Hydrogen in Gas Grids

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

D7.3

Communication and awareness plan Update 1

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Dissemination level:

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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Document history

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2.1	2021-03-15	First Draft Version 2.0
2.2	2021-04-16	Final Version 2.0
2.3	2021-04-20	Ready for submission Version 2.0

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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 first updated of the plan and will be updated once more during the Project duration, followed by a final report on dissemination activities and materials by the end of the Project.

1 Objective

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

This plan also takes into account dissemination activities targeted to different audiences, as workshops, conferences and fairs. It will be updated again in D7.4 (M27) according to the Grant Agreement.

The document aims at defining the methodology, audience, 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 Work Package 7, 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 updated once more in month M27 and summarized at the end of the project (M36) together with the exploitation and dissemination plan.

The consortium agrees to follow a basic set of rules of common understanding to help assure a good quality communication and dissemination in accordance with the Consortia 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 internal project page is the platform for all internal 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 OK from FHA as project coordinator, each interested partner will send the communication and the event information to the rest of the Consortia 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 Consortia with sufficient ahead planning (based on the CA rules) to help 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.html). Possibilities that are targeted for this are:

   - Open Research Europe (https://open-research-europe.ec.europa.eu/)

   - Scientific journals supporting open access options

2.2 Target groups

A first assessment of the main target audiences that are expected to be influenced by HIGGS results is carried out in this section. Results from other tasks of the project related to the description of pathway towards integrating H2 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.

Policy makers and regulatory bodies

HIGGS results may be a premise towards developing standards in hydrogen blends, according to technical, legal and regulatory conditions for safe operation and maintenance of the gas network at different H_2/CH_4 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 RE sources into the grid will be the main input for these organisms.

Renewable energy stakeholders and gas grid operators

HIGGS will impact directly on addressing the interaction on energy markets, first, by increasing the knowledge on impact on infrastructure, also by tackling the aspects from regulations codes and standards, and furthermore, directly considering as part of the pathway the cross border issues that are arising 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 electrolysis production of hydrogen.

The key message to be transmitted to these groups involves (1) the potential benefits of injection of hydrogen in terms of the potential of electrolysis technology for RE integration and transport of the H_2 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.

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.

General public

The dissemination efforts towards the general public will be focussed on the benefits of hydrogen and power-to-hydrogen solutions for RE integration and CO_2 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.

2.3 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. Screenshots of the current website can be found in ANNEX 1.

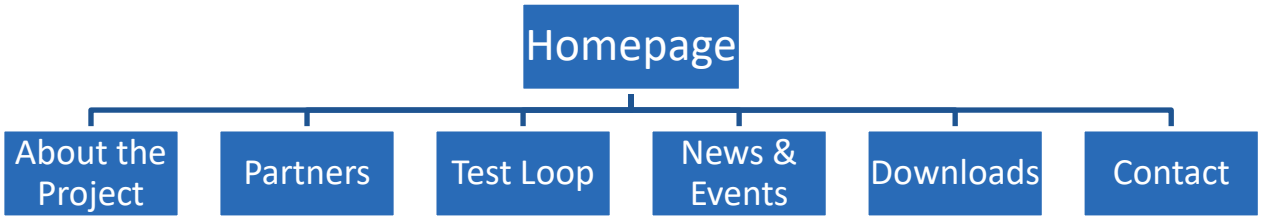


Figure 1. Web map scheme.

The website is designed to provide a general impression of the project and will be maintained for 2 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 involves, 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 sent 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 is being developed for the project, comprising 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. All material is updated according to the progress of the project. Due to the influence of COVID-19 the priority was set digital material rather than printing material (posters, flyers). However the developed factsheet can be used as a factsheet as well if needed and posters are going to be available once needed (presumably the latest in Q4 2021 for the GAT|WAT and ENLIT events).

The main graphic materials developed within HIGGS are or will be:

- **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 3. 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 "pipe-lines".

Several colour combinations for the logo were drafted and in the end the decision fell on the simple version with two colours. The colour transition throughout the Logo in blue and green shows how hydrogen (blue) can help make high pressure natural gas grids get greener (green). Both "G"s are turned towards each other and the cross bars in the form of arrows indicate the positive interaction between pure hydrogen and the natural gas grids in symbiosis. It also underlines that this interaction between hydrogen and the gas grids is at the centre of attention in the project.

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).

	Logo Blue: 41,107,183 (RBG)
	Logo Green: 150,193,60 (RGB)
	Text White: 255, 255, 255 (RGB)
	Text Black: 0, 0, 0 (RGB)
	Background light: 238, 236, 225 (RGB)
	Background dark: 31, 73, 125 (RGB)
	Accent 1: 255, 207, 40 (RGB)
	Accent 2: 255, 207, 40 (RGB)
	Accent 3: 204, 64, 67 (RGB)
	Accent 4: 105, 48, 138 (RGB)
	Hyperlinks un-used: 41, 107, 183 (RGB)
	Hyperlinks used: 105, 48, 138

The font that has been selected for project documents is Arial.

- **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.

