IVANHOE

Installed adVAnced Nacelle uHbr Optimisation and Evaluation

Deliverable 10.2

Dissemination and Exploitation Plan

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Contents

Glossary

Acronym	Description
ACARE	Advisory council for aviation research and innovation in Europe
CA	Consortium agreement
CFD	Computational fluid dynamics
CfP	Call for proposal
CS2	Clean Sky 2
CTH	Chalmers Tekniska Högskola AB
DEHARDE	Deharde GmbH
DNW	Stichting Duits-Nederlandse Windtunnels
GA	Grant agreement
HIT	HIT09 srl
IA	Implementation agreement
IPR	Intellectual property right
IADP	Innovative aircraft demonstration platform
ITD	Integrated technology demonstrator
JTI	Joint technology initiative
JU	Joint undertaking
KPI	Key performance indicator
PC	Project coordinator
RIA	Research and innovation actions
SA	Steering committee
SRIA	Strategic research (innovation) agenda
TM	Topic manager
TRL	Technological readiness level
TUB	Technische Universitaet Braunschweig
UNIPD	Universita Degli Studi Di Padova
UHBR	Ultrahigh bypass ratio
WP	Work package
WPL	Work package leader

Executive Report Summary

This document illustrates the plan on activities for the communication, dissemination and exploitation in the IVANHOE project. Actions are made to identify target groups outside the consortium and the topic manager (TM), for example, educational and scientific communities, industries and the general public. The respective strategies for communicating, disseminating and exploiting the project results (information, materials and knowledge, etc.) with the different target groups are devised. A variety of tools and channels are proposed for the planned activities. The communication and dissemination activities will be conducted during the whole project lifetime in collaboration with the TM and the joint undertaking (JU). Objectives for the future exploitation are set up. To realize these objectives, specific actions are put forward. The plan will be followed by an update as part of the mid-term project report at Month0+18.

The IVANHOE project will address the new challenges encountered in the installation of ultrahigh bypass ratio (UHBR) engines regarding the optimal design of nacelle geometries and locations. The result of the nacelle optimisation for a UHBR installation on the Common Research Model will be delivered in full compliance with the topic CfP09 CS2-LPA-01-67. Based on the present plan for the communication, dissemination and exploitation, the IVANHOE project results (including an improved design method, tools and facilities, etc.) will contribute to the European aviation industry for future aircraft projects. This will unlock the full potential of CO2 reduction of UHBR engines, while increase competitiveness by reducing costs for design and testing.

The communication plan is to identify target groups and define a communication policy for the project in conjunction with the necessary tools: promotional materials and website to serve information about the project activities and about the related field of research.

The dissemination is planned in consideration of objectives, identification of dissemination stakeholders, materials, and activities. The outlined materials are the project logo, flyers, the project website, and event representation materials, etc. The activities include workshops with the stakeholders, the use of internet resources, and publications in journals and conferences.

The planned exploitation gives a description of exploitable results, the identification of potential customers and policy makers, and the related activities. The plan outlines the use of the project results for commercial purposes and in the public policymaking.

1 Introduction

The IVANHOE project aims to resolve the new technical challenges commencing in UHBR engine installation in collaboration with the TM Rolls-Royce, aiming for UltraFan® propulsion systems. The project will advance the state of the art in nacelle design by smart use of various fidelity level aerodynamic modelling tools enabling fast iterations and down selection of nacelle geometries and locations. The methodology developed in the project will be validated using wind tunnel experiments with new and advanced wind tunnel models and measuring techniques.

At higher level, IVANHOE perfectly matches with the objectives of Clean Sky 2 (CS2) and ACARE Flightpath 2050. CS2 has the ambition to:

- accelerate the progress towards the ACARE SRIA goals for 2020-2050;
- enable a technological leap in the face of emerging competitors;
- justify the early replacement of aircraft that have yet to enter into service and accelerate the adoption of new technology into the global fleet.

IVANHOE will have a direct (drag reduction for nacelles) and an indirect (enabler for effective UHBR engine introduction) contribution towards the SRIA goals. By introduction of UHBR in conventional aircraft configurations (adoption of global fleet), and by further applications of the design technologies it contributes to more advanced integrated airframe/propulsion concepts. With similar CS2 projects on other multi-disciplinary design, it will lay the cornerstones for the required step changes in European aviation industry, providing economic benefits in addition to environmental protection.

