TANK HYDROGEN AUTOMOTIVE

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Deliverable D1.4 Data Management Plan

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P8 - POLARIX	Input

Document Abstract

This report is describing the data management life cycle for the data to be collected, processed and/or generated by TAHYA project to comply with "Open access to scientific publications" policy in H2020 project.

The data management plan (DMP) will include:

- the definition of the research data that will be shared/made open access taking into account IPR, commercial and security issues
- the definition of the repository to handle the research data during and after the end of the project
- the methodology and standards which will be used to curate and preserve (including after the end of the project) the data collected, processed and/or generated. If needed the DMP will be updated before final review of the project.

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1. INTRODUCTION

TAHYA is part of the Horizon 2020 Open Research Data Pilot, the Pilot project of the European Commission which aims to improve and maximize access to and reuse of research data generated by projects. The focus of the Pilot is on encouraging good data management as an essential element of research best practice.

The Deliverable D8.6 Data Management Plan (DMP), represents the first version of the DMP of the TAHYA project. TAHYA is a Research and Innovation Action project funded under the Fuel Cells and Hydrogen 2 Joint Undertaking that will last 36 months. As such, TAHYA participates in ORD Pilot, and, therefore, is providing, as requested, the current deliverable six months after the beginning of the project (M6, June 2018).

The DMP is not a fixed document, but it is likely to evolve during the whole lifespan of the project, serving as a working document. This document will be updated as needed during the Project General Assemblies.

The purpose of the current deliverable is to present the 1st version Data Management Plan of the TAHYA project. The deliverable has been compiled with the collaborative work among the coordinator and the consortium partners who were involved in data collection, production and processing. It includes detailed descriptions of all datasets that will be collected, processed or generated in all Work Packages during the course of the 36 months of TAHYA project. The deliverable is submitted six months after project start as required by the European Commission (EC) through the latest guidelines: The Open Research Data Pilot (ORD Pilot). For the methodological part, the latest EC guidelines[1] have been adopted for the current deliverable.

The deliverable is structured in the following sections:

1. An introduction to the deliverable and a brief description on how Data Management is approached in Horizon 2020 (H2020) program along with the importance of it.
2. A description of the methodology used, an analysis of the chapters of the provided template and last the methodological steps followed in TAHYA.
3. A description of the datasets to be used in TAHYA reflected on the template provided by the EC.
4. A summary table with all the datasets included in 1st TAHYA DMP.

[1] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf

2. DATA MANAGEMENT IN H2020 PROGRAM

According to the latest Guidelines on FAIR Data Management in Horizon 2020 released by the EC Directorate-General for Research & Innovation on the 26th of July 2016 "*beneficiaries must make their research data findable, accessible, interoperable and reusable (FAIR) ensuring it is soundly managed*".

FAIR data management is part of the ORD Pilot promoted by the European Commission. The purpose of the ORD is to improve and maximize access to and re-use of research data generated by H2020 projects and to take into account the need to balance openness and protection of scientific information, commercialization and Intellectual Property Rights (IPR), privacy concerns, security, as well as data management and preservation issues.

The inclusion of a DMP is a key element for FAIR data management in a H2020 project. In a DMP, the data management life cycle for the data to be collected, processed and/or generated by a H2020 project is described and analysed. The DMP should also include information on (a) the handling of research data during & after the end of the project, (b) what data will be collected, processed and/or generated, (c) which methodology & standards will be applied, (d) whether data will be shared/made open access and (e) how data will be curated & preserved (including after the end of the project).

3. METHODOLOGY

a. DMP Template

In order to assist the beneficiaries with the completion of the DMP, the EC produced and provided a template that act as a basis for data description. The template contains a set of questions that beneficiaries should answer with a level of detail appropriate to the project. If no related information is available for a given dataset, then the phrase "*Non-applicable*" or N/A will be used. In the following paragraphs, the main sections and proposed contents of the template are listed and presented, along with the way TAHYA reflects to these sections.

b. Data summary

In this section, beneficiaries are asked to describe (a) the purpose of the data collection or generation and how this purpose reflects to the objectives set in the project as a whole, (b) the types and formats of data that will be generated or collected, (c) the origin of the data, (d) the expected size of the data, and also (e) whether existing data will be reused and (f) the usefulness of the described datasets.

c. FAIR data

a) Making data findable, including provisions for metadata

This section includes a description of metadata and related standards, the naming and keywords to be used. In the context of TAHYA the following naming convention will be used for all the datasets of the project. First the work package number will be placed, then the serial number of the dataset within this work package and last the dataset title, all separated with underscore (Data_<WPno>_<serial number of dataset>_<dataset title>).