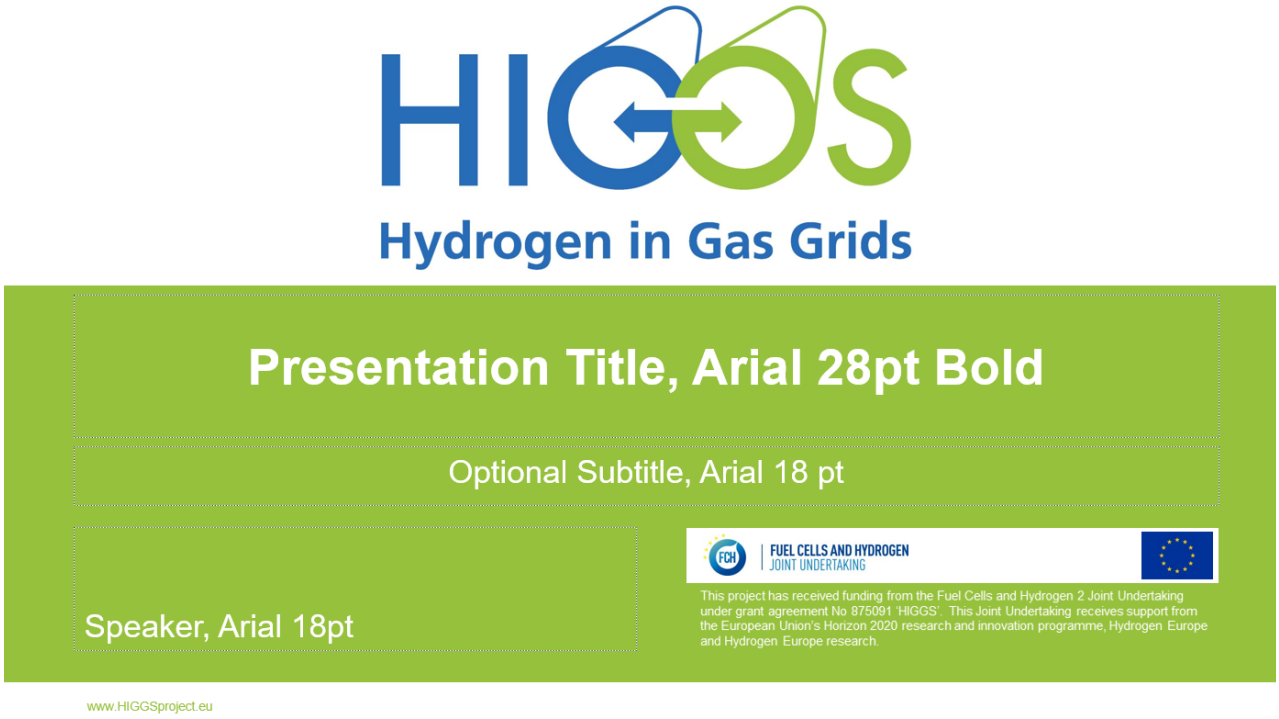


Figure 4. Power-Point presentation draft screenshot.

- **Press kit**

A press kit has been developed and distributed among partners. It is also 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 will include 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.

This document is thought to homogenize the communication approach and to promote the chosen project image.

- **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 has been designed in a way that allows for its use as a flyer to be handed out at events as well (see also ANNEX 2).

Updated versions of this material will be released with progress of the project and aiming to a wider public at EU level. At least one more update is planned during the time of the project. It includes a

general presentation of the project, at the current stage. On the latest versions, it will gather the main impacts on society and the environment as well.

The factsheet is also available for download 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.

- **Posters**

The initial plan was to develop at least one poster during the life of the project. In the same way as the factsheet/flyer, the poster would serve as a support material for special events where HIGGS would be presented. Due to the impact of COVID 19 on physical events the necessity for a poster was not given until the time of this report. Therefore a poster will be designed as soon as the need for such material arises. In the meantime, the factsheet is used to give an overview of the project in its current status.

- **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 so as to better explain the socio-economic and environmental benefits of the project, impact on EU decarbonisation as well as recommendations at EU level (policies, targets). Furthermore, the progress of the work on the testing platform is being documented as well to be possibly used for a later short video on the development of the platform.

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.

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. For the social media channels “Twitter” and “LinkedIn” separate accounts have been create for the HIGGS project and are managed by ERIG.

- **Twitter:** Used to reach the general public (target group 4). 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 (target group 2), technology providers/manufacturers (target group 3) and the general public (target group 4). Partners are encouraged to echo the project events, news, press releases and posts of the HIGGS project account 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. A individual HIGGS project profile has been created from where content can be posted and which can be implemented by the project partners into their own LinkedIn activities.

- **Facebook:** Used to reach the general public (target group 4). 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.

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 the FCH 2 JU and H2020 resources, HIGGS continuously identifies other projects and initiatives (section 2.4.1). Another activity in that field are the planned Deep Dive Events (see section 2.4.4 for more information).

2.3.4 Public Relations

Several press releases will be sent 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 described in 3.3.2 supports the Public Relations (PR) activities carried out by HIGGS project partners.

The first press release was sent by FHA on January 16th 2020. The next press release is planned once the testing platform is finished and ready to start the testing program.

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.

2.4 Dissemination activities

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

On European level, exchange and planning activities are especially prioritised to take place with ENTSOG, Hydrogen Europe Research, Eurogas, Gas Infrastructure Europe and Marcogaz. ERIG is 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 possible 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 disseminated project results and also reach the relevant stakeholders within those groups for other dissemination activities such as workshops.

2.4.1 Synergies with ongoing projects and other related activities

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 coorganise common activities and exchange, according to the Task 7.3.2 defined in the Grant Agreement.

The assessment of the collaboration will be studied case by case taking into account the objectives of each project and partners involved, but a preliminary list of possible synergies is summarised hereafter.

THyGA (2020-2023)

The objective of THyGA project (Testing Hydrogen Admixtures for Gas Appliances) 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 H_2 in natural gas
- Making recommendations for manufacturers and decision makers along the gas value chain for appliance design, manufacture and certification.

