



H2020-M-ERA.Net -3 Call 2021



Sustainable and Safe anode-free Na Battery

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Start date of the project: 01/09/2022

Duration: 36 months

Deliverable D.1.2

Project partners

LOGO	Partner full name	Acronym
CONSELO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS	Agencia Estatal Consejo Superior de Investigaciones Científicas	CSIC
JÜLICH	Forschungszentrum Jülich GmbH	FZJ
🕏 ALTRIS	Altris AB	Altris
DTU Danmarks Tekniske Universitet	Danmarks Tekniske Universitet	DTU
PHASETREE	PhaseTree	PT
UPPSALA UNIVERSITET	Uppsala University	UU
ACCUREC	ACCUREC Recycling GMBH	ACC





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Led by: CSIC

Participant partners: all

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List of Acronyms

Acronym	Description
WP	Work package
DMP	Data management Plan
EU	European Union
OA	Open Access
FAIR	Findable, accessible, interoperable and reusable.
IP	Intellectual property
IPR	Intellectual property rights

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Introduction

Dissemination and communication activities will be carried out within WP1 under the coordination of CSIC and with the involvement of all Consortium members. The main objective is to ensure the maximum visibility and impact of the project results and activities with potential applications in the development of new battery technologies.

To share data among partners, a TEAMS private group has been created by DTU with access to all the responsible of WPs. With that tool, immediate information can be shared, and virtual meetings can be called to maintain all the partners updated or whenever inputs or discussions are necessary.

1. Data Management Plan (DMP)

SuSaNa project is bound to fully comply with European regulations regarding Open Science and the management of research data. This applies also to project metadata that must cope with the FAIR principles.

Open access implies unrestricted online access to research outputs such as journal articles, without access fees seeking to foster access to and re-use of data generated by EU-funded projects. This implies to make data generated from EU funded project's FAIR which stands for *findable, accessible, interoperable and reusable,* according to the EU guidelines¹.

Data will be published Open Access and uploaded to public repositories, such as for example https://digital.csic.es/ (CSIC's public repository) or other partner's public institutional repositories. Furthermore, Open access publications, pieces of news and public deliverables will be made available on the webpage to the general public.

This Data Management Plan (DMP) describes the data management life cycle, including specific standards of the databases in terms of formats, metadata, sharing, archiving and preservation, as a way of further disseminating the data set of results to the research community.

The present document has been prepared with the help of the DMP Online tool.

1.1. Data Summary

SuSaNa project aims at obtaining a low-cost, safe, sustainable and highly performant Na-based battery by making use of non-critical materials while keeping in mind its end-life in order to obtain a technology that can surpass Li-ion batteries, especially in applications such as stationary energy storage system.

The project is structured in 6 work packages (WP). Three main WPs will be devoted to the study of materials properties and battery interphases. Thus, WP2 is focused on the study of the liquid electrolyte; WP3 is on the study of the polymer electrolyte and WP4 is on the cathode materials. Data resulting from these studies alone and in combination will be generated. Most of these data will be combined with computational

¹ https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/our-digital-future/open-science/open-access_en

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simulations in WP5 (Multiscale Modelling) and confirmed by experimental results in WP6 (battery tests and sustainability). In addition, there are WPs devoted to project management and to dissemination and communications tasks within WP1.

1.2. Type of data

In SuSaNa project, data coming from the above-mentioned WPs and their corresponding tasks will be generated and collected. In this first approach, four data types can be produced, namely: experimental, computational, combined testing and sustainability.

1.2.1. Experimental data

WP2, WP3 and WP4 are devoted to the study of the chemical, electrochemical and material properties of the materials composing a Na battery. For the correct development of the tasks included in these WPs, a variety of electrochemical, materials and surface science techniques will be used. The data will be used to recognize the performance of the proposed materials in the proposed battery. In deeper detail:

- WP2 will gather data regarding the relevant physicochemical and electrochemical properties of the liquid electrolytes. Their further application as electrolytes in Na-based batteries will be studied, for which electrochemical performance evaluation and conductivity measurements will be performed. Data obtained in the formulation and characterization of the electrolyte will be shared with the other partners, especially those involved in WP3, 4, 5 and 6.
- WP3 will develop polymer-based electrolytes with ionic conductivity ≥ 50% that of the pure liquid from WP2 and solid-like behaviour. Data regarding conductivity, rheological properties and capability to hinder dendritic growth will be generated and shared with WP2, WP4, WP5 and WP6.
- WP4 is devoted to the study of the cathode. The use of Prussian white is foreseen. Electrochemical studies will be carried out regarding the performance of Prussian white modified with different coatings as cathode, and results will be provided to the partners involved in WP2, WP3, WP5 and WP6.