An example can be the following Data_WP2_1_specifications_data.

However, it has to be noted that this naming convention describes only the general dataset that can contain files of different size and format. The naming of each separate file follows a different naming convention that is proposed by the partners who creates the files.

The use of a standard identification mechanism in for the datasets of TAHYA will be decided by the project consortium. If it turns out to be necessary, the use of the Guidelines and standards provided by the International DOI Foundation (IDF) and the DOI system and ISO 26324[2] will be considered.

b) Making data openly accessible

This section includes a description of the data that will be made accessible and how. It also explains why some datasets cannot be made open due to possible, legal, contractual or ethical issues. It is possible that some beneficiaries have decided to keep their data closed. A description of the potential data repositories is also included along with the potential software tools required to access the data.

In the context of TAHYA, the following options for open repositories of data, metadata, documentation or code will be considered: (a) The Registry of Research Data Repositories[3], (b) Zenodo[4], (c) OpenAIRE[5],

In the context of the TAHYA DMP, not any arrangements have been made with an identified repository. This will be discussed by the consortium during the upcoming plenary meeting. Currently the data are collected and preserved on a private platform: Project Netboard[6].

c) Making data interoperable

In this section, data interoperability is detailed for every dataset of TAHYA. Issues such as the allowing of data exchange between researchers, institutions or even countries are covered along with all the technicalities including standards for formats, metadata vocabularies or ontologies of vocabularies.

The issue of interoperability will be discussed among the consortium members in the upcoming project plenary meeting.

d) Increase data re-use (through clarifying licenses)

This section describes the licenses, if any, under which data will be re-used in TAHYA. It includes provisions regarding the period when data will be available for reuse and if third parties will have the option to use the data and when.

e) Allocation of resources

FAIR data management in TAHYA project is under WP9 –Dissemination and Exploitation strategy lead by Partner N°6 Absiskey, in close collaboration with the Coordinator. Within the project budget, a specific amount of person months has been dedicated for these activities. All costs related to FAIR data management that will occur during project implementation will be covered by the project budget. Any other cost that may relate to long term data preservation will be discussed among consortium members.

[2] https://www.doi.org
[3] http://www.re3data.org/
[4] https://zenodo.org/
[5] https://www.openaire.eu/
[6] http://www.projectnetboard.com/

f) Data security

Data security is of major importance in the TAHYA project. Special attention will be given to the security of sensitive data. The protection of data will be ensured through procedures and appropriate technologies, on Project NetBoard like the use of HTTPS protocol for the encryption of all internet transactions and appropriate European and Internet security standards from ISO, ITU, W3C, IETF and ETSI. If data will be kept in a certified repository, then the security standards of that repository will apply.

g) Ethical aspects

With respect to the H2020 ethics self-assessment, the TAHYA proposal and the use case scenarios to be defined will not be concerned with any ethical issue.

h) Other issues

In this section, other issues can be covered not included above such as the use of other national/funder/sectorial/departmental procedures for data management.

d. Methodological steps in TAHYA

For the 1st version of TAHYA DMP, the following methodological steps were followed:

1. Absiskey and the Coordinator, responsible for the implementation WP9 – Dissemination and Exploitation strategy - sent to all partners, well in advance, an email notifying them about the upcoming deliverable. Contribution was asked from all partners that were involved in any data collection in each task of the WPs. They were asked to answer a questionnaire on which data they were expecting to produce and collect during the project.
2. In parallel, the latest guidelines from the EC regarding data management were sent to all partners to be informed. Sufficient time was given to send their input.
3. The project team collaborated efficiently and contributed with the needed information.

