



elyntegration

Grid Integrated Multi Megawatt High Pressure Alkaline
Electrolysers for Energy Applications

Final Report Dissemination and awareness plan

DELIVERABLE 6.10

GRANT AGREEMENT 671458

Swiss (SERI) Contract No 15.0252

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PUBLIC



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Maite Imirizaldu¹, Vanesa Gil^{1,2}, Laura Abadía¹

¹ Fundación para el desarrollo de nuevas tecnologías del Hidrógeno en Aragón, Spain

² Fundación Agencia Aragonesa para la Investigación y Desarrollo (ARAID), Spain

Author printed in bold is the contact person/corresponding author



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Nomenclature

CA	Consortium Agreement
GA	Grant Agreement
DOA	Description of Action
CDAP	Communication, dissemination and awareness plan
PSC	Project Steering Committee
MW AWE	Multi MegaWatt Alkaline Water Electrolyser
RE	Renewable energy
DSOs	Distribution system operators
TSOs	Transmission system operators





1 EXECUTIVE SUMMARY

The final report of the dissemination and awareness plan (CDAP) describes the actions, activities and opportunities on the communication tools and channels 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. The CDAP described the dissemination goals, target audience and appropriate channels to provide a regular flow of information.

The CDAP has been updated twice during the Project duration, followed by this document as final report on dissemination activities and materials.

This final report on communication and awareness covers the activities carried out from September 2015 until May 2019.



2 OBJECTIVES

The objective of Deliverable 6.10 is to collect all the information on the activities carried out during the life of ELYNTEGRATION to maximise the impact of the dissemination.

Dissemination and awareness have been *complementary* to other project developments, having the common goal of maximising the impact. It is important to remark that, given that the intention is that the project results are also market oriented, an exploitation strategy and business plan have been also developed throughout the project. Therefore, the plan definition and the updates have been also focused to maximise the impact to stakeholders of interest according to the market potential studies and the strategic plans for commercial exploitation of the results.

Therefore, the main objective of the report hereby documented has to be to describe the audience, methods and tools that have been used to maximise the impact of the Project and its results.



3 DESCRIPTION

The final report on Dissemination and Awareness of the ELYNTEGRATION project is aimed to describe the impact of the project, at every level and with different focus of interest of the project results. The document includes a description of the activities carried out regarding to project communication methodology, target groups and communication tools defined to reach the selected audience.

3.1 Summary of methodology, groups and tools

The tasks related to communication and dissemination in the project has involved all the members of the Consortium, therefore all the partners have work and contribute to dissemination of the tasks according to the agreements and the DOA. Nevertheless, FHA, as project coordinator, has been the final element in charge of the dissemination, being invested in elaborating and contributing the dissemination plan, promoting the collaboration of all the partners and finally monitoring and compiling the dissemination and communication activities of the project.

Depending on the target that have been achieved the disseminated messages related to the project aim, activities or results have been different.

To **policy makers and regulators**, the message have been focus on explaining the potential markets of hydrogen together with the benefits, needs and challenges of the electrolysers connected to the grid to enable a higher penetration of RE in the energy mix of the power grid. The potential benefits of Multi MegaWatt Alkaline Water Electrolyser (MW AWE) working to balance the grid or providing grid services have been communicated to RE stakeholders, DSOs and TSOs, including new business models.

The results disclosed by the consortium regarding technology, framework and market, have been shared in forums oriented to **hydrogen stakeholders** and **technology providers**, in order to pave the way to the deployment of hydrogen technologies. The participation in the communication events and activities promoted by e.g. the FCH 2 JU has played a key role to reach these stakeholders.

On the other hand, a more general message related to the introduction of RE and hydrogen in the power grid, minimising the impact of the energy production and improving the impact on economy and social environment, has been disseminated to the **general public**. The main goal has been to boost such advanced technology by minimizing the existing resistance to novel technologies and motivating and inspiring early adopters.

Furthermore, the information obtained along the continuous monitoring of other related external projects has served as feedback to define specific stakeholders from the different groups.



3.2 Project communication tools

3.2.1 Project website

The project website (www.elyntegration.eu) has become the central place for the diffusion of all the information related to the project. The website has been designed to provide a general impression of the project's mission through the main page (Figure 1), by showing into three different paragraphs a brief description of its main topic, applications for the finished project and funding by the European commission and the Swiss State Secretariat for Education, Research and Innovation (SERI) under contract number 15.0252.



Figure 1. Elyntegration's website homepage

Elyntegration's website was launched at the end of February 2016, so it has been online during 39 months when this deliverable was prepared. The information regarding traffic, access and user behaviour during the visits to the site has been analysed and it is presented in this section.



Users	Sessions	Bounce Rate	Session Duration
3K	4K	63.07%	1m 43s
vs last 30 days			

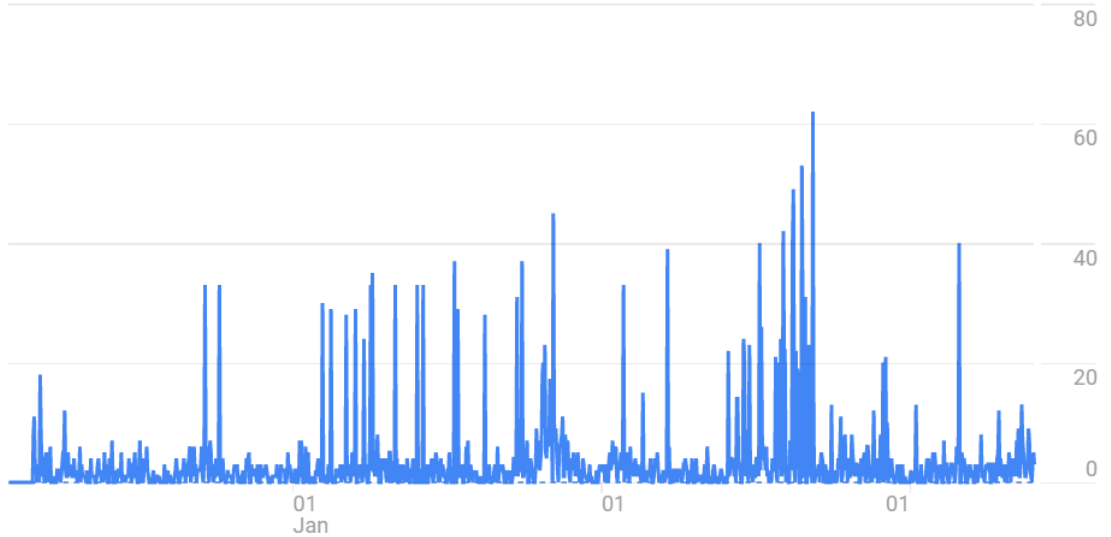


Figure 1. Audience Overview

The overall audience analysis of the Elyntegration website is very positive compared to the previous years and is that they have increased the number of visits considerably. More than 1.3K sessions and 816 visits have been registered giving us a total of 4K sessions in the life of the Elyntegration project.



Figure 2. Elyntegration’s website user behaviour

Most of the users start the visit on the website in the “home” section. Although the high number of visits, more than desired users, 36.1% stops continuing navigating the site at this point. The reason could be related due to the fact that most of the links in news and



presentations send the user to the homepage. It also appoints to the use of search engine optimization systems (SEO) for the project webpage.

