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DIGITAL SOLUTIONS TO EUROPEAN CHALLENGES

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Twin Transition in Industrial Automation

Comau viewpoint

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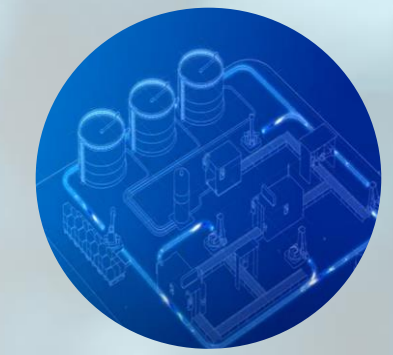
INNOVATION AND TRANSFORMATION

1973 ***1983***	1984 ***1994***	1995 ***2005***	2006 ***2016***	2017 ***2022***	2023 ***onward***
OUR **ROOTS**: 50 YEARS OF **EXPERIENCE**	FROM MASS PRODUCTION TO **FLEXIBLE AUTOMATION**	GOING **GLOBAL** & EXPANDING IN **MACHINING** TECHNOLOGY	DRIVE **INNOVATION** IN **AUTOMATION** & **MANUFACTURING**	START OF **E-MOBILITY** JOURNEY	ACCELERATE **DIGITAL TRANSFORMATION** & **SUSTAINABILITY** INITIATIVES
					

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INDUSTRIAL AUTOMATION IS GROWING