1.2.2. Computational data

WP5 gathers all the simulation activities to develop models to predict under which experimental conditions dendritic growth is prevented. For that, inputs from WP2 and WP3 will be needed. In addition, a continuum model of the cell to optimize its architecture will be made, with inputs regarding cell performance gathered in WP6.

1.2.3. Testing data

The information gathered with the outputs of WP2, WP3 and WP4 as the performance of the materials individually will be combined in a battery cell and evaluated as a whole in WP6. Therefore, WP6 will study the combination of materials developed in WP2 and WP3 in anode-free Na cells using Prussian white as the

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cathode (WP4). The cells will be standardized to be able to extract parameters used to feed computational models WP5.

Evaluations will be carried out in relevant conditions at TRL4, and results will provide the basis to determine the viability of the technology and possibilities of scaling up. Results from this WP6 will be provided to the partners involved in WP2, WP3 and WP4 in order to improve the active and inactive materials combination. In addition, a potential market analysis depending on the battery performance will be prepared.

1.2.4. Sustainability data

Within WP6, the aspects regarding sustainability in terms of the materials used in WP2, WP3 and WP4 and their potential recyclability will be considered. For that, evaluation of the raw materials employed and final products developed, including their properties, will be shared by the partners involved in the preparation and testing of materials (namely WP2, WP3 and WP4) with the partner ACCUREC.

1.3. Sets of data produced

In all the cases described above, details of the equipment used, such as the make and model of the instrument, the settings used and general conditions of the experiment will be provided along with each set of data.

The techniques used for the characterization of materials may include specific software but the data generated by the acquisition devices will be transformed into figures and tables in order to better share with the other partners and beyond. The obtained results will be useful to other scientists and the battery development industry.

For all the above-mentioned data, formats that might be used are presented in Table 1:

Data Type	Preferred Formats	Editing Software
Generic data file	.dat	Text editors (as Notepad, Wordpad)
Plain Text	.txt	Unicode text editors (as Notepad, Wordpad)
Text file	.doc	MS Word
	.docx	Open Office XML
	.pdf	Standard PDF viewers
	.odt	Open Document Text
Spreadsheet	.xls	Spreadsheet software (as MS Excel)
	.CSV	
	.asc	
Image	.jpg/.jpeg	Standard image viewers
	.png	
	.tif/.tiff	
Video files	.mp3	Windows Media Video

TABLE 1 DATA TYPE AND PREFERRED FORMATS.

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	.avi	
Quantitative data	SPSS (.dat/.sps)	SPSS Portable (.por)
analysis	.sav	SPSS read Perl script
Archive compressed file	.zip	Standard file archives (as WinRar, WinZip)
format	.rar	

These file formats have been chosen because they are accepted standards of widespread use.

1.4. FAIR Documents

In accordance with the EU Guidelines, documents produced in the present project should be FAIR, that is, as mentioned before, Findable, Accessible, Interoperable and Reusable.

In order to make the documents **findable** within the repositories, metadata will be inserted along with the data files. For that, relevant and sufficient free keywords will be used. Some examples could be the following words: energy storage system, battery, sodium, anode-free, polymer gel electrolyte, sustainability, etc. and any other more specific free keyword relevant to the content of the publication as well as appropriate and relevant titles.

All data and metadata will be stored using the English language in order to make them more easily findable for the scientific community. Besides, IUPAC standards² will be used for units and chemical names.

For identification purposes, the repositories offer the assignation of persistent and unique identifiers such as Digital Object Identifiers (**DOI**) identification numbers to clearly and univocally identify documents.