The IVANHOE consortium and the TM have agreed to opt out Open Research Data for the data management. The management of intellectual property rights (IPR) is defined and agreed in the Grant Agreement and the Consortium Agreement.

The present plan is designated to maximize the project impacts during the project progressing course and after the project completion. The planned activities will be regularly measured and

reported in the periodic progress reports. The plan is put forward for the purpose of identifying stakeholders and making related strategies, materials and tools serving for these strategies, events, and activities, etc. The activities will activate the public awareness for the project outcomes. The knowledge and results, which are gained from the research and innovation actions (RIA) in the project, will be transferred to potential users. The results can then be effectively used by means of scientific, economic, political and societal exploitation routines that are planned for this project.

2 Communication Plan

2.1 Communication Objectives

The communication plan aims to ensure the promotion and the establishment of cooperation actions with other initiatives, including other H2020 framework projects, EU and international initiatives, etc. The objective is to optimize synergies between projects by providing inputs and receiving feedback from initiatives addressing activities of common interest. The communication will address the general impact dimension of the project in terms of public awareness, influence on national and regional research policies and research programme administration.

2.2 Target Groups and Activities in Communication

The communication activities are envisaged as the contributions to the CS2 communication channels, the annual LPA-ITD meeting, and publications and presentations in conferences and workshops. The activities are detailed below.

1. Contribution to the Clean Sky project website, possible newsletters and possible inputs to overall movie (e.g. in case of wind tunnel tests): the layout and structure of this website will be determined by the JU and ITD, the consortium will provide regular inputs upon request of the JU on the results (public) and dissemination activities, the objective being to ensure communication to stakeholders and wider public. As such, the dissemination and communication plan will be harmonized with the JU.

2. Contribution to the annual LPA-ITD meeting. On request by the LPA ITD coordinator the consortium will contribute to the annual review meeting (such called in CS2), conducted by the industrial lead partner. It will offer unique opportunities for dissemination towards the Clean Sky 2 leaders, core partners and partners.

3. Publications and participation in conferences/workshops. The additional dissemination activities will consist of ad-hoc participation to conferences, as it was jointly performed in past projects of the technology trajectory. Every communication and dissemination opportunity will be used to present the project achievements and its added value regarding the development of propulsion integration technology and aircraft design in general. This might also include communication in other industries and their associations such as IMG4, EREA, EASN and induce access to both national and international dissemination channels to increase the awareness of its potential impact. The partners will also participate to common workshops organized by the JU.

Each research partner (UNIPD, CTH, TUB, HIT) aims at 2 peer-reviewed journal publications (the total number is around 6, due to joint publications among the partners). In terms of International Conference publications, the consortium aims at 8-10 papers.

2.3 Communication tools

To serve for the identified target groups and the communication policy, the communication tools are promotional materials and a project website. The promotional materials are the project logo, flyers, the project website, and event representation materials and so on. The visual statements (the project logo, etc.) for the public communication, as well as the dissemination and exploitation, are referred to Required Visual Statements.

The project website is established by the coordinator CTH using the commercial project management tool Project-netboard. The corporate identities of the consortium partners and TM are included. The website is utilized to advertise information about project research and societal activities. The website link is

- https://projectnetboard.absiskey.com/website/ivanhoe

In addition, the brief descriptions of the project have been published

- On CORDIS managed by the EU Publications Office of the European Commission: https://cordis.europa.eu/project/id/863415
- On the respective partners' website for advertising research projects. Take CTH for example. A brief introduction is given in the webpage: https://www.chalmers.se/en/projects/Pages/Installed-adVAnced-Nacelle-uHbr-Optimisation-and-Evaluation.aspx

To facilitate and enhance the collaboration with the TM Rolls-Royce, the TM has created an online repository using ForumPass supplied by EXOSTAR. The project data and documents (reports, deliverables, presentations, and meeting minutes, etc.) are shared among the TM and the consortium partners on this repository.

3 Dissemination Plan

3.1 Dissemination Objectives

To maximize the project impact, the dissemination is designed to overcome various societal, economical and scientific challenges. As a part of the CS2 programme of Research and Innovation Actions (RIA), IVANHOE aims to develop publicly visible outcomes for the scientific community and, furthermore, to demonstrate the industrial applicability of the outcomes. The demonstrated concrete industrial applicability will contribute to enhanced powerplant technology for world-leading turbofan engines UltraFan®

The planned dissemination activities will form a major part of the technology development roadmaps of the industrial consortium members of the European aeronautics industries, in particular, the leaders of integrated technology demonstrator (ITD) and Innovative Aircraft Demonstration Platform (IADP). This ensures that the achievements and deliverables of the project will be used to the best possible effect in getting a successful development and industrial uptake of advanced maintenance process in general. As IVANHOE advances, the aim is to disseminate the achieved results to, in general, the European scientific community and, in particular, the European industry for all the layers of the supply/value chain. This dissemination will maximize the potential exploitation of the new technologies developed across Europe and will increase the competitiveness of the involved actors.