+10,3%

2022-2030 CAGR

171 USD BN

377 USD BN

AUTOMOTIVE

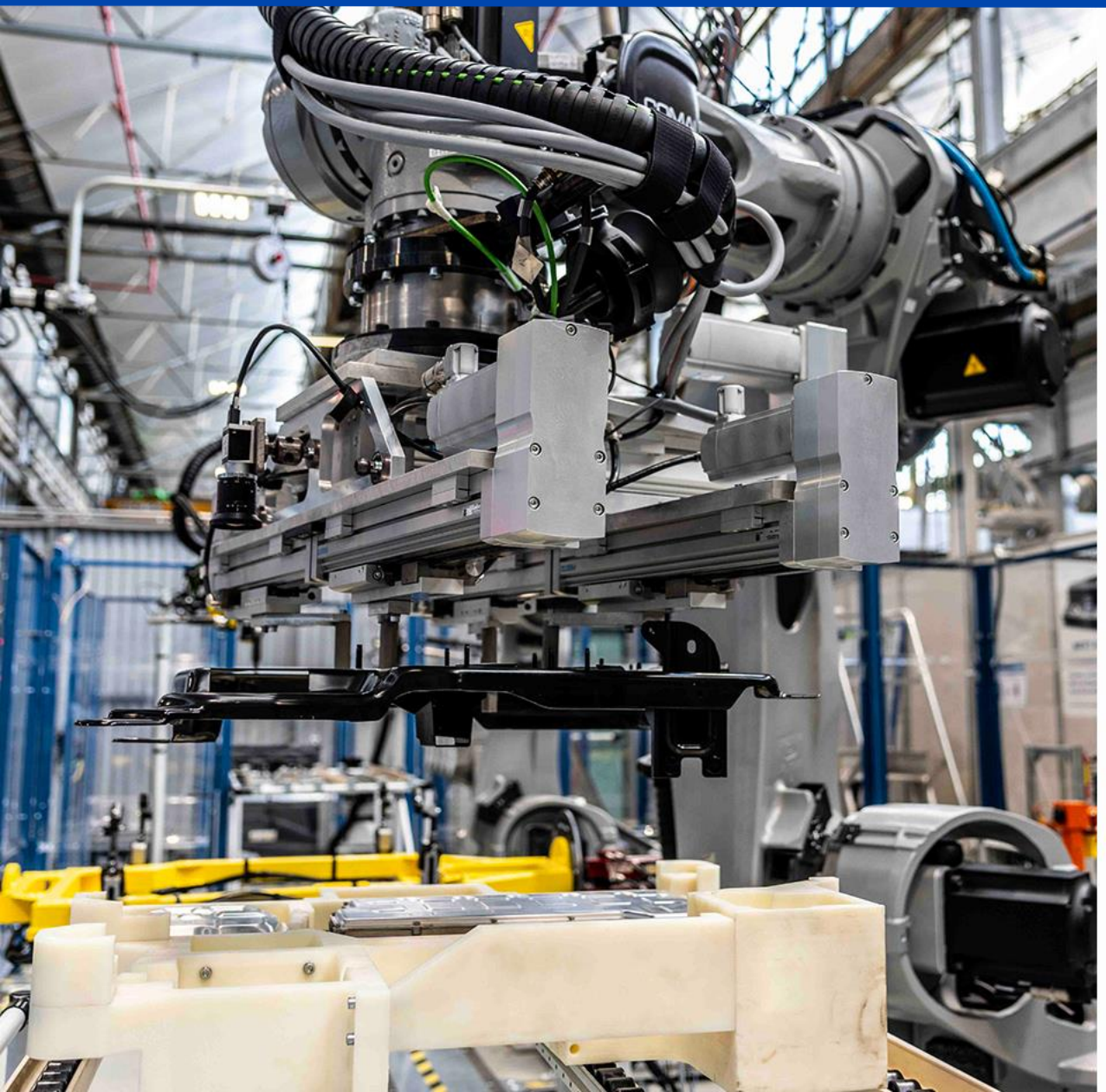
NON-AUTOMOTIVE

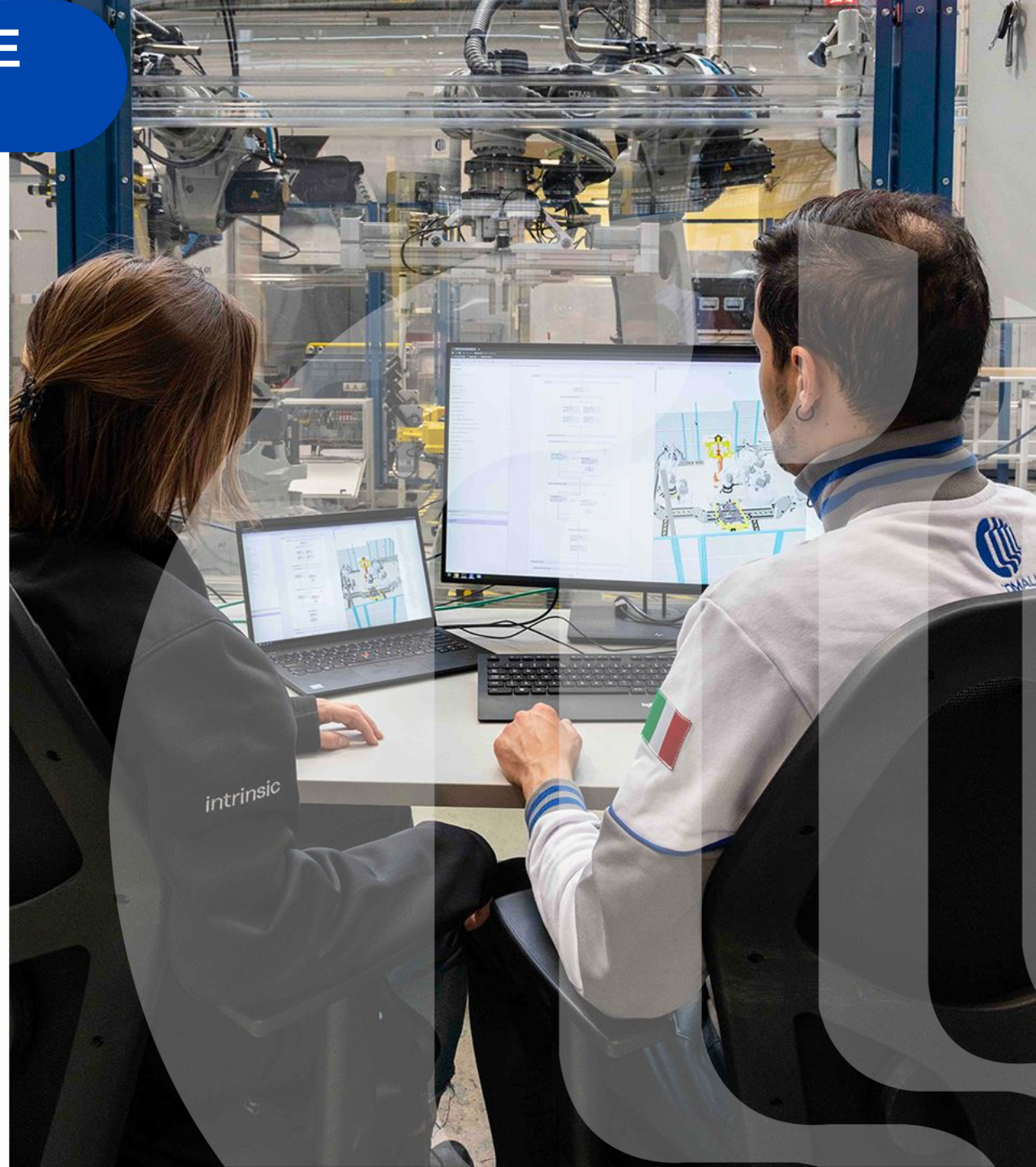
BENEFITS OF AUTOMATION

OUR TRADITIONAL AUTOMOTIVE EXPERIENCE GRANTS FASTER GROWTH IN E-MOBILITY

