TECHNISCHE UNIVERSITÄT WIEN

From one-time data collection to continuous monitoring

Lukas Kranzl

TIMEPAC 2023 International Workshop. Towards a dynamic and enhanced EPC: advanced procedures for building assessment and certification

Vienna, 21 November 2023

Data: a key enabler of climate and energy policy target achievement

Examples from the new (and still discussed) legislation: EED and EPBD recast

EUROPEAN COMMISSION

Brussels, 15.12.2021
COM(2021) 802 final

2021/0426 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on the energy performance of buildings (recast)

(Text with EEA relevance)

{SEC(2021) 430 final} - {SWD(2021) 453 final} - {SWD(2021) 454 final}

20.9.2023 EN Official Journal of the European Union L 231/1

I

(Legislative acts)

DIRECTIVES

DIRECTIVE (EU) 2023/1791 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 13 September 2023
on energy efficiency and amending Regulation (EU) 2023/955 (recast)

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 194(2) thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national Parliaments,

Having regard to the opinion of the European Economic and Social Committee [1],

Having regard to the opinion of the Committee of the Regions [2],

Acting in accordance with the ordinary legislative procedure [3],

Whereas:

Examples from the new (and still discussed) legislation: EED and EPBD recast

EUROPEAN COMMISSION

Brussels, 15.12.2021
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Proposal for a

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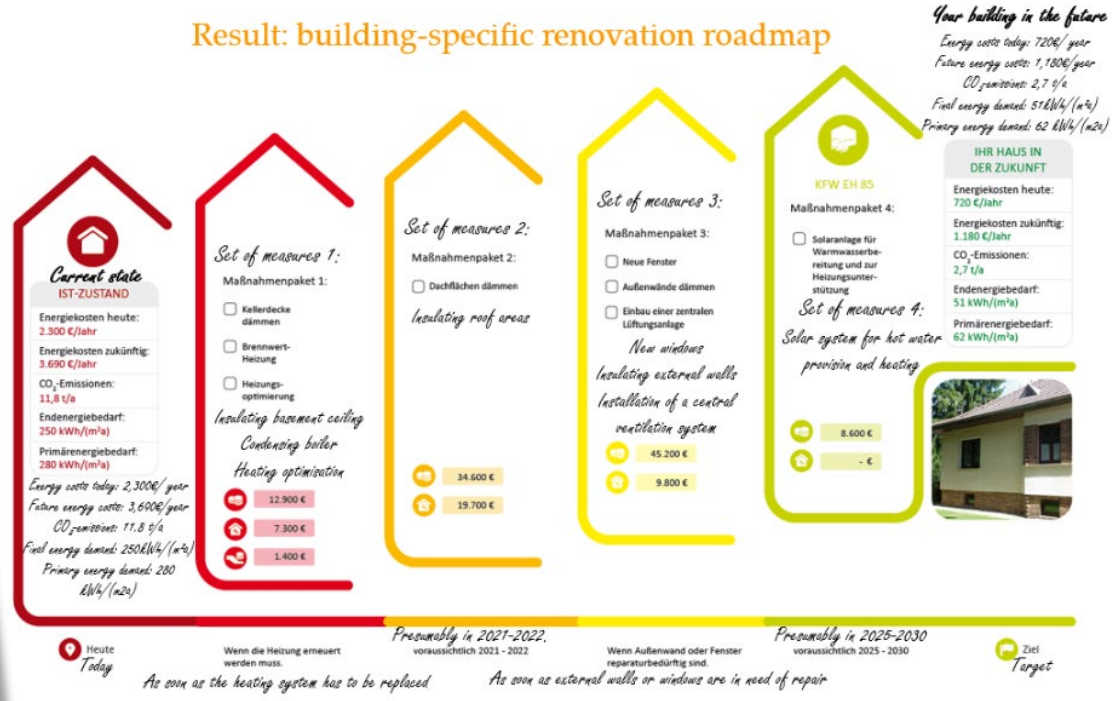
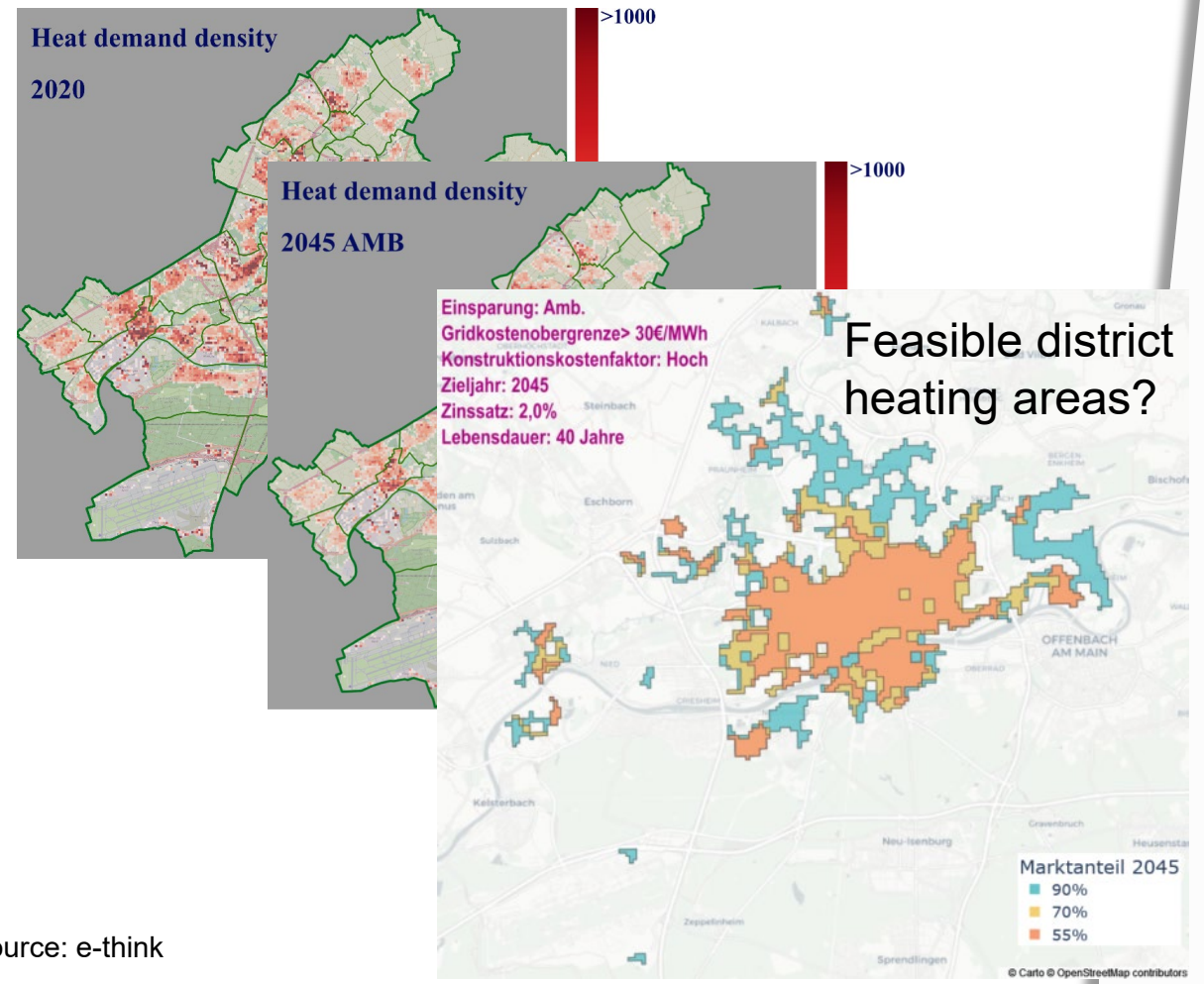
on the energy performance of buildings (recast)

strengthened role of BRPs and EPCs?

