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GreenCharge Project Deliverable: D1.1

Data Management Plan

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GreenCharge is recognized as a CIVITAS project that will contribute to cleaner, better transport in Europe and beyond.

About GreenCharge

GreenCharge takes us a few important steps closer to achieving one of the dreams of modern cities: a zero-emission transport system based on electric vehicles running on green energy, with traffic jams and parking problems becoming things of the past. The project promotes:

Power to the people! — The GreenCharge dream can only be achieved if people feel confident that they can access charging infrastructure as and when they need it. So GreenCharge is developing a smart charging system that lets people book charging in advance, so that they can easily access the power they need.

The delicate balance of power — If lots of people try to charge their vehicles around the same time (e.g. on returning home from work), public electricity suppliers may struggle to cope with the peaks in demand. So we are developing software for automatic energy management in local areas to balance demand with available supplies. This balancing act combines public supplies and locally produced reusable energy, using local storage as a buffer and staggering the times at which vehicles get charged.

Getting the financial incentives right — Electric motors may make the wheels go round, but money makes the world go round. So we are devising and testing business models that encourage use of electric vehicles and sharing of energy resources, allowing all those involved to cooperate in an economically viable way.

Showing how it works in practice — GreenCharge is testing all of these innovations in practical trials in Barcelona, Bremen and Oslo. Together, these trials cover a wide variety of factors: *vehicle type* (scooters, cars, buses), *ownership model* (private, shared individual use, public transport), *charging locations* (private residences, workplaces, public spaces, transport hubs), energy *management* (using solar power, load balancing at one charging station or within a neighbourhood, battery swapping), and *charging support* (booking, priority charging).

To help cities and municipalities make the transition to zero emission/sustainable mobility, the project is producing three main sets of results: (1) *innovative business models*; (2) *technological support;* and (3) *guidelines* for cost efficient and successful deployment and operation of charging infrastructure for Electric Vehicles (EVs).

The *innovative business models* are inspired by ideas from the sharing economy, meaning they will show how to use and share the excess capacity of private renewable energy sources (RES), private charging facilities and the batteries of parked EVs in ways that benefit all involved, financially and otherwise.

The *technological support* will coordinate the power demand of charging with other local demand and local RES, leveraging load flexibility and storage capacity of local stationary batteries and parked EVs. It will also provide user friendly charge planning, booking and billing services for EV users. This will reduce the need for grid investments, address range/charge anxiety and enable sharing of already existing charging facilities for EV fleets.

The guidelines will integrate the experience from the trials and simulations and provide advice on localisation of charging points, grid investment reductions, and policy and public communication measures for accelerating uptake of electromobility.

For more information

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Executive Summary

This deliverable presents the first version of the GreenCharge Data Management Plan (DMP) and describes:

- **The guiding principles** for data management in the project
- **The legal framework** constituted by the General Data Protection Directive (GDPR)
- **Data Summary**: Overview of what data will be gathered and processed in the project
- How data will be stored and processed according to the H2020 **FAIR Data Management principles**, making data: finable, accessible, interoperable, and reusable.
- **Resource allocation**: The costs of making data FAIR in this project
- **Data Security**: How we intend to keep the data secure
- **Ethical aspects**: A summary of the ethics and privacy strategy in GreenCharge

The purpose of the DMP is to contribute to good data handling through indicating what research data the project expects to generate and describe which parts of the data that can be shared with the public. Furthermore, it gives instructions on naming conventions, metadata structure, storing of the research data and how to make public data available.

During the 36 active months of the project, a SharePoint site will be used as the online working and collaboration platform. SharePoint is only accessible to project participants and can provide further access control through establishing folders and sub-sites with stricter access granted than to the main site. During the project all *anonymised* (public) datasets will be uploaded to this site and stored in accordance with the ethics and privacy strategy of GreenCharge. *Non-anonymised* datasets will be stored locally by the designated Data Controllers for the three pilot sites, and not shared or distributed in any way to others. Metadata will be added to all datasets, and instructions on how to upload research data is provided.

GreenCharge will use the open research data repository *Zenodo* to comply with the Horizon 2020 Open Access Mandate. This mandate applies to the underlying research data of publications, but beneficiaries can also voluntarily make other datasets open. In GreenCharge, all deliverables, publications and the anonymous parts of the underlying datasets will be uploaded to the *H2020 GreenCharge Community* as well as the *European Commission Funded Research (OpenAIRE) Community* in Zenodo. Uploads will be done upon approval of the deliverables by the European Commission, upon publication or acceptance of scientific publications, or, for underlying datasets, at the end of the project at the latest. Each dataset will be given a persistent identifier (Digital Object Identifier, DOI), supplied with relevant metadata and linked to the project name and grant agreement number. Publications and underlying research data will be linked to a Creative Commons license which regulate reuse. Data security arrangements are defined for the SharePoint site and Zenodo. Ethical aspects related to data collection, generation and sharing have been considered and nothing in this project shall be deemed to require a party to breach any mandatory statutory law under which the party is operating. This includes any national or European regulations, rules and norms regarding ethics in conducting research.

The DMP is a living document and will be updated at the end of the project to reflect the actual research data generated during the project and include updated instructions for how to access open data. Day-to-day data management and monitoring will be done using an online list in the SharePoint site that will be continuously updated to reflect actual data generation. The maintenance of this list is the responsibility of the Project Coordinator, supported by the Data Controllers, the task leader for Task 5.3, and the Work Package (WP) leader of WP9 Ethics.

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List of Abbreviations, acronyms and definitions

Table 1: List of abbreviations

Abbreviation, acronym definition	Explanation
Anonymous data	Items of information that do not allow the identification of individuals in the data material, neither directly through names or personal ID numbers, nor indirectly through background variables, a list of names, connection keys, encryption formula, or codes. However, a combination of background variables such as gender, age, location, etc. increases the risk of identifying individuals in the data material. At this stage Green assess that withholding the person name is sufficient to ensure the privacy of the informants, but we will need to reassess this continuously
BibTeX	A reference management software for formatting lists of references.
CC license	Creative Commons licenses are tools to grant copyright permissions to creative work.
CC-BY	This CC-license lets others distribute, remix, tweak, and build upon your work, even commercially, if they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials.
CC-BY-NC	This CC-license lets others remix, tweak, and build upon your work non-commercially, and although their new work must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.
CC-BY-SA	This CC-license lets others remix, tweak, and build upon your work even for commercial purposes, if they credit you and license their new creations under the identical terms. This license is often compared to "copyleft" free and open source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use.
CSL	Citation Style Language An open XML-based standard to format citations and bibliographies.
Data controller	The institution/company/other legally responsible person who determines the purposes, conditions and means of the processing of *personal data*. The Data Controller is a formal position and involves requirements for compliance with a number of duties in the Personal Data Act (*GDPR*).
Data processor	An external person or business that processes *personal data* on behalf of the Data Controller. The law requires that this relationship should be regulated by a data processing agreement. Examples of a Data Processor can be an external (i.e. not employed at the data controlling institution) provider of online surveys, transcription service provider or an interpreter.
DMP	Data Management Plan
DoA	Description of the Action

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Abbreviation, acronym definition	Explanation
DOI	Digital Object Identifier
DPA	Data Protection Authority
EC	European Commission
EEA	European Economic Area (Norway, Iceland and Switzerland)
EV	Electric Vehicle
FAIR data	Findable, Accessible, Interoperable, Re-usable data
GA	Grant Agreement
GDPR	General Data Protection Regulation EU regulation (regulation (EU) 2016/679) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.
Gold Open Access	Open access publishing (gold open access) means that an article is immediately provided in open access mode on the publisher or journal's website. Some publishers charge Article Processing Chargers (APCs) to make articles open.
Green Open Access	Self-archiving (green open access) means that a published article or the final peer-reviewed manuscript is archived (deposited) in an online repository before, alongside or after its publication. In some cases, the author can choose to delay access to the article (embargo period). H2020 rules state that embargo periods cannot exceed six months, expect for publications in social science and humanities where the maximum embargo period is twelve months.
JSON	JavaScript Object Notation An open-standard file format.
MARCXML	An XML schema based on the common MARC21 standards.
OAI-PMH	The Open Archives Initiative Protocol for Metadata Harvesting.
Personal data	Personal data is any information that relates to an **identified or identifiable living individual**. Different pieces of information, which collected together can lead to the identification of a particular person, also constitute personal data. Personal data that has been de-identified, encrypted or **pseudonymised** but can be used to re-identify a person remains personal data and falls within the scope of the law. Personal data that has been rendered *anonymous* in such a way that the individual is not or no longer identifiable is no longer considered personal data. For data to be truly anonymised, the anonymisation must be irreversible.
Processing personal data	Processing personal data entails collecting, registering, storing and/or putting together and handing out personal data.
REST API	REST is an architectural style that defines a set of constraints to be used for creating web services. API means Application Programming Interface.
SSL/TLS	Secure Sockets Layer / Transport Layer Security These are protocols offering secure communication on the internet.

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Abbreviation, acronym definition	Explanation
Zenodo	Zenodo is a catch-all research data repository that enables researchers, scientists, EU projects and institutions to share research results, make research results citable, and search and reuse open research results from other projects. Zenodo is harvested by the OpenAIRE portal and hosted by the CERN cloud infrastructure.

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1 About this Deliverable

1.1 Why would I want to read this deliverable?

It provides an easy overview of research data the project is expected to generate, the types and formats of this data, and how this data is processed and stored to make them findable, accessible, interoperable and re-usable, according to the principles of FAIR data management. The purpose of the DMP is to contribute to good data handling during the project's lifetime, and to describe how such data will be curated and preserved.

1.2 Intended readership/users

Internally in the project:

- All project participants who are responsible for, or in any way involved with, data collection and data handling can use this document, in addition to deliverable 9.1 POPD Requirement no. 1 describing the project's ethics and privacy strategy, for instructions on how to handle, store and process data.
- All project participants can use this document to get an overview of all data collected in the project and how this is processed and stored.