SUSTAINABLE SOLUTIONS: BATTERY DISMANTLING AND RECYCLING

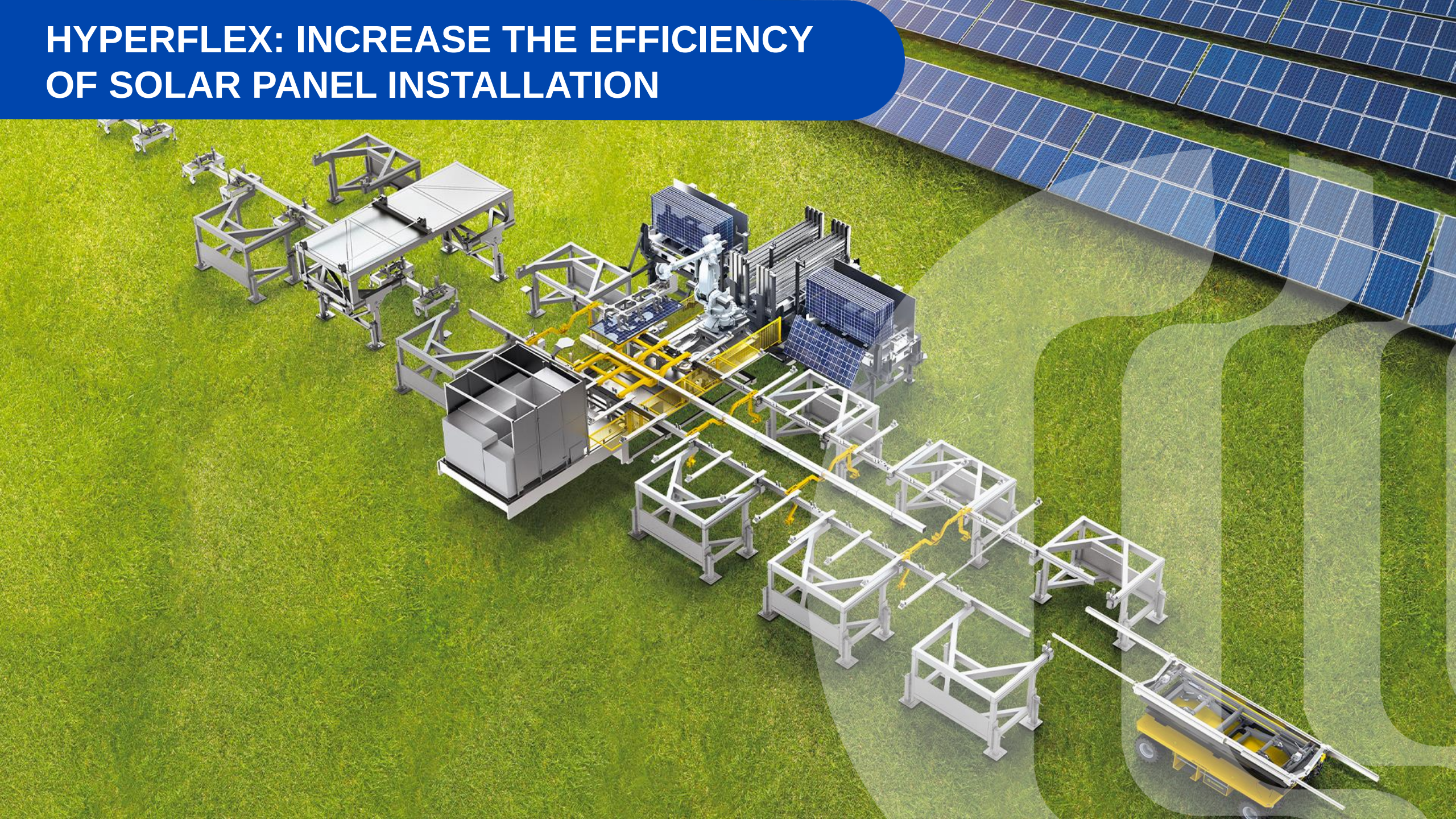
LOW CODE PROGRAMMING TO MAKE AUTOMATION EASIER TO USE



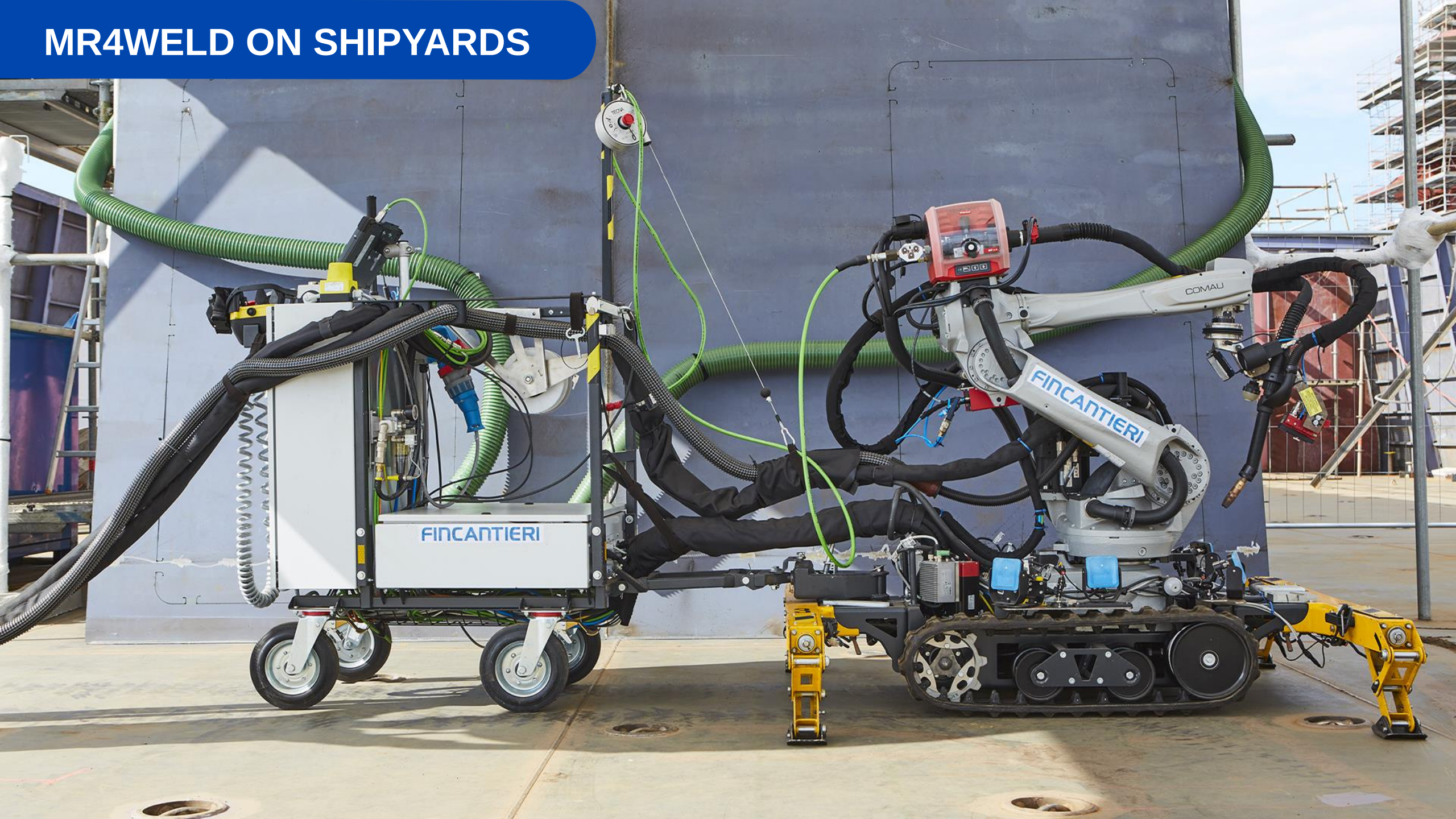


BRINGING AUTOMATION TO UNSTRUCTURED ENVIRONMENTS

