

Data Management Plan

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Abstract	<p>The DMP presents the data management in the project, and in particular:</p> <ul style="list-style-type: none"> • the data that will be collected, processed and generated • the methodologies and standards that will be applied • the handling of research data during and after the end of the project • whether data will be shared/made open access and • how data will be curated and preserved (also after the project is finalised). <p>The plan will be updated in time with the periodic reporting of the project, i.e. M18, M36 and M48.</p>

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1 INTRODUCTION

A Data Management Plan (DMP) describes the data management life cycle for the data to be collected, processed and/or generated by a Horizon 2020 project¹. As part of making research data findable, accessible, interoperable and reusable ('FAIR'), a DMP should include information on:

- the handling of research data during and after the end of the project
- what data will be collected, processed and/or generated
- which methodology and standards will be applied
- whether data will be shared/made open access and
- how data will be curated and preserved (including after the end of the project).

The due date of the first version of the DMP is month 6 (i.e. 28 February 2017).

The first version of the DMP does not provide detailed answers to all the questions in Annex 1 of the guideline. The DMP is intended to be a *living document* in which information can be made more detailed and specific through updates as the implementation of the project progresses and when significant changes occur. Thus, the DMP has a clear version number and includes a timetable for updates.

The DMP must be updated, as a minimum, in time with the periodic evaluation/assessment of the project, or whenever significant changes arise, such as (but not limited to):

- new data
- changes in consortium policies (e.g. new innovation potential, decision to file for a patent)
- changes in consortium composition and external factors (e.g. new consortium members joining or old members leaving).

This first version of the DMP focuses mainly on data management in the four lead partnerships, and presents the initial thoughts on data collection and management in the 12 local partnerships. A more comprehensive description for the local partnerships will be included in the second version of the DMP in M18 (January 2018).

The second version of the DMP will also include aspects of the General Data Protection Regulation² that shall apply from 25 May 2018, and the Directive³ by 6 May 2018.

¹ *Guidelines on FAIR Data Management in Horizon 2020*, Version 3.0, 26 July 2016

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

² (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.

³ (EU) 2016/680 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 by competent authorities for the purposes of the prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and on the free movement of such data, and repealing Council Framework Decision 2008/977/JHA. EU Member States have to transpose the Directive into their national law by 6 May 2018.

2 DATA SUMMARY

2.1 WP3: PLASTIC WASTE

Plastic waste data collected in WP3 will support decision making regarding the transition towards a more sustainable use of plastic materials. The aim is to generate and collect data, which provides a more accurate image of the recycling potentials, environmental, social and economic impact of different types of plastic waste, with an emphasis on flexible plastics.

The data generated in WP3 might be utilised to qualify the efficiency and quality of the three new collection schemes, which will be set up as part of task 3.1. Furthermore, it will be used to describe the challenges and possibilities that the industrial partners experience when recycling household plastic waste in new products as well as the specific requirements regarding waste composition, cleanliness, and uniformity that they set for their production processes. Thus, the data will be useful for waste handlers across the value chain and production companies with an interest in utilising more recycled plastics in their production. Furthermore, the data might be useful for other municipalities/local authorities aiming to increase their recycling rates of household plastic waste and improving their collaboration efforts with the private industry.

Specifically, the following data collection is expected:

For task 3.1 data will be collected to monitor the efficiency of the three collection schemes for household plastic waste, which will be set up. This includes:

- Quantitative data on:
 - material quantities (kg)
 - time of collection (week no.)
 - composition (PET, HDPE, PP, flexible plastics, other plastics, contaminants)
 - NIR sorting efficiency (%)
 - colours
 - economic value (euro)
 - avoided CO₂ emissions from activities (tonnes)
- Qualitative data from:
 - citizens (e.g. focus group interviews)
 - retailers

The qualitative data will concern citizens perception and use of the sorting schemes as well as their suggestions as to improvement.
- Other: data in the format of photos and videos of the waste materials and the collection and sorting equipment.

We will reuse existing data from the City of Copenhagen for the drafting of the baseline analysis (D3.1). This includes data regarding collection rates and frequency, collection scheme coverage, and waste recycling. Furthermore, it includes data from the annual citizen satisfaction survey. The baseline analysis will also include reused data that originates from continuous surveys conducted by the City of Copenhagen and partners regarding the efficiency of existing waste collection schemes.

For task 3.2 it is necessary to collect a number of data in order to identify 20 promising applications. The data includes material demands for the different products and data for quality of obtained polymeric materials from processing of different types of collected and pre-sorted materials. For the 20 promising applications, sufficient data must be generated to select 10 product applications, which will be tested at production facilities and used to prepare business cases.

The quantitative data with specification of amounts and composition/quality characterisation of materials. In connection with the 10 promising products end market potentials for three kinds of products will be estimated. The data will be based on data generated in the project for treatment

of the collected materials supplemented with existing knowledge from the participating companies regarding their products and technologies.

It is difficult to assess the size of the database generated through WP3. However, the aim is to generate data from the management of around 1,000 tonnes of plastic waste.

Local partnerships on plastic waste

In the table below, we have presented the initial thoughts on data collection and management for the three local partnerships on plastic waste.

