Air Carbon Recycling for Aviation Fuel Technology

Communication, Dissemination and Awareness Plan

DELIVERABLE 5.2

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Document history

Version	Date	Name	Description
v0.1	2021-06-15	Vanesa Gil, FHa	Table of contents and early description
v0.2	2021-07-10	Vanesa Gil, FHa Eduardo Bernad, FHa Marisa Martínez, FHa	Consolidated draft. Version v0.2 for revision by ALL partners.
v0.3	2021-07-30	Vanesa Gil, FHa	Final document after Quality Assurance.

Contents

List of Figures

List of Tables

List of Acronyms

CDA	Communication, Dissemination and Awareness
CDAP	Communication, Dissemination and Awareness Plan
CINEA	European Climate, Infrastructure and Environment Executive Agency
DMP	Data Management Plan
DoA	Description of Action
EC	European Commission
EU	European Union
GA	General Assembly
QKMP	Quality and Knowledge Management Plan
NDA	Non-Disclosure Agreement
PC	Project Coordinator
PSC	Project Steering Committee
R&D	Research & Development
WP	Work Package

Executive Summary

4AirCRAFT "Air Carbon Recycling for Aviation Fuel Technology" aims at developing a game-changer technology for ground-breaking jet fuel sustainable synthesis by the efficient CO_2 conversion into liquid fuel. 4AirCRAFT will move beyond the state of the art by the combination of highly efficient electro-, bio- and chemo- catalysts and their controlled spatial distribution within application tuned catalyst carrier structures based on metal-organic frameworks and engineered inorganic scaffolds with hierarchical porosity distribution.

The present deliverable describes the communication and dissemination action plan to be conducted during 4AirCRAFT. The plan for Communication, Dissemination and Awareness (CDAP) provides the guiding principles to support the aims of 4AirCRAFT and maximise the project's impacts at a large audience.

This deliverable is structured addressing the different aspects that a CDAP may focus on:

- the strategy from the project to the external audience,
- 4AirCRAFT key messages
- the target audiences
- the planned dissemination and communication material
- tools and channels
- the basis of an efficient internal communication between 4AirCRAFT partners,
- evaluation of the activities carried out
- contractual obligations of beneficiaries regarding Grant Agreement rules.

This plan includes measures and tools for external and internal communication and the different channels of dissemination for target audiences (general, scientific and industrial, policy makers) to provide a regular flow of information. The dissemination activities and dissemination and linked communication actions will be carried out during the 36 months of duration of the project and beyond, as some project results and findings will remain available once the project has finalised.

This plan and the progress, based on a strong cooperation of its partners which enables the impact at different sectors and levels, will be constantly monitored, reviewed and potentially adjusted twice throughout the project lifespan to include the track of foreseen communication activities carried out, as well as those non-foreseen activities and actions. Moreover, a final report summarizing dissemination and communication activities and materials will be addressed by the end of the project.

1. Introduction

The ultimate goal of 4AirCRAFT is to develop a next generation of active, stable, and selective catalysts for the direct CO_2 conversion into high density liquid fuels. This very innovative technology can become a breakthrough on the clean and efficient sustainable fuel production for aviation (and other sectors). That is the reason why the communication and dissemination strategies for the project's concept and expected results need to be defined from the early stages and will receive a major attention from the consortium.

The aim of this plan is to develop the Communication, Dissemination and Awareness strategy and describe the tools and actions to be implemented by all 4AirCRAFT partners towards increasing the visibility of 4AirCRAFT research, guarantee an effective communication and dissemination of the project activities and results and helping gain understanding and support as the best pathway to impact.

This deliverable, aligned to Grant Agreement and Consortium Agreement, supports the spread of knowledge and allows that knowledge to be built upon by introducing the procedures for a successful internal and external communication and the actions to be addressed for executing the dissemination and awareness plan of the project over time.

Work Package (WP) 5 is responsible for the dissemination of 4AirCRAFT results and communication of goals and research activities. Aragon Hydrogen Foundation is leading and monitoring this task at consortium level working in close collaboration with the rest of partners.

CDAP is aligned with major milestones and in strong interaction will all the WPs in accordance with the activities outlined in the Description of Action (DoA).

4AirCRAFT Grant Agreement, through the DoA, contained the draft of this plan as part of the measures towards the achievement of the expected impacts.

The main objectives of the 4AirCRAFT CDAP are:

- Identifying the tools and methodology to reach out to society and inform and promote the activities performed and the impact and the benefits of the project results and success will have for the citizens.
- Maximising project results/outputs through dissemination and exploitation at local, national, EU and worldwide level, contributing to the expected outcomes in "Building a low-carbon, climate resilient future secure clean and efficient energy" (H2020-LC-SC3-2020-NZE-RES-CC) with the topic targeted on International cooperation with Japan for Research and Innovation on advanced biofuels and alternative renewable fuels (LC-SC3-RES-25-2020) under the Horizon 2020.
- Supporting the diffusion of new scientific knowledge to the wider scientific community and spread of novel technological innovations enabling possible solutions to fundamental societal challenges.
- Open Science by appropriate means and strengthening the uptake of 4AirCRAFT research and innovation making research results work for society, boostering societal acceptance and generating innovation-based economic growth.
- Fostering synergies with other funded project or related initiatives.

- Define the procedures to ensure the requisites of the Grant Agreement and Consortium Agreement taking into account the rules on visibility of EU, Japanese and Brazilian funding.

The present document describes the main actions foreseen to ensure an adequate communication, dissemination and awareness activities to be developed during and after the 4AirCRAFT project.

The description of the plan starting in Section 2 introduces the methodology, procedures, means, target audience, tools and channels and relevant actions for external communication, dissemination and awareness.

Following, Section 3 reports the strategy, procedure and means for internal communication between the partner's Consortium.

This plan and the progress will be annually updated according to the Description of Action (DoA).

It is important to remark that a complementary plan for exploitation strategy has also been developed at the proposal stage as drafted in the DoA and that it will be updated throughout the project with a further deliverable (D5.4 Update of plan for exploitation strategy, Month 15).

A final report on dissemination and exploitation will be summarized at the end of the project (D5.7 Final report on dissemination and exploitation, Month 36).

2. External Communication, Dissemination and Awareness Plan

External CDA actions aim at circulating and spreading the project's objectives, task activities and project results to a wide audience by promoting the adoption of project's results and demonstrating its impact. In addition, CDA will facilitate the exchange of information and interaction not only with other related projects and initiatives but also with activities in industry, research and society as a whole.

A wide and effective dissemination of results has been planned as one of the strong cornerstones of the project and all partners are committed to contribute. To multiply the impact and enlarge the community reached by this effort, 4AirCRAFT will develop links with energy, transport and (petro-) chemical sector related entities including sustainable fuels producers, end-users, large consumer of long-chain hydrocarbons, CO_2 large producers and components and manufacturers.

In order to maximize the impact of CDA efforts:

- Information used must be accurate
- The right audience(s) should be targeted
- Messages should interest the target audience(s) and the language will be appropriately modulated.
- Activities should be appropriate in terms of expected impact.
- Public activities need to be carried-out in a timely manner and coordinated closely with the Commission
- SMART goals: Specific, Measurable, Achievable, Realistic and Timely.

