Customised membranes for green and resilient industries

Data Management Plan

Deliverable D8.1

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CUMERI

DELIVERABLE REPORT

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Nature of the Deliverable		
R	Document, report (excluding the periodic and final reports)	
DEM	Demonstrator, pilot, prototype, plan designs	
DEC	Websites, patents filing, press & media actions, videos, etc	
DATA	Data sets, microdata, etc.	
DMP	Data management plan	X
ETHICS	Deliverables related to ethics issues.	
SECURITY	Deliverables related to security issues	
OTHER	Software, technical diagram, algorithms, models etc.	

Dissemination level		
PU	Public, fully open, e.g. web (Deliverables flagged as public will be automatically published in CORDIS project's page)	X
SEN	Sensitive, limited under the conditions of the Grant Agreement	
Classified R-UE	EU RESTRICTED under the Commission Decision No2015/444	
Classified C-UE	EU CONFIDENTIAL under the Commission Decision No2015/444	
Classified S-UE	EU SECRET under the Commission Decision No2015/444	

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TABLE OF CONTENTS

LIST OF PARTNERS

N°	Name	Short name	Country
1	VLAAMSE INSTELLING VOOR TECHNOLOGISCH ONDERZOEK N.V.	VITO	Belgium
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3	FUNDACION TECNALIA RESEARCH & INNOVATION	TEC	Spain
4	UNIVERSITEIT MAASTRICHT	UM	Netherlands
5	ISTANBUL TEKNIK UNIVERSITESI	MEMT	Turkey
6	SINTEF AS	SINTEF	Norway
7	OSILUB	OSIL	France
8	EREGLI DEMIR VE CELIK FABRIKALARI TURK AS	ERDE	Turkey
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12	B4PLASTICS	B4P	Belgium
13	A-MEMBRANES	AMEM	Belgium
14	MEMSIS CEVRE TEKNOLOJILERI ARASTIRMA VE GELISTIRME LIMITED SIRKETI	MEMS	Turkey
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PROJECT SUMMARY

This report is part of the deliverables from the project "CUMERI" which has received funding from the European Union's Horizon Europe research and innovation program under grant agreement No. 101091812.

Increased energy and resource efficiency in industrial sectors is paramount to build a resilient and sustainable future. In this context, the CUMERI project will develop and demonstrate at TRL7 **advanced and customised membrane separation systems in two key industries**: in the steel sector where H_2 will be recovered and CO_2 captured in one comprehensive system, and in the O&G industry where a multi-step liquid filtration system will enable base oil and additives recovery from used lubricant oil. To reach these goals, CUMERI gathers 16 partners (7 RTOs and 9 companies including 4 SMEs) and will elaborate in 36 months three impactful membrane technologies: 1) Enhanced bio-based and recyclable polymer membranes for CO_2 permeation; 2) Stable and selective SiC/SiCN membranes for H_2 recovery, for a better H_2 valorisation in the steel sector; 3) Grafted porous ceramic membranes for waste oil purification and additives recovery. All membrane systems will unlock greater energy efficiency and decreased emissions in their respective sectors. High separation performances together with increased chemical, mechanical and thermal stability will be demonstrated. Moreover, re-usage and recycling of membranes will be validated. Beyond these demonstrations, the project will generate novel insights on membrane separation including a variety of flexible solutions to help industry, the scientific community and policy makers accelerate the rollout of separation technologies. To maximise the impact of CUMERI, other promising separations will be screened and the transferability of results to other industries (refinery, pharmaceuticals, etc.) will be ensured. Through its activities, CUMERI will pave the way to decreased emissions in the industry, to the greater valorisation of valuable chemicals, and to more energy-efficient processes, promoting resilient and circular industrial value chains.