External audience:

- **Section 3, 4**: All relevant stakeholders who are interested in GreenCharge related activities and research topics can use this document to get an overview of the data collected in the project, how to access this data, and, if applicable, how to re-use this data in their own activities.
- **Section 2, 4, 6, 7:** All persons who voluntarily participate in the pilots and contribute data to the project can use this document to learn how the project processes and store their data.

1.3 Other project deliverables that may be of interest

- **Deliverable 5.1 Evaluation Design for business model and technology prototype evaluation** and **Deliverable 6.1 Stakeholder acceptance Evaluation Methodology:** Describes the methodology for data collection.
- **Deliverables 2.4 Implementation plan for Oslo pilot / 2.10 Implementation plan for Bremen pilot / 2.17 Implementation plan for Barcelona pilot:** Describe the methods for data collection in the pilots.
- **Deliverables 4.1 Initial Architecture Design and Interoperability Specifications / 4.2 Final Architecture Design and Interoperability Specifications:** Describe the automated data collection and add detail to the technical measures for protection of data (secure storage, access control, etc.) and specifies functionality required by the GDPR (ability to see data, delete data, etc.).
- **Deliverables 5.2 Simulation and Visualisation tools** (initial version) / **5.3 Simulation and Visualisation tools** (final version) / **5.4 Intermediate Results for Innovation Effects Evaluation** / **5.5 Final Results for Innovation Effects Evaluation / 6.2 Data collection and Evaluation Tools**, and **6.3 Intermediate evaluation results for stakeholder acceptance analysis / 6.4 Stakeholder acceptance evaluation and recommendations**: These deliverables will all use the data collected and present the results of analysis of this data.
- **D8.2 Dissemination and exploitation plan** (V1) / **8.3 Dissemination and Exploitation Plan** (V2): These deliverables describe the plans for dissemination and exploitation of results and the completed and planned communication activities, and will help achieve widespread knowledge of where and how research data from the project can be accessed for reuse.

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2 Introduction

2.1 Guiding principle

The guiding principle of the GreenCharge project is to be an *open* project, with 48 out of 55 deliverables in the project being publicly available. Of the 7 that are not public, 2 are administrative reports and the remaining 5 are initial plans or prototypes. Figure 1 illustrates the main procedure used in the project to ensure open access to research data and publications.

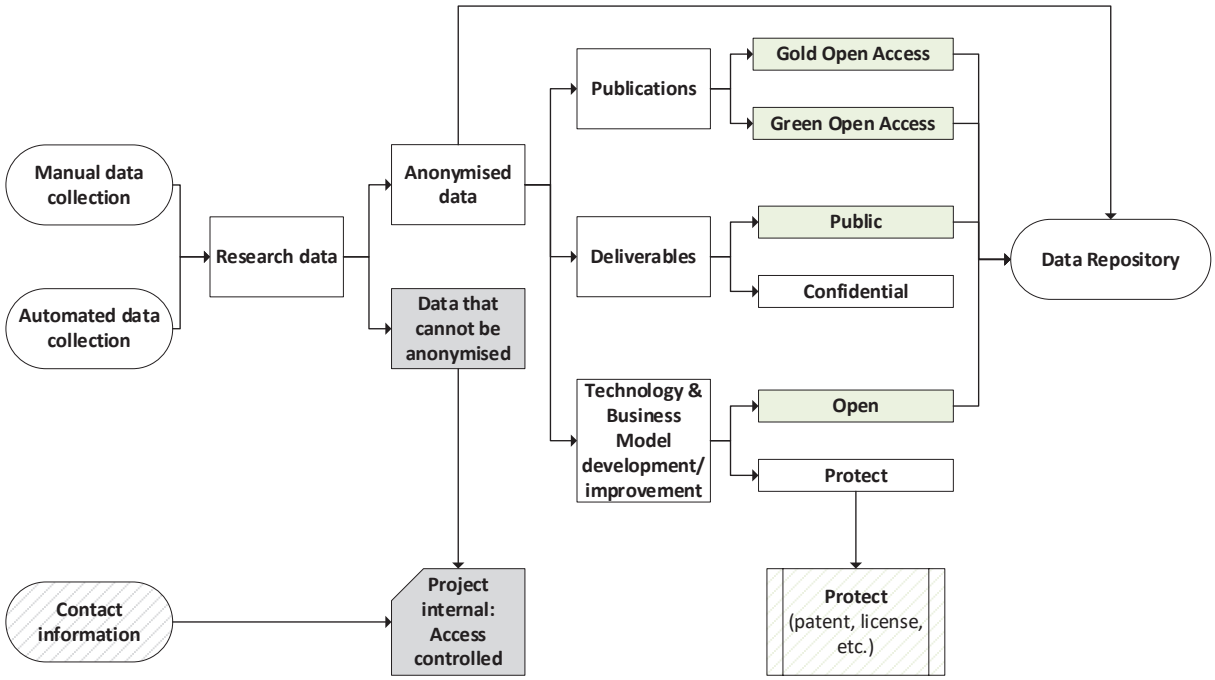

Figure 1: GreenCharge data management procedure

To protect the privacy of individual participants in the pilots, only data that can be irreversibly anonymised to the degree that it is impossible to identify individuals will be shared publicly. Non-anonymised data will be kept internally in the project and used as input to project work, but never shared publicly in its original format. Both the anonymised and non-anonymised data will, in an aggregated format, feed into project work and provide basis for analysis in deliverables and scientific publications. If the editor of a deliverable is concerned that their deliverable contains personal information, they request a separate screening for privacy and ethics issues before submission to be sure that no personal data is included. The leader of WP9 Ethics is responsible for performing these screenings. Public deliverables, publications and anonymised datasets will be shared openly through an open research data repository (see section 3.5).

During the lifetime of the project, partners might discover business opportunities based on the project's results that can lead to commercial exploitation. This will be monitored by the Innovation Manager, and if cases arise appropriate steps to protect such results for exploitation purposes will be taken. As Figure 1 shows, data underlying such results will not be openly shared.

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2.2 Legal Framework

As of May 2018, the General Data Protection Regulation (GDPR)[1] is applicable in all Member States in the European Union, as well as in the countries in the European Economic Area (EEA). GDPR updates and modernises existing laws on data protection to strengthen citizens' fundamental rights and guarantee their privacy in the digital age.

GDPR regulates the processing by an individual, a company or an organisation of personal data relating to individuals in the EU[2]. It does not apply to the processing of personal data of deceased persons or of legal entities. It sets down one set of data protection rules for all companies and organisations operating anywhere in the EU and European Economic Area (EEA), for two main reasons: 1) to give people more control over their personal data, 2) level the playing field for businesses and organisations operating in the EU and EEA. GDPR grant individuals a set of rights that must be protected by any actor who processes personal data. The individual rights include the right to:

- information about the processing of your personal data;
- obtain access to the personal data held about you;
- ask for incorrect, inaccurate or incomplete personal data to be corrected;
- request that personal data be erased when it's no longer needed or if processing it is unlawful;
- object to the processing of your personal data for marketing purposes or on grounds relating to your particular situation;
- request the restriction of the processing of your personal data in specific cases;
- receive your personal data in a machine-readable format and send it to another controller ("data portability"); and
- request that decisions based on automated processing concerning you or significantly affecting you and based on your personal data are made by natural persons, not only by computers. You can also have the right in this case to express your point of view and to contest the decision.

2.3 Permissions for collecting and handling personal data

All data collected from stakeholders in the project will be done in accordance with applicable ethical standards and requirements in the respective countries of the data collection, as well processed and handled securely and in line with applicable rules and regulations on privacy and data protection.

The national Data Protection Authorities (DPA) in the countries where data collection will be performed (Norway, Germany, Spain) have been notified of the project activities and the project has received approvals from these to collect and process personal data[3]. In accordance with these approvals, the following partners will have the role as *Data Controllers* in the project, one for each pilots site:

- Oslo pilot: SINTEF AS (SINTEF)
- Bremen pilot: Personal Mobility Center Nordwest eG (PMC)
- Barcelona pilot: Fundacio Eurecat (EUT)

Only parts of the data collected by GreenCharge will be personal data (see section 3.2). In case other partners require access to process personal data, they must request this from the Data Controllers, and if granted a data processing agreement will be set up between the Data Controller and the partner requesting access.

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[1] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32016R0679

[2] https://ec.europa.eu/info/law/law-topic/data-protection/reform/what-does-general-data-protection-regulation-gdpr-govern_en

[3] The approvals from the DPAs have been submitted to the EC along with the ethics and privacy strategy of GreenCharge in Deliverable 9.1 POPD Requirement no. 1, which is a confidential deliverable.

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All personal data will be collected only upon receiving informed consent from the participants, and any participant providing personal data can at any time withdraw their participation and related data from the project. The privacy, ethics and procedures for obtaining informed consent are described in detail in deliverable 9.1, and a short summary is provided in section 7.

Before any publications (e.g. scientific papers, public deliverables) with the potential of containing personal data is released to the public, it will go through an ethics and privacy screening to ensure that all data included is anonymised, aggregated and/or analysed in such a way as to ensure that none of the content can be traced back to an individual participant or respondent. The leader of WP9 Ethics is responsible for these checks.

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3 Data Summary

Appendix A, on page 28, provides a list of all datasets currently expected to be generated in the GreenCharge project and their planned accessibility. We recognise that this list will develop and grow as the project evolves.

3.1 Purpose of data collection and generation

The overall motivation for data collection in GreenCharge is to facilitate evaluations and learning. GreenCharge will empower cities and municipalities to make the transition to zero emission/sustainable mobility with innovative business models, technologies and guidelines for cost efficient and successful deployment and operation of charging infrastructure for Electric Vehicles (EV). This involves evaluating the proposed solutions in pilots to test their effect, as well as gathering input and feedback from citizens and users in order to improve solutions, increase user acceptance, encourage behavioural change, and achieve more optimal energy use in electric mobility.

