



Hydrogen in Gas Grids

A systematic validation approach at various admixture levels into high-pressure grids

D7.4

Communication and awareness plan Update 3

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PU **Public**

RE Restricted to a group specified by the consortium*

PP Restricted to other programme participants*

CO Confidential, only for members of the consortium*

*(including the Commission Services)

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Executive Summary

The communication and awareness plan defines the communication strategy and tools to be developed and used towards a successful dissemination of the project and its results. The project grant agreement, through the description of action, contained the draft of this plan as part of the measures to maximise the project's impact. This document describes the dissemination goals, target audience and appropriate channels to provide a regular flow of information. This version is the third and last updated version of the plan, followed by a final report on dissemination activities and materials by the end of the project.

Due to the project amendment by 12 months (new project end 31.12.2023 (M48)), the communication and dissemination activities are also affected. The extension of the project will not influence the content of WP7 but has an assumed positive effect on the overall impact of the HIGGS project in general. First, since the quality and results produced in the project will be more extensive and secondly since there is more time to reach out to a larger target group. Since the WP stretches over the complete runtime of the project, the activities will be stretched out to fit the new end date. The project extension provides the opportunity to attend additional events and to catch up on events that have been cancelled because of the Covid 19 pandemic and its restrictions. These will be additionally considered in the extension period. Activities will be rescheduled to fit with the new runtime and progress of results.

Finally, logos and templates have been adjusted due to changes within the funding regulation of Clean Hydrogen Partnership.

1 Objective

The communication and awareness plan aims at defining the tools and procedures to be carried out by the project consortium to maximise the impact of HIGGS developments.

This plan also takes into account dissemination activities targeted to different audiences, as workshops, conferences and fairs. D7.4 (M31) is the third update of the communication and dissemination plan.

The document aims at defining the methodology, stakeholders, tools, channels and relevant action so as to maximise the impact of the project and its results.

2 Description of work

2.1 Methodology

The dissemination and communication of HIGGS to stakeholders and target groups involved will be managed by the partners within WP7, led by ERIG and monitored by the project coordinator (FHA) to ensure the compliance of the Grant Agreement.

The communication and awareness plan will be summarized at the end of the project (M48) together with the exploitation and dissemination plan in a final report.

The consortium agreed to follow a basic set of rules of common understanding to help assure a good quality communication and dissemination in accordance with the consortium agreement (CA). These are:

1. The tasks of communications and dissemination of the project is understood as a task of common interest and due contributions and commitments from all partners applies. ERIG acts as the WP leader. In its role as project coordinator, FHA is the final resort in charge of all activities in the project and thus also regarding communication and dissemination.
2. The project website (<https://higgsproject.eu/>) is the platform for all documentation and documents management. Using the templates and keeping a comprehensible versioning and communication is everybody's duty.
3. In order to plan, track and monitor communication and dissemination activities of the project as such, all partners report these activities to ERIG and FHA. Upcoming activities are reported as soon as possible (and before submission, according to the consortium agreement) in order to help assure possible synergies or help avoid additional efforts. Each activity is reported to ERIG and FHA. After approval from FHA as project coordinator, each interested partner will send the communication and the event information to the consortium prior to submission. Each activity approved will be incorporated in the communication and dissemination reporting by ERIG.
4. In addition, each partner that foresees a publication of own project results informs the consortium with sufficient ahead planning (based on the CA rules) to ensure that results do not stand in conflict with potential commercial exploitation activities, confidentiality or legitimate interests of the partners.
5. Peer reviewed publications must be provided to open access according to the guidelines of the EU Horizon 2020 Manual: https://ec.europa.eu/research/participants/docs/h2020-funding-guide/cross-cutting-issues/open-access-data-management/open-access_en.htm

2.2 Target groups

An assessment of the main target audiences, that are expected to be influenced by the HIGGS project results, has been carried out. Results from other tasks of the project, related to the description of pathway towards integrating hydrogen in EU gas networks (WP6), will serve as additional input to detect new business cases and cases of study to focus better the dissemination efforts in the target groups' reach.

2.2.1 Policy makers and regulatory bodies

HIGGS results are of interest towards developing standards in hydrogen blends, according to technical, legal and regulatory conditions for safe operation and maintenance of the gas network at different H₂/CH₄ admixture levels. In the same way, the evaluation of potential markets and the assessment of the potential of water electrolysis to maximise the introduction of renewable energy sources into the grid will be the main input for these stakeholders.

To improve the cooperation with regulation and standardization bodies, an external consulting company was invited to the External Advisory Board (EAB). This company supports to expand the communication activities towards RSC bodies.

2.2.2 Renewable energy stakeholders and gas grid operators

HIGGS will impact directly on addressing the interaction of energy markets. First, by increasing the knowledge on impacts on the entire gas transport infrastructure, also by tackling the aspects from regulations codes and standards. Second, directly considering as part of the pathway the cross-border issues that may arise from the differences in gas quality, and that are already considered by the efforts towards the creation of a full internal gas market, where electricity and gas are coupled by means of hydrogen production through water electrolysis..

The key message to be transmitted to these groups involves (1) the potential benefits of hydrogen injection in terms of the potential of electrolysis technologies for renewable energy integration and transport of the H₂ produced in the gas grid, (2) the potential and needs to reach the EU goals on decarbonisation and specifically decarbonisation of gas usages, and (3) the results gathered during HIGGS trials will be shared in order to prove the feasibility of injecting hydrogen at different admixtures levels into the natural gas grid.

2.2.3 Technology providers/manufacturers

HIGGS trials are expected to increase industrial maturity and to reduce the integration/manufacturing costs. Lessons learned about product development, testing platform capabilities and potential new components will be shared among this target group, so new business models and business cases may be implemented to the market.

2.2.4 General public

The dissemination efforts towards the general public will be focussed on the benefits of hydrogen and power-to-hydrogen solutions for renewable energy integration and CO₂ reduction aiming a high decrease of fossil fuel dependence and highlighting the potential for local economy. Furthermore, emphasis will be laid on hydrogen technologies safety and European competitiveness.

2.2.5 Research and academia

Dissemination activities, especially towards conferences and scientific journals, address mainly the research and academia stakeholder. It is of particular importance here to engage in a direct exchange with these entities and to discuss and question results on a regular basis.

2.3 Communication channels

Communication activities in HIGGS are linked to a wide spectrum of communication channels to reach all the target audiences detailed previously. They will support the dissemination of results and activities for creating awareness.

2.3.1 Project website

The project's website (www.higgsproject.eu) is the central place for the communication of all the information related to the project. It is used as a tool for partners and to show project advances and deliverables. This channel addresses all target groups.

The website is designed to provide a general impression of the project and will be maintained for two years after the finalization of HIGGS project. Its maintenance will be the responsibility of ERIG.

The **About the Project** section includes all the necessary specifications of the project for a complete understanding of its goals and procedures.

The **Partners** section provides a description and background of all the organizations and companies involved, including links to their websites.

The **Test Loop** section explains the demo-site. This part of the website is currently under construction and will be put online in due time once the construction of the Test Loop has progressed further.