OBJECTIVE AND EXECUTIVE SUMMARY

CUMERI focusses on the development and demonstration of advanced and customised membrane separation systems in two key industries for separation tasks in liquid and gaseous media. This entails the generation of a huge amount of data by all partners involved in the project. This deliverable describes the Data Management Plan (DMP): the way how the CUMERI project will manage all this data. In line with Horizon Europe regulations and the provisions established in the CUMERI Grant and Consortium Agreements, data will be made openly and freely accessible as far as this does not jeopardize any future valorization or exploitation actions. On the other hand, data relevant for industrial use, will be properly protected by patent applications. Moreover, the CUMERI data management will be FAIR resulting in Findable, Accessible, Interoperable and Reusable data. CUMERI is not expected to process any personal data, subjected to GDPR rules.

In accordance to EC recommendations, this first version of DMP for CUMERI has been generated using the guidelines of the DMP Online tool (https://dmponline.be) and using the series of questions adopted for Horizon Europe.

1. INTRODUCTION

In Horizon Europe (HE), for all projects a Data Management Plan (DMP) including FAIR (i.e. Findable, Accessible, Interoperable and Reusable) data management following the Open Science in Europe rules is mandatory (OpenAIRE). According to the EC recommendations, the first DMP of CUMERI has been generated using the guidelines of the DMP Online tool (https://dmponline.be) and using the series of questions adopted for Horizon Europe.

In the CUMERI project no personal data will be processed. As a consequence, no Data Protection Impact Assessment (DPIA) required under the GDPR rules, was performed. We do remark, that the necessary permissions will be asked for, when using names or personal pictures in public CUMERI communications.

This deliverable report contains the first DMP for CUMERI. However this DMP is meant to be a living document that will be refined gradually, as the implementation of the project progresses and significant changes are considered relevant.

The DMP content, is also in line with the provisions established by the project contracts (Grant and Consortium Agreements, GA resp. CA) related to project exploitation, dissemination and IPR procedures.

2. DMP

2.1 Data summary

CUMERI will create different types of data:

- Mass and energy balance data, sensitivity analysis data, variety of cost and environmental impact data, resulting from the economic and environmental assessments in WP1 and 6;
- Experimental data of material or membrane properties from characterization tests in WP2,3 and 4;
- Experimental data of membrane performance from application and durability tests in WP2,3 and 4;
- Experimental data of membrane synthesis/grafting conditions from developments in WP2,3 and 4;
- Modelling data describing transport through membranes and modules of different designs, and in different application conditions resulting from modelling activities in WP2, 3 and 5.
- Module and pilot designs resulting from WP5;
- Experimental data resulting from pilot testing at 2 different industrial locations (at OSILUB France and ERDEMIR Turkey) resulting from WP5;
- Data collected via market research resulting from exploitation plan activities in WP7.

Data will be first produced in raw form (generated by measurements, simulations, market research). Subsequently, the partner(s) generating the data will typically analyze and process this raw data into more usable forms as data tables and graphs, reports, presentations, publications, videos etc. In a next step, the data is preserved using appropriate naming and metadata rules, and is openly shared (to public or consortium) or restricted, as appropriate, again to be decided by the partner(s) generating the data.

All data collected/generated in CUMERI will be used by the Coordinator and the partners to follow the KPIs and the progress made in the project. Moreover, well processed data will be used for dissemination, internal and external communication, and exploitation of results.

All data collected/generated by one partner, and relevant to be known/used by other partners for better performance of their activities in the project, will be openly accessible to all partners via the CUMERI SharePoint. As far as possible, data will be also made open to the public by open access publications or open data storage. However, not all data will be open to the public. Indeed, data collected/generated in CUMERI that will be the base for the development of tangible project results (membranes, processes) will not be made publicly accessible because of potential commercial exploitation opportunities. Where possible this type of data will be protected by patent applications (IP). All this follows the rules stipulated in GA/CA.

More details can be found in the answers to the questions recommended by the DMP online tool.

Will you re-use any existing data and what will you re-use it for?

Whenever relevant, existing data are re-used.

This refers for instance to previous work performed by the project partners. Indeed, especially CUMERI builds on pre-existing knowhow and membrane/process developments in previous projects (typically up to TRL4). This previous knowledge/data is well described for each partner in the CUMERI proposal.

Data re-use refers also to benchmarking the CUMERI results to open (patent) literature and other sources (e.g. proprietary information) available to the consortium in the domain of the project.

