

Introduction to BuiltHub

○ *Building a sustainable and meaningful data flow of the EU Building stock*

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Renewable Energy · EURAC Research





Agenda

1) BuiltHub's objectives and achievements so far



2) Challenges and open questions



BuiltHub's objectives and achievements so far



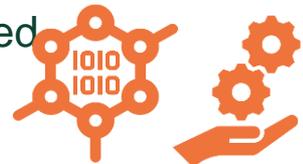
BuiltHub in a nutshell

Coordination and Support Action (CSA)

4 year-project, October 2020 - September 2024

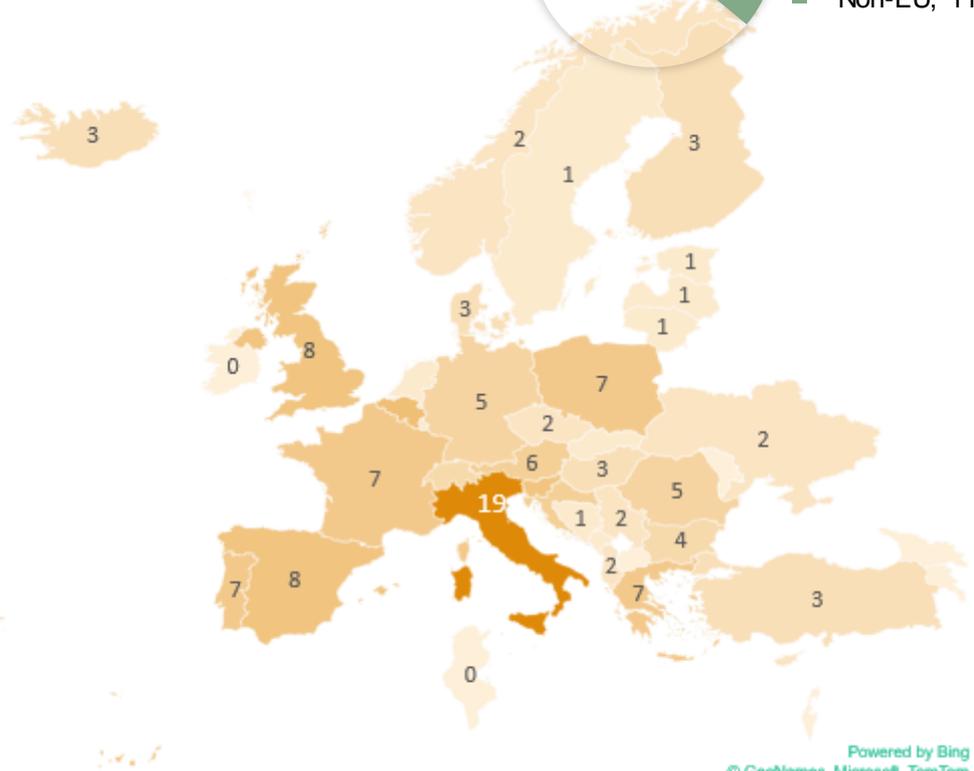
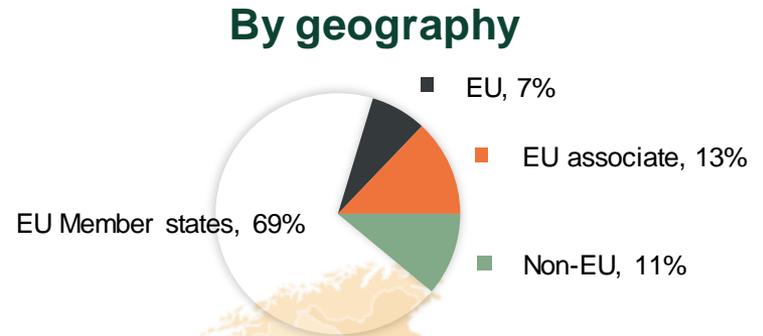
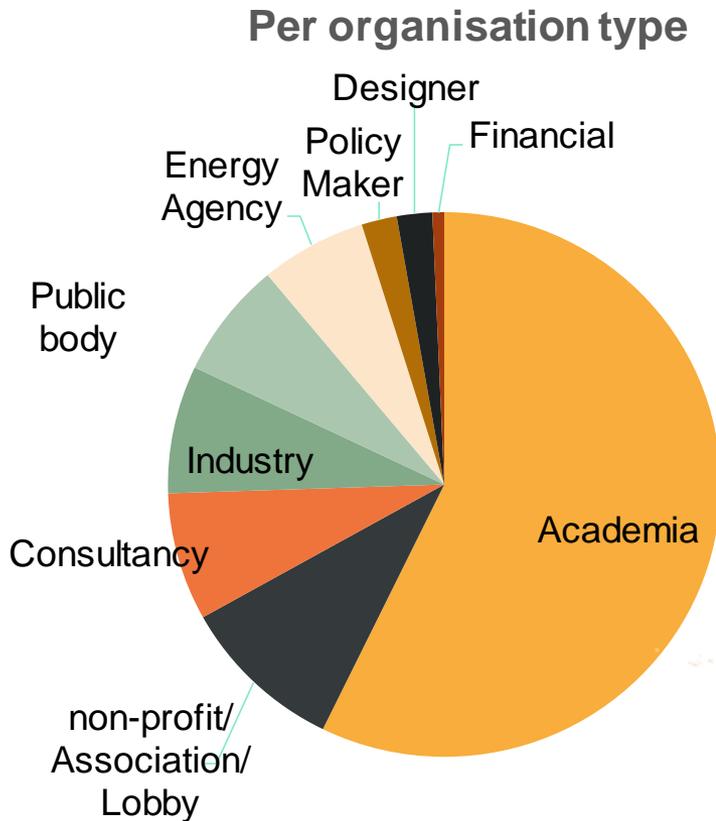
BuiltHub's main goals