The **News & Event** section includes all the press releases published as well as other articles about the development, events and achievements of the project. Furthermore the section to apply for the participation and suggestion of new topics for the HIGGS "Hydrogen Tolerance Deep Dives" is located within this area of the Homepage.

The **Downloads**' section serves as the main hosting page for all the public content generated by the project: deliverables, presentations, reports, publications, etc. Flyers, press kits and other corporate documents are also available in this area.

The **Contact** section provides a contact point for any person wishing to reach HIGGS' project. It includes a contact form that will automatically send the information to the project coordinator (FHA).

2.3.2 Graphic material

A visual identity has been developed for the project, including a logo, document templates, a press kit, a set of factsheets, posters and flyers. All the communication and visual identity materials will be available online in several formats. The material is updated according to the progress of the project. Due to the influence of COVID-19 the priority was set to digital material rather than printing material (posters, flyers). However, also printed material (poster, factsheets, publications, project cards, etc.) has been set up and presented on conferences or exhibitions. In most cases, project material is also available digitally via QR-codes that redirect to the project website. Especially for exhibitions, project beach flags, banner and exhibition material has been provided. The main graphic materials developed within HIGGS are the following:

2.3.2.1 Logo and colour schemes

Selected by the consortium on M1 the chosen logo establishes the basic lines for the project's documents visual appearance.



Figure 1: Logo of the HIGGS Project.

By the development of the design of the Logo for HIGGS the overarching approach has been to have a simple, yet expressive logo with clear relation to the content of the project. Since HIGGS in itself as acronym does not clarify anything about the topic of concern, it was decided from the start to include the short title “Hydrogen in Gas Grids” to ensure that the content of the project comes across whenever the logo is displayed. For the pictorial representation of the project and as an immediate eye-catcher, the design of the “G”s in the acronym are protruded up to the right and thereby visualises the object of attention in the project, namely the high pressure gas grids in the form of “pipelines”.

In addition to the colours included in the logo, further colours are defined to be part of the project identity of HIGGS. These colours are identified to fit with the two main colours represented in the logo and will be used for different purposes in the project documents i.e. in diagrams, presentations etc. For convenience the colours are also predefined in the project templates (Word, Excel, PPT). The font that has been selected for project documents is Arial.

2.3.2.2 Document templates

A set of document templates has been developed in order to ensure unified communications. Document templates for deliverables, minutes, agenda and power point presentations have been distributed among project partners and are available through the shared data platform. Templates have been adjusted due to changes within the funding regulation of Clean Hydrogen Partnership. The new logo and acknowledgment sentences of the Clean Hydrogen Partnership have substituted those of the former FCH (see Annex 1).

2.3.2.3 Press kit

A press kit has been developed and is available in the download section of the project website. This document helps partners draft their press releases and journalist in their job of writing about HIGGS. It includes a summary of the project, pictures, FAQs and tweetable facts. It also includes the project logo and the additional FCH JU logos that have to be used in the dissemination of the project. The Logos and funding regulations have to be adjusted according to the new funding regulations of Clean Hydrogen Partnership. This document is thought to homogenize the communication approach and to promote the chosen project image.

2.3.2.4 Factsheets and flyers

As a way to promote the project at selected events, a factsheet has been produced with the goal of providing general information and preliminary result, addressing both technical and non-technical public. The factsheet’s design allows to use it as a flyer to be handed out at events as well.

The factsheets' information has recently been updated and will be further updated throughout the results within the project. Yearly updates of this material will be released with progress of the project and aiming to a wider public at EU level. It includes a general presentation of the project, reflecting the current project stage. The factsheet can be downloaded on the project website. The printable versions are available for the partners in the document sharing platform of the project, as they will also serve as support documents for the partners attending to fairs, congresses, forums and workshops.

2.3.2.5 Posters

Within the poster presentation of WP3 and WP5 during the EGATEC conference in Hamburg, Germany (14th and 15th of June 2022) posters have been developed. In the same way as the fact-sheet/flyer, the poster will serve as a support material for special events where HIGGS will be presented. Due to the impact of COVID 19 on physical events the necessity for a poster was not given until the time mentioned conference. The posters will be available through the website and templates will be used for further events and conferences.

2.3.2.6 Video

An explanatory video will be issued in the second half of the project with the main communication messages to reach a wider public at EU level. The idea is to combine real images with infographics explaining the socio-economic and environmental benefits of the project, impact on EU decarbonisation as well as recommendations at EU level (policies, targets).

All project partners will upload the video to their YouTube channel once it is ready.

2.3.3 Social media and professional networks

The use of social media and professional networks are a key communication tool to disseminate information about the project. Partners will use their own accounts in the social/professional networks in order to contribute to the project dissemination. Regarding social media, the coordinator of the project (FHA) and the partner in charge of WP7 (ERIG) are encouraging the use of a dedicated hashtag (#HIGGS) and the dissemination of the posts made through the separate HIGGS accounts.

2.3.3.1 Social media

Main social media channels considered for the dissemination of the project and recommendations on how to use each of them are detailed below. Every communication activity is shared via this channel, as well as via the partners LinkedIn and social media channels.

- **Twitter:** Used to reach the general public. Partners are encouraged to echo the project events, news, press releases and posts of the HIGGS project account through a brief message or tweetable fact in the account holder language and also in English, linking to the article or piece of news published in the project website.
- **LinkedIn:** Used to reach renewable energy stakeholders and gas sector companies, technology providers/manufacturers and the general public. Partners are encouraged to echo the project events, news, press releases and posts of the HIGGS project through posts in their company profiles, in the account holder language and also in English, linking to the article or piece of news published in the project website

- **Facebook:** Used to reach the general public. Facebook has not been estimated as a high priority channel in comparison to other social media channels. Therefore, no individual HIGGS profile has been set up. However, partners are encouraged to echo the project events, news and press releases through a more detailed message in the account holder language and also in English, linking to the article or piece of news published in the project website.

A call to action (link, question, etc) is advised to be included in every social media post.

In Addition to that, relevant project results, e.g. public deliverable, will from now on be shared via the Hydrogen Europe Research newsletter.

2.3.3.2 Professional networks and related projects cooperation

Networking opportunities allow project partners to learn from each other, discuss common issues and get feedback on their work. The kinds of meetings also provide a great chance to carry out an effective communication of the project inside and outside the Consortium.

In this sense, but also with the idea to maximize the impact of the project and H2020 resources, HIGGS continuously identifies other projects and initiatives and work out collaborations or shared events. This also counts for workshop or deep dive events.

2.3.4 Public Relations

Several press releases will be published during the life of the project, directly linked to important events, achievements or milestones of the project, such as the project kick off meeting. The press kit supports the Public Relations (PR) activities carried out by HIGGS project partners.

2.3.5 Showcase and visits

A showcasing event will be organized at the demo-site of HIGGS (FHA facilities).

Linked to the educational and awareness activities carried out by the FHA, open visits to the demo-site will be encouraged. Information about these visits will be available on HIGGS website. Due to the impact of COVID 19 the showcasing event might be postponed to a later point. If that is the case the option to organise an online alternative first followed with physical tours once restrictions allow it is considered by the consortium.