The TEA and LCA activities in WP1 and 6 in particular, make use of existing open databases with engineering and environmental data.

What types and formats of data and other research outputs will the project generate or re-use?

Raw experimental characterisation/performance data is, either directly generated in excel, or exported to excel from partner-specific data acquisition software. Further data processing (tables, graphs) is in most cases also performed directly in excel.

Membrane transport/process modelling will use Computational Fluid Dynamics (software Simcenter FLOEFD), software for Hansen Solubility Parameters determination (HSPiP), MatLab and possibly Aspen. Results of all these packages will be directly turned into tables or graphs that can be used in reports, presentations, publications, patents, or exported to excel.

Techno-economical evaluation will be done using a VITO-developed excel tool, while LCA will be performed using SimaPro® software. Both allow to derive summary tables and graphs to be used in reports, presentations, publications, patents.

For pilot and module design, Microsoft Visio will be used (P&IDs) and AutoCAD and Solid Works for 3D drawings. The created graphs can be used in reports, presentations, publications, patents.

Reports (including deliverables), patents and publications are typically produced in Word (doc or docx format), Presentations for consortium meetings or conferences are typically produced in Powerpoint (ppt format). They standardly also contain graphs and/or pictures, typically in jpeg, tiff, png, bmp or other picture format. Video's will most likely be realised in mp3 format.

Re-used data (see previous section) is typically in doc, docx, xls, xlsx, ppt, pdf format. Data shared with partners, externals or publicly, will be mainly in pdf format.

What is the purpose of the data generation or re-use and its relation to the objectives of the project?

As mentioned before, re-use of own development data of partners is meant for further efficient membrane/process R&D and innovation activities in the project. Open literature and patent data is used as benchmark for CUMERI developments. Existing engineering/environmental impact data bases are used for relevant TEA/LCA analysis.

All new data collected/generated in CUMERI will be used by the Coordinator and the partners to follow the KPIs and the progress made in the project. Moreover, well processed data will be used for maximal dissemination, internal and external communication, and exploitation of results.

What is the expected size of the data that you intend to generate or re-use?

Data generated by one experiment is typical in the 100 kB range, while processed data leads to reports or presentations with different graphs and pictures, in the order of 10 MB. In total one can expect that CUMERI will generate at least 10 GB of data (factor 1000 higher).

Typically it is also expected that a similar amount of data will be re-used by the CUMERI consortium.

What is the origin/provenance of the data, either generated or re-used?

For answer to this question, we refer to the general description in the beginning of this section (for new data generated) and to the answer of the first question (for re-use of data).

To whom might your data be useful ("data utility"), outside your project?

As mentioned before, the data generated by one partner can be useful for the innovation activities of other partners within the consortium. On top, part of the generated data will be appropriate for open access publication/presentation, and will then be useful for the broad scientific community, industrial stakeholders and authorities, outside the project. The other part of the generated data (e.g. deliverables marked confidential) will be relevant for technology transfer, licensing or other commercial exploitation opportunities, and will be protected by patenting. Before the publishing of a patent (18 months after application) this data will only be available within the consortium (partners involved in the innovation), and to external companies involved in any exploitation/commercialisation actions.

2.2 FAIR data: Making data findable, incl. metadata rules

Details of our plan can be found in the answers to the questions recommended by the DMP online tool.

Will data and other research outputs be identified by a persistent identifier?

Each partners' institutional servers will be used to store and back-up data collected/generated all along CUMERI, possibly together with the corresponding metadata (for retrieval purposes), according to the usual practices of each institute.

Relevant collected/generated data will also be stored on the secure project SharePoint already created, and subdivided in Reference documents, templates, meetings, and the 8 WPs. Documents shared will bear concise names that describe the content well.

Deliverables in preparation on the SharePoint (joint preparation by different partners) are found in the respective WP folder, and if relevant, a specific subfolder. File names follow the general rule: date_CUMERI_Dx.y, allowing to create new clean versions on a later date for further partner modifications/revisions (dates are considered more efficient than version numbers). Final versions become FINAL_CUMERI_Dx.y.

