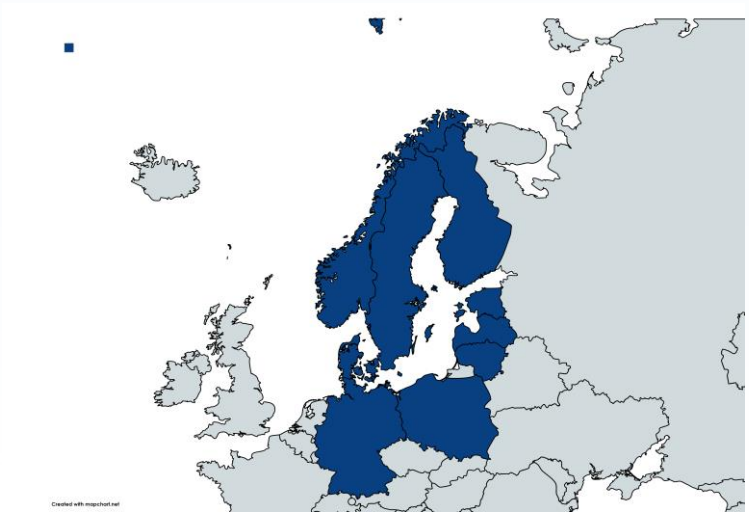

Figure 2 Geographical focus area of this report. Created with mapchart.net

This report was prepared in close cooperation with tasks 2.2. “Baltic Sea region diagnosis”, 1.6. “Ethics of the development of hydrogen valleys”, 2.3 “Social awareness and acceptance activities in the Main Valley”, 2.4 “Social awareness and acceptance activities in the Connected Valleys”, and 8.1. “Communication”, and the findings of this report feed directly into the forthcoming activities of these tasks.

2. Methods

To monitor public awareness and acceptance, the consortium is collecting mixed data in three consecutive phases, outlined in Figure 3. The first phase of monitoring data collection has taken place during M12-M13 and consists of

- **country profile questionnaire results** (Autumn-Winter 2023) and **literature review on public awareness and acceptance of hydrogen technologies** (April-May 2024), conducted for T2.2.
- **findings from a co-creation workshop** organized collaboratively by T1.6 and T2.6. in the BalticSeaH2 consortium meeting in June 2024 titled "Just Hydrogen transition", and
- **media monitoring data** collected in T8.1 from February to June 2024.

For further details on the data, see Table 1. A summary of the main finding from this data is outlined in section 3 of this report.

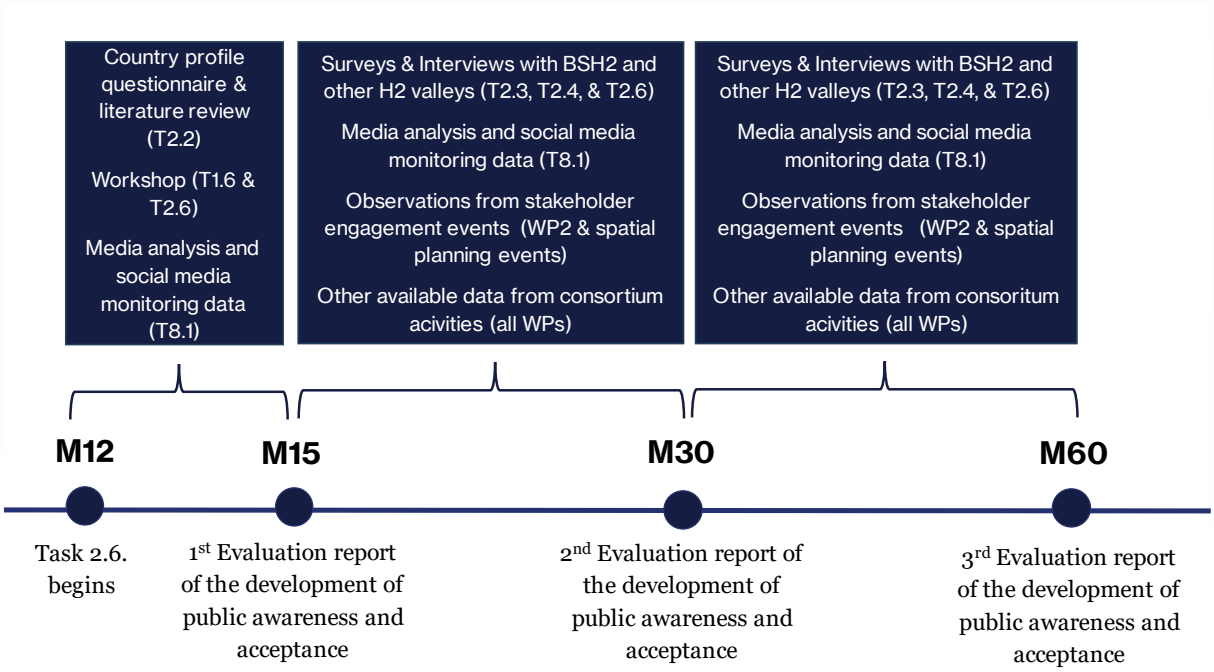

Figure 3 Timeline of monitoring data collection and reporting.

The second phase of monitoring data collection takes place from M15 to M30 and is designed to create a more in depth understanding of the drivers and barriers of public awareness and acceptance in the context of the hydrogen transition in the BSR. The monitoring data in the second phase includes media analysis and social media monitoring (T8.1.), surveys and interviews with the consortium partners and observation data from stakeholder engagement events organized by T2.3, T2.4. (e.g., observations from citizen panels) and the project partners (e.g., spatial planning public hearings). The third phase will repeat the data collection of the phase two, to assess changes and developments of public awareness and acceptance in the BSR. The findings of these two data collection phases will be outlined in the 2nd and 3rd Evaluation reports (M30 and M60).

Table 1 Description of monitoring data in the 1st phase of data collection.

MONITORING DATA, 1ST PHASE.			
Collected in (Task)	**Collection method**	**Description**	**Contributing to**
T1.6. & T2.6.	Expert workshop (4.6.2024) with the BSH2 consortium members (60 participants).	T1.6. and T2.6. organized a co-creative expert workshop for the consortium to enhance understanding on community insights on hydrogen and co-create means to facilitate benefit-sharing on a local level. Experts participating the workshop were divided into small focus groups, where each group responded to the following questions: 1) Have your H2 related initiatives faced local or public opposition? If so, where has it stemmed from? 2) How have you / your institution resolved such opposition? 3) How could the BalticSeaH2 prevent local opposition and share benefits over the project work with local communities? Workshop insights were collected though online Menti-tool and notes from discussions.	Public and community acceptance
T2.1.	Country profile questionnaire (Autumn-Winter 2023)	As part of task 2.1. (Country profiles) a questionnaire was sent to the consortium to investigate the current state, drivers, and barriers of hydrogen transition in each BSR country, including questions about social acceptance and awareness. Consortium members from each BSR country responded to the questionnaire. However, the answers received were insufficient to paint a picture of social acceptance in BSR.	Public awareness
T2.1.	Literature review on hydrogen acceptance and awareness in BSR (April-May 2024)	Since the country profile questionnaire could not respond to questions related to social acceptance and awareness of hydrogen in BSR in a sufficient manner, a literature review was conducted, consisting of 33 academic papers on hydrogen acceptance from the BSR, as well as public opinion data from European Social Survey (ESS 2016), Eurobarometer (2022), and Clean Hydrogen Partnership JU (2023).	Public awareness and acceptance, community acceptance

		Papers published from 2014 to 2024 were searched from Wiley, Scopus, Taylor & Francis and Google Scholar with the Boolean operator: (“acceptance” OR “acceptability” OR “social license to operate” OR “awareness” OR “opposition” OR “resistance”) AND (“hydrogen”) AND ("Denmark" OR "Finland" OR "Norway" OR "Sweden" OR "Germany" OR "Latvia" OR "Lithuania" OR "Estonia" OR "Poland")“. The main findings of each paper were summarized to table (see Appendix 1).	
T8.1.	Media monitoring data February-June 2024	Through a media monitoring service (Retriever), task 8.1 follows to what extent and how hydrogen is discussed in media and social media.	Public awareness

2.1. Ethics and Gender Dimension

Task 2.6. recognizes that ethics and gender dimensions are integral to the work in BalticSeaH2, as their application enhances the excellence and social relevance of not only the project, but also of the broader green hydrogen transition in the BSR. Ethics and gender dimension are also core aspects of this task, and as such, this deliverable has been approached with an ethics and gender dimension lens.

In practice, all data collection phases will extract gender-disaggregated and other social group specific data (e.g. nationality, age, socio-economic status) whenever accessible. In the first phase, gender-separated data was extracted from the country profile questionnaire, the literature review, and media review when possible.