The first version of the TAHYA DMP is intended to provide an initial screening of the data to be collected, processed and produced within TAHYA. It is also the first attempt to collect the vision and input from all the partners involved in any data management option. During the upcoming Project Steering Boards in October 2018 special attention will be given to data management in order to provide further clarifications and conclusions on data management.

4. DATASETS

a. WP1 – Project Decision making and innovation management

N/A

b. WP2 – End-users' specifications, product, safety & service definition

N/A
Specifications are highly confidential results which cannot be share and held by VW.

c. WP3 – Design and Prototyping

Design and developments for liner, composite and OTV are highly confidential results which cannot be share to the scientific community and held by industrial partners (Optimum, Raigi and Anleg).
Only one task in this WP could lead to the open access to data: Task 3.5 optimisation and filling and venting process.

DMP component	**WP3_1_Simulation assumptions_data**
1. Data summary	**Purpose:** Simulation data **Data formats**: *.xlsx, *.docx, *.pdf, *.pptx **Will you re-use any existing data and how?** - yes **What is the origin of the data?** - simulation, - experimental protocols, measurement conditions **What is the expected size of the data?** - The total file of this dataset will be approximately 0,2 Gb. **To whom might it be useful ('data utility')?** - scientific community
2. FAIR Data	Findable, Accessible, Interoperable, Re-usable
2.1 Making data findable, including provisions for metadata	Description of the data: - WP3_1_Simulation assumptions_data
2.2 Making data openly accessible	- assumption data on gas and Temperature distribution to members of a consortium on project, members of an international scientific community for research purposes. The data will be stored on Project Netboard a secure platform and TUC servers.

2.3 Making data interoperable	- the data produced in the project are interoperable, that is allowing data exchange and re-use between researchers, institutions, organisations
2.4. Increase data re-use (through clarifying licences)	Specify the licenses and the conditions for sharing and reusing the data: - No specific conditions
3. Allocation ofresources	All costs related to the data collection and processing are covered by the project budget with dedicated person months under WP9.
4. Data security	Audio, doc and xls files will be deposited in ABSISKEY servers and will be protected with the ABSISKEY server's security protocol: PNB security is provided by OVH. OVH is currently the number 3 web hosting provider worldwide. OVH condition of security: https://www.ovh.co.uk/aboutus/security.xml and https://www.ovh.co.uk/aboutus/datacentres.xml In addition to this security, a complete database backup is performed each day and stored during one week. Each week a secured backup is stored on CD. Finally, every connection to Project NetBoard is made using the https protocol to login to the platform.
5. Ethical aspects	There are no ethical issues regarding the project.
6. Other	N/A

d. WP4 – Design verification phase

To be defined later on in the project according to IP management of development realised in WP3.

e. WP5 – System validation phase and safety aspects

DMP component	**WP5_1_performance results_data**
1. Data summary	**Purpose:** Results of the hydraulic performance and fire resistance tests. **Data formats**: *.xlsx , *.docx, *.pdf , *.pptx, *.mp4, *.asc , *.opj **Will you re-use any existing data and how?** - N/A **What is the origin of the data?** - Experimental measurement data recorded with universal measurement amplifiers **What is the expected size of the data?** - The total size of all data will be approx. less than 2 Gb. **To whom might it be useful ('data utility')?**

	- Project partners, scientific community, notified bodies, competent authority
2. FAIR Data	Findable, Accessible, Interoperable, Re-usable
2.1 Making data findable, including provisions for metadata	Description of the data: - The following naming for the dataset will be WP5_1_BAM_performance results_data
2.2 Making data openly accessible	- mainly results of normalised data needed for publications (national/international scientific community and standards committee) - raw measurement data only to members of the consortium - Shared documents/data uploaded to Project Netboard All Data will be stored on company internal shared directory with limited number of users
2.3 Making data interoperable	All published data are generated with common programs and stored within common file formats and therefore they are interoperable and can be re-use between researchers, institutions, companies etc.
2.4. Increase data re-use (through clarifying licences)	Specify the licenses and the conditions for sharing and reusing the data: - Creative Commons: (CC BY-ND 3.0 DE or CC BY-NC-ND 3.0 DE) https://creativecommons.org/
3. Allocation of resources	All costs related to the data collection and processing are covered by the project budget with dedicated person months under WP9.
4. Data security	Files will be deposited in ABSISKEY servers and will be protected with the ABSISKEY server's security protocol: PNB security is provided by OVH. OVH is currently the number 3 web hosting provider worldwide. OVH condition of security: https://www.ovh.co.uk/aboutus/security.xml and https://www.ovh.co.uk/aboutus/datacentres.xml In addition to this security, a complete database backup is performed each day and stored during one week. Each week a secured backup is stored on CD. Finally, every connection to Project NetBoard is made using the https protocol to login to the platform.
5. Ethical aspects	There are no ethical issues regarding the project.
6. Other	N/A

