LUKAS KRANZL

Senior Scientist, TU Wien

TECHNISCHE UNIVERSITÄT WIEN

TIMEPAC

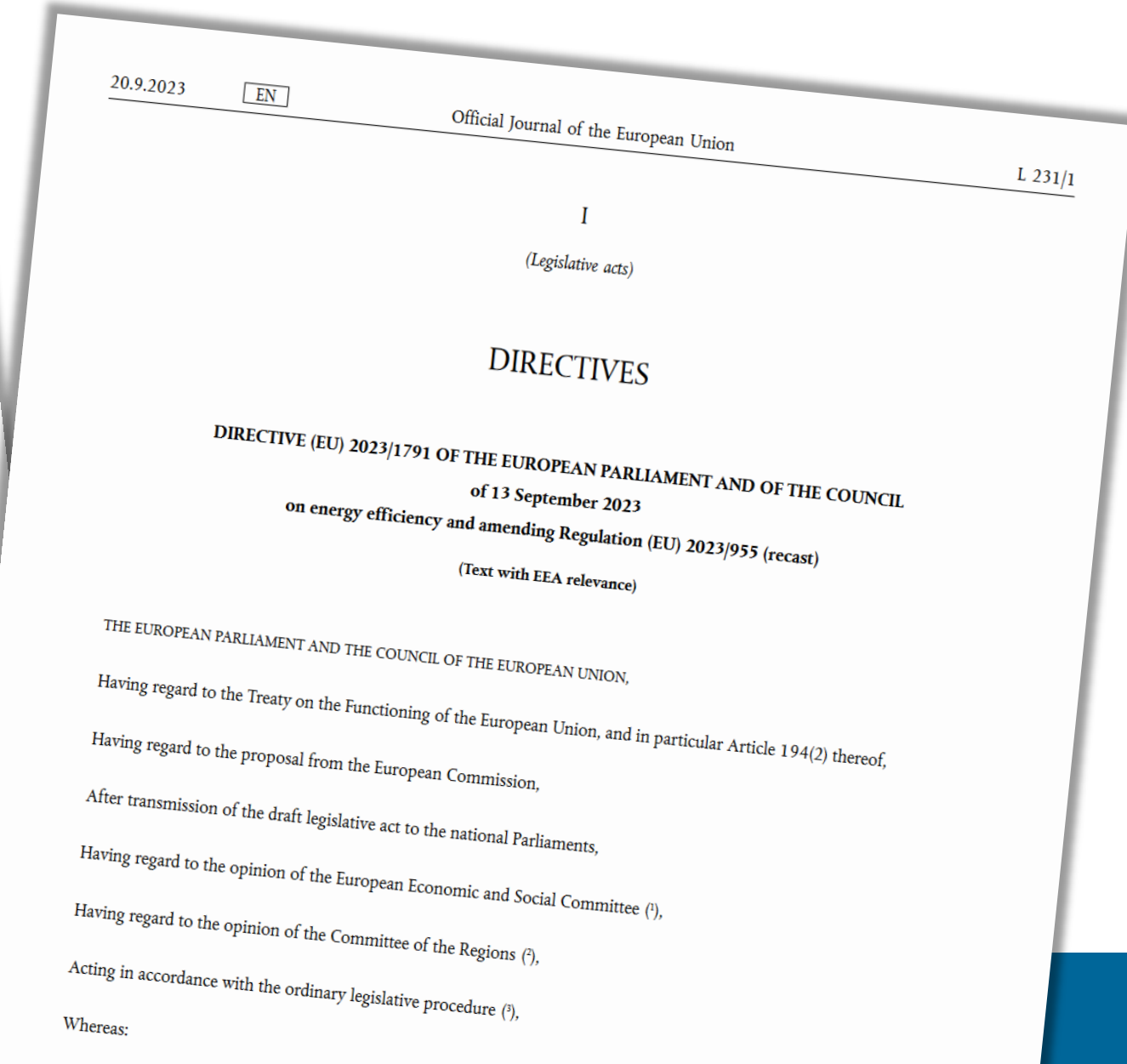# From one-time data collection to continuous monitoring