Only data that is needed to perform project activities will be collected, and as far as possible, participants will not be asked to provide personal data unless this is necessary (see section 3.2).

3.2 Data types, formats and size

Types of data

Some of the data the project will collect and generate is classified as personal data, such as names, IP address, residence of participants, and car license and registration numbers for EV owners. This data must be irreversibly anonymised before being made public. If such data cannot be irreversibly anonymised, it will remain confidential and only managed by designated Data Controllers in the project. If a partner who is not a Data Controller needs access to process data (Data Processer), an assessment of this will be done by the Data Controller and if granted a specific Data Processing Agreement will be set up between the Data Controller and the partner requesting access. A template for Data Processing Agreement is provided in appendix B. Non-anonymous data, although not openly shared in the project or beyond, can still provide input to deliverables and publications, but only analysis of the aggregated data, which cannot be linked to individual participants, will be made public.

The data collected in GreenCharge can be split into the following three categories (details on datasets provided in appendix A):

1. Manually collected data:
   A. Data on Electric Vehicle (EV) charging behaviour (e.g. frequency of charging, willingness to share energy from vehicle batteries)
   B. Data on energy use (e.g. information on energy use in general and willingness to share energy and change behaviour)
   C. Data on user acceptance
   D. Demographic data (e.g. age, gender, residence, ownership of EV)
   E. Car ownership information (e.g. car licence/registration number, customer registration number for EV charging)
   F. Pictures, audio and video (from pilots and workshops)

2. Data automatically collected through technology:
   A. Data on Electric Vehicle (EV) charging (e.g. location of charging point, energy amount, time of charging)
   B. Data on energy use in general in housing associations (e.g. energy profiles of common facilities at Røverkollen housing cooperative in Oslo)

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3. Contact Information
   A. Project partner representatives
   B. Project external individuals who voluntarily participate in project and pilot activities

Data will be organised in datasets relating to the category of the data and site of collection.

Data formats

A dataset can include different types of formats. As an example, a manually collected dataset concerning user acceptance can consist of both written interview notes, audio files from interviews, pictures from pilot sites, and survey responses. Some of this data cannot be anonymise within the scope of this project (e.g. audio files), so in most cases only parts of a dataset can be made openly available. Concerning the automatically collected data the project expects to deliver these datasets anonymised as open research data.

GreenCharge will only use widely accepted formats for data generation, such as:

- Documents/Reports/Publications: .PDF/A, txt, doc/docx
- Spreadsheets: .xls/.xslx
- Databases: .cvs
- Audio files. .mp3, .wav, .wma, .ra
- Pictures: jpg, png
- Video: avi, flv, mov, mp4, wmv

3.3 Origin of data

GreenCharge will collect data at three main locations: Oslo, Bremen and Barcelona. Depending on the type of data, there will be various methods and origins of data collection involved at each site.

For manually collected data the main origins will be:

- Interviews with groups and individual participants in the pilots at each site
- Feedback from participants at stakeholder workshops
- Survey responses
- Market survey
- Literature study/review and open data (re-use of existing data)

For automatically collected data the main origins will be:

- Automated data collection at EV charging points located at a pilot site
- Mobile phone application voluntarily downloaded by participants

3.4 SharePoint and metadata provision

All anonymised datasets will be stored in a SINTEF SharePoint project site. This will be the project's online collaboration platform during the project lifetime, and for up to 4 months after the end of the project for final closing activities (see section 4.4.2). Data Controllers at each pilot site will be responsible for uploading their public datasets to SharePoint. All datasets will use standard SharePoint version control.

The non-anonymous datasets will be stored locally by the Data Controllers and not shared with others, with the exception of project generated contact lists which will be stored in a strict access-controlled SharePoint folder. More details on how contact data will be handled is provided in section 7.2.7.

The following list describes the metadata that will be provided for each dataset:

- File name
- Date
- Version
- File type
- Description
- WP (Work Package) number
- Responsible person
- Lead partner / Data Controller
- Dissemination level

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3.5 Zenodo

GreenCharge will use the open research data repository *Zenodo* to comply with the H2020 Open Access Mandate[4]. All scientific publications, including public deliverables and public parts of underlying datasets will be uploaded to the *H2020 GreenCharge Community*[5] in addition to the *European Commission Funded Research (OpenAIRE) Community*[6] in Zenodo.

Zenodo is a "catch-all" open research data repository which gathers research data across all disciplinary fields. It is for non-military purposes only, and the repository is hosted and managed by CERN. All data deposited to Zenodo is stored securely in the CERN Data Centre's cloud infrastructure[7] (see section 6.2).

3.6 Instructions for uploading datasets to SharePoint

Table 2 and Figure 2 details the instructions to project participant on how to upload datasets to SharePoint and Zenodo.

Table 2: Instructions for uploading datasets

Upload instructions - GreenCharge Sharepoint Site

• Please upload all public datasets to this folder in the GreenCharge Sharepoint site:
  ○ *Research Data*
  ▪ There is one sub-folder per pilot site
• Use this naming convention (for details see 4.1.4):
  ○ *Descriptive text H2020_Acronym_DeliverableNumber_UniqueDataNumber*
  ○ *Descriptive text H2020_Acronym_PublicationNumber_UniqueDataNumber*
• Be sure to use the same file name when uploading later versions
• Register mandatory metadata on your data set by adding a new item to this list, located in the same folder. This list will also generate a Unique Data Number for your dataset:
  ○ *GreenCharge Research Data*

Upload instructions - Zenodo

• Scientific publications, public deliverables and public datasets must also be uploaded to the *H2020 GreenCharge Community* ***AND*** the *European Commission Funded Research (OpenAIRE) Community* in Zenodo. To do this you must complete the following steps:
  ○ Create a profile in Zenodo to be able to upload files
  ○ Click on the GreenCharge link above, or search for "*H2020 GreenCharge*" under the "Communities" tab at the top of the Zenodo site
  ○ On the Community site, click the green "New upload" button in the top right corner
  ○ Enter requested data and confirm the upload. The information requested is located in the metadata list on SharePoint (*GreenCharge Research Data*)
  ○ Remember to add the European Commission community in the box labelled "communities". You can use the search function to locate the community and add it. The data will then automatically be uploaded to both communities, so you don't have to do it twice.
• Uploading should be done as soon as possible and at the latest on article publication. Data Controllers are responsible for uploading datasets generated by them.

[4] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf
[5] https://zenodo.org/communities/h2020-greencharge/?page=1&size=20
[6] https://zenodo.org/communities/ecfunded/?page=1&size=20
[7] https://zenodo.org/

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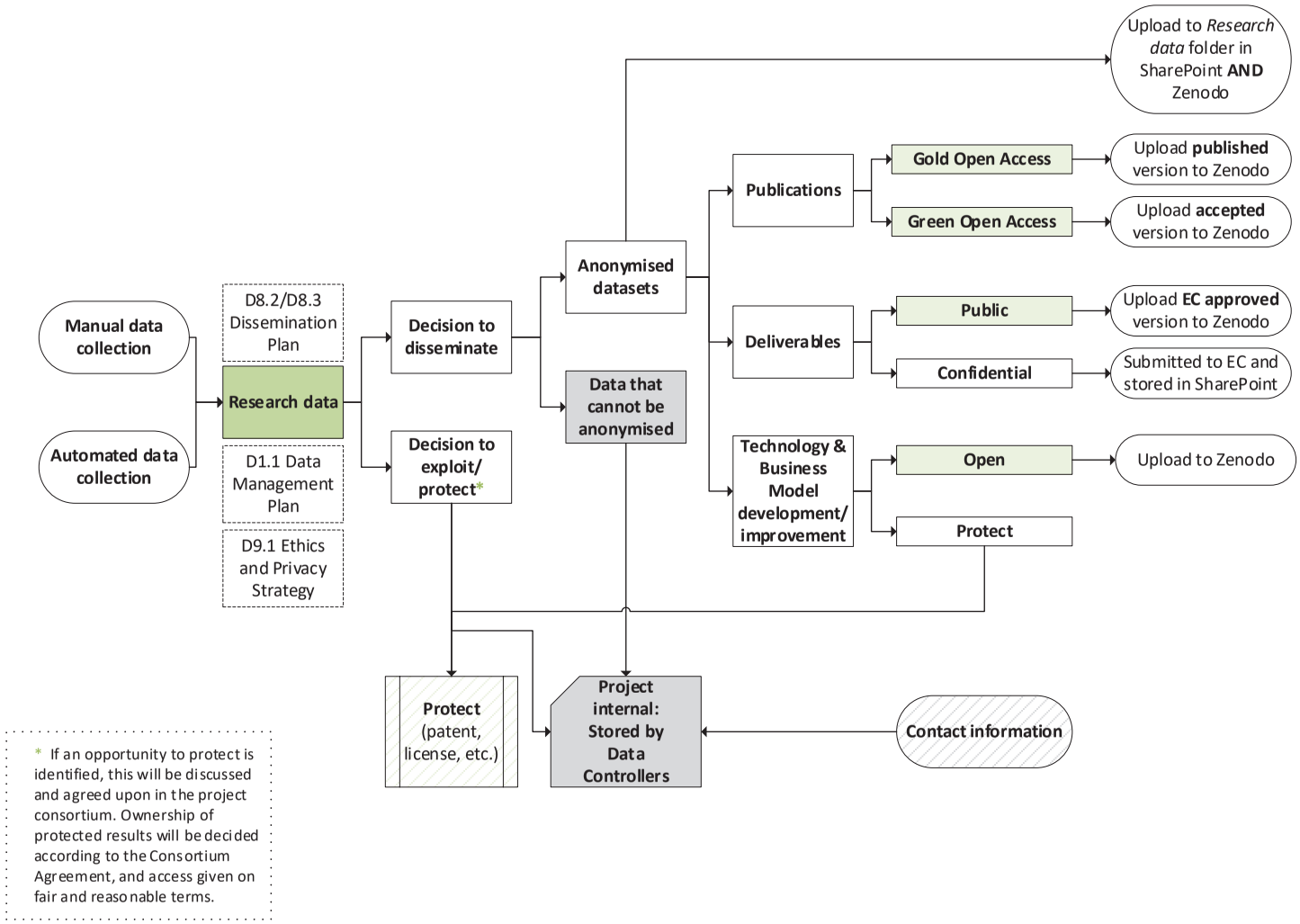

Figure 2: Process for uploading datasets

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4 FAIR Data Management

GreenCharge will manage data in accordance with the principles of **FAIR data management**[8] (Findable, Accessible, Interoperable and Re-usable data) The project aims to maximise access to, and re-use of research data generated by the project. At the same time, there are datasets, or parts of datasets, generated in this project that cannot be shared in order to protect the privacy of voluntary participants in the pilots. Appendix A provides a current overview on the datasets GreenCharge expects to generate and their accessibility.