HYPERFLEX: INCREASE THE EFFICIENCY OF SOLAR PANEL INSTALLATION



MR4WELD ON SHIPYARDS



AUTOMATION FOR EVERYONE

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The human-centric aspects of Twin Transition - Importance of innovation ecosystem cooperation

Wimar Bolhuis - TNO Vector Director

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DIGITAL SOLUTIONS TO EUROPEAN CHALLENGES

5 February 2024

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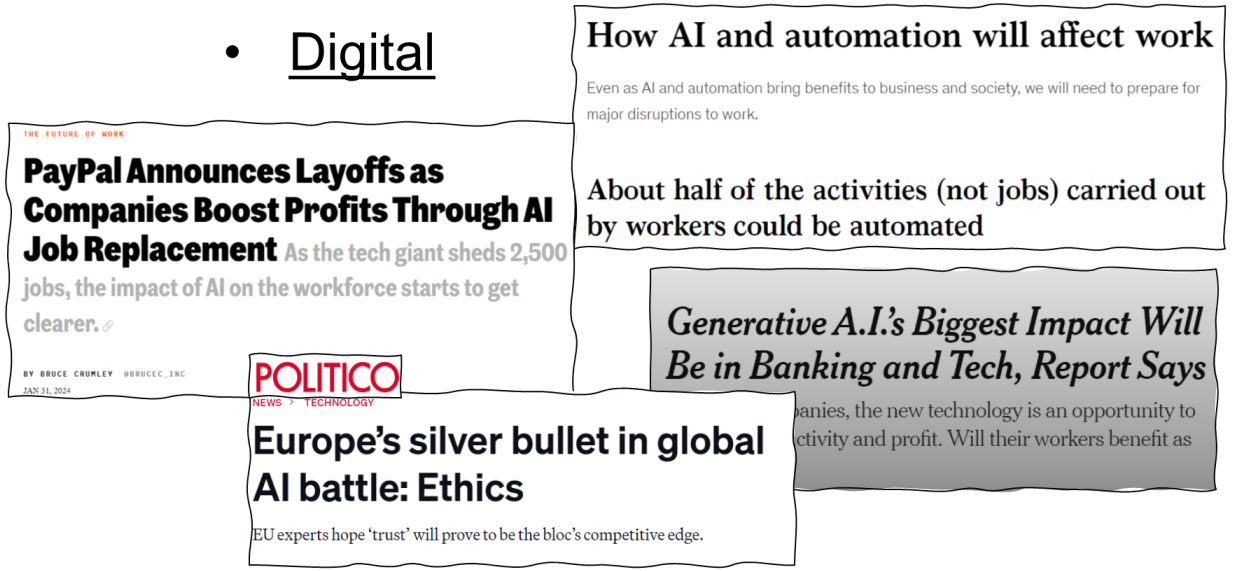
Centre for Societal Innovation and Strategy