2.1 Strategy and Methodology

A careful design of the action plan for communication and dissemination of the results in a project like 4AirCRAFT is vital for reaching success in making impact.

During the first three month of 4AirCRAFT timeline in WP5, a set of tools, methodologies and communication flows addressing the external audience have been thoroughly selected and tailored to the context.

Communication and Dissemination actions envisaged in 4AirCRAFT will be directed according to the general aim of the project and ensuring the compliance of contractual obligations. The effective dissemination of project results to target audiences relies on the engagement of the entire consortium in the individual activities however, FHa acting as the WP leader and Project Coordinator, will monitor the frequency of the publication of results, workshop organization, news and project progress in terms of dissemination, leading the overall fulfilment of the objectives and the tasks defined in WP5.

The consortium agrees to follow a basic set of rules of common understanding to assure a good quality external communication and dissemination in accordance with the Consortium Agreement. These are:

- All partners are committed to contribute with specific dissemination efforts and will strive to maximize the use of existing communication and dissemination channels for

the purpose of the project results adoption. Moreover, the consortium as a whole will actively contribute to the communication and dissemination of 4AirCRAFT in order to ensure its effectiveness.

- FHa acts as the WP leader and Project Coordinator, in charge of tracking and monitoring all communication and dissemination activities of the project but also coordinating the contributions by all partners.
- Communication and dissemination activities to stakeholders and advisory members are centralized through the Project Coordinator supported by Work Package leaders and other relevant partners.
- Consortium must be informed about any communication and dissemination of 4AirCRAFT activities and results with specific target audience prior to the action. Moreover, any information to be shared outside the Consortium must be approved by 4AirCRAFT General Assembly.
- Project Coordinator Procedures to ensure the requisites of the Grant Agreement (GA) and Consortium Agreement (CA), taking into account the rules on visibility of EU funding.

The strategy to be followed can be divided in three blocks according to the objective, focus and target audience and it will reflect the project progress and availability of project results, as shown in Figure 1.

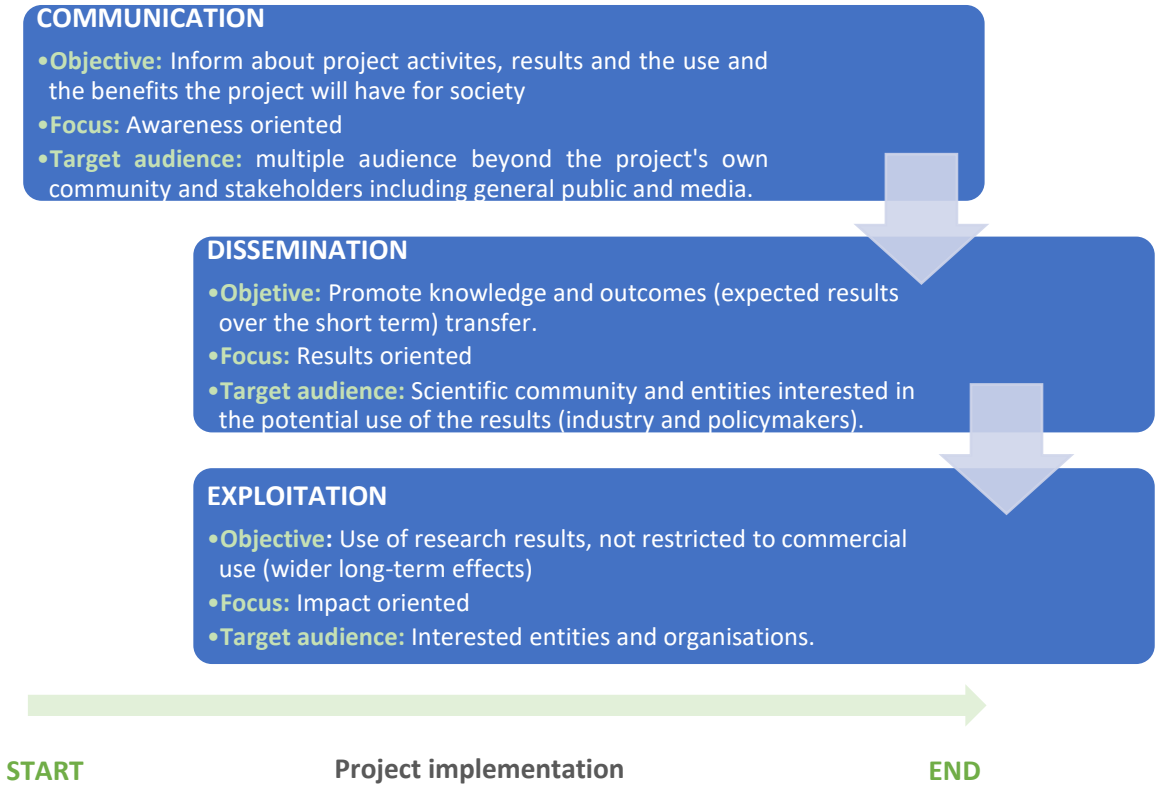

Figure 1. Communication, Dissemination and Exploitation strategy.

The exploitation of the results is outlined in the figure but will not be described in this deliverable as a draft is already described at the DoA and will be further updated in Month 15 (D5.4 Update of plan for exploitation strategy).

2.2 4AirCRAFT Key Messages

4AirCRAFT communication and dissemination actions will be directed by a common axis drawn according to the general aim of the project, expressed in the DoA as follows:

- The ultimate goal of 4AirCRAFT (Air Carbon Recycling for Aviation Fuel Technology) is to develop a next generation of active, stable, and selective catalysts for the direct CO_2 conversion into high density liquid fuels enabling the sustainable synthesis of aviation fuel. Key to the process will be the combination of highly efficient electro-, chemo- and bio- catalysts, which are selectively embedded within novel catalyst carriers, based on engineered hybrid scaffolds in a single cascade reactor, where the introduced CO_2 is converted to high-density hydrocarbons.
- The 4AirCRAFT game-changer concept relies on driving the conversion of CO_2 and H_2 into aviation fuels under much milder and greener conditions relative to conventional processes. Therefore, focusing on the cost optimisation potential methodologies and the good social perception and reputation of embracing sustainable productive methods.
- 4AirCRAFT means design of advanced catalyst for one-step fuel synthesis reactor, with new providers coming into scene. Their awareness on the project impacts and potential is important for them to appropriately shift resources to a potential huge market demand related to renewable synthetic liquid fuels. New technologies bring new perspectives, either to fulfil existing needs from other sectors or to imagine new products and applications. This particularly fertile framework is favourable to cross-sectorial innovation.

2.3 Target groups

All communication and dissemination activities will be primarily designed to firstly impact agents at EU, Japan and international level, secondly on a national level of all countries directly involved and thirdly at local and regional environments of all project partners.