Partner	Activity	What	How	How to store the data
SRH Hamburg	Provision of collection infrastructure (Purchase of 20 grid boxes for 10 receipt stations, 1 open container, 1 additional press container)	Number of filled grid boxes/time, ideally per recycling station Weight of filled boxes (tbd)	Manual documentation at receipt stations (by staff) Digital documentation: unclear if data (weight) can be differentiated by receipt station	Internally: Documentation in SAP ERP system / container delivery (not single boxes) Aggregate (anonymous) on Confluence
	Waste composition	To be developed		
City of Lisbon	Event exhibition with 10 urban pieces	Amount of plastic (kilograms)	Weight	Municipal data server in data sheets
		CO ₂ footprint	CO ₂ calculation (conversion indicators)	Aggregated data in confluence
		Number of collaborating artists	Counting	
City of Genoa	To be developed			

2.2 WP4: STRATEGIC METALS

To gather information about the supply and demand of used electronic for the analysis of market for second hand equipment, we will collect data from online-shops (e.g. ebay, rebuy, momox, Shpock and NGO-advertisements) and local advertisements in newspapers. This will be done with Big Data Technology.

Through a portal/app for collection points and repair services we will gather information about all registered repair facilities for electronic devices and geo-coordinate this data with suitable search parameters and be displayed on a public portal. All facilities will receive a possibility to update their entries constantly i.e. to generate a link to their direct websites. The Stadtreinigung Hamburg provides information on recycling areas, storage containers and other recycling possibilities. Websites which provide repair instructions will be connected also.

The DST development in WP4 and WP7 is based on the same Big Data collection. The designated user and their user interface will be quite different and also the corresponding responses to the user:

In WP4 and WP 7.5 in the context of DST two separate data streams are used:

- Day to Day DST (only developed and applied in the context of WP4)⁴:

⁴ Day-to-day decision support tool: To observe, understand and govern the market of EEE and WEEE, a continuously running DST based on Big Data technology will be set up. The DST will search the second

- Data is collected in an ongoing process from internet sites such as Ebay. The regularly collected data is used for real-time analysis about specific EEE (e.g. used electronic goods) and their availability, selling prices and options for repair. The results of the analysis will be available for citizens and other actors via the App/Portal (to be developed in WP4). The App/Portal only provides information about the real-time situation. The Day to Day DST will not provide any data analysis over longer periods of time.
- The App/Portal will have areas of limited access (i.e. only registered users can access certain areas): Registered users can provide individual information on e.g. disassembling of equipment, locations of repair shops and their offerings etc. for publication. A data base of personal repair instructions can be created.
- The end product (App/Portal) can be useful to everyone (users, repair cafés, recycling companies etc.) to inform decisions on how to reuse, repair and/or recycle EEE. Users can adjust their behaviour according to the real-time information provided.
- DST (developed in WP7 for the waste streams EEE and wood): Provides specific analysis based on the sampled data from the Day to Day DST within a given timeframe, i.e. the real-time data gathered by the Day to Day DST is aggregated, stored and analyzed for longer time periods. Changes in waste generation, resale, reuse, repair and recycling can be analyzed over longer time periods. This information can be used to inform decision makers from the public and private sectors on how to steer processes in order to increase the reuse, repair and/or recycling of EEE. Data generated by the analysis function of DST can be used by other parties interested in such statistical information (e.g. decision makers in waste collection companies).

The origin of the continuously collected data is the Internet (web sites such as Ebay). The offers and sales of specific EEE (or furniture) in internet based second-hand markets will be downloaded. Personal data, like names or e-mail addresses, will be excluded from sampling. All data will be stored in MongoDB in Xml, JSON formats.

Local partnerships on strategic metals

In the table below, we have presented the initial thoughts on data collection and management for the three local partnerships on strategic metals.

Partner	Activity	What	How	How to store the data
City of Copenhagen	Measuring tests results	Amount/volume Value Costs	Collection vehicle or manual weighing Assessment by partners	Placed in relevant City of Copenhagen set up for e-storage of documents (folder, eDoc)
	Setting up the partnership	Contracting documents	Documents for partnership agreement developed by CPH	
City of Lisbon	Repair cafés	Amount of reused equipment (kilograms)	Weight	Municipal data server in data sheets
				Aggregated data in confluence
City of Genoa	To be developed			

hand shops in the internet, paper based advertisements and other data. The outcome will be connected to an App/Portal open for all stakeholders (incl. individuals) along the value chain.

2.3 WP5: FOOD WASTE PREVENTION AND BIOWASTE

Food waste data collected will support managing the transition process for recovering food waste and produce a more accurate image of the economic, social and environmental impact of food waste, through the cross-referencing with data sources from the waste collection and treatment processes.

Data collected regarding food waste will comply with the *Food Waste Loss Accounting and Reporting Standard*⁵ in order to facilitate its validation for future research purposes. Types and formats for other datasets to be cross-referenced with food waste data will be defined at a later stage, as it is still not known at this point, what datasets it will be possible to import to the system.

The parameters regarding food waste that has to be collected are:

- Recovered food, measured in mass (kilograms)
- Typology of recovered food (categorical):
 - Soup
 - Complements
 - Main dish
 - Uncooked foodstuff.
- Geographical location of waste production and recovery namely regarding:
 - Coordinates according to the World Geodetic System (WGS 84)
 - Country
 - Municipality
 - Parish.
- Date of food recovery (month and year)
- Destination of recovered food
- Number of beneficiaries of recovered food for social use
- Number of participants of the food recovery supply chain.

