

H2 Call of Interest

Virtual Workshop 25/9/24

Questions & Responses

1. Do you see a domestic H2 market development or only H2 production/import to be further transited to Europe?

Our vision is aligned with the purpose of the South-East European Hydrogen Corridor ([SEEHyC](#)), which is a cooperation of seven European gas infrastructure companies (DESFA, Bulgartransgaz, Transgaz, FGSZ, Eustream, NET4GAS and OGE), driven by the vision to secure green hydrogen supply to South-East and Central Europe.

Nevertheless, the development of domestic H2 markets in Europe is essential alongside the production and import strategies outlined in the REPowerEU plan. The ambitious target of the EU for 10 million tonnes of domestic hydrogen production and 10 million tonnes of imports by 2030 highlights the importance of and interdependence of the success of both avenues.

Bulgaria and Greece, given their favorable geographic locations and natural conditions, are well-positioned to play a pivotal role in this dual approach. They can contribute significantly to the development of a local hydrogen market while also serving as key transit points for imports from reliable green sources.

2. Is there any timeline regarding the Regulatory Framework preparation for the green hydrogen in European and local level, which is essential for the energy transactions? Are there any defined milestones regarding this task?

On 15 July 2024, the EU Hydrogen and Gas Market Decarbonization Package (Gas-Hydrogen Package), consisting of Regulation (EU) 2024/1789 on the internal markets for renewable gas, natural gas and hydrogen and Directive (EU) 2024/1788 on common rules for the internal markets for renewable gas, natural gas and hydrogen was published in the Official Journal of the EU. It updates the EU natural gas market rules and introduces a new regulatory framework for dedicated hydrogen infrastructure. Member States must transpose the Gas Regulation within 6 months, so no later than 5 February 2025. The Gas Directive must be transposed into national law within 2 years, so no later than by 5 August 2026.

These tasks need to be carried out on national level by the governments and the NRAs, however BTG and DESFA already participate in the foundation process of the European Network of Network Operators for Hydrogen (ENNOH) and shall put efforts and cooperate in the process for the timely implementation and completion of all mandatory tasks in order to meet hydrogen goals.

3. a. How are you going to treat the lack of relevant laws and regulations that might block or delay your plans? b. What about the safety issues? Are you going to have detailed hazard and risk analysis studies and in what way?

- a. The regulation and creation of a completely new market, including the implementation of planned hydrogen projects, requires the introduction of an appropriate international and national regulatory and legal framework, along with comprehensive studies, research, and analysis at all levels of project implementation. Bulgartransgaz and DESFA actively participate in shaping the hydrogen regulatory framework and are prepared to adapt project timelines if necessary.
- b. In full compliance with all applicable newly adopted legislation TSOs will carry out any necessary in-depth hazard and risk assessments, following EU safety standards, to ensure the safe and reliable operation of the hydrogen transmission infrastructure.

4. Since this is an entirely new market, what measures will you take during the market test process so as for unrealistic projects with no solid background, off taking etc., not to participate and skew the process?

The current study of the H2 market is an initial, non-binding step designed to gather a comprehensive picture of planned hydrogen market developments. To address the aforementioned issue, we have already included a question regarding the maturity status of the projects. In case further proof of technical and financial viability for projects is needed, DESFA and Bulgartransgaz will contact directly market participants and request more information.

Furthermore, and since the Call of Interest is non-binding, we recognize that submitted projects may not be able to materialize in the future, regardless of their current status. Thus, our goal is to gather the most consistent, comprehensive and up-to-date information on hydrogen market development, in order to assess current challenges and help mature the hydrogen market in both countries. In this regard, we are not only welcoming

submissions, but actively encouraging potential stakeholders to share their plans regardless of the level of maturity of their projects.

This collaboration will help us ensure that the necessary infrastructure for hydrogen transmission in the region can be planned and developed in a timely and constructive manner in order to meet all needs in terms of both supply and demand.

5. What type of support funding scheme exist in Bulgaria and Greece to support hydrogen projects? What do you need from both governments/private sector to boost H2 growth?

At EU level, the main source of financial support for hydrogen production/consumption projects is the European Hydrogen Bank ([EHB](#)), a financing instrument, run internally by European Commission services, which plans to accelerate the establishment of a full hydrogen value chain in Europe. Additionally, in December 2024, the Commission will open its second auction for the production of renewable hydrogen via the Innovation Fund.