Human centric twin-transition

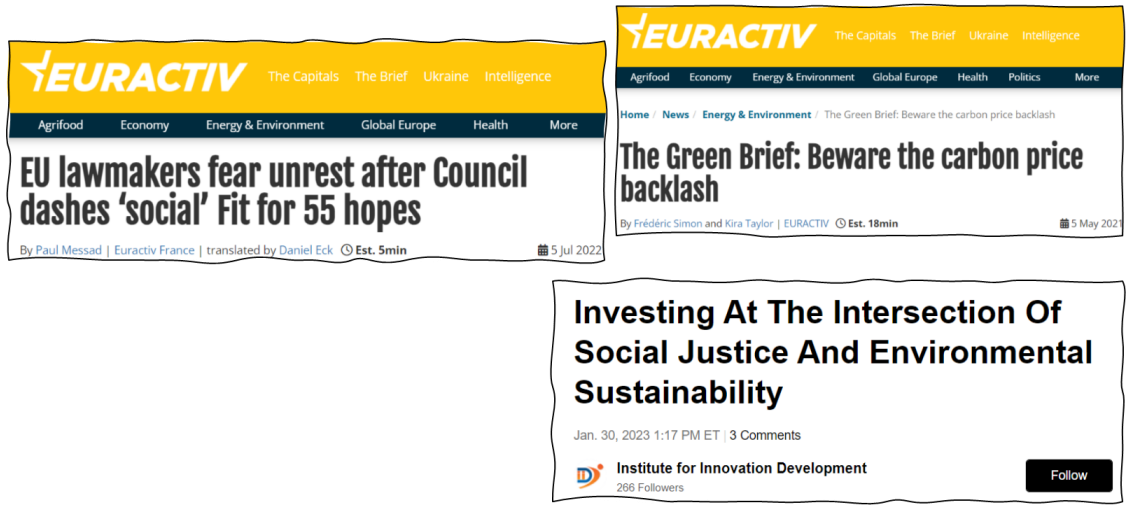
There are different understanding and address of the human-centric aspects of the twin transition

Moving away from technology to societal impact of the Twin Transition, there are entire fields of research and innovation to chart

- Digital



- Green deal



TNO Vector: Centre for Societal Innovation and Strategy

TNO Vector focuses on impact in 5 domains

Transformation 1
Green & Sovereign Industries

Transformation 2
Value-Driven Sustainable Cities & Regions

Transformation 3
Value-Based Digital Societies

Enabler 1
Transformative Innovation Systems

Enabler 2
Methodology Centre for TNO

Vision

For successful transitions, several building blocks are necessary

TNO Vector focuses on Societal Innovatie & Strategie

Various forms of innovation play a role in transitions

Technology	**Societal**	Social

- Multi-level governance
- Institutional innovation capabilities
- Economics, business & finance
- Spatial integration of transitions
- Policy interventions
- Participation and support

Thematics

- Societal System Analysis
- Create new ecosystems (orchestrating innovation)
- Adaptative governance

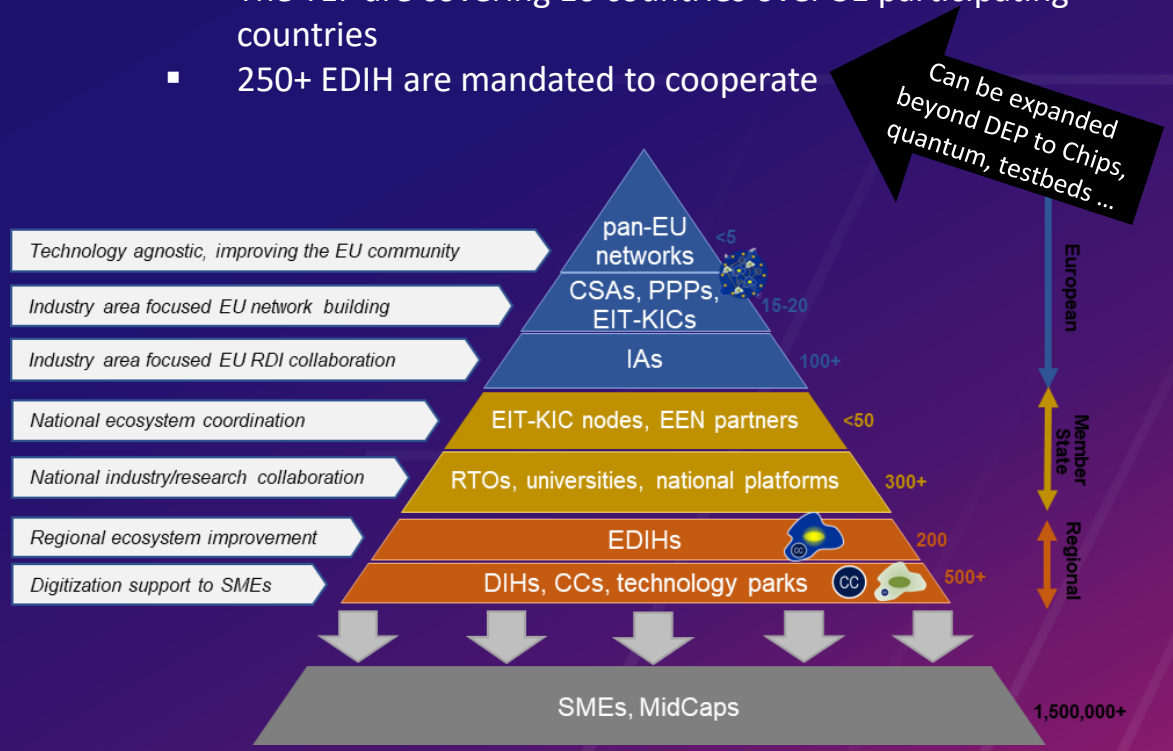
- ....