The known, generated data at this point are:

- Economic generated value (in euro)
- Avoided CO₂ emissions (in tonnes)
- Avoided organic residue (in tonnes).

As the tool manages the food recovery transitional process, the data above is recorded and generated through the transactions and registered in the ICT tool databases. The metrics might be changed as the process is adapted to the ICT.

Other data might be added to this list, as it becomes more clear, which datasets on waste treatment and collection that can be successfully incorporated. Besides incorporating these datasets, the ICT platform with historical data sets from the Zero Waste Network in Lisbon will migrate its operations to the new platform.

The expected size of the data cannot be asserted at this point as the data from waste treatment and collection has not been identified and categorized.

Both the data collected and generated might be useful for:

- Public administration as a monitoring tool for compliance of food waste prevention and waste management goals.
- Food waste producers'/donor entities, as a source of data for historical analysis of food waste both at individual level and at a sectorial level as well as a metric for the social, economic and environmental value generated from the recovered food.
- Receiving entities, for the social, economic and environmental value generated from the recovered food.

⁵ World Resources Institute (WRI): http://www.wri.org/sites/default/files/REP_FLW_Standard.pdf

- Academic and scientific purposes.

Local partnerships on food waste and biowaste

In the table below, we have presented the initial thoughts on data collection and management for the three local partnerships on food waste and biowaste.

Partner	Activity	What	How	How to store the data
City of Copenhagen	Technology mapping for treatment of biowaste	Waste composition and of digestate	Collection of data from partners in waste management	Data management in CPH complies with EU regulation on data management.
		Treatment technology data	Collection of data from partners and previous works	
	Survey in households about the collection of biowaste	Citizens opinions about the waste management system	Anonymous surveys	
		Citizens suggestions for improvement of the collection of waste	Anonymous surveys	
SRH Hamburg	Implementation and test of 10 underground collection systems for biowaste disposal (for residents of apartment buildings)	Perform surveys with residents in order to understand challenges and obstacles concerning biowaste disposal	Survey with residents and stakeholders on acceptance of the tested collection system Weighing and review of quality of collected biowaste	Stadtreinigung internal standard procedures in terms of data security and safety are followed
City of Genoa	To be developed			

2.4 WP6: WOOD WASTE

The purposes of the data collection/generation are:

- to develop the Value Chain Based Partnership by identifying and involving all relevant stakeholders to re-engineer wood waste streams and collection schemes;
- to implement wood collection schemes within a specific Urban Lab applied in a city district;
- to promote research activities in order to develop technology solutions to close the wood chain loop;
- to analyse and test market applications in terms of business model sustainability.

Different types and formats of data will be generated/collected in WP6 over the project lifecycle, as for instance:

- Quality and quantities of wood from contributors and re-manufacturers
- Number and surface of beach resorts
- Qualitative and quantitative data regarding market applications (e.g. market growth rate, size of the market, availability of raw materials, bargaining power, social acceptance for a product) and technology applications.

Existing data will be used mainly to develop the Value Chain Based Partnership. To serve this purpose, it may be necessary to share some data, in the foreseen newsletter, local press information, communications or meetings and possibly through the partners' communication channels (website, newsletters, social media, etc.).

Other existing data include:

- Amiu company's data referring to the city (citizens' waste disposal information (when available), including data from Fabbrica del Riciclo and EcoVan App, etc.)

- Statistics at municipal level (population density and demographics)
- Municipality Open Data Catalogue
- Geoportal of the municipality (Genoa)
- Data of the administrative districts such as list of local associations
- GIS regional data on Fire Damaged Areas 2003 – 2013
- Regional data on forests.

Data come from institutional databases (region, metropolitan city, municipality, sub-municipalities) or from local partners, from scientific publication, public and private statistics and outcomes of previous projects (Silvamed, Robinwood).

The expected size of data is not yet possible to evaluate.

Data may be useful for:

- the local level to improve the efficiency of collection schemes
- the local and national level to share value chain data in terms of quantities and quality to promote market development
- the local and EU level to establish a new governance model
- EU, national and local level to assess new technology applications, feasibility and market attractiveness.

Big Data and DST (see also WP 7.5): Similar to the collection of data about used EEE in WP4 but only for a period of about six months a Big Data application will collect data about the offerings of used furniture in the internet. The data analysis done with the DST may allow to identify patterns in citizen behaviour with regard to waste generation, reselling, reuse, recycling and repair and furniture (what used furniture is offered and where, what is bought with which price and where etc.). This information will be used to (re-)design approaches to citizen involvement and will be considered when developing recommendations on citizen involvement (task 7.3).

Local partnerships on wood waste

In the table below, we have presented the initial thoughts on data collection and management for the three local partnerships on wood waste.

Partner	Activity	What	How	How to store the data
City of Copenhagen	Measuring tests results	Amount/volume Value Costs	Collection vehicle or manual weighing Assessment by partners	Placed in relevant CPH set up for e-storage of documents (folder, eDoc)
	Setting up the partnership	Contracting documents	Partnership agreement developed by CPH	
SRH Hamburg	Introduction of new wood waste services (shredding, chimney wood production)	Identification of suitable properties (property owners) for new „wood“ services => identification of properties with gardens, contact of property owners to offer/disseminate services	Existing data from waste fee payers may be used to identify property owners Aerial photographs may be used to identify properties with gardens/ trees	Stadtreinigung internal standard procedures in terms of data security and safety are followed Information about property owners will remain internal at SRH
City of Lisbon	Sorting and storage of wood waste	Amount of wood reusable (kilograms)	Weight	Municipal data server in data sheets
				Aggregated data in confluence

2.5 WP7: GOVERNANCE AND DECISION SUPPORT

The following sections present the data collection and use for tasks 7.1-7.5.