Sensitive deliverables will only be shared within the consortium via the SharePoint. Public deliverables are automatically made public by the EU after uploading, and can be found on the EU Participant Portal on the Project Results platforms.

Persistent identifiers will mainly be used for open access publications, these have each their own digital object identifier (DOI), in line with open science practices. These DOIs will also be used on the SharePoint, and when referring to these publications on the project website, in presentations and on social media.

For those partners that have no open access bibliographic repository compliant with HE regulations (most Universities do have compliant repositories), Zenodo or another trusted repository linked to OpenAIRE, will be used for the mandatory open access storing (see also next section on data accessibility). This will lead to another DOI, linked to the Journal DOI.

We remark that in trusted repositories as Zenodo, not linked to a specific research organisation, communities can be created per organisation, so that all publications uploaded by a specific organisation are grouped, as is intrinsically the case for the University repositories.

Within CUMERI we will not make use of the above mentioned repositories for non-public data, although e.g. the Zenodo repository allows for sufficient access control (e.g. restricted access) and protection.

Will rich metadata be provided to allow discovery? What metadata will be created? What disciplinary/general standards will be followed? In case metadata standards do not exist in your discipline, outline what type of metadata will be created and how?

For each open access publication stored in HE compliant repositories (e.g. University repositories, Zenodo) meta data will be created. In all cases, metadata referring to the HE funding, the CUMERI acronym and grant number, will be included. On Zenodo metadata is created/stored internally in JSON-format according to a defined JSON schema, and is exported in several generic standard formats such as MARCXML, Dublin Core, and DataCite Metadata Schema (according to the OpenAIRE Guidelines).

Will search keywords be provided in the metadata to optimize the possibility for discovery and then potential re-use?

For all trusted open access repositories that will be used for publications, keywords can be added to tag the submission. These are free text and no controlled terminology can be used in the interfaces at the moment.

Will metadata be offered in such a way that it can be harvested and indexed?

The type of metadata that is used in all trusted open access repositories, allows harvesting by Google and other search engines.

2.3 FAIR data: Making data accessible

Details of our plan can be found in the answers to the questions recommended by the DMP online tool.

Will the data and other research outputs be deposited in a trusted repository?

Data or research outputs that are confidential to one or more partners (e.g. data that will be included in patent applications) is restricted in access and will be safely stored by the developing partner(s) on their institutional servers. Data or research outputs confidential to the consortium will be stored and accessible to all partners only via the CUMERI SharePoint.

However, as far as possible, when not jeopardizing future valorization actions, CUMERI research outputs will be made open to the public by open access publications. In HE, it is mandatory that all peer-reviewed publications resulting from project funding are freely available online with no restrictions on use, by deposition in a trusted repository, immediately after publication. Embargo's are no longer accepted.

There are two ways to guarantee this mandatory **immediate Open Access**.

- Open Access Publishing: Open Access journals offer anyone immediate open access to articles without a subscription. Some Open Access journals charge authors a fee to publish Open Access, the so-called Article Processing Charges (APC), some don't (the so called diamond open access journals). A list of qualitative, peer reviewed Open Access Journals can be found on the Directory of Open Access journals, DOAJ. Only APC costs in a fully Open Access journal can be charged to the project. An APC to open 1 article in an otherwise non-open access journal, so-called Hybrid Open Access journals, will not be eligible. Researchers of European projects can also publish free of charge on the Open Research Europe platform.
- Deposit in an open repository: by depositing an accepted version of the publication in an institutional or other trusted repository one can immediately open a publication if the following condition is met: 1/ the author has transferred the copyright to a publisher who allows immediate open access to an accepted version uploaded in a repository, 2/ the author retains the copyright to the published article and puts the publication himself in Open Access. The Sherpa/Romeo database giving an overview of copyright and open access of publishers, can be accessed to check publisher policies.

Whatever the way of choice, the publications always need to be uploaded in a trusted open repository, immediately after publication. More details can be found on : https://www.openaire.eu/how-to-comply-with-horizon-europe-mandate-for-publications

As mentioned before, researchers at many CUMERI partner institutes can fulfill this mandate by depositing and opening an accepted version of their publications in their institutional repositories. All other partners will make use of Zenodo, the OpenAIRE repository hosted by CERN, or another trusted repository (possibly under the community reserved for their institute). We stress here that is not according to the EU rules to only list publications via a project website or networks such as ResearchGate.

