Copy of C3 - Ontwikkeling van een holistisch beoordelingsmethode en selectie instrument om de energiearmoede en de milieu-impact van het woningbestand te verminderen

A Data Management Plan created using DMPonline.be

Creator: Els Van de moortel

Affiliation: KU Leuven (KUL)

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Project abstract:

The research project further develops the findings from the PhD thesis “Development of a tool to guide sustainable renovation of social housing in Flanders.” The aim of the research is to reduce energy poverty and the environmental impact of the residential building stock in a feasible and affordable way and is focused on the following research question: “How can an existing methodology to select the most optimal renovation option from an environmental and financial perspective be expanded in line with recent economic developments, being the circular, collective and cooperative economy, to respond to urgent societal problems such as energy poverty and the high environmental impact of the residential building stock?” To answer the research question from a holistic perspective, researchers with different backgrounds teamed up. The methodology will be illustrated on multiple cases in the social housing stock, where a high level of homogeneity guarantees replicability.

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Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
		Indicate: ***N****(ew data) or* ***E****(xisting data)*	Indicate: **D**(igital) or **P**(hysical)	Indicate: **A**udiovisual **I**mages **S**ound **N**umerical **T**extual **M**odel **SO**ftware Other (specify)		Indicate: <1GB <100GB <1TB <5TB >5TB NA	
See annex							

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

An excel file is provided to store all info on the datasets, see annex.
The source of the existing data is include in the overview file on the datasets used in the research.

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- No

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- Yes

Database on default buildings (materials, build-ups and technical installations) and renovation options (materials, build-ups and technical installations) and calculation tool (including derived data and/or programming code) for life cycle environmental and financial impact can be used for consultancy / spin-off in the future.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- Yes

Before involving third parties, a letter of consent is sent to them which describes that project data, generated by us, should be treated as confidential by them, and that data, provided by them, will be utilized for scientific research. Any sharing of data between stakeholders will be, beforehand, discussed and formalized through written consent.
Attached to this DMP plan you can also find a template for the letter of informed consent (in Dutch and English) and for the letter of information.

Following agreements have been or are being made by The SySi Team:

- Data has been provided by Cordium for use in dynamic simulations in the frame of a master thesis. If these data will be used in this C3 project, an additional formal agreement will be set up after consulting LRD.
- An NDA is being set up with Daikin Europe (under the umbrella of EnergyVille). When this specific producer agrees to share data for this C3 project, a new NDA will be set up after consulting LRD.
- An agreement will be made with the residents of Blauwpoorte to safeguard their privacy when using their heat pump data in research.

- Meteo data and forecasts have been made available by the RMI for which an agreement has been signed – only to be used in the PhD of Jelger Jansen and Delbar Faghihmirzaei. Extensions can be requested, but the raw data should not be made public.

The MPC code cannot be shared (IP), though the numerical results of dynamic simulations can be used in this C3 project.

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

Project data will be consistently and continuously collected and updated throughout the 2 years of the research program. Project data is stored on the Onedrive in a system of folders. In this folder, a differentiation is made between different types of data, such as received data and data processed by us. The same folder structure will then be utilized when archiving the data. An excel with overview of the data sets and README.txt file with a small note how to use the excel file will be added in the folder. During each team meeting or external meeting, a report is made that summarizes the meeting results. The date of the meeting is incorporated in the filename of those documents.

Will a metadata standard be used to make it easier to find and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- Yes

Data on consulted research literature is stored with tags in an Endnote shared library.
Currently, project data are stored in a Onedrive folder with a README file for explaining the data structure. Thus, the location of a file within that drive (e.g the folders it is in) and name of the file act as a basic metadata.

Data Storage & Back-up during the Research Project

Where will the data be stored?

- OneDrive (KU Leuven)
- Shared network drive (J-drive)
- Personal network drive (I-drive)

During the research project, data is stored in a KU Leuven Onedrive. And optionally on the shared servers (I of the faculty. For more info on servers, see DATA STORAGE – ICTS (kuleuven.be) .
For the researchgroup of professor Wurm a maximum of documents will be centralized and saved on the KU Leuven server and cloud application: the shared data of a research project at the Faculty of Architecture is stored on the J-disk in Leuven/ department of Architecture. The PhD student and supervisors have access to this, the supervisors grant permission to the respective researchers. The ICT support is provided by LUCA. All personal data will be stored on the I-disk/ in Leuven/ department of Architecture. As a cloud application, Box is supported (up to 2TB per user). The long-term storage is guaranteed up to 10 years after the end of a project. This is stored on servers in Leuven, on the K-disk. The members of the research group have access to the data with the permission of the supervisor.