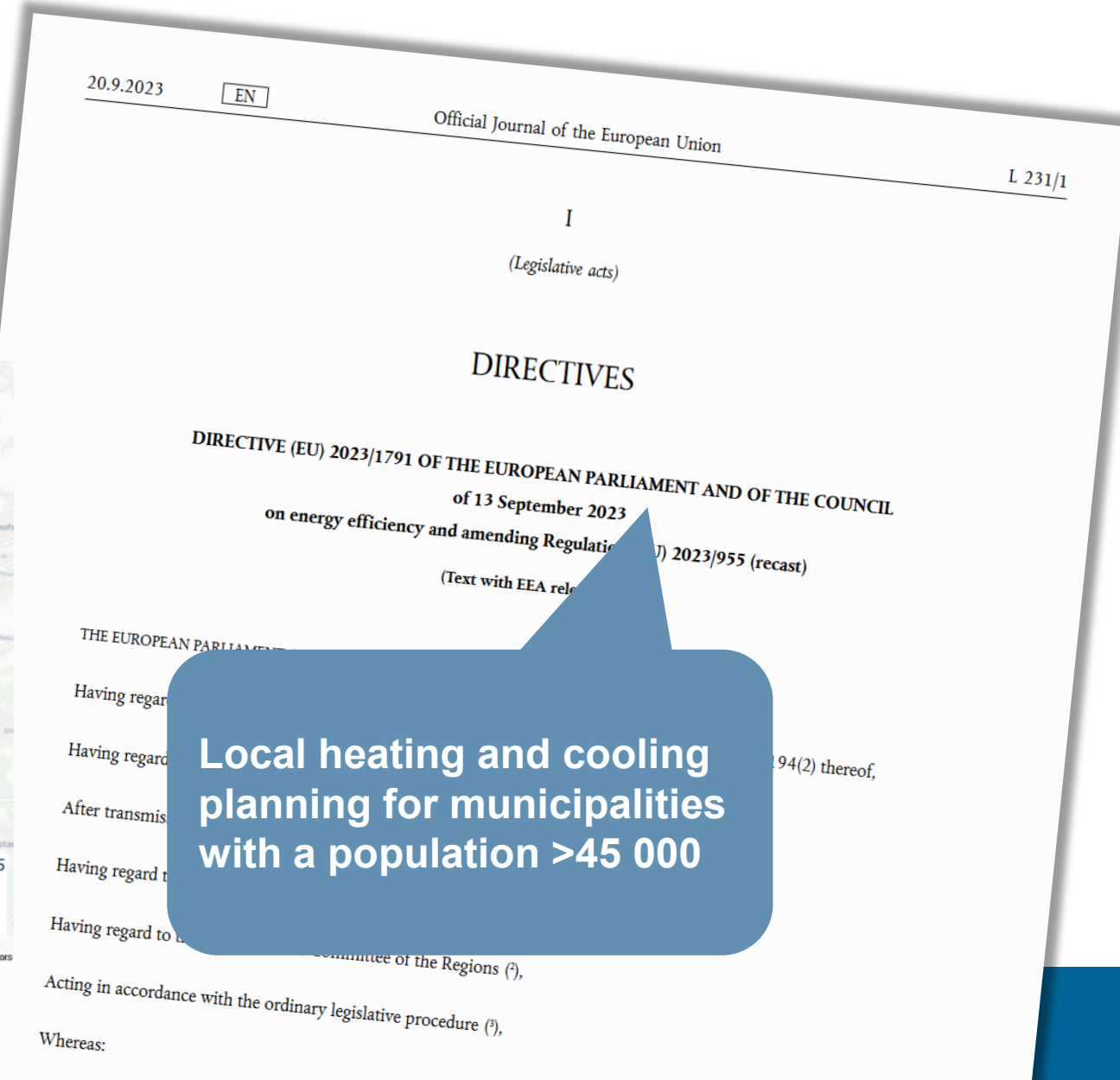


Source: BPIE, https://www.bpie.eu/wp-content/uploads/2017/01/Building-Passport-Report_2nd-edition.pdf, accessed: 26.4.2022

Examples from the new (and still discussed) legislation: EED and EPBD recast



Source: e-think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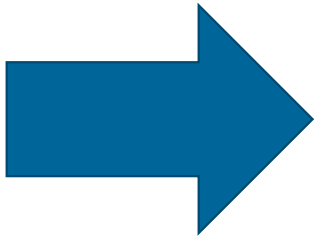
Whereas:

Local heating and cooling planning for municipalities with a population >45 000

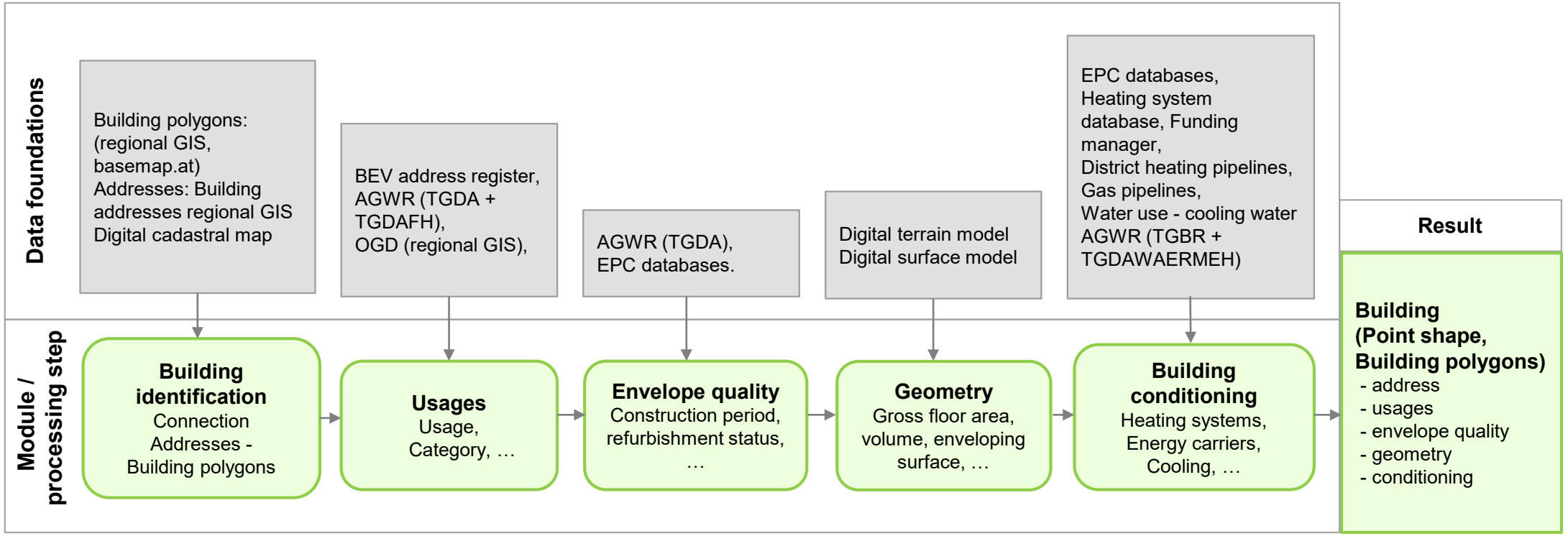
See e.g. Hummel, M., Büchele, R., Müller, A., Aichinger, E., Steinbach, J., Kranzl, L., Toleikyte, A., Forthuber, S., 2021. The costs and potentials for heat savings in buildings: Refurbishment costs and heat saving cost curves for 6 countries in Europe. Energy and Buildings 231, 110454. https://doi.org/10.1016/j.enbuild.2020.110454