- Develop **roadmap for sustained dataflow** to EU Building Stock Observatory (BSO)
- **Build and engage community** for data collection, exchanges, data-to-knowledge processes
- **Standardized data governance and services** offered and demonstrated through **BuiltHub platform**
- **Coordinated action** among associated projects





BuiltHub stakeholders overview





Survey results – stakeholder needs

Highest importance

- Access to **more data**
- **Comparable data** for other countries/cities/municipalities
- Access to **benchmarks, scenarios, plans and goals**

High importance

- Data **collection**/storage
- Data **analysis**/processing
- Data **community building**/exchange with community/data **sharing**
- Complementary **data from other sectors** that interact with buildings (e.g. energy, manufacturing industry)
- Cross sector analysis that BuiltHub will provide based on the size of database
- Comparison tools for your dataset with other datasets
- Quality analysis of data
- Check/clean data
- Import/integrate data into other platforms
- Validation tools for your dataset, for example across different time periods
- **Privileged access to a live data-sharing community**

BuiltHub platform

Filters

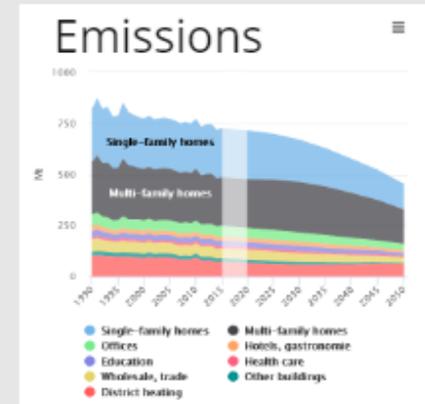
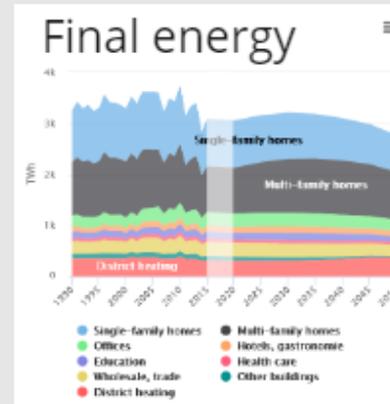
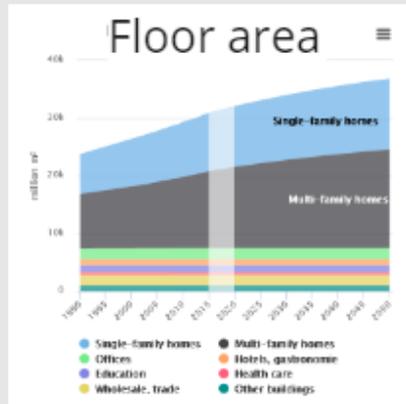
Dimension:
indicators

