



HORIZON-CL5-2023-D5-01 Clean and competitive solutions for all transport modes

TRIATHLON

Thermodynamics-dRIven control mAnagemenT of Hydrogen powered and electrified propuLsion for aviatiON

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Duration: 48 months

= Deliverable D5.4= Initial communication kit

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PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
СО	Confidential, only for members of the consortium (including the Commission Services)	



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Executive Summary

Deliverable 5.4 - Initial Communication Kit - is part of task 5.1 Dissemination and communication activities, which ensures the results of the project will be disseminated to the European research and industrial community and will be communicated to the general public, the scientific community, technicians, experts, media, policymakers, industries, end-users, and other stakeholders. The initial communication kit of TRIATHLON is a set of promotional materials aimed to inform the wider public about the project, its objectives, and its expected impact. The package includes TRIATHLON logo, (2) brochure, roll-up, webpage and social media. In addition, the social media accounts of the project are presented.

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1. Introduction

Deliverable D5.4 is associated with task T5.1 – "Dissemination, Communication, and Exploitation". The objective of this task is to ensure that the results of the project will be disseminated to the European research and industrial community, will target all important stakeholders, and will assure an ongoing communication flow with the general public, the scientific community, technicians, experts, media, policymakers, industries, end-users.

The aim is to present promotional materials and distributed widely in all key events and through a regularly updated database of contacts. Social media will also be used to reach a broader audience. Moreover, the document includes the creation of a dedicated website for the project, presenting comprehensive information about the project visually and interactively. This public website is created at the beginning of the project and will be actively maintained during the whole implementation.

2. Results and discussion

2.1. TRIATHLON logo

The project logo was prepared by an AMIRES designer and proposed to the Project Coordinator (M2i) and Technical coordinator (TUD) to establish a visual identity for the project and its consortium. The logo is used in all project-related communication materials, websites, leaflets, posters, and brochures as well as internal document templates and confidential materials.

The logo is inspired by the two main keywords of the project: aviation (plane's wing in orange) hydrogen (H2 in blue).

The logo was presented and approved by the coordinators in December 2023, before the official start of the project. All files referred to the logo package can be found in project shared cloud, such as the logo colourful, black&white, and in high-quality.



Figure 1 TRIATHLON logo

2.2. Project image

During the proposal stage, two schemes (**Figure 2**) were developed to illustrate the central concept of the project. This schematic delineates the primary technologies that the consortium will contribute, including the powertrain architecture of the ZEROe turboprop demonstrator and the structure of the "multi-state storage".

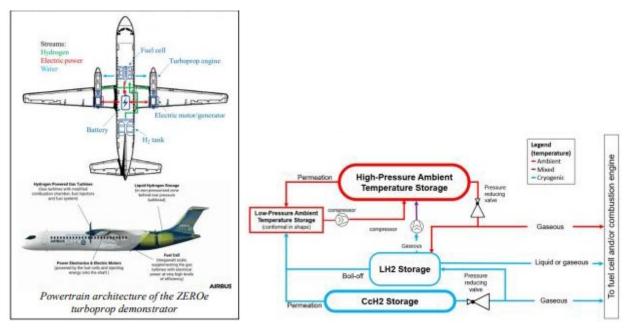


Figure 2 Schemes made during the proposal stage - overall concept of TRIATHLON project

However, the image (**Figure 2**) is very technical and not attractive to be displayed in the dissemination and communication materials. For this reason, a new project image was designed with the objective of the reader to see the image and understand the key elements of the project.

In **Figure** *3*, it is possible to observe the new scheme of the TRIATHLON powertrain, developed by AMIRES and ERGON. This new scheme is clearer, more colourful and made ad-hoc for dissemination.