HIGGS and THyGA have started their close cooperation with bilateral meetings were common issues for both projects are discussed. Synergies especially in reference to the Regulations, Codes and

Standards aspects of both projects have been identified. In regard of the development of the roadmap, leakage testing and other topics a cooperation between both projects can prove useful and will be investigated further in future regular meetings. Additionally, project coordinators, on behalf of their respective projects, are in close contact and interesting documents are exchanged between both projects.

HyGRID (2016-2021)

The key objective of the HyGrid project is the design, scale-up and demonstration at industrially relevant conditions a novel membrane based hybrid technology for the direct separation of hydrogen from natural gas grids. The focus of the project will be on the hydrogen separation through a combination of membranes, electrochemical separation and temperature swing adsorption to be able to decrease the total cost of hydrogen recovery.

Partners involved: Technische Universiteit Eindhoven, Fundacion Tecnalia Research and Innovation, HyGear Technology and Services BV, SAES Getters SpA, HyET Hydrogen BV, Quantis Sarl, Nortegas Energia Distribucion SA

Synergies in regard of the membrane technology within both projects are identified and used through Tecnalia being partner in both projects.

HyDelta (2020-2022)

HyDelta 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 and has a provisional term until January 2022. Innovations closest to market introduction will be tackled first.

Partners involved: DNV GL, kiwa, New Energy Coalition, TNO, Gasunie, Netbeheer Nederland, TKI Nieuw Gas

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

The project HyDelta consortium has been contacted but the feedback for a first meeting is still pending.

HyNTS FutureGrid (2020-2021)

This national project (GB) is the planning phase which defines the principles and specification of a full scale NTS hydrogen test facility. The project will be split into 3 work packages, detail design of the test rig, master testing plan and materials testing and enable the building of a test facility to test critical components with up to 20% hydrogen/methane gas blend and up to 100% hydrogen.

The main objective is to design an off-line test facility, to specify a test programme and to carry out some laboratory tests to demonstrate that transporting hydrogen and hydrogen/natural gas blends in repurposed National Transmission System assets is no less safe than transporting natural gas now.

Partners involved: DNV GL

The HyNTS FutureGrid consortium will be contacted in the coming weeks.

Super P2G (2019-2022)

SuperP2G 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.

Partners involved: DTU ME, DTU Elektro, GreenLab Kive, JKU Linz, DBI-GTI, DVGW-EBI, CNR, Uni Bologna, RUG-FEB, ERIG

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 with regard to P2G and their corresponding need-owners in EU with each other to utilise synergies with regard to the evaluation tools and procedures used when evaluating P2G
- Showcase the potential for P2G in each involved country and derive pan European conclusion with regard 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 can be used through coordinated events. Future options in that regard will be considered.

MefHySto (2020-2023)

The MefHySto project 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.

Partners Involved: CMI, CEA, Mahytec, NPL, ERIG, BAM, PTB, DBI, DVGW, Max Planck Institute, FHa, Reganosa, Universidade da Coruña, University of Valladolid

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).
- 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 regard of hydrogen quality and shared stakeholder groups have been identified and can be utilized for both projects.

NETZlabor Wasserstoff-Insel (2019-2023)

This is a pilot project funded and carried out by Netze BW which aims to demonstrate that hydrogen amounts of up to 30% are already today technically possible in large parts of the gas supply.

The facilities are located in Öhringen (Hohenlohe, Germany) at the network operator's office and the adjacent streets with about 20 residential buildings. The selected area of the natural gas network is decoupled from the surrounding supply infrastructure and operated as a so-called island network.

The project is characterised by two different stages:

- Phase 1: Demonstration of successively increasing hydrogen amounts of up to 30% vol. in Netze BW0s own property
- Phase 2: Demonstration of successively increasing hydrogen amounts of up to 30% vol. in neighboring streets and houses The NETZlabor Wasserstoff-Insel consortium will be contacted in the coming weeks.

JRC – Joint Research Center

The Joint Research Centre (JRC) is the European Commission's science and knowledge service which employs scientists to carry out research in order to provide independent scientific advice and support to EU policy. A first meeting between the HIGGS project and JRC has been done and synergies in regard of pre-normative research and synergies with the HIGGS testing platform have been identified. Furthermore JRC is considered as a future member of the External advisory board to ensure the exchange of synergies.

Standardization and certification bodies (NEN, CEN, DIN, KIWA, DVGW CERT GmbH, DNV-GL)

Interaction with standardisation and certification bodies has been established through DVGW employees. DVGW is part of CEN groups, DIN NAGas and recommendations for possible new and/or revised standards and linked regulations.

RGC

RGC is an Ukranian Alliance of 20 DSO´s covering 70 % of the Ukranian distribution grid. Currently the RGC is running various test on materials and equipment in use regarding gas quality and material conditions with various H2 blends. Synergies between the RGC project and the testing planned for HIGGS have been identified in a first meeting. Currently the kind of possible exchange and usage of synergies between both projects is being evaluated.

Sedigas – Think Tank

The Think Tank addresses various steps and barriers necessary for a transformation of the gas grid. First of all the adaptations that would be necessary in the current gas infrastructures for the transportation of hydrogen and natural gas mixtures in a first phase or their conversion into hydrogen networks in a definitive phase (Infrastructures Group) are identified. Furthermore the regulatory barriers that currently pose an obstacle for hydrogen injection to become a reality, as well as preparation of proposals to solve them (Regulation Group) are adressed. Lastly the applications that can best contribute to the extensive use of hydrogen as an energy source, as well as the necessary adaptations to current equipment so that the final consumption of hydrogen is a reality in all market segments (Utilization & Consumption Group) are identified. Aside from Sedigas being a member of the HIGGS external advisory board Redexis and FHa are in close exchange to ensure the use of synergies between the Think Tank and the HIGGS project.