Dimension:
Countries

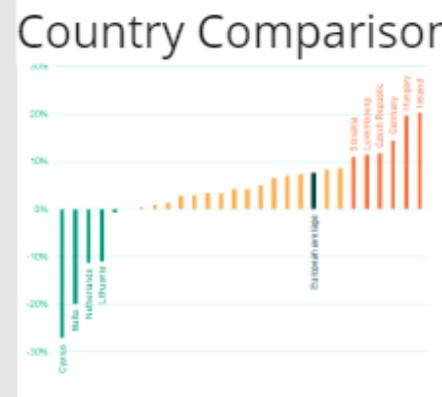
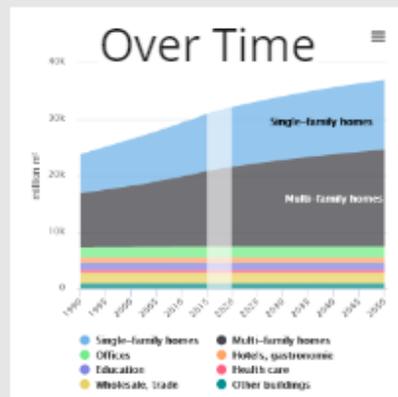
Dimension:
Years

Dimension:
Breakdown
fuels, uses,
technologies

Select indicator you want to see



Select visualization type





BuiltHub platform datasets

Legend	
A	Building stock related datasets
B	Socio-economic datasets
C	Climatic datasets

Dataset number	Topic type	Name	Content
1	A	Horizon 2020 HotMaps project: Building stock analysis	Complete building stock analysis for the EU27+UK. Values related to final energy consumption and useful energy demand for space heating, space cooling and domestic hot water, construction materials and methodologies, technologies used and building stock data/information (thermal transmittancy, building stock vintages and characteristics, household occupancy related data, etc.) can be found both for the residential and the non-residential sectors per building types and construction vintages.
2	A	IEE TABULA project: Typology Approach for Building Stock Energy Assessment	Building stock data and data focused on technical systems for heating, cooling and domestic hot water production in different buildings types are the main outputs of this dataset. Final energy consumption and envelope performance data are available as well.
...
28	C	EDGAR (Emissions Database for Global Atmospheric Research) CO2 Emissions	Carbon Dioxide (CO ₂) emissions by country and sector (Buildings, Transport, Other industrial combustion, Power Industry and other sectors) have been collected for the years between 1970 and 2018 and are reported expressed in MtCO ₂ /year.
29	C	CORDEX - Regional climate model data on single levels for Europe	Climatic data for Europe expressed in daily, monthly and seasonal mean values as well as 3 or 6 hours resolution. Data for air temperature at 2 m, wind speed, atmospheric pressure and humidity can be found.
30	C	PVGIS - Photovoltaic Geographical Information System	This GIS dataset contains data related to the solar radiation. It takes into account both day and night-time periodsexpressing the solar radiation raster map in W/m2.
...



Networking and outreach

Collaboration for next-generation building data collection and sharing

Surveys, interviews, one-to-one calls, webinars, workshops, stakeholder dialogues

- Eurostat, JRC, CA EPBD
- H2020 big data projects BEYOND, BIGG, MATRYCS
- Other H2020 projects
- Initiatives, associations, institutions



BIGG



MATRYCS



BEYOND



enefirst.