3. Summary of key results

3.1. Status of public acceptance and awareness of hydrogen transition in the Baltic Sea Region

The Baltic Sea Region (BSR) demonstrates a complex landscape of public acceptance and awareness of hydrogen transition. Although literature and knowledge on the public acceptance and awareness of hydrogen remains scarce, through an assessment on the available hydrogen acceptance literature (27 academic papers from the BSR), coupled with BalticSeaH2 workshop findings, this document can provide preliminary insights of the current state of public acceptance and awareness of hydrogen in the BSR, as well as the drivers and barriers behind public acceptance.

This section presents these insights in two sub-sections: Public awareness (3.1.1.) and Public acceptance (3.1.2.).

3.1.1. Public awareness

Research on the public awareness of hydrogen technologies show mixed results: Whilst some outputs (see e.g. Clean Hydrogen Partnership JU, 2023) indicate rather high public awareness of hydrogen energy (82% on European level), others suggest low awareness (Arlt et al., 2023; Bentsen et al., 2023; Baur et al., 2022; Emodi et al., 2021; Oltra et al., 2017; Sloka et al., 2014; Viks-Binsol et al., 2021).

According to a recent Clean Hydrogen Partnership JU survey report (2023)[1], in the context of the BSR, general awareness of hydrogen is highest in Germany (90%), and lowest in Denmark (63%)[2]. According to the report, awareness is highest when it comes to the usage of hydrogen as a fuel for transport, and lowest when it comes to use of hydrogen for heating (Figure 4). Interest to learn more about hydrogen varies in the BSR, ranging from 51% (Denmark) to 77% (Poland). On the other hand, a recent Estonian study outlined that "The main problems with social acceptability are people's low awareness of hydrogen use and the fear and ignorance of previous accidents." (Viks-Binsol, 2021, p. 13). According to Arlt et al. (2023) and the Clean Hydrogen Partnership JU (2023) report, men appear more informed of hydrogen technologies than women[3].

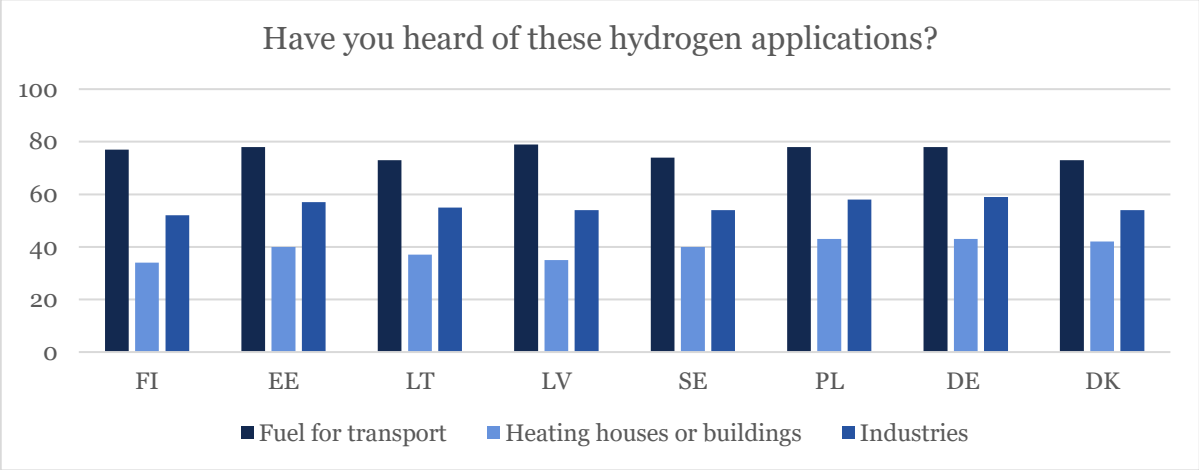

Figure 4. Percentage (%) of respondents per country who have heard about the different hydrogen applications (fuel for transport, heating houses or buildings, industries). Extracted from the Clean Hydrogen Partnership JU country factsheets on hydrogen awareness (2023).

Most awareness studies concentrate on single hydrogen technologies (e.g., hydrogen fuels or domestic usage of hydrogen). As such, the extent of public awareness of the scale, magnitude and sustainability of the green hydrogen transition, including substantial infrastructural development from wind and solar farms to electricity transmission lines and hydrogen transmission pipelines, storages, and hydrogen production and end-use facilities, also remains unclear in the BSR. In the country profile questionnaire, some partners also expressed concern of both the lack of public awareness and public awareness raising activities[4]. Based on the questionnaire, Germany appears to have most extensive ongoing public

[1] The Clean Hydrogen JU survey (2023) sample consists of approximately 1000 online survey responses, 1190 telephone interviews, and 25,934 field interviews conducted in 2022.
[2] In the Clean Hydrogen JU (2023, p.22) survey report, Chart 15. *"Have you seen, read or heard anything about hydrogen, shown as % by Member State",* 90% of German respondents responded that they have heard about hydrogen, in contrast to 63% of Danish respondents.
[3] In the Clean Hydrogen JU (2023, p.22) survey report, Chart 16. *"Have you seen, read or heard anything about hydrogen, shown as % by key sociodemographic groups",* 36% of men responded that they are familiar with hydrogen, in contrast to 22% of women respondents.
[4] Country profile questionnaire, Autumn-Winter 2023

awareness-raising activities, ranging from project-led information campaigns to national campaigns, while Poland, Norway and Estonia appear to have little on-going awareness-raising campaigns.

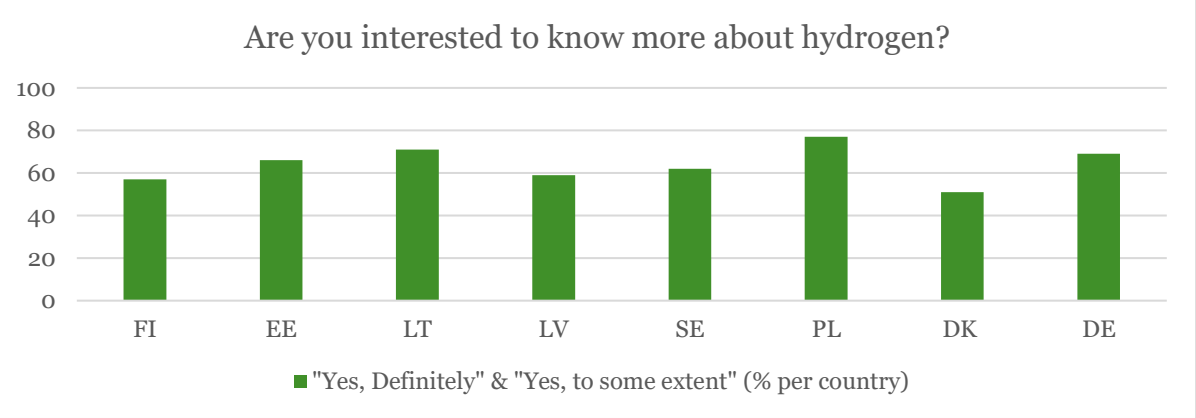

Figure 5. Percentage (%) of respondents per country who are interested to know more about hydrogen. Extracted from the Clean Hydrogen Partnership JU country factsheets on hydrogen awareness (2023).

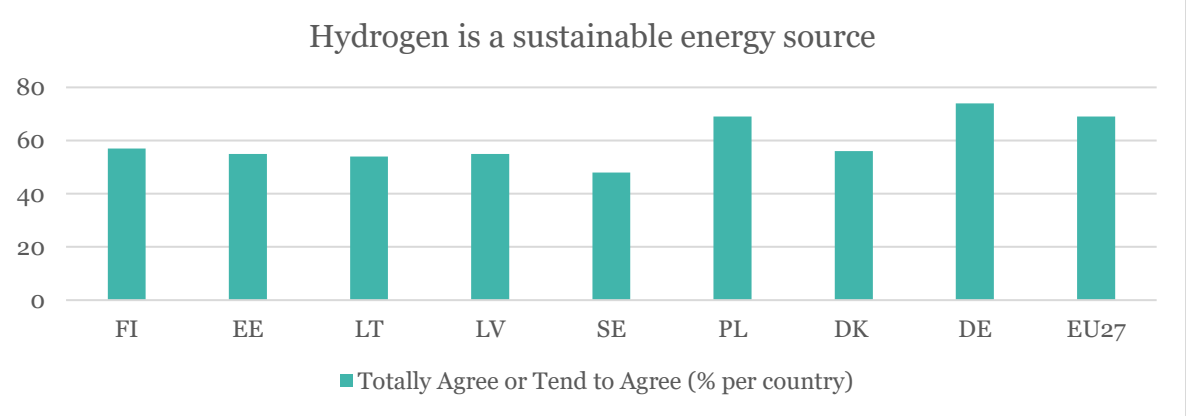

Figure 6. Percentage (%) of respondents per country who Totally Agree or Tend to Agree that hydrogen is a sustainable energy source. Extracted from the Clean Hydrogen Partnership JU country factsheets on hydrogen awareness (2023).

