



D 8.3 DATA MANAGEMENT PLAN

Initial DMP

Project title	Collaborative Recommendations and Adaptive Control for Personalised Energy Saving
Project acronym	enCOMPASS
Project call	EE-07-2016-2017 Behavioural change toward energy efficiency through ICT
Work Package	WP8
Lead Partner	SUPSI
Contributing Partner(s)	SETMOB, SES
Security classification	PU (Public)
Contractual delivery date	31/03/2017
Actual delivery date	30/03/2017
Version	1.0
Reviewers	CERTH POLIMI

History of changes

Version	Date	Comments	Main Authors
0.1	10/03/2017	Initial version, generated using https://dmponline.dcc.ac.uk/	Andrea Emilio Rizzoli (SUPSI)
0.2	13/03/2017	Added the names of the Data Managers	Andrea Emilio Rizzoli (SUPSI)
0.3	17/03/2017	Quality check	Piero Fraternali (POLIMI)
0.4	29/03/2017	Quality check	Stelios Krinidis (CERTH)
1.0	31/03/2017	Final version ready for publishing	Andrea Emilio Rizzoli (SUPSI)

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723059.

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EXECUTIVE SUMMARY

The Commission is running a flexible pilot under Horizon 2020 called the Open Research Data Pilot (ORD pilot).

Projects participating in the pilot must submit a first version of the DMP (as a deliverable) within the first 6 months of the project. The DMP needs to be updated over the course of the project whenever significant changes arise.

The enCOMPASS project is taking part in this pilot and this is the initial version of the Data Management Plan set up according to the ORD pilot specifications.

Therefore, this document describes the data, how it will be created, how it will be stored and backed-up, who owns it and who is responsible for the different data.

1 DATA SUMMARY

The enCOMPASS project will collect data related to energy consumption in households, in schools and in public buildings in pilots located in Germany, in the city of Haßfurt, in Greece, in Athens and Thessaloniki, and in Switzerland, in the municipality of Gambarogno.

Purpose of data collection

The purpose of the data collection is to implement and validate an integrated socio-technical approach to behavioural change for energy saving, by developing innovative user-friendly digital tools for making energy data consumption available and understandable for the different users and stakeholders (residents, employees, pupils, building managers, utilities, ICT providers) empowering them to collaborate to achieve energy savings and manage their energy needs in energy efficient, cost-effective and comfort-preserving ways.

Relation to the objectives of the project

In order to provide information to energy users about their consumption levels and their potential for improvement it is necessary to collect, process, and analyse a variety of data sources, from smart meter reading, providing detailed energy consumption, to building characteristics, to user psychographic data.

Types and format of data

There are 3 major types of data:

- **Feature data:** these data describe the structural properties of a building (e.g. the surface area, the type of insulation, the lighting installation, etc.) or of an individual (age, education, environmental attitude, comfort preferences, etc.). These data are both quantitative and qualitative.
- **Sensor data:** these data are data streams regarding observed measurements including energy consumption, temperature, humidity, luminance, presence.
- **Interaction data:** these data represent the interaction of the users with the enCOMPASS platform such as logs of accesses, actions performed and so on.

Re-use of existing data

The data used in the enCOMPASS project is being collected and generated by the project itself.

Origin of data

- Psychographic data of residential users will be provided by the users themselves through voluntary answering to data collection questionnaires in an anonymous way.
- Electrical and thermal energy consumption will be provided by smart meter readings, where available. Power consumption of individual appliances will be provided by smart plugs, where available.
- Local comfort measurements in households and buildings, such as temperature, humidity, luminance, will be collected by in-situ sensors, installed by the project.
- Presence of humans in monitored buildings and rooms will be also be monitored by in-situ sensors installed by the project.
- Interaction data is generated by the use of the enCOMPASS platform by the users. The data can refer to interaction with web and mobile apps.

Users of the data

The collected data will be mainly used to build profile of users in order to provide meaningful and effective suggestions for energy efficiency. The data is also collected to experimentally verify the impact of the energy saving suggestions. Data will be therefore used by the researchers of the enCOMPASS project. Other participants of the enCOMPASS project will also have access to the data (e.g. building managers, home owners, utility operators, etc.) but specific interfaces will be provided to them to access the data and therefore they are not expected to directly access the datasets.