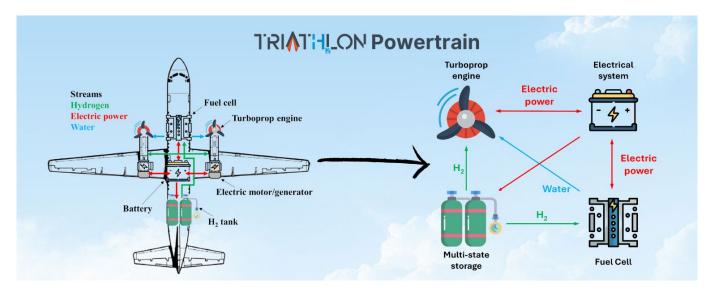


Figure 3 Project image: an updated version to be displayed in the dissemination materials.

2.3. TRIATHLON brochure

The project two-fold brochure (**Figure 4**) is a short print material to provide a brief overview of the project in an attractive text, to make the reader curious to learn more and visit the project's social media and website. It's summarized the overview, goals, impacts, and partners briefly to those interested in the topic.

The brochure can be distributed at conferences, events and on the premises of the partners. The leaflet provides acknowledgement of EU funding and includes the EU emblem.

It also contains the contact information of the Project Coordinator and Project Manager and the QR codes to access TRIATHLON website and LinkedIn page.



Figure 4 TRIATHLON two-fold brochure

2.4. TRIATHLON roll-up

The Roll-up (**Figure 5**) will be present in the main events and meetings. The background image is standard to all communication materials and is presented and matches the logo's colours. The roll-up is focused on project names and disseminating the website, also serves as a background for pictures during the project's meetings.

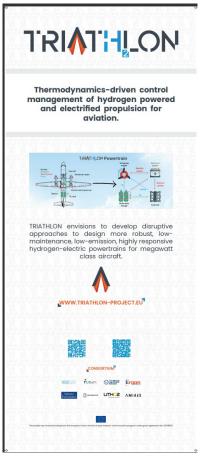


Figure 5 TRIATHLON Roll-Up

2.5. First press release

In the second month of the project, a press release announcing the successful launch of the project was prepared. The press release is titled: "Scaling clean aviation: EU-Funded 'TRIATHLON' Project aims high with hydrogen propulsion and innovative storage solutions." It describes the project's ambition and expected results and gives an overview of the consortium. Contacts can be found at the end of the document. The press release will be downloadable on the TRIATHLON website and will be available on all the consortium partners' websites.

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Press Release

Scaling clean aviation: EU-Funded 'TRIATHLON' Project aims high with hydrogen propulsion and innovative storage solutions.

In a hid to boost arisation towards a suntainable future, TRATHLON, a new Horizon Europe funded pusion; kilo-traved its ambitions journey in January 2004. Coordinated by Sicking Manuel inservation institutes (EU) and Belly University of Technology (TU 1058). TRAITHLON unless a consention of 8 partners from 6 conseries. The collaboration includes universities, industrial designers, and collaboration includes universities, industrial designers, and continuous partners. All pooling their experies to primare disreptive procurates for replact, low-unitains, kelly-responsive hydrogen-electric posterorists for suggested class. aircraft.

At its core, TRIATHLON seeks to tackle the synangy between powertrain components to address the challenges of scaling up hydrogen propulsion technology. By adopting a varsatile architecture similar to the 2EEEO temptopop dimensionator, TRIATHLON aims to develop solutions applicable across various aincraft configurations. TRIATHLON will run for 4 years.

What is TRIATHLON about?

TRIATHLON covisions to develop disruptive approaches to design more robust, low-maintenance, low-emission, highly responsive hydrogen-electric powertrains for megawatt class aistraft.

However, the impact of TRIATHLON extends far beyond its consortium. Through its innovative technologies, TRIATHLON anticipates a host of transformative outcomes for the aviation industry:

Emissions Reduction: Implementing NOx reduction strategies and harmoning excess hydrogen for

Storage Solutions: Eliminating cryogenic pumps and enhancing fael distribution with high-pressure storage buffers.