HIGGS External Advisory Board

The HIGGS External advisory board currently consists of 13 representatives from Gas associations and transmission grid operators across the European Union. The exchange between the board and the project team is ensured through regular meetings where the board is updated on the current status and progress of the project and is given the opportunity to comment on the project development and advise the consortium for further steps or on critical issues. A first meeting with the board was organised in M10 and a second meeting is planned for M16. Further meetings will be organised on a regular basis throughout the whole lifespan of the project.

2.4.2 Publications and media impact

Scientific papers (relevant journals and conference proceedings) 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 ERIG.

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. (See also chapter 2.1 Methodology)

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 descarbonizacion en Europa y que Aragón puede liderar (Alexa Rank in Spain 56, aprox 64,5 million monthly visits).
2. **Heraldo**: Aragón lidera desde Walga 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 descarbonizacion 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)

2.4.3 Conferences, Events and Fairs

HIGGS partners will show the results obtained during and after the project at conferences, fairs and events related to the target groups stated on section 2.2.

By targeting the major national events of the Gas Grid Operators as well as international events, 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.

For highest possible impact towards the major stakeholders, High Preasure Grid Operators, the project targets European and national events featuring targeting the Natural Gas Grid Operators The consortium presented or targets the events listed below. The HIGGS consortium will evaluate other possible events to attend to. This list will evolve and will be updated in following versions of this plan.

World Hydrogen Iberia - participated

This online conference will be taking part alongside Iber-REN which will be taking place from 23 - 24 March 2021 (digital). The event focuses on an in-depth investigation into the Iberian Hydrogen market. The HIGGS project has been presented on this event by FHa. Other topics addressed during the conference were the opportunities Green Hydrogen has in supporting the National Hydrogen Strategies of Portugal and Spain, various case studies (including HIGGS) as well as multiple panel discussions on the role of hydrogen Iberia, Portugal and Spain.

Green Gas Mobility Summit 2020 - participated

The Spanish GASNAM Event “Green Gas Mobility Summit” (22-24 September 2020, digital) responded to the challenges that transport faces today in more than 50 conferences, B2B meetings, and a large virtual exhibition. It has been an essential event in which the highest representatives of the natural and renewable gas sector meet to discuss the energy and climatic challenges facing the road and maritime transport sector. The HIGGS project was presented at event by Redexis.

Technikforum Wasserstoff – approved

This digital Event is organised by DVGW and features mainly the transition of the German gas grid towards a hydrogen infrastructure. In the two day event (28-29 April 2021, digital) various projects as practical examples will be featured alongside presentations and discussions on the transformation approach and application possibilities of hydrogen. Within that event ERIG has been approved contribute to the event and giving a view on research activities on the European level. The Title of the presentation is “Die Zukunft von Wasserstoff in Europa – Internationale Forschungsprojekte” (“The future of Hydrogen in Europe – International research projects”) and features the HIGGS project as well.

World Hydrogen Technologies Convention (WHTC) - approved

WHTC is alternating with WHEC and one of the most prestigious conferences focusing on hydrogen. Next event, 9th WHTC “Digital Edition” empowering Hydrogen Innovation will take place in 20-24 June 2021.

The abstract submitted on the “Injection of hydrogen in high-pressure gas grids: technical, regulatory and legal aspects” has been approved by the Organizing Committee as oral contribution and will be presented by FHa.

The Themes of 2021 will be:

- Advanced control
- Distribution / compression / storage of Hydrogen
- Fuel Cells
- Heating
- Industrial Processing
- Policies and Strategies
- Power Generation
- Production / Purification
- Safety
- Transportation

GAT|WAT Cologne – planning ongoing

Gat | Wat in Cologne 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 2020 edition of the GAT|WAT events had to be postponed due to COVID 19. The 2021 edition of the event will take place in September and maintains a high priority. ERIG is already in close exchange with the organisers to arrange HIGGS participation and possibly room for interaction with other identified relevant projects. The event is foreseen to take place as a hybrid event.

36th International Scientific & Expert Meeting of Gas Professionals – planning ongoing

This conference and exhibition will take place from 16th to 18th of June, 2021 in Opatija, Croatia. It gives the participants the opportunity to showcase their activities, products and technical solutions and thus create new opportunities with other gas and energy professionals across Europe. FHa has submitted an abstract titled “Experimental platform for the validation of the impact of hydrogen admixtures in the European Transmission Gas Grid”, which has been accepted as oral contribution. The participation in “virtual mode” is under discussion.

ENLIT Europe (former European Utility Week) – planning ongoing

As an annual conference for the energy community, this event has previous focused on electricity but gradually pushed on to include more cross energy vector alternatives. This is also one of the highest-ranking European events that addresses the grid operators in Europe. ERIG is in regular contact with the organisers, and it is the ambition to place the project in the relevant hub-sessions and floors. 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 2021 edition (30 November – 2 December 2021) in Milan, Italy.