To boost public awareness, BalticSeaH2 is constantly communicating about the project activities on several channels, such as website, newsletters, traditional media, events and other engagement activities and active social media. In the Finnish context, T8.1. collects for example social media monitoring data around BalticSeaH2 channels & key terms (beginning from February 2024), which indicates high interest in hydrogen is key word "hydrogen economy" with a potential reach of 22.9M[5]. As such, the current media date for exposure for the project is expected to increase during the project span. Based on this initial media monitoring data, currently, the active parties in traditional and social media are

[5] Figure is derived Finnish media survey service and estimates potential reach for digital media content with key word #hydrogen economy and #vetytalous for the period of Feb 2024-June 2024 (Retriever Service June 2024, search with key words "hydrogen economy" and "vetytalous" in Finland)

mainly politicians, or industry representatives, with discussion topics circling around hydrogen investments.

3.1.2. Public acceptance

At a broader level, green hydrogen appears to enjoy high public acceptance driven by concerns over climate change and energy security (Bentsen et al., 2023; Clean Hydrogen Partnership JU, 2023; Hä; ußermann et al., 2023). For instance, European Social Survey (ESS, 2016) and Eurobarometer (Flash Eurobarometer, 2022) survey results demonstrate public concerns over climate change and dependence on fossil fuels, as well as a correlation between the Russian annexation of Ukraine (Flash Eurobarometer, 2022; Loewe et al., 2024) and strong public sentiments for EU Member States to invest in renewable energy[6]. According to a recent survey study conducted by the Clean Hydrogen Partnership JU (2023) the public views hydrogen as a good solution for reducing energy dependence.

However, perceptions on the environmental benefits of hydrogen vary, and seem to be linked to the means of hydrogen production. For instance, generation of electricity via renewables, such as wind, solar, and hydropower, enjoys public support in the Baltic Sea Region (Clean Hydrogen Partnership JU, 2023; ESS, 2016), indicating that green hydrogen also enjoys higher public acceptance than grey, blue, or pink hydrogen. On the other hand, the public support to pink hydrogen is likely to vary, as, for instance, nuclear power enjoys higher support in Poland, Lithuania, and Finland in contrast to other BSR countries (ESS, 2016). The degree to which climate change concerns drive public support to hydrogen also varies, as for instance, Baltic countries are less concerned than other EU Member States about air pollution and about greenhouse gas emissions (ESS, 2016).

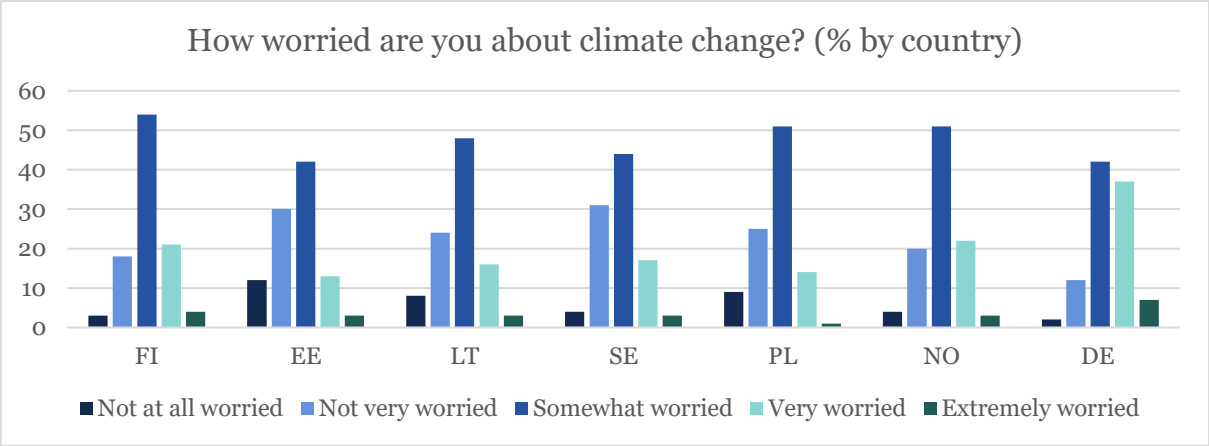

Figure 7 Percentage (%) of respondents per country. Extracted from European Social Survey Round 8 (2016).

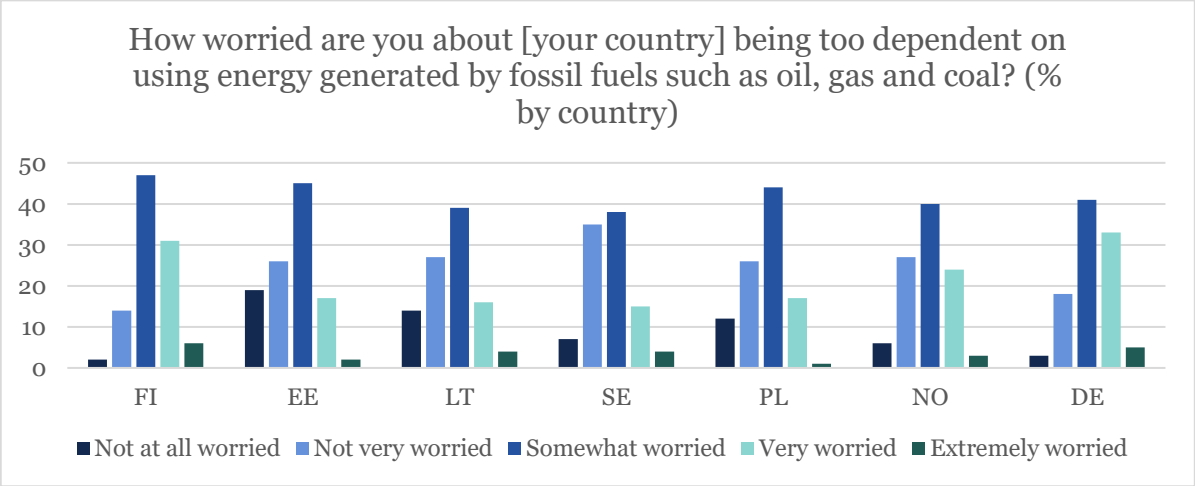

Figure 8 Percentage (%) of respondents per country. Extracted from European Social Survey Round 8 (2016).

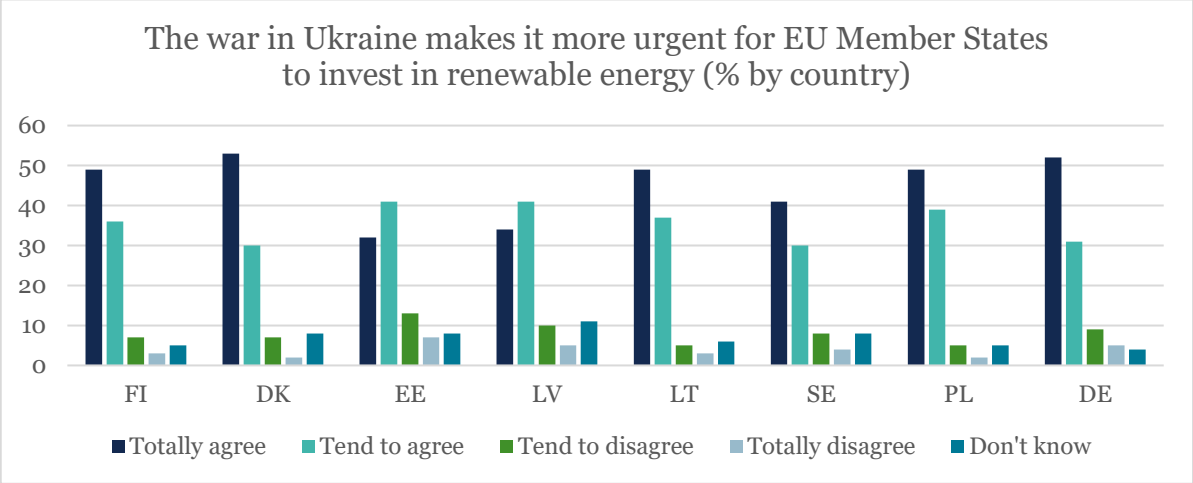

Figure 9 Percentage (%) of respondents per country. Extracted from Flash Eurobarometer 514 data, "EU's response to energy challenges" (2022). Base: all respondents (n=26 337).

