

EUROPEAN HYDROGEN BACKBONE

**EHB initiative to provide insights
on infrastructure development
by 2030**

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EUROPEAN
HYDROGEN
BACKBONE



Guidehouse

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EHB Maps update

The European Hydrogen Backbone (EHB) initiative is developing a vision for future hydrogen pipeline infrastructure to accelerate the clean energy transition across the European continent. Currently, the EHB initiative has 32 members across 28 countries. The latest numbers published by EHB projecting the size of a pan-EU hydrogen network date from April 2022¹. In the interim, the EHB dynamic online map has been updated to visually reflect an acceleration of all five corridors, as well as further development of national hydrogen infrastructure plans. This publication provides the first official update on the length of the EHB since April 2022.

Since the previous publication, EHB efforts have focused on quantifying the resources needed to implement the envisioned hydrogen network by 2030. As a part of this work, we reassessed the proposed pipeline routes and distances. The overall growth in network length is displayed in Table 1; for a visual overview of the current EHB vision, please consult our [website](#).

The new update shows that repurposed pipelines are still a clear majority of the overall network, and that for both 2030 and 2040 networks, the total length of repurposed pipelines has increased. Please note, however, that the increase in total pipeline length for the 2040 network is still mainly due to newly built pipelines. The previous EHB vision—as laid out in the report ‘A European hydrogen infrastructure vision covering 28 countries’¹—was published right after Russia invaded Ukraine and the European Commission published their REPowerEU targets. Because of these developments and the increased importance of maintaining security of supply, several natural gas pipelines that are currently in operation are to be utilised longer than previously expected, explaining why a large part of the projected growth stems from newly-built hydrogen pipelines.

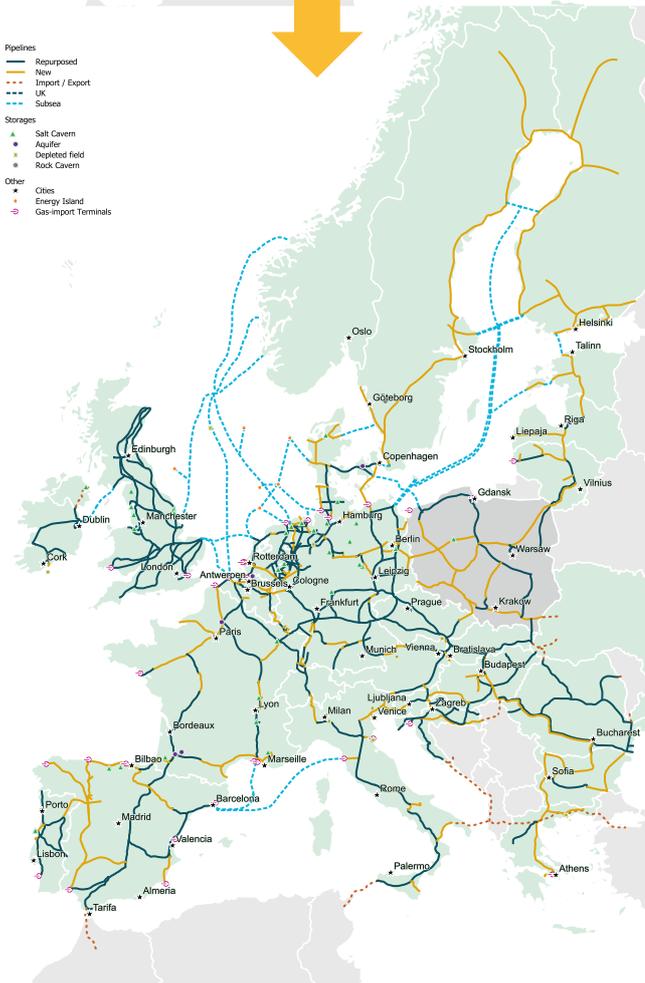
TABLE 1. Overview size of the envisioned EHB network

	Report April 2022 ¹	Current values	% Increase
Year		2030	
Overall length, km	27,986	32,616	17%
Length of repurposed pipelines, km	13,479	16,864	25%
Year		2040	
Overall length, km	53,087	57,662	9%
Length of repurposed pipelines, km	33,703	34,290	2%

¹ A European hydrogen infrastructure vision covering 28 countries, European Hydrogen Backbone, 2022. Source: <https://ehb.eu/files/downloads/ehb-report-220428-17h00-interactive-1.pdf>



EHB Vision 2030



EHB Vision 2040

Context for the development of the network

A European Hydrogen Backbone connecting countries across Europe contributes to a sustainable and affordable energy supply, while allowing for the scale-up of domestic hydrogen production that contributes to energy independence². Furthermore, the EHB facilitates the transport of both domestically-produced and imported hydrogen, traveling either through pipelines or as shipped liquids.