EU Green Week Partner Event – Planning Ongoing

The EU Green Week 2021 is an event organised by the European commission that will be an opportunity to engage with all stakeholders and interested citizens on how we can work together to make the ambition for a zero pollution and toxic-free environment a reality. Centered around the main week numerous partner events from 03.05-13.06.2021 are going to take place. ERIG applied to participate with a partner event of its own by the title "Gas - a key player for the European Green Deal" scheduled for the 21st of May. The event argues for the vital role of gas in the EU Green Deal. The participator gets a comprehensive introduction to a full-fledged approach with overarching principles and leading theses for a successful transition. Details are highlighted by current ongoing research projects addressing vital issues along the gas value chain and concluded by an open dialogue with leading experts on energy and gas. One of the projects featured within the event is planned to be the HIGGS project. Underlined with the contributions, the overall goal is to have a fruitful discussion with the participants.

World Hydrogen Energy Conference (WHEC) – future event

WHEC is considered as the most well-now conference with several accompanying events in the field of hydrogen energy, under the auspices of the International Association for Hydrogen Energy (IAHE), hosts more than several thousands of attendees from more than hundred countries and offers numerous opportunities for participants, exhibitors and sponsors to exchange scientific and market information with global leaders in business, governments and scientific communities. The 23rd edition of this event has been postponed due to COVID to June 26-30 in 2022 (Istanbul, Turkey).

Relevant topics for HIGGS during remain:

- Hydrogen Strategies, Policies, and Roadmaps
- Hydrogen transportation / Hydrogen safety
- Pipelines / Hydrogen Infrastructure / Distribution / Filling Stations
- Renewable Hydrogen Technologies and Applications
- Sectoral Hydrogen Applications

European Hydrogen Energy Conference (EHEC) – Future Event

The European Hydrogen Energy Conference (EHEC) is the Europe's conference of reference in the field of hydrogen energy.

EHEC provides an excellent framework for updates on hydrogen and fuel cell technologies and represents the best setting to show the latest advances in research, projects and products. It will bring the latest breakthroughs in the research and business sector to the public eye. Moreover, the conference will facilitate the presentation of cutting-edge hydrogen and fuel cell science and technology.

Next edition: 2021 Madrid, Spain (specific date tbd.)

Power2gas conference – Future Event

Power2gas conference brings together major stakeholders from the industry to explore the latest developments related to this technology. Last edition was celebrated in October 2019 in Marseille, France. Currently there is no information available on a next edition of this event.

Key topics: EU regulatory and support framework / Examination of running projects – practical case of studies / P2G economics - reducing CAPEX & OPEX / Latest technological advancements / Convergence of power and gas infrastructures / Hydrogen storage improvements and safety issues / Scaling up opportunities and challenges / P2G for mobility and chemical sector / Building partnerships.

Iberconappice – Future Event

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 Autumn 2021 in Spain.

SVGW/VSG Research day – Future Event

SVGW/VSG Research Day – contacts with the Swiss association SVGW has proven that the best impact can be generated in Switzerland by participating in a special dedicated research day. In 2020 the event has been cancelled due to COVID. The next edition of this event will be targeted again for participation. Currently no specific information is available in that regard.

2.4.4 Workshops

HIGGS will 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 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.

External Advisory Board Meetings

In M10 a first meeting with the HIGGS external advisory board was held. In the meeting the progress and status of the project was presented to the board. In an in-depth discussion on the project the board and the project team had the opportunity for an extensive knowledge exchange and detailed question about the approaches in the various work packages. The next meeting with the Board is

scheduled for M 16. From there it is foreseen to have such meetings on a regular basis to ensure a periodic update on the progress towards the advisory board members as well as advise and input from the members towards the project team.

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

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.

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 TNO´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.

Hydrogen Tolerance Deep Dives

Aside from the planned workshops HIGGS will organise a series of online workshops under the title “Hydrogen Tolerance Deep Dives” starting mid-2021. The idea is to have events similar to the Workshop connected to WP 2 but transferred into a proper, repeating format. Each of the workshops will be dedicated to a specific topic centered on the content of the HIGGS project. The workshops are exclusively for experts on that field with the idea to offer a platform to share in-depths knowledge and learn from each other. 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.

Furthermore there are two more major workshops planned in M23 and M33:

- M23: HIGGS first results’ workshop. The exploitation plan (D7.2) will provide the first results available for dissemination.
- M33: HIGGS final results workshop

Dates of these workshops are indicative, as they were determined during the project’s Kick-Off meeting, and they may vary depending on the development of the project. Dates will adapt to the availability of results.

3 Conclusions

The present document is the first update of the original communication and awareness plan 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 to get it. All activities will be approved according to the provisions set in the Grant Agreement and the Consortium Agreement.