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
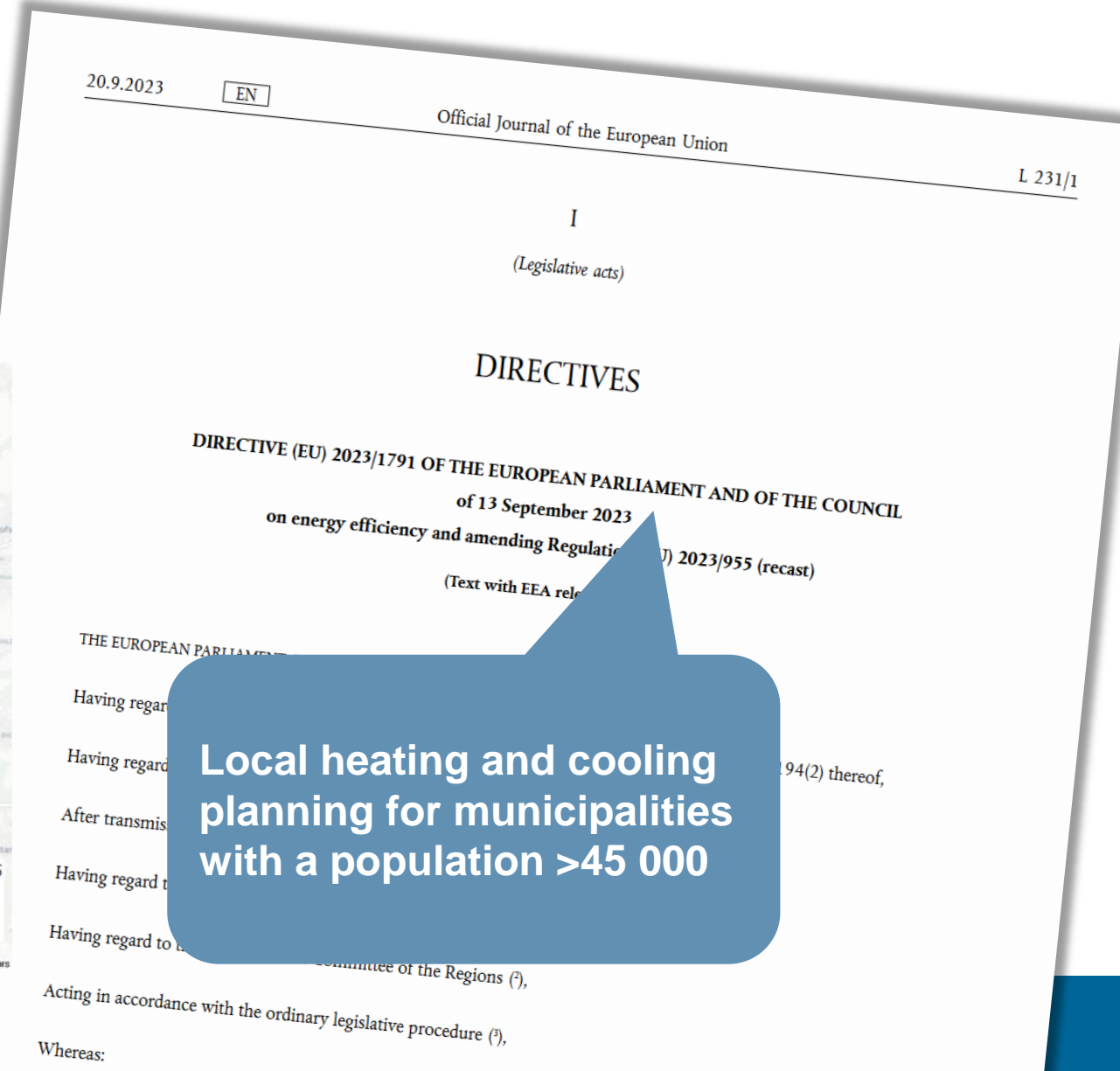COM(2021) 802 final

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
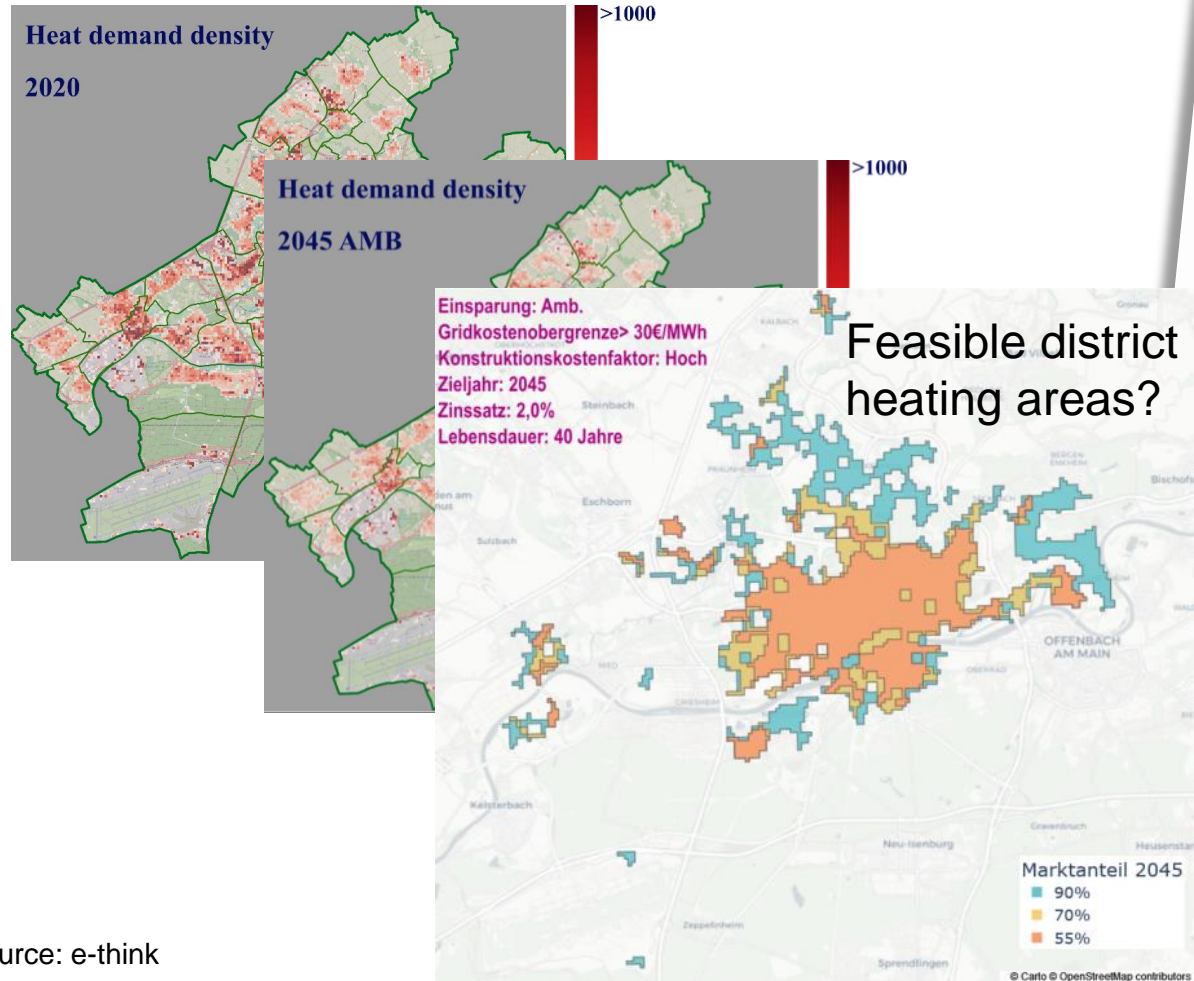COM(2021) 802 final