4.1 Making data findable

4.1.1 The H2020 GreenCharge Community in Zenodo

GreenCharge will use the Zenodo repository as the main tool to make our research data findable in accordance with the H2020 Open Access Mandate.

A *H2020 GreenCharge*[9] community has been established on the Zenodo website, and the project will upload all our public datasets and deliverables as well as scientific publications to this community. In addition, we will link all our uploads to the *European Commision Funded Research (OpenAIRE)* community for maximum findability. All uploads will be enriched with standard Zenodo metadata, including Grant Number and Project Acronym. Zenodo provides version control and assigns DOIs to all uploaded elements.

4.1.2 Metadata in Zenodo

Metadata associated with each published data set in Zenodo will by default be as follows:

- Digital Object Identifiers
- Version numbers
- Bibliographic information
- Keywords
- Abstract/description
- Associated project and community
- Associated publications and reports
- Grant information
- Access and licensing info
- Language

In addition, we will add the project name and GA number

4.1.3 Approach to search keywords

The Data Controllers at each pilot site will be responsible for uploading public datasets that they have generated and to assign specific keywords relevant to these datasets. Dataset specific keywords must be descriptive to the content of the dataset. E.g., a dataset containing information on EV user acceptance should be tagged with corresponding keywords such as, "*EV user acceptance*". In addition, the project has defined a set of general keywords that should apply to all public datasets, scientific publications and public deliverables. These are as follow:

- Electric Mobility
- E-mobility
- Zero Emission Transport
- Energy Smart Neighbourhoods
- Sharing Economy

[8] http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf
[9] https://zenodo.org/communities/h2020-greencharge/?page=1&size=20

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 769016.

4.1.4 Naming conventions

Datasets will be named using the following naming conventions:

DS_PilotCode_DataCategoryNr_DataController_Description_H2020_Acronym_UniqueDataNr

Explanation of the naming convention:

- "DS" stands for dataset
- The pilot site identification codes are as follows:
  - Oslo: OSL
  - Bremen: BRE
  - Barcelona: BCN
- "DataCategoryNr" refers to the list of data categories described in section 3.2:
  - 1 = Manually collected data
  - 2 = Automatically collected data
  - 3 = Contact information
- "DataController" refers to the short name of the partner/Data Controller who is responsible for the dataset. GreenCharge has three Data Controllers, one for each pilot site (see section 2.3 for overview).
- "Description" refers to a *short* description of the content of the dataset (see example)
- "UniqueDataNr" is the number automatically generated by the research metadata list in SharePoint (see section 3.6).

Example of dataset name: *DS_2_OSL_SINTEF_EV-ChargingProfiles_H2020_GreenCharge_0001*

4.1.5 Versioning

Zenodo provides DOI versioning of all datasets uploaded to their communities, which allows us to edit and update the uploaded datasets after they have been published. This also allows us to cite specific versions of an upload and cite all versions of an upload. As an example, DOI versioning of an uploaded software package that is released in two versions can look like this[10]:

- v1.0 (specific version): 10.5281/zenodo.60943
- v1.1 (specific version): 10.5281/zenodo.800648
- Concept (all versions): 10.5281/zenodo.705645

The first two DOIs for versions v1.0 and v.1.1 represent the specific versions of the software. The last DOI represents all the versions of the given software package, i.e. the concept of the software package and the ensemble of versions. They are therefore also referred to as *Version DOIs* and *Concept DOIs*, but technically they are both normal DOIs.

This does not, however, mean that you will receive a new DOI each time you edit the metadata related to your upload (e.g. change the title of a file or dataset). A new DOI version will only be created if you update the actual files you have uploaded.

[10] http://help.zenodo.org/ (DOI versioning)

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4.2 Making data accessible

The H2020 Open Access Mandate aims to make research data generated by H2020 projects accessible with as few restrictions as possible, but also accept protection of personal or sensitive data due to privacy concerns and/or commercial or security reasons.

All public datasets, scientific publications and deliverables will be uploaded to Zenodo and made openly available, free of charge. Publications and underlaying data sets will be linked through use of persistent identifiers (DOI versioning). Data sets with dissemination level "confidential" (non-anonymous datasets) will not be shared due to privacy concerns. Potentially, some datasets might be restricted due to protection for commercial exploitation. If such cases arise during the project, this will be informed in the final version of the DMP.

Metadata including licences for individual data records as well as record collections will be harvestable using the OAI-PHM protocol by the record identifier and the collection name. Metadata is also retrievable through the public REST API. The data will be available through www.zenodo.org, and hence accessible using any web browsing application.

The list of expected datasets in appendix A constitutes the first version of dataset description and we recognise that it will develop and grow as the project evolves. In addition, some information concerning the datasets remain unknown at this time, e.g. size of the datasets. An updated version of this list will be provided at the end of the project. Furthermore, information on how GreenCharge will handle and process pictures and video is described in section 7.2.3, and how we handle and process contact information is described in section 7.2.7.

4.3 Making data interoperable

Zenodo uses JSON schema as the internal representation of metadata and offers export to other formats such as Dublin Core, MARCXML, BibTeX, CSL, DataCite and export to Mendeley. The data record metadata will utilise the vocabularies applied by Zenodo. For certain terms, these refer to open, external vocabularies, e.g.: license (Open Definition), funders (FundRef) and grants (OpenAIRE). Reference to any external metadata is done with a resolvable URL.

4.4 Reusable data

The GreenCharge project will enable third parties to access, mine, exploit, reproduce and disseminate (free of charge for any user) for all *public* data sets, and regulate this by using Creative Commons Licences.

4.4.1 Recommended Creative Commons (CC) licences

Application of licences will be assessed on a case-by-basis in close collaboration with the Coordinator, Innovation Manager and partners concerned.

If applicable, GreenCharge will use Creative Commons licences (CC), which are tools to grant copyright permissions to creative work. As a default, the CC-BY-SA license will be applied for public GreenCharge data. This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. This license is often compared to “copyleft”, free and open source software licenses. With this licence all new work based on GreenCharge data and results will carry the same license, so any derivatives will also allow commercial use. This does not preclude the use of less restrictive licenses as CC-BY or more restrictive licenses as CC-BY-NC, which does not allow commercial usage.

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4.4.2 Longevity of the GreenCharge research datasets

Public (anonymous) data

For data published in scientific journals, the underlying data will be made available no later than by journal publication. The data will be linked to the publication. Data associated with public deliverables will be shared once the deliverable has been approved and accepted by the EC. For other public datasets not directly linked to a scientific publication or deliverable, such datasets will be made available upon assessment by the Data Controllers that it is ready for publishing, and in the final month of the project at the latest.

Open data can be reused in accordance with the Creative Commons licences. Data classified as confidential will as default not be reusable due to privacy concerns.

The public data will remain reusable via Zenodo for at least 20 years. This is currently the lifetime stated by the host laboratory CERN. In the event that Zenodo has to close their operations, they have provided a guarantee that they will migrate all content (including metadata) to other suitable repositories.

Confidential (non-anonymous) data

All non-anonymous data will be deleted at the end of the project. In case permission is given by the party providing and owning the data, some non-anonymous data will be kept for a maximum of 4 months after the contractual end date of the project[11]. The additional 4 months is to keep the underlying datasets available to allow the completion of any scientific publications being prepared towards the end of the project.

An exemption is pictures and videos, taken with consent from voluntary pilot participants, that are used for communication purposes. If consent is *not* withdrawn at an earlier time, such data will be kept for up to 4 years after the end of the project in order to comply with the EC contractual obligation to continue dissemination and exploitation activities after the project ends. If a party withdraws the consent to use this material (pictures, videos), it will be deleted without delay.

Classification of research outputs

The process of classifying research outputs from GreenCharge follows the guidelines provided in the "*H2020 Guidance for the classification of information in research projects*"[12] and will be described in the D1.2 Project Management Handbook.

[11] At present, the contractual end date of the GreenCharge project is: 2021-08-31. However, changes can be made to this date during the project, e.g. in case of a project extension, and the final version of the DMP will provide the exact date.
[12] H2020 Programme. *Guidance for the classification of information in research projects*. Version 2.1. 26 October 2016. https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/secur/h2020-hi-guide-classif_en.pdf

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 769016.

5 Allocation of resources

Costs

GreenCharge uses standard tools and a free of charge research data repository. The costs of data management activities are limited to project management costs and will be covered by allocated resources in the project budget.

Long-term preservation of the public data is ensured through Zenodo. Other resources needed to support reuse of data after the project ends will be solved on a case-by-case basis.

Data Manager

The overall responsibility for data management lies with the project coordinator, Mr. Joe Gorman from SINTEF.

Supporting the coordinator is a data management team consisting of the Data Controllers for each pilot site (BREMEN, EUT, SINTEF), the leader of WP9 on ethics (SINTEF), and the task leader of Task 5.3 *Research Data Management* (SUN).

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 769016.

6 Data security

In this chapter, the security features of the research data infrastructure used to store and handle data in the GreenCharge project are described.