For the visits which explore further the website, the usual traffic goes to the “download” section, so it appoints that the users are interested in consulting the project’s results and documents. Another important amount of users selects instead of “download” the “project” section to continue the navigation of the website where the objectives and goals of Elyntegration are described. So, it is seen that most of the visits and users seem to be interested on the project and partners contributing to the development.

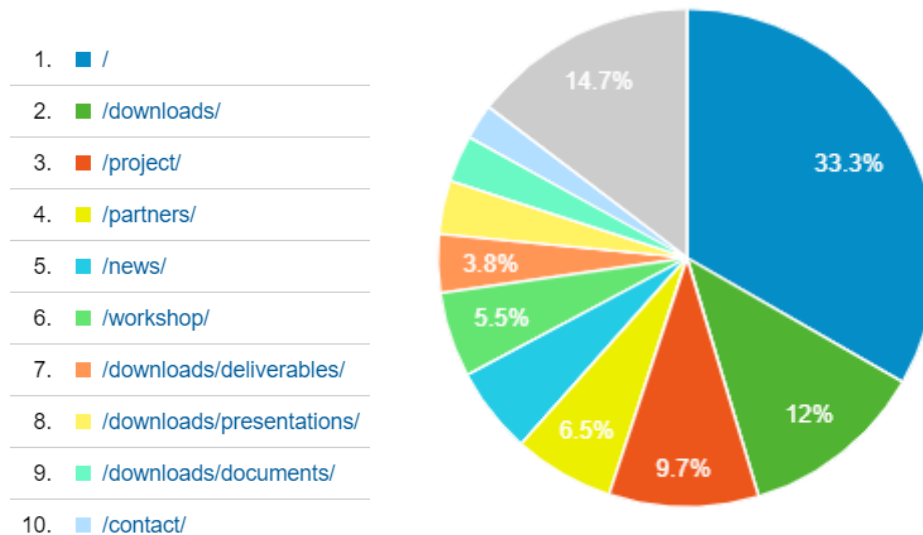


Figure 3. Elyntegration’s website: visits to sections

The analytics show that more than half of the visits are from new visitors, so it seems adequate taking into account that the project is on its first year, but the objective is to increase not only the total visits to the website but also the number of users that return to obtain updated information of the project, which could be achieved also keeping the “news” and “downloads” sections active.

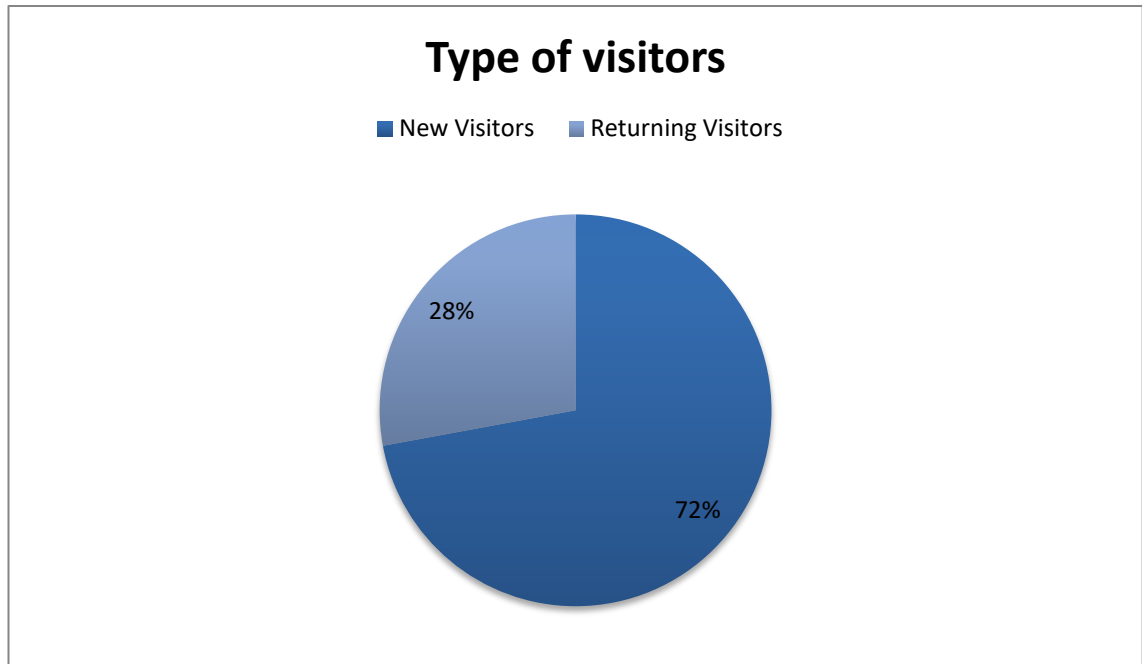


Figure 4. Elyntegration’s website new and returning users

Regarding the geographical data, there is clearly an opportunity for improvement. Most of the traffic to the website comes from Spain, which is mostly related to the extensive dissemination activity from the coordinator in Spanish media. On the other hand, one of the most active partners regarding communication is also from Spain.



Figure 5. Elyntegration’s website: geographical information

Nevertheless, the visits from the website come from all around the world, so it clearly indicates the importance of maintaining active the website in order to maximise the impact of the project.



3.2.2 Graphic material

Different graphic materials were developed for the project and have been used during the life of the project, including the logotype, selection of fonts, templates for documents and slides, a leaflet of the project and a poster for public presentations. The graphic material is available also for everyone in the section “downloads/corporate” of the webpage. It is also updated along the whole duration of the project.

In order to help partners in the elaboration of their press releases and communications to magazines, a press kit was developed and distributed among them. The press kit is also available in the webpage, including photos, general description of the project and the concepts related to it (Q&A document). By this it has been possible not only to homogenize all the communications made into the same style, thus promoting the chosen project image, but also to catch the general and specific magazines interest to communicate the project.

At the time of finalization of the project, a video is being produce that will include the main public results and impact of Elyntegration. This video will be shared through press release and it will be posted at the project’s main website. The aim of the video is to serve as the global final message of the project, and to provide a general view of the work performed.



Figure 6 Elyntegration’s info point (FHA hall)

Besides, some graphic and *merchandising* materials have been developed to be distributed during the events and fairs. Moreover, a permanent info point has been established at the coordinator’s facilities to distribute the information about the project to the people visiting FHA’s premises. Besides, we have designed a new leaflet of the project with the latest information of the advances in the project.