The collaboration developed among the TM and consortium partners will contribute to strengthening the creation of a network of multidisciplinary technology clusters, which fosters extensive collaborations among industry, universities and research institutes. Moreover, the collaboration will support the development of competences and qualified workforce across EU in various fields of engineering and technologies. For this purpose, IVANHOE will help in building the European Research Area, by encouraging the cooperation between research from different countries with European class industry. IVANHOE will also be an opportunity to encourage the mobility of young European engineers and researchers (Early Stage Researchers) inside Europe.

3.2 Dissemination Activities for Delivering Innovation to Market

The dissemination strategy is made to include actions: definition of a project website, logo and flyer, regular press releases through partner websites and/or relevant publishers, main target conferences and journals for scientific publications, and the organization of a workshop. The consortium has identified a set of dissemination actions, with specific stakeholders and a metric to measure the impact of the actions taken.

The dissemination activities are planned to reach all actors of the sector, via the dissemination action plan defined in Figure 1. The different channels envisaged by the partners are presented. This plan will be updated and harmonized in line with the ITD.

The planned dissemination will address different kinds of potential end-users. The activities and actors are listed in Table 1.

Table 1. Dissemination activities and main actors.

Activities	Actors	Audiences
Workshops offering European industries, such as manufacturers, network of sub-contractors, relevant SME	CTH	SAAB, GKN Aerospace, etc.
R&T centres offering the opportunity to become familiar with the IVANHOE developed technologies	CTH	VKI
	TUB	DLR
Universities with their engineering schools and institutes offering training in the frame of master's degrees or PhD, e.g. through the supervision of study projects, Master theses, and involvement of PhD students.	CTH, UNIPD, TUB	Master programs and PhD eductions in the actors' universities
Engineering training/introduction offered by means of open/guest lectures in undergraduate and graduate courses. For example, guest lectures for the courses in bachelor's degree programs, and project courses in master's degree programs.	CTH	Bachelor and master courses in the actor's university
General public, through the partner's websites)	All partners	Public
General public, through JU websites and e-news	CTH	Public and JU stakeholders
Participation in relevant trade fairs towards the end of the project (e.g., ILA, Le Bourget, Farnborough, Aerodays).	CTH	Public

The partners will participate via publications in international scientific journals, participation to International Scientific Congresses, contribution to the content of the JU website (E-news), and other activities in conjunction with the communication described in Section 2.2.

The visual statements (the project logo, etc.) used for the dissemination activities, as well as other communication and exploitation activities, are referred to Required Visual Statements.