1.4.1. Public Deliverables

In the case of the project deliverables (some of which will be public), they will be identified with number and version, date and type of document. Following the rules below:

- Type: DEC/R/ DEM according to the description provided by the EU depending on the type of document.
- Dissemination Level: PU/CO (public/ confidential)
- Name: Name of the Deliverable.
- Document ID: should be D.X.x- TYPE- deliverable number-year.
- Date: Day/Month/Year

² https://iupac.org/

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1.4.2. Scientific publications

The most effective way to spread the data generated by the SuSaNa project is by means of scientific publications. In accordance with EC Open Access Mandate, peer-reviewed publications resulting from the Project must be made Open Access. This means that scientific publications of the research findings directly from the project must be made openly and publicly available by the partners involved and its institutions, at least in its almost-final version. In any case, the principal investigators on the project and their institutions will hold the **intellectual property rights** for the research data they generate, but they will grant redistribution rights to the repository for purposes of data sharing.

Each partner will be responsible for making its publications resulting from SuSaNa open according to the H2020 FAIR guidelines. In order to do that, data will be stored in the institution's public repositories (*i.e.*, DigitalCSIC). In the case that the partner does have an institutional repository (*i.e.*, non-academic partners), the eventual publications by such partners will be uploaded to ZENODO. ZENODO is an international Open Access repository maintained by CERN/OpenAire and open to all scholars. Data uploaded to either Digital CSIC or ZENODO are linked to OpenAire and the EC portal, which guarantee its **accessibility** to the public.

In addition to those institutional repositories and ZENODO and with the purpose of increasing its potential impact, copies may be uploaded to social networks (*i.e.*, ResearchGate) and the project website hosted at <u>https://susanaproject.csic.es/en</u>.

The procedure will be as follows:

- As soon as results from the project are published in Open Access, PDF copies along with any complementary data will be uploaded to the academic repository³ of the partner delivering the result.
- In any case, the publisher's policies regarding access to the author's version, embargo period, etc., will be respected. The version published in Open Access will comply with such rules (if applicable).
- In parallel, they will be announced on Social Networks, including links to the publication location.

In addition to scientific publications, some of the project deliverables are public. These are D1.1 and D1.2. Upon approval by M-ERA.Net Secretariat, these deliverables will also be uploaded to ZENODO/CSIC repository to provide the document with a DOI. Complementary experimental data supporting the results will also be provided (if applicable).

1.5. Data sets

All research data resulting from the project will be made available as soon as possible after the consortium has analysed them and published their findings. However, there will be different access levels.

³ See section 6 for details

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For instance, research results that can reasonably be expected for commercialisation or industrial exploitation and/or require special protection due to confidentiality will not be made Open Access. This action is compatible with the Grant Agreement obligations concerning the dissemination of results and in compliance with confidentiality security obligations and obligations to protect personal data.

Other datasets will be openly shared after an embargo period, during which the project consortium will be able to examine the generated data and work on preliminary results. Metadata of such datasets will be publicly available on DIGITAL.CSIC unless they may compromise the outcomes of the ongoing investigation.

Table 2 shows the different collections of datasets that are expected during the project. This overview gives information about data types, the origin of the data, the corresponding Work Package number, the format and the estimated size in which the data will be stored.

#	#WP	Data Type	Origin	Format	Estimated Data Size
1	WP2	Experimental data	Data collected during electrolyte/cell evaluation	Docx, xlsx Graph/Table, spectra, .csv, json, .z; .xlsx; ASCII	1GB
2	WP3	Experimental data	FTIR, DSC, DETA	.csv; .xlsx; ASII	10 GB
3	WP3	Images/	Pictures of the polymer gel electrolytes	PNG JPG	10GB
4	WP3	Videos	videos of the polymer gel electrolytes to see its rheology	MP3	20 GB
5	WP4	Experimental data	Data collected during material testing	Docx, xlsx, tiff,	10 GB
6	WP5	Simulation Data	Data obtained from DFT calculations (VASP code), ML simulations, phase-field simulations, and COMSOL software.	ASE database (.DB), HDF5 CSV	500GB
7	WP6	Recyclability data/experimental data	Data collected during material testing	Docx, xlsx	1GB

TABLE 2: TYPE OF DATASETS FORESEEN

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In order to make data publicly **accessible**, data sets will be uploaded to Open Access repositories. All datasets will be accompanied by their descriptive metadata and described according to international standards and good practices in line with the journal's data-sharing policy requirements and open data mandates.