In addition to concerns over climate change and energy dependence, safety and security-related sentiments are critical factors in public acceptance of hydrogen technologies in the BSR. Safety concerns stem from the inherent properties of hydrogen as a highly flammable and explosive gas, fear of potential for accidents and the perceived risks associated with storing and transporting hydrogen (Baur et al., 2022; Emodi et al., 2021; Goraj et al., 2022; Sloka et al., 2014; Vallejos-Romero, 2022). Past accidents (Asna Ashari & Koch, 2024; Damman et al., 2021; Viks-Binsol et al., 2021) and historical associations with hydrogen bombs further exacerbate fears, as the public may conflate contemporary hydrogen applications with destructive weapons[7]. On a European level, 59% consider hydrogen as safe as any other energy source, with BSR countries (particularly Sweden and Latvia) being less convinced of the safety of hydrogen (Figure 10). While gender-specific literature on hydrogen acceptance in BSR is scarce,

[7] Workshop finding, 4.6.2024

some research outputs (Clean Hydrogen Partnership JU, 2023; Schönauer & Glanz, 2022) indicate that women are more critical towards hydrogen technologies and have more frequently concerns over their sustainability and safety.

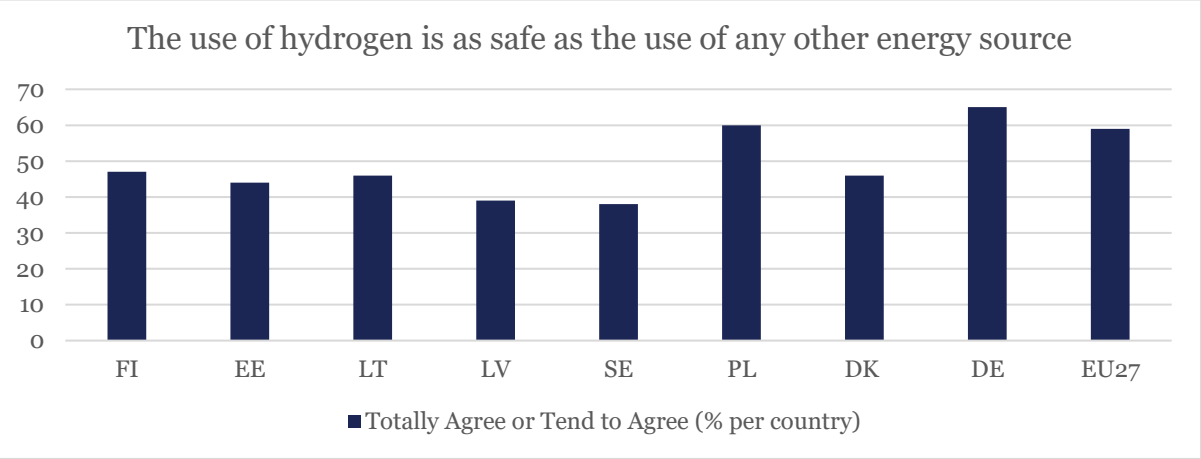

Figure 10 Percentage (%) of respondents per country who think that hydrogen is as safe as other energy sources. Extracted from the Clean Hydrogen Partnership JU country factsheets on hydrogen awareness (2023).

Security concerns are likely heightened by the current geopolitical climate, particularly due to Russian aggressions and the ongoing conflict in Ukraine[8]. As a result, communities and stakeholders may be more wary of adopting new technologies, such as hydrogen infrastructure, due to potential risks of sabotage, terrorism, or military conflicts. The heightened awareness of these risks means that any hydrogen infrastructure must demonstrate high-level security measures to gain public and stakeholder trust.

Research also indicates that public acceptance of hydrogen technologies tends to decrease with large-scale infrastructure projects and their proximity to communities (Schönauer & Glanz, 2022). Despite high public acceptance of green energy technologies, some community-level opposition to hydrogen initiatives has been detected, similar to wind and solar power initiatives in the BSR[9]. Studies suggest that community concerns namely stem from safety and security issues (Baur et al., 2022; Vallejos-Romero, 2022; Emodi et al., 2021) although some NIMBY (Not In My Backyard) opposition has also been identified (Schönauer & Glanz, 2022). The BalticSeaH2 consortium has also identified several patterns of community concerns and opposition to hydrogen initiatives. Key concerns include the utilization of heat, the size of Power-to-X (P2X) plants, safety issues, and impacts on local nature and culture[10]. Additionally, local opposition to wind power could extend to hydrogen initiatives, particularly in areas with minimal existing industrial activity.

[8] Workshop finding, 4.6.2024
[9] Growing local opposition towards wind power in the BSR stems from a variety of concerns, ranging from environmental costs and biodiversity loss, noise and visual disturbance, place identity, place-technology-fit, and perceived threats to property value and other industries (See e.g., Westlund & Wilhelmsson, 2021; Wehrmann, 2024; Niskanen et al. 2024)
[10] Workshop findings, 4.6.2024.

Other identified factors contributing to local hesitation and opposition to hydrogen and other green energy initiatives include a lack of trust in governments, science, and companies; insufficient meaningful engagement with local communities; the fast pace of planning and execution; a general unawareness of the benefits and impacts of the proposed technologies; and a lack of significant benefits to the affected community (Arlt et al., 2023; Bentsen et al., 2023; Emodi et al., 2021; Häußermann et al., 2023; Maczka et al. 2023; Oltra et al., 2017; Svartdal & Kristoffersen, 2023). Additionally, political opposition and resistance from the fossil fuel industry against the European Green Deal could potentially influence public support and create challenges for the widespread adoption and implementation of the hydrogen economy in the region[11].

4. Conclusions

Based on the first stage of monitoring data collection, several drivers, and barriers for social acceptance of hydrogen transition were identified (Table 2). While hydrogen technologies seem to enjoy strong public acceptance on a broader level due to their potential to facilitate energy security and decarbonization, on a community-level concerns have been raised over the safety and security, environmental costs and biodiversity loss, noise and visual disturbance, place identity, and place-technology-fit of hydrogen-related infrastructure. Therefore, local engagement processes are likely to hold a critical role in the sustainable and just implementation of the hydrogen transition.

The central role of community acceptance is highlighted by extreme examples from the BSR, where community opposition has halted or canceled energy projects, such as the rejection of wind power by a municipality in Norway in 2019, and the 2023 Norwegian Supreme Court ruling on the illegality of two wind farms in Norwegian Sápmi (AP, 2019; Weston 2024). Although participatory elements in spatial planning processes are common in the BSR, it seems that the participatory processes themselves do not by default prevent conflict, nor solve conflict that arises from new infrastructural or industry development. As such, further dialogue, benefit-sharing (e.g. economic), inclusive spatial planning of the hydrogen infrastructure (e.g., preferring pre-existing industrial sites), and transparent information sharing with local communities is needed in the BSR to facilitate a socially sustainable and just hydrogen transition. Fostering public trust through active community engagement and education, coupled with implementing stringent safety standards, can also help alleviate safety and security fears and build a supportive environment for the hydrogen transition in the BSR. However, currently there exists little general communication towards the public about hydrogen economy, with communication efforts mainly being targeted at businesses and decision-makers.

At present, literature on the social awareness and acceptance of hydrogen is scarce in the BSR, although of recent more literature on the topic has emerged (e.g., 73% of the papers reviewed for this deliverable were published during the past three years). Bulk of the existing literature in the region is concentrated on Germany (33% of papers collected) and Norway (24% of papers collected) while less focus has been placed on other BSR countries. Thus, the efforts of this and other related tasks in the BalticSeaH2 respond to a significant need for more contextual and in depth understanding of public acceptance in the BSR. In addition, most literature and knowledge available is concentrated on the public awareness and acceptance of single hydrogen technologies. Consequently, less focus has been placed on the public

[11] Workshop findings, 4.6.2024.

awareness and acceptance of the hydrogen transition, constituting the whole hydrogen value chain. Thus, this report recommends forthcoming awareness and engagement activities focus on communicating and understanding the needs, concerns, and perceptions of the public regarding the hydrogen transition in the BSR. This is crucial, as the public acceptance of hydrogen transition seems to be detrimentally linked to acceptance of other related energy initiatives and infrastructure, such as wind, solar, and nuclear power, CCUS technologies, fuel cell technologies, and smart grids.