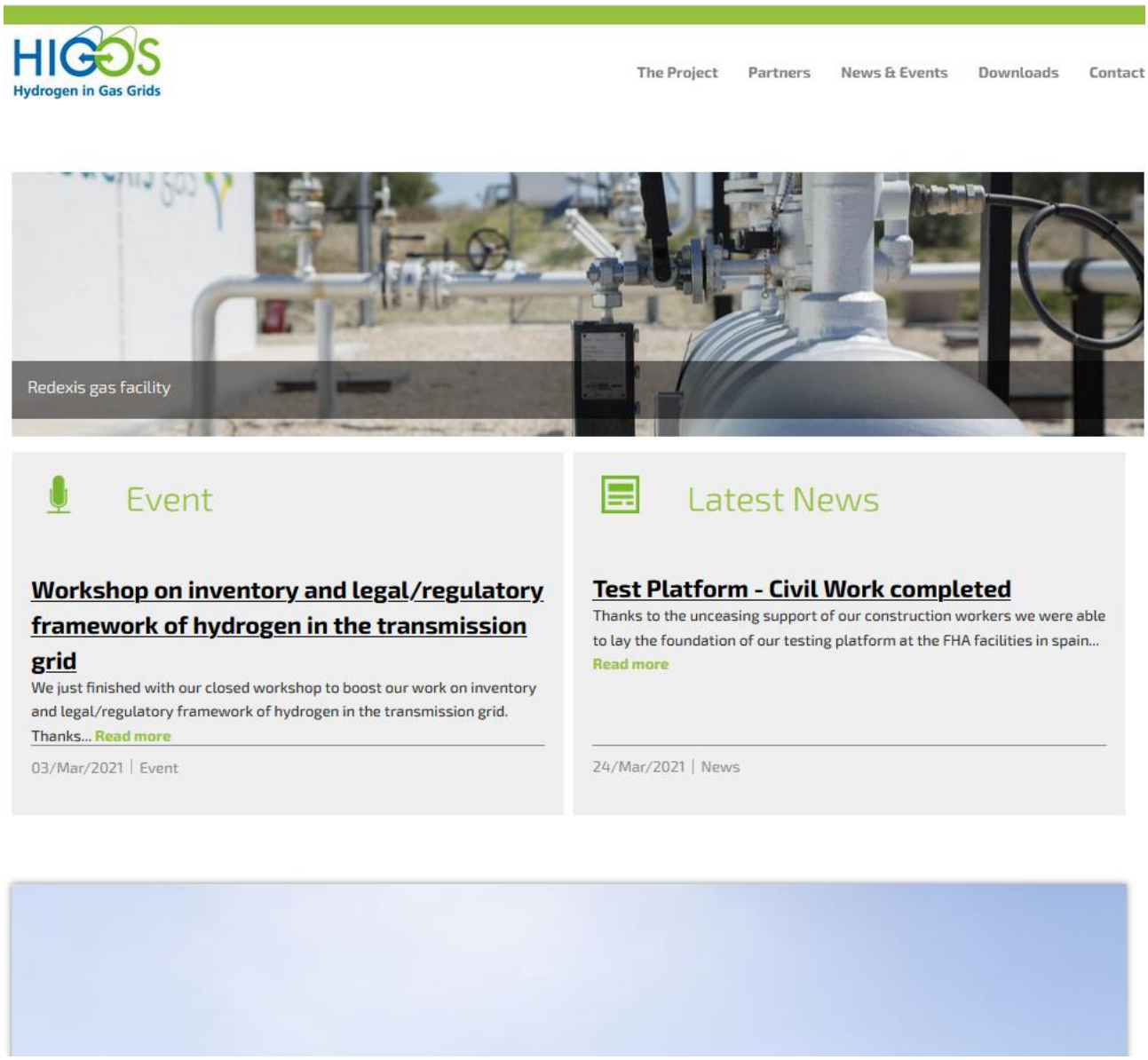
A search of synergies with other European projects has been performed aiming a knowledge exchange between the project advisory board and other relevant projects with same HIGGS mission. Hence, common workshops have been organised as a measure of maximizing HIGGS impact and the cooperation will be continued throughout the projects life-time. Similarly, it is proposed a list of conferences and events to attend as dissemination activities within communication work package of HIGGS. Due to the influence of COVID 19 the list of originally foreseen events had to be largely adjusted. While the influence of the pandemic continues the participation in such conferences and events remains a priority and will be implemented within the possibilities.

This document will be updated once again within D7.4 in M27.

ANNEX 1. Website

Screenshot of the landing page

[26.03.2021]