2021/0426 (COD)

Proposal for a

DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

on the energy performance of buildings (recast)

strengthened role of BRPs and EPCs?

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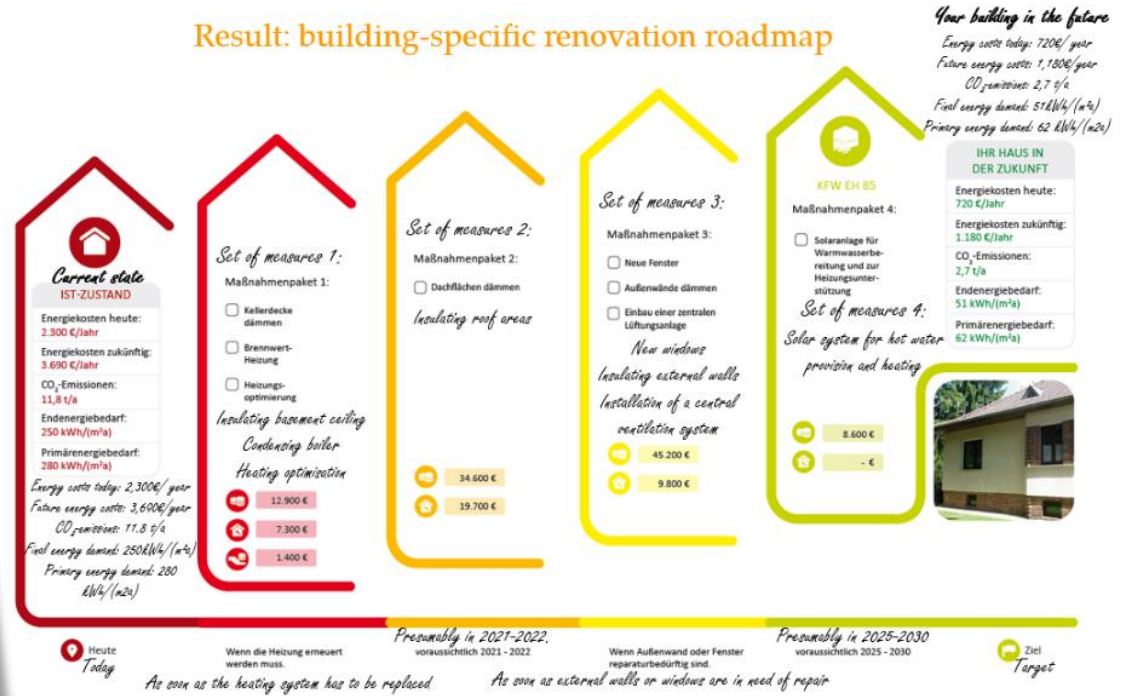
Source: BPIE, https://www.bpie.eu/wp-content/uploads/2017/01/Building-Passport-Report_2nd-edition.pdf, accessed: 26.4.2022

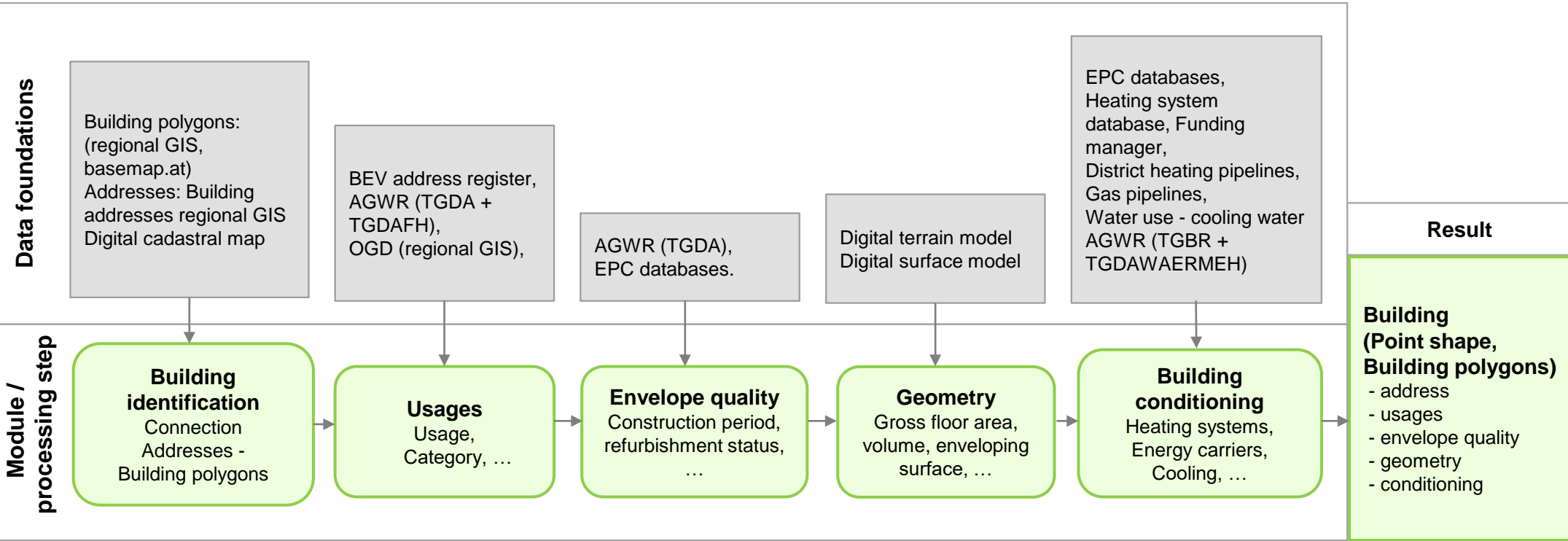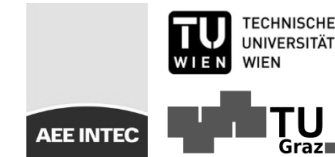# Examples from the new (and still discussed) legislation: EED and EPBD recast