Table 2 Drivers and barriers for public acceptance of hydrogen, and recommendations for further action

PUBLIC ACCEPTANCE OF HYDROGEN	
Drivers	**Barriers**
• Concern over climate change and commitment to decarbonization drives public support to investments in green energy investments, including hydrogen • Russian invasion of Ukraine boosts public and political sentiments to gain energy independence from Russia and to invest in renewable energy. • Hydrogen is seen as a good way to reduce energy dependence and increase energy security. • Community engagement in spatial planning and community-based energy ownership modules are known to boost acceptance in local levels (e.g. communal ownership of wind renewables in Denmark)	• Public and local concerns over safety, security, and sustainability of hydrogen technologies • Lack of public awareness of the existence and sustainability aspects of hydrogen technologies • Growing local opposition to wind and solar power placements on local levels in the BSR stemming from concerns over, e.g., biodiversity loss, noise and visual disturbance, place technology fit, and perceived threats to property value, are likely to spillover to hydrogen transition • Lack of sufficient community ownership or people-first structures (e.g. legislation) in most Baltic Sea Region countries • Insufficient participation of local stakeholders in the planning and implantation of the green hydrogen transition to mitigate opposition • Lack of understanding of public acceptance and awareness of the hydrogen transition (value chain approach)
RECOMMENDATIONS FOR FURTHER ACTION	
• Transparent sharing of information with the public from all parts and actors of the hydrogen value chain • Early and continuous engagement of local communities and integration of local perspectives to the planning and implementation of hydrogen initiatives	

- Economic benefit-sharing with local communities, through co-financing, local job creation, and contributions to local infrastructure[12]
- Sustainable spatial planning (e.g., preferring pre-existing industrial sites, mitigation environmental impacts)
- Harmonizing safety management practices
- Integration of social justice perspectives into the political coordination of hydrogen transition (e.g. to national, regional and European Hydrogen Strategies)
- Further research on the public acceptance and awareness of the hydrogen transition
- Continuous collaboration between different operators across the value chain to combat challenges

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Appendices

Appendix 1. Findings table of the literature review.

Table 3 List of literature and main findings of the literature review, conducted in April-June 2024.

Authors	Title and link	Country	Main findings
Svartdal & Kristoffersen, 2023	Why in my backyard (WIMBY): Forging the link to community futures when energy transition projects are met with indifference	Norway	- This paper introduces the concept of "Why in my backyard" (WIMBY) to describe local indifference or reluctance toward participating in energy transition projects at the community level. - Paper recognizes the critical role of hydrogen in Norwegian energy transition - Case Studies: Based on pilot projects in Arctic Norway (Lofoten and Senja), the study shows how local communities passively accept or reluctantly support green energy measures in fisheries and energy systems. - Implications of WIMBY: The findings suggest that even if local communities support green transitions and acknowledge climate challenges, they may not perceive the relevance of these changes to their immediate community, potentially hindering project anchoring and success. - Challenges and Barriers: The paper highlights challenges such as overlooking local practices, inadequate community engagement, and the risk of WIMBY turning into active opposition (NIMBY) if community concerns are not addressed. - Recommendations: To enhance community engagement and project success, the paper recommends early consideration of local practices and values, fostering genuine dialogue and trust, and tailoring energy projects to align with community needs and aspirations.

Arlt et al., 2023	What does the public know about technological solutions for achieving carbon neutrality? Citizens' knowledge of energy transition and the role of media	Germany	- Low Knowledge Levels: The study highlighted significant knowledge deficits among the German population regarding awareness of imminent changes in the energy system and principles of hydrogen use. For instance, only about 40% understood electrification, while concepts like power-to-X and sector coupling were largely unfamiliar, known by less than 15% of respondents. - Knowledge Distribution: Knowledge about technological solutions for the energy transition is unevenly distributed. While 10% showed high knowledge levels, a substantial portion (35-45%) indicated they did not know answers to knowledge questions, demonstrating a prevalent "not knowing" category. - Influence of Control Variables: Gender, education level, and personal interest in climate issues consistently influenced knowledge levels. Higher education and male gender were positively associated with both awareness-knowledge and principles-knowledge, while personal interest in climate change positively influenced awareness-knowledge. - Limited Role of Media: Contrary to expectations, exposure to journalistic media and non-media actors showed weak or even negative associations with knowledge levels. Public television use had slight positive associations with awareness-knowledge, while private television use showed negative associations. Information from scientific actors had a small positive effect on awareness-knowledge of energy system changes, but

			information from political and economic actors had a negative impact on principles-knowledge of hydrogen. - Implications and Future Research: The study questions the effectiveness of traditional media in enhancing public knowledge on technological solutions for energy transition. It suggests exploring alternative communication channels like direct engagement with scientific information or integrating knowledge transfer into entertainment formats to potentially improve public understanding
Goraj et al., 2022	Validity of decision criteria for selecting power-to-gas projects in Poland	Poland	- The study assessed several criteria for P2G project implementation, highlighting substrate resources (C3) and investment return time (C2) as the most crucial factors. These were consistently prioritized across stakeholder groups, indicating their fundamental importance in project planning. - Low Priority of Social Acceptance: Social acceptability (C5) emerged as the least significant criterion across all surveyed groups. This suggests that while public perception is acknowledged, it holds less weight compared to economic and resource-related considerations in decision-making processes. - Public Awareness and Acceptance: Despite being a minor factor, there is recognition of public awareness regarding the importance of developing low-carbon technologies. This awareness extends to potential social resistance, which can initially hinder project initiation but may evolve positively over time

			with effective communication strategies. - Local Concerns: Specific local concerns, such as odor issues from biogas plants, have historically affected public acceptance in Poland. However, studies indicate that acceptance can improve post-construction as communities experience the benefits and mitigate initial concerns. - Policy and Implementation Challenges: While environmental policies (e.g., EU's zero CO2 goals) are crucial for guiding renewable energy investments, they were omitted in quantitative analysis due to their complexity. Policy issues pose challenges in quantification but are integral for shaping the regulatory landscape for P2G technologies.
Upham et al., 2020	The revolution is conditional? The conditionality of hydrogen fuel cell expectations in five European countries	Europe	- Expectations data from a large scale stakeholder interview process in five EU countries. - These expectations are conditional on uncertain socio-politics and policy as well as technology. - Individual expectations have policy value in terms of highlighting conditions to be met.
Oltra et al., 2017	The public acceptance of hydrogen fuel cell applications in Europe	Europe	- less than half of the population in the seven countries surveyd are aware of the existence of hydrogen and fuel cell technologies in the context of energy production - "we observed higher levels of awareness of HFC applications in Germany and Norway, and a low-er level in Spain, France and the UK. Acceptance of home fuel cells was clearly higher in Germany, Slovenia and Spain, whilst acceptance of HFCEVs was higher in Norway and

			Spain. We finally found that affect, perceived benefits, trust and age were significant correlates of acceptance of home fuel cells. For acceptance of HFCEVs, affect, trust, age and preference for conventional cars were the most associated variables" (p.10)
Belova et al., 2023	The more the merrier? Actors and ideas in the evolution of German hydrogen policy discourse	Germany	- The discourse shows little polarization and conflict. - It was long clustered around non-exclusive proposals which sought funding. - Economic actors and political components of the discussion are the most prominent. - Economic stakeholders, particularly from the car and energy industries, played central roles in shaping the discourse. They emphasized hydrogen's potential for climate-neutral energy solutions amidst competitive pressures and transformation challenges. - Initially centered on hydrogen applications, the discourse evolved to include broader themes like climate neutrality. Discussions expanded to sectors beyond transport, such as steel and heavy-duty transport, reflecting changing priorities and technological potentials. - Political agendas strongly influenced the discourse, highlighting strategic cooperation, policy support, and international relations in hydrogen development. Recent geopolitical shifts, like Germany's decoupling from Russian energy, further shaped the discourse landscape.
Loewe et al., 2024	The Impact of the Russian War against Ukraine on the	Germany	- The Russian-Ukrainian war prompted a shift in the German hydrogen discourse from sustainability and climate

	German Hydrogen Discourse		change mitigation to securing energy supplies and developing new energy partnerships. - Post-invasion, topics such as "Nord Stream 2," "LNG Terminals," and "German-Canadian Hydrogen Partnership" gained significant attention, reflecting Germany's strategic response to the geopolitical changes. - The discourse shift influenced policy adjustments, including updates to the German National Hydrogen Strategy and the announcement of a hydrogen import strategy for 2023. - There was an increased emphasis on the external dimension of Germany's hydrogen policy, highlighting the importance of international energy partnerships and the "H2Global" initiative. - Discussions on "H2 readiness" of LNG terminals underscored the integration of hydrogen into Germany's energy infrastructure, accelerating the adoption of green hydrogen technologies.
Häußermann et al., 2023	Social acceptance of green hydrogen in Germany: building trust through responsible innovation	Germany	- Lack of knowledge towards hydrogen - Openness towards local use of H2 - High expectations for H2 regarding environmental and climate protection - H2 acceptance relies on trust in science, government, and media - Participatory processes can promote acceptance and foster trust
de Leeuw & Vogl, 2024	Scrutinising commodity hype in imaginaries of the Swedish green steel transition	Sweden	- Green steel production is a flagship project for Sweden, aiming to lead globally in environmental sustainability and become fossil-free. - It promises significant emissions reductions in steel

			production, addressing a major source of pollution. - However, it also risks increasing pressures on Indigenous Sami lands, local communities, and biodiversity due to increased mining and energy consumption. - The narrative constructs a powerful sociotechnical imaginary that promotes growth-oriented green transitions, overshadowing alternative sustainable pathways. - It reproduces colonial logics of resource extraction, portraying Northern Sweden as an empty frontier ripe for industrial exploitation, neglecting historical and ecological contexts
Jikiun et al., 2023	Saved by hydrogen? The public acceptance of onshore wind in Norway	Norway	- Mild Opposition to Onshore Wind: People generally oppose wind farms in their area and adding hydrogen production doesn't significantly change this - Offering compensation for property value losses doesn't increase support; electricity discounts do - Highlighting renewable energy benefits makes people neutral, but local hydrogen distribution boosts support significantly - Younger and more educated respondents are more supportive, especially with hydrogen-related scenarios. - Urban areas typically support wind farms more, but hydrogen integration shifts support positively in rural areas, especially among villagers.
Moula et al., 2017	Public acceptance of biofuels in the transport sector in Finland	Finland	- A significant portion (60%) of respondents lack sufficient information about biofuels, hindering their willingness to purchase and use them for transportation.