f. WP6 – Manufacturing process

N/A according to IP definition and management.

g. WP7 – Economical aspects and implementation strategy

N/A
This topic and associated results are highly confidential and cannot be shared by industrial partners.

h. WP8 – RCS standardisation work

DMP component	WP8_1_safety levels composite cylinders_data
1. Data summary	**Purpose:** Identify and improve existing safety level of composite cylinders and standards. **Data formats**: *.xlsx, *.docx, *.pdf, *.pptx **Will you re-use any existing data and how?** - N/A **What is the origin of the data?** - Experimental test results **What is the expected size of the data?** - The total size of all data will be approx. less than 0,2 Gb. **To whom might it be useful ('data utility')?** - Project partners, scientific community, notified bodies, competent authority
2. FAIR Data	Findable, Accessible, Interoperable, Re-usable
2.1 Making data findable, including provisions for metadata	Description of the data: - The following naming for the dataset will be WP8_1_BAM_safety levels composite cylinders_data
2.2 Making data openly accessible	- mainly results of normalised data needed for publications (national/international scientific community and standards committee) - Shared documents/data uploaded to Project Netboard All Data will be stored on company internal shared directory with limited number of users
2.3 Making data interoperable	All published data are generated with common programs and stored within common file formats and therefore they are interoperable and can be re-use between researchers, institutions, companies etc.
2.4. Increase data re-use (through clarifying licences)	Specify the licenses and the conditions for sharing and reusing the data: - Creative Commons: (CC BY-ND 3.0 DE or CC BY-NC-ND 3.0 DE) https://creativecommons.org/

3. Allocation of resources	All costs related to the data collection and processing are covered by the project budget with dedicated person months under WP9.
4. Data security	Audio, doc and xls files will be deposited in ABSISKEY servers and will be protected with the ABSISKEY server's security protocol: PNB security is provided by OVH. OVH is currently the number 3 web hosting provider worldwide. OVH condition of security: https://www.ovh.co.uk/aboutus/security.xml and https://www.ovh.co.uk/aboutus/datacentres.xml In addition to this security, a complete database backup is performed each day and stored during one week. Each week a secured backup is stored on CD. Finally, every connection to Project NetBoard is made using the https protocol to login to the platform.
5. Ethical aspects	There are no ethical issues regarding the project.
6. Other	N/A

i. WP9 – Dissemination and exploitation strategy

NA

5. SUMMARY TABLE

WP / Task	Responsible partner	Dataset name	File types	Findable	Accessible	Interoperable	Reusable	Size	Security	Ethics
WP3 T3.5	TUC	WP3_1_Simulation assumptions_data	*.xlsx, *.docx, *.pdf, *.pptx	WP3_1_Simulation assumptions_data	Results published (papers, presentation etc.) - depository: project netboard	Yes	Yes	<0,2 GB	Kept in AK /TUC servers	N/A
WP8 / T08.01, T08.02, T08.03.	BAM	WP8_1_safety levels composite cylinders_data	*.xlsx, *.docx, *.pdf, *.pptx	WP8_1_BAM_safety levels composite cylinders_data	- Results published (papers, presentation etc.) - depository: project netboard and company internal	Yes	License publications CC BY-ND 3.0 DE or CC BY-NC-ND 3.0 DE	<0,2 GB	Kept in AK /BAM servers	N/A