A first assessment of the main target audiences that are expected to be communicated about 4AirCRAFT activities and influenced by 4AirCRAFT results is carried out in this subsection. New results and findings during the project implementation will serve as additional input to detect new opportunities in the target groups already and/or recently identified. 4AirCRAFT target audiences have been clustered in the following categories:

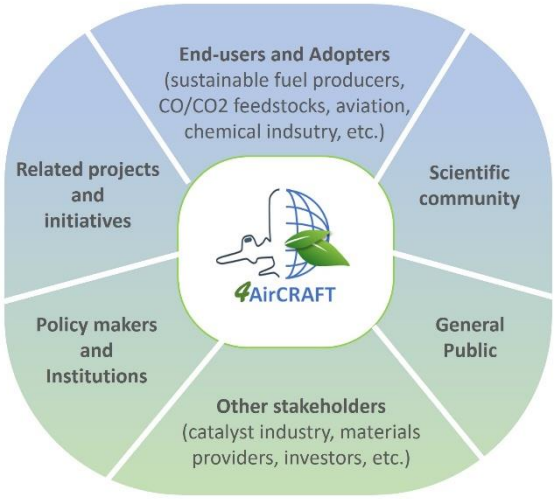

Figure 2. 4AirCRAFT Target Audience.

2.3.1 Scientific Community

The goal will be to reach the highest possible impact on the scientific community, public and private research centres, universities, R&D groups in private companies and experts boards by publishing in high impact factor journals and attending the most important conferences related with sustainable fuel synthesis, catalyst, advanced materials, etc. The consortium believes in the high scientific and technological potential of the research proposed in the project, so the initial dissemination plan is to publish several scientific papers per year and attend to the main international conferences. The novel scientific and technologic results will be disseminated, following the open access policy in H2020, through scientific international peer reviewed journals and conferences. In all cases, the aim of the Consortium will be to make the research results output accessible as widely as possible.

2.3.2 Potential end-users and adopters

4AirCRAFT will impact directly on addressing the interaction on industrial potential end-users and adopters of the novel catalytic materials and the game-changer one-pot synthesis reactor technology in the long term (e.g. producers of renewable and sustainable fuels, large consumer of long-chain hydrocarbons, large producer of CO_2, feedstocks CO/CO_2 suppliers, aviation and maritime industry, chemical producers, etc..).

4AirCRAFT partners will disseminate the project technological achievements at suitable events providing awareness about the potential of bifunctional catalytic routes and hierarchical structures, efficient production of sustainable fuels (and other high value chemicals) from H_2 and carbon recycling, observations and lessons learnt from proof of concept validation, etc…with the goal of increasing technology maturity in the long-term for ensuring fast adoption.

2.3.3 General Public (Citizens)

The 4AirCRAFT project dissemination and communication for the general public awareness will be mainly focused on two different communities: society at large and Education. The action will

be focused to raise public awareness and acceptance of disruptive catalytic technology for production of alternative renewable fuels by the conversion of H_2 and recycled carbon to meet net-zero targets. The aim will be promoting and explaining the industrial and technological benefits of the 4AirCRAFT project developed technology contributing to decrease the fossil fuel dependence and highlighting the potential for local economy. Furthermore, emphasis will be laid on raising the interest of the next generation of scientist and engineers about environmental concerns, benefits of alternative fuels and integration of renewable feedstocks and energies.

The tools that are planned to be specifically used for this audience, are popular magazines, twitter, LinkedIn, websites, outreach activities, etc.

2.3.4 Related projects and initiatives

Synergies identification with complementary projects and relevant initiatives will be carried out during the project's lifetime. Knowledge exchange will be encouraged by means of activities coordination considering on-going initiatives in other projects and investigating on the possibility of defining joint actions.

Moreover, the collaboration with rest of the ongoing joint projects with a topic targeted on "International cooperation with Japan for Research and Innovation on advanced biofuels and alternative renewable fuels LC-SC3-RES-25-2020) will be promoted.

2.3.5 Authorities, Policy Makers and Public bodies

The dissemination to the policy makers, European Commission, National Public Bodies, Regional Institutions Non-governmental organizations of industry associations, and other influent institutions is one of the main targets of the dissemination activity.

The general outcomes of the project and its sustainability, the new developing technologies and their eco-friendly and cost optimisation potential may be a premise towards providing recommendations for the introduction of incentives and support instruments for efficient use and conversion of CO_2 and production of alternative high-density fuels. In the same way, the evaluation of potential markets and the assessment of the potential of 4AirCRAFT conversion to solve the technology challenge of sustainable and profitable production of jet fuels for decarbonisation of the aviation sector will be the main input for these organisms.

This will be mainly driven by the 4AirCRAFT website and the design and distribution of one digital flyer. In addition, the partners of the project participate in different international and national agencies and committees from where the project achievements and goals will be promoted. Each partner will be responsible for the dissemination of the project results to the regional institutions, national and international organization where it belongs to.

2.3.6 Other stakeholders

A first assessment of the main target audiences that are expected to be influenced by 4AirCRAFT main results on advance catalysts for one-step fuel synthesis reactor has been carried out in the previous sub-sections. However, project outcomes could also serve as additional input to new target groups as technology suppliers of equipment, advanced components, catalyst, technology and end product manufacturers, etc.

Some of the key messages to new providers coming into scene could be related to:

- Awareness on the project impacts and potential to appropriately shift resources to a potential huge market demand related to renewable synthetic liquid fuels
- Knowledge in the expected evolution of hybrid catalyst towards sustainable high density fuels production.
- Affordable manufacturing costs while reducing footprints by means of the new processes defined in 4AirCRAFT.

Furthermore, potential short-term investors might expect to emerge betting for individual components and materials in the short term after project execution, supporting the required TRL increases and upscaling towards market uptake.

2.4 Communication and Dissemination Material

2.4.1 Press kit

A press kit will be developed and distributed to the partners in M12. It will be also available for download on the project website. This document will help partners drafting their press releases and journalist in their job of writing about 4AirCRAFT. It will include a non-technical summary of the project (easy for journalists to understand), objectives, ambitions, structure and partners.

Summarized calendar of expected results, pictures & graphic materials, available contacts for interviews and statements as well as and project's contacts for the press might also be included.

2.4.2 Flyer

A digital flyer, following the project corporative image, will be developed in order to easily disseminate the project in different events where the partners of the project are taking part. The factsheet(s) will also be uploaded to the website and available for download. Yearly updates of this material will be released with progress of the project and aiming to provide information about first available results such as facts & figures (easily 'tweetable' facts) and the main impacts on society and the environment.

2.4.3 Presentation

An official general presentation of 4AirCRAFT describing project overview, goals, concept, strategies, motivation and activities is under preparation. This presentation will be distributed with all the partners for their individual dissemination activities throughout the project lifetime.

2.4.4 Other materials

Other materials to be provided during the project duration are the public deliverables listed in Table 1. Publication will occur via the website.

Table 1. Deliverable list.

Deliverable	Title	Due date
D4.1	Toolbox of 4AirCRAFT cascade reactor testing, operation windows and limitations	Month 27
D4.4	Environmental and Economic Assessment from a Life Cycle perspective of the 4AirCRAFT project	Month 36
D5.1	Logo, visual identity, guidelines and document templates	Month 3
D5.2	Communication, Dissemination and Awareness Plan	Month 3
D5.3	Project's website	Month 6
D5.5	Update 1 of dissemination, communication and awareness plan	Month 15
D5.6	Update 2 of dissemination, communication and awareness plan	Month 27
D6.2	Data Management Plan	Month 6
D6.3	Midterm publishable summary report	Month 19
D6.4	Final publishable summary report	Month 36

2.5 Communication and Dissemination tools and channels

Communication activities in 4AirCRAFT 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.