			- Half of the respondents believe that biofuels derived from food crops contribute to increased food prices and greenhouse gas emissions, leading 50% to oppose purchasing such biofuels. - Half of the respondents also indicate that the lack of biofuel availability at petrol stations is a barrier to their adoption, suggesting that improving accessibility could increase consumer uptake. - A majority (60%) of respondents look to governments to lead initiatives that reduce biofuel prices, indicating a strong reliance on government action to facilitate biofuel adoption in the transportation sector. - Among car owners surveyed, 60% prefer electricity and 20% prefer hydrogen as ideal fuels, highlighting a strong inclination towards renewable energy sources if technological barriers and availability issues can be addressed.
Hassan et al., 2024	Mapping Europe renewable energy landscape: Insights into solar, wind, hydro, and green hydrogen production	Europe	- Renewable Energy Surge: EU and UK make significant strides in solar, wind, hydro, and green hydrogen production. - Germany Leads the Way: Germany emerges as a renewable energy powerhouse, setting the production benchmark. - Green Hydrogen Rising: Germany and France shine in green hydrogen, highlighting its role as a crucial fuel source. - Energy Transition Trends: Countries with high electricity demands drive the shift towards renewables. - Regional Powerhouses: Northern Sweden, Germany, and France identified as

			renewable energy hubs; supply-demand balance key.
Inderberg, 2023	Institutional context, innovations, and energy transitions: Exploring solar photovoltaics with hydrogen storage at a secondary school in Norway	Norway	- The study emphasizes the critical role of local government and administration in driving sustainable energy transitions, often overlooked in existing literature. - Institutionalized cultural identity and historical ties to technology in Kongsberg municipality provided a foundation for innovative energy solutions. This included establishing a semi-independent public property company (KKE) in 2001. - Key moments of policy entrepreneurship played a pivotal role in advancing radical energy solutions, such as solar PV, smart-grid optimization, and hydrogen storage at Vestsiden High School. - Formal decisions and mandates granted significant autonomy to local initiatives, shielding them from immediate political pressures and enabling long-term innovative projects. - The success in Kongsberg underscores the importance of aligning formal mandates with a supportive cultural and organizational environment to foster energy innovation, potentially serving as a model for other municipalities.
lker & Klagge, 2024	Infrastructure Bottlenecks as Opportunity for Local Development: The Case of Decentralized Green-Hydrogen Projects	Germany	- The study highlights the critical role of energy infrastructures and market design in shaping decentralized green-hydrogen production and local development, particularly in Germany. - Infrastructure bottlenecks dictate where and how green hydrogen can be produced and consumed, influencing the alignment between renewable

			electricity generation and hydrogen production locations. - Germany exhibits a dual geography of green-hydrogen production: large centralized projects in the north and smaller decentralized projects across the country, driven by local renewable electricity availability and transmission-grid limitations. - Green-hydrogen markets are interconnected with renewable-electricity markets, where geographical and temporal correlations play a crucial role defined by EU market regulations. - The study underscores the political nature of market design and infrastructure decisions, which shape the distributional effects of green-hydrogen production and its integration into broader energy systems.
Bentsen et al., 2023	In the green? Perceptions of hydrogen production methods among the Norwegian public	Norway	- There is limited public awareness about hydrogen fuel and its production methods. Many confuse 'hydrogen fuel' in general with environmentally friendly 'green hydrogen'. - Public acceptance of hydrogen varies significantly based on production methods. 'Green' hydrogen, produced from renewable sources, enjoys the highest acceptance (average score 3.9 out of 5), while 'blue' and 'grey' hydrogen, produced from fossil fuels with or without carbon capture, receive lower scores (3.2 and 2.3 respectively) - Support for hydrogen technologies, especially green hydrogen, correlates with higher levels of concern about climate change. Political affiliation also plays a role, with different groups showing

			varying levels of support for different production methods. - Miscommunication or lack of clarity regarding hydrogen production methods, especially for blue and grey hydrogen, could lead to public resistance and reduced trust in government and industry initiatives. Around 20% of the public remains undecided or uninformed about hydrogen as a fuel. - Policymakers need to enhance public understanding of hydrogen technologies and clarify the environmental implications of different production methods to align public expectations and avoid potential backlash.
Scherrer, 2023	How media coverage of technologies affects public opinion: Evidence from alternative fuel vehicles in Germany	Germany	- Media coverage of energy technologies can influence their evaluation by the public - Media attention towards alternative fuel vehicle (AFV) technologies, particularly battery electric vehicles (BEVs), varies in frequency and tone over time, influencing public attitudes differently across technology types. - Media portrayal of BEVs versus fuel cell electric vehicles (FCEVs) shows conflicting sentiments, potentially influencing how individuals perceive and choose between these technologies. - Media emerges as a significant mediating force in shaping public perceptions and attitudes towards technological transitions, indicating the need for both policy and media attention to drive sustainable technology adoption. -
Gordon et al., 2022	Homes of the future: Unpacking public perceptions to power	Global, includes data	- Few researchers have examined behavioral acceptance for hydrogen homes.

	the domestic hydrogen transition	from Norway and Germany	- Hydrogen remains a remote and neutral proposition to most of society. - Domestic hydrogen acceptance hinges on overcoming attitudinal and cost barriers. - Financial costs of hydrogen appliances are the principal concern for most consumers. - Socio-political acceptance may rest on public perceptions of blue hydrogen.
Vallejos-Romero, 2022	Green hydrogen and social sciences: issues, problems, and future challenges	Europe	- The green hydrogen value chain spans production from renewable sources to end-use applications, influencing social acceptance differently across regions and contexts. - Public perception of green hydrogen varies globally, with significant gaps in understanding its production processes and benefits, highlighting the need for more comprehensive public education and awareness campaigns. - Safety concerns, particularly during storage and transport stages, influence public trust in green hydrogen technologies, emphasizing the importance of effective risk communication strategies. - Effective policies and regulatory frameworks are crucial for advancing green hydrogen adoption, with varying approaches and priorities observed across different countries and regions. - Social acceptance of green hydrogen technologies, especially in sectors like transportation and residential energy, is influenced by factors such as familiarity with technology, infrastructure availability, and environmental awareness.

Scovell, 2022	Explaining hydrogen energy technology acceptance: A critical review	Global (review)	- Perceived effects, and associated emotions, are strong predictors of acceptance. - Unclear what context-specific beliefs underpin attitudes towards hydrogen. Most studies focused on acceptance of hydrogen fuel stations and hydrogen cars. - A dearth of research investigating acceptance of the whole hydrogen value chain. - Identified inconsistencies in the measurement of psychological constructs.
Maczka et al. 2023	Epistemic justice impossible? Expert perceptions of the participatory monitoring of geo-energy projects in Poland	Poland	- Three distinct narratives emerged among experts regarding public participation in geo-energy projects: emphasizing expert dominance, advocating for partnerships, and promoting informative engagement. - Despite narrative differences, there was consensus among experts on the importance of engaging local communities in geo-energy projects to build trust, with investors seen as responsible for organizing this process. - Experts generally assert their epistemic dominance but vary in their openness to non-expert participation in environmental monitoring and decision-making, highlighting potential for epistemic injustice. - The study identified varying contexts for hermeneutical justice in experts' interactions with non-experts, from cautious listening to one-way communication, influencing the quality of participatory democracy in practice.
van der Leer et al., 2023	Energy systems in sustainability-profiled districts in Sweden: A literature review and a socio-technical ecology	Sweden	- The review synthesizes 70 articles spanning from 2003 to 2021 on energy systems in sustainability-profiled districts in Sweden, highlighting

	approach for future research		interdisciplinary gaps and extensive but fragmented research. - Identified themes include conceptualizations and critiques of sustainability-profiled districts, evaluations of energy goals, technical and economic assessments of heating/electricity systems, integration of innovative energy solutions in urban planning, stakeholder perspectives, collaboration, and governance/policy instruments. - Prominent districts studied include Hammarby Sjöstad, Western Harbor in Malmö, and Royal Seaport in Stockholm, illustrating concentrated research on these model sustainability districts. - The review advocates for a socio-technical ecology approach to understand energy systems' complexities, emphasizing the integration of ecological, cultural, economic, social, and technical dimensions. - Recommendations include developing new energy indicators, enhancing stakeholder inclusion and roles, integrating ecology into energy system planning, and adopting an arena perspective for comprehensive research and planning in urban energy systems
Streimikiene et al., 2021	Energy Poverty and Low Carbon Just Energy Transition: Comparative Study in Lithuania and Greece	Lithuania	- Lithuania has implemented policies targeting energy renovation of residential buildings and promotion of micro-generation technologies to mitigate energy poverty and vulnerability. These efforts aim to enhance living conditions and reduce energy costs, particularly critical during economic recessions.