6.1 Data security as specified for SINTEF SharePoint

SINTEF SharePoint is the online collaboration platform used the GreenCharge project. A dedicated project site has been established on this platform, accessible only by the partner representatives in the consortium. Furthermore, a dedicated folder for research datasets is set up, allowing for stricter access control than the main project site. Only anonymous datasets will be uploaded to this SharePoint folder.

The GreenCharge Sharepoint site has the following security settings:

- Access level: Restricted to persons (project members only). Further access restrictions on specific folders is enabled.
- Encryption with SSL/TLS protects data transfer between partners and the SINTEF SharePoint site.
- Threat management, security monitoring, and file-/data integrity prevents and/or registers possible manipulation of data.

Documents and elements in the SINTEF SharePoint sites are stored in Microsoft's cloud solutions, based in Ireland and the Netherlands. There will be no use of data centres outside EU/EEA (Norway, Iceland and Switzerland) or in the US.

Nightly back-ups are handled by SINTEF's IT operations contractor. As a baseline, all project data will be stored for 10 years according to SINTEF's ICT policy, unless otherwise agreed in contracts and data processing agreements.

6.2 Data security as specified for Zenodo

The following list describes the security settings for Zenodo:

- Versions: Data files are versioned. Records are not versioned. The uploaded data is archived as a Submission Information Package. Derivatives of data files are generated, but original content is never modified. Records can be retracted from public view; however, the data files and records are preserved.
- Replicas: All data files are stored in the CERN Data Centres, primarily Geneva, with replicas in Budapest. Data files are kept in multiple replicas in a distributed file system, which is backed up to tape on a nightly basis.
- Retention period: Items will be retained for the lifetime of the repository. The host laboratory of Zenodo CERN, has defined a lifetime for the repository of the next 20 years minimum.
- Functional preservation: Zenodo makes no promises of usability and understandability of deposited objects over time.
- File preservation: Data files and metadata are backed up nightly and replicated into multiple copies in the online system.
- Fixity and authenticity: All data files are stored along with an MD5 checksum of the file content.
- Files are regularly checked against their checksums to assure that file content remains constant.
- Succession plans: In case of closure of the repository, a guarantee has been made from Zenodo to migrate all content to suitable alternative institutional and/or subject based repositories.

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7 Ethical aspects

7.1 Legal aspects

The legal aspects that impact data sharing is described in section 2.2 *Legal framework*. The proposed work in GreenCharge will fully comply with the regulations set out in the GDPR. In addition, GreenCharge comply with the principles of the European Charter for Researchers, the European Code of Conduct for Research Integrity, including ethical standards and guidelines, regardless country in which research is carried out.

Nothing in this project shall be deemed to require a party to breach any mandatory statutory law under which the party is operating. This includes any national or European regulations, rules and norms regarding ethics in conducting research.

The ethical aspects impacting the GreenCharge project are described in detail in deliverable 9.1 *POPD – Requirement No 1* and responds to the findings of the ethics review performed by the European Commission in the proposal evaluation phase. However, since deliverable 9.1 is a confidential document, a summary of the ethics and privacy strategy is included in section 7.2. The template for the information letter and the informed consent form that will be used when collecting data from voluntary participants in the pilots is included in appendix C and D.

7.2 Summary of Ethics and Privacy Strategy

7.2.1 Commitment to ethical principles

All project partners are obliged by European and national law (GDPR) to protect personal data.

The coordinator of the GreenCharge project, SINTEF, follow ethical guidelines in its work, and *all* work conducted by SINTEF is subject to the SINTEF Ethics Council and the appointed Ethics Representative. SINTEF will also ensure that all participants in the GreenCharge project follows the ethical guidelines of SINTEF. Important aspects with respect to this are:

- The ethical guidelines are based on the vision of using science and technology to create a better society and are reviewed continuously to ensure they stay up to date with developments in society and the challenges of today. They generally fall into these categories: research ethics, business ethics, and ethics in interpersonal relationships.
- SINTEF is a member of the UN Global Compact and Transparency International, and SINTEF's ethics are guided by the principles highlighted by these organisations, as well as based on the regulations of the national ethics committees, the principles promoted by the European Group on Ethics in Science and New Technologies (EGE), and on international conventions such as the Vancouver Convention. When dilemmas of research ethics require an assessment beyond the scope of our guidelines, our Ethics Council and Ethics Representative, we refer to statements from the EGE.
- All SINTEF's employees are expected to act in accordance with the ethical guidelines and principles. As coordinator of the GreenCharge project, SINTEF will ensure that any ethical issues, which may arise, will be handled appropriately and in a transparent and fair manner.

7.2.2 Privacy strategy

To ensure compliance with all applicable ethical and privacy requirements, the privacy strategy encompasses all data assurance activities that will be performed in the context of the GreenCharge project. Figure 3 provides an overview of deliverables and activities related to the data collection from the pilots.

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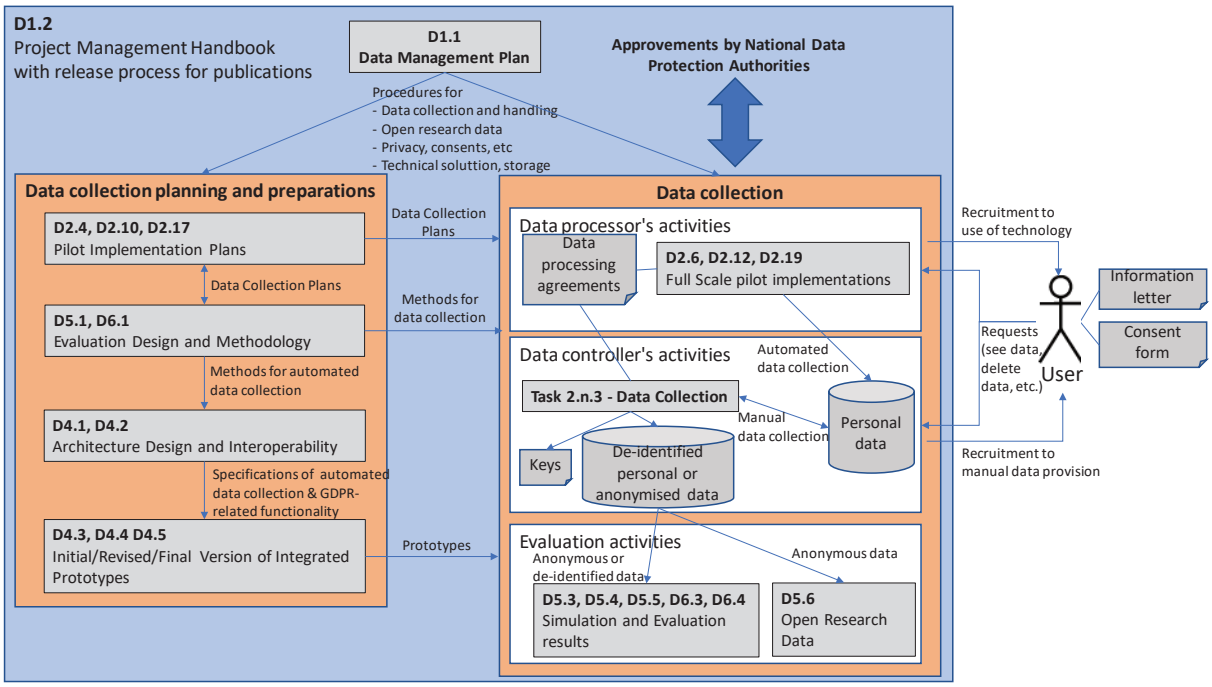

Figure 3: Processing personal data from pilots in GreenCharge

For information on how GreenCharge will handle and process contact information, which is considered personal data not directly linked to the pilots, see section 7.2.7.

7.2.3 Collecting personal data from pilots

Data collection activities (interviews, surveys, etc.) will be designed to maintain privacy. Personal data will not be requested unless this is absolutely necessary. Vulnerable groups like minors and individuals unable to freely provide an informed consent will be excluded. Participation is voluntary. Participants will be given the possibility to decline and withdraw their participation at any time.

GreenCharge will collect pictures and video for use in communication activities (website, newsletter, social media, see section 4.4.2). Pictures and video can contain personal data if an individual is the focus of the image or video. Examples include: 1) pictures/video of individuals stored together with personal details (e.g. identity cards); 2) pictures/video of individuals posted on the project website along with biographical details; 3) individual images published in a newsletter. Examples of pictures and video that is unlikely to contain personal data are: 1) pictures/video where people are incidentally included in an image or are not the focus (e.g. at a big conference/workshop); 2) images of people who are no longer alive (the GDPR only applies to living people, see section 2.2).

When collecting pictures and video GreenCharge will follow established guidance and best practice on collecting and processing such data to ensure that we adhere to the legal requirements (e.g. guidance established by the University of Reading, UK[13]). Under no circumstances will pictures containing personal information be publicly shared without the subject's explicit consent.

7.2.4 Information letter and consent form

The participants will be given an information letter and a consent form (on paper or electronically). The information letter will provide information about:

[13] https://www.reading.ac.uk/internal/imps/DataProtection/DataProtectionRequirements/imps-d-p-photographic.aspx

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- The type of data that will be collected during the study.
- How the data will be collected (interview, automatic data collection, etc.)
- What the data will be used for. The information letter will explain the purpose of the project and the expected results. It will also be explained that published information always will be anonymous, and that no personally identifiable information will be published in any way.
- How the data collected will be handled. The information letter will explain that personal data will be treated in full confidentiality and will be registered and stored in a secure manner. The data will be de-identified before it is processed (name or other characteristics serving to identify person will be replaced by a number and the list of identifiers will be kept separate from the data).
- Who will have access to the data. The information letter will state that data will be handled by a very limited number of authorised personnel and that confidentiality will be regulated by legal agreements. The data will be de-identified before it is discussed and processed within the project.
- The rights of the participants. The information letter will state that participation is voluntary and that participants have the right to see the data collected about them and that they can withdraw from the study at any time without any obligation to explain their reasons for doing so (contact information for such requests will be provided).

