



GRASSHOPPER

Grid Assisting Modular Hydrogen PEM Power Plant

D8.9: Project workshop

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Fuel Cells and Hydrogen Joint Undertaking (FCH JU),
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Executive Summary

Under Horizon 2020 funding, dissemination activities should be promoted and should be envisaged to reach the scientific community, industry, civil society, policy makers, investors, customers. Dissemination activities, in this case, of GRASSHOPPER project are focused in spreading the project philosophy, objectives, challenges, progress and results outside the consortium of this project.

This public deliverable, D8.9, called “Project workshop” is the one foreseen for reporting the GRASSHOPPER workshop including its objectives, attendance list, summary of the findings and feedback obtained. As it was decided in the Second Amendment, and due to the restriction caused by the COVID-19 pandemic, it wasn’t possible to organize the expected workshop, which will be replaced with an online event. Instead of this workshop, an online webinar was celebrated on 29th March 2022, virtual conference to show the main results and learnings from the Grasshopper project, including a virtual visit to the pilot plant in Seville and showing the results obtained.



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List of Acronyms and Abbreviations

Abbreviation	Definition
DP	Dissemination Plan
DSM	Demand Side Management
DSO	Distribution System Operators
FCPP	Fuel Cell Power Plant
INEA	Informatizacija Energetika Avtomatizacija
IPR	Intellectual property
JMFC	Johnson Matthey Fuel Cells Limited
MEA	Membrane Electrode Assembly
NFCT	Nedstack Fuel Cell Technology B.V.
P2P	Power to power
Polimi	Politecnico di Milano
RTD	Research and Technological Development
TSO	Transmission System Operator
ZBT	Zentrum für Brennstoffzellen Technik GmbH



1. Introduction

The objective of GRASSHOPPER project is to create a cost-effective, flexible, MW-size FCPP unit based on the learnings from a 100 kW pilot plant design, implementing newly developed stacks and MEA's. This pilot plant is large enough to implement cost savings as well as to validate operation flexibility and grid stabilization capability via fast response. This unit will be validated under a real industrial environment using by-product hydrogen from chlorine production and will be operated continuously for several months for engaging grid support modulation as part of an established on-site Demand Side Management (DSM) programme.

This deliverable (D8.9) is the report which includes the main information about the online webinar organized on 29th March 2022 by Abengoa with the participation of GRASSHOPPER consortia. Due to the Covid limitations, the preliminary workshop was replaced by this online event. Through the GRASSHOPPER webinar, the main results and learnings from the project were shown. The webinar finalized with a virtual visit to the GRASSHOPPER 100 kW pilot plant and a set of questions from the audience.



2. GRASSHOPPER webinar

2.1 Invitations to the webinar and registration

The diffusion of GRASSHOPPER webinar took place via different channels:

- Website: the information and registration form concerning the webinar was published in:
 - GRASSHOPPER website
 - <https://www.grasshopperproject.eu/project-webinar-it-is-time-to-meet-the-team/>
 - The partner ZBT also shared it in its corporate website <https://zbt.de/nc/aktuell/news-anzeige/detail/News/grasshopper-project-webinar/>



Figure 1. Webinar announcement in the GRASSHOPPER website



The screenshot shows the ZBT website header with the logo 'ZBT The hydrogen and fuel cell center ZBT GmbH' and navigation links: Home | Sitemap | Impressum | Datenschutz | Anfahrt | Kontakt | Login. Below the header is a navigation bar with 'Aktuell', 'Das ZBT', 'Portfolio', 'TIW', and 'Jobs' tabs, and a search bar. The main content area features a large image of a fuel cell stack. On the left, there is a sidebar with a 'Aktuell' section containing links for 'Aus unserer Forschung', 'Veranstaltungen', 'Publikationen', 'Presse', 'Stellenangebote', 'Awards', and 'Ausschreibungen'. The main article is titled 'Grasshopper Project webinar' and is dated 'März 2022'. The text of the article discusses the project's progress and the upcoming webinar. A list of topics for the webinar is provided: Overview of project goals and objectives, Main results and achievement obtained so far, Virtual tour to the 100 kW pilot plant, and Questions and interaction with the technical members of the project. At the bottom, there is a note about limited spots and a registration link: <https://www.grasshopperproject.eu/project-webinar-it-is-time-to-meet-the-team/>.