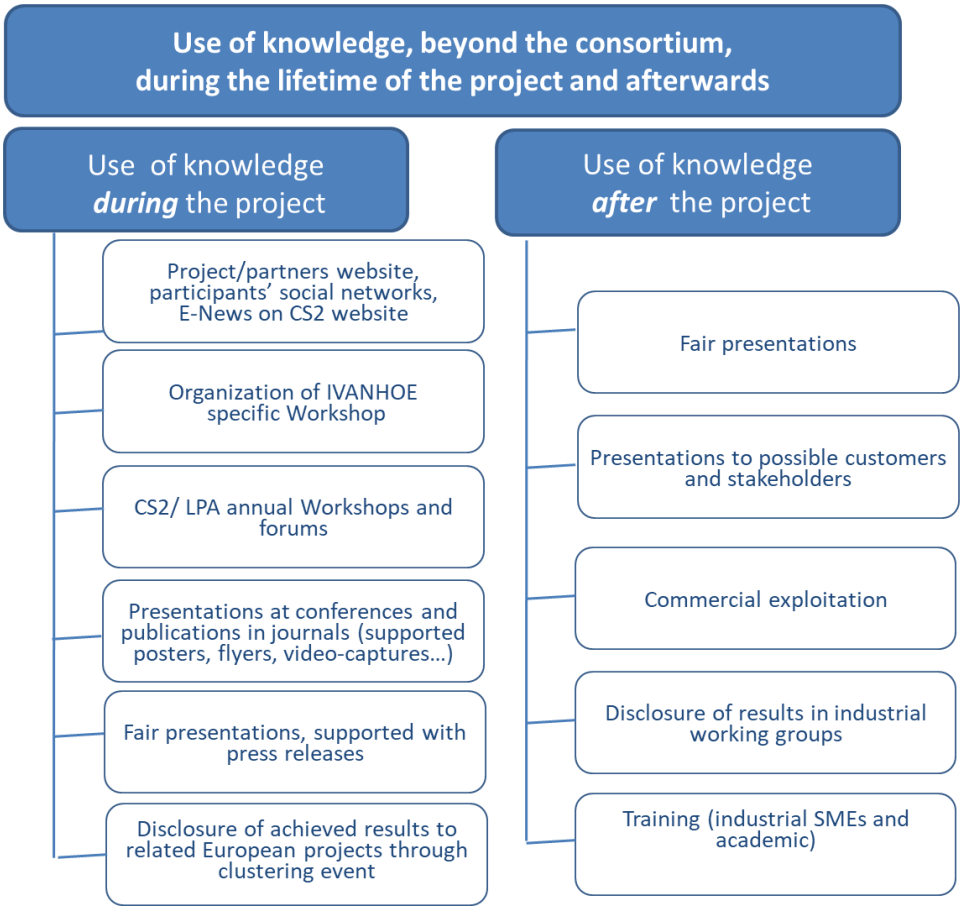

Figure 1. The dissemination action plan of the IVANHOE project.

3.3 Education and Promotion of Early-Stage Researchers

The IVANHOE project is devoted to promoting young researchers and engineers inside Europe. Moreover, the gender equality is cultivated in the project. The young researchers funded by the project are listed in Table 2.

Table 2. The young researchers financed by IVANHOE.

Name	Organization	Position	Job description
Josefin Andersson (female)	CTH	PhD student	Engine cycle design & computational fluid dynamics (CFD) for simulation of nacelle-installation aerodynamics
Xiaojian Li	CTH	PhD student	CFD for simulation of nacelle-installation aerodynamics
Omar Fares	CTH	Project assistant	CFD for simulation of nacelle-installation aerodynamics. Note, the position had been ended. Mr. Fares is working at Scania AB.
Xin Zhao	CTH	Researcher (permanent employment)	Engine cycle design, aircraft integration and CFD
Andrea Magrini	UNIPD	PhD student	Design and optimization of nacelle installation
Gokul Subbian	TUB		CFD for simulation of nacelle-installation aerodynamics

4 Exploitation Plan

4.1 Exploitation Objectives

The technologies enabled in IVANHOE will contribute to a major step forward for answering to market demands and gaining first-mover advantage in the global competition. The project will have a direct impact in maintaining the European competitiveness in the sector and favor economic growth within EU.

The demonstration and development of game-changing designs from IVANHOE will provide the possibility to sustain and even increase jobs (especially qualified workforce) not only for the TM, but also for of the supply chain, end users and operators, and other stakeholders. In addition, the development of competences across EU in various fields of engineering and technologies will be promoted.

The IVANHOE partners expect a significant increase in the innovation exploitation due to the development of new scientific and technological knowledge coming from the project. This will provide a subsequent improvement to market position and the knowledge,

technology and tools generated will allow for further project funding to the partners, both from industry and public funding, which in turn can lead to creation of new jobs.

4.2 Exploitation Actions

The consortium has identified the main project outcomes based on the innovations developed in the project. To exploit these outcomes, a set of activities are planned. The details of the outputs and the corresponding activities are detailed in Table 3, which is shown on Page 15.

The project results will reinforce the excellence in the research and development of the IVANHOE partners in projects, contracts and the training and education of researchers, engineers and technicians. Moreover, the collaboration among the partners offers the opportunity to establish a fruitful partnership that can be exploited in the future, after the project conclusion.

The IVANHOE partners are research organizations or private entities, with their own business/industrial or development objectives and specialization focus. All partners will exploit the project results according to these given factors and standard joint ownership regulations set in the Grant Agreement for Partners (GAP), the Consortium Agreement (CA) and the Implementation Agreement (IA) signed with the ITD. It is anticipated that the IVANHOE partners will generate 2 patents: one for innovative nacelle shapes, and the other for new solutions to realise experimental UHBR® simulators.