Historically: static, locally constrained, one-shot data collections for energy planning and policy monitoring



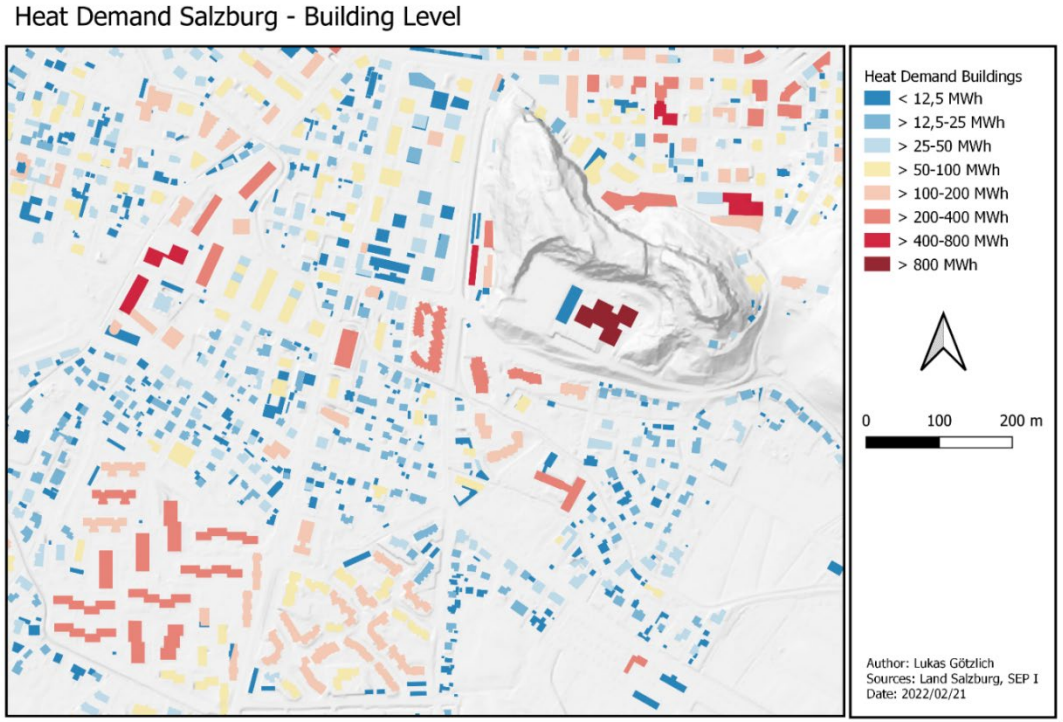
Dynamic, continuosly updating, cross-regional, integrated data and monitoring framework

Building model of the project "Spatial Energy Planning" (SEP)



www.waermeplanung.at

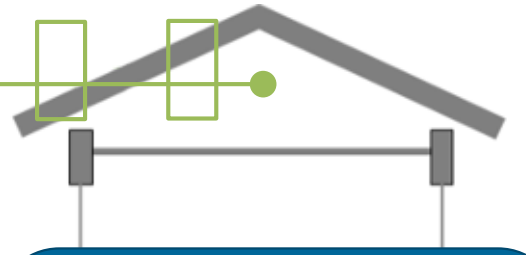
Heat demand on building level (SEP)



Quelle: Götzlich et al, 2022

Results per building address from the SEP model

Spatial Energy Planning



Identification

building address ID
building polygons ID
municipality code
municipality name
postcode
street code
street name
house nu
address c
building a
address c
building id
land regis
assignme
point geo
building p

Data on mixed use of buildings?

Details for non-residential buildings?

Status of existing heating systems?

Intersection of data sources?

Data on previous (partial) renovation measures?

Usage

usage unit identifier	[-]
building address ID	[-]
stock status	Classif.
building Main residences	[-]
building Secondary residences	[-]
building category	Classif.
building usages	Classif.
usage data source	[-]
main usage of the building	Classif.
owner type of the building	Classif.
ownership status	Classif.
date of the last change	ddmmyy

Geometry

building polygons ID	[-]
external floor area	[m^2]
ridge height	[m]
gross volume	[m^3]
gross f	
BGF	
condi	
extern	
roof a	
condi	
A/V ra	
comp	
date	

Data gaps and errors in building registries

building	s ID [-]
space he	ng supply location Classif.
space heating system age group	Classif.
energy carriers for space heating	Classif.
	rce Energy carriers Space heating [-]
	pace heating system Classif.
	ce Energy carriers Space heating [-]
	mestic hot water system Classif.
	eat emission system Classif.
	mperature of heat emission system [°C]
	mperature of heat emission system [°C]
	lar thermal system Classif.
	surface area [m^2]
	the heating system [kW]
	heating grid ID [-]

Envelope quality

building address ID	[-]
building age group / construction period	Classif.
construction period data source	[-]
building construction year	yyyy