Figure 2. Webinar announcement in the ZBT website

- LinkedIn: the webinar was published in:
 - GRASSHOPPER LinkedIn Group
https://www.linkedin.com/feed/update/urn:li:activity:6910226725784199168/?utm_source=linkedin_share&utm_medium=member_desktop_web
 - Abengoa corporate's LinkedIn
https://www.linkedin.com/posts/abengoa_grasshopper-webinarregistration-activity-6914130267695644672-i7NZ/?utm_source=linkedin_share&utm_medium=member_desktop_web
 - Abengoa's project manager LinkedIn profile
https://www.linkedin.com/posts/mariatejadamtv_webinar-grasshopperproject-hydrogen-activity-6910226506975731712-vrmP/?utm_source=linkedin_share&utm_medium=member_desktop_web
 - Corporate ZBT LinkedIn
https://www.linkedin.com/posts/zbt_grasshopper-project-



webinar-activity-6912028929562132480-
NrN5/?utm_source=linkedin_share&utm_medium=mem-
ber_desktop_web

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Maria Tejada Valderrama • 1st
Hydrogen Process Engineer
1w •

The Grasshopper Webinar

Register now on our website: ...see more

GRASSHOPPER
Grid Assisting Modular Hydrogen PEM Power Plant

WEBINAR
29/03/22
10:30h CET

www.grasshopperproject.eu

Tue, Mar 29, 10:30 AM - 11:30 AM CEST

The Grasshopper Webinar

Online

Lucía Martínez Balaguer, Javier Valerdí, PMP and 8 other connections attending

You and 3 others

Figure 3. Webinar announcement in the GRASSHOPPER LinkedIn Group

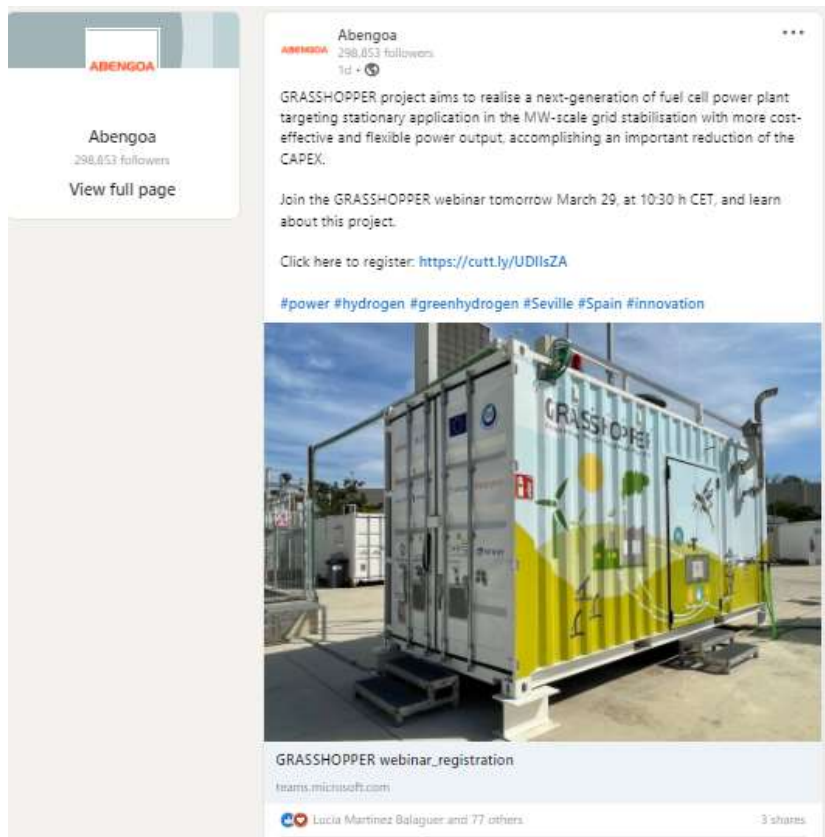


Figure 4. Webinar announcement in the Abengoa's LinkedIn



Figure 5. Webinar announcement in the Abengoa's project manager LinkedIn profile

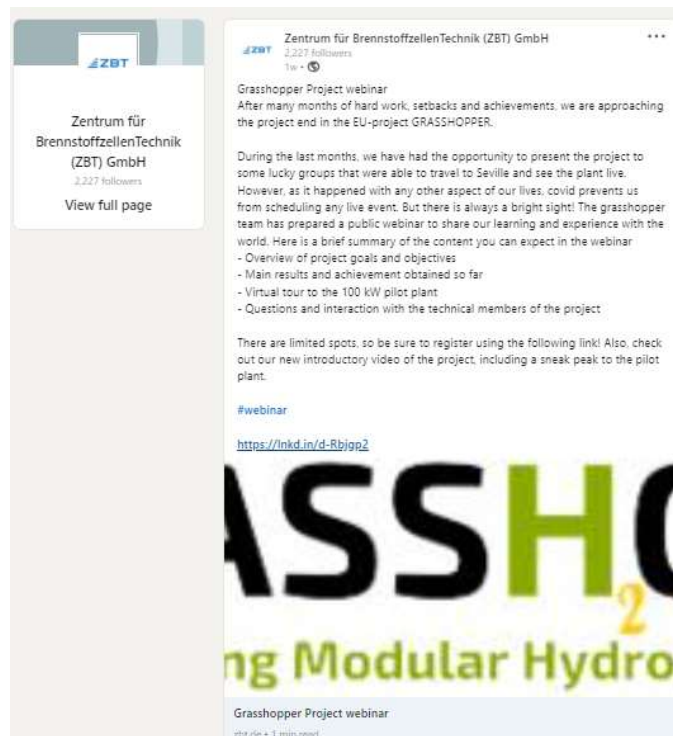


Figure 6. Webinar announcement in the ZBT LinkedIn

- **Emails:** a list of distribution was prepared for announcing the webinar. Two formal notes were prepared and sent to inform the audience about the upcoming webinar. The potential attendees were selected from energy key players companies, universities, authorities, suppliers and hydrogen associations. Additionally, the partners of the Consortium sent the webinar information to their adequate contacts.



The Grasshopper Webinar

GRASSHOPPER Project tries to contribute solved societal challenges relating to the sustainability, affordability and security of supply hydrogen production technologies.

GRASSHOPPER project aims to realise a next-generation of fuel cell power plant targeting stationary application in the MW-scale grid stabilisation with more cost-effective and flexible power output, accomplishing an important reduction of the CAPEX.