2.5.1 Website

The project's Website aims to become the main information showcase of 4AirCRAFT. The tentative proposed domain of the website is www.4AirCRAFT-project.eu. A complete functional and operational website is foreseen for Month 6. This channel will be addressed at all target groups. All partners will be requested to deliver content for the website.

The Website map will be designed to offer a complete overview of the project, its partnership and objectives and an easy access to all its activities and latest news. There will be a main "4AirCRAFT Wall" promoting the latest project achievements, news and outcomes, events, activities, etc.. The download area (under news and publications) will give the possibility of free downloads of all the public outputs carried out during the project's life.

Website efficiency will be underpinned by the criteria of:

- Usability. Clear and accessible structure
- Content updating
- Accuracy in the content suitability

The website structure is as follows[1]:

[1] Provisional structure. 4AirCRAFT website is under construction at the time of the release of this deliverable.

- **HOMEPAGE/MAIN PAGE**
    - Main Slider
    - "4AirCRAFT Wall"
    - Social Networks Widgets
    - Website Footer (including funding)
- **ABOUT 4AirCRAFT**
    - Project info and objectives
    - Partners and Advisory Board
- **NEWS & PUBLICATIONS**
    - 4AirCRAFT News
    - 4AirCRAFT Publications (Download area)
- **EVENTS**
- **CONTACT**

The Website will be maintained and updated during the project and for a couple of years after the project ends.

2.5.2 Social and professional Networks

Social media has become a very popular means of disseminating information fast across heterogeneous target groups. These channels serve on-demand access to content anytime, anywhere, on any digital device. No social media profiles will be created for this project, as resources are limited. However, a hashtag with the name of the project will be created, and the project partner will communicate in its own social media channels (Twitter, LinkedIn, ResearchGate) all relevant information about the project. All project partners will be involved in this dissemination task via their own social media channels.

Partners will leverage their existing social media activities to continuously communicate about the project progress, achievement of milestones and important events. The use of the dedicated hashtag #4AirCRAFT and alert CINEA will be encouraged.

Main social media channels considered for the dissemination of the project and recommendations on how to use each of them are detailed below:

- **Twitter:** Used to reach the general public, public bodies and potential interested industry. Twitter can help to increase the website visits and to easily share press and media releases. The individual partners and institutions of the project will be encouraged to echo the project events, news and press releases 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.

- **ResearchGate:** This channel is dedicated to people more specifically interested on the field since it is a social networking site for scientist and researchers to share papers, ask and answer questions, and find collaborators. Here the researchers can follow the news of the project and start discussions.

- **LinkedIn:** Used to reach stakeholders, scientific community, general public, interested companies, etc. Partners will echo the project events, news and press releases through posts in their existing profiles (individual or company profiles), in the account holder language and also in English, linking to the article or piece of news published in the project website.

Furthermore, most partners have regular newsletters and regular posts on their own websites, etc. This activity will be used to disseminate the activities of the project regularly via these channels. Additionally, a general description of 4AirCRAFT will be created in all partners websites as a static information point and linked to 4AirCRAFT official website.

In addition, EU public bodies website and social media channels (e.g. the CORDIS website) will be considered, profiting the tools and events that these bodies provide.

2.5.3 Public relations and general media impact

To have our project accessible to the wider public, mass media will be addressed thanks to the distribution of several press releases or pieces of news during the life of the project, directly linked to important events, achievements or milestones of 4AirCRAFT, such as the project kick off meeting and the two foreseen workshops. Press releases will be drafted in English and published on the project website. FHa, as WP leader, will distribute these press releases in its own country (Spain). For the distribution of these press releases in further countries, all project partners must be active in the translation to their local language and dissemination to local, regional and national mass media. The press kit described in section 2.4.1 will help the public relations activities carried out by 4AirCRAFT project partners.

2.5.4 Scientific and Technical publications

To ensure visibility with the scientific and technical community, several publications in high impact scientific journals are foreseen, as well as diffusion in dedicated national and international professional magazines and associations.

A list of high-impact scientific journals and magazines have been identified as potential channels for dissemination. A tentative list is provided:

Advanced Functional Materials, ACS Catalyst, Angew. Chem. Int. Ed., Journal of American Chemical Society, Nature Chemistry, Nature Communications, Chemical Science, Cell, Matter, Chemistry of Materials, ACS Applied Materials & Interfaces, RSC Advances, International Journal of Hydrogen Energy, etc.

According to the Consortium Agreement, all the information to be disseminated will be managed and will have to receive the agreement of the Steering Committee to ensure the intellectual property rights, confidentiality and the legitimate interests of the partners.

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.

Any scientific publication generated, its open access publication, in order to ensure broad dissemination, will be guaranteed according to "Green Mode Open Access" or "Gold Open Mode Access". The corresponding author will be in charge of filing a copy of the final manuscript to be distributed among the partners and archiving it in a public archive web (e.g. arXiv.org, zenodo), including the mandatory metadata and the link to the original article, and other publishers' and programme requirements, once the embargo period has expired ("Green Open Mode Access"). Embargo periods in the target journals will not exceed 6 months. If the article is published in a journal with wider embargo periods, then the partners signing it shall cover the Gold Access costs. Nevertheless, this option will only be approved by the General Assembly when that is the only valid option after studying other alternatives.

Each partner is responsible for complying with the regulations mentioned in the Grant Agreement.

2.5.5 Conference/Forums/Fairs/

4AirCRAFT partners will present, during and after the project, the latest project results and on-going research findings at national and international forums such as conferences, forums and symposiums, as well as through associations and platforms related to the target groups stated on section 2.3.

By targeting the major 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, FHa will try to address those as well.

A tentative list of international conferences and forums are reported below:

- International Conference of Biofuels and Bioenergy
- International Symposium on Chemical Reaction Engineering (ISCRE)
- European Congress on Catalysis (EuropaCat)
- North American Catalysis Society Meeting
- International and European MOF Conferences
- Faraday Discussion meetings
- ECS (USA) meetings
- Gordon Conferences in the themes of the proposal
- European Biomass to Power
- World Ethanol & Biofuels Conference
- World Hydrogen Energy Conference
- World Hydrogen Technology Convention

The 4AirCRAFT consortium will evaluate other possible events to attend to. This list will evolve and will be updated in following versions of this plan.

2.5.6 Events/Workshops

Project partners will participate in several workshops and external events, and they will always take into account the opportunity for the project to be mentioned as a means for visibility.

4AirCRAFT foreseen events to date are the project kick-off, info-day for external advisors and two workshops.

Dedicated workshops, which might be organized in parallel to other on-going relevant projects, will promote the project results and facilitate knowledge exchange while end-users and stakeholders will gain access to the project outcome.

Scientific Workshop (Month 24):

Target: scientific community.

Focus: Rational design and manufacturing of catalytic materials for sustainable synthesis of high-density hydrocarbons.

Topics: Synthesis of catalysts for more sustainable transformations, their performances, structure-properties relations, and catalytic modelling.