Feasible district heating areas?

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

Source: e-think

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

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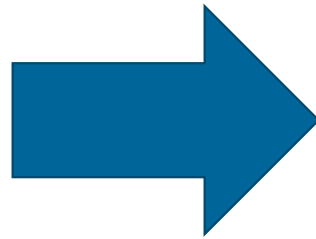
Dynamic, continuosly updating, cross-regional, integrated data and monitoring framework

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

Data foundations

|				
Building polygons: (regional GIS, basemap.at) Addresses: Building addresses regional GIS Digital cadastral map	BEV address register, AGWR (TGDA + TGDAFH), OGD (regional GIS),	AGWR (TGDA), EPC databases.	Digital terrain model Digital surface model	EPC databases, Heating system database, Funding manager, District heating pipelines, Gas pipelines, Water use - cooling water AGWR (TGBR + TGDAWAERMEH)

Module / processing step

| **Building identification** Connection Addresses - Building polygons | → | **Usages** Usage, Category, … | → | **Envelope quality** Construction period, refurbishment status, … | → | **Geometry** Gross floor area, volume, enveloping surface, … | → | **Building conditioning** Heating systems, Energy carriers, Cooling, … |

Result

Building (Point shape, Building polygons)
- address
- usages
- envelope quality
- geometry
- conditioning

Heat demand on building level (SEP)

Heat Demand Salzburg - Building Level

Heat Demand Buildings
- < 12,5 MWh
- > 12,5-25 MWh
- > 25-50 MWh
- > 50-100 MWh
- > 100-200 MWh
- > 200-400 MWh
- > 400-800 MWh
- > 800 MWh

0   100   200 m

Author: Lukas Götzlich
Sources: Land Salzburg, SEP I
Date: 2022/02/21

Quelle: Götzlich et al, 2022
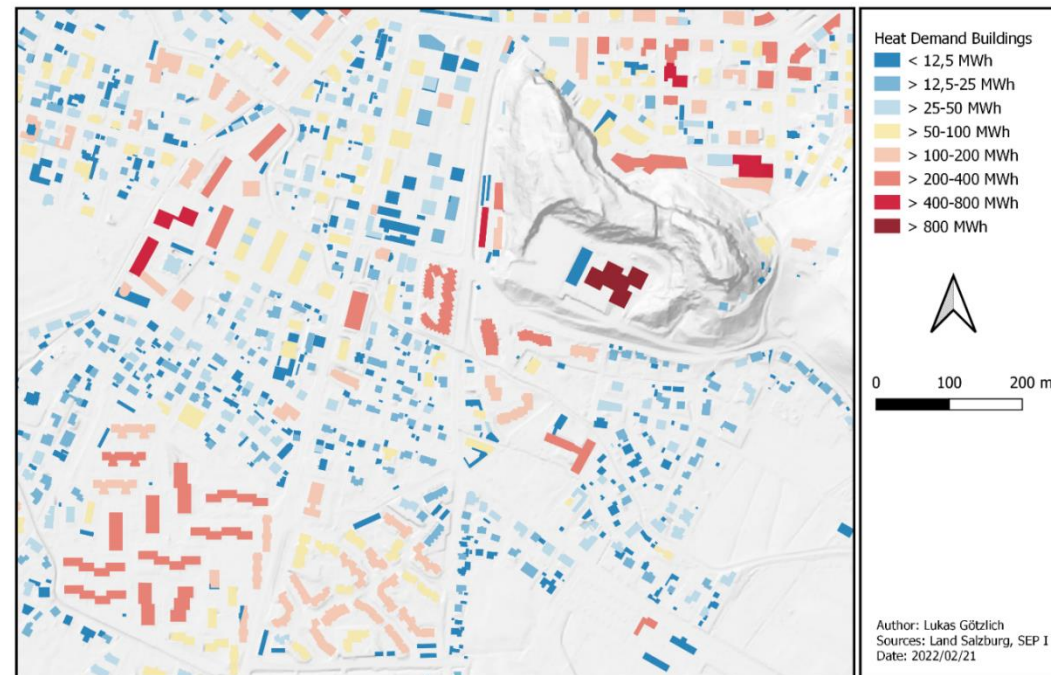
Results per building address from the SEP model

Identification

- building address ID
- building polygons ID
- municipality code
- municipality name
- postcode
- street code
- street name
- house num...
- address c...
- building a...
- address c...
- building id...
- land regis...
- assignme...
- point geor...
- building p...