Our definition of human-centric: **the users of the technology, but also the impacted persons. Its about tradeoffs between public values in the digital domain (for example inclusivity, privacy) but also about a just transition (income effects, insecurity).**

One aspect of the Twin-Transition: the innovation ecosystem

By design, the Digital Europe Program madates cross-border cooperation

- Geographically distributed infrastructures
  - 3 exascales HPC
  - The TEF are covering 16 countries over 31 participating countries
  - 250+ EDIH are mandated to cooperate



Why interregional collaboration is important?

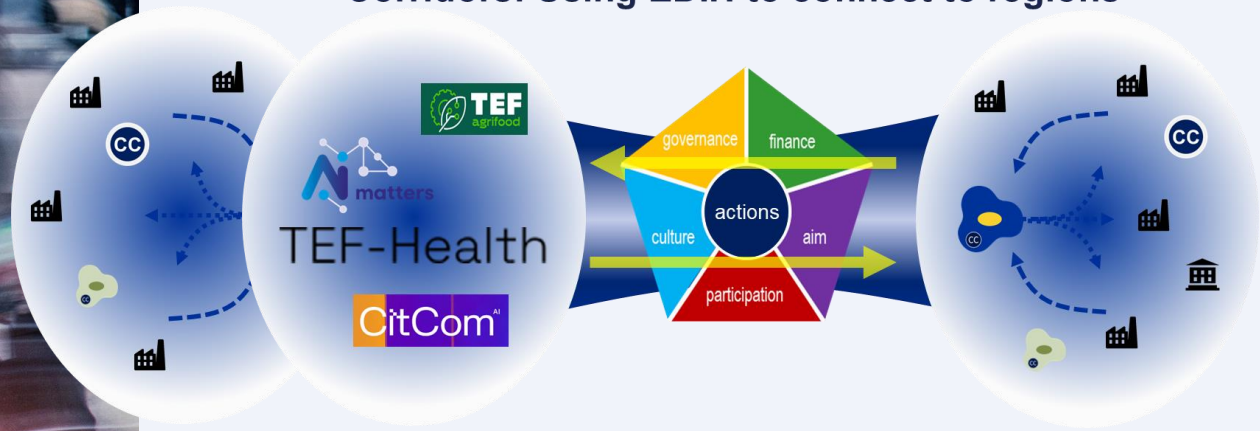
- Lead to easy access to **leading edge technologies and skills/expertise** at European level
- Support and initiate **new business opportunities** to broaden and reinforce innovative **markets** in other regions
- Exchange experience on **good practices** to support digital transformation between regional stakeholders
- Facilitate cross-border **synergies, co-creating and complementarities** in technology and knowledge development
- Help to create **pan-EU value chains** to increase the competitiveness and dependency of the EU industry
- Increased **impact of public funding**, avoiding unnecessary duplication infrastructures/investments and accessing EU funds

1+1=2

Our Answer: the BOWI corridor

a reference architecture for structured and sustainable cross-border cooperation between innovation ecosystems

Corridors: Using EDIH to connect to regions



- Based on 5 Pillars
- 5 level of Interregional Collaboration maturity

- Boosting Widening Digital Innovation Hubs
- Widening project
- 11 partners

- 8M€
-January 2020 to June 2023
bowi-network.eu

For all dimensions and Interregional Collaboration levels, we designed actions, services and KPIs.