Table 1 gives an overview of all trusted and HE compliant repositories that will be used by the publishing (academic) partners of CUMERI.

Table 1 – Trusted, HE compliant repositories for CUMERI open access data

CUMERI publishing partner	**Repository used**
VITO	Zenodo, under VITO community https://zenodo.org/communities/vitobelgium/
IKTS	Fordatis https://fordatis.fraunhofer.de/
TEC	For publications : http://dsp.tecnalia.com/ For data: https://zenodo.org/
UM	Dataverse Maastricht repository https://dataverse.nl/dataverse/maastricht/
MEMT	https://zenodo.org/
Sintef	https://zenodo.org/
FHNW	https://irf.fhnw.ch/

Have you explored appropriate arrangements with the identified repository where your data and other research outputs will be deposited?

All partners assure that the used repositories are fulfilling all HE regulations for Open Access research.

Does the repository ensure that the data and other research outputs are assigned an identifier? Will the repository resolve the identifier to a digital object?

As mentioned before the repositories that will be used by CUMERI (see Table 1) all assign a persistent identifier or DOI, or they work with the DOI of the publishing Open Access Journals. These DOIs are all digital objects.

Will all data and other research outputs be made openly available?

In accordance to the HE mandatory regulations, the public research outputs of CUMERI will be made openly available (see answer to first question in this section). All other data will be kept only open within the consortium, or to one or more partners, as explained before.

Is an embargo applied to give time to publish or seek protection of the intellectual property (e.g. patents)?

As mentioned before, CUMERI research outputs will only be published and made publicly available, when this does not jeopardize any future valorisation actions. If research outputs are considered valid for later industrial transfer/use, the data will be first protected by patent applications whenever possible, or if not patentable, by IP depot. After patent application, and until the patent becomes public (18 months after application), release of information in publications or public presentations will be done with utmost care, and in anyway limited to the exact data included in the patent application, all to ensure the protection of the innovation. For this, the patenting partner(s) is(are) responsible for proper handling.

To allow all partners to judge the commercial value of CUMERI project results, we will adopt a procedure that is common to many EU and other projects: every partner that wants to publish results in a journal, or wants to present results in a conference/workshop/course or any other public event, is required to inform and ask permission to all other partners (full contact list) via E-mail at least one month before the submission/event. Every partner will check the shared information (preferably only available on the SharePoint, and not attached to the mail) as soon as possible. If no objections are formulated within 2 weeks, the publishing/presenting partner can continue his disclosing actions.

If an embargo is applied specify why and how long this will apply, bearing in mind that research data should be made available as soon as possible.

As mentioned in the answer to the previous question, patentable CUMERI data will not be openly disclosed to the public, as long as no patent application is submitted. After that, publicly sharing the results is also done with utmost care to prevent jeopardizing patent approval. CUMERI results valid for public disclosure will be deposited in an open access trusted repository, immediately after publication, as is mandatory for all HE projects.

Will the data and other research outputs be accessible through a free and standardized access protocol?

Using the trusted repositories mentioned in Table 1, public CUMERI data and research outputs will be indeed accessible through a free and standardized access protocol. Typically standardized CC (Creative Commons) licenses will be attached to the data in the repositories:

- CC-0: Waves all rights and releases work to public domain. This is not technically a licence at all but a waiver of the ownership of copyright for a particular item. CC-0 permits others to freely build upon, enhance and reuse the work. There is no legal requirement to give acknowledgement to the original creator when material is released under the CC-0 terms, but professional standards for citation of sources should be adhered to when using data released under CC-0.
- CC-BY: By Attribution, which permits sharing and reuse of the material, for any purpose, as long as the original authors are credited. The material can be freely shared, redistributed, transformed, built upon and adapted for any purpose, including commercial use. Anyone using the material must provide credit to the original authors and indicate clearly any changes that were made, and there is a legal obligation to do this. CC-BY is widely used for open access articles in academic journals.