Envelope quality

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

building address ID	[-]
useful energy demand space heating	[kWh/m²a]
useful energy Hot water demand	[kWh/m²a]
useful energy Cooling demand	[kWh/m²a]
useful energy Household electricity demand	[kWh/m²a]
heating energy demand for space heating	[kWh/m²a]
heating energy demand Hot water demand	[kWh/m²a]
heating technology energy demand	[kWh/m²a]
total heating energy demand	[kWh/m²a]
cooling energy demand	[kWh/m²a]
household electricity demand	[kWh/m²a]
primary energy demand for space heating	[kWh/m²a]
primary energy demand for hot water	[kWh/m²a]
primary energy demand for heating technology	[kWh/m²a]
total primary energy demand	[kWh/m²a]
primary energy demand for cooling	[kWh/m²a]
primary energy demand for household electricity	[kWh/m²a]
CO2 space heating	[kg/m²a]
CO2 hot water	[kg/m²a]
CO2 heating technology	[kg/m²a]
CO2 heating energy demand	[kg/m²a]
CO2 cooling	[kg/m²a]
CO2 household electricity demand	[kg/m²a]
heating load	[W/m²]
cooling load	[W/m²]

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
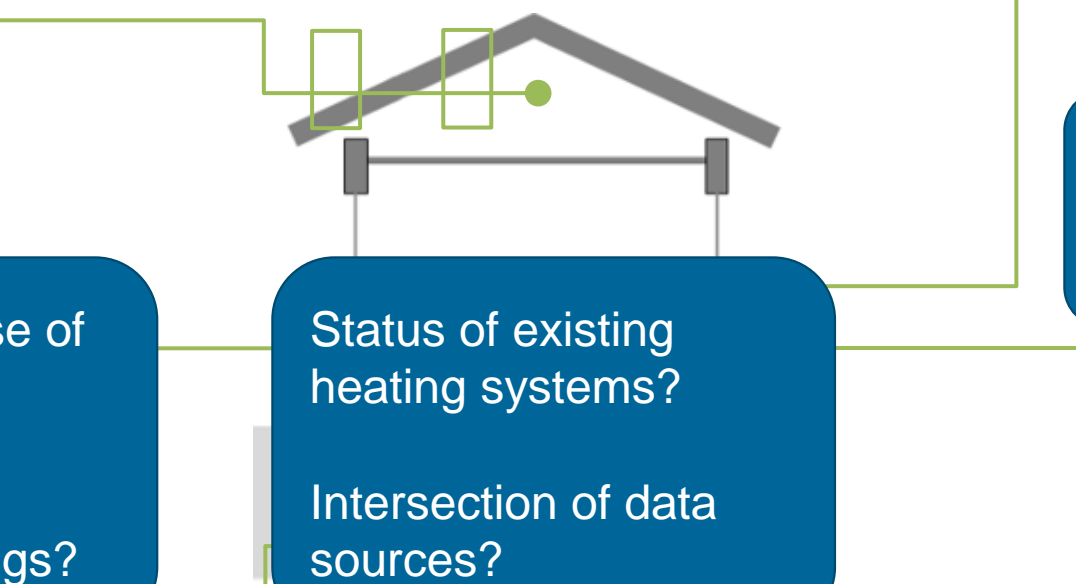
Geometry

building polygons ID	[-]
external floor area	[m²]
ridge height	[m]
gross volume	[m³]
gross f...	
BGF ...	
condi...	
extern...	
roof a...	
condi...	
A/V ra...	
comp...	
date ...	

(Heating systems)

building ... ss ID	[-]
space heating 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	[-]
...omestic hot water system	Classif.
...eat emission system	Classif.
...mperature of heat emission system	[°C]
...nperature of heat emission system	[°C]
...lar thermal system	Classif.
...surface area	[m²]
...the heating system	[kW]
...heating grid ID	[-]

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?

Data gaps and errors in building registries

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

‣ http://renoveu.five.es/#/home

‣ Select your own building on a map

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

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

- Select your own building on a map
- Determine the status quo (default settings available based on the underlying building type)