A first visit of the platform at FHA in Spain is planned for September 2022.

2.4 Dissemination activities

Aside from the activities and events mentioned in this section other channels for later dissemination activities have also been prepared.

At European level, exchange and planning activities are especially prioritised to take place with European Network of Transmission System Operators for Gas (ENTSOG), Hydrogen Europe Research (HER), Hydrogen Europe (HE), Eurogas, Gas Infrastructure Europe (GIE) and Marcogaz. The HIGGS consortium is represented as a member of the ENTSOG advisory Board panel for future gas grids as well as a member of the “Prime movers Group on Gas Quality & H₂ handling” where an exchange with relevant stakeholders of the field is taking place on a regular basis. Furthermore, ERIG is an associated member of Marcogaz and a member of the Hydrogen Europe Research “Policy Working Group”.

All those channels can and will be used to directly disseminate project results and also reach the relevant stakeholders within those groups for other dissemination activities such as workshops.

Furthermore, the knowledge exchange between the project team and its external advisory board took place in M10 with a first meeting and second meeting in M28. During the 2nd meeting WP3, WP4, and WP5 presented their results:

- Introduction to the experimental platform for high-pressure network testing of H₂ and H₂/NG mixtures
- Results of the first experimental campaign
- Techno-economic modelling for H₂/CH₄ admixtures

There was an active exchange between all participants and the chance was taken to share the deliverables D2.3 and D5.1 within the framework of the EAB. Afterwards, the deliverables were published on the website.

The next, third EAB meeting will be held during the first visit of the platform at FHA in Spain, which is planned for September 2022. Afterwards a fourth EAB meeting is planned for the summer of 2023, as the test series on the test platform will be completed and the work in WP6 will require close coordination with the stakeholders, as well.

2.4.1 Synergies with ongoing projects

2.4.1.1 Horizon results booster – Service 1

In regards of synergies with ongoing projects, HIGGS applied for Service 1 of the horizon results booster (an initiative of the European Commission). This service focusses on the development and execution of an “Portfolio Dissemination & Exploitation Strategy”. It is divided in two main streams addressing Dissemination & Exploitation strategies, activities and goals. The aim of Dissemination services (Module A and B) is to strengthen the capacity of Project Groups (PGs) in disseminating, maximizing the dissemination of a portfolio of results and offering a wider and more complete view to potential users. The aim of Exploitation service (Module C) is to support single projects in exploiting their research results and enhance beneficiaries’ capacity to improve their exploitation strategy. Within the HIGGS project module A and module C (FHA) was conducted. Module B will be carried out in September 2022. As module C focusses on exploitation of results, this will be mentioned in detail in D7.5 “Update2 of plan for dissemination and exploitation of results”. In module A, and as shown in Table 1, a project group was formed (H₂Gen Cluster –decarbonizing the gas sector through hydrogen). It consists out of the following members:

Table 1: Project group: H₂Gen Cluster

| Project | Organization |
|----------------|---|
| HIGGS | European Research Institute for Gas and Energy Innovation (ERIG a.i.s.b.l.) Aragon Hydrogen Foundation (FHa) |
| MefHySto | European Research Institute for Gas and Energy Innovation (ERIG a.i.s.b.l.) |
| HyDelta | New Energy Coalition |
| SuperP2G | European Research Institute for Gas and Energy Innovation (ERIG a.i.s.b.l.) |
| Energy Storage | DGC- Danish Gas Technology Centre |

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The project group's results deliver knowledge and progress for the decarbonization of the gas sector through hydrogen. However, to decarbonize the gas grid and its usage, there is still several technical, regulatory, and legal mapping and testing that needs to be carried out. The project group is looking for solutions to this purpose by tackling different aspects, for example studying the economic and technical feasibility of transporting hydrogen in the existing natural gas network. Seen the commonalities among the members of the project group, there is a strong potential for collaboration and to carry out joint dissemination activities to disseminate common results.

Regarding the different projects in the project group a SWOT (Strengths, Weaknesses, Opportunities, Threats) and stakeholder analysis was carried out. The results revealed that there is already a high level of engagement with the addresses target group and stakeholders as well as on a regional up to international level. However, the following barriers haven been identified when it comes to dissemination:

- Many results are expected by the end of the project (for almost all projects) because of the high experimental load implied
- COVID 19 restricted a lot conferences, during the peak of the pandemic and/or many changed to online format
- The overall research area around hydrogen is moving very fast – Results may be partly and rapidly outdated
- National projects want to disseminate internationally but are reluctant to do so
- Difficulties to disseminate intermediate results because of their tentative nature sometimes
- Post-corona it is difficult to motivate participants and public audience for physical events since they have get used to the online format

With these opportunities and barriers, the project group will participate in module B of the horizon results booster service in September 2022. This module focuses to design a joint dissemination plan for the portfolio and to carry out the actual dissemination of the portfolio results. The service delivery includes the visual identity for the beneficiary project group and a short video describing the project results.

2.4.1.2 Projects with synergies

Identification of similar projects funded in recent years and relevant initiatives will be carried out during the whole project lifecycle in order to find synergies and organise common activities and exchange, according to the Task 7.3.2 defined in the Grant Agreement. During the project and compared to the previous deliverable, 3 new projects with synergies were identified and contacted: H2GAR, LivingH2 and Heavenn. For the purpose to increase the interaction with metrology related projects and besides MefHySto, the joint activities have and will be expanded by the H2GAR and LivingH2 projects, which address metrology tasks partly.

2.4.1.2.1 HyDelta (2020-2022) and HyDelta 2.0 (2022-2023) → Part of the H2Gen-Cluster

HyDelta (<https://hydelt.nl/>) is a national research program (Netherlands) aimed at the safe integration of hydrogen in the existing infrastructure for gas transport and distribution. The cooperation program aims to remove barriers to innovative hydrogen projects. Innovations closest to market introduction will be tackled first. The Main objective is to collect and build on current and planned international studies and initiatives linked to the topics of:

- Technical adaption in the natural gas network
- Safety during use

- Metering of hydrogen
- Odorization and visibility
- Standardization and norms
- Development of educational processes
- The operation of blending obligations
- Economy of the hydrogen value chain

The interaction with the HyDelta project, took mainly place in the framework of the horizon results booster, as mentioned in 2.4.1.1 and is foreseen to be expanded.

2.4.1.2.2 Super P2G (2019-2022) → Part of the H2Gen-Cluster

SuperP2G (<https://www.superp2g.eu/>) interconnects leading P2G initiatives in five countries, ensuring joint learning. Each national project focuses on different challenges, where researchers team up with local need-owners to co-create solutions. SuperP2G focuses on improving existing tools including open access, as well as develop a new open tool based on the OptiFlow and H2IndexII tools. This is supplemented with analysis of regulation and markets, as well as stakeholder involvement.