Figure 7 Elyntegration's first leaflet cover



Figure 8. Elyntegration's first leaflet inside

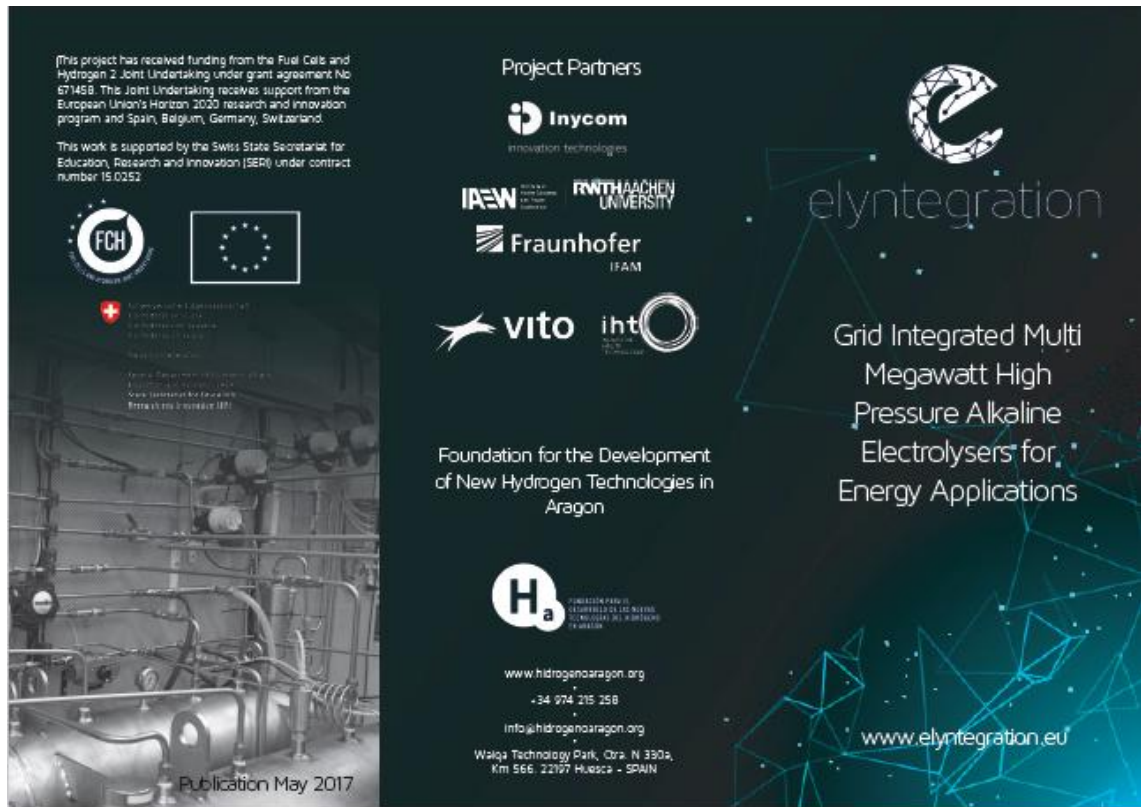


Figure 9. Elyntegration’s new leaflet cover

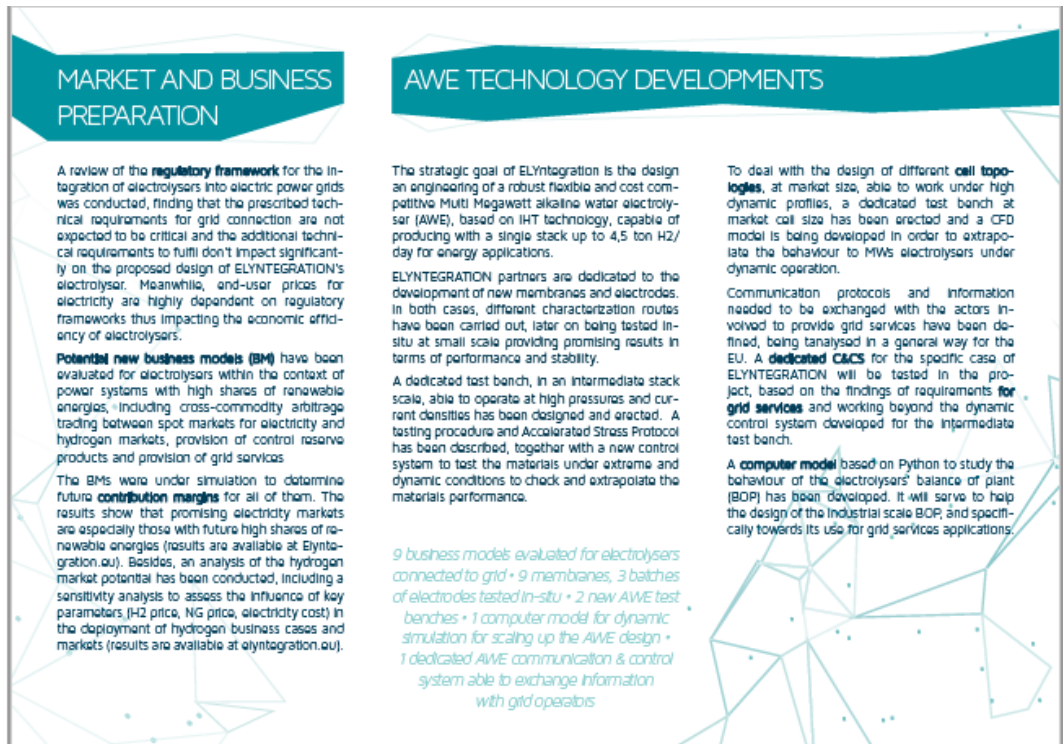


Figure 10. Elyntegration new leaflet inside

We also designed an information vinyl for the test bench:



The New Integrated alkaline Electrolysis test Bench for Lifetime Assessment (NIEBLA) is part of a project that has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking under grant agreement No 671458. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Spain, Belgium, Germany, Switzerland. This work is supported by the Swiss State Secretariat for Education, Research and Innovation (SERI) under contract number 15.0252.

- o NIEBLA (New Integrated Alkaline Electrolysis test Bench for Lifetime Assessment)
- o Tests up to 60 bar, 90°C, $\leq 1A/cm^2$
- o Testing protocol load variable, defining input in CSV
- o CCS ready (following each protocol)
- o Stack diameter (IHT technology) 400 mm
- o Less than 25kW depending on current and number of cells being tested

FCH
FUEL CELL HYDROGEN FOR ENERGY

SCHWEIZERISCHE Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Serie: CH-Engpass
Federal Department of Economic Affairs,
Education and Research (SEK)
State Secretariat for Education,
Research and Innovation (SERI)