6. ANNEX 1: QUESTIONNAIRE SENT TO THE PARTNERS:

Task No	Task Title	Lead Participant Short Name	Describe the generated Data	File types Examples of type of format: *.xlsx , *.mp3,*.doc,*.pdf, Jpeg, Audio	Openly accessible: Yes No NA
T2.1	Product definition and industrial requirements	VW	Product definition		NA
T2.2	Economic specifications	OPTIMUM	Economic specifications		NA
T3.1	Cylinder	OPTIMUM	Additional know how on cylinder		NA
T3.2	Liner	RAIGI	Additional know how on liner and materials		NA
T3.3	OTV	ANLEG	New OTV		NA
T3.4	System design	ANLEG	New system design		NA
T3.5	Optimization of filling and venting process	TUC	1. Gas flow simulation models 2. Simulation assumptions, scenarios, boundary conditions 3. Filling/emptying simulation progress report	1. Code, text files 2. Pdf 3. Pdf/docx	1. No 2. Yes 3. No
T4.1	Design verification of the system components	TUC	1. Verification plan 2. Verification results 3. Verification report – system	1. Pdf/docx 2. various 3. Pdf/docx	1. No 2. No 3. No
T4.2	Gas and temperature distribution	TUC	1. Test rig design 2. Measurement protocols 3. Measurement results/data 4. Verification report – gas and temperature distribution	1. Pdf/ptc design files 2. Labview/dspace 3. Excel/pdf 4. Pdf/docx	1. no 2. tbd 3. no 4. no
T4.3	Simplified numerical vessel filling simulation	TUC	1. Simplified simulation tool 2. Tool documentation	1. Matlab/Simulink model files (.m, .slx) 2. pdf	tbd tbd
T5.1	System integration at user level	ANLEG	Integration process		NA
T5.2	End to end trials and demonstrations	ANLEG	Demo, qualification, validation of the system		NA

T5.3	Proof of performance requirements for current and proposed RCS	BAM	Measurement data	*.xlsx , *.docx, *.pdf , *.pptx, *.mp4, *.asc , *.opj	No
T5.4	Structural Health Monitoring (SHM) for thermoplastic FRP	TUC	Integration of SHM process		No
T6.1	Description of enabling technology in details	TUC	1. Analysis and description of related technologies 2. State of the art	1. pdf/docx 2. pdf/docx	NA
T6.2	Design and construction of changes at existing units and devices	TUC	1. Detection of necessary changes 2. Generation of concepts (sketches, drawings …) 3. Development new motion concept and drive system for orbital winding of CPV 4. Design implementation	Pdf/docx Pptx Stp .sldprt .sldasm .slddrw .prt .asm .	NA
T6.3	Implementation and installation of a labor-device and preliminary tests	TUC	1. Test design of the labor device and motion control 2. Preliminary tests 3. Validition of the test	1. Pdf/docx; Pptx; Stp; .sldprt; .sldasm; .slddrw; .prt; .asm 2. Doc, jpeg, dxf, xls 3. Doc; jpeg, xls	No
T6.4	Characterization of the material processed by the new method and optimization of the process	TUC	1. Characterisation of the product properties 2. Optimization of the processing 3. Optimization of the processing and the layer structure 4. Presentation of the main results	Pdf/docx; Pptx; Stp; .sldprt; .sldasm; .slddrw; .prt; .asm;	NA
T6.5	Apply the deliverables to the new CPV	TUC	New CoW machine		NA
T7.1	Cost assessment of state-of-the art COPV serial production lines	POLARIX	Cost analysis		NA
T7.2	Assessment of COPV alternative production technologies	POLARIX	Cost analysis		NA

T7.3	Cost assessment of BOP components and system requirements of a complete on-board fuel storage system	POLARIX	Cost analysis		NA
T7.4	Overall fuel storage system cost assessment and future perspectives	POLARIX	Cost analysis		NA
T8.1	Methods for comparison and safety assessment of regulation requirements	BAM	Report & Presentation	*.xlsx, *.docx, *.pdf, *.pptx	Yes
T8.2	Analysis of regulation requirements	BAM	Report & Presentation	*.xlsx, *.docx, *.pdf, *.pptx	Yes
T8.3	Potential improvement of regulations requirements	BAM	Report & Presentation	*.xlsx, *.docx, *.pdf, *.pptx	Yes
T9.1	Dissemination activities	AK	NA		NA
T9.2	Exploitation strategy	AK	NA		NA