Goal: Knowledge exchange not only between participating members and institutions but also with other technologies where 4AirCRAFT results could be extrapolated, for example, targeting other important transformations including the synthesis of fuels and CO_2 conversion.

Scientific-Technical Workshop (Month 36):

Target: Several actors around synthetic fuel production, renewable energies, and potential adopters of 4AirCRAFT advancements (detected as part of the exploitation strategy related to each Key exploitable result as described in Section 2.2.1 from the Grant Agreement).

Focus: Next generation of catalysts for the direct CO_2 conversion into renewable liquid fuels.

Topics: Catalysts, jet fuel synthesis, CO_2 conversion, etc.

Goal: Dissemination of final achievements of the project and focus on the continuation of 4AirCRAFT.

3. Internal Communication Plan

The interdisciplinary nature of this project requires that all matters of communication in 4AirCRAFT are conducted in an efficient way internally. All partners will need to work closely together in order to make the project a success. This applies to not only research matters, but also to dissemination and IP (being formulated in the Consortium Agreement). Moreover, all expectations and difficulties need to be discussed in an open manner.

The mechanisms that will be used throughout the project in order to ensure the quality level of an internal communication is described in deliverable D6.1 Quality and Knowledge Management Plan.

Figure 3 shows how communication may flow through different task leaders, WP leaders, Project Steering Committee towards the coordination bodies, and also towards the European Commission Project Officer.

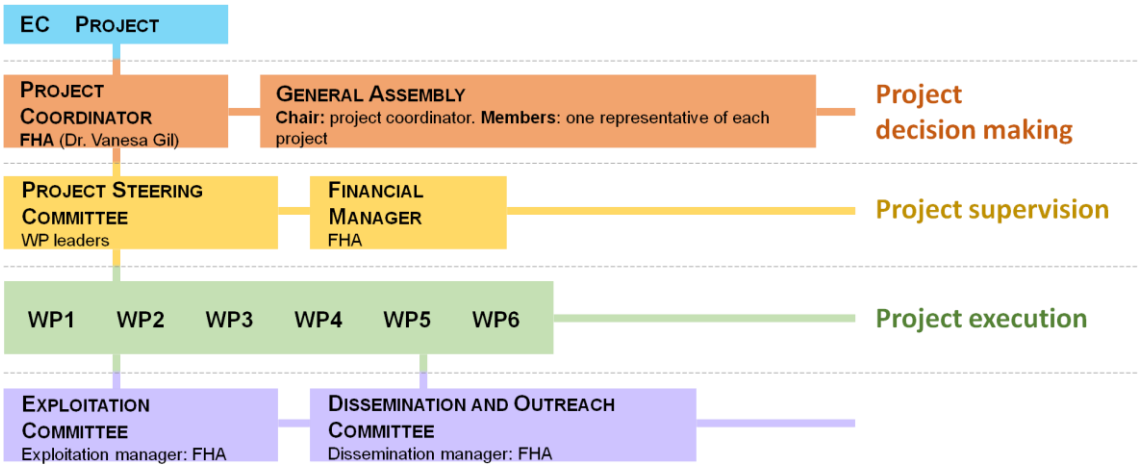

Figure 3. Organizational structure of the 4AirCRAFT project.

3.1 4AirCRAFT SharePoint

A SharePoint for the project has been set up between all partners in Microsoft Teams. A tentative folder structured is provided:

- General
- Communication-Dissemination
- External Advisors
- General Assembly
- Management-Meetings
- WP1-inorganic catalysts
- WP2-biocatalysts
- WP3-catalyst carrier
- WP4-reactor

All partners are able to readily search for an upload document and include more files if needed. When it concerns a working document, the version and date need to be specified. Also the initial of the partner should be mentioned in the file name, to allow ready tracing of the evolution of a document. Upon uploading any final version, the file name must reflect this, and the document must be in a pdf format. Management in this is important since the structure can get chaotic very quickly if multiple partners need to contribute to the same files.

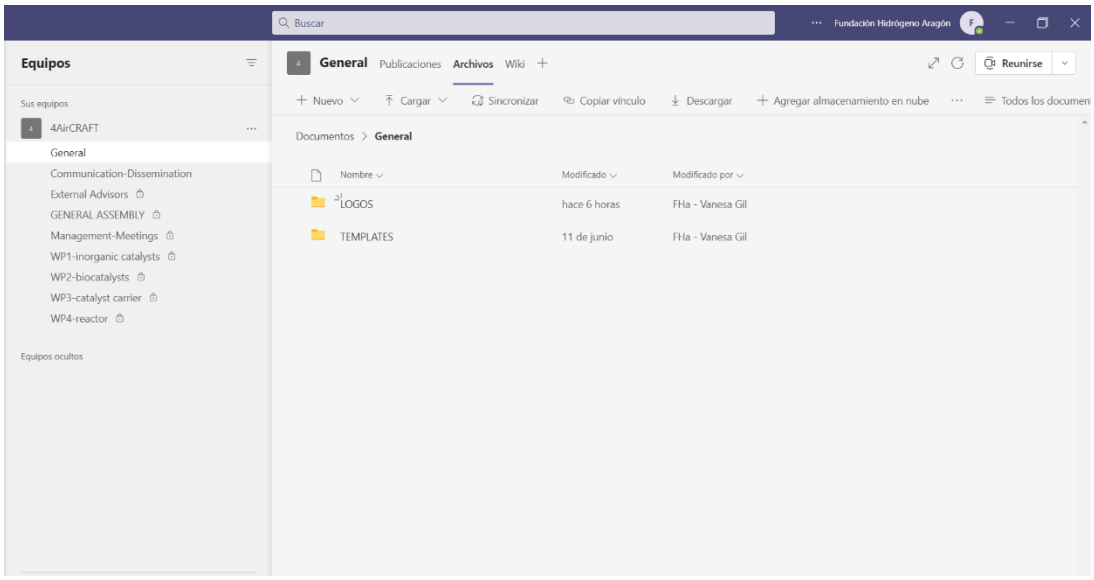

Figure 4. 4AirCRAFT SharePoint.

3.2 Methodology, rules and recommendations

During the periodic planned Project Steering Committee Meetings (every 3 months), we will coordinate the communications aspects of the project in every country, as well as evaluate the performance of the dissemination plan and undertake correcting measures when needed.

The basic tools that will be used during the project to accomplish the internal communication among the partner are:

- Regular email
- 4AirCRAFT SharePoint
- Periodic Meetings (every 3 months)

There are basic guidelines which must be followed:

- All partners report any planned upcoming communication and dissemination activity to FHa and the Consortium ahead to the activity. 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 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.

- The 4AirCRAFT SharePoint is the platform for all internal documentation and documents management. Using the templates and keeping a comprehensible versioning and communication is everybody's duty.

3.3 Dissemination outcomes management

The outcomes and outreach activities produced during the project will be collected and reported by FHa as dissemination responsible. A table with the details and targets of each dissemination activity will be shared periodically with the project partners in order to collect, report, and control all the activities that have been carried out. In addition, a table summarizing publications and the media impact will be considered for monitoring purposes.