2.5.1 Development of governance models (tasks 7.1, 7.2 and 7.4)

Within the process of developing the governance models, we will gather data in the four partner cities via expert interviews.

Identification and selection of interviewees

Interviews will be conducted with key stakeholders for the implementation of eco-innovative solutions and governance arrangements in the respective local contexts of the four cities. Key stakeholders will include project partners of the value chain partnerships implemented in WP3-6 as well as non-project partners. Interviewees will be identified based on the results of the analysis of local framework conditions and the stakeholder analysis, in coordination with the city cluster coordinators and the WP3-6 Leaders respectively. The identified stakeholders (public institutions, enterprises, intermediate organisations) will be contacted to identify interviewees within the respective organisations.

Processing and protection of data gathered in interviews

We will contact interviewees to arrange face-to-face interviews (if possible). Via interviews, we will gather qualitative data on the local situation, framework conditions and cooperation processes. Before conducting the interview, each interviewee will be informed about the purpose of the analysis and the further use of the interview material⁶. The involvement of research participants (interviewees) will follow the recommendations on good research practices of the European Science Foundation⁷ and the proposals for safeguarding good scientific practice of the Commission on Professional Self-Regulation in Science of Deutsche Forschungsgemeinschaft⁸.

The interviews will be recorded and transcribed (if permission by the interviewee is given). The interview transcripts form the basis for the qualitative analysis of the interviews (tasks 7.1 and 7.2). In order to ensure confidentiality, the full interview transcripts will not be published and not be shared with other persons (nor within the FORCE consortium). The interviewee will receive a brief summary of the interview for approval. During the interview analysis, the gathered data will be anonymised and aggregated. Only aggregated and anonymised analysis results will be published in project reports and scientific papers.

2.5.2 Evaluating citizen involvement (task 7.3)

In the context of evaluating local citizen involvement tools, qualitative and/or quantitative data may be gathered from local citizens in the four cities. Details of how and to which extent this will be done during the project will be developed together with the project partners.

Irrespective of the applied methods to gather information about the perspectives and/or behaviour of local citizens, the collected data will be anonymised before the start of the analysis. Participating citizens will be informed about the FORCE project, the purpose of the interview/questionnaire and the further use their data⁹. The involvement of citizens will follow the recommendations on good research practices of the European Science Foundation and the proposals for safeguarding good scientific practice of the Commission on Professional Self-Regulation in Science of Deutsche Forschungsgemeinschaft. Only aggregated and anonymised analysis results will be published in project reports and scientific papers.

⁶ Via the informed consent forms and information sheet in WP1.

⁷ European Science Foundation, 2011, p 8-9

Source: European Science Foundation (2011): The European Code of Conduct for Research Integrity. Available at http://www.esf.org/fileadmin/Public_documents/Publications/Code_Conduct_ResearchIntegrity.pdf (accessed 16/01/2015)

⁸ Deutsche Forschungsgemeinschaft. Kommission Selbstkontrolle in der Wissenschaft, 2013, p. 21-22 and p. 74-76

² Source: Deutsche Forschungsgemeinschaft. Kommission Selbstkontrolle in der Wissenschaft (2013): Vorschläge zur Sicherung guter wissenschaftlicher Praxis: Empfehlungen der Kommission "Selbstkontrolle in der Wissenschaft" (Proposals for safeguarding good scientific practice/DFG). Available at http://www.dfg.de/download/pdf/dfg_im_profil/reden_stellungnahmen/download/empfehlung_wiss_praxis_1310.pdf (accessed 16.01.2015)

⁹ Via the informed consent forms and information sheet in WP1, no 4.

2.5.3 Development of decision support tool(s) (task 7.5)

See section 2.2.

2.6 WP9: EXPLOITATION, REPLICATION AND MARKET DEPLOYMENT ACTIVITIES

2.6.1 Exploitation Plan

The preparation of the FORCE exploitation plan, which is a strategy on how to exploit the project results, is based on input provided in the Grant Agreement, the work programme and on literature review / desk research. Literature research has been done based on an internet research where open accessible files available for free use were checked. All references are marked in a reference list and citations in the text are marked recognizable and according to scientific standards. Project partners were asked to check and to contribute to the plan.

The exploitation plan (D.9.1) is confidential and only for internal use of the FORCE consortium members including the Commission Services.

2.6.2 Stakeholder analysis

In order to acquire the deployment perspectives for the results gathered in frame of the project a stakeholder analysis will be carried out. It will focus on the opportunities and obstacles with regard to the project results in the participating cities and beyond.

As a first step, all FORCE city cluster coordinators will be asked to provide organisation names, contact data and website links of relevant value chain stakeholders on local, national and international level engaged in the four waste streams. All contact data received will be treated strictly confidential and will not be used for any other purposes other than the intended (stakeholder analysis; invitations to business workshops). Based on this information tailored questionnaires will be designed taking different waste streams and stakeholder levels into consideration. Questionnaires will be sent either by mail or personalized e-mail. Answers and information gathered in frame of the survey will be evaluated anonymously. Within the stakeholder analysis report, compiled data and information will also be presented in a way which ensures anonymity of personal information.