This kind of power plant has a novelty compared to conventional fuel cell plants, which allows a dynamic and flexible operation that could run from 20 to 100% power for a demand-driven operation. This, together with its rapid response capacity, allows it to participate in electricity reserve markets, where the €/MW is higher.

The MW-size unit is based on learnings from a 100 kW pilot plant, which is now running in Seville in a start-up stage. When the FAT test period finishes, the plant will be transported to The Netherlands, where it will use the Hydrogen produced as a byproduct of the Chlor-alkali industry.

Would you like to know how it became a reality to have this next-generation fuel cell power plant targeting stationary applications in grid stabilisation?

Join us at this webinar and learn about this exciting and ambitious project. The registration is free, but the space is limited, so book your now here:



[Project webinar - It is time to meet the team - Grasshopper Project](#)

If you can't join us, [sign up](#) to receive the recording and presentations a few days later.

Thank you, and for any questions or comments, don't hesitate to get in touch with us by replying to this email.

info@grasshopperproject.eu

Share this event on your social networks!



This project has received funding from the Fuel Cells and Hydrogen 2 Joint Undertaking (now Clean Hydrogen Partnership) under Grant Agreement No 779430. This Joint Undertaking receives support from the European Union's Horizon 2020 Research and Innovation program, Hydrogen Europe and Hydrogen Europe Research.



Figure 7. Note 1 for Webinar diffusion



Figure 8. Note 2 for Webinar diffusion

2.2 Webinar objective, agenda and content

As it is indicated in the introduction of this deliverable, the GRASSHOPPER workshop was replaced by an online webinar due to pandemic concerns.

The objective of the webinar was to disseminate a general vision of the aims of the Grasshopper project and how the consortium has worked to achieve them.

The webinar took place on 29th March 2022 and the key issues of GRASSHOPPER project were reviewed. This online event lasted approximately 1 hour via online Microsoft Teams. During the event, it was used a beginning presentation and a video for virtual visit was shown. The webinar was finished with a section of questions and answers. This webinar was completely recorded for distribution and dissemination purposes.

The agenda of the event was the following one indicated below. Each partner of the Consortium participated as speaker for introducing their representative activities carried out during the project and their main results.