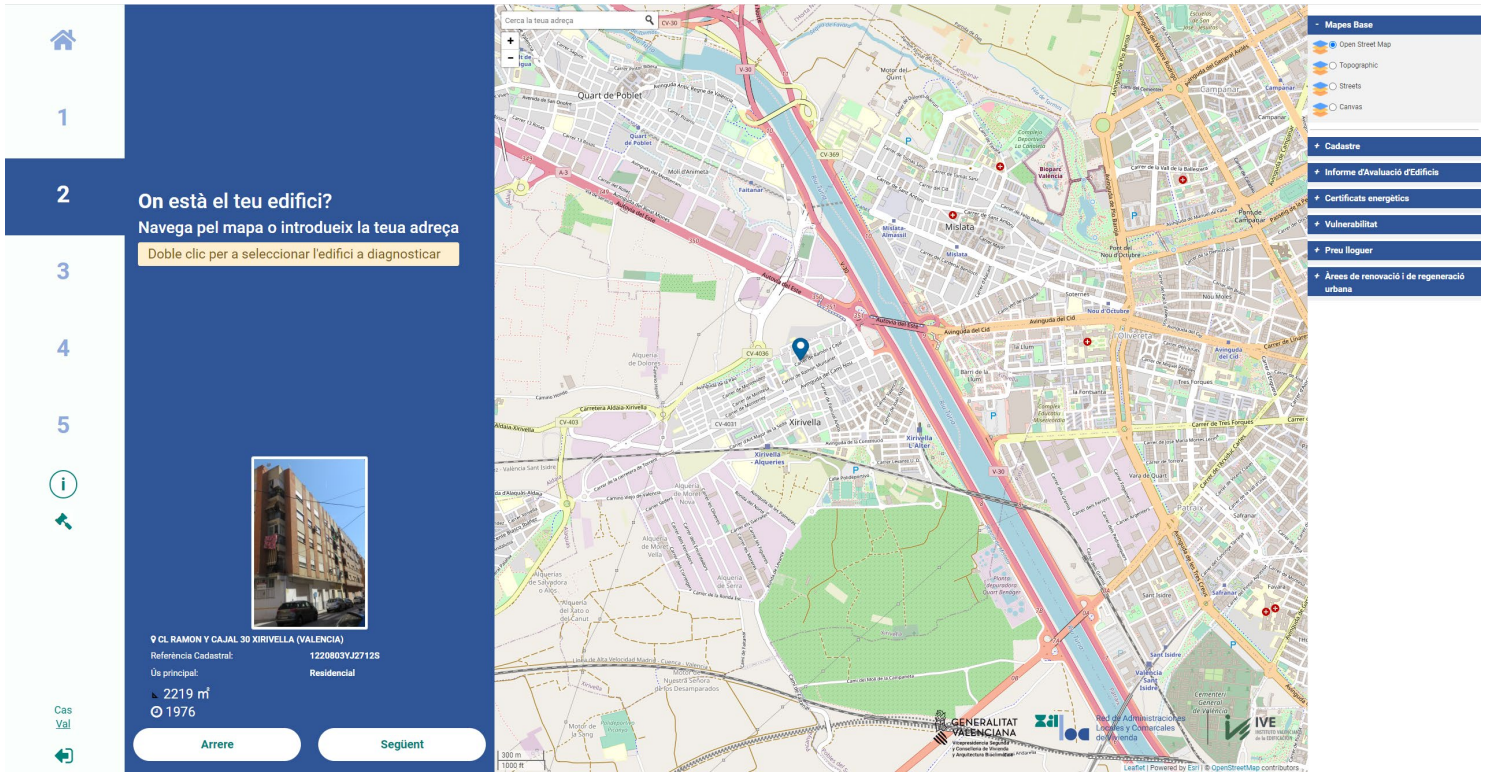
Energy demand

building address ID	[-]
useful energy demand space h ng	[kWh/m^2a]
useful energy Hot water demand	[kWh/m^2a]
useful energy Cooling demand	[kWh/m^2a]
useful energy Household electricity demand	[kWh/m^2a]
heating energy demand for space heating	[kWh/m^2a]
heating energy demand Hot water demand	[kWh/m^2a]
heating technology energy demand	[kWh/m^2a]
total heating energy demand	[kWh/m^2a]
cooling energy demand	[kWh/m^2a]
household electricity demand	[kWh/m^2a]
primary energy demand for space heating	[kWh/m^2a]
primary energy demand for hot water	[kWh/m^2a]
primary energy demand for heating technology	[kWh/m^2a]
total primary energy demand	[kWh/m^2a]
primary energy demand for cooling	[kWh/m^2a]
primary energy demand for household electricity	[kWh/m^2a]
CO2 space heating	[kg/m^2a]
CO2 hot water	[kg/m^2a]
CO2 heating technology	[kg/m^2a]
CO2 heating energy demand	[kg/m^2a]
CO2 cooling	[kg/m^2a]
CO2 household electricity demand	[kg/m^2a]
heating load	[W/m^2]
cooling load	[W/m^2]

Automatic creation of BRPs, example Valencia (with continuous, integrated data updating!)

- http://renoveu.five.es/#/home

- Select your own building on a map



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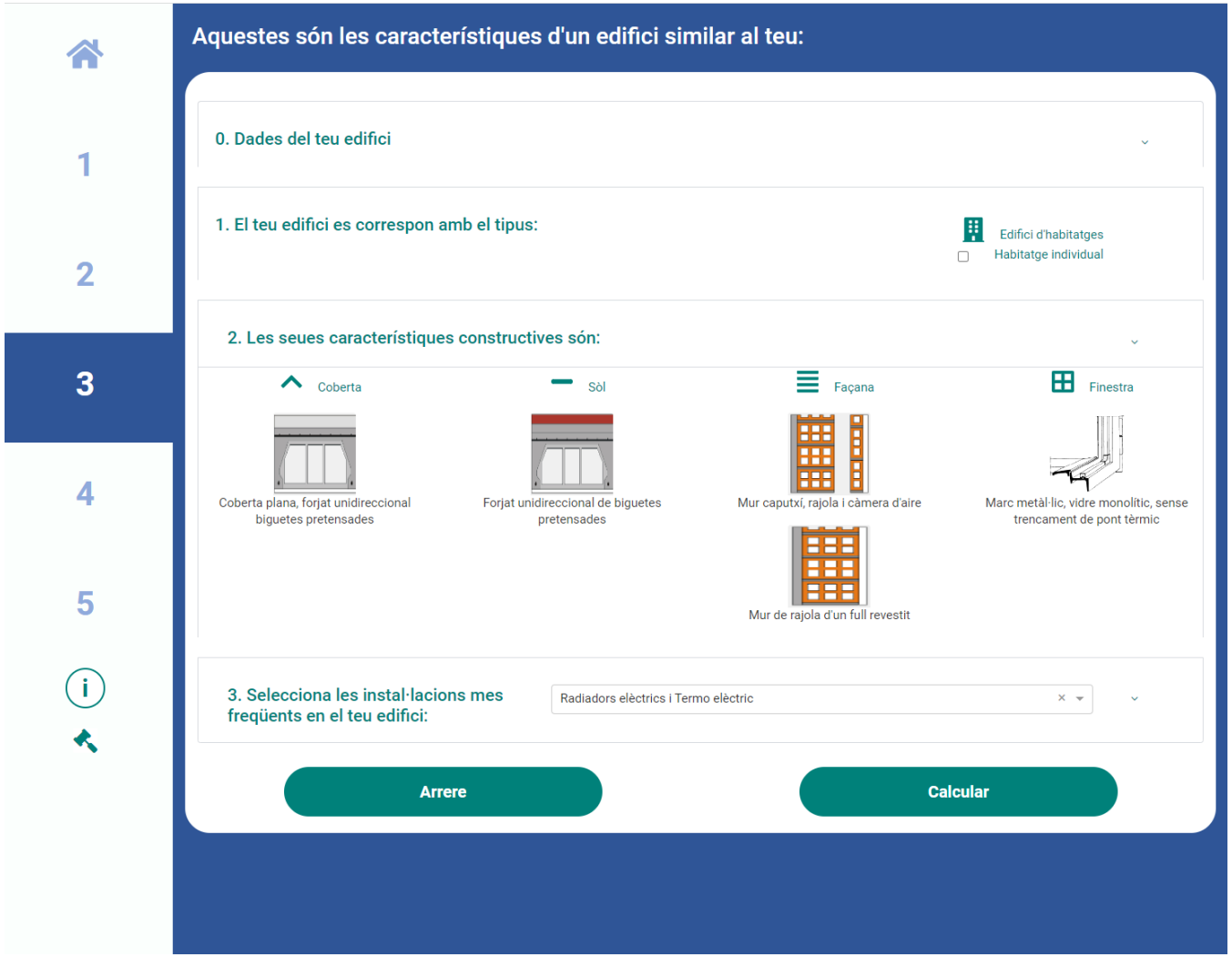
- Determine the status quo (default settings available based on the underlying building type)