7.2.5 Protecting personal data collected from pilots

Personal data will be handled in accordance with European legislation on privacy (GDPR). Under no circumstance will the deliverables or processes compromise the individual right to privacy and satisfactory handling of personal data.

All personal data will be stored on secure servers with access control managed by the Data Controllers. Personal data will be handled by authorised personnel, and no one will have access to the data unless this is necessary to carry out the project work.

7.2.6 Using and sharing data from pilots

Analysis of the data (e.g. in evaluations) will be carried out on de-identified and anonymised data.

At the end of the project, all personal data (audio and video files included) will be deleted, and the de-identified data will be completely anonymised, meaning that the links to the lists of keys will be deleted. No personal data will be stored after the end of the project, unless explicit consent to do this is given by the provider/owner of the data (see section 4.4.2). If such permission is given, non-anonymous data will be stored for a maximum of 4 months after the contractual end of the project (to allow for finalisation of scientific publications).

For other non-anonymous data, such as pictures and videos used for project communication activities, these will be kept for up to 4 years after the end of the project (see section 4.4.2 for more information). Such data will be shared, upon explicit consent only, through the project website, newsletters, and social media. If a party withdraws the consent to use this material (pictures, videos), it will be deleted without delay.

The anonymous data will be documented and archived in a research data repository as open research data, and thus placed at the disposal of colleagues who want to replicate the study or elaborate on its findings.

Any publications, including publications online, neither directly nor indirectly will lead to a breach of agreed confidentiality and anonymity.

The research outcomes will be reported without contravening the right to privacy and data protection.

7.2.7 Managing contact information

Some of the contact information to external parties will be totally curated and preserved by one partner. The dissemination partners PNO and ICLEI do for example have their own pre-existing contact lists that will be used for dissemination and communication purposes. These contact lists will not be shared within the project, but the will be managed according to GDPR by these partners.

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Contact information for other external actors established just for the purpose of the project will be managed within the project in accordance with GDPR. All project generated contact lists will be stored in the GreenCharge SharePoint project site hosted by SINTEF. Access control will be implemented to ensure that only those who require this information to perform their activities can access it. Access will be managed by SINTEF. Contact information will never be shared with third parties, and only the essential information needed will be kept and stored. On request from external parties, the project will provide information on the personal information the project is managing related to this party, as well as provide opportunity to correct or delete information (upon withdrawal of consent).

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8 Conclusions

Formal approval and release of this deliverable within the consortium constitutes a formal commitment by partners to adhere to the data management strategy and the procedures it defines. When the deliverable is formally approved by the European Commission, this constitutes confirmation that the procedures are considered by the European Commission to be adequate.

As coordinator of the GreenCharge project, SINTEF will ensure that any data management issues which may arise during the project will be handled appropriately and in a transparent and fair manner.

The DMP is a living document that will expand as the project evolves and new information on data collection, generation and handling arise. Day to day data management will happen through the online tools described in this document, and through continuous collaboration between the coordinator, the Data Controllers, the WP9 leader, and the T5.3 leader. A revised and extended version of this DMP will be prepared towards the end of the project to reflect the current status of data management in the project.

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 769016.

9 References

European Commission. *H2020 Programme. Guidance for the classification of information in research projects*. Version 2.1. 26 October 2016

European Commission. *H2020 Programme. Guidelines on FAIR Data Management in Horizon 2020*. Version 3.0, 26 July 2016

European Commission. *Horizon 2020 Programme. Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020*. Version 3.2, 21 March 2017

Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020) under grant agreement n° 769016.

A Appendix A

A.1 Expected datasets in GreenCharge

WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
2	OSL	User survey	Survey sent out to all residents in housing cooperative	.doc	SINTEF	Survey responses	PU	Raw data is confidential but has been anonymised and is presented in D2.3
2	OSL	Charge requests	Charge request from EV users	.xls	SINTEF	Coming through smartphone app provided by charging provider	PU	Raw data is confidential but will be anonymised to enable open access
2	OSL	EV charging profiles (Energy meter readings)	Data from charge management system to neighbourhood energy management system	.csv	SINTEF	Automated collection through software at EV charging points (Fortum	PU	Raw data is confidential but will be anonymised to enable open access
2	OSL	Weather	Weather data used by neighbourhood energy management system as input to predictions and optimization	.csv	SINTEF	Weather service and open data from e.g. yr.no	PU	
2	OSL	Energy prices	Price data used by neighbourhood energy management system as input to predictions and optimization	.xls	SINTEF		PU	

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WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
2	OSL	RES production profiles	Specify the characteristics of RES production profiles at Røverkollen in Oslo	.csv	SINTEF	Automated collection through software at energy management system (eSmart Systems)	PU	Useful for technology developers working on implementing RES in energy grids
2	OSL	Booking of charging points	Time slots booked for charging and resulting energy draw	.csv	SINTEF	Automated collection through charging operator's back office (Fortum)	PU	Raw data is confidential but will be anonymised to enable open access
2	OSL	Info on registered EVs	Information on EVs registered using the charging points	.xls	SINTEF	User input via App.	CO	
2	OSL	Economic data	Data related to the implementation of the business models, such as revenue and saving.	.xls	SINTEF	Automated collection through charging operator's back office (Fortum) and energy management system (eSmart Systems)	PU	Raw data is confidential but will be anonymised to enable open access
2	OSL	Energy use	Data on overall energy use from meters, such as the peak consumptions.	.csv	SINTEF	Automated collection through energy meters	PU	Raw data is confidential but will be anonymised to enable open access
5	OSL	Environmental data	Data on emissions, …	.xls	SINTEF	Calculated based on other data	PU	
2	OSL	User opinions	Data on user acceptance, awareness, etc.	.doc	SINTEF	Surveys, interviews, workshops	PU	Raw data is confidential but will be aggregated and anonymised to enable open access
2	OSL	Auxiliary energy profile	Energy used e.g. for heating cables in driveway and for water heating	.csv	SINTEF		PU	

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WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
2	BCN	EV charging profiles at MOTIT	Energy curves extracted from meter readers in the MOTIT battery hub	.xls/.csv	MOTIT	Automated collection through software at battery hub	CO	Raw data is confidential but indicators calculated in WP6 derived from it will be public
2	BCN	EV charging profiles at EURECAT	Energy curves extracted from meter readers in each charging point in Eurecat parking garage	.xls/.csv	EUT	Automated collection through software at EURECAT parking garage	CO	Raw data is confidential but indicators calculated in WP6 derived from it will be public
2	BCN	EV charging profiles at St. Quirze	Energy curves extracted from meter readers in the e-bike station	.xls/.csv	EUT	Automated collection through software at Sant Quirze e-bike station	CO	Raw data is confidential but indicators calculated in WP6 derived from it will be public
2	BCN	List of MOTIT users participating in the incentive scheme plan	List of individuals who will be addressed to participate in dropping the e-scooter in the battery hub		MOTIT	MOTIT selection from their users' portfolio	CO	Confidential to protect privacy of individuals
2	BCN	Energy consumption for Eurecat-Manresa premises	Energy curves extracted from the BEMS in the Eurecat premises in M	.csv	EUT	Eurecat-Manresa Building Energy Management System	CO	Confidential due to privacy issues (according to Eurecat policy). A summary, some representatives graphs can be made public as a result of WP5
2	BCN	Hourly electricity prices	Data for electricity prices in Spain published daily by the electricity market operator (e-SIOS)	.xls/.csv	EUT	e-SIOS webservice	PU	

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WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
2	BCN	Weather conditions at Cerdanyola	Data for actual and forecasted temperature and other weather conditions from an open service	.xls/.csv	EUT	To be determined (most likely meteocat, meteoclima	PU	
2	BCN	Weather conditions at Manresa	Data collected from an on-site weather station	.xls/.csv	EUT	Eurecat-Manresa weather station (BEMS)	PU	
2	BCN	Energy mix in Spain	Data collected from the Spanish TSO API with hourly granularity	.xls/.csv	EUT	REE or Entso-e	PU	To calculate carbon footprint and some KPI for WP5
2	BCN	Energy mix in Eurecat-Manresa	Energy production curves extracted from the BEMS in the Eurecat premises in Manresa	.xls/.csv	EUT	Eurecat-Manresa Building Energy Management System	CO	Confidential due to privacy issues (according to Eurecat policy). A summary, some representatives graphs can be made public as a result of WP5
3	BCN	Stakeholder list	List of email addresses identified as stakeholders and invited to fill-in the stakeholder survey	.xls	PNO/ EUT	Contacts	CO	Confidential to protect privacy of individuals
6	BCN	Survey response	Surveys filled-in by respondents	.doc, pdf	EUT	Survey responses	PU	Raw data is confidential but will be anonymised to enable open access through the Stakeholder Report (public report)
6	BCN /OSL /BRE	Reports of business modelling workshops	The 2nd and 3rd of workshop are planned to be filmed or taped in order to capture the discussions	.doc, pdf	PNO	Individual taping (video and/or audio) of workshops	PU	Raw data is confidential but will be anonymised to enable open access

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WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
6	BCN /OSL /BRE	Reports of interviews	Individual interviews to get information from relevant stakeholders	.doc, pdf	EUT/SINTEF/ PMC	Individual taping (video and/or audio) of interviews	PU	Raw data is confidential but will be anonymised/summarized to enable open access
2	BCN	Number of EV	Database of DGT (registration of EVs per location)	.cvs	EUT	Publicly available data source	PU	
2	BCN	Number of public charging points	Database of ICAEN and Electromaps	.cvs	EUT	Publicly available data source	PU	
2	BRE	EV charging profiles at CS#1-4	Data from charge mgmt. system (metering and session datasets)	Database (SQL)	PMC	Automated collection through backend s/w at EV charge points	CO	Raw data confidential
2	BRE	RES production profile	Get the daily RE supply available for charging	Database (SQL)	PMC	Automated collection through PV-converter at CS#3	PU	Open access
2	BRE	SOC 2nd-life storage	Current charge status of the stationary battery system connected to on-roof PV and power grid	Database (SQL)	PMC	Automated collection from BMS	PU	
2	BRE	Booking of charging point at CS#6	Charging point is booked by EV user for a time slot, when CS is not occupied by shared EV	…	MOVA	Coming through smartphone App	PU	Raw data confidential, but open access in anonymised form
2	BRE	EV-sharing mobil.punkt	Time start/end of CarSharing event	...	MOVA	From fleet mgmt. system	CO	
2	BRE	EV-sharing neighbourhood	Time start/end of CarSharing event	...	MOVA	From fleet mgmt. system	CO	
2	BRE	Number of public CP’s	Data of operator networks + web-site infos (e.g., lemnet)	database	BREM	Publicly available data source	PU	