Figure 11. Elyntegration vinyl test bench

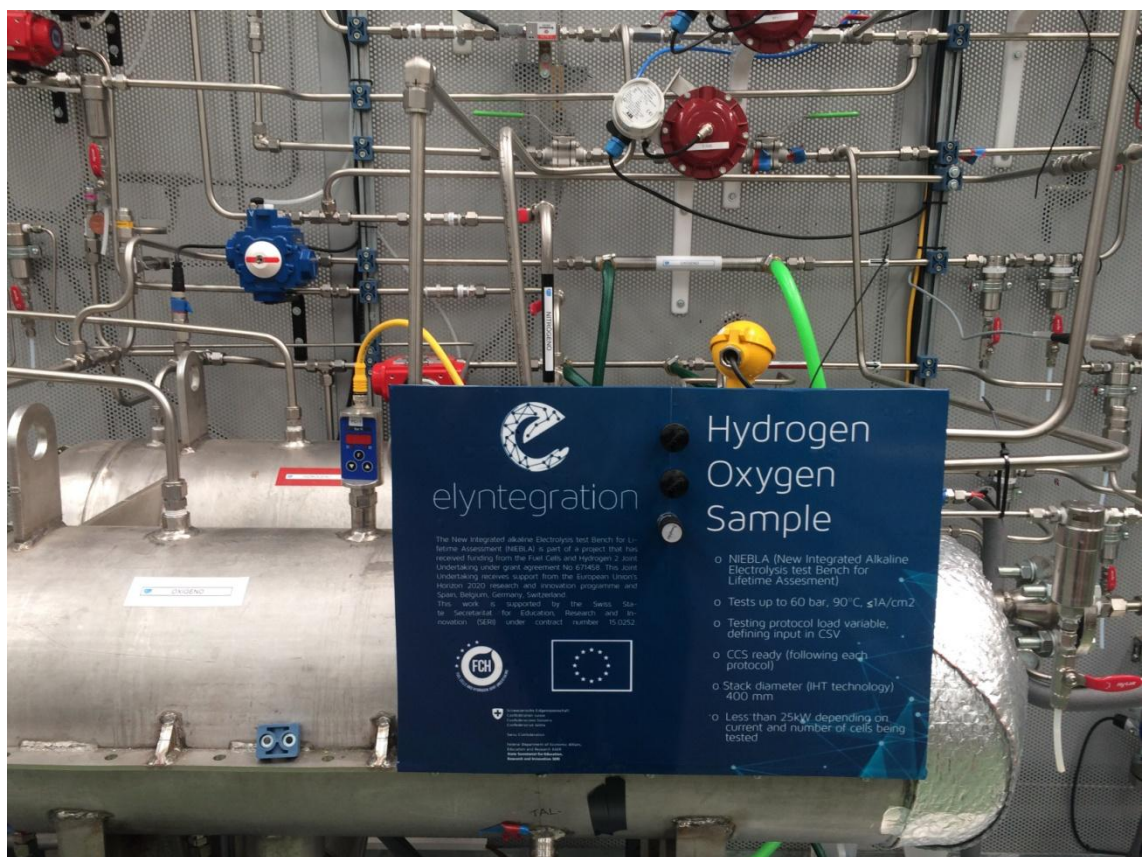


Figure 12. Image of the Elyntegration Test Bench with vinyl.



3.2.3 Social and professional networks

The use of social media and social and professional networks has been also a key communication tool to disseminate information about the project, events and project results. Partners have been using their own accounts in the social/professional networks to contribute to the project dissemination and to create open debates and detect future industrial investors from other cities in Europe. The main social networks considered for the dissemination of the project communications and recommendations were LinkedIn, Twitter, Facebook and Youtube channels.

The reasons why we have found interesting to include the project Elyntegration in this social network have as main objective to expand the network of contacts, search for companies, as well as potential clients to participate and / or generate debates in groups related to our experience, encourage conversations with related professionals, share information (articles of interest) and knowledge (own documents).

In addition not only have been provide this type of advantages but also a profile rich in keywords have been raise your place in Google, because LinkedIn limits their searches to the Google search network. Conducting a LinkedIn search via Google produces more results, which means that being noticed by Google increases the professional possibilities. Likewise, we benefit from the dissemination of the project news as well as the re-strengthening of the corporate brand Elyntegration project.

In the first place, we chose to make a project group as it could provide us with a place for professionals from the same industry or with similar interests to share content, publish progress and work related to the project, make business contacts, etc. The main problem that we saw to this type of group was the adhesion of its members that was something tortuous and complicated. So to improve this we created a LinkedIn profile of company from which we hope to have better diffusion of the project.

As for other types of social networks like Twitter or Facebook the option of creating a project profile has not been contemplated. In return partners have been always using the hashtag *#Elyntegration* when making publications about the project in their organizations' social networks and even their personal ones. This has been serve to analyze at the end of the life of the project the impact of this hashtag and can quantify the diffusion achieved.

Some examples of the ongoing activity on social networks are showed in ANNEX 1:

3.3 Communication activities

3.3.1 Project cooperation

Possible paths of collaboration in public workshops and seminars have been be explored by the Consortium when it is considered suitable and of interest for the project and the partners. Although, the assessment of the collaboration have been be studied case by case taking into account the goals of the project and partners involved, below there is a preliminary list of ongoing European projects that could be assessed.



For instance, a first contact with the CertifHy project has been established, attending to the proposed CertifHy workshops and following the progress of the project in order to search for synergies. Nevertheless it is considered that the timing of both projects has been not be perfect, as CertifHy is at the end of the duration, to prepare common activities. But the results of the project have been be very interesting also to be shared or distributed to Elyntegration stakeholders, to make them aware on guarantees of origin and new potential business models.

Also the partners from FHa went in July 2017 to the symposium of Qualygrids in representation of Elyntegration. And those from Aachen presented the network services part of the project. The idea was to coordinate with other projects that have to do with electrolysers.

The Elyntegration has collaborated with the FCHJU European Project Ely4Off in the organization of a Workshop.

3.3.2 Publications

Scientific papers

At the time of this deliverable, the following scientific papers and proceedings have been submitted and accepted for publication. In addition, at least 3 more scientific publications are ongoing and will be submitted in the coming months.

Publication	Name of the publication	Date of issue	Author(s)
<i>International Journal of Hydrogen Energy</i>	Techno-Economic Modelling Of Water Electrolysers In The Range Of Several MW To Provide Grid Services While Generating Hydrogen For Different Applications: A Case Study In Spain Applied To Mobility With FCEVs G. Matute et al. https://doi.org/10.1016/j.ijhydene.2019.05.092	May 2019	INYCOM
<i>Journal of Electrochemical Society</i>	Powder Metallurgy Route to Produce Raney-Nickel Electrodes for Alkaline Water Electrolysis C. I. Bernäcker et al. Volume 166, Issue 6, F357-363 DOI: 10.1149/2.0851904jes	March 2019	IFAM
<i>"Renewable Energy"</i>	Potential of new business models for grid integrated water electrolysis P. Larscheid et al. Volume 125, pp. 599-608 https://doi.org/10.1016/j.renene.2018.02.074	September 2018	IAEW
<i>Proceedings at EHEC (2018)</i>	Test protocols for accelerated in situ degradation of alkaline water electrolysis under dynamic operating conditions	Marzo 2018	FHA



<i>Proceedings Iberconappice (2017)</i>	<i>at</i>	Diseño De Protocolos De Testeo Acelerados Para Un electrolizador Alcalino pp. 191	September 2017	FHA
<i>Proceedings Iberconappice (2017)</i>	<i>at</i>	Desarrollo En Phytón De Un Modelo Dinámico De Balance De Planta De Un Electrolizador Alcalino Para Su Integración En Servicios De Red	September 2017	FHA

Figure 13. Scientific Papers and Proceedings

Press releases

During the development of the project, it was planned to produce a number of press releases, covering the most important milestones, as well as events being attended by Elyntegration partners. The project coordinator has been the partner in charge of the main dissemination of the press notes. The first press release of the project was related to the kick off meeting and there was a second note referring to the website. More news related to the midterm review meeting and a workshop focused on exploitation results were included under the news section of the project website. (ANNEX 2.). The Elyntegration project has appeared more than 50 times in general media.

3.3.3 Conferences, Events and Fairs

The project has been presented by every partner in multiple occasions. The table below shows the participation of the partners in conferences, events and fairs.



PRESENTATIONS

Slides used by the partners to present the project and its results in conferences and events will be available here. If you missed it, do not worry!