The stakeholder analysis (D.9.2) is confidential and only for internal use of the FORCE consortium members including the Commission Services. It will serve as a baseline and additional information for project partners to prepare their project results according to the needs and including insights gathered from external relevant stakeholders.

2.6.3 Exploitation and market deployment strategy

Project partners will be asked to identify their results and outcomes which have potential for further exploitation and which have been referenced to in the exploitation plan. Based on the identification of project results, an exploitation and market deployment strategy will be developed for the four waste streams (D.9.3).

Relevant data for this strategy will be gathered through interviewing FORCE consortium members. Insights gained will be backed by further empirical, secondary data from additional scientific research. All research activities will follow the recommendations on good research practices of the European Science Foundation and the proposals for safeguarding good scientific practice of the Commission on Professional Self-Regulation in Science of Deutsche Forschungsgemeinschaft.

The exploitation and market deployment strategy (D.9.3) is confidential and only for internal use of the FORCE consortium members including the Commission Services. It will serve as a baseline for project partners to further prepare and design the exploitation of their results.

2.6.4 Business modelling strategies

Four business modelling strategies (D.9.4) will be produced based on the business cases, achievements and feasibility studies developed within the four waste streams. Data relevant for

this task will be gathered by interviewing / using data provided by project partners. The level of detail of partner's project data will be agreed with the project partners beforehand in order to ensure IPR. The strategies will be backed with latest market information including status quo analysis and prognosis. (Scientific guiding principles see above).

The business modelling strategies be made available for public use via the project website.

2.6.5 Workshops with business stakeholders

In order to raise awareness of the project and to enhance network activities and collaboration between business stakeholders and project partners for potential exploitation of project results, various workshops with business stakeholders will be carried out during the project.

Stakeholders who will participate in the workshops will be invited by HAW and contacted by project partners through their value chain networks. Additional participants including corresponding contact details will be gathered by internet research. Participant lists will be prepared (including name of participants and organisations name) and shared during the workshops. Data protection standards will be respected. The same applies for photos to be taken during the workshops, i.e. only with prior agreement may these be used in the project context.

3 WP3: PLASTIC WASTE

3.1 FAIR DATA

3.1.1 Making data findable, including provisions for metadata

In order to ensure the comparability of data, standard naming conventions will be used whenever suitable.

For the waste materials, the European list of waste¹⁰ will be used as a standard nomenclature. The plastic resins resulting from sorting and reprocessing will be classified following the naming convention used in PlastEurope's Plastics Exchange¹¹.

Due to the nature of the project, which focuses on development of new prototypes of plastic products based on innovative, new plastic resin mixtures and production processes, it is not expected that the use of standard naming conventions will always be suitable. In these cases, a suitable categorisation will be developed in collaboration with the experts involved in the project.

In addition, some plastic resin mixtures might be considered as a trade secret by the involved companies. In this case, the project management will engage in productive dialogue with the companies about which data can and cannot be published.

3.1.2 Making data openly accessible

The project aims to make all data openly accessible and exploitable, which might be relevant for the key stakeholders pointed out in the stakeholder analysis. However, it will not always be possible to publish data, due to contractual reasons. Data which is found to be of vulnerable nature to the involved stakeholders (e.g. trade secrets, process data) will not be made public without prior consent of these stakeholders. This data is contractually protected.

Qualitative data resulting from interviews with citizens, stakeholders etc. will only be made public on an aggregated level, meaning that the overall conclusions and summaries will be published; not the individual results.

¹⁰ http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2014.370.01.0044.01.ENG

¹¹ <https://rohstoffe.kunststoffweb.de/en/index.html>

3.1.3 Making data interoperable

The use of standardised nomenclature such as PlastEurope's Plastics Exchange and the European List of Waste will ensure the interoperability, reusability and exchangeability of the data generated.

When possible, quantitative data will be collected, managed, and stored in Excel format, ensuring the interoperability with other possible users.

3.1.4 Increase data re-use (through clarifying licenses)

Data licensing matters will be clarified by the project partners once the main datasets have been developed. At this point, it is too early to define the licensing issues.

The increase of data-reuse is also dependant on the success of the dissemination and exploitation activities as described in the Communication and Dissemination Plan and the Exploitation Plan.

Data will be available for reuse on a continuous basis as soon as the data is ready and cleared for publishing. All data, which is made public during the project period, is useable by third parties also after the end of the project period. Public data will be available via the project website, which will be online until one year after the end of the project period. After this, the public datasets will be available through direct contact with the project partners.

Data quality assurance processes will be presented in the second version of the DMP.

3.2 ALLOCATION OF RESOURCES

The City of Copenhagen is responsible for collection and storage the data generated in task 3.1, including data on waste sorting, quantities, polymer types etc. The Danish Technological Institute is responsible for collection and storage of data generated in task 3.2, including data related to regranulation and production of ten prototypes.

Costs for making data FAIR are under consideration by the City of Copenhagen and the Danish Technological Institute.

3.3 DATA SECURITY

All data is securely stored by the project partners, and will follow the respective security measures deployed in their organisations. This includes generation of data backups to ensure that all data can be recovered. Regarding the transfer of sensitive data relating to the project, the project partners will discuss how to best manage this issue.