1.5.1. Making data interoperable:

In order to make the data **interoperable**, data stored in Open Access repositories will include a description of the equipment, conditions and settings used to acquire data as well as a comprehensive explanation and description on of the experimental procedures followed to obtain data, whenever it applies. In the case of simulation data, all the boundary conditions simulation settings, input parameter values and simplifying assumptions will be provided with the data.

In order to be able to reproduce experiments, publications might include additional supporting information with complementary data that help verifying the results presented for the sake of interoperability in order to make the data presented fully reproducible in other laboratories.

IUPAC nomenclature will be used as well as International Standards and metric units in order to facilitate interoperability.

Social Media news will use common language for the general public to understand.

1.5.2. Increase data re-use:

Data presented in the public repositories might be used by third parties for research purposes as state-ofthe-art, in order to avoid duplication of efforts and as the basis for future research on the topic.

The research data will be mostly made available for **re-use** as soon as possible. Data used in a publication will be deposited on the chosen repository as soon as the publication is made public by the journal or upon acceptance for publication, whatever the journal data sharing policy will state. The research data to be generated by the project and not directly associated with any publication may also be made available through DIGITAL.CSIC by the coordinator at the end of the funded action upon request.

Research data will be labelled with a clear user license. The Creative Commons CC-BY 4.0 International license will be used to protect the ownership of all data deposited in DIGITAL.CSIC, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. For other data sets, including software, the appropriate license will be chosen in the tool https://ufal.github.io/public-license-selector/.

The generated data can be re-used in similar configurations.

Nevertheless, the **commercial** use of the data generated by the project might be restricted if any patent or exploitation agreement has been filled or signed by the consortium members. In which case, information about the patent will also be provided by the project foreseen ways.

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1.6. Allocation of resources

The responsibility for data preservation corresponds to the partner(s) generating the data. For the compilation of the documents, the coordinator is responsible for gathering and reporting to the M-Era-Net secretariat.

Each partner is responsible for:

- complying with the data management policies of their institutions
- making its data and results open
- uploading the results to their repositories

The coordinator (CSIC) is responsible for creating and eventually updating the DMP. The cost of documentation preparation and uploading is included in the WP1 management tasks.

In a first approach, only Open Access repositories such as those provided by the institutions and ZENODO will be used. However, the publication in Open Access in peer-review journals comes with a cost that is eligible costs to be supported by the partner budget.

1.7. Data security

The research data from this project will be deposited with the institutional repository on the partner's official page, to ensure that the research community has long-term access to the data.

The data files from this study will be managed, processed, and stored in a secure environment (e.g., lockable computer systems with passwords, firewall system in place, power surge protection, virus/malicious intruder protection) and by controlling access to digital files with password protection. Partners involved have self-stored mechanisms that are intended to preserve data. SMEs also have backup systems that preserve their information.

In deeper detail:

- ICTP-CSIC: At CSIC all computers are password protected and equipped with virus and firewall protections according to CSIC protocols. Computers for collection of data in measurement equipment are connected to UPS in order to avoid data loss caused by unpredicted electrical failure. User's data are stored in several computers and backed up regularly. Researchers from CSIC have access to the data management services provided by DIGITAL.CSIC which includes data storage and open access data publication, repositories and DOI assignation (https://www.re3data.org/search?query=DIGITAL.CSIC). DIGITAL.CSIC meets the quality criteria of the global directory of repositories and has the Data Seal of Approval Certificate.
- FZJ: Computers and servers are protected by password, antivirus and firewall according to wellestablished protocols at University of Münster (WWU) (<u>https://www.unimuenster.de/IT.Technik/Netz/NetzseitigeSicherheitsmassnahmen.html</u>) and fully meet the BSI

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standard for data security. These protocols are ensured by Stateful-Packet Screening (SPS) as well as Intrusion-Detection and Prevention-Systems (IPS). Each PC user at FZJ has to request a certificate profile from German research network (DFN-PKI) which is used for the authentication of the user (<u>https://info.pca.dfn.de/doc/Info_Zertifikatinhaber.pdf</u>). User's data will be stored in corresponding computers and backed up regularly. Data acquired from measurement devices as well as all the post-processing scripting will be run and saved on external data drives accessible to only a certain group of people related to the project. These hard drives are stored centralized and have multiple backups. When a person working for the project leaves the project/institute, the project data is passed on and kept for 10 years.