2 FAIR DATA

2.1 MAKING DATA FINDABLE, INCLUDING PROVISIONS FOR METADATA

The data generated by the enCOMPASS project will be annotated using public metadata standards where appropriate. In particular, the DDI (Data Documentation Initiative <http://www.ddialliance.org/>) will be used for socio-economic data where possible, and OGC's Observation and Measurements (<http://www.opengeospatial.org/standards/om>) will be used for sensor generated data.

Provided the data is not covered by non-disclosure agreements and provided that it does not violate ethics, it will be published using the Zenodo platform (<https://zenodo.org>), which enables the association of a DOI to the generated data sets.

Data sets will be catalogued by a structured approach to a naming convention defined as follows:

enCOMPASS_TYP_AAA_CC_PP_BT_Y_BLDID_vXX_(short_title)

- T: Type of data, one of FET (feature), SEN (sensor), INT (interaction)
- AAA: Author organisation (use the acronyms of the contract)
- CC_PP: Country and Place of origin, one of: DE_HS for Haßfurt, GR_AT for Athens, GR_TH for Thessaloniki, CH_GM for Gambarogno.
- BT_Y: building type, one of: RES (residential), SCH (school), PUB (public)
- BLDID: building id, a unique id associated to each building in the project
- vXX: progressive version number

This convention might be revised according to the specific needs arising during the project.

2.2 MAKING DATA OPENLY ACCESSIBLE

All data will be made available after anonymisation where required and appropriate. Before publishing data sets, even after anonymisation, clearance must be issued by the data owners (typically the utilities and the municipalities)

Data will be published using an open platform such as Zenodo, aiming for compliancy with the OpenAIRE initiative.

Restricted data will not be published online and will not be made available to the public.

2.3 MAKING DATA INTEROPERABLE

The interoperability of the collected data will be ensured by the compliance to standard ontologies as much as possible, in particular, as stated in Section 2.1, to the DDI (Data Documentation Initiative <http://www.ddialliance.org/>) for socio-economic data where possible, and OGC's Observation and Measurements (<http://www.opengeospatial.org/standards/om>) for sensor generated data.

2.4 INCREASE DATA RE-USE (THROUGH CLARIFYING LICENSES)

Access to data will be Open Access as it is published on Zenodo. Data will be available to the public as long as the Zenodo repository will be available. Copies of the data will be retained by the partners for a maximum of three years after the project's end.

3 ALLOCATION OF RESOURCES

The cost for making enCOMPASS data fair can be ascribed to Task 8.4 "Open data and standards", where a total of 7 months has been allocated. Part of these resources will be thus devoted to the preparation and organisation of data for making it FAIR compliant.

The enCOMPASS project has designed Stelios Krinidis of CERTH as Data Manager and each site has an individual data manager, which reports to the project Data Manager. These persons are:

- Greek pilot: Konstantinos Arvanitis (WVT)
- German pilot: Felix Zösch (SHF)
- Swiss pilot: Marco Bertocchi (SES)

The cost for long term preservation are dramatically reduced thanks to the availability of the Zenodo platform.

4 DATA SECURITY

Sensitive data is transmitted over the Internet only by secure channels such as *ssh* and *sftp*. In general the enCOMPASS project does not deal with data that can be directly traced to a single individual (anonymization). There will be certain type of data which the enCOMPASS users will generate in conjunction with the use of the platform (login ids, emails, passwords) that will be transmitted only over https secured channels.

The enCOMPASS servers where data are temporarily stored for data processing and elaboration are protected by state-of-the-art techniques and they are constantly monitored and regularly updated to limit the risk of intrusion.

5 ETHICAL ASPECTS

Although enCOMPASS does not introduce any critical ethical issues or problems, several considerations typical to ICT and IoT applications and on-site trials shall be taken into account. The consortium is fully aware of these and has the necessary experience to address them seamlessly.

enCOMPASS proposed solutions does not expose, use or analyse personal sensitive data for any purpose. In this respect, no ethical issues related to personal sensitive data are raised by the technologies to be employed in Pilot sites foreseen in Germany, Greece and Switzerland. However, enCOMPASS consortium is fully aware of the privacy-related implications of the proposed solutions and respects the ethical rules and standards of H2020, and those reflected in the Charter of Fundamental Rights of the European Union. Generally speaking, ethical, social and data protection considerations are crucial and will be given all due attention. enCOMPASS will address any ethical and other privacy issues in **WP3**, as well as allocated specific **Task 3.2** to review the deployed solutions for privacy and security. Thus enCOMPASS will assure the investigation, management and monitoring of ethical and privacy issues that could be relevant to its envisaged technological solution and will establish a close-cooperation with the Ethics Helpdesk of the European Commission.