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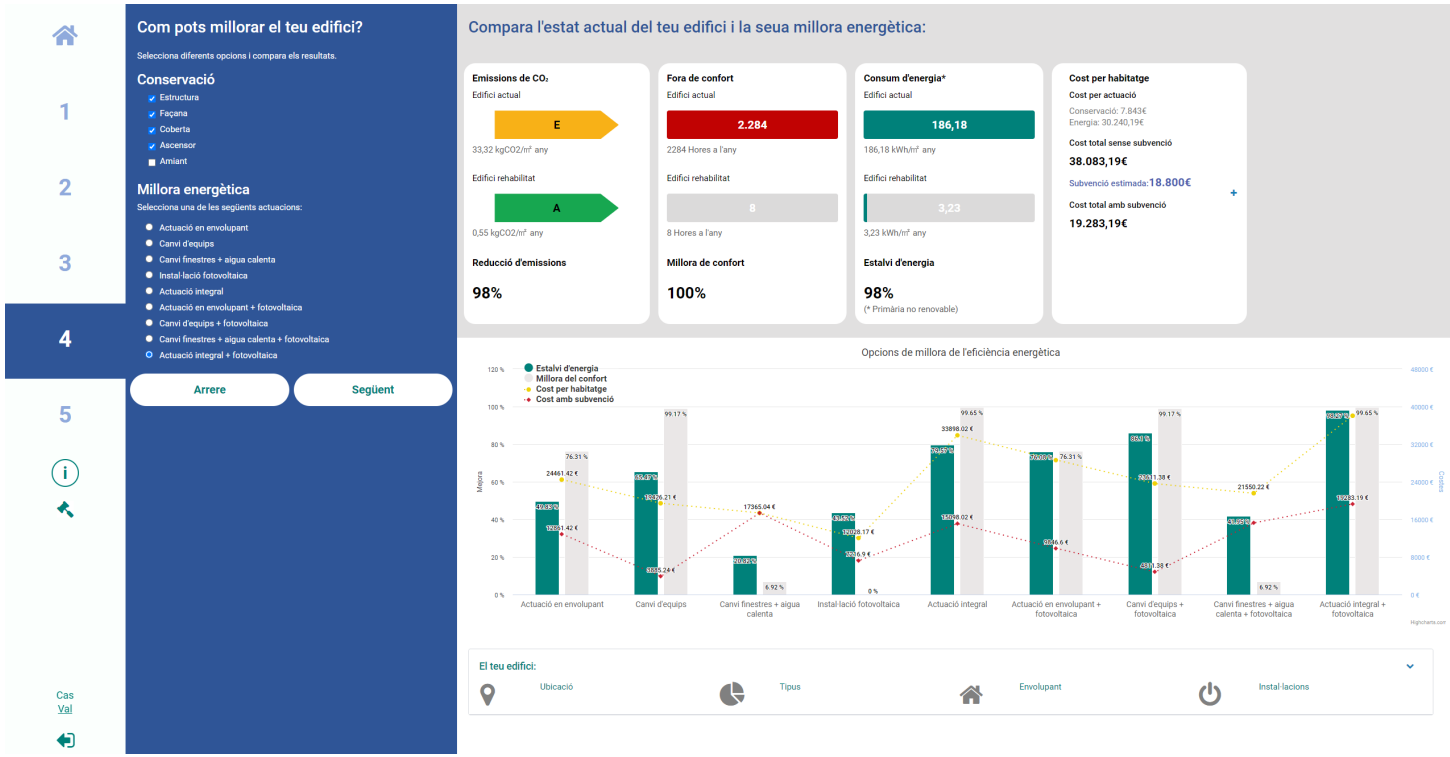
- Calculate recommended measures and their effects on energy consumption and costs



Automatic creation of BRPs, example Valencia (with continuous, integrated data updating!)