1. Introduction. María Tejada, Project manager, Abengoa
2. Flow Field development. Sönke Gößling, leader of simulation and control group, ZBT



3. MEA development. Paddy Hayes, Lead Scientist, Johnson Matthey Fuel Cell
4. Stack development. Jorg Coolegem, manager customer development & projects, Ned-stack
5. System modeling. Elena Crespi, PhD student, Politecnico di Milano.
6. Platform to grid Integration. Marijan Vidmar, Projects Group Manager, INEA
7. 100 kW pilot plant. María Tejada, Project manager, Abengoa
8. Pilot Plant Results. Germán Nieto, process engineer and FCPP test specialist, Abengoa
9. Next steps, Germán Nieto, process engineer and FCPP test specialist, Abengoa
10. Applications, Germán Nieto, process engineer and FCPP test specialist, Abengoa
11. Pilot Plant Virtual Visit
12. Q&A

2.3 Webinar material

The main material produced for organizing the webinar are, as it is indicated before, a beginning presentation (please find in Annex C, GH-PRE-F34-740-700-0001 Webinar presentation) and a video for virtual visit.

The recorded session of the webinar and its dedicated presentation were sent to registrants some days after the webinar and published in GRASSHOPPER website and YouTube (youtube.com/GrasshopperProject).

2.4 Webinar registrants

A list of GRASSHOPPER webinar registrants is included as Annex D.

A total of 95 people was registered to the GRASSHOPPER webinar. As it is shown in the figure below, around the 22% of the registrants were women while most of the registrants were men.

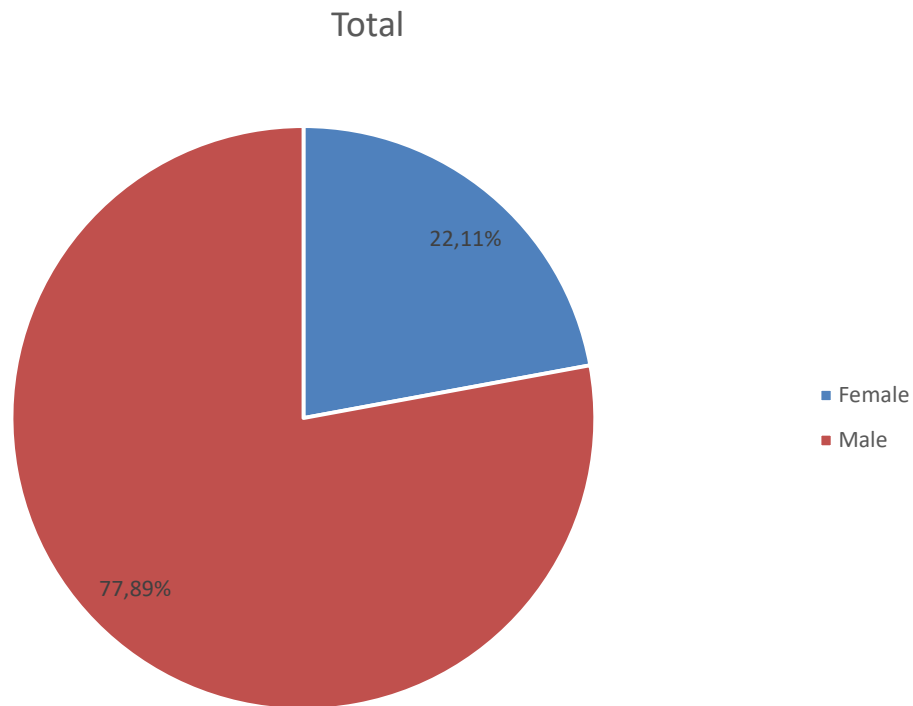


Figure 9. Gender analysis of the registrants

As it is shown in the geographical analysis of registrants (followings Table and Figure), 58% of the registrants are from Spain and the others come from different countries mostly in Europe (France, Belgique, Czech Republic, Germany, Italy, Netherlands, Poland, Portugal, Slovenia, United Kingdom) while some registrants are located in Korea, Japan, India, Brazil, Peru, Turkey and Russia.