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

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

‣ http://renoveu.five.es/#/home

‣ 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
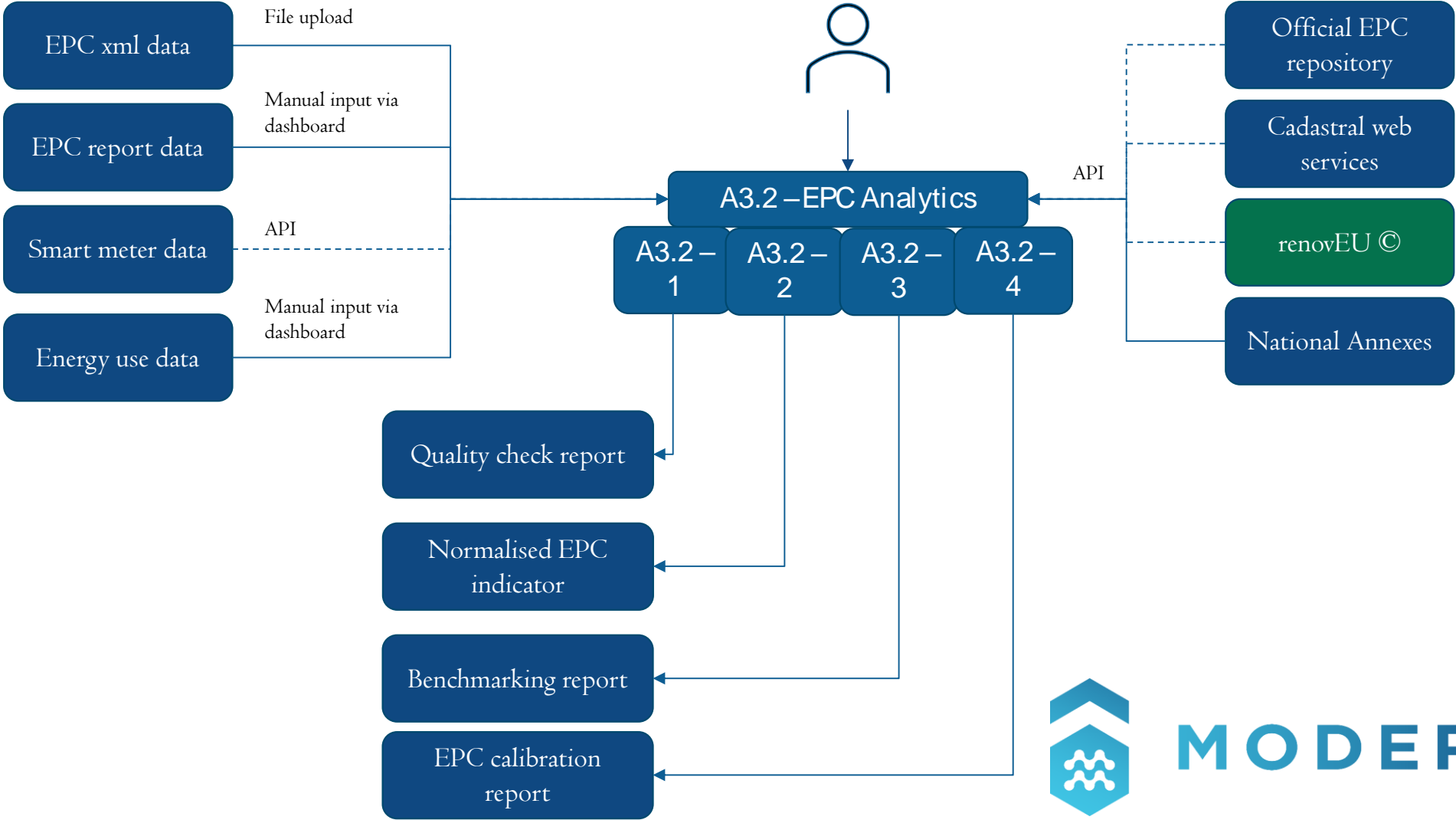
BRP and EPC data - exploring synergies