			- Lithuania shows positive trends in economic indicators driving energy poverty reduction, such as GDP per capita and household energy prices, which are lower compared to Greece and EU-27 averages. However, these indicators are still lower than the EU average. - Lithuania has made significant strides in environmental indicators of low carbon transition. It boasts the highest share of renewables in final energy consumption among Greece and EU-27 countries and has achieved substantial reductions in GHG emissions since 1990. - Despite progress, Lithuania faces challenges with social indicators related to energy poverty. A notable share of households struggle to keep their homes adequately warm, indicating persistent vulnerabilities compared to EU-27 averages. - Expert assessments reveal varying effectiveness of climate change mitigation policies in Lithuania. Policies promoting energy efficiency in buildings are rated highly for achieving just low carbon transition goals, whereas those for promoting renewables require more support due to low awareness and high costs of micro-generation technologies.
Schreiber et al., 2023	Driving discussion: Media framing of electric, hydrogen, and conventional vehicles in German newspapers and Twitter	Germany	- Media frames on alternative fuels differ between German newspapers and Twitter. - Frames about industry and governance dominate newspaper discourse. - Frames about adoption and consumer issues are more common on Twitter.

			- Overall, electric cars are often framed as replacing combustion vehicles. - Hydrogen fuel-cells are framed as playing only a weak role in car markets.
Cheng, 2023	Does time matter? A multi-level assessment of delayed energy transitions and hydrogen pathways in Norway	Norway	- The Russian-Ukraine conflict has sped up the EU's shift towards low-carbon energy, influencing Norway's energy export strategy. - Norway faces depleting gas reserves and declining export value, prompting aggressive petroleum exploration despite environmental concerns. - Norway plans to transition from blue hydrogen (derived from natural gas with carbon capture) to green hydrogen (produced via renewable energy) for long-term viability. - Different scenarios highlight the urgency for Norway to phase out its petroleum sector and ramp up hydrogen production to align with climate goals by 2050. - Timely action is crucial; delaying the transition risks economic instability and loss of competitiveness in the evolving global energy market.
Baur et al., 2022	Assessing the social acceptance of key technologies for the German energy transition	Germany	- general acceptance for all technologies is slightly higher than local acceptance - “studies report low public awareness and knowledge of hydrogen” and “inconsistent results with regard to the acceptance of hydrogen technologies” (p. 14) - “people have mixed attitudes concerning the safety and storage of hydrogen near residential areas” (p.14) - low awareness rooted in moral considerations - more distance à more acceptance

Emodi et al., 2021	A systematic literature review of societal acceptance and stakeholders' perception of hydrogen technologies	Global (review)	- Acceptance papers are dominated by Western European studies. - Prior knowledge, perceived cost, risks and benefits are among acceptance factors. - There was low hydrogen awareness in more than 60% of the countries analysed. - Community engagement, infrastructure availability and safety are common perceptions. - Few post-hydrogen implementation surveys and dynamic social analysis.
Damman et al., 2021	A hybrid perspective on energy transition pathways: Is hydrogen the key for Norway?	Norway	- Hydrogen is identified as pivotal in Norway's sustainable energy transition, particularly for decarbonizing maritime and heavy-duty transport, industrial processes, and providing flexibility services. - Methodological Approach: The study combines qualitative and quantitative methods, utilizing a multi-level perspective (MLP) to analyze how exogenous trends and uncertainties interact with national energy system processes and strategies. - Three distinct pathways towards a low-emission society by 2050 were explored: an "Industry Society" where hydrogen is a significant export; a "Service Society" with reduced dependence on oil and gas but continued transport decarbonization; and a socio-technical pathway suggesting a radical energy system reconfiguration. - The study highlights critical bottlenecks such as infrastructure limitations, legal-administrative barriers, and technological uncertainties, particularly regarding carbon capture and storage (CCS) and wind power integration. It

			underscores the need for new collaborations and interventions. - To advance towards sustainable transitions, the study calls for enhanced integration of socio-technical analysis with quantitative modeling, emphasizing the need for actionable knowledge to guide policy-making and pathway development effectively.
Schönauer & Glanz, 2022	Hydrogen in future energy systems: Social acceptance of the technology and its large-scale infrastructure	Germany	- Hydrogen technology is highly accepted in the German population. - Acceptance is decreasing, when it comes to large-scale infrastructure. - Effects of NIMBY are related to project-related, personal and place-based factors. - NIMBYism can be addressed through increasing trust in stakeholders.
Høyland et al, 2023	Exploring the complexity of hydrogen perception and acceptance among key stakeholders in Norway	Norway	- Four Dimensions of Acceptance: The study identifies four key dimensions influencing hydrogen perception and acceptance in Norway: environmental awareness, infrastructural conditions, public hydrogen profile, and knowledge and trust defining risk perceptions. - Trust and Knowledge Interplay: Trust in technology and comprehensive knowledge about hydrogen are crucial for risk perception and acceptance among stakeholders, influenced by Norway's historical context of high societal trust and stringent safety regimes. - Infrastructural and Market Challenges: The current limitations in hydrogen infrastructure and market readiness, including the need for better solutions for transportation and varied market requirements, are

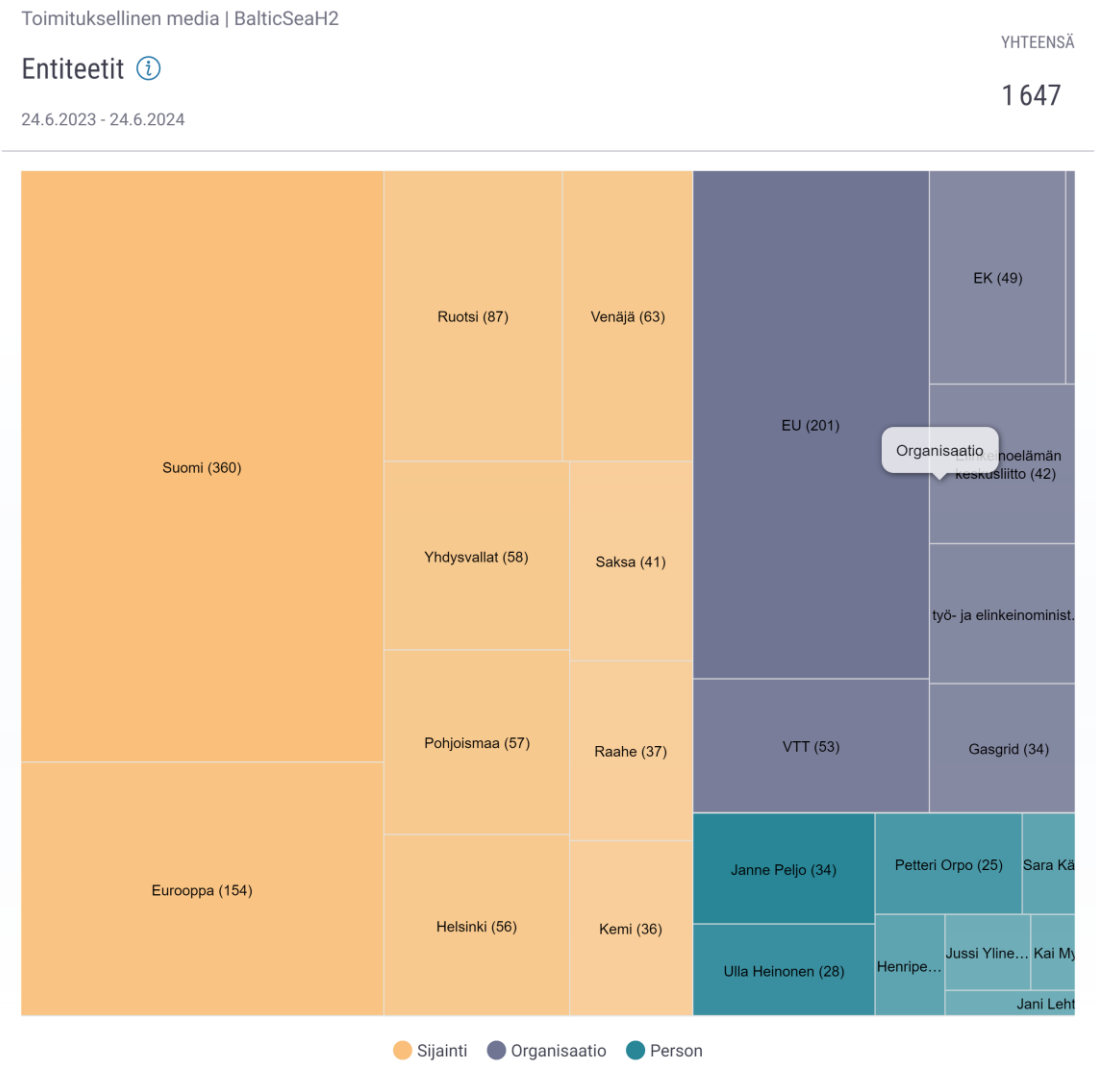
			significant barriers to widespread hydrogen adoption. - Regulatory and Financial Support: Effective national, regional, and local policies, financial support schemes, and clear incentives are essential for advancing hydrogen technology and gaining public acceptance. - Whole System Approach: A holistic perspective that includes societal considerations, regulatory frameworks, and environmental impacts is necessary to understand and promote hydrogen technology adoption in Norway, with further research needed to explore these dimensions in different contexts.
Apostolou et al., 2023	Prospects of the hydrogen-based mobility in the private vehicle market. A social perspective in Denmark	Denmark	- Social perspective on hydrogen-based transportation for private use. - Empirical study assessing potential social barriers of hydrogen vehicle technology. - Public's environmental awareness affects positively the hydrogen transport prospect. - Technology knowledge is a significant parameter towards green mobility. - Hydrogen vehicles capital cost reduction will enhance substantially the market. - Environmental Sensitivity and Technology Awareness: The Danish public's strong environmental sensitivity positively influences their attitude towards hydrogen-fueled vehicles, and awareness of the technology significantly impacts their willingness to invest in FCEVs. - Impact of Media Support: Media plays a crucial role in enhancing public knowledge about hydrogen technology, with increased media support