3.4 ETHICAL ASPECTS

Templates of the informed consent form and an information sheet about the FORCE project has been prepared as part of the deliverables in WP1 Ethics, D1.4: H – Requirement no 4.

The informed consent form will be used when beneficiaries collect information via interviews, questionnaires, workshops and similar activities in the five work packages, WP3-WP7. The form includes a brief presentation of the project, a description of how participants will be involved, and how data will be used in the project, all in the native language.

3.5 OTHER

All procedures followed comply with national and international legislation.

4 WP4: STRATEGIC METALS

4.1 FAIR DATA

The Day to Day DST (WP4) only provides information and data, if someone runs it. Who and under what conditions this will be done after the end of the project is part of the exploitation plan in WP9.

WP7 Task 7.5 DST: The collected data from the internet in the mongoDB has to stay with Consist because the amount of data will be too much to hand it over and the e.g. ebay usage rights would not allow to do that either. However, the DST provides analysis using the collected data. These analysis (could be huge tables themselves) are open to further use.

4.1.1 Making data findable, including provisions for metadata

EAN numbers will be used as metadata for the metal for the analysis of data generated by the Day to Day DST. Naming conventions and categorizations from WEEE regulations will be further used for specifying keywords. Analysis always refer to a given timeframe and region.

4.1.2 Making data openly accessible

The Day to Day DST will be re-usable and freely accessible to the public beyond the end of the project if someone runs it. The analysis from the DST will be made openly accessible. All project related data, as well as the code and the documentation will be long term stored on the Consist server.

4.1.3 Making data interoperable

The DST tool can be reused in other fields. The DST interface will be developed based on the specific needs of the metal (and wood chains), therefore certain adjustments might be needed for further usage.

4.1.4 Increase data re-use (through clarifying licences)

The DST tool can be reused in other fields. The DST interface will be developed based on the specific needs of the metal (and wood chains), therefore certain adjustments might be needed for further usage. The statistical data generated by the DST in case of a metal chain will remain useful for e.g. time series analysis as long as the categorization in the WEEE has not changed.

The DST will be made freely accessible to the public beyond the end of the project. This statement is valid for principle data categories and structures being used in the project as well. By that, it shall be possible to transfer, adapt and reuse the Big Data application as a base component in other cities or regions after the project has finished¹².

Data quality assurance processes will be presented in the second version of the DMP.

4.2 ALLOCATION OF RESOURCES

All data management will be done under the surveillance of the data protection officer of Consist and according to the data protection rules of Consist. All employees have to agree to these rules and their statements are being recorded. (The DST for the wood chain will be also developed by Consist ITU, therefore the same regulations will be followed).

4.3 DATA SECURITY

At Consist ITU, there are standard procedures to ensure data security of company's projects. All data is stored on the separate servers in Kiel and Hamburg, as well as on the backup servers provided by third parties. The Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz) is followed. (The DST for the wood chain will be also developed by Consist ITU, therefore the same regulations will be followed).

¹² Grant Agreement, page 174.

4.4 ETHICAL ASPECTS

Day to Day DST: Registered users can provide own information on e.g. disassembling of equipment, repair shop offerings, collections point etc. for publication. In the context of registration, users will be informed about the use of their data via the 'Informed consent' (in conformance to the rules of the respective country), all in the native language.

The DST will not provide any personal information, therefore there is no need to consider ethical aspects here.

4.5 OTHER

Consist ITU applies the following procedures for data management in WP4 (includes DST for WP6):

- Standard procedures for data security at Consist ITU
- Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz)
- German User data protection regulations.

5 WP5: FOOD AND BIOWASTE

5.1 FAIR DATA

5.1.1 Making data findable, including provisions for metadata

Regarding naming convention, the *Food Waste Loss Accounting and Reporting Standard*¹³ will be followed when possible. If, and when, this standard fails to encompass a given subject further research will be done to find an adequate standard, if one is available, if not a convention will be defined in collaboration with experts in the given field.

Matters related with metadata, identification mechanisms and versioning numbers are under consideration with the developer, Addapt Creative.

5.1.2 Making data openly accessible

Raw Data collected through the transactional processing of food waste recovery cannot be made publicly available due to contractual reasons. The access to an individual donors or receptors food waste data might enable insights of operational, commercial or other value that must be protected to ensure their engagement with the project. As such, this data is contractually protected.

On the other hand, aggregated data (e.g. sectoral data, geographical data) will be made public whenever the privacy of the donor or recipient is not at stake. This will be done online, through a public access webpage accessible by any browser.

Access to the disaggregated data might be possible for academic purposes under a confidentiality agreement. Data can be supplied in CVS File format in order to be universally accessible.

The need for a data access committee will be established once the datasets to be supplied regarding the collection and treatment process are determined. Until then it is difficult to analyse the full involvement of each partner in the decision process. When such is established conditions for access as well as the methodology to do so will be defined.

The data and associated documentation will be deposited on the ICT tool itself.

¹³ World Resources Institute (WRI): http://www.wri.org/sites/default/files/REP_FLW_Standard.pdf

5.1.3 Making data interoperable

The use of the *Food Waste Loss Accounting and Reporting Standard* will support the interoperability, reusability and exchangeability of the data gathered and generated through the ICT tool.

Technical aspects of interoperability are under consideration by the developer, Addapt Creative.