- ALTRIS: At Altris all computers are protected by password, antivirus and firewall. The computers
 are also continuously backed up to the OneDrive cloud. All data obtained within SuSaNa will also be
 stored on a Network Attached Storage (NAS) protected by password, which is also connected to a
 UPS system in case of power failure.
- DTU: Computers and clusters are protected by password, antivirus and firewall. The data are produced using the Niflheim cluster hosted at DTU. Niflheim is currently assuring for the standards required by the Danish research council and DTU in terms of preservation of data (from daily backups to long-term storage of the data). All the post-processing scripting will be run and saved in the project folder of the same cluster. Periodic local updates (on removal disks) will also be performed. When the person responsible for the project will move, the data will be transferred to the PI of the project (Juan María García Lastra, DTU Energy, Section for Atomic Scale Modelling and Materials). The final data, protected by a DOI, will also be stored in the computational materials repository (CMR https://cmr.fysik.dtu.dk/) which is hosted at DTU Physics and has been active for more than 10 years. The properties collected in a database will be accompanied by ReadMe files to understand how the data was obtained and what exactly is included. Code will be commented in the python script, as well as additional ReadMe instructions will be attached describing how to use and run the script.
- **Phase Tree:** All of the computers are protected by password, antivirus and firewall. All of the simulation data are encrypted and stored in the database. All of the data will be backed up to ensure redundancy and will only be accessible to the members of PhaseTree who are directly involved in the project.
- **Uppsala University:** At UU, computers and clusters are protected by password by the users. Periodic local updates (on removal disks) will also be performed by those from UU involved in SuSaNa project. Researchers and PhD student from UU have Access to BOX online cloud to store files.
- ACCUREC Computers and clusters are protected by password, antivirus and firewall. Computers for collection of data in measurement equipment are connected to UPS in order to avoid data loss caused by unpredicted electrical failure. User's data are stored in several computers and backed up on Accurec's server regularly.

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2. Dissemination Plan

The dissemination strategy presented in the present deliverable has the purpose of setting the guidelines regarding dissemination and communication activities to be carried out by all the participating partners throughout the project life.

The project coordinator (CSIC) is responsible for the implementation of the dissemination strategy. In particular, CSIC coordinates the dissemination actions of the project with the direct participation of the whole consortium feeding this dissemination activity with results achieved during the project.

All the dissemination activities and events organized by the SuSaNa consortium as well as all public documents generated during the project lifetime will be made available through the public project website https://susanaproject.csic.es/en.

As explained in D 1.1, different social networks profiles have been created in a combination that is aimed to reach the widest possible audience, from purely scientific networks such as ResearchGate, to professional such as LinkedIn and the general public such as Twitter

2.1. Objectives

The communication strategy will be the roadmap for getting the project activities across to the targeted audiences. This plan is to be seen as an essential tool of marketing and public relations management. In this context, communication needs to translate the science into a language that is understood by non-experts.

As a main objective of the communication plan, the dissemination activities will focus on improving public awareness with the general purpose of making the project known. Special importance will be put on spreading the results and project knowledge amongst the general public, with periodic updates on the project progress and achievements. R&D European community as well as the energy industry related organizations will be prioritized.