			likely to improve the market prospects for FCEVs. - Refueling Infrastructure and Costs: While refueling costs do not significantly deter investment in FCEVs, the inadequate refueling infrastructure poses a substantial barrier to market growth. - Vehicle Cost and Market Acceptance: High initial costs of FCEVs are a significant factor affecting public willingness to purchase, indicating the need for price reductions to boost market acceptance. - Survey Methodology and Broader Application: The study's methodology, which includes identifying and correcting biases in survey responses, can be applied to assess the acceptance of sustainable transportation technologies in different contexts and countries.
DUPLICATE	Pathways to the hydrogen economy: A multidimensional analysis of the technological innovation systems of Germany and South Korea	Germany	- Limited Public Awareness: Public awareness of hydrogen technologies in Germany is limited, which affects social acceptance. Although there is generally positive social perception, knowledge about hydrogen technologies is not widespread. - Regulatory Framework Development: Germany's institutional structure, including the regulatory framework and quality infrastructure (QI), is still under development. This evolving framework is critical for ensuring safety and building public trust in hydrogen technologies. - Market and Government Role: The hydrogen market in Germany is concentrated in industrial niches with

			intermediate government involvement. Efforts include R&D funding, demonstration projects, and partial reimbursement of green hydrogen infrastructure costs. - Technological Leadership: Germany holds a leading position globally in various parts of the hydrogen value chain, driven by safety and economic motives. However, the overall system dynamics show that the hydrogen TIS in Germany is in the late formative phase. - Promotion and Acceptance Initiatives: Promotional activities aimed at increasing social acceptance are primarily focused on demonstration projects. There is a need for more proactive public awareness campaigns to mitigate potential adverse effects on acceptance due to incidents or accidents.
Asna Ashari & Koch, 2024	HYDROGEN AS ENERGY SOURCE-CHALLENGES FOR REGIONS IN LATVIA (RESULTS OF PUBLIC OPINION SURVEY).	Latvia	"4. Public awareness of hydrogen energy in Latvia generally can be evaluated as comparatively low, higher acceptance is for part of society with better education. 5. Society in general supports implementation of renewable energy technologies in Latvia and would be interested to receive more information in the media about the use of hydrogen experience in other countries. 6. Society in general agrees that hydrogen technology demonstration project might be suitable activity to increase public awareness about hydrogen energy. 7. Society in general supports the introduction of hydrogen energy industry. 8. There results in regions are different, but there are no significant differences

			on evaluations by region. 9. Hydrogen safety issues have been recognized, though, in average, the majority of respondents totally agreed that "Hydrogen power is safe when all safety standards are met"" (Extracted directly from the survey report)
Sloka et al., 2014	ANALYSIS OF THE HYDROGEN RESOURCES USAGE IN ESTONIA		- The introduction of hydrogen is mainly associated with the risks related to social acceptance, technology and safety. - The main problems with social acceptability are people's low awareness of hydrogen use and the fear and ignorance of previous accidents. The higher cost and low availability of hydrogen technologies also play a role, giving preference to existing conventional technologies

Annex 2. Excerpts from T8.1. media monitoring.



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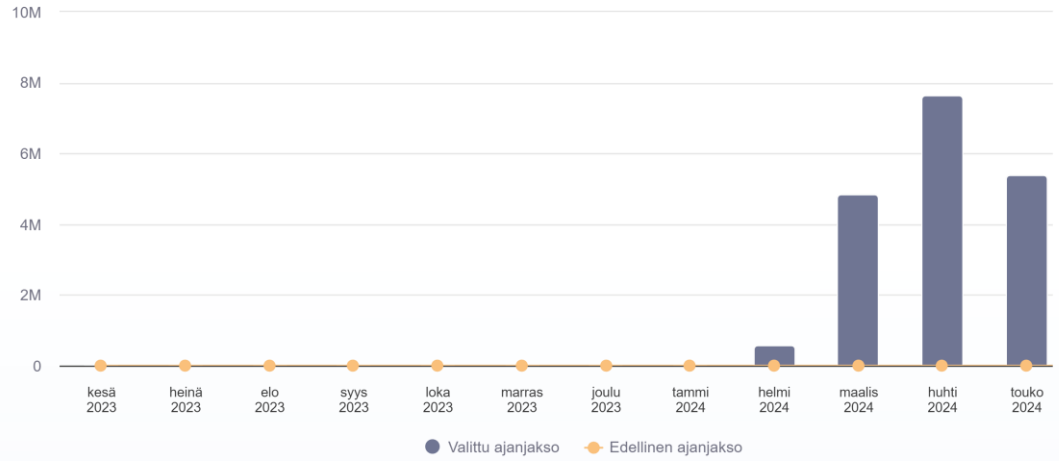
Potentiaalinen yleisö ajan mittaan

24.6.2023 - 24.6.2024

YHTEENSÄ	EDELLINEN AJANJAKSO	VRT EDELLINEN
22.9M	0	–



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Medianäkyvyyden määrä

24.6.2023 - 24.6.2024

YHTEENSÄ	EDELLINEN AJANJAKSO	VRT EDELLINEN
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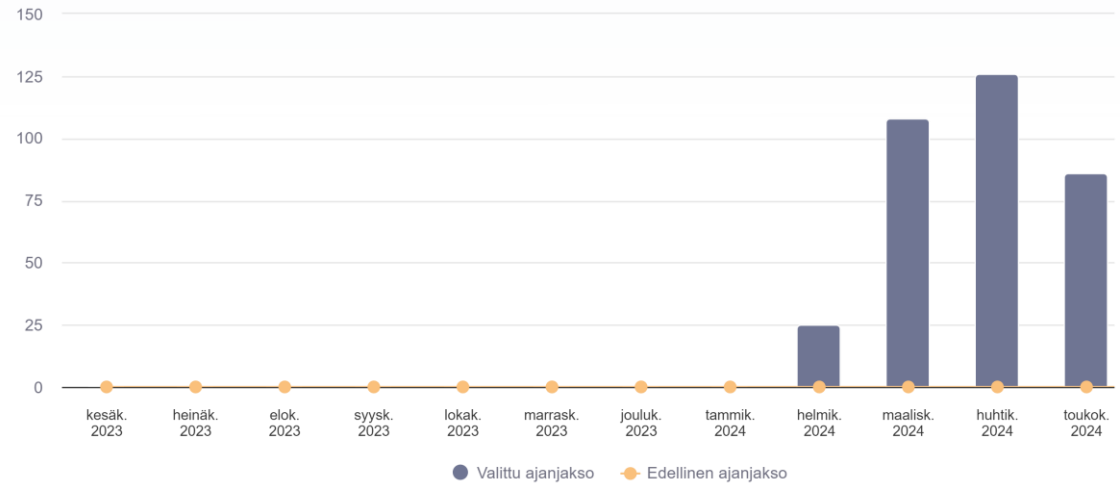

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Yleisimmät 57 avainsanaa

24.6.2023 - 24.6.2024

YHTEENSÄ

6 294

-/+ 60