4. Evaluation of communication and Dissemination activities carried out

4.1 Ongoing projects for project cooperation

A tentative list of identified projects as relevant to be taken into account has been assessed as summarised hereafter. The assessment of any collaboration will be studied case by case taking into account the objectives of each project and partners involved:

- **LAURELIN**

Title: Selective CO_2 conversion to renewable methanol through innovative heterogeneous catalyst systems optimized for advanced hydrogenation technologies (microwave, plasma and magnetic induction

Goal: Optimization and improvement of the CO_2 hydrogenation process to obtain methanol as a renewable fuel

Partners: AIMPLAS; CSIC, University of Almería; University of Manchester; University College London; Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V.; Process Design Center BV; Alienoreu SPRL; National University Corporation Tokyo Institute of Technology; National University Corporation the University of Tokyo.

Duration: 01/05/2021-30/04/2024

Funding Body: EU Horizon 2020

- **ORACLE**

Title: Novel routes and catalysts for synthesis of ammonia as alternative renewable fuel

Goal: Development of novel technology to generate new ways of creating green ammonia.

Partners: Aarhus Universitet; Stichting Nederlandse Wetenschappelijk Onderzoek Institutyen; Institut Jozef Stefan; Vlaamse Instelling Voor Technologisch Onderzoek N.V.; C2CAT BV; Casale SA; Osaka Research institute of Industrial Science and Technology; National Institute of Advanced Industrial Science and Technology.

Duration: 01/05/2021-30/04/2024

Funding Body: EU Horizon 2020

- **COZMOS**

Title: Efficient CO_2 conversion over multisite Zeolite-Metal nanocatalysts to fuels and OlefinS

Goal: Development, demonstration and exploitation of innovative catalyst and process technologies for the conversion of CO_2 to C_3 fuels and chemicals building blocks.

Partners: Oslo University; SINTEF AS; King Abdullah University of Science and Technology; HALDOR TOPSOE AS; CNRS; LINDE GMBH; Turkiye Petrol Rafinerileri Anonim Sirketi; Tata Steel UK Limited; Turin University; The University of Sheffield; Shanxi Institute of Coal Chemistry Chinese Academy of Sciences.

Duration: 01/05/2019-30/04/2023

Funding Body: EU Horizon 2020

- **KEROGREEN**

Title: Production of Sustainable aircraft grade Kerosene from water and air powered by Renewable Electricity, through the splitting of CO_2, syngas formation and Fischer-Tropsch synthesis

Goal: Production of sustainable aircraft grade kerosene from water and air powered by renewable electricity, through the splitting of CO_2, syngas formation and Fischer-Tropsch synthesis.

Partners: Stichting Nederlandse Wetenschappelijk Onderzoek Instituten; Karlsruher Institut Fuer Technologie; Vlaamse Instelling Voor Technologisch Onderzoek N.V.; Ceramic Powder Technology AS; Hygear BV; Ineratec GMBH.

Duration: 01/04/2018-31/02/2022

Funding Body: EU Horizon 2020

- **TAKE-OFF**

Title: Production of synthetic renewable aviation fuel from CO_2 and H_2

Goal: Development an innovative process for producing sustainable aviation fuels to convert CO_2, captured from industrial flue gases, and green H2 into fuel via ethylene as an intermediate.

Partners: TNO; CNRS; RWE Power Aktiengesellschaft; MITSUBISHI Power Europe GMBH; Asahi Kasei Europe GMBH; FEV Europe GMBH; SYNRG BV; Rheinisch-Westfaelische Technische Hochschule Aachen; Syddansk Universitet; CO_2 Value Europe AISBL.

Duration: 01/01/2021-31/12/2024

Funding Body: EU Horizon 2020

Moreover, the following projects might also develop some research activities relevant for 4AirCRAFT:

- **DECADE**

Title: DistributEd Chemicals And fuels production from CO_2 in photoelectrocatalytic DEvices

Goal: Development of a new photoelectrocatalytic (PEC) approach for the conversion of CO2, avoiding water oxidation, maximizing effective energy utilization to produce different green solvents (e.g. ethyl acetate (EA), ethyl formate (EF)).

Partners: European Research Institute of Catalysis A.I.S.B.L.; Consorzio Interuniversitario Nazionale per la Scenza e Technologia dei Materiali; Fundacio Privada Institut Catala D'investigacio Quimica; MAX-PLANCK; CIC biomaGUNE; Forschungszentrum Julich GMBH; NEXTCHEM SPA; HYSYTECH SRL; Ekodenge Muchendislik Mimarlik Danismanlik Ticaret Anonim Sirketi; UNISMART – Fondazione Universita Degli Di Padova; Motor Oil (HELLAS) Dilistiria Korinthou AE; MERIT Consulting House; National University Corporation The University of Tokyo; FILA Industria Chimica SPA; CASALE SA; MERIT Consulting House.

Duration: 01/05/2020-30/04/2024

Funding Body: EU Horizon 2020.

- **OCEAN**

Title: Oxalic acid from CO_2 using Electrochemistry At demonstration scale

Goal: Development of new technology to produce an integrated process of synthesis high-valuable C2 chemicals from CO_2, using electrochemistry.

Partners: European Research Institute of Catalysis A.I.S.B.L.; Gaskatel Gesellschaft Fuer Gassysteme Durch Katalyse und Elektrochemiemit Beschrankter Haftung; Gensoric GMBH; HYSYTECH SRL; Avantium Chemicals BV; Fondazione Instituto Italiano Di Technologia; RWE Generation SE; Universiteit Van Aamsterdam; RWE Power Aktiengesellschaft.

Duration: 01/10/2017-30/09/2021

Funding Body: EU Horizon 2020

- **BIO4A**

Title: Advanced sustainable BIOfuels for Aviation

Goal: Sale up the industrial production and the market uptake of sustainable aviation fuel, made from residual lipids. The project will enable the large-scale pre-commercial production of ASTM-certified sustainable aviation fuel in the EU. It will also investigate the alternative supply of sustainable feedstocks by recovering EU MED marginal land for drought resistant crop production. The project will test the entire value chain and logistic at industrial scale and it will assess the environmental performance of the overall process

Partners: Consorzio per la Ricerca e la Dimostrazione Sulle Energie Rinnovabili; TOTAL Raffinage Chimie; SKYNRG BV; Fundacion Cener; ETA – Energia, Transporti, Agricoltura SRL; Camelina Company España S.L; JRC; TOTAL Raffinage France.

Duration: 01/05/2018-30/04/2022

Funding Body: EU Horizon 2020

- **FLITE**

Title: Fuel via Low Carbon Integrated Technology from Ethanol

Goal: Build the first-of-its-kind alcohol-to-jet facility in Europe.

Partners: SKYNRG BV; RSB Roundtable on Sustainable Biomaterials Association; Lanzatech BV; E4TECH (UK) LTD; Fraunhofer Gesellschaft Zur Foerderung der Angewandten Forschung E.V.

Duration: 01/12/2020-30/11/2024

Funding Body: EU Horizon 2020

- **FlexJET**

Title: Sustainable Jet Fuel from Flexible Waste Biomass

Goal: Development a highly scalable technology, to the production of sustainable aviation biofuels from waste vegetable oil and organic solid waste biomass.