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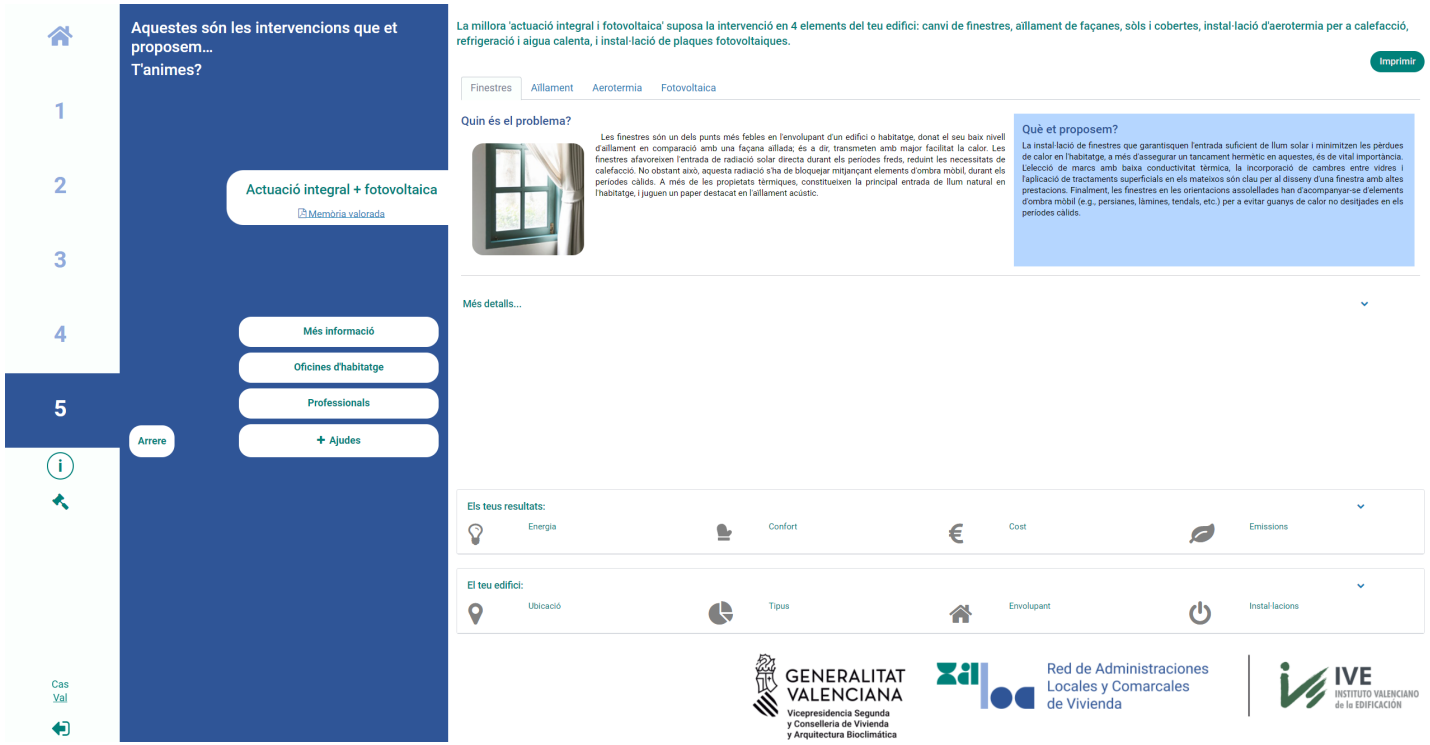
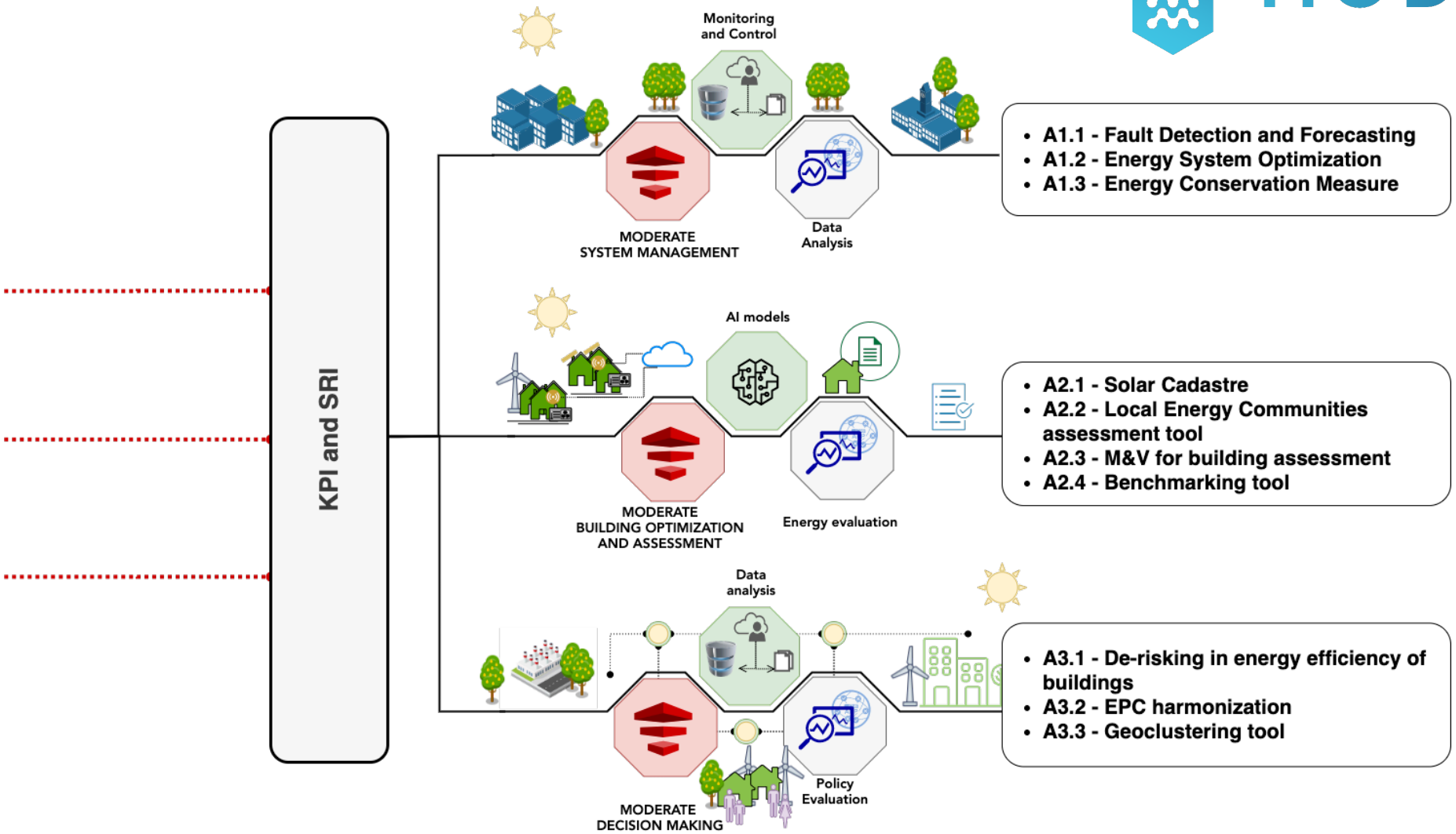
- Select your own building on a map
- Determine the status quo (default settings available based on the underlying building type)
- Calculate recommended measures and their effects on energy consumption and costs
- Details of the measures
- => Link to implementing companies and experts who carry out more detailed analyses and **enter the updated data into the tool!**