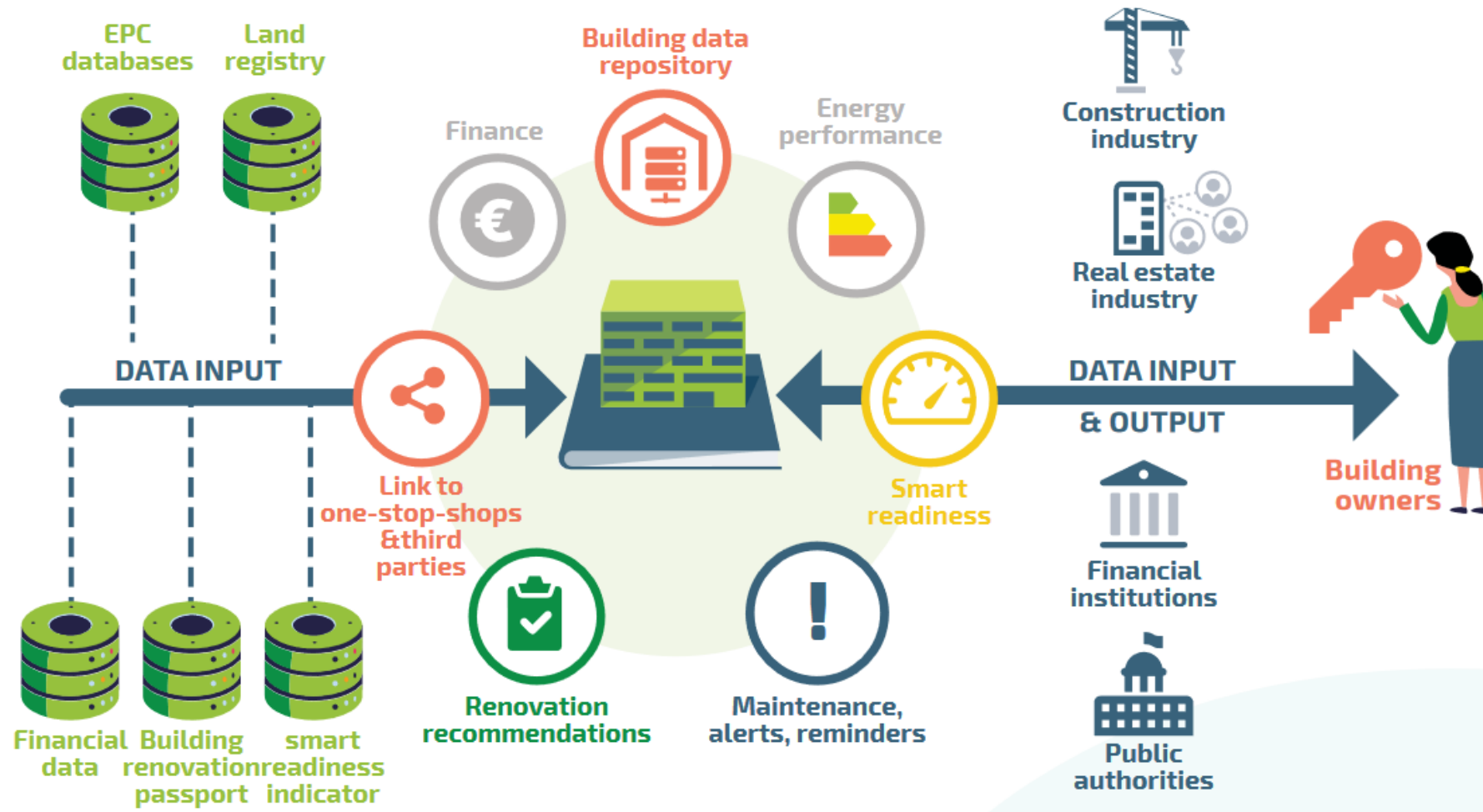
Moderate - Data-Driven Services
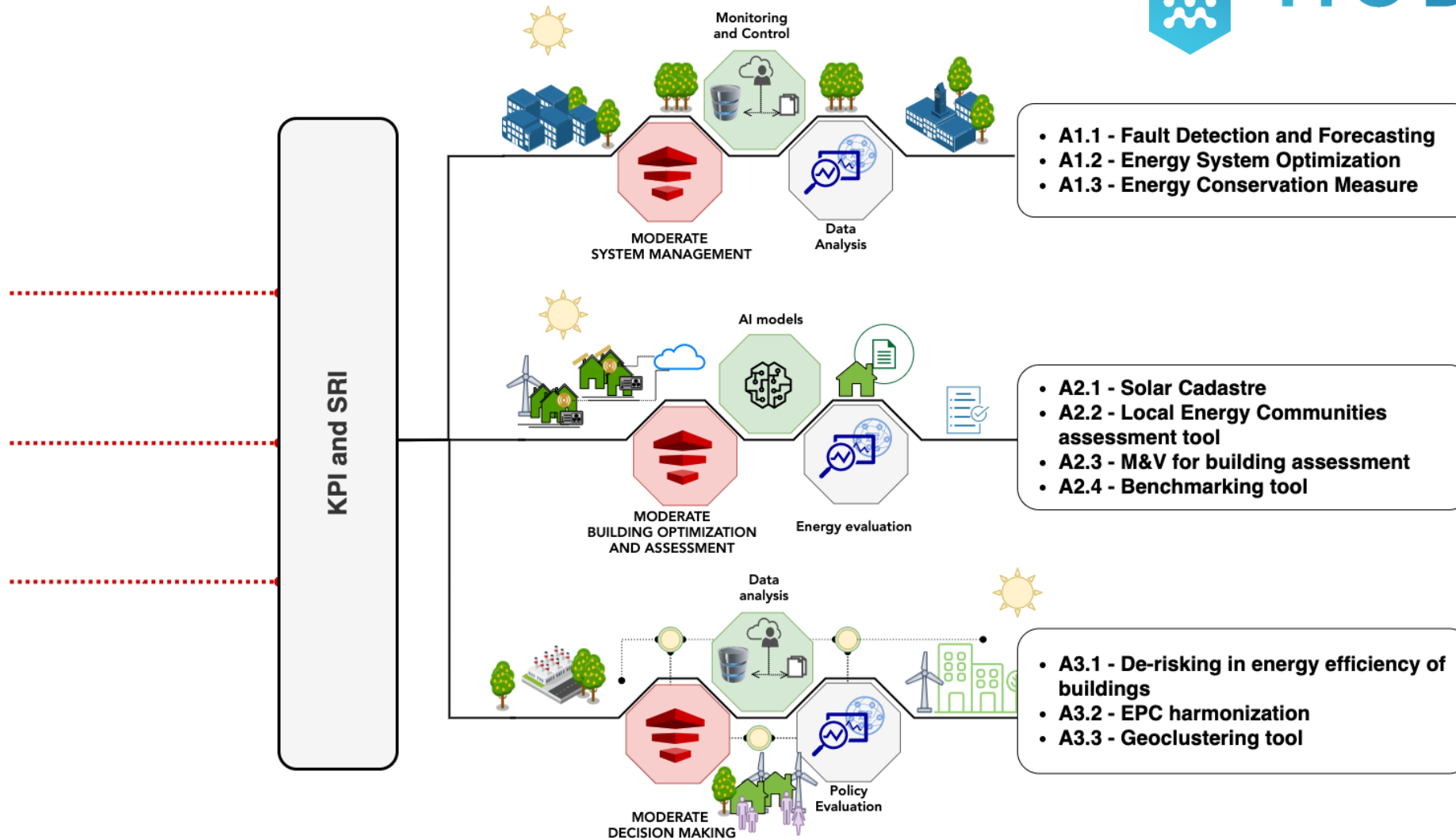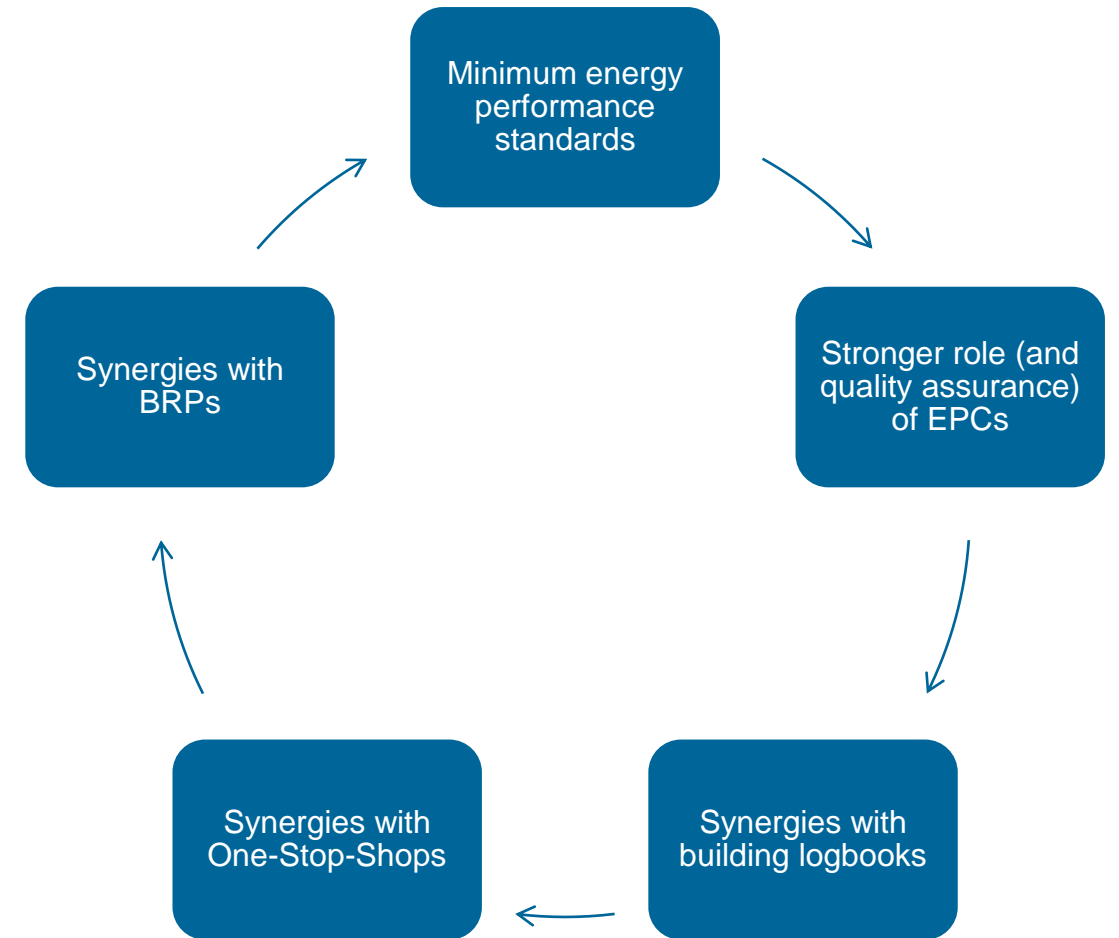
Exploiting synergies between BRP and EPC data
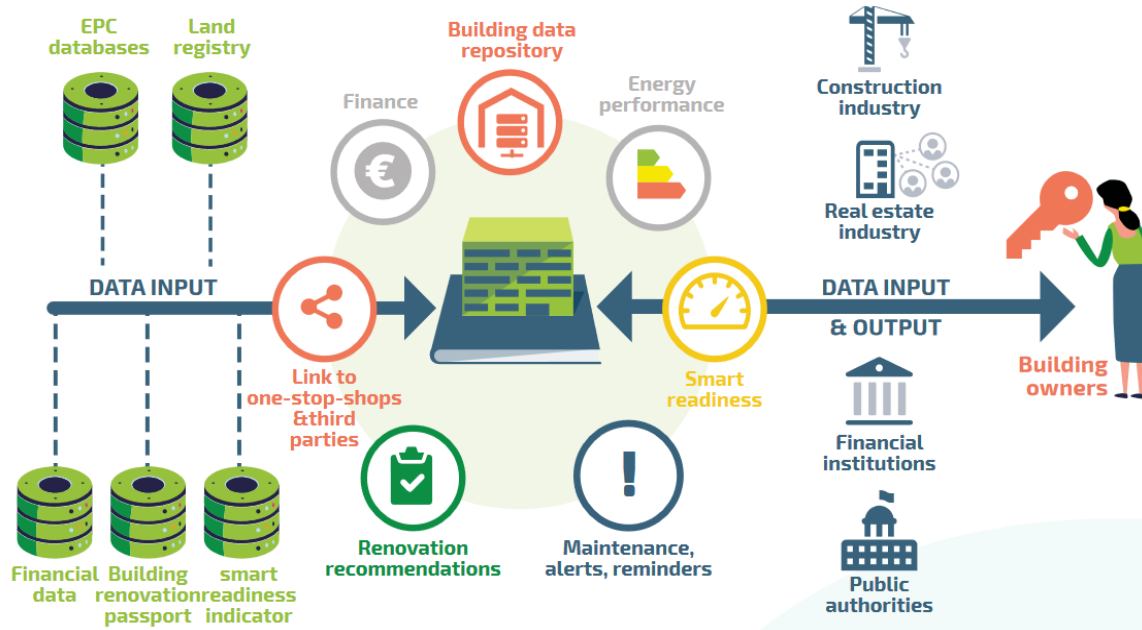
BRP and EPC data, logbooks and MEPS - exploring synergies

Logbooks, BRPs, EPCs (and MEPS)

Logbooks, BRPs, EPCs (and MEPS)

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

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!

Lukas Kranzl
TU Wien
Institut für Energiesysteme und elektrische Antriebe
Energy Economics Group
lukas.kranzl@tuwien.ac.at
eeg.tuwien.ac.at