The main objective of SuperP2G is to lower the threshold for need-owners to validate and put P2G to practice for "Smart Energy Systems", "Sectorial Integration" as well as "Local & Regional development". The sub-objectives of the consortium are to:

- Optimise P2G systems by connecting leading national projects/regions and their corresponding need-owners in the EU to utilise synergies with regard to evaluation tools and procedures
- Showcase the potential for P2G in each involved country and derive pan European conclusions with respect to the technology, market conditions and stakeholder adaptation
- Raise visibility and knowledge levels about the possibilities with P2G throughout Europe and especially in the involved countries.

Synergies in regard of the analysis of regulations and markets as well as a shared group of stakeholders have been identified and already used through coordinated events, like GAT | WAT and Wind meets gas.

2.4.1.2.3 MefHySto (2020-2023) → Part of the H2Gen-Cluster

The MefHySto project (<https://mefhysto.eu/>) addresses the need of large-scale energy storage, which is required for a shift to renewable energy supply. Such storage is required to supply energy at peak times when renewable sources fluctuate. A possible solution for energy storage is large-scale use of hydrogen. Metrological traceability in the energy infrastructure for hydrogen storage is crucial. Thus, improved knowledge of chemical and physical properties of hydrogen as well as traceable measurements and validated techniques are imperative.

Main objectives:

- Development of online measurement of hydrogen quality
- Improvement of Equations of state for: Hydrogen enriched natural gas, pure hydrogen
- Air and hydrogen quality effects on fuel cell operation
- Reversible storage (Metal hydride storage and cryo storage). Development of unified methods and protocols for a reliable characterisation of metal hydrides and porous materials (cryo storage).

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- Underground gas storage (UGS) (geological storage and storage in natural gas pipelines): tackle metrological and thermodynamic issues in the large-scale storage of hydrogen in underground gas storages (UGS) and the conversion of existing UGS from natural gas to hydrogen

Synergies in regards of hydrogen quality and shared stakeholder groups have been identified and utilized for both projects. Workshops and project events can be combined, as already done during the EGERID event.

2.4.1.2.4 THyGA (2020-2023)

The objective of THyGA project (Testing Hydrogen Admixtures for Gas Appliances, <https://thyga-project.eu/>) is to study the impact of hydrogen blends in natural gas on residential and commercial gas appliances. This assessment will take into account technical, safety, lifetime and environmental performance. The project consortium is composed of French energy company Engie as coordinator and eight more European partners including laboratories, gas companies and manufacturers representing different applications. The consortium will identify and recommend the adequate codes and standards needed for addressing the new challenges linked to these activities. This identification will be performed by:

- Screening and segmenting the portfolio of appliance technologies in the domestic and commercial sectors and assessing the impact of hydrogen admixtures.
- Testing up to 100 residential gas appliances to provide a generic protocol that can be adapted for virtually any appliance.
- Developing a validated certification protocol for different levels of H₂ in natural gas
- Making recommendations for manufacturers and decision makers along the gas value chain for appliance design, manufacture and certification.

A first contact with the THyGA's project coordinator was established through the HIGGS project right from the project's start. Synergies especially in reference to the Regulations, Codes and Standards aspects of both projects have been identified. Furthermore in regard of the development of the roadmap, leakage testing and other topics a cooperation between both projects is useful. Therefore, a joint workshop was held on 15.12.2021 to exchange ideas and discuss synergies. FHA as HIGGS coordinator and thus the project's delegate, has been invited to all EAB meetings held by THyGA for information exchange as member of their EAB. Further exchange meetings are planned for the further course of the project.

2.4.1.2.5 H2GAR: H2 Gas Assets Readiness

H2GAR is a group of European gas transmitters, formed earlier this year to share knowledge about pipelines, compressors, separation, metering, safety and storage. The working groups are as follows:

- WG1 Network materials, components, operation and issues
- WG2 Compressor stations
- WG3 Membranes
- WG4 Metering/other instrumentation
- WG5 Safety
- WG6 Underground gas storage

The HIGGS consortium has identified important areas for collaboration. A bilateral meeting is expected during 2022.

2.4.1.2.6 LivingH2 (2019-2023)

The project LivingH2 (<https://eriq.eu/livingh2>) aims for the demonstration of a complete solution of a renewable hydrogen power supply in a living laboratory environment, using a H₂ fuel cell cogeneration (H₂-FC-CHP) system. The consortium is widely positioned and characterized by a French-German collaboration.

The development of pure H₂-CHP can drastically impact the energy sector between the years 2030 and 2050, as renewable hydrogen is an essential solution as an energy storage to increase the share of renewable energy within the energy sector. Pure H₂-FC-CHP could become a CO₂ free energy solution for buildings that should progressively replace existing natural based CHP solutions.

Main objectives

- Development of an all-in-one solution for regenerative H₂ energy supply in a laboratory environment using domestic approved standards.
- Electricity and heat generation by the fuel cell cogeneration system for the utilisation within the building including photovoltaic, electrolyser and storage tanks.
- Operation with an odorized H₂ supply line by use of a micro-odorization station.
- Development of odorant resistant fuel cell membrane electrode assembly (MEA) by applying a textured catalyst layer.
- Techno-economic analysis of the all-in-one solution and comparison with alternative technologies.

ERIG supports this project in its communication and dissemination activities. In the framework of LivingH2, a European final event with stakeholders at DSO and TSO level as well as other actors from industry and research and academia will take place. This event can also be used to disseminate the results of HIGGS, if found useful.

2.4.1.2.7 Heavenn

HEAVENN (<https://heavenn.org/>) comprises a wide range of projects with related and supporting complementary studies. Experience and best practices will be gathered, tested, and translated into a means of demonstrating the replicability of this concept in Europe and beyond. HEAVENN is a large-scale programme of demo projects bringing together core elements: production, distribution, storage and local end-use of hydrogen (H₂) into a fully-integrated and functioning “H₂ valley” (H₂V), that can serve as a blueprint for replication across Europe and beyond. The concept is based on the deployment and integration of existing and planned project clusters across six locations in the Northern Netherlands, namely Eemshaven, Delfzijl, Zuidwending, Emmen, Hoogeveen and Groningen. The main goal is to make use of renewable hydrogen across the entire value chain, while developing replicable business models for wide-scale commercial deployment of H₂ across the entire regional energy system. HEAVENN aims to maximise the integration of abundant renewable energy sources available in the region, both onshore (wind and solar) and offshore wind, using H₂ as: (i) a storage medium to manage intermittent and constrained renewable inputs in the electricity grid; and (ii) an energy vector for further integration of renewable inputs and decarbonisation across other energy sectors beyond electricity, namely industry, heat and transportation.

Within the ERIG activities there will be a closer exchange with HEAVENN which can also benefit the HIGGS projects. E.g., joint dissemination activities like on the Wind Meets Gas 2022’s parallel session on Hydrogen Transport Infrastructure, will drive forward communication activities. Comparable activities can be planned in 2023.

2.4.2 Publications and media impact

2.4.2.1 Scientific papers and other communications

Publications in high-impact scientific journals are foreseen, as well as diffusion in dedicated journals, magazines and associations like Hydrogen Europe, HYER and others..