Table 1 – Geographical analysis of the registrants

Country	Nº Registrants per country
Spain	55
Italy	5
United Kingdom	5
Germany	4



Country	Nº Registrants per country
India	4
Slovenia	3
Poland	3
Turkey	2
France	2
Portugal	2
Netherlands	2
Belgium	2
Russia	1
Brazil	1
Japan	1
Czech Republic	1
Peru	1
Korea	1
Total	95

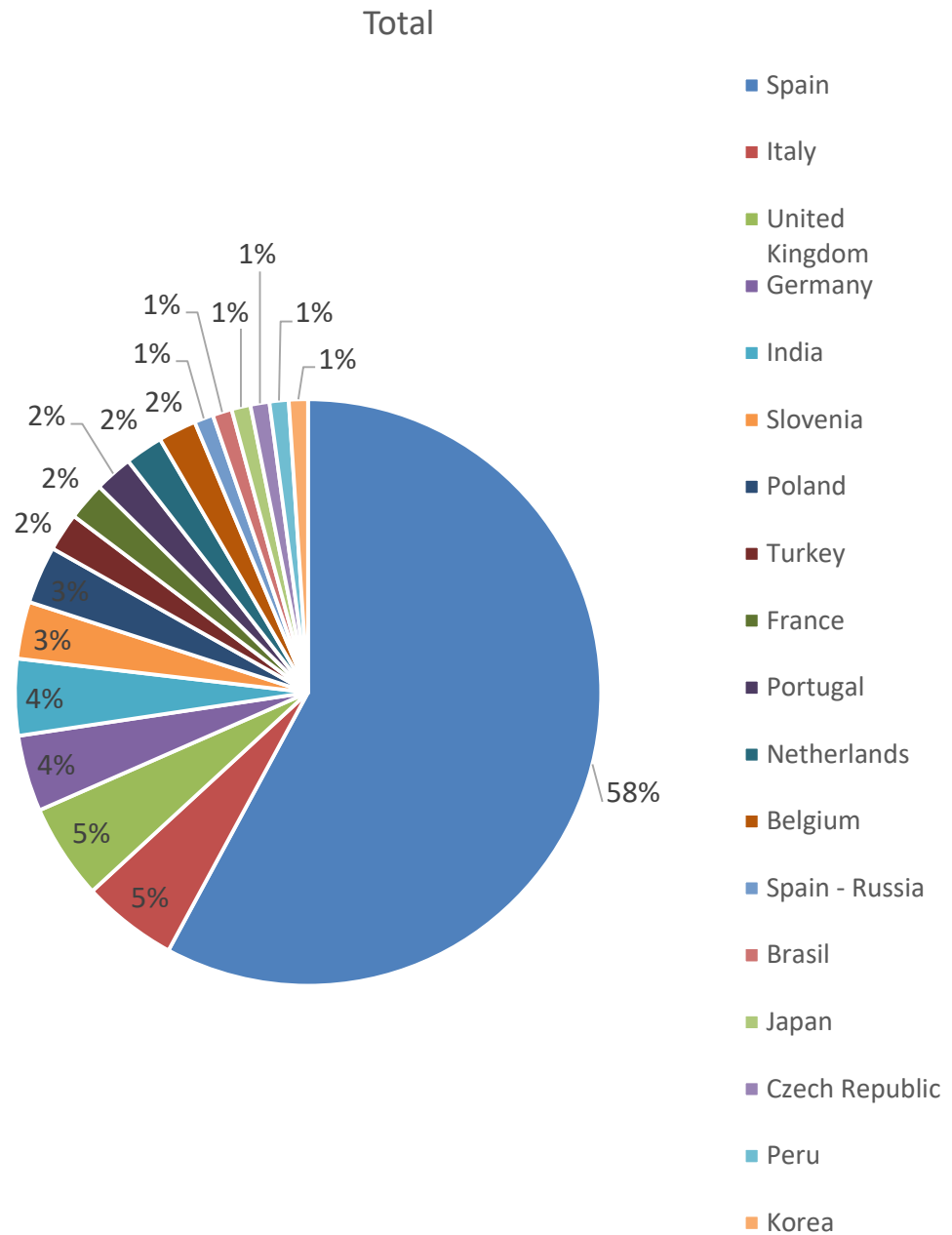


Figure 10. Geographical analysis of the registrants

2.5 Webinar participants

The list of GRASSHOPPER webinar attendees can be also found in Annex D.

64% of the registrants participated in the webinar, a total of 61 people attended the GRASSHOPPER webinar where 25% are female and 75% are male. 56% of attendees come



from Spain while about half of attendees are from outside Spain: Italy, UK, Poland, Slovenia, France, India, Germany, Netherlands, Portugal, Czech Republic, Turkey, Belgium and Japan. In the following figures and tables, the gender and geographical information about the attendees is shown.