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WP	Pilot site	Name of dataset	Description	Format	Responsible/ Data Controller	Origin	Class	Comments
2	BRE	Number of EV's	Statistical database of vehicle registration admin	database	BREM	Publicly available data source	PU	
2	BRE	EV charging profiles at CS#1-4	Data from charge mgmt. system (metering and session datasets)	Database (SQL)	PMC	Automated collection through backend s/w at EV charge points	CO	Raw data confidential
2	BRE	RES production profile	Get the daily RE supply available for charging	Database (SQL)	PMC	Automated collection through PV-converter at CS#3	PU	Open access

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B Appendix B

B.1 Template for Data Processing Agreement

DATA PROCESSING AGREEMENT

Between

[ENTER DATA PROCESSOR], Company Reg. No. [xxx xxx xxx] ("**the Data Processor**")

and

[ENTER CLIENT/PARTNER], Company Reg. No. [xxx xxx xxx] ("**the Data Controller**")

being an agreement regarding the processing of personal data ("**the Agreement**") to be performed by the Data Processor on behalf of the Data Controller as a consequence of [ENTER BACKGROUND, e.g. agreement entered into with the Data Processor as the Supplier and the Data Controller as the Client dated [date] ("**the Principal Agreement**")].

1. The purpose of the agreement

The Data Processor shall process personal data on behalf of the Data Controller based on the background indicated above.

The purpose of the data processing, the duration and nature of the processing, the type of personal data to be processed and the categories of registered individuals are specified in attachments to this Agreement.

The Agreement shall ensure that personal data are processed in accordance with prevailing statutory requirements for processing personal data, including EU Directive 95/46/EF of 24 October 1995 on the protection of individuals relating to the processing of personal data and on the free movement of such data, which has been implemented in Norway through Act No. 31 of 14 April 2000 relating to the processing of personal data (the Personal Data Act) and associated statutory regulations, as well as the requirements pursuant to decree of the European Parliament and Council relating to the protection of individuals with regard to the processing of personal data and on the free movement of such data, superseding on 27 April 2016 Directive 95/46/EF (the Data Protection Directive), and Norwegian law and associated statutory regulations adopted pursuant to the Data Protection Directive and replacing the Norwegian Personal Data Act. Both the current and the subsequent Personal Data Act are referred to below as "the Personal Data Act".

The Data Processor shall process the personal data as described in the Agreement, and in other ways as may be agreed in writing between the Data Processor and the Data Controller.

Terms and definitions used in the Agreement shall be construed in the same way as in the Personal Data Act.

2. The rights and obligations of the Data Controller. The obligations of the Data Processor

The Data Controller shall ensure that the relevant personal data can be processed. Specifically, Data Controllers shall ensure that adequate legal authority exists and that the agreements entered into with the registered individuals and any consents given are commensurate with and facilitate the processing of personal data as specified in Attachment 1.

The Data Processor confirms that it will implement suitable technical and organisational measures to ensure that all processing pursuant to this Agreement satisfies the requirements of the Personal Data Act with respect to the protection of the rights of the registered individual, as well as complying with all the requirements of Article 32 of the Data Protection Directive. See also Section 4 for additional obligations. The Data Controller shall at all times maintain full legal ownership of the personal data.

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The Data Processor shall only process personal data on the basis of written instructions received from the Data Controller. The Data Processor shall at all times be able to provide documentation of such instructions. The Data Processor shall not process personal data to which it obtains access in any other manner than is necessary to carry out the assignments it receives from the Data Controller.

The Data Processor shall assist the Data Controller in responding to requests submitted by a registered individual wishing to exercise his or her rights pursuant to Chapter III of the Data Protection Directive, taking into account the nature of the processing, also assisting as far as possible by way of suitable technical and organisational measures. The Data Processor shall also assist the Data Controller by ensuring compliance with the requirements connected with personal data security and the assessment of the consequences for personal protection and prior consultation in Articles 32 to 36, taking into account the nature of the processing and the information available to the Data Processor. If approved standards of conduct exist, pursuant to Article 40 of the Data Protection Directive or approved certification pursuant to Article 42, with which the Data Processor has undertaken to comply or according to which it has undertaken to be certified, the Data Processor is obliged to comply with said standards of conduct or certification requirements.

The Data Processor shall maintain a log of processing activities it carries out on behalf of the Data Controller, which shall include at least the information specified by Article 30 of the Data Protection Directive. The Data Controller may at any time demand to be provided with a copy of such log.

The Data Processor shall make available to the Data Controller any information necessary to demonstrate that the obligations specified in this Section 2 are fulfilled, as well as facilitating and contributing to audits, including inspections, performed by the Data Controller or any other inspector authorised by the Data Controller. This also applies to providing access to security documentation. The Data Controller itself has direct responsibility for liaison with the relevant supervisory authorities.

The Data Processor has an obligation of secrecy with regard to personal data to which it obtains access as a consequence of the Agreement and its processing of personal data, and shall ensure that persons authorised to process the personal data have undertaken to do so confidentially or are subject to appropriate statutory professional confidentiality. This provision applies also after the expiry of the Agreement.

The Data Processor shall not divulge data or information that it processes on behalf of the Data Controller to third parties without explicit instructions from the Data Controller. The Data Processor shall forward any enquiries received in this respect to the Data Controller without undue delay.

If the Data Processor is of the opinion that an instruction from the Data Controller is in conflict with the Data Protection Directive, the Personal Data Act or any other regulation regarding the processing of personal data, the Data Processor shall immediately inform the Data Controller of this. The Data Processor undertakes to discharge its obligations pursuant to the Agreement irrespective of its opinion.

3. The use of sub-vendors

When processing personal data, the Data Processor shall only use sub-vendors (data processing sub-vendors) which have been approved in writing by the Data Controller and which have been confirmed as implementing suitable technical and organisational measures to ensure that processing pursuant to this Agreement complies with the requirements of the Personal Data Act and the need to protect the rights of registered individuals.

Approved data processing sub-vendors at the time of entry into the Agreement are specified in an attachment to the Agreement.

The Data Controller grants the Data Processor general permission to use data processing sub-vendors to process personal data pursuant to the Agreement. If the Data Processor plans to use other data processing sub-vendors or substitute other data processing sub-vendors, the Data Processor shall

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inform the Data Controller of such plans and give the Data Controller an opportunity to oppose such changes.

Any data processing sub-vendor shall be made familiar with the obligations of the Data Processor pursuant to this Agreement and with the regulations governing the processing of the Data Controller's personal data, and shall be subject to the same obligations with regard to the protection of personal data as are stipulated in the Agreement. The data processing sub-vendor shall furnish adequate guarantees that technical and organisational measures will be adopted to ensure that its processing complies with statutory requirements. If a data processing sub-vendor fails to satisfy its obligations with regard to the protection of personal data and the requirements of the Agreement, the Data Processor shall assume full responsibility vis-à-vis the Data Controller for the sub-vendor's failure to satisfy those obligations.

4. Security and non-conformances

The Data Processor shall satisfy the requirements with regard to security measures as specified by the Personal Data Act and associated statutory regulations. The Data Processor shall be able to document its procedures and other initiatives for satisfying these requirements. The documentation shall be made available to the Data Controller on request.

Security audits shall be carried out regularly at times agreed by the parties to the Agreement. An audit may embrace a review of procedures, random inspections, more comprehensive local inspections and other appropriate verification measures. Agreement shall be reached with regard to the Data Controller's obligation to cover the cost of any use of personnel and resources necessary in connection with the performance of such audits.

In the event of breach of security or personal protection stipulations, the Data Processor shall notify the Data Controller without undue delay. Such notification shall include at least the following:

1. A description of the nature of the breach of personal data security, including, wherever possible, the categories and approximate number of registered individuals affected, and the categories and approximate number of personal data records affected,
2. the name and contact details of the personal protection advisor or any other contact site at which additional information may be obtained,
3. a description of the probable consequences of the breach of personal data security,
4. a description of the measures taken or proposed to handle the breach, including where relevant measures for reducing any adverse effects resulting from the breach.

If all the information cannot be provided in the first instance, it shall be provided successively as soon as it becomes available.

The Data Controller is responsible for submitting notification to the supervisory authority and the Data Processor shall not submit such notification nor contact the supervisory authority unless instructed to do so by the Data Controller.

5. Transfer of data to foreign countries

Personal data shall only be transmitted to third countries outside the EU or EEA according to instructions from the Data Controller. The Data Processor shall therefore not transmit, or allow parties in third countries in any way to obtain access to, personal data without explicit prior approval and instructions to this effect from the Data Controller. Consent and instructions must specify the countries to which the information may be transmitted. Even with consent and instructions, transfer to third countries shall only take place on condition that the requirements regarding security and the protection

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of the rights of the registered individuals pursuant to the Personal Data Act and other rules are satisfied.

6. The duration of the Agreement, termination orders, obligations in the event of expiry or cancellation

The Agreement is valid as long as the Data Processor processes or has access to personal data on behalf of the Data Controller pursuant to the Principal Agreement.

In the event of breach of this Agreement, the Personal Data Act or other relevant rules, the Data Controller is entitled to order the Data Processor to cease processing of the information with immediate effect.