Smart Built4EU



CONCERTED ACTION
ENERGY PERFORMANCE
OF BUILDINGS



BEreel!
BELGIUM RENOVATES FOR ENERGY EFFICIENT LIVING



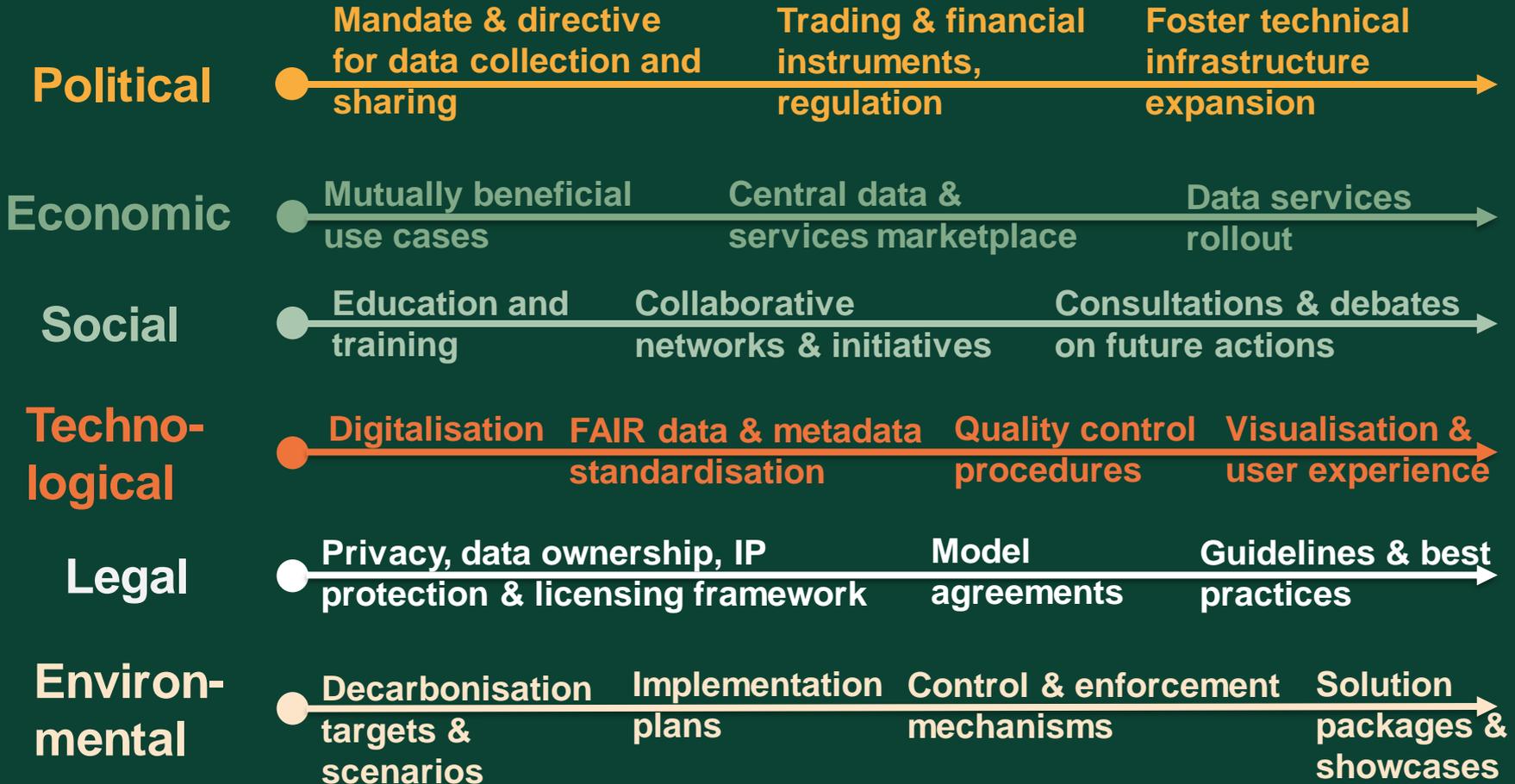
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

Future²







BuiltHub resources



Get involved!

Be proactive by becoming a...