Other standardized licenses are available but will not be used for CUMERI data, especially because we will not use open repositories as Zenodo for non-public data, even though they allow for sufficient protection and access restrictions via these other licenses.

If there are restrictions on use, how will access be provided to the data, both during and after the end of the project?

See also answer to the previous question. The CUMERI data with restricted access will be stored on the project SharePoint (open to consortium) or on one or more institutional servers (only open to one or more partners), also after the end of the project. In case of knowledge transfer to exploiting partners in or outside the consortium, data access will be part of a license/transfer agreement.

How will the identity of the person accessing the data be ascertained?

As only CUMERI results valid for public disclosure will be made accessible, and this in an open way, the identity of the persons accessing the data will not be known, except for authors referring to the CUMERI publications.

Is there a need for a data access committee (e.g. to evaluate/approve access requests to personal/sensitive data)?

No we do not see a need for this. If a need would pop up later, we will use the General Assembly of the project to evaluate/approve such requests.

Will metadata be made openly available and licensed under a public domain dedication CC0, as per the Grant Agreement? If not, please clarify why.

As mentioned in previous answers, metadata is automatically coupled to any open access publication in trusted repositories, typically licensed via CC0 or CC-BY. This is however, not mentioned in the CUMERI Grant Agreement, but is included in this DMP.

Will metadata contain information to enable the user to access the data?

As the trusted open repositories with structured metadata will only be used for the CUMERI results that can be publicly disclosed, access will always be fully open, and there is no need for this type of information in the metadata.

How long will the data remain available and findable? Will metadata be guaranteed to remain available after data is no longer available?

Data and metadata stored in the trusted open repositories mentioned in Table 1, is expected to be retained and remain available for the lifetime of the repositories.

Will documentation or reference about any software needed to access or read the data be included? Will it be possible to include the relevant software (e.g. in open source code)?

Modelling actions within CUMERI are expected to be performed with commercially available software (see section 2.1). In open access publications, proper reference will be made to the used software packages.

2.4 FAIR data: Making data interoperable

Details of our plan can be found in the answers to the questions recommended by the DMP online tool.

What data and metadata vocabularies, standard, formats or methodologies will you follow to make your data interoperable to allow data exchange and re-use within an across disciplines? Will you follow community-endorsed interoperability best practices? Which ones?

As mentioned before in section 2.1, data will be converted in interoperable formats (e.g. xls, docx, supported by the Microsoft package, or pdf) whenever possible. This will ensure that each partner can access and process it. These same file/data formats are also used across disciplines.

Further, to describe CUMERI results, we will use performance parameters typically used in the membrane community e.g. flux, permeability, permeance, retention, extraction rate, selectivity etc.

In case it is unavoidable that you use uncommon or generate project specific ontologies or vocabularies: Will you provide mappings to more commonly used ontologies? Will you openly publish the generated ontologies or vocabularies to allow reusing, refining or extending them?

In CUMERI we expect to use only vocabularies or ontologies, common to our scientific domain.

Will your data and other research outputs include qualified references to other data (e.g. other data from your project, or datasets from previous research)?

In CUMERI, the different membrane/membrane process development partners will definitely build further on their earlier research in previous projects (developments up to TRL4). But we expect also that each partner can profit from results of other CUMERI partners, but also from other researchers outside CUMERI. In all case, when using these previous project results, proper reference will be made to any previous results relied upon. This is standard practice in science.

2.5 FAIR data: Increase data re-use

Details of our plan can be found in the answers to the questions recommended by the DMP online tool.

How will you provide documentation needed to validate data analysis and facilitate data re-use?

Data shared in the consortium or to the public via open access publications will be properly described (e.g. equipment and measurement protocols used for data collection, accuracy and error bars in measurements, modelling boundary conditions, etc.) in order to allow further data analysis by other partners or third parties outside the consortium. This will also facilitate data re-use.

Will your data and other research outputs be made freely available in the public domain to permit the widest re-use possible? Will your data and other research outputs be licensed using standard reuse licenses, in line with the obligations set out in the GA?