The consortium is aware that a number of privacy and data protection issues could be raised by the activities (in WP3-WP5) to be performed within the scope of the project. The project involves the carrying out of data collection in all pilots in order to assess the effectiveness of the proposed solution. For this reason, human participants will be involved in certain aspects of the project and data will be collected. This will be done in full compliance with any European and national legislation and directives relevant to the country where the data collections are taking place (INTERNATIONAL/EUROPEAN):

- The Universal Declaration of Human Rights and the Convention 108 for the Protection of Individuals with Regard to Automatic Processing of Personal Data.
- Directive 95/46/EC & Directive 2002/58/EC of the European parliament regarding issues with privacy and protection of personal data and the free movement of such data.
- Core ethical issues and with the European Charter of Fundamental Human Rights and as well as with any relevant EU standard in the fields of privacy and data protection.

In addition to this, to further ensure that the fundamental human rights and privacy needs of participants are met, the privacy-preserving data collection activities within encompass project will further comprise of the writing of detailed ethical guidelines for the project (deliverable D10.1). In order to protect the privacy rights of participants (e.g. public building employees, students, visitors, etc.), a number of best practice principles will be followed. These include:

- No data will be collected without the explicit informed consent of the individuals under observation. This involves being open with participants about what they are involving themselves in and ensuring that they have agreed fully to the procedures/research being undertaken by giving their explicit consent.
- No data collected will be sold or used for any purposes other than the current project.
- A data minimisation policy will be adopted at all levels of the project and will be supervised by each Industrial Pilot Demonstration responsible. This will ensure that no data, which is not strictly necessary to the completion of the current study will be collected.

- Any shadow (ancillary) personal data obtained during the course of the research will be immediately cancelled. However, the plan is to minimize this kind of ancillary data as much as possible. Special attention will also be paid to complying with the Council of Europe's Recommendation R(87)15 on the processing of personal data for police purposes, Art.2:

"The collection of data on individuals solely on the basis that they have a particular racial origin, particular religious convictions, sexual behaviour or political opinions or belong to particular movements or organisations which are not proscribed by law should be prohibited. The collection of data concerning these factors may only be carried out if absolutely necessary for the purposes of a particular inquiry."

- Compensation, if and when provided, will correspond to a simple reimbursement for hours lost as a result of participating in the study; special attention will be paid to avoid any form of unfair inducement.
- If employees of partner organizations, are to be recruited, specific measures will be in place in order to protect them from a breach of privacy/confidentiality and any potential discrimination; in particular, their names will not be made public and their participation will not be communicated to their managers.

More information related to the ethical aspects related to the data collected and utilized within encompass project will be documented at deliverable D10.1.

6 OTHER

The implementation and deployment of core components will be performed in Germany, Greece and Switzerland, under the leadership of each Pilot Site responsible (SHF, WVT and SES respectively). In the following, the consortium outlines the legislation for the countries involved in the pilots:

i) German Pilot Trials in schools, residential and public buildings in Haßfurt, Germany have to comply with German legislation “German Federal Data Protection Act (BDSG)” and the responsible state data protection acts, relating to the collection, processing and use of personal data: http://www.gesetze-im-internet.de/bdsg_1990/index.html

- Federal regulatory authorities and ethical committees: German Federal Data Protection Authority (BfDI) <http://www.bfdi.bund.de/>
- State regulatory authorities: Bavarian Data Protection Authority <https://www.datenschutz-bayern.de/>

ii) Greek Pilot in National Documentation Centre in Athens and Residential & Offices buildings of WATT+VOLT customer portfolio in Greece, have to comply with Greek legislation “Law 2472/1997 (and its amendment by Law 3471/2006) of the Hellenic Parliament”.

- Regulatory authorities and ethical committees: Hellenic Data Protection Authority <http://www.dpa.gr/>

iii) Swiss Pilot Trials in Locarno have to comply with Swiss federal legislation “235.1 Legge federale sulla protezione dei dati (LPD) / Federal Act on Data Protection (FADP)” relating to the processing of personal data: <https://www.admin.ch/opc/en/classified-compilation/19920153/index.html> and <https://www.admin.ch/opc/it/classified-compilation/19920153/201401010000/235.1.pdf>

- Regulatory authorities and ethical committees: Federal Council <https://www.admin.ch/gov/en/start.html>