- **Pilot user** of our building data platform
- **Data provider** in exchange of services
- **Ambassador**, promoting responsible data sharing and collection
- **Networker**, interacting with our stakeholder community

Or simply follow us:

Contact us at: info@builthub.eu

Or write me: ulrich.filippi@eurac.edu



Challenges and open questions



Challenges and open questions

- **Why** share data?
- **How** to encourage data sharing?
- How to **exploit** available data?
- Data **FAIR**ification (Findable, Accessible, Interoperable, Reusable)
- Data **quality** and reliability
- What **standards** to follow?
- How to bridge the **micro and macro data** gap?
- Establish construction/buildings **dataspace**
- GDPR, IP protection, **security**
- Data provision agreements, **licensing**
- Digitalisation, automation, **interoperability**



Why share data?

Stakeholders **highly request more data.**

However...

Our BuiltHub community has reported a **lack of knowledge on benefits, risks, efforts, and costs** associated with data collection and sharing.

A **quantitative, credible, and reliable demonstration** of the above factors is lacking.

Further, there is a **lack of readily accessible resources supporting data sharing.**

- Guidelines
- Training
- Platforms
- Tools
- Model agreements
- Best practices



How to encourage data collection and sharing?

- **Demonstration of added value**
- **Quantitative cost-benefit analysis**
- **Demonstration of risk management**
- **Public entities** – legitimacy, resources, clear view of advantages
- **Private entities** – resources, sound business models
- **Enablers**
 - Mandate
 - Directives
 - Guidelines
 - Training
 - Best practices
 - Financing
 - Dissemination and communication

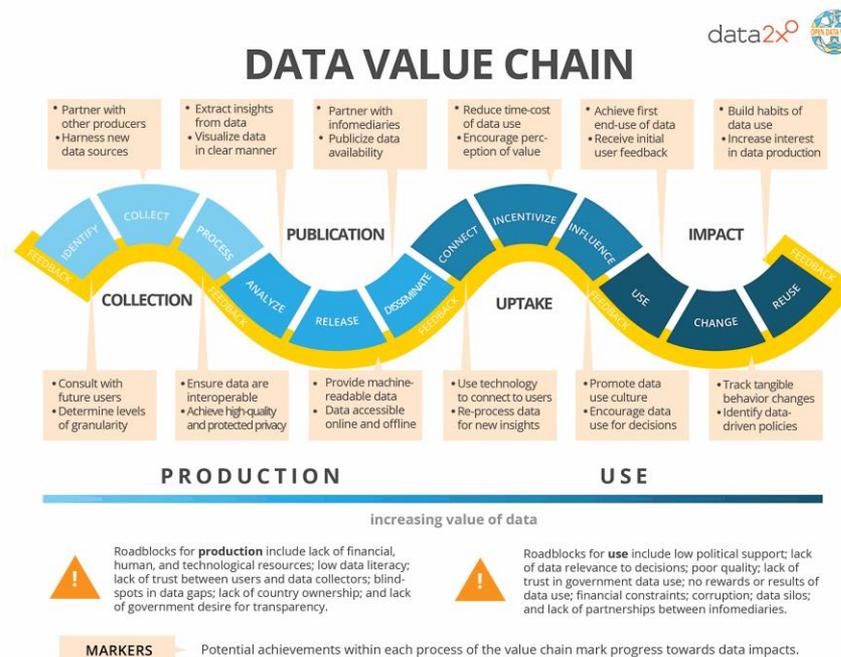


How to exploit available data?

„I have collected data – what should I do with it?“

→ High effort required to plan and execute excellent data value chain, from data collection and analysis to providing services

→ Establish guidelines and learn from best practices



<https://7wdata.be/open-data/the-data-value-chain-moving-from-production-to-impact/>



Data quality

→ Automated pre- and post-processing

→ Complete, standardised metadata

- DataCite, schema.org, Zenodo
- Author(s), title, DOI, publisher, publication year, resource type, link, content, origin, geographical extension, spatial and temporal granularity, access, terms of use

→ Comparability of indicators

- Built, gross, net, commercial, rentable, useful, usable, treated, ... square meters
- Primary, final, delivered, useful, ... energy
- Complete, transparent description of collection/measurement/calculation methods