Bulgartransgaz and DESFA rely on EU funding mechanisms through Connecting Europe Facility (CEF) and other possible tools to support their respective hydrogen transmission projects. Support from both governments in streamlining regulations and attracting private investment is essential to boost hydrogen growth.

6. How can smaller hydrogen producers participate in such a project, given that I can infer it is intended for larger production units?

There are no restrictions in place based on the size of the production unit, whether it be small or large. Our goal is to be inclusive, incentivizing all potential stakeholders to participate, regardless of their planned production capacity. In our view, smaller players can also have a contribution to H2 market development. We encourage the involvement of all stakeholders to foster the creation of a diverse and robust hydrogen market.

7. Question for Greek and BG speakers. You use future tense (we will). a. What is the SoA? b. What are the activities towards production of H2 in our region? Our pipeline will need GW dimensions of electrolyzers production. We do not have them. c. What is the level of negotiations with Germany for future market?

- a) The hydrogen sector is still in its early stages in Greece and Bulgaria, focusing on regulatory frameworks and infrastructure development.

- b) Currently, there is limited electrolyzer capacity, but plans are underway to scale up production, aligning with future European energy needs.
- c) Discussions with Germany and other Central European markets are ongoing, particularly regarding future hydrogen imports/exports and market integration. The Greek Hydrogen Backbone, along with the respective Bulgarian, will be part of the Southeast European H2 Corridor (SEEHyC - <https://www.seehyc.eu/>), aiming to supply Germany and the SEE region with hydrogen to ensure the fulfilment of REPowerEU targets. More specifically, DESFA & Bulgartransgaz are cooperating with five more European TSOs – Transgaz, FGSZ, Eustream, NET4GAS and OGE – for the implementation of the South-East European Hydrogen Corridor – SEEHyC, part of the wider European Hydrogen Backbone. H2 projects are currently mostly in the planning phase and for this reason all hydrogen development plans are envisioned to be completed in the near future (mid- and long-term). The important role of TSOs in the H2 value chain is to provide the necessary connectivity in terms of infrastructure and optimal operation of the system in order to effectively connect production and demand centers.

8. My question is related to the potential opportunities for the Energy Community countries and more specifically Albania?

Both Bulgartransgaz and DESFA are part of the Southeastern European Hydrogen Corridor ([SEEHyC](#)) initiative. SEEHyC will be the main corridor for transporting hydrogen from South-East towards Central Europe and a key infrastructure for fostering a robust hydrogen market across the Balkans. The region holds significant potential for hydrogen production, particularly from renewable sources, due to its geographic and natural resource advantages. The completion of the corridor will enable Balkan countries to integrate into the broader European hydrogen market, enhancing energy security, supply diversification, and reducing reliance on fossil fuels.

In terms of financing hydrogen infrastructure projects and according to the TEN-E Regulation, Projects of Common Interest (PCI) projects must involve at least two Member States. This is exactly the case for Bulgartransgaz and DESFA H2 projects. The recognition of projects with PCI status demonstrates the high level of readiness for interconnectivity between both countries. The further extension of the H2 infrastructure towards Romania will also be based on this principle.

Furthermore, the TEN-E Regulation also allows for projects of mutual interest (PMI projects, between Member States and third countries, including Energy Community Contracting Parties) to be considered as part of the EU network. We welcome such initiatives and the respective developments of the future H2 transmission infrastructure could be included in future discussions.

9. Within the framework you mentioned, where DESFA acts as a facilitator between buyers and suppliers, could DESFA assist in identifying potential buyers for a producer who approaches the company for discussions?

DESFA has a strong commitment towards maturing the hydrogen market in Greece. Thus, utilizing best practices from other European Transmission System Operators, DESFA is considering acting as a facilitator, if needed, by leveraging its position within the hydrogen ecosystem to connect producers with potential buyers, fostering a well-functioning hydrogen market.

10. After PCI (Projects of Common Interest), what is the detailed schedule for the CEF (Connecting Europe Facility) fund?

The end date for submission of projects under the currently open CEF call for co-financing studies and works on energy infrastructure projects is 22 October 2024. The results from the call will be published by the end of February 2025. According to the indicative schedule, the planned studies and the design of the H2 infrastructure will be completed in Q2 of 2027. Next step would be the application for construction works (in future CEF call) to allow for the commissioning of the infrastructure as planned by 2029.