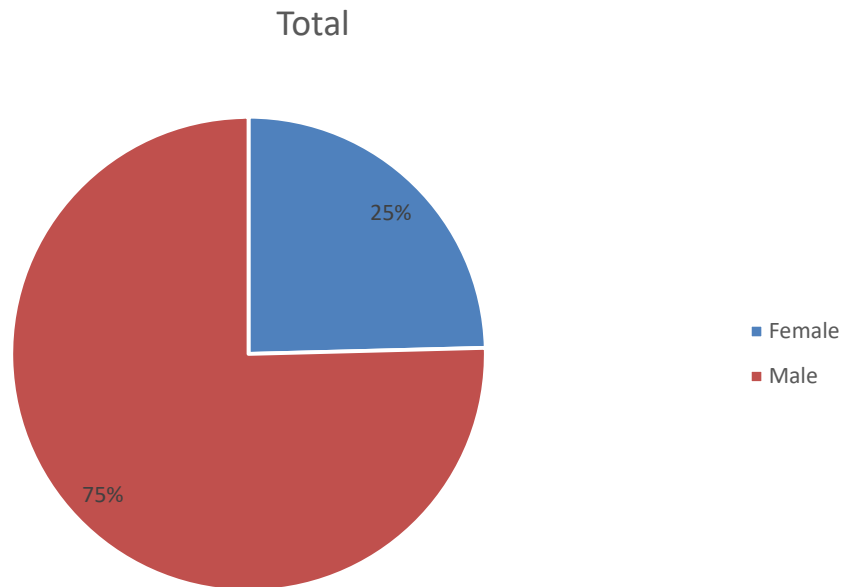


Figure 11. Gender analysis of the attendees

Table 2 – Geographical analysis of the attendees

Country	Nº Registrants per country
Spain	34
Italy	4
United Kingdom	4
Poland	3
Slovenia	3
France	2
India	2



Country	Nº Registrants per country
Germany	2
Netherlands	2
Portugal	1
Czech Republic	1
Turkey	1
Belgium	1
Japan	1
Total	61