Partners: The University of Birmingham; Fraunhofer Gesellschaft Zur Foerderung der Angewandten Forschung E.V.; University of Bologna; Sterling Power LTD; WRG Europe LTD; Green Fuels Research LTD; HYGEAR BV; BIGA Energie GMBH & CO KG; ETA – Energia Transporti; Agricoltora SRL; SKYNRG BV; Acondicionamiento Tarrasense Association; Susteen Technologies GMBH; The University of Sheffield.

Duration: 01/04/2018-31/03/2022

Funding Body: EU Horizon 2020

- **eCOCO2**

Title: Direct electrocatalytic conversion of CO_2 into chemical energy carriers in a co-ionic membrane reactor

Goal: Development technology for conversion of CO_2, using renewable electricity and water steam, to carbon-neutral synthetic liquid fuels for their use as transport fuel, and in particular as jet fuel.

Partners: CSIC; University of Oslo; Coorstek Membrane Sciences AS; SINTEF AS; Universitat Politecnica de Valencia; Rheinisch-Westfaelische Technische Hochschule Aachen; Hera Holding Habitat, Ecologia y Restauracion Ambiental S.L.; Cemex Research Group AG; Arcelormittal Belgium NV; Shell Global Solutions International BV; National University Corporation Kyushy University; Xiamen University.

Duration: 01/05/2019-30/04/2023

Funding Body: EU Horizon 2020

- **HIGFLY**

Title: HIGee to Furanic-based jet Fuel technologY

Goal: Development of highly efficient and scalable reactor and separation technologies for bio jet fuel production in a cost-effective way.

Partners: Technische Universiteit Eindhoven; TNO; Skynrg BV; CSIC; Fraunhofer Gesellschaft Zur Foerderung Der Angewandten Forschung E.V.; Jonshon Matthey PLC; IFEU-Institut Fur Energie – Und Umweltforschung Heidelberg GGMGH; Kneia SL; Boeing Aerospace Spain.

Duration: 01/01/2021-31/12/2024

Funding Body: EU Horizon 2020

Additionally, the following ended projects have been identified. Setting up project synergies between 4AirCRAFT and these projects, is not any longer possible however, it is relevant to keep in mind the main conclusions and findings.

- **ALFA-BIRD**

Title: Alternative Fuels and Biofuels for Aircraft Development

Goal: Development a variety of alternative fuels for their use in aeronautics, from classical solutions (plant oils, synthetic fuels) to the most innovative, such as new organic molecules.

Partners: European Risk & Resilience Institutye (EU-VRI) EWIV; AIRBUS; AVIO SPA; CNRS; Technologica Group– European Technical Joint Venture CVBA; Dassault Aviation; DLR; Institut National De L'Environnement et des Risques Ineris; Institut National Des Sciences Appliquees de Toulouse; IFP Energies Nouvelles; LESAFFRE International SARL; MTU Aero Engines GMBH; Office National D'Etudes et de Recherces Aerospatiales; Rolls-Royce PLC; SASOL Technology (PTY.) Limited; SHELL Aviation Limited; SAFRAN Aircraft Engines; The University of Sheffield; Karlsruher Institut Fuer Technologie; Technische Universitaet Graz; The Governing Council of the University of Toronto; AIRBUS Operations SAS; Insitut National de Recherche pour l'Agriculture, L'Alimentation et L'Environnement.

Duration: 01/07/2008 – 30/06/2012

Funding Body: FP7 EU

- **LifesCO2r**

Title: Liquid Fuels & Energy supply from CO_2 reduction

Goal: Development of a sustainable bio/electrochemical technology for low-carbon fuel supply via CO_2 reduction.

Partners: University of Oxford; University of Sheffield; University of Surrey; University South Wales; Newcastle University.

Duration: 01/03/2016-30/06/2020

Funding Body: Engineering and Physical Sciences Research Council (EPSRC), UK

- **NEXT-GTL**

Title: Innovative Catalytic Technologies & Materials for Next Gas to Liquid Processes

Goal: Exploration novel and innovative routes for transformation of natural gas to liquid products.

Partners: Consorzio Interuniversitario Nazionale per la Scienza e Technologia Dei Materiali; Dechema Gesellschaft Fuer Chemische Technik und Biotechnologie E.V.;; L'AIR LIQUIDE SA; BASF SE; BAYER Technology Services GMBH; ENI SPA; ACKTAR LTD; Parametric Optimization Solutions Limited; SINTEF; CNRS; CSIC; Ustav Fyzikalni Chemi J. Heyrovskeho AV CR, v. v. i.; University of Stuggart; Gottfried Wilhelm Leibniz Universitaet Hannover; National Centre for Scientific Research Demokritos; Technische Universiteit Eindhoven; Technische Universiteit Muenchen; Universiteit Gent; Delft University; Instytut Katalizy I Fizykochemii Powierzchni IM. Jerzego Habera Polska Akademia Nauk; Systimata Prostasias Perivallontosepe; IPEL SA; KT – Kinetics Technology SPA.

Duration: 01/11/2009 – 31/10/2013

Funding Body: FP7 EU

- **SOLAR-JET**

Title: Solar chemical reactor demonstration and Optimization for Long-term Availability of Renewable JET fuel

Goal: solar thermochemical kerosene production from H2O and CO2 captured from air in a laboratory environment.

Partners: Bauhaus Luftahrt EV; Eigdenoessische Technische Hochshule Zuerich; DLR; Shell Global Solutions International BV; ARTTIC.

Duration: 01/06/2011 – 31/10/2015

Funding Body: EU FP7

- **SUN-to-LIQUID**

Title: SUNlight-to-LIQUID: Integrated solar-thermochemical synthesis of liquid hydrocarbon fuels

Goal: Design, fabricate and validate a large-scale solar fuel production plant that include the whole production chain from sunlight, H2O and CO2 to liquid hydrocarbon fuels (e.g. kerosene).

Partners: Bauhaus Luftfahrt EV; Eidgenoessische Technische Hochschule Zuerich; DLR; IMDEA Energía; Hygear Technology and Services BV; Abengoa Research SL; Arttic; Abengoa Energía SA.

Duration: 01/01/2016-31/12/2019

Funding Body: EU Horizon 2020

4.4 General Media Impact

As stated on section 2.5.3 the 4AirCRAFT project will carry out some Public Relations actions and several press releases will be distributed. Several news and press releases have been published in general media so far.

A GLOBAL STRATEGY

The 360º road map to follow

The concept of a 360-degree communication plan refers to a communication campaign that reaches the target at all possible points of contact. Successfully putting together such a plan is important because it enables us to maximize the chances of finding new potential customers and engaging them in a wide variety of ways. Figure 4 shows the different channels to follow.

Figure 5. 4AirCRAFT communication road map.