11. What is the main purpose of these projects - to create H2 infrastructures a) going THROUGH the countries or b) spreading INSIDE the countries (Bulgaria and Greece) themselves and connecting H2 producers and consumers inside each of the countries?

The purpose of Bulgatransgaz's and DESFA's projects is twofold: a) to create hydrogen transit infrastructure that passes through Greece and Bulgaria initially and further connecting South-East Europe to Central European markets through the completion of South Eastern European Hydrogen Corridor ([SEEHyC](#)), and b) to support domestic hydrogen market development by connecting producers and consumers within each country.

12. To both TSOs - do you plan to blend H2 and NG or you envision only constructing entirely new infrastructure purely for H2 transportation?

DESFA and Bulgartransgaz envision constructing dedicated hydrogen infrastructure for pure hydrogen transportation, while also considering the potential for hydrogen-natural gas blending in the interim, depending on market readiness and regulatory frameworks.

See also the answer to Q14 for further information on this matter.

13. What is your assessment regarding the competitive position of Norway in supplying H2 to Germany and other countries of central Europe? German and Norwegian Authorities have advanced their engagements on this matter e.g. <https://www.regjeringen.no/en/whatsnew/dep/smk/press-releases/2023/closer-cooperation-between-norway-and-germany-to-develop-green-industry/joint-statement-germany-norway-hydrogen/id2958105/> Is there enough H2 demand to justify corridors from North, South (Italy, Africa) and South East.

Germany is expected to become a major hub for hydrogen consumption, according to all current estimates. However, production cannot be concentrated only in Germany or neighbouring countries and a single import corridor will not be able to satisfy the H2 import demand.

All H2 transmission corridors defined to date are crucial not just for imports but also for transporting hydrogen produced domestically in other EU countries, which is particularly important for utilizing the high production potential in our region. This highlights the necessity for a diverse set of hydrogen supply routes, including the South East region, which Bulgaria and Greece are part of. The estimations for demand for hydrogen in Germany and Central Europe and the importance of having diversified sources and supply routes fully justifies these corridors, ensuring a robust and balanced supply across the continent.

14. What will be the percentage of H2 in blending and when will you start implementing it on the NG networks?

The recently adopted EU Gas-Hydrogen Package requires that flows of natural gas blended with up to 2% hydrogen by volume are accepted and facilitated at cross-border interconnection points.

DESFA and Bulgartransgaz envision constructing dedicated hydrogen infrastructure for pure hydrogen transportation, while also considering the potential for hydrogen-natural gas blending in the interim, depending on market readiness and regulatory frameworks.

15. Are there any plans on expanding the hydrogen transmission pipeline to West Balkans also?

As mentioned, the TEN-E Regulation includes in its scope co-financing of projects of mutual interest (PMIs) – projects promoted by EU countries in cooperation with third countries. Please refer to the answer of Q8 for more detailed information,

16. Do you plan to use blended NG/H2 on the existing commercial (private owners) low pressure network?

The natural gas transmission activities through the low-pressure and high-pressure networks in both Bulgaria and Greece are carried out by separate license holders. Low-pressure networks are not part of DESFA's and Bulgartransgaz's business scope. Independent studies, as well as estimations by different licensed distribution operators show readiness of the low-pressure network to allow the transmission of higher concentration NG-H2 blends (e.g. significantly exceeding 10% H2).

17. Which is your strategy regarding the % H2 content in the NG pipeline in order to be able to formulate a robust business plan? Which will be the relevant levels of H2 content and when this will be implemented?

Please refer to the above answer to Q16.

18. Have you assessed the additional transportation cost that will have to be added on top of hydrogen production cost for supplying it to off-takers in Central Europe through H2 backbone?

Preliminary studies have been conducted, but precise figures referring to transportation costs need further assessment as market conditions and regulatory framework evolves.

19. Is the planned H2 dedicated transmission system in Bulgaria susceptible to EU (co) funding?

Bulgartransgaz' Phase 1 of the Bulgarian hydrogen backbone is a PCI project (project of common interest according to the TEN-E Regulation), included in the First list of PCIs, while Phase 2 will be submitted for inclusion in the Second List of PCIs. PCI projects are eligible for co-funding by the Connecting Europe Facility (CEF).