Energy Efficiency: Leveraging excess heat for hydrogen conditioning through state-of-the-art 3D printed heat exchangers.

Gravimetric Index Improvement: Enhancing powertrain efficiency and compactness through

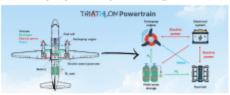
To meet its ambitions, TRIATHLON aims to achieve 4 specific objectives:

- Develop a hybrid power generation system that achieves high efficiency, power density, and ultra-low NOx emissions.
- Develop and investigate the feasibility of target-oriented storage solutions for higher gravimetric density and lewer loss to atmosphere, increasing safety and reducing cost.



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- Characterize interfacial heat and mass transfer of hydrogen phase change flow and define thermal management (TM) solutions based on structured minichannels.
 Assess technologies and pass draw a roadmap to increased Technology Readiness Lavels (TRL).



The consortium includes 8 partners from 6 EU countries: The Notherlands, Germany, Turkey, Austria, Italy and Croch Republic, bringing together the necessary disciplinary and interdisciplinary knowledge, expertise and capabilities for the execution of the project. 3 of the partners are knowledge institutes and 5 are SMEs.

- Bifft University of Technology, Sahanci University and Ergon, convoltancy company for host transfer and combustion, will contribute with their expertise on host transfer and combustion to advance the understanding of Hydrogon powersite for MW class aircraft.
 Cryomative, hydrogon mobility SMI, will perform 1D thermodynamic simulations.
 Dreaden University of Technology, and in particular The Instance for Lightweight Engineering and Polymer Technology of the TUDD, will focus on lightweight storage solutions for cryo-commenced bedroom.
- compressed hydrogen.

 Lither, SME developing systems for coramic materials, will propare the photocurable coramic
- Lindburk, 38th devicining systems nor cannot materials, was project our protectation consists empirious model.
 M21, a non-port or agentization, was chosen to act as project coordinator and project manager to avoid conflicts of interest.
 AMBERS, a consulting and management company for research, development, and innovation projects, with to responsible for disconsistation and communication.

The TRIATHLON tous will benefit from the expertise and guidance of an external Advisory Board (AB), consisting of accomplished experts in their respective fields, such as: Sultan, Poistrel, HIPulse, Artio Aero, Gl. Turkey.



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The Convertions

Partner Name	Short name	Country
1. Stichting materials innovation institute	M2i	Netherlands
2. Delft University of Technology	TUD	Netherlands
3. Technische Universität Dresden	TUDD	Germany
4. Ergon Rosearch Srl	ERG	Italy
5. Sahanci Universitosi	SAR	Turkey
6. Cryomotive Gmbh	CRY	Germany
7. Lithox Gmbh	шт	Austria
8. AMIRIS SRO	AMI	Crech Republic

Website: www.triathlon-project.ou (full version available in April 2024)

Linkedla: https://www.linkedia.com/company/101358766

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Tunded by the European Union

Figure 6 TRIATHLON first press release

2.6. TRIATHLON website

At M2 of the project period, the primary webpage was published with general information about the project and its partners. The preliminary page (**Figure 7**) contains the project logo, abstract and the partners list. It was created as a preliminary version in case visitors would like to have more information about the project. As soon as the domain address (<u>www.triathlon-project.eu</u>) was purchased, the preliminary page was set-up. However, a new design, layout, has been developed and released in M5. The website development and maintenance are led by AMIRES.



THERMODYNAMICS-DRIVEN CONTROL MANAGEMENT OF HYDROGEN POWERED AND ELECTRIFIED PROPULSION FOR AVIATION

Start date: 1st January 2024

Duration of the project: 48 months

Abstract:

In order to mitigate the negative impact of human activity on the environment, significant efforts to lower carbon emissions are being pursued at both the global and European levels. Globally, the aviation industry aims for a 50% reduction of its carbon emissions by 2050, relative to 2005. In this transition towards net zero carbon emissions, novel powertrain technologies exploiting fuel cells and/or combustion systems that rely on hydrogen will play a significant role.