Several scientific publications are foreseen during the time of HIGGS' development. For all participants on the Horizon 2020 program, it is necessary to meet a number of requirements related to the diffusion of any result of the project. These include ensuring open access to all peer-reviewed scientific publications, and trying to provide open access to other types of publications, such as monographs, books, reports, etc. Suggested and high impact journals, suitable for scientific publication are the following:

1. International Journal of Hydrogen Energy – Elsevier – Impact factor: 5.2
2. Hydrogen - Open Access Journal from MDPI – Impact factor: tbd

Since most of the results are expected to be achieved by the end of the project, scientific publications will be written in a later stage of the project. One paper is expected to be written with the first results of the testing loop and planned for submission by the end of 2022 in the International Journal of Hydrogen Energy (special issue EHEC22).

2.4.2.2 General media impact

As stated on 2.3.4, the HIGGS project will carry out some Public Relations (PR) actions and several press releases will be distributed. Several articles, interviews or pieces of news are expected to be published in general media during the life of the project. Media impact results of the first press release include:

1. **20 minutos:** [Aliaga subraya que HIGGS es un proyecto clave para impulsar la descarbonización en Europa y que Aragón puede liderar](#) (Alexa Rank in Spain 56, aprox 64.5 million monthly visits).
2. **Heraldo:** [Aragón lidera desde Walqa un proyecto clave para la descarbonización en Europa](#) (Alexa Rank in Spain 317, aprox 8.7 million monthly visits).
3. **EuropaPress:** [Aliaga subraya que HIGGS es un proyecto clave para impulsar la descarbonización en Europa y que Aragón puede liderar](#) (Alexa Rank in Spain 187, aprox 7.8 million monthly visits).
4. **El Periódico de Aragón:** [Aragón lidera un proyecto para descarbonizar la economía](#) (Alexa Rank in Spain 403, aprox 3.2 million monthly visits).
5. **Diario del Alto Aragón:** [Arturo Aliaga asiste en Huesca a la presentación del proyecto HIGGS de la Fundación Hidrógeno](#) (aprox 2.62 million monthly visits)
6. **Energy News:** [HIGGS, un proyecto de hidrógeno clave para impulsar la descarbonización en Europa](#) (No public traffic data available)
7. **PV Magazine:** [La Fundación Hidrógeno Aragón coordina un proyecto para impulsar la descarbonización en Europa](#) (No public traffic data available)
8. **Interempresas:** [El proyecto HIGGS, de la Fundación Hidrógeno Aragón, presentado en sociedad](#) (No public traffic data available)
9. **APPICE:** [HIGGS, un proyecto de hidrógeno clave para impulsar la descarbonización en Europa](#) (No public traffic data available)
10. **Aragón Hoy:** [Arturo Aliaga asiste a la presentación del proyecto HIGGS de la Fundación Hidrógeno](#) (No public traffic data available)

Another press release is planned for the visit meeting of the platform at FHA in Spain which will take place at the end of September 2022

2.4.3 Attended conferences, events and fairs

HIGGS partners have presented the results obtained during the project at conferences, fairs and events related to the target groups stated on section 2.2. A list of attended conferences, events and fairs is provided in Table 2. The crossed-out events, were planned but were cancelled by the organizer due to COVID19. Many other events were held online and attended by the consortium accordingly. In the event of cancellations, alternative events were identified, and replacements found.

Table 2: Attended conferences, events and workshops from project start until June 2022

| Nr. | Type | Title | Who | Where | When | Until | Action | Participants |
|-----|------------|---|-----------------|---------------------------|-----------------------|-----------------------|---------------|--------------|
| 1 | Conference | Spanish Renewable Gas Conference | Redexis | Madrid, Spain | 03.03.2020 | 03.04.2020 | Presentation | >200 |
| 2 | Workshop | ENTSOG WS 1 | ERIG | online | 10.03.2020 | 10.03.2020 | Participation | <50 |
| 3 | Conference | Green Gas Mobility Summit 2020 | Redexis | online | 01.04.2020 | 02.04.2020 | Presentation | <100 |
| 4 | Workshop | ENTSOG WS 2 | ERIG | online | 21.04.2020 | 21.04.2020 | Participation | <50 |
| 5 | Workshop | ENTSOG WS 3 | ERIG | online | 29.04.2020 | 29.04.2020 | Participation | <50 |
| 6 | Event | ThyGa Webinar | FHa | online | 06.05.2020 | 06.05.2020 | Participation | <50 |
| 7 | Event | SVGWVSG Research Day | OST | Switzerland | 03.09.2020 | 03.09.2020 | - | - |
| 8 | Internal | 1st External Advisory Board Meeting | All | online | 20.10.2020 | 20.10.2020 | Presentation | <50 |
| 9 | Internal | HIGGS Online Event | All | online | 27.10.2020 | 27.10.2020 | Presentation | <50 |
| 10 | Conference | European utility week (ENLIT Europe) | ERIG | Mailand, Italy | 27.10.2020 | 29.10.2020 | - | - |
| 11 | Conference | European Hydrogen Energy Conference (EHEC) | Redexis | Madrid, Spain | 04.11.2020 | 06.11.2020 | Presentation | - |
| 12 | Conference | GAT WAT | All | Berlin, Germany | 17.11.2020 | 18.11.2020 | Presentation | - |
| 13 | Conference | GAT WAT | All | Cologne, Germany | 24.11.2020 | 25.11.2020 | Exhibition | <500 |
| 14 | Internal | WP2 Workshop | All | online | 22.02.2021 | 22.02.2021 | Presentation | <50 |
| 15 | Conference | World Hydrogen Iberia | FHa | online | 23.03.2021 | 24.03.2021 | Presentation | <100 |
| 16 | Event | Hannover Fair H2FC | ERIG | Hannover, Germany | 12.04.2021 | 16.04.2021 | ??? | - |