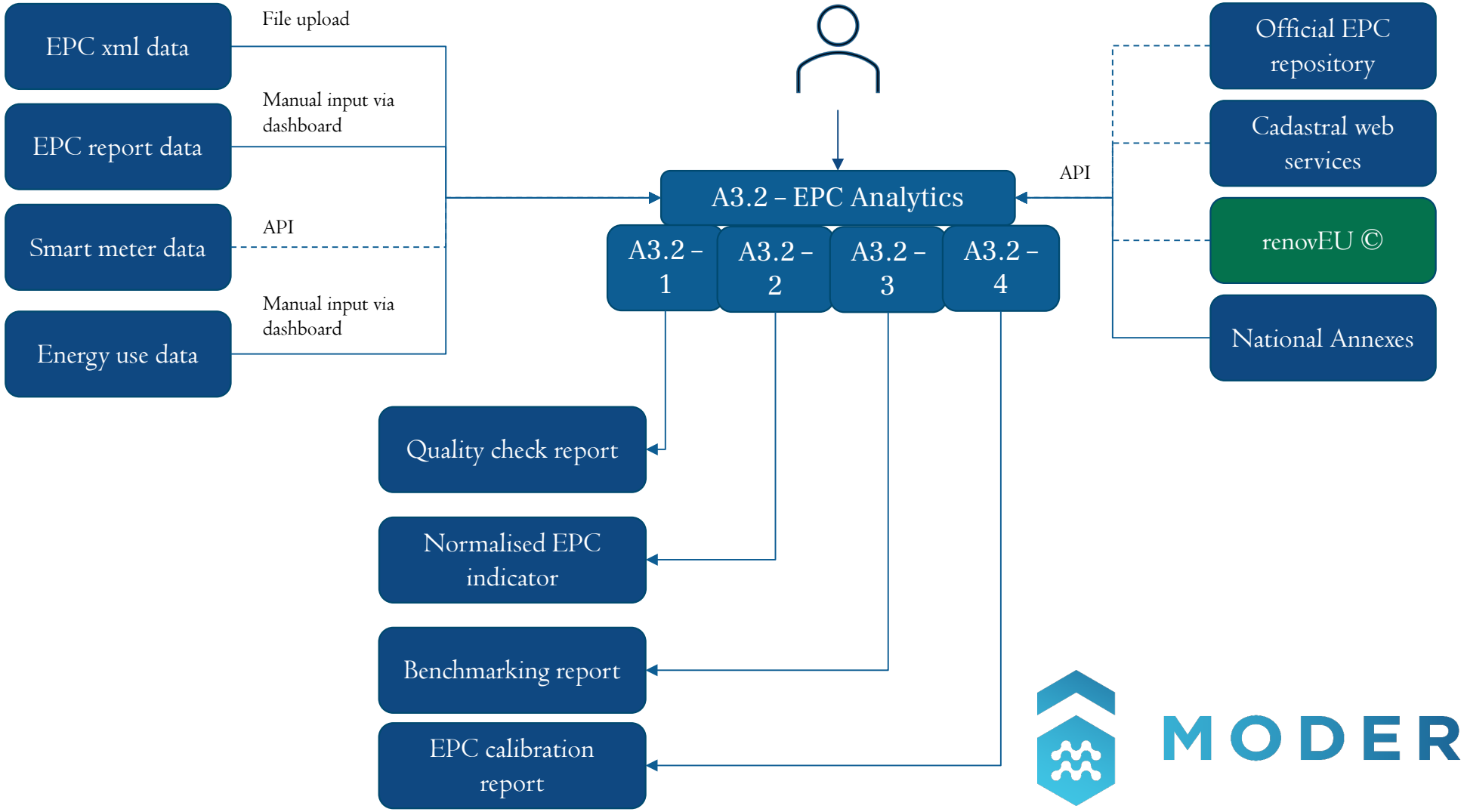
- OneClickReno - project starting 11/2023
- Equipping buildings with automated, massive and customized Building Renovation Passports as an effective tool to drive deep renovation
- Replicate and expand upon RenovEU by improving the accuracy of the estimated performance of building typologies and providing automatic staged BRPs combining different renovation scenarios

BRP and EPC data - exploring synergies

Moderate - Data-Driven Services



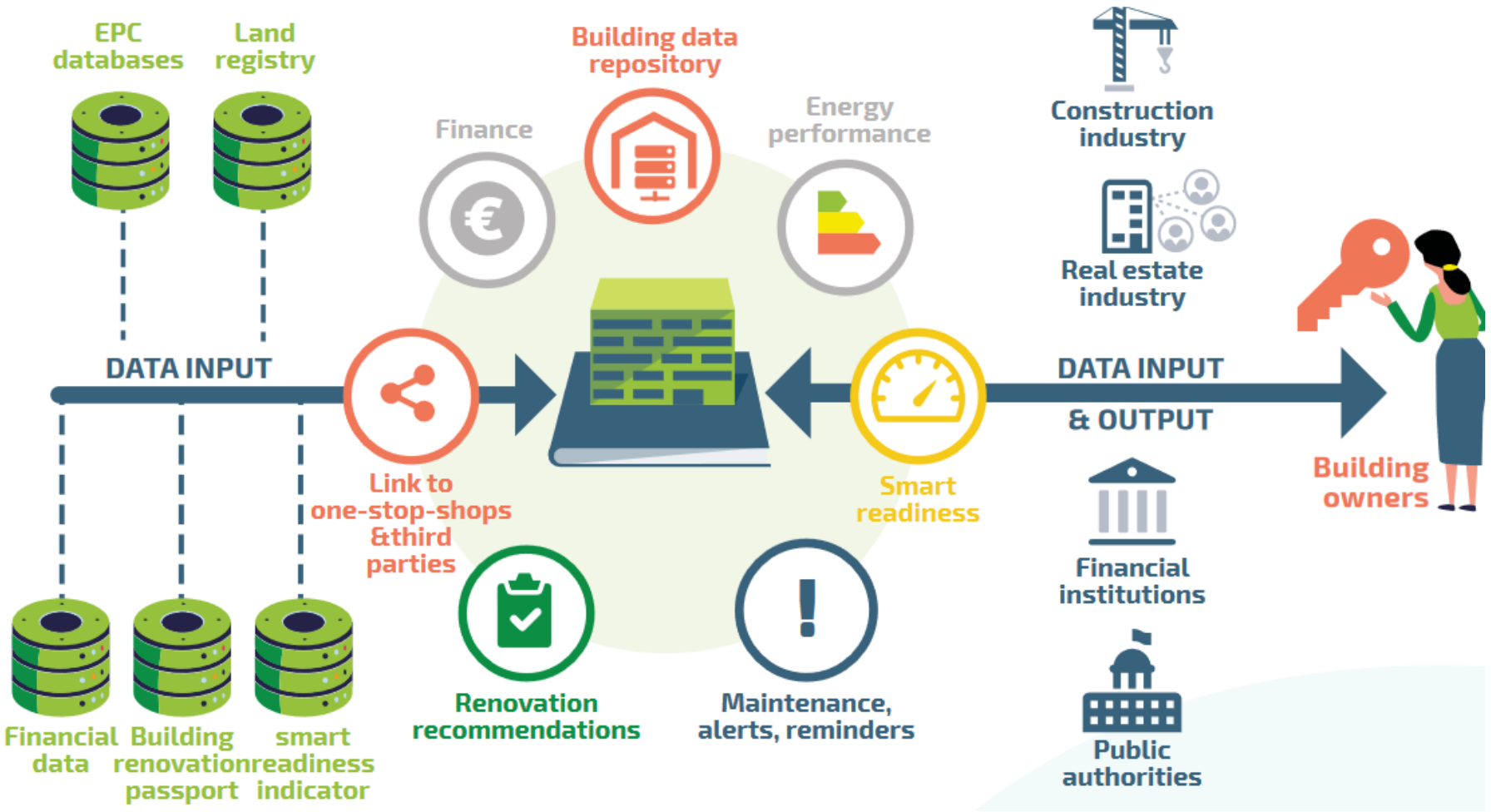
Exploiting synergies between BRP and EPC data