→ Data inspection and quality assessment services

→ Open community discussions on data quality and reliability

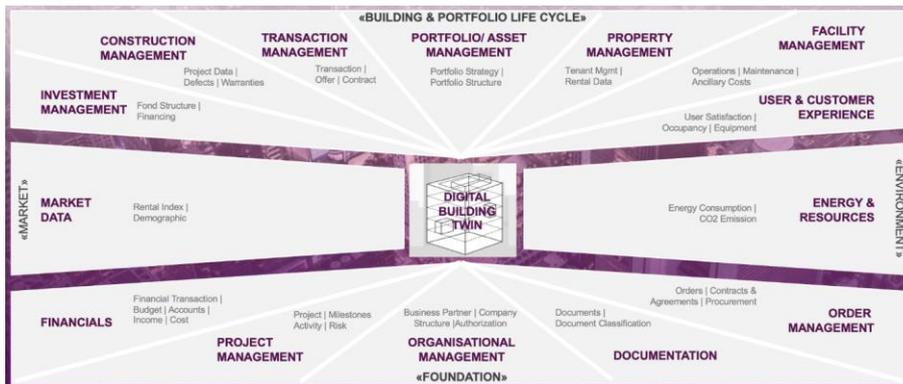


What standards to follow?



Data Spaces Business Alliance

<https://internationaldataspaces.org/bdva-fiware-gaia-x-and-idsa-launch-alliance-to-accelerate-business-transformation-in-the-data-economy/>

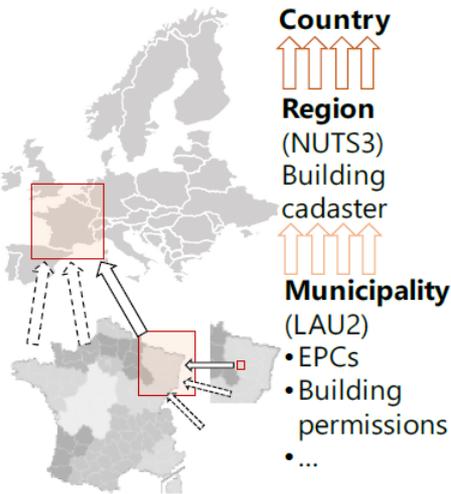


IBPDI real estate Common Data Model

<https://github.com/ibpdi/cdm/blob/main/README.md>



How to bridge micro and macro data gap?



Stakeholders: data provision to BuiltHub

DATASETS: Data assembly and validation (WP3)

Top down with suitable licence:
 + available bld info from municipality (LAU2) to country domain
 + national/EU statistic agencies
 + geomatic open data
 + any via webservice

Bottom up informed consent:
 + smart meters
 + open street map
 + crowd data collection (by citizen)
 + any spot providing

BuiltHub
 IT infrastructure (WP5)
 Metrics and Analytics (WP4)

BuiltHub: services delivered to the stakeholders

SERVICE: Stakeholders map and needs (WP2)

SERVICE 1 – Researchers (Lead User)
 Standardised building stock indicators

SERVICE 2 – Facility Managers. (Lead User)
 Benchmark and building O&M strategies

SERVICE 3 – Real estate devel. (Lead User)
 Bld. stock monitor and benchmarks

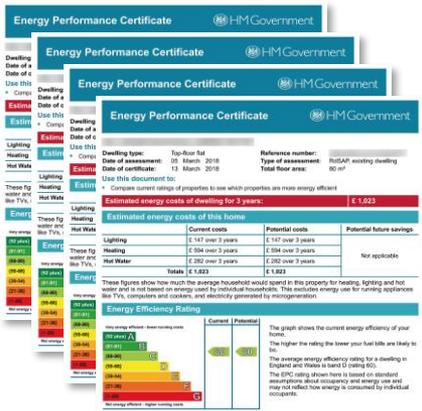
SERVICE 4 – Utilities (Lead User)
 Geo-spatialized building load profiles

SERVICE 5 – Policy makers (End User)
 Bld. stock progress towards carbon neutrality

SERVICE 6 – Designers (End User)
 Benchmarks and technologies tracker

SERVICE 7 – Local authorities (End User)
 Urban renovation scenarios and plans

SERVICE 8 – Citizens (End User)
 Renovation goals and investment benchmarks



Individual building's

against benchmarks

- Energy performance
- Potential energy savings
- Energy refurbishment cost



CARTIF

NTT DATA

eurac
research



RI.
SE





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