2.2. Target audience

SuSaNa dissemination activities are focussed, as main audience, on the European Research and Scientific communities as well as potential stakeholders within the industry, especially battery industry and battery recycling. However, other communities are also targeted due to its potential interest in the project results. Therefore, the identified audience of the project is the following:

- Research groups working in batteries, electrochemistry and polymers
- Research centers (academic and non-academic)
- Other EU/Era-Net projects
- Environmental/ Recycling organizations (i.e. EPBA, EUROBAT, EBRA and Eucobat) and recycling companies (i.e. Ecopilas-Recyclia, Umicore, Akkuser, SNAM, and uRecycle)
- Dissemination TYPE NAME REFERENCE Level Document ID Edition/revision DATE PAGE Data management plan and DEC PU D1.2--PU-2023 01/00 28/02/2023 14/21 dissemination strategy
- European institutions involved in Research and Innovation







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- NGOs such as industry associations
- Societal engaged actors: experts, info providers, end-users...
- Media representatives
- Policy makers, regulators and standardization groups as EERA and European Battery Alliance
- General public

2.3. Public image and public recognition

Common graphic identity in the dissemination activities allows a better recognition that helps creating a project identity, in order to make easier to identify the "project brand". This visual identity includes a logo and a colour scheme both for the website and for printed materials.

2.3.1. Logo

A logo has been created and proper templates prepared and shared with the partners, as explained in deliverable 1.1. The logo, already in use in this document, is presented in *Figure 1*.



FIGURE 1: SUSANA PROJECT LOGO

2.3.2. Language

The official language of the project is English. Thus, all the dissemination material generated by the project will be available in that language. However, a project partner may need to use the general image or presentation template of the project for an event or presentation in their own language if required.

2.4. Dissemination channels

The progress and outcomes of the project will be disseminated in a variety of ways to ensure maximum coverage and information outreach. All partners will be involved in knowledge transfer, in order to reach as large an audience as possible. A combination of dissemination channels will be used to touch all relevant sectors including: politics, science, industry and the general public.

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Therefore, dissemination activities will be structured at four levels:

- i. Dissemination to scientific community, including in workshops and conferences
- ii. Dissemination to potential end users
- iii. Dissemination to general public

2.4.1. Dissemination to the scientific community

i. Congresses:

The participation in events and conferences as those presented in Scientific results will be disseminated in national and international conferences. **Table 3** shows some of the tentative conferences where the partners could present to the scientific community their most relevant results related to the project.

Partner	Action	Foreseen date	Potential
CSIC	Annual meeting of the polymer group (GEP) of the Spanish Royal Society of Chemistry (RSEQ)	8-12 May 2022 & successive years	200
CSIC	Young Scientists in Polymers, organised by GEP (RSEQ)https://jip2023.polimero.org/	October 2023	100 (young researchers)
CSIC	Biennial RSEQ Meeting	2023 / 2024	300
FZJ	Advanced Battery Power Conference Münster	2023-2025	300
FZJ	75 th Annual Meeting of the International Society of Electrochemistry Montréal, Canada	2024	600
Altris	NordBatt 2022 conference	October 2022	200
Altris	ICNaB 2023 conference	October 2023	300-400
UU	Nordbatt 2022 conference	26/10/2022	200
UU	ICNaB 2023 conference	Oct 2023	300-400
DTU	Joint European Summer School on Fuel Cell, Electrolyser and Battery Technologies	September 2022, 2023 & 2024	25 Ph.D. students
DTU	"BATMAN" Summer School (Battery Modelling & Advanced Numerical Simulation)	September 2022 and 2024	30 Ph.D. students, postdocs, and industrial researchers
Accurec	International conference of battery recycling	September 2024	300-400

TABLE 3: (FORESEEN) PARTICIPATION AT CONFERENCES AND WORKSHOPS

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 95				t No 958174.		





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ii. Scientific publications

Publications in peer-review journals (OA, see section 1.4.2) is expected by all the research partners. Some of journals where the papers can be potentially published include: *Nature Energy, Science Advances, ACS Nano, Advanced Energy Materials, Nano Letters, Nanoscale, Journal of Energy Storage, Journal of Power Sources, Journal of Physical Chemistry C, Journal of the Electrochemical Society, Polymer, Electrochimica Acta, ACS Applied Materials and Interfaces, ACS Energy Letters, Chemical Science, Physical Chemistry Chemical Physics, ChemComm, Journal of Molecular Liquids, Inorganic Chemistry, Journal of Materials Chemistry A, Advanced Functional Materials, Electrochemistry Communications, Physical Review Letters, ChemSusChem, Polymers, ACS Applied Polymer Materials, Macromolecules. Being all of them top-level peerreview journals.*

iii. Others

SuSaNa project might also produce output in form of PhD and Master Thesis. **Table 4** displays the foreseen output of PhD and Master Theses by partner.