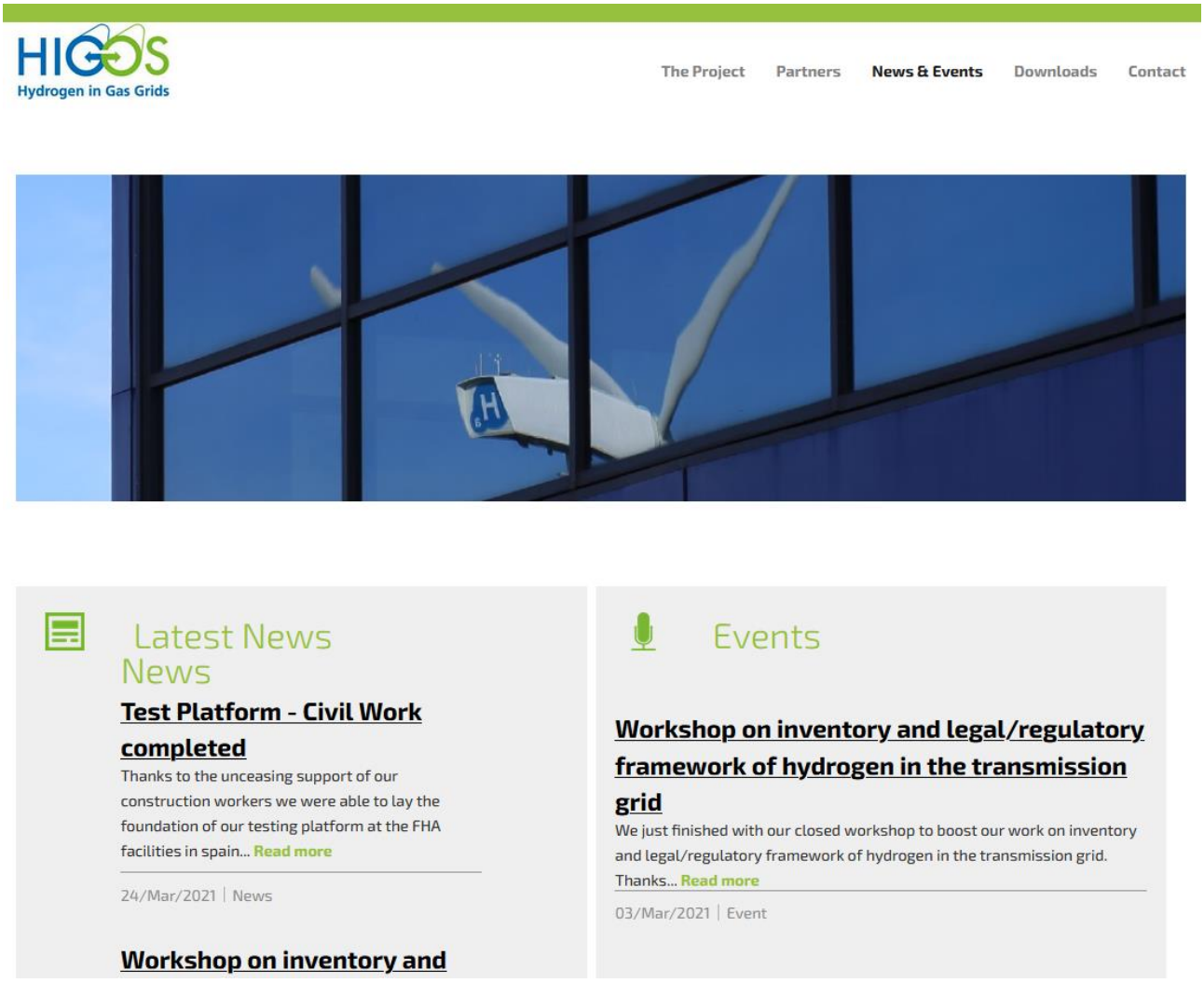


Screenshot of Partners Section

[26.03.2021]

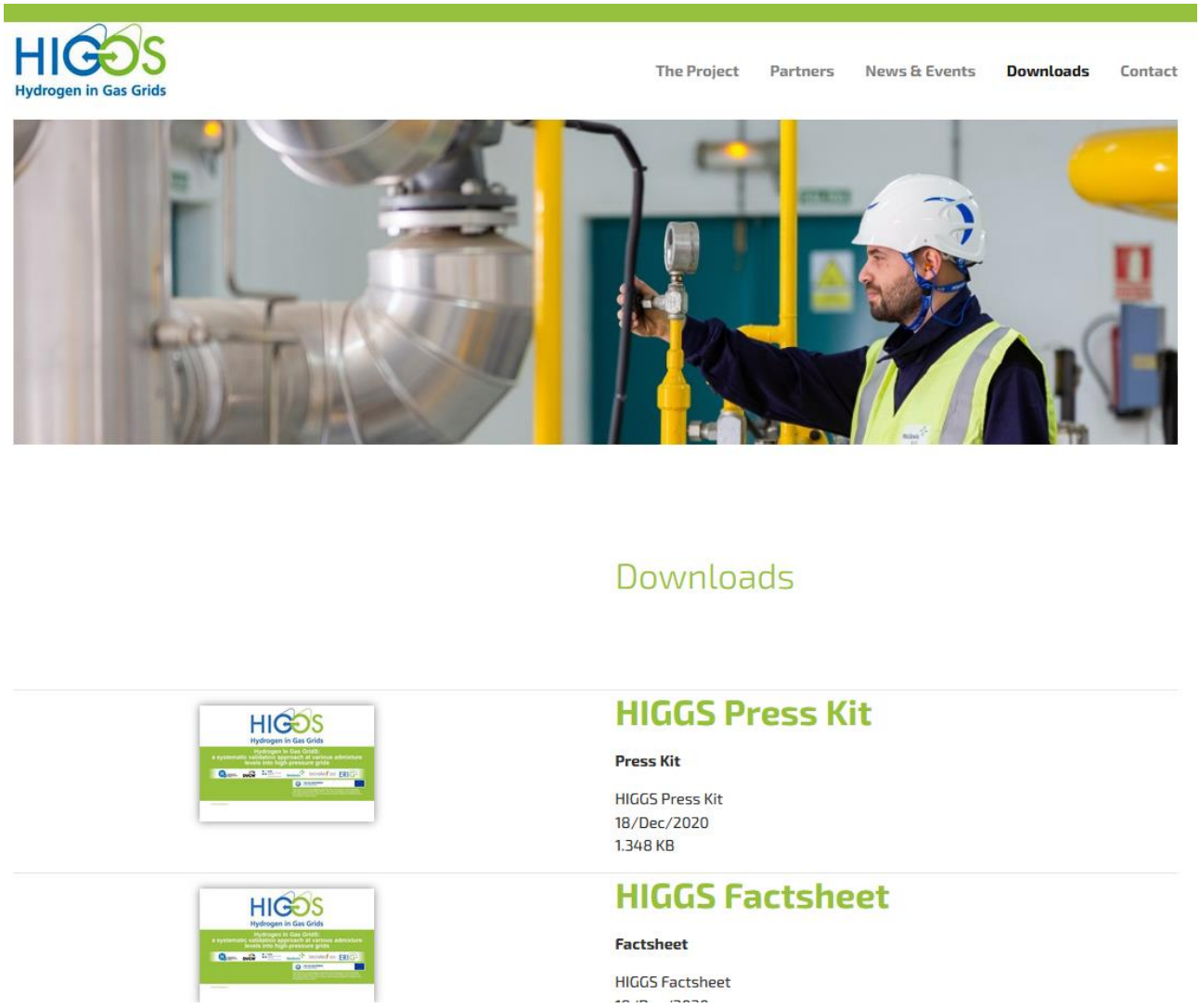
Screenshot of News & Events Section

[26.03.2021]



Screenshot of Downloads Section

[26.03.2021]



ANNEX 2. Factsheet

Factsheet - Frontpage

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

HIGGS Hydrogen in Gas Grids

"The HIGGS project will help decarbonise the European gas grid by clearing the pathway for the admixture of hydrogen."