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| | | | | | | | | |
|----|------------|--|-------------|------------------|------------|------------|---------------|-------|
| 17 | Event | 2nd International Hydrogen Symposium | ERIG | Hamburg, Germany | 14.06.2021 | 15.06.2021 | Presentation | <100 |
| 18 | Workshop | Entsog Prime Movers Group | FHa/ERIG | online | 17.06.2021 | 17.06.2021 | Presentation | <50 |
| 19 | Event | World Hydrogen Technologies Convention (WHTC) | FHa | online | 20.06.2021 | 24.06.2021 | Presentation | 3,000 |
| 20 | Conference | Renmad Hydrogen 2021 | Redexis/FHa | online | 14.09.2021 | 15.09.2021 | Presentation | ??? |
| 21 | Conference | Wind Meets Gas | ERIG | Groningen, | 07.10.2021 | 08.10.2021 | Presentation | <200 |
| 22 | Event | Iberconappice | FHa?? | Madrid, Spain | 23.10.2021 | 25.10.2021 | Presentation | - |
| 23 | Conference | EGERID | All | online | 15.11.2021 | 19.11.2021 | Presentation | <200 |
| 24 | Event | Programme Review Days (PRD) 2021 | FHa | online | 02.12.2021 | 03.12.2021 | Presentation | <500 |
| 25 | Event | ThyGa Workshop | FHa | online | 15.12.2021 | 15.12.2021 | Presentation | <50 |
| 26 | Workshop | 1 st Task Force industrial needs Hydrogen Qual. | FHa/ERIG | online | 22.02.2022 | 22.02.2022 | Participation | <50 |
| 27 | Workshop | 2 nd Task Force industrial needs Hydrogen Qual. | FHa/ERIG | online | 16.03.2022 | 16.03.2022 | Participation | <50 |
| 28 | Conference | 9 th Session of the Group of Experts on Gas | FHa | online | 24.03.2022 | 24.03.2022 | Presentation | <100 |
| 29 | Workshop | 3 rd Task Force industrial needs Hydrogen Qual. | FHa/ERIG | online | 07.04.2022 | 07.04.2022 | Participation | <50 |
| 30 | Internal | 2 nd EAB Meeting | All | online | 25.04.2022 | 25.04.2022 | Presentation | <50 |
| 31 | Workshop | READY4H2: Steering Group meeting 14 | ERIG | online | 02.05.2022 | 02.05.2022 | Presentation | <50 |
| 32 | Conference | EHEC 2022 | FHa/Redexis | Madrid, Spain | 18.05.2022 | 20.05.2022 | Presentation | <500 |
| 33 | Workshop | 4 th Task Force industrial needs Hydrogen Qual. | FHa/ERIG | online | 31.05.2022 | 31.05.2022 | Participation | <50 |
| 34 | Conference | EGATEC | ERIG | Hamburg, Germany | 13.06.2022 | 15.06.2022 | Poster | <500 |
| 35 | Event | World Hydrogen Energy Conference (WHEC) | FHa | Istanbul, Turkey | 26.06.2022 | 30.06.2022 | Presentation | 5,000 |

A few highlighted activities are presented in the following and more in detail.

2.4.3.1 WHTC, EHEC, and WHEC

The World Hydrogen Energy Convention, the European Hydrogen Energy Conference, and the World Hydrogen Energy Conference are the events of highest international importance when it comes to the topic of hydrogen. They bring together researchers, academicians, industrial professionals, and all individuals interested in the field of hydrogen energy and to contribute to the development of low-carbon/carbon-free solutions with hydrogen. The HIGGS project and results have been presented on each in 2021 and 2022.

2.4.3.2 ENTSOG Workshop

Within a total of 3 workshops, HIGGS participated in the ENTSOG workshops: “Roadmap for gas grid 2050”. In detail they tackled the following topics:

- 10th March, 2020 - Workshop 1: EU Gas Market for New Gases
- 21st April, 2020 - Workshop 2: Innovative Regulatory Approach for the Energy Transition - Sector Coupling & Regulatory Sandbox
- 29th April, 2020 - Workshop 3: Principles for EU Gas Qualities, handling of Hydrogen and CO₂ Transportation

2.4.3.3 Task Force industrial needs hydrogen quality

To increase the interaction with standardization groups ERIG and FHA, representing HIGGS, participated in the Task Force industrial needs hydrogen quality workshops. The task force industrial needs hydrogen quality regularly discusses the required quality criteria for H₂ with partners from standardization bodies, gas network operators, and industrial H₂ producers and consumers. This is an important topic for HIGGS, especially with regard to injection and extraction criteria and for the development of the H₂ roadmap in WP6. Therefore, HIGGS regularly participates in meetings organized by DVGW.

2.4.3.4 EGERID 2021

The European Gas and Energy Research Innovation Days, organized by ERIG took place online, from the 15th to 19th November, 2021. During five days of program, a variety of stakeholders participated in six hours of presentations, ten hours of deep dive workshops, and nine hours of discussion, covering the complete hydrogen value chain – production, transport, metrology, storage and utilization. In the following, you find a short summary of each day and further information.

The HIGGS project was at the third conference day, dedicated to the overarching topic of hydrogen tolerance of the gas infrastructure. FHA as the project coordinator explained how HIGGS contributes to paving the way for the decarbonization of the gas grid and its usage, by covering the gaps of knowledge of the impact that high levels of hydrogen could have on the gas high pressure grid, its components, and its management. Representatives of Hydrogen Europe Research and ENTSOG welcomed the project and expert speakers connected it to the European Hydrogen Backbone initiative (by OGE – Open Grid Europe) as well as the hydrogen utilization project THyGA (ENGIE). In a subsequent deep dive session, the focus was put on intermediate results of the HIGGS project centered around legal, regulatory and technical aspects of hydrogen admixing as well as techno-economic modelling and validation, enablers and interoperability of hydrogen/natural gas grids.

During EGERID, the HIGGS consortium held also a workshop: “Hydrogen Tolerance Deep Dives” The workshop was dedicated to specific content of WP2 and WP5. It was exclusively for experts on that field with the idea to offer a platform to share in-depths knowledge and learn from each other.

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Each workshop will be up to two hours and feature two insight presentations by experts from inside and outside of the HIGGS project team.

Interested parties are also able to suggest topics they are interested in for future Deep Dive Sessions. The application process for participants and speakers as well as suggested topics is managed through the project website and will be selected beforehand by the consortium.

Videos of the workshops and presentations have been recorded and uploaded via YouTube. These have also been disseminated on events, e.g. EGATEC conference. On the exhibition stand the videos were run on screens, so that the awareness of visitors was risen. It is also planned to publish these via the HIGGS website.

2.4.3.5 Joint Project Online Event

In M3 a public online event was held together with the THyGA and the SuperP2G project in order to have a public presentation for all projects to relevant stakeholders. The overall goal was to raise the general awareness for the projects and their corresponding objectives. The Workshop was split into a general pitch session for all projects and separate breakout sessions for the HIGGS and the SuperP2G project. In total 192 people participated in the workshop overall with 54 participants in the HIGGS breakout session

2.4.3.6 HIGGS online Event

In M10 a public workshop was held in order to compensate for the lack of opportunities to promote and present the project at other events in 2020 which have been cancelled or postponed due to COVID 19. Within the event the project was presented in general as well as the progress made within each active WP. The event was attended by 97 participants from all target groups.

2.4.3.7 Workshop on inventory and legal/regulatory framework of hydrogen in the transmission grid (WP 2)

In M14 a closed workshop was held in order to support the work and necessary data collection in WP 2. In total 38 people have been directly invited from which 25 participated in the workshop. The targeted group for this event were specifically European TSO's as well as gas associations on EU level. Within the workshop the current status of the Work package was presented and the need for a comprehensive data collection in order to fulfil the tasks in WP 2 was once again brought to the attention of the participants.

2.4.4 Planed conferences, events and fairs

Planed events, conferences, and fairs where the HIGGS consortiums wishes to be present are listed in Table 3. This is a list that is permanently revised and adjusted in the project's work flow. At regular meetings with the WP leaders at the communication jour fixe, every 6 weeks, activities are added as needed and available. At the moment, not all external events are planned or dated by the organizers. Therefore, this will be improved in the ongoing process, if there is new and further information.