-  Elyntegration poster – Iberconappice 2016
-  Elyntegration presentation – WHEC 2016
-  Harmonization of testing protocols for electrolysis applications
-  IBERCONAPPICE 2017 – Desarrollo en Python de un Modelo Dinámico del Balance de Planta de un Electrolizador Alcalino para su Integración en Servicios de Red
-  IBERCONAPPICE 2017 – Diseño de Protocolos de testeo Acelerados para un Electrolizador Alcalino
-  ICE2017 (Poster) – NEW SEPARATOR CONCEPTS FOR A RADICAL IMPROVEMENT OF THE GAS QUALITY IN ALKALINE WATER ELECTROLYSIS (AWE)
-  ICE2017 – RANEY-NI ELECTRODES FOR THE ALKALINE ELECTROLYSIS OF WATER
-  EHEC2018 – Test protocols for accelerated in situ degradation of alkaline water electrolysis under dynamic operation conditions
-  WHEC2018 – Lifetime assessment of novel membranes for water electrolysis technology providing grid services

Figure 14. Presentations published at www.elyntegration.eu

Conference, congress, etc.	Name of the publication	Date of issue	Place	Author(s)
Aragon Hydrogen Foundation Board Meeting	General Elyntegration Presentation	December 2015	Zaragoza, Spain	FHA
Congreso Iberoamericano de Hidrógeno y Pilas de Combustible (Iberconappice)	Grid Integrated Multi Megawatt High Pressure Alkaline Electrolysers for Energy Applications	April 2016	Málaga, Spain	FHA
Hannover Fair, 2016	General Elyntegration Presentation	April 2016	Hannover, Germany	FHA
Workshop Harmonization of testing protocols for electrolysis applications within the FCHJU projects	General Elyntegration Presentation	May 2016	Brussels, Belgium	FHA
World Hydrogen Energy Conference 2016 (WHEC2016)	Grid Integrated Multi Megawatt High Pressure Alkaline Electrolysers for	June 2016	Zaragoza, Spain	FHA



	Energy Applications: ELYntegration				
World Hydrogen and Energy Conference 2016 (WHEC2016)	The Electrochemical Activity Of Porous Electrodes For The Alkaline Electrolysis Of Water	June 2016	Zaragoza, Spain	<i>IFAM</i>	
5th Symposium of Bavarian Hydrogen Center	General Elyntegration Presentation	July 2016	Waischenfeld, Germany	<i>FHA</i>	
BCH Symposium	Green H2 Production From Electrolysis: A Review Of The Experience Of The Fha In The Region Of Aragón	September 2016		<i>FHA</i>	
Program Review Days	General Elyntegration Presentation	November 2016	Brussels, Belgium	<i>Consortium</i>	
Hydrogen Trade Mission to Aragon	General Elyntegration Presentation	February 2017	Huesca, Spain	<i>FHA</i>	
Technical Forum of the Hydrogen and Fuel Cell exhibition	Electrocatalysts: A Key Component For Power-To-X Technology,	April 2017	Hannover Fair, Hannover	<i>IFAM</i>	
1st International Conference on Electrolysis (ICE 2017)	New Separator Concepts For A Radical Improvement Of The Gas Quality In Alkaline Water Electrolysis (Awe).	June 2017	Copenhagen, Denmark	<i>VITO</i>	
1st International Conference on Electrolysis (ICE 2017)	Raney-Ni Electrodes For The Alkaline Electrolysis Of Water.	June 2017	Copenhagen, Denmark	<i>IFAM</i>	
EEM 2017	Economic Potential Of Water Electrolysis Within Future Electricity Markets.	June 2017	Dresden, Germany	<i>IAEW</i>	
Hypothesis XII	Potential Of New Business Models For Grid Integrated Water Electrolysis.	June 2017	Syracuse, Italy	<i>IAEW</i>	
European Grid Service Markets Symposium	Opportunities Of Water Electrolysers In The European Flexibility Markets. A Report From The Fch Elyntegration Research	July 2017	Lucerne, Switzerland	<i>IAEW</i>	



Project".					
QualyGridS workshop	General Presentation	Elyntegration	June 2017	Lucerne, Switzerland	<i>FHA</i>
Seminar at Kurt-Schwabe Institut	General Presentation	Elyntegration	July 2017	Waldheim, Germany	<i>IFAM</i>
Congreso Iberoamericano de Hidrógeno y Pilas de Combustible (Iberconappice 2017)	Diseño De Protocolos De Testeo Acelerados Para Un electrolizador Alcalino		October 2017	Huesca, Spain	<i>FHA</i>
Congreso Iberoamericano de Hidrógeno y Pilas de Combustible (Iberconappice 2017)	Desarrollo En Phytion De Un Modelo Dinámico De Balance De Planta De Un Electrolizador Alcalino Para Su Integración En Servicios De Red		October 2017	Huesca, Spain	<i>FHA</i>
Congreso Iberoamericano de Hidrógeno y Pilas de Combustible (Iberconappice 2017)	Desarrollo De Un Sistema De Control Y Comunicación Con Funciones De Mantenimiento Avanzado Y Operación Inteligente Para La Provisión De Servicios De Red Por Un Electrolizador Alcalino		October 2017	Huesca, Spain	<i>INYCOM</i>
European Hydrogen Energy Conference (EHEC 2018)	Test protocols for accelerated in situ degradation of alkaline water electrolysis under dynamic operating conditions		March 2018	Malaga, Spain	<i>FHA</i>
VUELTAH Project	Electrolizadores Para Balance De La Red Eléctrica El Proyecto Elyntegration		March 2018	Huesca, Spain	<i>FHA</i>
ICOME 2018	Case Study Water Electrolysis For Grid Balancing		May 2018	San Sebastian, Spain	<i>FHA</i>
International Hydrogen and Fuel Cells Conference	Impact Of Dynamic Operation In The Degradation Of Alkaline Water Electrolysis Stack		May 2018	Trondheim, Norway	<i>FHA</i>



Providing Grid Services					
World Hydrogen and Energy Conference (WHEC 2018)	KEYNOTE Lifetime Assessment Of Novel Membranes For Water Electrolysis Technology Providing Grid Services	June 2018	Rio de Janeiro, Brazil	<i>FHA</i>	
Elyntegration workshop 2018	Water electrolysis to provide grid services	September 2018	Dresden, Germany	<i>INYCOM</i>	
Elyntegration workshop 2018	Tests protocols for accelerated in situ degradation of alkaline water electrolysis under dynamic operation conditions	September 2018	Dresden, Germany	<i>FHA</i>	
Elyntegration workshop 2018	Electrode development within Elyntegration	September 2018	Dresden, Germany	<i>IFAM</i>	
Elyntegration workshop 2018	Economic potential of ancillary service provision by water electrolyzers	September 2018	Dresden, Germany	<i>IAEW</i>	
ACI's H&FC Summit	Alkaline Water Electrolysis Technology Operating Dynamically Is Seen With A Huge Potential To Cover The Gap Between The Intermittent Renewable Power Production And The Grid Demand At Different Scales. Case Study: Elyntegration Project (Fch Ju No. 671458)	February 2019	Madrid, Spain	<i>FHA</i>	



H2020 project E-LAND on smart grids in which INYCOM is partner	Presentation On Elyntegration To Explain The Possibility To Have A Use Case In E-Land With Demand Side Flexibility In The Walqa Microgrid By Using The Electrolyzer To Produce Hydrogen With Price Minimization Criteria. The E-Land Project Involves 14 Eu Partners And Will Deploy Smart Control Solutions For Optimization Of The Operation Of Microgrids In 3 Pilots Including Walqa.	April 2019	Zaragoza, Spain	INYCOM
Presentation to students of Degree on Electrical Engineering at University of Zaragoza on demand side flexibility	Presentation Of Interrumpibility Grid Service Studied In Wp4 To Students And The Possibilities For Multi Mw Loads To Participate In Balancing Services In The Eu.	May 2019	Zaragoza, Spain	INYCOM
World Hydrogen Technologies Convention (WHTC 2019)	Perspectives And Challenges Of Advanced Alkaline Water Electrolysers Providing Grid Services– Lifetime Assessment Of Novel Materials And Components	June 2019	Tokyo, Japan	FHA
1st Workshop Elyntegration		2017	Zaragoza, Spain	ELYNTEGRATION CONSORTIUM
2nd Workshop Elyntegration		2018	Dresden	ELYNTEGRATION CONSORTIUM
3rd Workshop Elyntegration		2019	Huesca	ELYNTEGRATION CONSORTIUM

Figure 15. Conferences, congress, fairs participated by the Elyntegration partners



3.3.4 Workshops

Three workshops have been carried out through the second period of the Project. The target groups and audience for each of them have been defined taking into account the progress and timeline of the project.