Media impact results of the first press releases include:

- **WEB**
  1. https://hidrogenoaragon.org/es/proyectos/4aircraft/
  2. https://hidrogenoaragon.org/en/proyectos/air-carbon-recycling-for-aviation-fuel-technology/
  3. https://hidrogenoaragon.org/en/we-participate-in-the-4aircrafts-project-researching-new-sustainable-aviation-fuels/
  4. https://cinea.ec.europa.eu/news/significant-eu-japan-horizon-2020-cooperation-and-investment-alternative-renewable-fuels-2021_en
  5. https://www.bcmaterials.net/the-new-project-4aircraft-starts/
  6. https://fegp.unizar.es/ods-fegp
  7. https://www.uantwerpen.be/en/research-groups/emat/research/projects/
  8. https://www.araid.es/es/node/56882 | ARAID

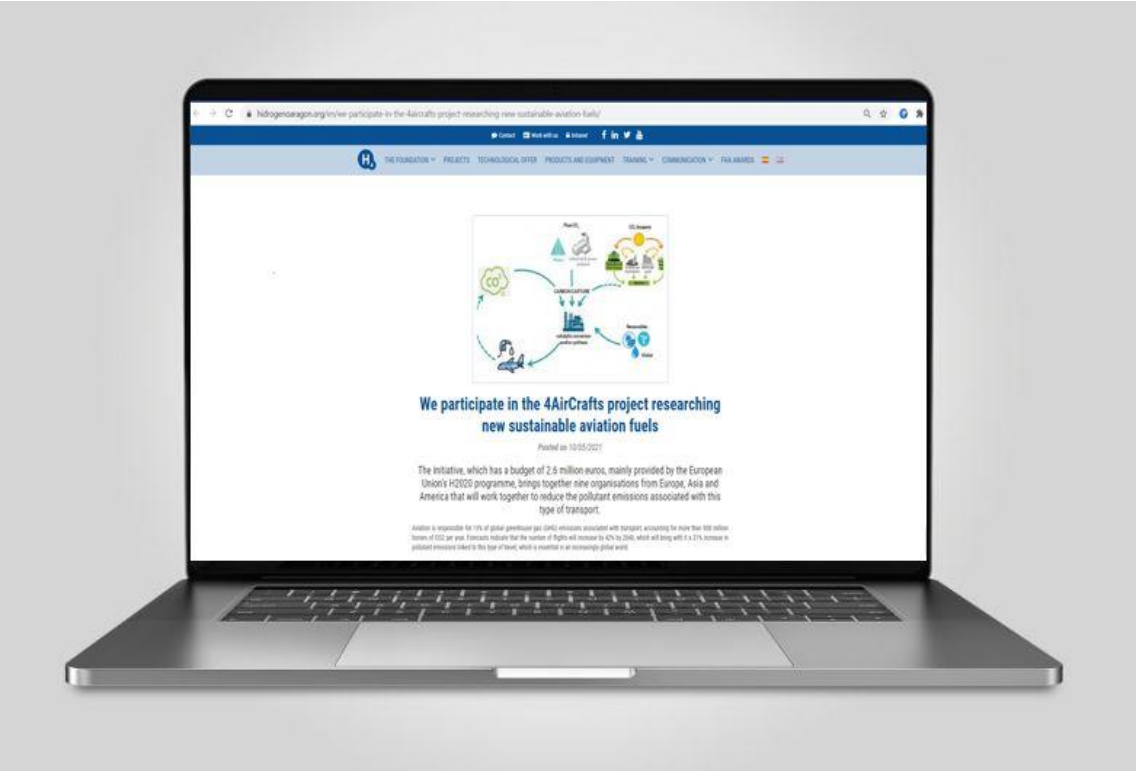

Figure 6. 4AirCRAFT in FHa Homepage (News Section).

- **PRESS**

1. https://eeas.europa.eu/delegations/japan/96563/node/96563_en
2. http://aragonhoy.aragon.es/index.php/mod.noticias/mem.detalle/id.276980
3. https://www.helsinki.fi/en/news/mathematics-and-science/eu-and-japan-jointly-invest-eu107-million-breakthrough-research-advanced-biofuels-and-alternative-renewable-fuels
4. https://www.retema.es/noticia/la-fundacion-hidrogeno-aragon-participa-en-el-proyecto-4aircrafts-gT3J
5. https://diarioaragones.com/la-fundacion-hidrogeno-aragon-participa-en-el-proyecto-4aircrafts-que-investiga-nuevos-combustibles-sostenibles-para-aviacion/
6. https://www.radiohuesca.com/huesca/la-fundacion-hidrogeno-en-busca-de-nuevos-combustibles-sostenibles-de-aviacion-09052021-154049.html
7. https://www.miragenews.com/eu-and-japan-jointly-invest-e107-million-for-554941/
8. https://aviationweek.com/aerospace/emerging-technologies/europe-japan-fund-advanced-saf-research
9. https://www.mobilitycity.es/noticia/la-fundacion-hidrogeno-aragon-participa-en-el-proyecto-4aircrafts-que-investiga-nuevos-combustibles-sostenibles-para-aviacion/
10. https://www.goaragon.es/innovaccion-goaragon-emprender-la-fundacion-hidrogeno-aragon-participa-en-el-proyecto-4aircrafts/

- **SOCIAL NETWORKS**

1. https://www.facebook.com/Crimsonairservices/photos/a.1904483909562945/4369058966438748/?type=3&theater
2. Gobierno de Aragón en Twitter: "La @HidrogenoAragon participa en el proyecto #4AirCrafts que investiga nuevos combustibles sostenibles para aviación #industria #IndustriaAragón → https://t.co/LiVGe7sj1Y https://t.co/0G9LejqLyQ" / Twitter
3. https://www.linkedin.com/company/fundacion-hidrogeno-aragon/posts/?feedView=all
4. https://twitter.com/KumpulaScience/status/1389929231233298433
5. https://twitter.com/wuttkescience/status/1397835154496929794
6. https://twitter.com/BCMaterials/status/1389563020309839872

Figure 7. Some examples of impact in LinkedIn and Twitter.

4.5 Info Day to potential interested entities

An Info Day of 4AirCRAFT was organized virtually on the 2nd of June 2021 targeting potential interested entities. FHa, on behalf of 4AirCRAF consortium, was responsible for presenting the project aim, main objectives and expectations to several organizations from different sectors: sustainable fuel producers, aeronautics, chemical industry, energy sector, etc...

Nine companies from several countries (Spain, Finland, Germany, Norway, Chile) have expressed so far their interest to be enrolled as Advisory Board Members. The needed signing of a Non-Disclosure Agreement (NDA) is under process.

5. Contractual obligations and requirements

All the communication (website, flyers, etc.) and dissemination activities (articles, presentations, etc.) that will be generated with the 4AirCRAFT funds and results will show the same acknowledgement sentence displaying the EU emblem and JST logo:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101022633. This work is supported by Japan Science and Technology Agency (JST) under Grant Agreement No JPMJSC2102. This project is developed in the frame of a Mission Innovation Challenge.

6. Conclusions

The present document describes the goals, methodology and strategy for the external and internal communication and dissemination activities of the 4AirCRAFT project.

It contains information about target groups, key messages to be transmitted, tools and channels and materials to be developed.

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 and potential interested entities has been already approached and are under the process of being enrolled as Advisory Board of 4AirCRAFT as a measure of maximizing the project impact. Similarly, it is proposed a list of conferences and events to attend as dissemination activities within communication work package of 4AirCRAFT. A more detailed plan will be updated each year through deliverables D5.5 and D5.6 in Month 15 and Month 27, respectively.

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