Table 3: Planed conferences, events and workshops from July 2022 until the end of the project

| Nr. | Type | Title | Who | Where | When | Until | Action |
|-----|------------|---|------|------------------------|------------|------------|--------------|
| 36 | Event | Hydrogen Dialogue 2022 | ERIG | Nuremberg, Germany | 21.09.2022 | 22.09.2022 | Presentation |
| 37 | Conference | Wind Meets Gas | ERIG | Groningen, Netherlands | 07.10.2022 | 08.10.2022 | Exhibition |
| 38 | Conference | European Hydrogen Week | TBD | Brussels, Belgium | 24.10.2022 | 28.10.2022 | TBD |
| 39 | Conference | Enlit Europe | TBD | Frankfurt, Germany | 29.11.2022 | 01.12.2022 | TBD |
| 40 | Conference | European Hydrogen Conference (EHC) | TBD | Vienna, Austria | 27.03.2023 | 29.03.2023 | TBD |
| 41 | Conference | 38th International Scientific and Expert Meeting of Gas Professionals | TBD | Opatija, Croatia | 01.05.2023 | 02.05.2023 | TBD |
| 42 | Conference | World Hydrogen Technologies Convention (WHTC) | TBD | China | 22.05.2023 | 26.05.2023 | TBD |
| 43 | Workshop | Working group of the Think Tank project (Spanish Gas Association) | FHA | online? | xx.07.2022 | xx.07.2022 | Presentation |
| 44 | Workshop | 4th External Advisory Board Meeting | All | online | xx.07.2023 | xx.07.2023 | Presentation |
| 45 | Conference | GAT WAT | ERIG | Cologne, Germany | xx.10.2023 | xx.10.2023 | Exhibition |
| 46 | Conference | Wind Meets Gas | ERIG | Groningen, Netherlands | xx.10.2023 | xx.10.2023 | Exhibition |
| 47 | Event | Programme Review Days (PRD) 2022 | TBD | TBD | xx.yy.2022 | xx.yy.2022 | TBD |
| 48 | Event | Programme Review Days (PRD) 2023 | TBD | TBD | xx.yy.2023 | xx.yy.2023 | TBD |
| 49 | Event | International Hydrogen Symposium | TBD | TBD | xx.yy.2023 | xx.yy.2023 | TBD |
| 50 | Conference | Iberconappice | TBD | TBD | xx.yy.2023 | xx.yy.2023 | TBD |
| 51 | Event | Energy Transition World Forum | TBD | TBD | xx.yy.2023 | xx.yy.2023 | TBD |

2.4.4.1 Hydrogen Dialogue 2022

This event brings together decision-makers from business, politics and science along the entire value chain of hydrogen and provide the space to present new technologies in the accompanying expo area. It focuses on these main topics:

- Opportunity of the century H₂: Germany as a hydrogen country
- Scaling up & speeding up the market
- Framework for a successful hydrogen business
- Lessons Learned worldwide
- Applications: Industry, energy, mobility & transport
- Ramp-up of the European hydrogen infrastructure & role of H₂ imports

Regarding the topics and the audience this event is a good fit for the HIGGS project, which is planned to be pitched by ERIG, representing the project.

2.4.4.2 Wind Meets Gas

The Wind meets gas event in 2022 focusses on two major topics:

1. The North Sea Energy Issue
2. Hydrogen Valleys connected

Specific offshore challenges will be addressed from various stakeholder perspectives, such as, how to integrate sustainable energy electrons and molecules. Many representatives of Hydrogen Valleys and involved stakeholders will share their hands-on experiences, seek for modalities to align mutual interest and to create lasting cross-border alliances.

Regarding these topics and the audience that will be present, it is planned to be present with project information regarding the HIGGS project. The consortium also considers a participation in 2023, dependent on the topics that are addressed.

2.4.4.3 European Hydrogen Week

The European Hydrogen Week is the biggest annual event dedicated to hydrogen under the lead of the Clean Hydrogen Partnership and its members, the European Commission, Hydrogen Europe, and Hydrogen Europe Research. It is intended to focus on the following:

- A policy conference (hybrid) focused on Research and Innovation activities in the EU
- High-Level Conference centering around the global, European, and national hydrogen developments and will include policy decision makers, C-suite industry representatives, and experts across the hydrogen value chain as speakers.
- Business to Business Conference will be a source of inspiration for stakeholders as it will cover a wide range of aspects related to technology, market, and finance developments in the hydrogen sector.
- Hydrogen Europe's Flagship Event and Expo is taking place in presence in Brussels in parallel

The event is taking place from the 24th to the 28th of October 2022 and it is planned to present HIGGS with project material on the exhibition stand during the flagship event in Brussels.

2.4.4.4 Enlit Europe

At the European edition, the Enlit community will come together for three days in Frankfurt from 29 November through to 1 December 2022, to meet and inspire each other and to develop their discussions and actions to take steps forward in the energy transition. It is also one of the highest ranking European events that addresses the grid operators in Europe. ERIG, on behalf of the HIGGS consortium, is in regular contact with the organisers and it is the ambition to place the project in the relevant hub-sessions and fora. In 2019 there has been a special stage for Horizon 2020 projects and a further alternative would be to co-organise a hub-session specially dedicated to the general topic of "Synergy of Hydrogen in Natural Gas Infrastructure". With the event being cancelled in 2020 due to COVID ERIG is currently in close exchange with the organisers for the 2022 edition mentioned above. The same is planned for 2023, where one of the hub sessions of the events could be lead via ERIG with regards to the HIGGS topics.

2.4.4.5 European Hydrogen Conference (EHC)

The Energy Council has created the European Hydrogen Conference (EHC) to discuss how hydrogen will be integrated across the value chain through ministerial, industrial and technological collaboration.

Key themes explored at EHC include:

- Identifying the latest hydrogen projects and sharing the successful examples of the roll-out of hydrogen cluster strategies
- Delving into the regulatory and technological advances required to promote low-carbon and renewable hydrogen production
- Promoting demand across the value chain and sharing how industry players have integrated hydrogen into their long-term GHG reduction strategies

The next EHC is taking place in Vienna 27.03.2023-29.03.2023 and HIGGS will consider to participate here.

2.4.4.6 38th International Scientific and Expert Meeting of Gas Professionals

The 38th International Scientific and Expert Meeting of Gas Professionals will be held in May 2023 in Opatija. This event is one of the best-known three-day international gas conferences & exhibitions in central and south-east Europe and gathers many distinguished gas and energy experts and managers from various gas companies and institutions as well as many exhibitors from 20 and more countries to discuss the current gas and energy topics. Conference will cover a number of current issues relevant to the gas economy and energy industry that stretch along the entire natural gas chain as well as the key issue that will determine the development of natural gas markets in the near future. The HIGGS consortium will consider to participate here.