How will the data be backed up?

- Standard back-up provided by KU Leuven ICTS for my storage solution

Back up of folders can be managed through the Onedrive system.
Regarding recovering deleted files from a Onedrive system: " Deleted files are kept for up to 90 days. You can also do a full Restore of your OneDrive." source: Frequently asked questions OneDrive – ICTS (kuleuven.be)
Regarding restoring older versions of files from a Onedrive system: "If you sign in with a work or school account, the number of versions will depend on your library configuration." source: Restore a previous version of a file stored in OneDrive - Office Support (microsoft.com)

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

The KU Leuven Onedrive is limited to 2TB, but on request it can be enlarged to 5 TB.
Seeing as 3 research groups are involved in this project, we can theoretically rely on 15TB of Onedrive storage space during the project.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

During the research, Onedrive security is utilized.
If deemed necessary, it is possible to store strictly confidential data at KU Leuven OneDrive for Business. In that case you commit to activate multifactor authentication with the KU Leuven Authenticator app as described on https://admin.kuleuven.be/icts/english/news/authenticator

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

Storage is paid by the Department of Architecture (2Tb + 5Tb archiving). One drive offers 2 Tb for free per staff member. This is sufficient, no additional data storage is needed.

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

After finishing the research project, the data that is deemed irrelevant by all researchers and supervisors to the project will be removed or can be moved to other research projects.
All data will be stored on the archive folder on the KU Leuven server.

Where will these data be archived (stored and curated for the long-term)?

- Other (specify below)

The data is stored on the K-drive (archive with restricted access to the people involved in the project).

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

The Department of Architecture pays for 5TB of storage and can be extended if needed.
The data used by the department of TME will be stored on virtual machines hosted by ICTS, and maintained by ICTS-SET. Typical cost is 22.33€ per CPU-core en 11.80€ per GB memory. Together with the overhead cost, the data storage cost is estimated at about 150€ per year, which is included in the consumables budget of the project.

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Other (specify below)

Part of the data will be potential open data, made available via journal papers or stored in open data repositories such as for example the KU Leuven data repository RDR (https://www.kuleuven.be/rdm/en/rdr).
Part of the data will be closed access, such as the environmental data. These will be stored as described above.

If access is restricted, please specify who will be able to access the data and under what conditions.

Data with restricted access will be available for the research groups in which they have been generated.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

Please explain per dataset or data type where appropriate.

- Yes, intellectual property rights

The reason for restriction of data has to do with IPR.

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- KU Leuven RDR (Research Data Repository)

When will the data be made available?

- Upon publication of research results

There is no date set after which data will be automatically made available. Data will only be made available after consent from the stakeholders and the responsible parties at KU Leuven.

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)

It is possible that novel tools, such as software, are created during the research. Necessary steps for providing IP protection of the end product will be taken. In the case we opt for an open source format of this software, one of the licenses, also available for Github repositories, can be considered. More info on this at https://ufal.github.io/public-license-selector/ .

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- Yes, a PID will be added upon deposit in a data repository

What are the expected costs for data sharing? How will these costs be covered?

As we don't know yet which data will be share, it is not possible yet to estimate the costs for data sharing.

Responsibilities

Who will manage data documentation and metadata during the research project?

Els Van de moortel, Karen Allacker and Jan Wurm for the department of Architecture. Lieve Helsen for TME.

Who will manage data storage and backup during the research project?

Els Van de moortel, Karen Allacker and Jan Wurm for the department of Architecture. Lieve Helsen for TME.

Who will manage data preservation and sharing?

Els Van de moortel, Karen Allacker and Jan Wurm for the department of Architecture. Lieve Helsen for TME.

Who will update and implement this DMP?

Els Van de moortel and Karen Allacker.