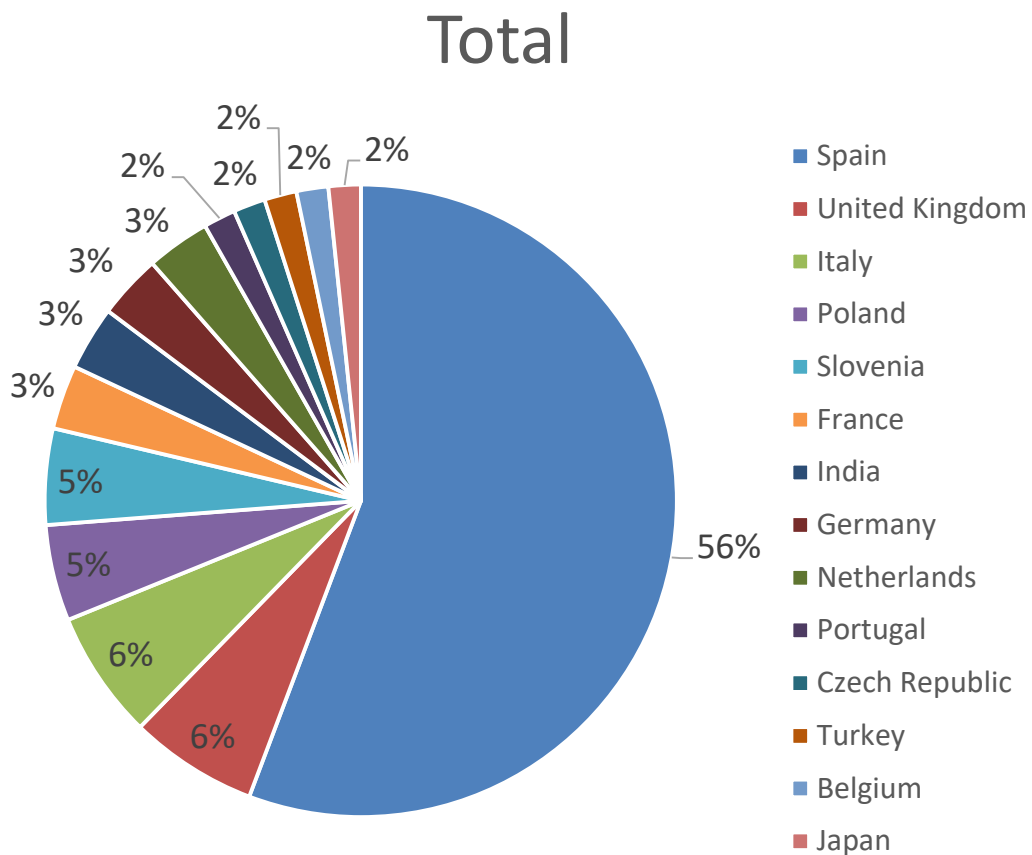


Figure 12. Geographical analysis of the attendees



3. Conclusions

Despite having to cancel the initial GRASSHOPPER workshop, an online webinar was organized on 29th March 2022 by Abengoa with the participation of all the GRASSHOPPER partners. The main results and knowledge from the project were shown through a presentation and a virtual visit to the GRASSHOPPER 100 kW pilot plant.

The GRASSHOPPER webinar had a successful impact considering the number of registrants and participants and the geographical distribution of them. This webinar was recorded, and this video was published in the GRASSHOPPER website to guarantee the continuous dissemination of the project. The contact of each GRASSHOPPER partner was also included in the presentation in order to guarantee the potential future contacts.



4. Annexes

4.1 Annex A: Consortium

Table 3 – Consortium.

Participant organization name	Short name	Country
INEA INFORMATIZACIJA ENERGETIKA AVTOMATIZACIJA DOO	INEA	Slovenia
NEDSTACK FUEL CELL TECHNOLOGY BV	NedStack	Netherlands
JOHNSON MATTHEY FUEL CELLS LIMITED	JMFC	United Kingdom
ABENGOA INNOVACIÓN SOCIEDAD ANÓNIMA	Abengoa, AI	Spain
ZENTRUM FÜR BRENNSTOFFZELLEN-TECHNIK GMBH	ZBT	Germany
POLITECNICO DI MILANO	Polimi	Italy

4.2 Annex B: Dissemination contact points

Table 4 – Dissemination contact points.

Partner identification and basic information		
Project Partner	Responsible for Dissemination Activities	E-mail
INEA	Pia Polovšek	pia.kuralt@inea.si
NedStack	Jos Lenssen	Jos.Lenssen@nedstack.com
JMFC	Paddy Hayes	paddy.hayes@matthey.com
Abengoa, AI	María Tejada Valderrama	maria.tejada.v@abengoa.com
ZBT	Peter Beckhaus	p.beckhaus@zbt-duisburg.de
Polimi	Giulio Guandalini	giulio.guandalini@polimi.it



4.3 Annex C: GH-PRE-F34-740-700-0001 Grasshopper webinar presentation



4.4 Annex D: List of GRASSHOPPER webinar registrant

Table 5 – List of GRASSHOPPER webinar registrants

ID	Gender	Webinar attendance	Organization	Country
1	Female	Organizer	Abengoa Innovación	Spain
2	Female	Attendee	Abengoa Innovación	Spain
3	Male	Presenter	Abengoa Innovación	Spain
4	Male	Attendee	Ingeniería 3D - Marketing Industrial - Simulación (Josu3D)	Spain
5	Male	Attendee	Area Paper Japan	Japan
6	Female	Presenter	Politecnico di Milano	Italy
7	Male	Attendee	Politecnico di Milano	Italy
8	Male	Presenter	ZBT GmbH	Germany
9	Female	Attendee	Abengoa Innovación	Spain
10	Male	Presenter	Inea	Slovenia
11	Male	Presenter	Nedstack fuel cell technology	Netherlands
12	Male	Presenter	Johnson Matthey	United Kingdom
13	Male	Attendee	Enmaro	Poland
14	Male	Attendee	MYPEGASUS	Germany
15	Male	Attendee	ENMARO	Poland