Table 3. The expected main project outcomes and the planned actions for the industrial exploitation.

Main outcomes	Actors	Planned actions	Further R&D work and applications enabled by project results
Potential patent regarding nacelle shape, and another one for new solutions to realise experimental UHBR simulators	all	Verification of the grounds for novelty claims after successful project completion *Estimated investment for each patent: around 30 kEuros for a European patent implementation and acceptance*	**Applications**: Engine/airframe integration of UHBR engines. **End-users**: Engine and aircraft manufacturers, like Airbus, Rolls-Royce, Safran, etc. **Estimated market impact for each patent**: 10% increased turnaround thanks to the patent exploitation, either direct or indirect.
CRM configuration within Europe	all	Service development for other projects, further international and national collaborative research	**Applications**: wind-tunnel benchmark measurement **End-users**: Universities, tool developers, engine and aircraft manufacturers,
Implementation of an innovative multi-point, multi-objective, multi-constrained optimization procedure for advanced UHBR nacelles shape AND installation position	HIT	Product development towards introduction of the tool at an industrial level, Service development for other projects *Estimated investment: small*	**Applications**: Analysis, simulation and design optimization of innovative engine/airframe integration **End-users**: Engine and aircraft manufacturers, like Airbus, Rolls-Royce, Safran, etc., aeronautical systems and equipment manufacturers. **Estimated market impact**: 5% increased turnaround thanks to introduction of new optimization technology.
Trusting numerical analysis of complex integrated design solutions by advanced CFD-methods	TUB, CTH, HIT	Develop best practices in CFD processes. *Estimated investment: small*	**Applications**: Simulation-based analysis of flow phenomena not yet accessible by experiments. **End-users**: Engine and aircraft manufacturers, like Airbus, Rolls-Royce, Safran, etc., aeronautical systems and equipment manufacturers. **Estimated market impact**: 2% cost reduction in product development thanks to improved and shortened processes.
Quantified data on improved	HIT, TUB,	Further experimental testing and CFD	**Applications**: Database for supporting industrial decision making on

propulsion efficiency and take-off thrust of UHBR concept	CTH	analysis with higher fidelity	large scale demonstration **End-users**: Engine and aircraft manufacturers. **Estimated market impact:** 3% increased product value
Quantified data on improved propulsion efficiency and take-off thrust of UHBR concept	TUB	Estimation of further improved propulsion efficiency and take-off thrust by passive and active means of flow control at inlet *Estimated investment: small*	**Applications**: Simulation-based quantification of potentials for further reductions of inlet/nacelle length by flow control. **End-users**: Engine and aircraft manufacturers, like Airbus, Rolls-Royce, Safran, etc., aeronautical systems and equipment manufacturers. **Estimated market impact**: 0.5-1% fuel burn reduction for integrated Ultrafan nacelles.
Industrialisation of novel measurement techniques in wind tunnel experiments	DNW	Service development for other projects	**Applications**: Other wind tunnel tests **End-users**: Wind tunnel companies **Estimated market impact:** 10% increased revenues
Improved thrust bookkeeping and testing approach	DNW	Service development for other projects	**Applications**: Other wind tunnel tests **End-users**: Wind tunnel companies **Estimated market impact**: 20% increased revenues
Experimental aerodynamic and aero-acoustic dataset of flow field in vicinity of powered UHBR nacelle and wing (increased knowledge, know-how)	DNW	Further internal or collaborative research	**Applications**: Validation dataset for design tool development **End-users**: Universities, tool developers, engine and aircraft manufacturers.
Advanced engine design and improved thrust bookkeeping used for engine design	CTH	Further internal or collaborative research	**Applications**: Engine design, simulation, optimization, tests **End-users**: Engine manufactures
Implementation of Reduced Order Models for integrated fan+nacelle performance assessment in UHBR engines (increased knowledge, know-how)	UNIPD	Further internal research for increased knowledge of phenomena	**Applications**: Analysis, simulation and performance assessment of fan+intake behaviour within UHBR engines **End-users**: Engine and aircraft manufacturers, like Airbus, Rolls-Royce, Safran, etc., aeronautical systems and equipment