There is a perception that the hydrogen economy is not growing as fast as possible, perhaps because supply, demand, infrastructure, and regulatory actors are all waiting on each other in taking a first steps toward growth—a problem often referred to as the *chicken and egg problem*. The joint vision of the members of the EHB initiative includes the view that building sufficiently sized infrastructure is the most cost-effective, long-term solution to this problem.

Market consultations in many countries are indicating an emerging hydrogen demand, and many industries view hydrogen as a key pillar of their decarbonisation strategy. To be able to supply this emerging demand, sufficient infrastructure must be in place and speed is essential. That is why existing permitting processes governing the build-out of a hydrogen conveyance network must be accelerated in a way that helps the EU reach its targets.

Well-chosen and adequately sized hydrogen corridors can bring together regions with abundant, low-cost hydrogen supply with areas projecting a large hydrogen demand. However, these pipelines must be sized to with foresight to accommodate the expected future hydrogen flows, avoiding insufficient transport capacity as a potential bottleneck for Europe's decarbonisation. Oversizing of hydrogen pipelines—namely the significant costs of doing so—increases risks for the TSOs who will operate future hydrogen infrastructure. This risk must be mitigated to incentivise hydrogen infrastructure build-out.

Furthermore, EHB members believe that early clarity about the phasing of hydrogen network build-out enables the market to decarbonise the energy system at the lowest societal cost. As such, it is important to provide credible information about expected hydrogen infrastructure development to the multitude of actors in the hydrogen value chain.

² Assessing the benefits of a pan-European hydrogen transmission network, Gas for Climate, 2023. Source: <https://gasforclimate2050.eu/publications/>

Upcoming EHB Fall 2023 study

The EHB initiative is publishing a new study in 2023 which elaborates on the still existent challenges spanning the hydrogen value chain. Given the 2030 timeline, these challenges must be overcome as soon as possible to accommodate the full build-out of European Hydrogen Backbone.

A significant focus of the upcoming study is to quantify the financial challenges facing the EHB, particularly those relating to the reduction of investment risks. In the European Commission's 9th Energy Infrastructure Forum in Copenhagen, the Commission has recognised the urgency of these financial challenges, asking several bodies such as the European Hydrogen Bank and the European Clean Hydrogen Alliance to develop tools to address parts of this problem³. The EHB both quantifies and discusses these challenges and in its upcoming paper, aiming to contribute to the dialogue around possible solutions.

The EHB initiative will assess and publish the financial investment required for EHB network build-out, defining and updating key cost metrics associated with hydrogen infrastructure build-out. The paper argues how early hydrogen infrastructure works to enable the European energy transition, facilitating large-scale deployment of renewable energy and hydrogen production. Cross-border infrastructure is a crucial component of the energy value chain – connecting supply with demand and creating the future hydrogen market. Creation of cross-border infrastructure sends important signals to market participants, project developers, and downstream end-users. Innovative tools are required to accelerate its development, including supportive funding and policy proposals to reduce the financial risks around network build-out.

The paper will also highlight a set of in-progress hydrogen infrastructure projects—representing all EHB corridors across Europe—that demonstrate how the committed, tangible ambitions of TSOs are backed by concrete projects. Subsequently, the study considers the conditions required to deploy a pan-EU hydrogen transmission network, such as supporting domestic supply, facilitating hydrogen imports, the need for urgency due to the construction lead times of typical infrastructure projects, workforce needs, and the importance of energy system integration.

³ 9th Energy Infrastructure Forum Conclusions, European Commission, 2023. Source: http://www.cedec.com/files/default/conclusions%209th%20EIF_%2012%20and13%20June%20final1.pdf