The HIGGS project aims to show that the safe **injection of hydrogen into the EU high pressure transmission natural gas grid** is a sustainable, long-term solution to decarbonise the energy system.
To enable the power of Hydrogen HIGGS is going to **identify remaining weaknesses** regarding H_2-Readiness and **develop a pathway** for a stepwise integration of hydrogen in the EU gas network

Project Duration
01.01.2020 - 31.12.2022

Project Budget
Total Budget: € 2.107.672.-

Project Website / Contact
www.higgsproject.eu

Project Coordination
Dr. Vanesa Gil (FHa)
vgil@hidrogenoaragon.org

Communication Management
Felix Künkel (ERIG)
kuenkel@erig.eu

Main objective

The main objective of the HIGGS project is to cover the gaps of knowledge of the impact that high levels of hydrogen could have on the gas infrastructure, its components and its management. The main tasks within the project:

- Mapping of technical, legal and regulatory barriers and enablers for up to 100% H_2 in the high-pressure grid
- Set up and operate a research and development platform reproducing all the components of a high-pressure network
- Testing and validating different accessories, appliances and innovations for various H_2/CH_4 admixtures
- Techno-economic modelling for H_2/CH_4 admixtures within the high-pressure grid and equipment

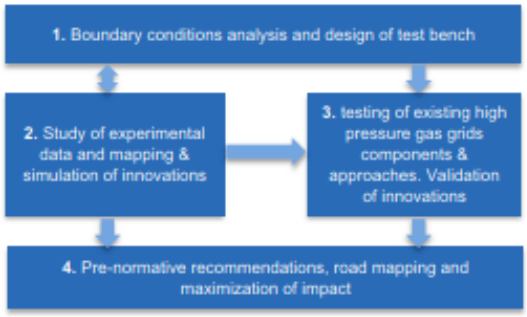


Figure 1: Main elements and outcome of the project

Expected main results

The main findings and assessments compiled in the project will be merged in the form of a document that discribes a pathway to enable higher concentrations of hydrogen in the natural gas transmission grid. This pathway, among other things, will inculde a list of potential issues, barriers and facilitators for cross-border and interoperability in the gas grids, recommendations on regulations codes and standards, a summary of the recommendations for admixture and injection facilities as well as Gas market and operation considerations.

Icons made by Smashicons from www.flaticon.com

Factsheet – Backpage

Mapping of Key Aspects

In order to achieve the set goals, the HIGGS project team is collection information on various key aspects regarding the integration of hydrogen in the high-pressure EU gas grid. Special emphasis is put on taking up on legal, regulatory and technical aspects by mapping the present equipment, as well as regulations, standards and certification (RSC) of the natural gas grids. The identification of the most critical RSC bottlenecks will not only enable end users and operators to work the entire gas grid safely but also help to prevent the replacement of fully operable equipment and appliances due to rising hydrogen concentrations in the gas grid.

Systematic and experimental validation

The biggest concern for safety when admixing hydrogen into the natural gas grid is related to materials detrition and embrittlement. The HIGGS project is going to target this issue by mapping the existing materials used in the gas networks, defining a laboratory test protocol to study them and finally provide recommendations for those materials to be used in high pressure hydrogen mixtures.
To be able to carry out those tests on materials and the impact of transporting high amounts of hydrogen through the gas grid the HIGGS team is designing an experimental R&D platform that will be built in 2021. The site is composed of an injection platform that recreates the different flows of H_2 with various compositions, a testing loop that is designed to work up to 80 bar and includes the main components needed to recreate the operational environment of a high-pressure gas grid and a hydrogen purification prototype that is based on membrane technology for the separation of H_2 and CH_4. The P&ID Scheme of the platform is shown in Figure 2.

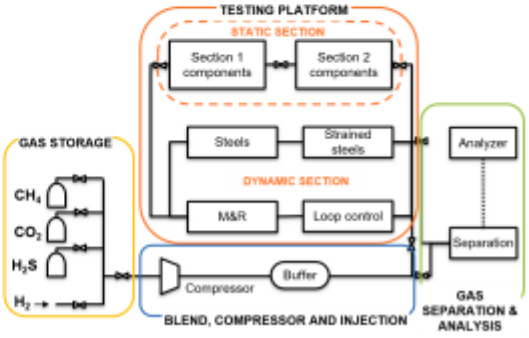


Figure 2: P&ID Scheme of the HIGGS Research and development platform

Project Partners

About the Fuel Cells and Hydrogen Joint Undertaking | www.fch.europa.eu/
The Fuel Cells and Hydrogen Joint Undertaking (FCH JU) is a unique public private partnership supporting research, technological development and demonstration (RTD) activities in fuel cell and hydrogen energy technologies in Europe. Its aim is to accelerate the market introduction of these technologies, realising their potential as an instrument in achieving a carbon-clean energy system.
The three members of the FCH JU are the European Commission, fuel cell and hydrogen industries represented by Hydrogen Europe and the research community represented by Hydrogen Europe Research.

This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (FCH JU) under grant agreement no. 875091. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme, Hydrogen Europe and Hydrogen Europe research.