Partner	Number of Master Thesis	Number of PhD Thesis	
CSIC	1	1	
FZJ	0	1	
DTU	0	1	
UU	1	1	
	0	0	

TABLE 4: EXPECTED OUTPUT OF PHD AND MASTER THESES BY PARTNER

2.4.2. Potential end users

SuSaNa project roots in the conviction that the device needs to incorporate the vision of end-users since its conception. In this sense, some stake-holders at different stages of the device life (i.e.; material development (E-lyte, Haldor Topsoe) end-user (Wico, Morrow, Isemaren) and recycling industry (Envirobat)) form part already of a SuSaNa community, which will help orienting the technology for the best. To discuss interests, needs and strategies, meetings and/or participation in roundtables with those and other stakeholders are foreseen at consortium level as well as networking activities and informal actions per partner on (inter)national forums, with the objective of getting overall visibility at EU and global level.

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2.4.3. General public

i. Website

A dedicated project website has been established at the beginning of the project. CSIC is the responsible of it, providing uninterruptedly maintenance during the project life. As already mentioned, the project Website is hosted at https://susanaproject.csic.es/en.

This website acts as central information channel for the wider public and the project's participants and it will be periodically updated with relevant news and events. More information regarding the website structure and content is provided in D1.1

The project will also benefit from ICTP-CSIC dissemination mechanisms with the publication of relevant information and reports including important results from SuSaNa project in different media such as ICTP web page & newsletter and the *Revista de Plásticos Modernos*, edited by ICTP uninterruptedly since 1950 and mainly distributed in the industry sector.

ii. Social networks

Social networks will be used for dissemination purposes and SuSaNA has created profiles in the following:

- ResearchGate This network that gathers the scientific community is the perfect environment for scientific discussion and to share deep knowledge on the matter, such as scientific breakthroughs and advances. Within this network, the scientific publications, open source, will be shared. The set profile in this network is the following: <u>https://www.researchgate.net/project/Sustainable-and-Safe-anode-free-Na-battery-SuSaNa</u>.
- **LinkedIn,** this network is mostly used by professionals and companies, therefore is the perfect environment to attract potential stakeholders towards the project. A profile for the project has been set in the following link <u>https://www.linkedin.com/company/susana-project</u>.
- Twitter the account named @SuSaNa_project has been created in the most generalist network, Twitter. From this account general news and events will be released. Relevant news will be published here to the general public in a non-formal language. The twitter account is <u>https://twitter.com/SuSaNa_project</u>

The social networks will be periodically fed with all the project related news. More information can be found in deliverable D01.1.

Additionally, the Promotion and Science Dissemination Department of the ICTP-CSIC is devoted to knowledge transfer and dissemination of the activities of the ICTP researchers at all levels, including social networks, which will be used for the communication of SuSaNa activities in its webpage (http://www.ictp.csic.es/ICTP2/es/divulgacion) and social media channels in Twitter (<u>@ictp promocion</u>) and <u>Youtube</u>.

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In addition to the project's and coordinator's channels, the rest of the partners will also use their social networks for promotion and dissemination activities of the project.

iii. Other activities

Other activities are considered as a means of dissemination of the science behind the project to a broader audience. The focus is put in **young people and children** in order to raise awareness not only in the specific results of the research involved, but rather at a more transversal and general level, in Energy, Climate Change Challenges, SGDs and women in STEM. In this sense, the participation in **Science Fairs** and events such as **European researchers' night, The Science Week of Madrid** as well as the involvement of the women researchers in the **International day of Women and Girls in Science** (11 February) and **SciFest** are foreseen. Moreover, activities involving young people as **Open days** for school and high school visits will be planned along the project's life, with special emphasis put in reaching the most disadvantaged social stratum, usually beyond the reach of this sort of activities. More specifically, SuSaNa will participate in the Pilot Program of *Científic@s en Prácticas* (Training Scientists)⁴ fostered by CSIC. This Pilot Program develops a 1-year project in four High Schools chosen among the least favoured areas in Madrid region.