MODERATE

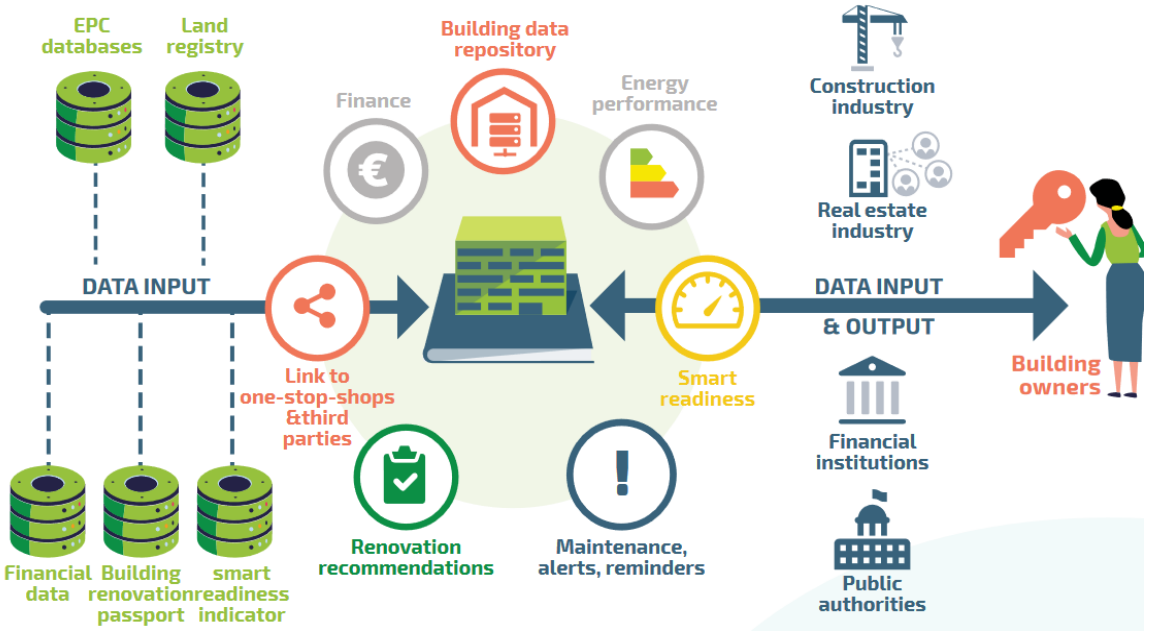
BRP and EPC data, logbooks and MEPS - exploring synergies

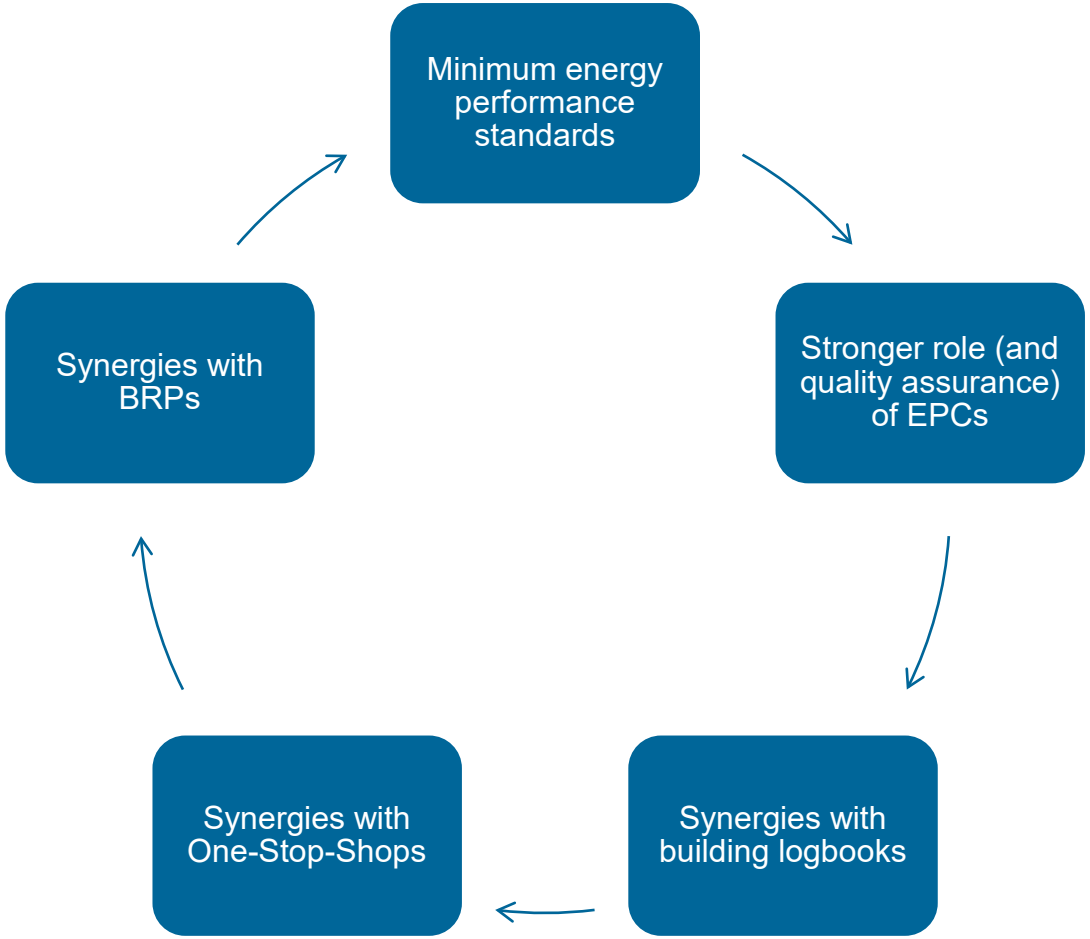
Logbooks, BRPs, EPCs (and MEPS)



Quelle: https://x-tendo.eu/toolboxes/building-logbook/

Logbooks, BRPs, EPCs (and MEPS)





- Ongoing improvement and updating of the data situation as measures are implemented

Quelle: https://x-tendo.eu/toolboxes/building-logbook/

What‘s next?

Effective implementation of the EPBD in line with short-term and long-term policy requirements - EPBD.wise, LIFE-project, 2023-2026

- Motivation: new and revised policy elements in the (not yet adopted) EPBD

- Objectives:
  - Support public authorities in six MS (focus countries) in the design, implementation and evaluation of instruments
  - Adopt a consistent approach for the implementation of building policies and build a replicable model

- Main activities:
  - Analyse policy needs and national examples
  - Provide support and technical advice and develop tailored policy packages
  - Provide recommendations on innovative monitoring systems including related data concepts

Conclusions

- Static data, collected one-time quickly becomes outdated.
- The effort for such activities should be better allocated towards the establishment of effective, smart, and continuously updating dynamic data concepts.
- Related methods are starting to be available or in the process of being prepared, let’s keep working on it!

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