2.4.4.7 National and European Events targeting Gas Grid Operators

By targeting the major national events of the Gas Grid Operators, a substantial higher impact to the core technology stakeholders could be achieved, than what would be the case by only addressing European events. First priority will be on the nationalities represented via the consortium. Furthermore, if other national events allow for presentations in English, ERIG will try to address those as well. I first orientation is given here:

Gat | Wat in Berlin will be the leading congress of the German gas and water industry and it will focus on the strategic and political leading congresses for the gas and water industry, top-class panel discussions, and in-depth specialist articles. The 2023 edition of the GAT|WAT in Cologne will be targeted. ERIG is in exchange with the organisers to arrange HIGGS participation and possibly room for interaction with other identified relevant projects.

2.4.4.8 World Hydrogen Technologies Convention (WHTC)

WHTC is alternating with WHEC and one of the most prestigious conferences focusing on hydrogen. The next event will take place in 2023 in China. A participation by HIGGS will be discussed with the consortium

2.4.4.9 Iberconappice

Under the name of Iberoamerican Congress on Hydrogen and Fuel Cells (Iberconappice), the Spanish Fuel Cells Association organizes a series of conferences with the aim of facilitating dissemination of the progress made in Hydrogen and Fuel Cell technology from different areas (e.g. university, research centres, technology centres, companies and governments).

Despite its original national character, it has been an increase in the participation at international level, providing the opportunity to establish valuable partnerships beyond Spain and its borders.

Next edition is expected to take place in 2023 in Spain. Currently there is no specific information available on a next edition of this event but HIGGS is considering a participation.

2.4.4.10 International Hydrogen Symposium

To show the great potential of hydrogen and to highlight the leading role of Northern Germany in this context, the IHK Nord e.V. (Association of North German Chambers of Commerce and Industry) and the Wasserstoff-Gesellschaft Hamburg (Hydrogen Society Hamburg) jointly organised the International Hydrogen Symposium in Hamburg.

Next edition is expected to take place in 2023. Currently there is no specific information available on a next edition of this event but HIGGS is considering a participation.

2.4.4.11 Energy Transition World Forum

This event consists on one-day specialist forum bringing together the major stakeholders in the decarbonisation of industry, transport and the connected energy system. Part of Flame, Europe's leading Gas and LNG conference.

Next edition is expected to take place in 2023. Currently there is no specific information available on a next edition of this event but HIGGS is considering a participation.

2.4.4.12 Workshop: Hydrogen Tolerance Deep Dives

HIGGS has had the goal from the beginning to organize at least two workshops further to the project kick-off. They will be especially dedicated to target the key stakeholders of the topic such as the high-pressure natural gas grid operators. In 2020 and 2021 two workshops already have been organised from which one was held in close cooperation with two related projects (THyGA and SuperP2G). The already held and future public and closed Workshops are as follows.

As mentioned in 2.4.3.4, in M23 one workshop was realized during the EGERID event. The HIGGS consortium held also a Workshop: "Hydrogen Tolerance Deep Dives" The workshop was dedicated to specific content of WP2 and WP5.

Furthermore there is one major workshops planned M48: HIGGS final results workshop. With this final event, all final results will be presented and thereby all relevant stakeholders will be addressed. The Dates of this workshop are indicative, as they were determined during the project's Kick-Off meeting, and they may vary depending on the development of the project.

3 Conclusions

The present document is the third and final update of the previous communication and awareness plans and describes the goals, target groups, channels and individual approaches for particular partners providing a regular flow of information. It contains information about target groups, the message to be transmitted to them and the communication tools needed. All activities will be approved according to the provisions set in the Grant Agreement and the Consortium Agreement.

Module A of the Horizon Results Booster has made it possible to generate a project group with which synergies with similarly operating projects could be further developed. It is planned to deepen this cooperation via Module B and to develop a joint dissemination strategy. It could also be shown that the project was very present at many events and that the target groups were reached through the indicated channels. Due to the extension of the project by one year, it is planned to expand these activities even more and to focus especially on the last year of the project, since most of the project results are expected here.

Due to the influence of COVID 19 the list of originally foreseen events had to be adjusted. A negative influence of the pandemic on dissemination and communication activities has not yet become apparent, as online events and the increased use of online channels, have been able to compensate for this. It is not expected that this will change by the end of the project, although it remains to be seen how the pandemic will develop. Therefore, the participation at conferences and events remains a priority and will be implemented within the possibilities.

The communication and awareness plan will be updated at the end of the project.

Acknowledgements

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No. 875091 'HIGGS'. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.



Annex 1 Updated templates and funding lines



Presentation Title, Arial 28pt Bold

Optional Subtitle, Arial 18 pt

Speaker, Arial 18pt

Name of Orga

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No. 675091 HIGGS. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.

www.HIGGSproject.eu

Figure 2: Adjusted template for power point presentations

MEETING OCCASION

| | |
|------------|--|
| DATE | |
| VENUE | |
| ATTENDANTS | (FHA) Vanesa GIL (VG), Manuel MUNIESA (MM), Laura ABADIA (LA), Rodrigo PEREZ (RP), Teresa VILLUENDAS (TV), Javier SANCHEZ (JS), Rubén CANALEJAS (RC), Paula LLORET (PL), Pedro CASERO (PC) |
| | (DIVG) Michael WALTER (MW), Armin BOLLIER (AB) |
| | (TECNALIA) Pablo BENGURIA (PB), Ekain FERNANDEZ (EF), Virginia MADINA (VM) |
| | (OST) Markus FRIEDL (MF), Luiz Carlos DE SOUSA (LS) |
| | (REDEXIS GAS) Maria Dolores STORCH DE GRACIA CALVO (MG), Marcos LOPEZARENA (ML), Agustín PASQUAL (AP), Alberto CEREZO (AC) |
| | (ERIG) Hans RASMUSSEN (HR), Felix KUNKEL (FK) |

AGENDA:

| Team | Presented by |
|-------|--|
| TOP 1 | Title of the topic N.N. (Come) |
| TOP 2 | Content |
| TOP 3 | |
| TOP 4 | Coffee break Background, roles and expectations |
| TOP 5 | |

Disclaimer: The information shared in the H2M meeting (presentations, discussions), both orally and in written form, has to be considered and treated as confidential unless the disclosing party considers it as no confidential information.

Lunch break

MINUTES:

| Topic | What | Who | When |
|---------------------------|------|-----|------|
| TOP 1 Presented by | | | |
| TOP 2 WP2 presented by | | | |
| TOP 3 presented by | | | |
| TOP 4 presented by | | | |
| TOP 5 presented by | | | |

Disclaimer: The information shared in the H2M meeting (presentations, discussions), both orally and in written form, has to be considered and treated as confidential unless the disclosing party considers it as no confidential information.

| | | | | |
|-------|--|--|--|--|
| Other | | | | |
|-------|--|--|--|--|

* I - Information A - Action D - Done

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Disclaimer: The information shared in the H2M meeting (presentations, discussions), both orally and in written form, has to be considered and treated as confidential unless the disclosing party considers it as no confidential information.

Figure 3: Adjusted template agenda and minutes



Figure 4: Adjusted funding line on the HIGGS website (<https://higgsproject.eu/>)