		Estimated investment: small	manufacturers. **Estimated market impact**: 2% cost reduction in product development thanks to improved and shortened processes.
Experience with design and manufacture of a large variable wind tunnel model, in which different Nacelle geometries on different positions easily can be tested, minimizing tunnel time and therefore optimizing clients' costs.	DEHARDE	Product development for other customers *Estimated investment:* none	**Applications**: The gained experience with design of complex models, needing unconventional design for variations, can be exploited for other customers. **End-users**: RR, Other future (large) wind tunnel models for aircraft OEMs

5 Reporting and data access

5.1 Reporting process

In the activities of communication, dissemination and exploitation, the project results are advertised by means of deliverables, reports, presentations, flyers, posters, and publications in journals/conferences, etc. Prior to advertising the materials documenting the results, these materials will be first reviewed by the work package leaders (WPL), the coordinator, and the TM. For this purpose, the project partners have made a technical review process. The process is illustrated in Figure 2.

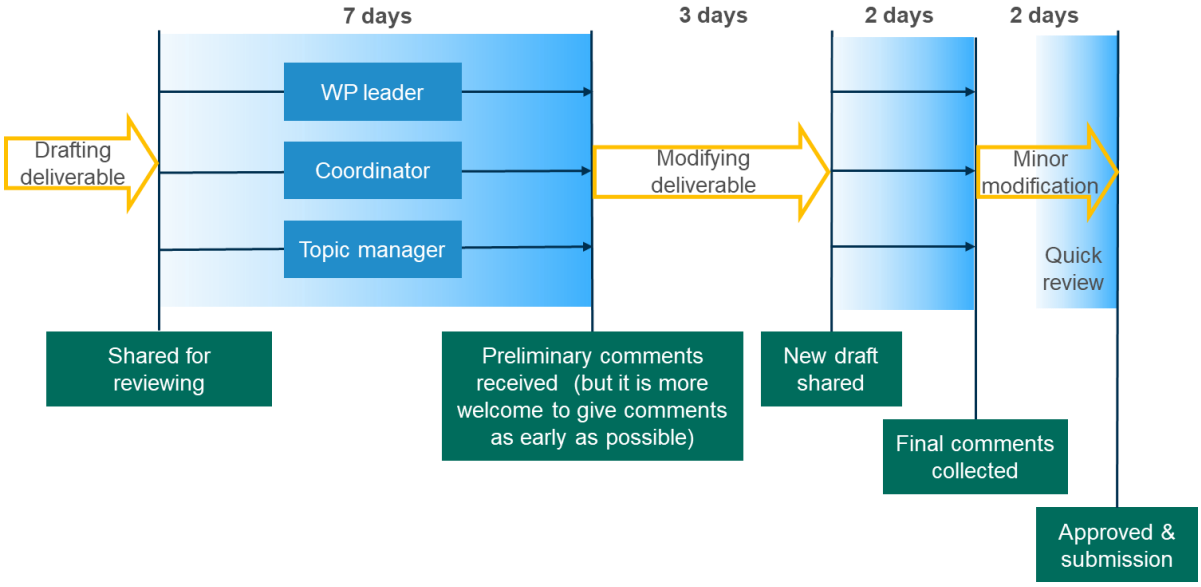

Figure 2. The technical review process for the communication, dissemination and exploitation.

5.2 Data Access and Project Repositories

To provide easy data access, a central database will be constructed and maintained. This will be accessible via the internet and will have private or open access areas. The simulation and measurement data generated by the project will be stored in the online repositories set up by the TM and the coordinator.

The default position is that the IVANHOE data will be placed on the common consortium access area of the database, unless a partner has a specific need for confidentiality in respect of commercially sensitive data. The data ownership and IPR have been addressed in the CA.

The coordinator will host and maintain the database on an existing infrastructure. At the end of the project, the entire data base will remain available on its site for 3 years. Additionally, the research data generated during the project will be archived in one volume. Each partner will obtain an identical copy.

The infrastructure for storing the database is listed below.

- An SFTP server set up by CTH: ivanhoe.m2.chalmers.se
- A secure repository set up by Rolls-Royce: ForumPass supplied by EXOSTAR.
- A commercial project management tool set up by CTH: Project-netboard supplied by Absiskey.

5.3 Expected Project Data

The possible data produced from the project has been identified. The data are listed in Table 4.

Table 4. The identified project data that are expected to produce.