3.3.4.1 First Workshop

The first ELYntegration workshop is focused on H₂ applications and end users. The objective of the workshop is to put together different energy sectors (electricity, gas, and hydrogen as link between those markets) and discussing on impact, needs and barriers that end users, grid operators and stakeholders in the H₂ chain have faced or could face in the next years.

Among the invited international speakers are electricity grid experts, gas companies and research community that will help for further input. A detailed description of the workshop programme is shown in Figure 1.

The workshop is organized into 3 different sessions:

- Session 1 is about Electricity market.
- Session 2 focuses on hydrogen as the link between electricity and gas markets
- Session 3 analyzes about end uses of hydrogen

The Workshop, organized in Zaragoza (Spain) the 8th of November 2017 (see Figure 4), has been very valuable for the ELYntegration project. It was successful in gathering a total of 21 participants from 6 European countries (Figure 5), which were eager to discuss about the Workshop expectations (Figure 6).

The event, besides the project itself, has generated a lot of attention on the media, five press notes were realised in local newspapers. The generated input from the perspective of the grid services requirements and applications, gave a good overview of the market potential of the ELYntegration project. Additionally, the attendants and speakers of the seminar might provide valuable input in the future of the project.



Figure 16. ELYntegration organization picture.



Figure 17. Country origin of the ELYntegration Workshop participants.



Quickly, in only 1 word: what do you think this workshop is about?

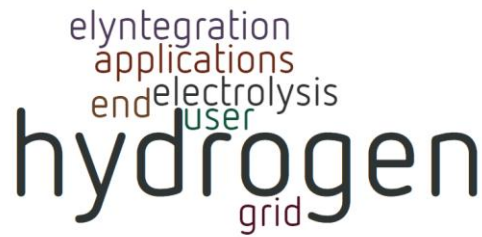


Figure 18. Attendant expectations at the beginning of the Workshop.

In general, the contribution of potential end users of hydrogen, who might have shared experiences and challenges of the technology was difficult to address. Nevertheless, the IHT contribution, as electrolyzers manufacturer and therefore in contact with customers and users of hydrogen, was considered as a key player in this sense.

The organization of following up workshops will allocate extra efforts for carrying out this action, as relevant end user speakers might point out the key points to implement the use of green H₂ in order to boost the water electrolysis technology in the market.

A few highlights are summarized below as conclusions and key learnings from the first ELYntegration Workshop:

- Involving electricity and gas operators would be needed to move towards hydrogen business cases at every country, not as separate effort but joint effort. If hydrogen is considered a link between those markets, communication between their operators should be promoted.
- Electrolysis technology is ready, and engagement of end-user is needed: make clear that there are business cases to move towards the use of green hydrogen.
- As the business cases depend greatly on business climate (and regulations-codes) it is not possible to generalise, and a case-by-case communication is needed.
- Showing the work of other projects, demonstration in other countries could help engaging other end users and operators, as first step to analyse if a business case is profitable for them.
- Next workshop will be focused on electrolysis technology: it will be needed to keep end user engagement and include among the objectives of the workshop towards solving doubts, comments and questions of users on the technology and integration in their actual processes.



elyntegration

PROGRAM – WORKSHOP ELYNTEGRATION

H₂ applications and end users: challenges, barriers, and lessons learned

9:30 Registration and welcoming of participants

10:00 Opening remarks

Agenda, Review of workshop objectives. Project ELYNTEGRATION Presentation.

10:30 SESSION 1: ELECTRICITY MARKET

Objective: Understanding, through studies, discussion, and participation of attendants, the actual and future paradigm of electricity and power market, achieving an affordable, decarbonized and secure electricity supply.

Participants intervening:

- INYCOM (Overview, solutions for smart electricity distribution);
- CENER (STORY Project, Innovative approaches for energy storage)

11:45 NETWORKING COFFEE

12:15 SESSION 2: HYDROGEN AS LINK BETWEEN ELECTRICITY AND GAS MARKETS

Objective: As one of the potential solutions to solve the needs of the future power markets, H₂ produced by electrolysis also has the characteristic of linking the electric market and gas market (Power to Hydrogen and Power to Gas). Attendants will discuss on projects and initiatives, status and prospects, challenges found while developing P2H/P2G deployments, potential needs in terms of regulation, codes, and standards that are encountered.

Participants intervening:

- GASUNIE (Hystock project)
- ENAGAS (RenovaGas project)
- Universidad de Zaragoza (Power to Gas in Aragon)

13:30 LUNCH and NETWORKING

15:00 SESSION 3:

END USES OF HYDROGEN

Hydrogen is mostly used nowadays at the industrial level, with industry representing more than 90% of the hydrogen market share (chemical processing (ammonia, polyurethane, nylon...), refineries and metal processing). Regarding hydrogen for mobility applications, hydrogen as a fuel for FCE vehicles is considered a key market to achieve a sustainable growth, linked with the needed reduction in GHG emissions of transport. Session 3 will be focused on discussing how green hydrogen could empower the use one these markets and new market segments.

Participants intervening:

- IHT (Electrolytic hydrogen for energy applications in industry, DEMO4GRID case)

16:00 CLOSING REMARKS. CONCLUSIONS AND NEXT STEPS

Date: 8th November 2017

Venue:

Hotel NH Zaragoza Centro – Hesperia
Calle Conde Aranda, 48, 50003, Zaragoza

Registration: www.elyntegration.eu

More info: vgil@hidrogenoaragon.org
(Vanessa Gil)



Figure 19. First Workshop Agenda



3.3.4.2 Second Workshop

The 2nd workshop of the ELYntegration Project took place at Fraunhofer IFAM in Dresden (Germany) at the 19th of September. The goal of the workshop was to present and also discuss the technical challenges and solutions for electrolyzers connected to the electricity grid. The program was divided in two topics: first, materials for alkaline electrolyzers (AEL) as well as corresponding manufacturing technologies therefore and second, the application of AEL in grid operation. Beside the ELYntegration project partners, experts from science and industry field gave presentation related to the two topics. The names and the organization of the presenters are listed in the program. Previous to each session, a short impuls was given by Dr. Röntzsch (IFAM) who also directed the podiums discussion after the presentations. In addition to all presentations, there was room for discussion and interaction among the participants.

The workshop program was very well received in the public as well as in the electrolyzer community. Around 50 participants attended the workshop, who gave a very positive feedback.



Figure 21. Second Workshop Pictures

The debate after the presentations as well as the podium discussion was very fruitful. The participants appreciated to get in contact with industrial partners from different fields. The main results and conclusion are given below.