In line with previous answers, if specific CUMERI results are suitable to disclose to the public, this is done by publications openly accessible via trusted repositories. Standard reuse licenses CC0 and CC-BY will be applied to allow maximal reuse of the research outputs. This is in line with the CUMERI GA.

Will the data and other research output produced be useable by third parties, in particular after the end of the project?

As mentioned above, public results will be freely usable by third parties (with the correct referencing). Data that was kept confidential to the consortium or to one or more partners, will most likely be used in patent applications, and can be shared to third parties for valorisation/commercialisation/exploitation, also after the end of the project. The conditions for reuse of this type of data will be the subject of separate transfer/license agreements, responsibility of the patenting/valorising partner(s), in line with the regulations stipulated in the CUMERI GA.

Will the provenance of the data and other research outputs be thoroughly documented using the appropriate standards?

Each data file, be it shared only on the SharePoint or publicly disclosed in open access, will properly describe how the data was collected (e.g. equipment, protocols, accuracies, modelling conditions etc.). Moreover, in the meta data of public results, and in the acknowledgements of the publications, proper reference will be made to the HE funding, the CUMERI project and grant number.

Describe all relevant data quality assurance processes.

Data quality in CUMERI is ensured in different ways:

- Many partners in CUMERI work following an accredited quality management system. Others are following very similar quality rules;
- Deliverables will be joint efforts, and are reviewed by the deliverable responsible, and the Coordinator at the minimum;
- Publications are typically send to high-quality, peer-reviewed journals, ensuring proper data/result/method evaluation.

2.6 Allocation of resources

Details can be found in the answers to the questions recommended by the DMP online tool.

What will the costs be for making data and other research outputs FAIR in your project?

The costs to make CUMERI results FAIR, are the costs related to open access publications. Costs are expected to amount to about 25kEuro.

How will these be covered?

The majority of these costs will be covered by the EU funding, as far as fully open access journals will be chosen for publications (eligible costs). VITO, IKTS and Tecnalia have foreseen 5kEuro in their budget, UM 4 kEuro for this type of costs. The related costs for the Swiss associated partner FHNW will be funded by the Swiss government.

Who will be responsible for data management in your project?

The coordinator VITO will be responsible for the CUMERI data management. However, WP7 responsible partner EuroQuality will ensure that data management practices are also in line with the dissemination/communication/exploitation and IPR rules within the project.

How will long term preservation be ensured?

The long-term data preservation and back-up of confidential CUMERI results on the servers of each partner, is the responsibility of each partner. The long-term preservation of the confidential CUMERI data on the SharePoint, and the long-term preservation of the CUMERI website is the responsibility of the coordinator VITO. All related costs will be borne by the partners and VITO respectively. The public research results will be preserved thanks to their deposition on trusted open access repositories.

2.7 Data security

Details can be found in the answers to the questions recommended by the DMP online tool.

What provisions are or will be in place for data security?

Data security is ensured by the security policies applied:

- by each partner on their own servers (for data confidential to one or more partners);
- by SharePoint (for data confidential within the consortium);
- by the trusted, open access repositories (for public data).

Will the data be safely stored in trusted repositories for long term preservation and curation?

As mentioned before, the data will be safely stored, or on institutional servers, or on the CUMERI SharePoint, or in trusted open access repositories. All allow long term preservation and curation.

2.8 Ethics

Details can be found in the answers to the questions recommended by the DMP online tool.

Are there, or could there be, any ethics or legal issues that can have an impact on data sharing?

In CUMERI no personal data, subject to GDPR rules, will be processed. So no ethics issues are foreseen.

The treatment of project data/results is, however, subjected to the rules stipulated in the legally binding Consortium and Grant Agreements, and prescribes to protect data when it can be the base for future valorisation/exploitation actions. All other data should be made publicly and openly accessible to preserve maximal data use and re-use.

Will informed consent for data sharing and long term preservation be included in questionnaires dealing with personal data?

Not relevant to CUMERI, as no personal data will be used.

2.9 Other issues

We expect not to make use of any other national/sectorial/departmental procedures for data management, other than the ones described above.