Data collected/ generated during the project: brief description	Standards used	Partner(s)	Means of exploitation and/or share/access for verification and re-use	How will this data be curated and preserved?
Methodology for aerodynamic simulations on UHBR nacelles/wing integration, and simulation data validated against wind tunnel data	Text files, Excel files, input&output files of ANSYS Fluent and TAU solvers	HIT09, CTH, TUB	project repository, Confidential Access, restricted to partners and TM	Data volumes preserved at CTH and TM premises, project repository
Methodology for multi-point, multi-objective design optimization of UHBR installed nacelles validated against wind tunnel data	Compiled code in C++	UNIPD, HIT09, CTH	project repository, Confidential Access, restricted to partners and TM	Data volumes preserved at CTH and TM premises, project repository
Procedures for 3D nacelle parameterization (internal and external cowls, including intake and exhaust)	Routines in C++, Text files	HIT09, CTH	project repository, Confidential Access, restricted to partners and TM	Data volumes preserved at CTH and TM premises, project repository
Experimental aerodynamic and aero-acoustic dataset of flow field in vicinity of powered UHBR nacelle and wing	ASCII data files	DNW	project repository, Confidential Access, restricted to partners and TM	Data volumes preserved at DNW, CTH and TM premises, project repository
Methodology for rapid modelling of fan performance assessment within UHBR installed nacelles	Text files, Excel files, input & output files of ANSYS Fluent solver	UNIPD	project repository, Confidential Access, restricted to partners and TM	Data volumes preserved at UNIPD, CTH and TM premises, project repository

6 Project Webpages

The project information (news, events, and activities, etc.) will be released on the webpage set up by the coordinator. In addition, a brief description of the project had been published on CORDIS.

- The project webpage: https://projectnetboard.absiskey.com/website/ivanhoe
- The project introduction published on CORDIS: https://cordis.europa.eu/project/id/863415

7 Required Visual Statements

7.1 Text for Acknowledgement in Publications

This study is financed by the Clean Sky 2 project IVANHOE (Installed adVAnced Nacelle uHbr Optimisation and Evaluation). The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement number 863415.

7.2 Project Logo

7.3 Clean Sky 2 JU Logo

7.4 EU Emblem

8 Register of Project Activities

8.1 Communication activities

Table 5. List of communication activities.

No.	Type of activity	Main leader	Title/Subject	Date/Period	Place	Type of audience	Size of Audience	Countries addressed
1								
2								
3								
4								
5								
6								
7								
8								
9								

8.3 Scientific (peer reviewed) publications and technical papers

Table 6. List of scientific (peer reviewed) publications and technical papers.

No.	Publication	Open access*
1	Reference in **the APA format**	**Yes / No / N/A**
2		
3		
4		
5		
6		
7		
8		
9		

* Open Access is defined as free of charge access for anyone via Internet. Please answer “yes” if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

8.4 Conferences and other dissemination activities

Table 7. List of conferences and other dissemination activities.

No.	Type of activity	Main leader	Title/Subject	Date/Period	Place	Type of audience	Size of Audience	Countries addressed
1								
2								
3								
4								
5								
6								
7								
8								
9								

8.5 Patents and trademarks, etc.

Table 8. List of applications for patents, trademarks, registered designs, etc.

No.	Type of right*	Confidential	Foreseen embargo date	Application reference(s)	Title/subject	Applicant(s) (as on the application)
1		Yes/No	Dd/mm/yy	e.g., EP123456		
2						
3						
4						
5						
6						
7						
8						
9						

* Choose the type of IP rights: Patents, Trademarks, Registered Designs.

8.6 Exploitable foreground

Table 9. List of exploitable foreground.

No.	Type*	Nature*a	Description	Confidential	Foreseen embargo date	Sectors of application$	Timetable, commercial or any other use	Patents or other IPR exploitation (license)	Owner & other beneficiary(s) involved
1				Yes/No	Dd/mm/yy				
2									
3									
4									
5									

For each record in the above table is possible to further explain the exploitable foreground, in particular by addressing the following points:

a. Purpose of exploitable foreground
b. Achieved TRL at the end of period (where applicable)
c. How the foreground might be exploited, when and by whom
d. IPR exploitable measures taken so far or intended
e. Business case aspects considered (i.e. market study, opportunities, …)
f. Further research necessary, if any
g. Potential/expected impact (quantify where possible)
h. Role of ITD members towards potential commercialization of results
i. Relation to technical standards, EU/international regulations, directives

* Choose type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

*a Choose nature of foreground: Product innovation, Process innovation, New method, Scientific breakthrough.

$ Choose the type sector (NACE nomenclature): https://ec.europa.eu/competition/mergers/cases/index/nace_all.html