Processed or Raw	Open or Closed	1.primary(us) 2.second.	Dataset ID	Description	Data type	Format	Volume	How created/source
				C3 PROJECT ASIRE²				
				Statistical DATA				
Raw	Open	2	S1	Average income of tenants in social housing in Flanders	Numerical Textual	.xlsx	123kB	BRON: https://www.vlaanderen.be/sociaal-woonbeleid/cijfers/huurders
Raw	Open	2	S2	Average rent for social housing in Flanders	Numerical Textual	.xlsx	28kB	BRON: https://www.vlaanderen.be/sociaal-woonbeleid/ciifers/huurders
Raw	Open	2	S3	Eurostat price electriciy	Numerical Textual	.xlsx	24kB	https://ec.europa.eu/eurostat/web/products-datasets/-/ten00117
Raw	Open	2	S4	Eurostat price natural gas	Numerical Textual	.xlsx	25kB	https://ec.europa.eu/eurostat/databrowser/view/ten00118/default/table?lang=en
Raw	Open	2	S5	Printscreen website VREG overview price electriciy	Images	.jpeg	92kB	https://dashboard.vreg.be/report/DMR_Prijzen_elektriciteit.html
Raw	Open	2	S6	Printscreen website VREG overview price natiral gas	Images	.jpeg	75kB	https://dashboard.vreg.be/report/DMR_Prijzen_gas.html
Raw	Open	2	S7	Average energy use in Flanders	Numerical Textual	.pdf	365kB	https://www.vreg.be/nl/energieverbruik
			S8					
			S9					
			S10					
			S11					
			S12					
			S13					
			S14					
			S15					
				SITE DATA OTHER				
Raw	Open	2	O1	Site aerial pictures (prints)		pdf, jpeg, tiff or gif	<5 GB	Prints from Geopunt, cartesis, other open data sources
Processed	Closed	1	O2	Site 3D model		skp rvt	<5GB	Sketchup/Revit (client)
Processed	Closed	1	O3	Dwg site		.dwg	<10 GB	Own processing
				MARKET or STAKEHOLDER DATA				
Raw	Closed	1	M1	Stakeholders - Contact list		xls	<500MB	emails, web, interviews
Processed	Closed	1	M2	Presentations given by stakeholders (processed)		pdf, ppt	<1GB	sythesis from data above
Processed	Open	2	M3	Company data		xls	<10GB	Data from KBO, webinfo, twitter...
				STREET LEVEL SITE VISIT DATA				
Raw	Closed	1	L1	Pictures - fieldwork		jpeg	<5GB	Digital camera
Raw	Closed	1	L2	Fieldwork notes		doc or onenote	<5GB	Observation
				WORKSHOPS				
Raw	Closed	1	W1	Recording of workshops		mp3 and mp4	<60GB (30 times 20 min at a rate of 0.100 GB/minute at 720p/30fps MP4)	recordings
Raw	Closed	1	W2	Workshop results - raw		model, jpeg	<1 GB	scan or photography
Processed	Closed	1	W3	Workshop results - reports		pdf	<1 GB	conclusions of workshops
Raw	Closed	1	W4	Workshops - Participant list		xls	<500 MB	email, stakeholders
Raw	Closed	1	W5	Pictures of workshops		jpeg	<1GB	photography
				SPECIFIC BUILDINGS				
Raw	Closed	1	B1	Detailed building drawings		pdf, jpeg, tiff or gif (probably in format A0-4)	<10 GB (30 buildings *15 plans per building*20MB per plan)	recieved from stakeholders
Raw	Closed	1	B2	Building energy use data		jpeg, tiff	<300MB (30 buildings *2 pictures per building*5MB per plan)	recieved from stakeholders
Raw	Closed	1	B3	Bill of quantities of materials and products per building or building parts		pdf or doc or xls	<150 MB (30 buildings * 5MB)	recieved from stakeholders
Raw	Closed	1	B4	Pictures from building		jpeg, tiff	<1,5 GB (30 buildings *10 pictures per building*5MB per plan)	Site-visit with camera from KU Leuven or from building tenants
				PRODUCT AND MATERIAL DATA				
Processed	Open	2	P1	Data per product (EPD)		pdf or doc or xls	< 500 MB (50 materials *10MB per plan)	acquired from manufacturers
Processed	Closed	2	P2	Environmental databases and LCA results		csv, ilcd	< 500 MB (50 materials *10MB per plan)	European databases (ecoinvent)
				BIBLIOGRAPHY				
Processed	Closed	2	A1	Research articles and books		Pdf	<10GB	Publishers
Processed	Closed	2	A2	Summaries and text files of research articles and books		doc, pdf	<500MB	Processing of A1