TRIATHLON will use the synergy between powertrain components to overcome the challenges associated with scaling up hydrogen powertrain technology to MW class. The ambition of TRIATHLON is the development of disruptive approaches to design more robust, low-maintenance, low-emmission, highly responsive hydrogen-electric powertrains for megawatt class aircraft.

When the distruptive technologies developed by TRIATHLON are adopted by the industry beyond TRIATHLON, it will lead to:

- Reduction of emissions by implementation of NOx reduction strategies like injection of exhaust water of the FC into the CC and by capturing vented and permeated hydrogen and recompressing it;
- 2) Elimination of the need for a cryogenic pump by using a high-pressure storage buffer for pressurisation of the fuel distribution system (making the fuel distribution more robust for turbulence as well);
- 3) Reduction of the power required for hydrogen conditioning using excess heat from FC and CC by means of 3D printed heat exchangers using innovative materials like ceramics, and smart thermal management;
- 4) Improvement of the gravimetric index of the entire powertrain by providing an effective heatsink to powertrain components, reducing the need for coolant, allowing design of a more compact and lightweight CC, as well as the need for insulation of the hydrogen storage whilst enabling a longer dormancy time.

List of participants:

#	Participating Organisation	Country	Role
1	STICHTING MATERIALS INNOVATION INSTITUTE (M2I)	Netherlands	Coordinator
2	TECHNISCHE UNIVERSITEIT DELFT	Netherlands	Partner
3	TECHNISCHE UNIVERSITAET DRESDEN	Germany	Partner
4	ERGON RESEARCH SRL	Italy	Partner

Figure 7 Primary TRIATHLON Website

The purpose of the TRIATHLON website is to achieve the following objectives:

- To be a digital "business card" for partners, highlighting mission, members, and opportunities for those who want to learn more about hydrogen engines in aviation.
- To relay timely information about the project developments, events, and results.
- To create a digital contact mechanism for those who wish to contact the team.

• To allow interested parties to follow the LinkedIn page of the project, to attract more followers for regular communication in related fields.

The website layout has received approval from both the coordinator and the dissemination manager. The subsequent phase involves the coding process, to be executed by AMIRES designer in WordPress. Upon completion of the website development, content creation will undergo a thorough review by both beneficiaries. This is why the content in the figures below appears blurry; the coordinator and dissemination manager will review it meticulously to prevent any potential misinformation.

The homepage, (**Figure 8**), will mirror the content found in the brochure (**Figure 4**), offering a concise project overview alongside crucial details such as partner count, participating countries, duration, and budget. The menu bar will maintain a clean appearance, featuring easily accessible submenus. Under the "Project" tab, visitors can explore the project's impact, ambition and cluster. Under the tab "Partners", one will find information about the each of the consortium members and EAB members. In "News and events" updates of the projects will be shared. The "Results" section will house public deliverables and publications, press releases, media resources, and other downloadable content.

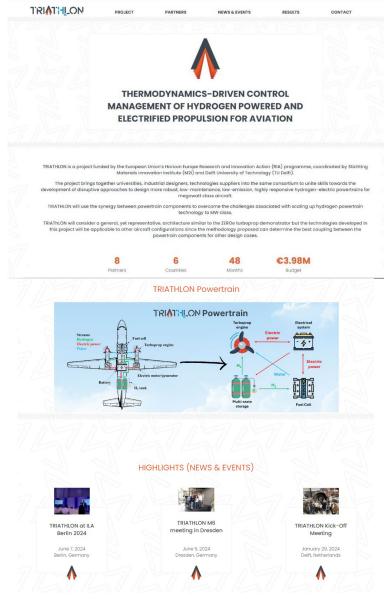


Figure 8 TRIATHLON website - homepage layout.

As mentioned, the "Project" tab will have submenus as the "Overview", "WP structure", "Ambition", "Impact" and "Clusters". it will be a concise page to explain to the visitor the main objectives and novelty of TRIATHLON and the impact that is expected (**Figure 9**).