ID	Gender	Webinar attendance	Organization	Country
16	Male	Attendee	The Fourth D SL	Spain
17	Male	Attendee	Enaire	Spain
18	Male	Attendee	JRC-EU	Spain
19	Male	Attendee	Brainboxes	United Kingdom
20	Female	Attendee	Instituto Tecnológico de Galicia	Spain
21	Male	Attendee	INEA	Slovenia
22	Male	Attendee	Johnson Matthey	United Kingdom
23	Male	Attendee	European Commission	Spain
24	Female	Attendee	Kiwa Technology	Netherlands
25	Male	Attendee	Smartenergy	Portugal
26	Male	Attendee	Abengoa Innovación	Spain
27	Male	Attendee	Université Catholique de Louvain	Belgium
28	Female	Attendee	EC JRC - EIPPCB (Seville)	Spain
29	Female	Attendee	JM	United Kingdom
30	Male	Attendee	JRC - SEVILLE	Spain
31	Male	Attendee	Enmaro	Poland
32	Male	Attendee	INEA	Slovenia
33	Male	Attendee	Chart Ferox a.s.	Czech Republic

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ID	Gender	Webinar attendance	Organization	Country
34	Male	Attendee	ISE	Spain
35	Male	Attendee	Abengoa	Spain
36	Female	Attendee	Agencia Andaluza de la Energía	Spain
37	Female	Attendee	Abengoa	Spain
38	Male	Attendee	ABG	India
39	Male	Attendee	Abengoa	India
40	Male	Attendee	TotalEnergies	France
41	Male	Attendee	Proinsener	Spain
42	Male	Attendee	Sacem	Spain
43	Male	Attendee	MSA	France
44	Male	Attendee	Capgemini	Spain
45	Female	Attendee	Klinger Spain	Spain
46	Male	Attendee	Abengoa	Spain
47	Male	Attendee	AENA SME	Spain
48	Female	Attendee	ingetam	Spain
49	Male	Attendee	Kelvion Thermal Solutions,S.A.U	Spain
50	Male	Attendee	Klinger Spain	Spain
51	Male	Attendee	Ineco	Spain

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ID	Gender	Webinar attendance	Organization	Country
52	Male	Attendee	Politecnico di Milano	Italy
53	Female	Attendee	Proinsener	Spain
54	Male	Attendee	ATA	Spain
55	Male	Attendee	Nubenergy	Spain
56	Female	Attendee	Autónoma	Spain
57	Female	Attendee	Abengoa Innovación	Spain
58	Male	Attendee	Digital Five Investment	Spain
59	Male	Attendee	Tekfen Engineering	Turkey
60	Male	Attendee	cesi	italy
61	Male	Attendee	Universidad de Sevilla	Spain
62	Male	Not attendee	Cade soluciones de ingenieria	Spain
63	Female	Not attendee	Alight	Spain
64	Female	Not attendee	Interesado	Spain
65	Female	Not attendee	INSS	Spain
66	Female	Not attendee	Abengoa Innovación	Spain
67	Male	Not attendee	Currently Unemployed	India
68	Male	Not attendee	Red Electrica de España	Spain
69	Male	Not attendee	Hyundai Motor Company	Korea

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ID	Gender	Webinar attendance	Organization	Country
70	Male	Not attendee	Abengoa Innovación.	Spain
71	Male	Not attendee	Abengoa Energía	Spain
72	Male	Not attendee	Abengoa Innovación	Spain
73	Male	Not attendee	Lean Hydrogen	Spain
74	Male	Not attendee	Instalnox	Spain
75	Male	Not attendee	Eisenhuth GmbH	Germany
76	Female	Not attendee	AGBAR	Spain
77	Male	Not attendee	Clean Hydrogen Partnership	Belgium
78	Male	Not attendee	Politecnico Di Milano Italy	Italy
79	Male	Not attendee	Smartenergy	Portugal
80	Male	Not attendee	MGIMO	Spain - Russia
81	Male	Not attendee	DENSO	Germany
82	Male	Not attendee	ESL	India
83	Male	Not attendee	Proinsener	Spain
84	Male	Not attendee	Independiente	Spain
85	Male	Not attendee	Abengoa	Spain
86	Male	Not attendee	ISE	Spain

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ID	Gender	Webinar attendance	Organization	Country
87	Male	Not attendee	ACOM	Spain
88	Male	Not attendee	AEC	Spain
89	Male	Not attendee	Gama Power Systems	Turkey
90	Female	Not attendee	Keraben	Spain
91	Male	Not attendee	Situ Plan	United Kingdom
92	Male	Not attendee	Pfisterer Brasil	Brasil
93	Male	Not attendee	Aena	Spain
94	Male	Not attendee	Edpr	Spain
95	Male	Not attendee	unprg	Peru