3. Exploitation of results and commercialization plans

The rights on the intellectual property generated during the project will be defined and regulated in the consortium agreement that will be signed between the partners based on DESCA Model provided by the EU. In any case, the following general rules apply:

• Each Party will remain the owner of and will retain control of its own background, while granting access rights to its Background for project implementation if needed. Access Rights for exploitation purposes are subject to fair and reasonable compensation.

• The property of the results, arisen as a consequence of the execution and development of SuSaNa Project, shall be owned by the party that generates them. To the extent these results can be legally protected, the ownership of the Industrial Property Rights derived from such results will correspond to the Party or Parties that have created them.

• If more than one party have jointly generated results, they will share its ownership. The coownership of the parties will be established according to their intellectual and material contribution to the Project result and will act diligently and jointly to take the necessary steps to protect it.

• Joint owners will grant each other fair and reasonable compensation in case of commercial usage of the joint results and/or granting non-exclusive licenses Parties not established for the purpose of directly carrying on an industrial or commercial activity (for instance public research or academic bodies) "Fair and

⁴ https://aeac.science/ci-l-cientifics-en-practicas/

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Reasonable compensation" necessarily means a financial compensation in case of direct or indirect Exploitation of joint Results.

• Parties have the right to transfer ownership of its own results (licensing for exploitation) to third parties having its principal place of business in the European Union or Associated Country following the specific procedures detailed in the Consortium Agreement and Grant Agreement and ensuring that the other Parties will not be affected by that transfer.

• Transfer of results to third parties outside the European Union or Associated Country is subject to the approval of the parties and the Funding Authorities.

For the background/foreground results specific access are be fully defined in the consortium agreement.

3.1. IP management

The new IPR generated will be managed to ensure that any foreground is properly protected before any dissemination or communication on those results is generated. The Consortium Agreement addresses the framework and procedures to be followed by the project partners which intention will be to maximize opportunities for effective collaboration and exploitation or results that come from the project.

3.2. Commercialization plans

- CSIC, DTU and Uppsala Universities are public institutions with no commercialization purposes. Own
 or joint results can be patented by each of them and its exploitation licenced to third parties.
 Agreements will be signed in such case, which will be prepared and handled by department in each
 institution devoted to IPR and transference of results. Creation of new start-ups derived from
 research are supported in teach institution.
- FZJ is one of the largest interdisciplinary research centres in Europe and a member of the Helmholtz Association of German Research Centres. It is mainly funded by the Federal Ministry of Education and Research (BMBF), and other federal and state ministries in the implementation of programrelated funding. Due to this any kind of commercial exploitation of Intellectual Property e.g. royalty bearing activities require fair and reasonable compensation (financial) subject to a separate written agreement. For contract research the Research Centre applies a full cost calculation to comply the European State Aid Law.
- Altris is a company which core business is to produce and sell Prussian white cathode material. The coating technology to be developed within the project can be commercialised by implementation in the Prussian white production process. The recycling method can be exploited by communication to users and policy makers to promote sodium-based batteries.
- Phasetree is a scientific software company providing material design solutions through multiscale simulations. Its core competency is to extend electronic- and atomic-scale simulation results to predict mesoscale phenomena at material interfaces. The phase-field model of the electrode-electrolyte interface that predicts formation and growth of dendrites at varying conditions (i.e.,

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different material compositions, temperature, current density, etc.) will be incorporated to our software product as a phase-field simulation module.

 ACC will have the Na-ion battery recycling process at TRL4 by the end of project. After the project, ACC will investigate the recycling process at higher TRL, possibly at TRL6 (a pilot plant). Then, when the there is enough end-of-life batteries on the market, ACC will commercialize the recycling process to higher TRL (possibility at TRL8) utterly providing a new service.

Final remarks

The present deliverable gathers the strategy to follow by the SuSaNa consortiums in terms of data management, sharing and communication of results and outlines potential exploitation routes for each partner involved.

This is to be follow as a guideline for a proper and smooth implementation of the project and for an effective communication and dissemination of the project results, to maximise its impact during the project life time and beyond.

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