On completion of the services connected with processing, the Data Processor shall, as instructed by the Data Controller, delete or return any personal data to the Data Controller and delete all existing copies unless required by law to continue to store the personal data. This also applies to any back-up copies, where it is enough to overwrite according to established routines for back-up creation.

The Data Controller shall receive written confirmation from the Data Processor that all personal data have been returned or deleted according to the instructions of the Data Controller, and that the Data Processor has not retained copies, printouts or personal data in any other form.

7. Other obligations and rights

Other obligations and rights ensue from the Principal Agreement between the Data Processor and the Data Controller regarding the services that necessitate the processing of personal data, and from this Agreement. The same contact representatives will serve in connection with this Agreement as for the Principal Agreement.

This Agreement shall not expand the Data Controller's right to impose sanctions, including the Data Processor's liability for damages, beyond the rights pursuant to the Principal Agreement.

In the event of conveyance of the Principal Agreement to other parties, this Agreement shall be conveyed correspondingly.

_____. _____ 2017

The Data Processor	**The Data Controller**
_____	_____
NAME	NAME

Two original copies of this Agreement have been prepared, of which each party has received one.

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Attachments

The purpose of processing

[The purpose and intention of the processing shall be entered here.]

The duration of the processing

[Enter the length of time the processing shall take. If the processing is according to an agreement between the parties, the duration shall be expressed as "The processing shall last for as long as the Data Processor provides services to the Data Controller pursuant to the Principal Agreement.]

The nature of the processing

[Specify here what the processing consists of, for example, "Storage of personal data" or whatever circumstances necessitate the processing pursuant to the Principal Agreement.]

Types of personal data to be processed

The following types of personal data shall be processed pursuant to the Agreement:

[Enter the type of personal data, e.g. personal name, e-mail address, telephone number, etc. It is not necessary to give details of the information to be processed, only *the type* of information.]

Categories of registered individuals

[Specify categories of registered individuals, such as employees, clients, etc.]

Data processing sub-vendors at the time of entry into the Agreement

[Specify data processing sub-vendors and countries in which the data will be processed]

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C Appendix C

C.1 Information letter and Informed Consent form

[Preliminary information letter. Variants in appropriate local languages will be produced.]

Would you like to participate in the innovation project GreenCharge?

This information letter provides information about the GreenCharge project to persons who are asked to contribute and provide input to the project. It will give you information on the goals of the project and what participation will mean for you.

Project Goal

GreenCharge will empower cities and municipalities to make the transition to zero emission/sustainable mobility with innovative business models, technologies and guidelines for cost efficient and successful deployment and operation of charging infrastructure for Electric Vehicles (EV).
The business models are inspired by ideas from sharing economy, meaning they will focus on how to best allow for using and sharing the excess capacity of private renewable energy sources (RES), private charging facilities and the batteries of parked EVs, in a way that makes everyone gain from it.
The technology will coordinate the power demand of charging with other local demand and availability of local RES, leveraging load flexibility and storage capacity of local stationary batteries and parked EVs. Furthermore, it will provide user friendly charge planning, booking and billing services for EV users. This will reduce the need for grid investments to establish new charging stations, remove range and charge anxiety and enable the sharing of already existing dedicated charging facilities for EV fleets.
Pilots will be carried out in Barcelona, Bremen and Oslo to demonstrate and evaluate the proposed approach.
The guidelines will integrate the experience from the pilots and simulations and advice on localisation of charging points, grid investment reductions, and policy and public communication measures for accelerating uptake of electromobility and will be aligned with Sustainable Urban Mobility Plan (SUMP) processes.

Who is responsible for the project?

SINTEF is an independent non-profit research institute based in Norway and is the coordinator of the GreenCharge project with the overall responsibility for its implementation. *[Partner responsible for the local pilot/data gathering]* is a partner in the consortium with the responsibility of carrying out the local pilot in [insert city/country]. They are part of a consortium of 16 organisation from around Europe, funded by the European Union's framework programme for research and innovation, Horizon 2020, under the Grant Agreement number 769016.

Why are you asked to participate?

To make the results from the GreenCharge project useful and adoptable, user expectations and behaviours need to be understood. The project will test the proposed concept in 3 pilot cities, and collect feedback from users through interviews, workshops and questionnaires.
You receive this invitation because you are identified as a relevant stakeholder In the GreenCharge project, and are part of one of these categories:

- Citizens: Existing and potential users of Electric Vehicles. Above the age of 18 with a driver's license.
- Businesses: Both small and lager businesses operating in the area of Energy Smart Neighbourhoods (ESN).

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- City representatives: Members of the local authority sectors relevant to the GreenCharge project (e.g. energy, infrastructure, city planning etc.).
- Interest groups: E.g. car owners associations, citizens involvement associations, electric vehicle associations and organisations, etc.

What does it mean for you to participation in the project?

The participants can choose to join one or more activities (interviews, focus groups and questionnaires):

- **Local Reference Group**: Each pilot site will have a Local Reference Group including relevant stakeholders (citizens, businesses, city representatives, interest groups etc.). Members of this group will be invited to participate through for example business model workshops, surveys/questionnaires and interviews, to provide input on needs, requirements and feedback for the project development, evaluation and exploitation.
- **Uptake Cities Group**: This groups will consist of 12 cities that are not partners in the project, but with interest in the project's outcome/results. Participants in this group will contribute user needs and feedback from a variety of urban contexts across Europe as well as input on market reality and policy changes. In return, the group will get first-hand knowledge about the project, on-site discussions with the GreenCharge cities and a dedicated distance coaching programme for the preparation of roadmaps for integration of GreenCharge solutions.
- **Interview**: An interview typically lasts between one hour and one and a half hour. Typically, two persons from the GreenCharge project team will take part in the interview. Interviews may be conducted face-to-face or (if more convenient for participants) using teleconferencing.
- **Workshops**: The workshops will take place online (webinar) or face-to-face in a meeting room, depending on the needs and availability of those attending. Participants will collaborate with partners from the GreenCharge team to ensure and maximise end user applicability and acceptance. The duration of each workshop will be from a few hours up to two days.
- **Survey/questionnaire**: The surveys/questionnaires will be both online forms sent to those who accept the invitation to participate, and paper forms handed out to at the local pilot sites to those who wish to participate. A survey/questionnaire will typically have between 10 and 20 questions for the participants to answer at their own convenience.

Participation is voluntary

It is voluntary to participate in the project and you can at any time withdraw your consent without giving any reason. If you withdraw, all your personal data, interview transcripts and recordings will be irreversibly anonymised. In case anonymisation is not possible the information will be deleted. There will be no negative consequences for you to withdraw your consent.

Your privacy is important to us – how we store and handle the information you provide

The data you provide will only be used for the purpose described in the previous sections. All data will be treated confidentially and in line with the General Data Protection Regulation (GDPR).

- Only the project coordinator and dedicated project team members who will have direct contact with you will have access to your information.
- As far as possible, all data will be anonymised.
- The directly identifiable personal data will be linked to the collected data through a reference number which refers to a separate list of names. This list will be stored separately from the data on a secure server in a network belonging to the project coordinator. The separate list of names will be access restricted, and all data is protected by multi-factor authentication.

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- Only anonymised data will be included in publicly available reports and articles.

What happens to your information when the project ends?

The project will according to plan end on August 31st 2021. Following the end of the project your data will be stored on the secure sever described above for a maximum of 4 months before being deleted. This is to allow time for the project to close and delete all data according to required procedures, and to allow for final project publications after the end of the project.

Your rights

If you can be identified in the data material, you have the right to:

- obtain access the personal data registered about you,
- ask for incorrect, inaccurate or incomplete personal data to be corrected;
- request that personal data be erased when it's no longer needed or if processing it is unlawful;
- receive your personal data in a machine-readable format (data portability); and,
- file a complaint to your National Data Protection Authority (DPA).

Our rights to handle information provided by you

We handle the information you provide to this project based on you consent.
On behalf of <*the responsible Data Controller*>, <*the relevant National Data Protection Authority*> has assessed that the processing of personal data in this project is in accordance with the governing privacy policy.

Will I receive any financial compensation for my participation?

We are not able to pay you for taking part. We hope that you will find it interesting to take part, and that it will not involve a great deal of time or effort.

I think the project sounds interesting. How can I find out more about its activities and results?

You can find more information on our website at: greencharge2020.eu

If want to contact us directly for more detailed information or any other reason, please contact the project coordinator (joe.gorman@sintef.no) or the Points of Contact (PoC) in your country:

[INSERT CONTACT INFO FOR LOCAL PoC1 HERE]	[INSERT CONTACT INFO FOR LOCAL PoC2 HERE]

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D Appendix D

D.1 GreenCharge Statement of Consent

Project: GreenCharge, Innovation Action, Horizon 2020 Mobility for Growth

I have read and understood the details of the research as explained in the GreenCharge information letter for participants and have been given the possibility to ask questions about the project and my participation.

I provide my consent to participate in <*include those of relevance in the consent form*>:

- ☐ Local Reference Group
  - ☐ Oslo
  - ☐ Bremen
  - ☐ Barcelona
- ☐ City Uptake Group

I provide my consent to <*include those of relevance in the consent form*>:

- ☐ Participate in interviews
- ☐ Participate in workshops
- ☐ Participate in surveys and questionnaires
- ☐ My personal data can be stored for up to 4 months after the official end date of the project

<*include if relevant*> I provide my consent to use audio recording in relation to interviews I participate in (for transcript purposes only)

- ☐ I agree to audio recording

<*include if relevant*> I agree that on my explicit consent prior to project events that I participate in, video recording or pictures can be taken of me during the study and that this may be used in research publications and for communication purposes on the project website <*include those of relevance in the consent form*>:

- ☐ I agree to video recording
- ☐ I agree to photos being taken

I confirm that I consent to participate in the study and that my participation is entirely voluntary.

_____

Participant name & signature, place, date

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Members of the GreenCharge consortium

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