5.1.4 Increase data re-use (through clarifying licences)

Data licensing matters will be established once the datasets to be supplied regarding the collection and treatment process are determined. Until then it is difficult to analyse the full involvement of each partner in the decision process. When such is established conditions for access as well as the methodology to do so will be defined.

Public data is made accessible as it is inserted in the system during the transitional process management.

Disaggregated data will be accessible at the official launch of the ICT tool, after the trial period, under the conditions described above.

The data will remain available after the end of the project, especially because it is intended that the ICT tool remains active beyond 2020 collecting data.

Currently, *Zero Desperdicio Network* data quality assurance processes will be adapted to the ICT tool and included in the user manual.

5.2 ALLOCATION OF RESOURCES

Data management is a co-responsibility for Addapt Creative, with responsibility for the technical aspects, and DARIACORDAR as a data curator. Long term preservation of data processes will be established once the datasets to be supplied regarding the collection and treatment process are determined. Until then it is difficult to analyse the full involvement of each partner in the decision process. The preservation of this data is essential has, at this time, there are no available time series for sectorial food waste recovery, among others.

Costs for making data FAIR are under consideration by the developer, Addapt Creative.

5.3 DATA SECURITY

Security provisions are under consideration by the developer, Addapt Creative.

5.4 ETHICAL ASPECTS

The data collected and generated by the ICT tool does not include personal data. As such, there are no ethical issues that impact on data sharing beyond the contractual limitations pointed out in section 2.3. Still, any concern that might arise as well as all the foreseen data uses will be included in the terms of use of the ICT tools.

For data collection via interviews, questionnaires, workshops and similar activities, templates of the informed consent form and an information sheet about the FORCE project has been prepared as part of the deliverables in WP1 Ethics, D1.4: H – Requirement no 4. The informed consent form includes a brief presentation of the project, a description of how participants will be involved, and how data will be used in the project, all in the native language.

5.5 OTHER

All procedures followed comply with national and international legislation.

6 WP6: WOOD WASTE

6.1 FAIR DATA

6.1.1 Making data findable, including provisions for metadata

The data produced and used in the project will be discoverable with metadata, identifiable and locatable by means of the standard identification mechanism in use in the Municipality of Genoa that refers to different methodology (RNDT methodology, INSPIRE methodology. The software used for the metadata catalogue will be GeoNetwork (open source).

The metadata available from by the Geoportal are *Inspire Compliance* that is adhering to EU legislation¹⁴. The municipality of Genoa will make available all the considered/expected information collected by the Geoserver opensource platform of the Geoportal through interoperability services of WMS and WFS.

An example of a metadata set that will be created by the Geonetwork application is:

IDENTIFICATION INFORMATION

- Date
- Cited responsible party
- Point of contact
- Resource maintenance
- Resource constraints
- Equivalent scale
- Topic category
- Geographic bounding box

DISTRIBUTION INFORMATION

- Distributor

REFERENCE SYSTEM INFORMATION

DATA QUALITY INFO

METADATA

- Date
- File identifier
- Metadata language
- Character set
- Hierarchy level
- Date stamp
- Metadata standard name
- Metadata standard version

Data already openly available, is the Open Data portal of the Municipality of Genoa at the following link: <http://dati.comune.genova.it/> licenses chosen are Creative Commons 3.X e 4.X.

Issues regarding search keywords and version numbers will be decided upon during the project.

6.1.2 Making data openly accessible

Aspects of data management will include open access and support protection of personal data to allow effective and secure exploitation. Public interests and the protection of intellectual property will be well-balanced (Grant Agreement p. 174).

Shared data on existing platform:

Municipality: Open data catalogue <http://dati.comune.genova.it/search/type/dataset>

The public geographic databases are accessible at:

<http://mappe.comune.genova.it/geoserver/wms?service=wms&version=1.3.0&request=GetCapabilities>

¹⁴ REGULATION (EU) No 1089/2010 EU COMMISSION of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards territorial and spatial data services data set interoperability.

Ticass and ActiveCells may manage some confidential information relative to the task 6.3 “Innovative applications” at the aim of the protection of IP necessary for to provide the incentives for private investment and exploitation of the results (according to the Grant Agreement, p. 174).

6.1.3 Making data interoperable

Open access to the Geoserver opensource platform of the Geoportal would be provided through interoperability services of WMS and WFS (see above).

6.1.4 Increase data re-use (through clarifying licences)

The data will be licensed to permit the widest re-use possible according to the Exploitation Plan and Communication and Dissemination Plan. In the case of WP6, Guidelines for scalability and replication they will be developed in general with licenses depending on the degree of product data openings. It will be defined in more detail in the next version of the DMP.

The data produced and/or used in the project will be useable by third parties, in particular after the end of the project, according to WP6 Guidelines for scalability and replication and Italian Data Protection Code.

In general, licenses will depend on the degree data access. It will be defined later on. For the time being, we expect data will remain re-usable during the project plus one year.

Data quality assurance processes will be presented in the second version of the DMP.

6.2 ALLOCATION OF RESOURCES

For data protection and system management the responsible office is the Informative Systems of the Municipality of Genoa. For data collection and data quality, the responsible office is the Environmental Department.

The DST for the wood chain will be also developed by Consist ITU, so all data management will be done under the surveillance of the data protection officer of Consist and according to the data protection rules of Consist. All employees have to agree to these rules and their statements are being recorded.