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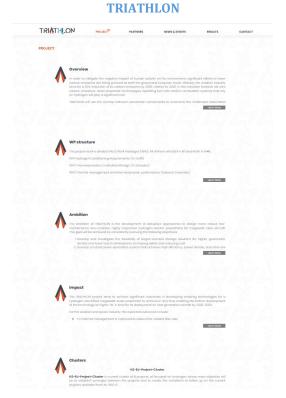


Figure 9 TRIATHLON website - "Project" tab.

Following the menu in the home page the next tab is "Partners". The visitor can click on "Show more" to get further info about each of the consortium partners and EAB members.

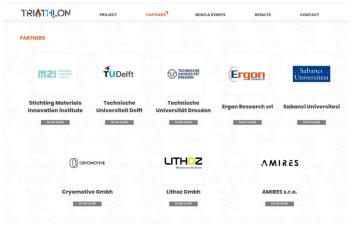


Figure 10 TRIATHLON website – "Partners" tab.

The results will be allocated for the public deliverables, such as this one and future publications. The other sections can be allocated for scientific publications, videos and all the downloadable materials which will be created for the project's dissemination.

HORIZON-CL5-2023-D5-01 GA: 101138960 TRIATHLON

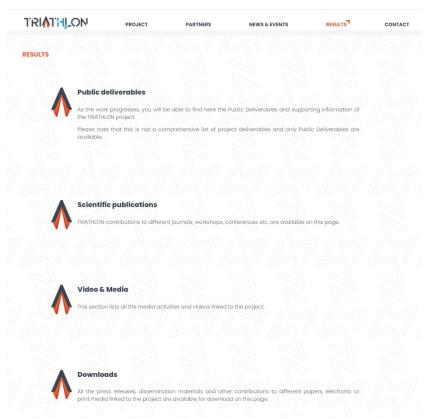


Figure 11 TRIATHLON website – "Results" tab.

In the last tab, "Contact", the visitor will find the contact details of the Project Coordinator, Project Manager and Dissemination Manager, as well as the "Contact form" that is redirected to the three email addresses.



Figure 12 TRIATHLON website - "Contact" tab.

The website will be updated periodically even after 5 years after the termination of the project. In the footnote there is an acknowledgement to the EU.

2.7. Social Media Channels

Templates for social media content have been created along with the visual identity of the LinkedIn account. More details on how this content will be used will be shared in D5.1 – Dissemination and exploitation plan -, due on M5 of the project (April 2024).

A LinkedIn account for TRIATHLON was set before the project start and an X account will be established in M12.

The page has 427 followers, and it is updated twice per month.

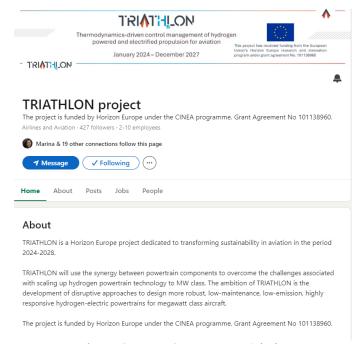


Figure 13 TRIATHLON account on LinkedIn

3. Conclusion

The TRIATHLON project website https://triathlon-project.eu/ has been set up. It will continue to be improved and regularly updated. The main objective of the website is to increase public awareness of TRIATHLON and hydrogen engines for aviation. It will be also used to disseminate the project's results. Basic information on the project can be found on the webpage as well as public deliverables and project outcomes and publications.

Other communication materials, brochure and roll-up, will be used to advertise the project to wider audiences on industrial fairs and meetings, as well as at conferences and other scientific events with the aim to establish initial interest and contact with a range of stakeholders.

4. Degree of progress

The deliverable has been completed for 100%. An update will be made at the end of the project, in month 48 (M48).

5. Dissemination level

This Deliverable is Public.