- A network and platform to get component suppliers and AEL manufacturer together. Such a network event should be repeated (IFAM intent to provide such a platform in future).
- Necessity to build up a supply chain for AEL production.
- There are a lot of potential industrial suppliers for components (“hidden players”). The whole supply chain has to be illustrated in order to activate the industry to take part.
- Think big: up scaling of the AEL production is challenging but also an opportunity to reduce the CAPEX.
- Greenpeace Energy emphasized that there is already a market for green hydrogen in Europe.
- The regulations for power-to-gas technologies have to be revised in order to motivate the industry to put money in this technology.



10:00	Welcome address	13:45	Impulse „Business models and applications for AEL“ (Lars Röntzsch)
10:05	NOW: „Electrolysis - key element for energy and fuel transition“ (Johannes Daum)	13:50	Greenpeace Energy: „proWindgas: a crucial element for the cross-sectoral energy turnaround“ (Erich Pick)
10:20	Impulse „Introduction advanced AEL“ (Lars Röntzsch)	14:05	DBI-GTI: „Green hydrogen for CO₂ conversion to valuable chemicals“ (Jenő Schipek)
10:25	FHA: „ELYntegration - project overview (Vanessa Gil)	14:20	RWTH Aachen: „Economic potential of ancillary service provision by water electrolysers“ (Patrick Larscheid)
10:30	HS Anhalt: „History of AEL“ (Henry Bergmann)		
10:50	Fraunhofer IFAM: „Electrode development within ELYntegration“ (Christian Immanuel Bernäcker)		
11:05	Alantum: „Powder metallurgy for industrial electrode fabrication“ (Sebastian Eckstein)	14:35	Coffee break
11:20	Coffee break	15:05	ABO WIND: „Wind hydrogen as a bridge for sector integration“ (Thomas Nietsch)
11:50	Dexmet: „Porous electrode substrate materials“ (Matthias Hermes)	15:20	Hitachi Zosen Inova ETOGAS: „Power-to-gas“ (Adrian Schneider)
12:05	UCT Prague: „Membranes for AEL“ (Karel Bouzek)	15:35	INYCOM: „Water electrolysis to provide grid services“ (Matute Guillermo)
12:20	FHA: „Accelerated stress tests for AEL“ (Vanessa Gil)	15:50	Podium discussion with all speakers of the day
12:35	WFS GmbH: „Business location Saxony“ (Alexandra Gering)		
12:45	Lunch break	16:35	End of the workshop and get-together

Figure 22. 2nd Workshop Agenda



3.3.4.1 Third Workshop



Figure 23. Publication in Social Networks to promote the Workshop

This workshop was celebrated in Huesca, Spain the 23 of May. It was organized in collaboration with the FCHJU ELY4OFF project.

The main objective of the workshop is to promote and facilitate a first exchange of views about the integration of Renewable Electricity through applications of WE technology. The joint event will bring together key industry stakeholders, potential end-users and technology developers for knowledge sharing.

The event provided a forum to discuss the latest technological innovations. Key discussions were involved sharing challenges and opportunities related to hydrogen production from water electrolysis. The workshop also provided the best platform to explore potential collaborations. The key topics at the workshop were:

- Optimization of H₂ production cost based on electricity source (PV, wind, grid)
- How off-grid affects to standard on-grid configuration from control perspective
- Current regulation barriers and recommendations to overcome them
- Power to H₂: elements of value (values to the power grid, values to the gas grid, values to decarbonized industry, values to the UE Economy, etc...)
- R&D needs: demonstration at MW scale, reliability, durability, cost reduction, efficiency, mixing technology (and regulations)
- Harmonization testing protocols: grid balancing vs. off-grid

Around 50 participants attended the workshop, who gave a very positive feedback. Most of the attendees to the Workshop were end users (60%) mostly from the renewable & environment industry (34,5%)

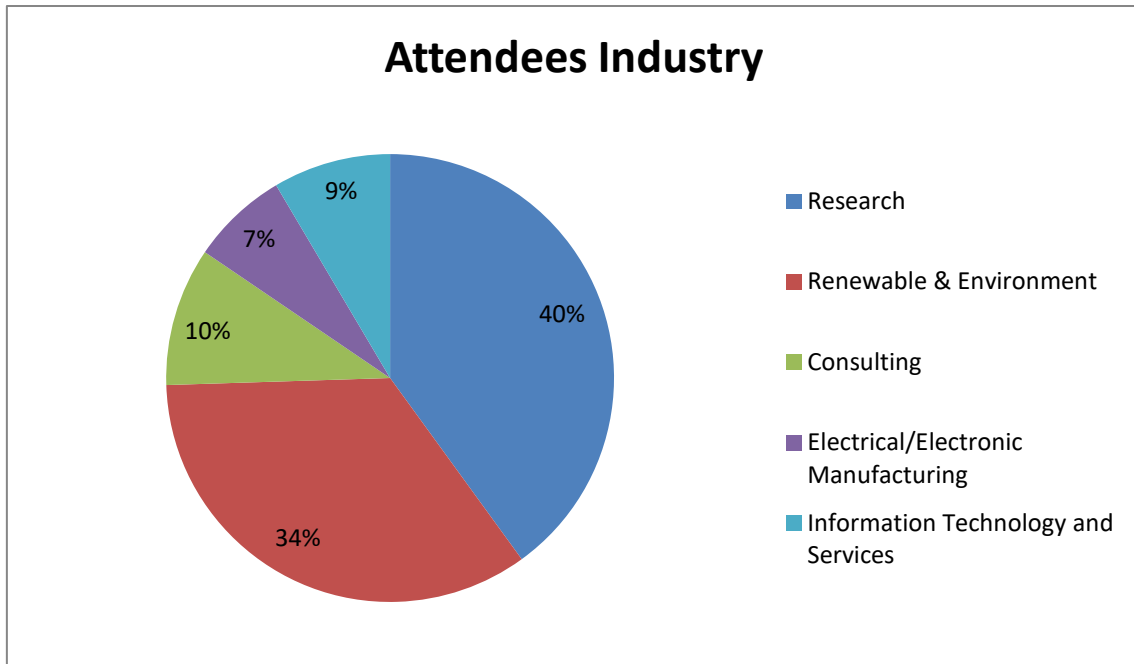


Figure 24 3rd Workshop Industry Attendees



PROGRAM

- 9:00AM**
REGISTRATION
- 9:30AM**
WELCOME & INTRODUCTION
- 9:45AM**
ELYAOFF PROJECT
FHA PROJECT COORDINATOR
- 10:15 AM**
ELYNTEGRATION PROJECT
FHA PROJECT COORDINATOR
- 10:45 AM**
GLOBAL TRENDS AND OUTLOOK FOR HYDROGEN
REPRESENTATIVE OF HIA IEA
- 11:00 AM**
NETWORKING COFFEE
- 11:15 AM**
LOW-TEMPERATURE WATER ELECTROLYSIS (LTWE)
HARMONISATION ACTIVITIES FRAMED WITHIN JRC-
FCH230 FWC
REPRESENTATIVE OF JRC
- 11:30 AM**
ENERGY OBSERVER: THE FIRST HYDROGEN VESSEL
REPRESENTATIVE OF CEA TECH
- 11:45 AM**
Q&A
- 11:55AM**
VISIT TO FHA ELYNTEGRATION-ELYAOFF DEMOSITES
- 13:15 PM**
NETWORKING LUNCH
- 14:15PM**
ROUNDTABLE I
BUSINESS MODELS + BARRIER CAPS + REGULATION
REPRESENTATIVES OF CEA, AEW, HYLOW PROJECT
HPM2025 PROJECT
- 15:00PM**
ROUNDTABLE II
ON-GRID/OFF-GRID: CONTROL ISSUES
REPRESENTATIVES OF INYCOM, ERC, ITH, HT, ESA
- 15:45PM**
ROUNDTABLE III
R&D NEEDS AND OPPORTUNITIES
REPRESENTATIVES OF ESA, VITO, ITH, HPM2025, ITH
- 16:45PM**
CLOSURE

Figure 25. 3rd Workshop Agenda



4 CONCLUSIONS

The present document constitutes the final report of the communication activity related to the Elyntegration project. It contains all the necessary information in relation to the target groups, how the project has reach them and which have been the necessary tools to perform these tasks, as well as a selection of potential partners within Europe and conferences, congress and fairs that have been suitable for the dissemination of the results of the project.