Costs for making data FAIR are under consideration by the City of Genoa.

6.3 DATA SECURITY

Security provisions will be in accordance with Municipality of Genoa standards (e.g. security protocol and policy of disaster recovery).

6.4 ETHICAL ASPECTS

D1.3: H – Requirement no 3: Details on the procedures and criteria that will be used to identify/recruit research participants for the interviews in WP6.

For data collection via interviews, questionnaires, workshops and similar activities, templates of the informed consent form and an information sheet about the FORCE project has been prepared as part of the deliverables in WP1 Ethics, D1.4: H – Requirement no 4. The informed consent form includes a brief presentation of the project, a description of how participants will be involved, and how data will be used in the project, all in the native language.

6.5 OTHER

We will use information on cross application founded by own municipality resource (the Geoportal) and regional resources (e.g. cartography 1:5000). More details will follow in the second version of the DMP.

7 WP7: GOVERNANCE AND DECISION SUPPORT

This section describes data management in task 7.1-7.4. Task 7.5 is presented together with strategic metals in sections 2.2 and 4.

7.1 FAIR DATA

7.1.1 Making data findable, including provisions for metadata

Not applicable to the qualitative data gathered for implementing of tasks (cf. section 2.5).

7.1.2 Making data openly accessible

In order to ensure confidentiality, the full interview transcripts from the expert interviews and the citizen involvement will not be published and not be shared with other persons (also not within the FORCE consortium). This allows research participants to freely express their opinions and thus improves the research results of the project. During the interview analysis, the gathered data will be anonymized and aggregated. Only aggregated and anonymised analysis results will be published. The data will be published in project reports and scientific journal articles, conference papers and (scientific) conference presentations.

7.1.3 Making data interoperable

Not applicable to the qualitative data gathered for implementing tasks.

7.1.4 Increase data re-use (through clarifying licences)

Not applicable to the qualitative data gathered for implementing tasks.

7.2 ALLOCATION OF RESOURCES

At HCU, there are standard procedures in place for data management, which ensure data security (including data recovery, secure data storage and transfer) of data gathered and processed in research projects. These include the storage of on separate servers and networks with restricted access only for selected research staff of HCU. Data security standards are overseen by the responsible data protection officer. Moreover, the Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz) is followed.

Since standard procedures are followed which are already in place and generally applied to all research data there will be no additional costs for managing project data.

7.3 DATA SECURITY

At HCU, there are standard procedures in place to ensure data security (including data recovery, secure data storage and transfer) of data gathered and processed in research projects. These include data storage on separate servers and networks with restricted access only for selected research staff of HCU. Data security standards are overseen by the responsible data protection officer. Moreover, the Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz) is followed¹⁵.

7.4 ETHICAL ASPECTS

Since the gathered data is anonymised and aggregated before publication there are no ethic issues that impact data use or sharing (see above for details).

7.5 OTHER

HCU applies the following procedures for data management gathered in tasks:

- Recommendations on good research practices of the European Science Foundation

¹⁵ See <https://www.hh-datenschutz.de/> for further information.

- Proposals for safeguarding good scientific practice of the Commission on Professional Self-Regulation in Science of Deutsche Forschungsgemeinschaft
- Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz)
- Standard procedures for data security at Hamburg's universities.

8 WP9: EXPLOITATION, REPLICATION AND MARKET DEPLOYMENT STRATEGIES

8.1 FAIR DATA

8.1.1 Making data findable, including provisions for metadata

Not applicable to the data gathered for implementation of tasks in WP9.

8.1.2 Making data openly accessible

Most of the data collected and used in frame of WP9 is relevant to draft information in an aggregated, not individualized manner (exploitation plan, stakeholder analysis, market deployment strategy). It is meant to serve project partners as background and guiding information when planning the exploitation of project results. According to the Grant Agreement, these documents are for internal (FORCE consortium and EC services) use only and will not be published openly. Nevertheless, data / information collected when preparing the stakeholder analysis will be handled anonymously and the corresponding reports for partners will not include any data that allows reference to a particular entity or person. Only aggregated and anonymised analysis results will be published. The business modeling strategies will also be drafted to serve as guiding documents for project partners in order to enable them plan their business cases/model for exploiting their results in a commercial way but the strategies will be made available and accessible via the project's website. No special software tools will be necessary to access the data.

8.1.3 Making data interoperable

Not applicable to the data gathered for implementing tasks in WP9.

8.1.4 Increase data re-use (through clarifying licences)

Not applicable to the data gathered for implementing tasks in WP9.

8.2 ALLOCATION OF RESOURCES

HAW has the same procedures for managing data as the HCU (section 7.2). Furthermore, HAW is also governed public law, and therefore the Data Protection Act of the City of Hamburg will also be followed.

8.3 DATA SECURITY

Same applies for HAW Hamburg as presented in section 7.3.

8.4 ETHICAL ASPECTS

The same applies for data gathered in WP9 as in section 7.4.

8.5 OTHER

HAW applies the following procedures for data management gathered for tasks to be undertaken in WP9:

- Recommendations on good research practices of the European Science Foundation
- Proposals for safeguarding good scientific practice of the Commission on Professional Self-Regulation in Science of Deutsche Forschungsgemeinschaft

- Data Protection Act of the Free and Hanseatic City of Hamburg (Hamburgisches Datenschutzgesetz)
- Standard procedures for data security at Hamburg's universities.