20. Taking into consideration the very low temperature hydrogen needs to be cooled at to liquefy and transport, how is the transportation of it possible

in large scale? If piping network is the answer, is the current natural gas network suitable?

According to various studies, including EHB, transporting hydrogen over 1,000 km via pipeline infrastructure is an attractive and the most cost-effective option for long-distance transmission of hydrogen. Furthermore, Bulgatransgaz's and DESFA's proposed hydrogen pipelines will transport hydrogen in gaseous form, thus no liquification is needed.

Please, also refer to Q12 and Q18.

21. Please, tell us something to produce clean hydrogen, the support in this direction, because this part in the BG Resilience plan is rejected. How shall we fill the pipeline? Please, give also the questions that are "difficult"

Please refer to the answer of Q5.

22. I would like to discover with Desfa, the project sites in Greece where H₂+CO₂ (from industry or Biomethane) can be injected as e-gas (greengas) into existing gas pipeline infrastructure. We want to demonstrate 100MW Electrolyser+ methanation facility by 2026 and scale up in 2027-2030 to large scale production/Injection into gasgrid. We have offtakers in EU to export from Greece.

Please include your project in the questionnaire and DESFA will contact you accordingly.

23. Within the framework you mentioned, where DESFA acts as a facilitator between buyers and suppliers, could DESFA assist in identifying potential buyers for a producer who approaches the company for discussions?

DESFA has a strong commitment towards maturing the hydrogen market in Greece. Thus, utilizing best practices from other European Transmission System Operators, DESFA is considering acting as a facilitator, if needed, by leveraging its position within the hydrogen ecosystem to connect producers with potential buyers, fostering a well-functioning hydrogen market.

24. Where is hydrogen made in Greece? Is DESFA a producer via natural gas reforming? And if no is there a plan for that?

Currently, DESFA is not a producer of hydrogen. Hydrogen production in Greece is expected to come primarily from renewable energy sources, specifically through electrolysis. DESFA's role focuses on developing infrastructure to domestically transport and import/export hydrogen.

25. Are the routes for the newly developed H2 pipeline set in stone, or there can be alterations or additional connections to nearby regions?

The plans for the Hydrogen Backbones in Bulgaria and Greece have been based on preliminary studies and were presented during the Workshop. Additional connections to nearby regions will be planned, both to production and consumer/demand centers. One of the key objectives of the ongoing hydrogen Call of Interest is to identify these strategic locations to ensure that the infrastructure can be expanded where necessary to meet future needs.

The projects have an ambitious timeline, and where possible, the routes will follow the existing gas infrastructure. This will allow for an expedited design, permitting process and will allow for the prompt commissioning of H2 projects. Additionally, it will help minimize negative impacts on the environment, which is a leading priority in our development strategies.

26. Is DESFA planning to cover the costs of connecting a green hydrogen production facility to its main pipelines? Is there any existing strategy addressing this?

The Regulatory Framework for Hydrogen is currently under development. The specific provisions for the connection of H2 projects with the Gas System will be described therein.

27. Given that as you already mentioned h2 market is a future market and that the consumer demand in Greece will probably be weak at this stage, do you plan to combine the outcomes of this market test with similar market tests of other TSOs in western EU to assess whether there is demand for the excess H2 produced in Greece? Are there currently ongoing H2 market tests around EU?

Yes, DESFA plans to collaborate with other TSOs in the EU to combine market test outcomes and assess overall demand for hydrogen in Western Europe. There are currently ongoing hydrogen market tests across several EU countries.

28. What should be the minimum h2 flow for allowing economic feasibility for the deployment of these infrastructures? have you got any preliminary figures?

Preliminary figures for the minimum hydrogen flow required for economic feasibility are still under assessment, however PCI projects of Bulgartransgaz

and DESFA will create a bidirectional hydrogen capacity of 80 GWh/d between Bulgaria and Greece.

29. What is the expected cost per MWh for a consumer?

The expected cost per MWh for a hydrogen consumer will depend on production methods, transportation costs, and market demand. While specific figures are not yet available, the cost will likely decrease as infrastructure matures and the market scales up, aligning with broader EU decarbonization goals.