The main target groups identified are the public regulator bodies, the hydrogen technology providers and manufacturers, the renewable energy stakeholders, DSOs, TSOs and of course the general public too. The ways of reaching these audiences have been different for each of them, but in any case, the website of the project has been the central point of information related to the project, as it have been contain all the public documents generated during the project, as well as a 'News' section to gather all the important updates on the project. During the time of execution of the project, the partners have been making use of their institutional accounts in social networks (Twitter, Facebook, LinkedIn, etc.) to promote the work performed in the project.

A set of graphic materials have been prepared to unify the corporate image of any work performed under Elyntegration and to help the diffusion of the project and its presence in fairs, congress, etc. These include the logo, a poster, a leaflet and a press kit, between other materials. Overall, they have served as the main support material to introduce the project to both technical and non-technical audiences.

The main opportunities to improve awareness are also identified as follows:

1. Improve involvement of partners to increase awareness in Europe
2. Send press kits to specific, technical and general magazines
3. Reach the conferences and fairs during the next years to increase impact
4. Identify synergies for workshops and networking



5 ANNEX 1: SOCIAL NETWORKS

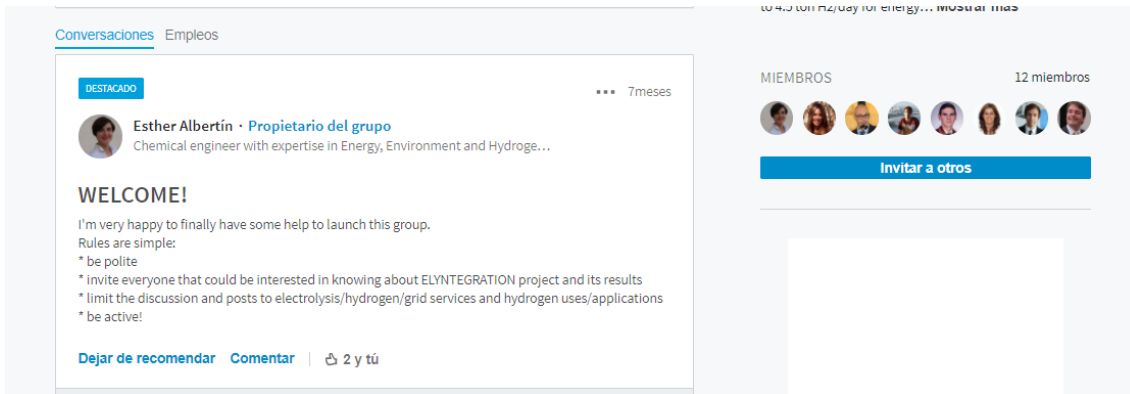


Figure 26. LinkedIn. Elyntegration Group



Figure 27. Twitter #Elyntegration.



6 ANNEX 2. PRESS, MEDIA AND PARTNERS' SITES

Partners' websites

Elyntegration Website News

Figure 28. Elyntegration website. News Section



El proyecto europeo ELYntegration estudia las posibilidades del hidrógeno para estabilizar las redes eléctricas e integrar la generación de origen renovable

La capital aragonesa ha acogido un encuentro de expertos internacionales que han compartido experiencias en el marco de esta iniciativa que financia la Unión Europea a través de la Fuel Cells and Hydrogen Joint Undertaking

El proyecto europeo ELYntegration, que coordina la Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón con sede en el Parque Tecnológico Walqa, ha celebrado su primera reunión de trabajo en Zaragoza, en la que los participantes han podido presentar propuestas para facilitar la implantación de esta tecnología en el mercado.

ELYntegration tiene como principal objetivo el diseño y desarrollo de un prototipo industrial de electrolizador alcalino de alta potencia, capaz de generar 4,5 toneladas de hidrógeno al día y que, además de estar conectado a la red, responda eficientemente a las necesidades de los operadores. Se

trata de contar con una herramienta que pueda ayudar a estabilizar las redes de transporte eléctrico y contribuir a integrar la generación de origen renovable, fuentes cuyo comportamiento es difícil de predecir y gestionar.





La Fundación Hidrógeno Aragón, escenario del lanzamiento del proyecto europeo ELYntegration

Viernes, 16 de octubre de 2015



ER

El proyecto europeo ELYntegration, que coordina la Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón (FHa), ha celebrado la reunión de comienzo de proyecto (Kick off Meeting) en las instalaciones de la propia Fundación situadas en el Parque Tecnológico Walqa. Esta reunión tenía como objetivo comenzar el proyecto de manera oficial con todos sus socios como partícipes, así como establecer las líneas de actuación que se llevarán a cabo durante los próximos meses.

Difusión: Regional
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EGM: 43632

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Pº página: 23
Español

LAS NUEVAS ENERGÍAS

Bruselas elogia cinco proyectos de la Fundación del Hidrógeno

La CE los respalda por su contribución a esta tecnología

EL PERIÓDICO
ZARAGOZA

Cuatro proyectos coordinados por la Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón y otro en el que también participa la entidad han sido presentados por su contribución al desarrollo relacionado con estas tecnologías en los Programme Review Days celebrados esta semana en Bruselas.

Se trata de la principal cita anual en la que la Fuel Cells and Hydrogen Joint Undertaking -FCH JU- la principal iniciativa público-privada del programa europeo Horizon 2020 que apoya la investigación, el desarrollo tecnológico y las actividades demostrativas en materia de hidrógeno y pilas de combustible en Europa- expone las iniciativas más importantes en esta materia.

Los proyectos de la Fundación del Hidrógeno destacados son Elyntegration, que se basa en el diseño y desarrollo de un prototipo industrial de electrolizador al-

calino de alta potencia capaz de generar 4,5 toneladas de hidrógeno al día. Ely4off tiene como objetivo el diseño y construcción de un electrolizador tipo PEM robusto, flexible, competitivo y de alta eficiencia, alimentado exclusivamente con energía fotovoltaica y aislado de la red. También figuran Big Hit, centrado en desarrollar una economía basada en el hidrógeno, e Hytedcycling, que busca estudiar los mejores procedimientos para reciclar y demantelar los dispositivos basados en tecnologías del hidrógeno y las pilas de combustible. =



HIDRÓGENO

Primera reunión en Zaragoza del proyecto europeo ELYintegration

El proyecto europeo ELYintegration, que coordina la Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón, ha celebrado su primera reunión de trabajo en Zaragoza. Los participantes pudieron presentar propuestas para facilitar la implantación de esta tecnología en el mercado. El presupuesto total del proyecto es de 3,3 millones de euros.

Figure 29. Media Impact of the press releases sent by the FHa.