Different *actions* for different collaborations

IC5: Synchronized	Joined R&D projects in multi-regional innovation programmes, structural activities that involve multiple stakeholders from both regions.
IC4: Managed	Key, inspirational projects with high impact and considered building blocks for the future, strategic activities to improve the corridor
IC3: Structural	Selected RDI collaborations and limited structural activities to support the corridor
IC2: Responsive	Pre-planned innovation projects, participations in EU-projects, as well as exchange of good practices
IC1: Casual	Opportunistic exchange of experiences, incidental innovation projects

The human-centric aspect of the corridor

We have designed an entire training and coaching programmes to forge corridors

BOWI Training Programme overview of modules — Version 220602

	Module	track	participation	core instruction	Date (tentative)	mentors
M1	**Introduction to the BOWI Training Programme** Kick-starting the overall BOWI Training Programme, including an overview of content, the overall approach and training of the supporting mechanisms.	general	optional	online training	3/6/2022	**Maurits Butter** Kristina Karanikolova Harri Kuusela Antonio Salvador Calvo Laura van Veen
M2	**Working on innovation in Europe and role in setting up collaborations** Opportunities from EU partnership and Commission for innovation, cultural challenges to engage and how to get access; role of policymakers and the Commission in Europe.	general	optional	online training	24/02/2023	**Sander van der Molen** Maria Roca
M3	**Participation with regions and other stakeholders** Training on getting connected to the regional ecosystem partners, including public authorities and other stakeholder	general	optional	2-day visit	June-Sept 22	**Kristina Karanikolova** Maurits Butter
M4	**Branding, communication and marketing** The importance of branding and communication for hubs and corridors and training on how you can make that operational.	general	optional	online training	27/01/2023	**Laura van den Aarssen** Maurits Butter
M5	**Introduction to PPPs and ecosystems** What are strategic public/private innovation networks, typologies, where do they come from and different stages of evolution.	strengthening	optional	2-day visit	June-Sept 22	Maurits Butter
M6	**Introduction to interregional collaboration** Introduction to the concept of corridors, argumentation of why European collaboration, its opportunities and approaches to creating interregional collaborations.	corridor creation	required	2-day visit	June-Sept 22	**Kristina Karanikolova** Maurits Butter
M7	**Forging collaboration activities** Making operational the concept of corridors into practical activities (the corridor forging, as well as interregional projects) and training on how to organize that.	strengthening corridor creation	optional	online training	19/09/2022	**Ron Oren** Maurits Butter Harri Kuusela
M8	**Building a network and business plan** How to build the network (hubs and corridors), including the development a systematic planning for the network business (partnership and finance).	strengthening corridor creation	required	online training	9/12/2022	**Pepijn Vos** Frank Berkers Maurits Butter
M9	**Engaging with SMEs** Understanding the perspective of the SMEs and how to get them actively engaged in the BOWI project, as well as in DIH and corridors in general.	strengthening corridor creation	optional	online training	25/11/2022	**Harri Kuusela** Jeroen Broekhuizen
M10	**Developing mission and strategy** Finding out and formalizing the USPs and role of the network in its ecosystem. It includes both better understanding the ambition of a hub, as well as the corridor.	strengthening corridor creation	optional	2-day visit	June-Sept 22	**Ron Oren** Maurits Butter
M11	**Creating value for your customers** What are the customers, their pains/needs. What services are to be offered and what assets are needed for its delivery. This includes both looking at the customer and services for hubs and corridors	strengthening corridor creation	optional	2-day visit	June-Sept 22	**Maurits Butter** Kristina Karanikolova
M12	**Organisation & governance of networks** How can you get to an efficient and effective organisation of the work, what shape does it take and how to govern it. Both looking at hubs and corridors.	strengthening corridor creation	optional	online training	14/10/2022	**Anita Lieverdink** Maurits Butter
M13	**Finance, revenues and funding** Understanding the costs of operating a network, how to get paid for it (revenue models), and financing opportunities. This includes the perspective of hubs, as well as corridors.	strengthening corridor creation	optional	online training	28/10/2022	**Maurits Butter** David Otto Maria Roca
M14	**The experiments: support and admin** Training of the widening hubs in the BOWI administration of the TTEs, including its support. This module focuses on the formal activities for being engaged in the BOWI project	BOWI participation	required	2-day visit online training	June-Sept 22	**Harri Kuusela** Laura Seryte
M15	**Keeping track of progress** Articulating the progress of the SME experiments, ensuring the active participation of the Widening and mature hub and the creation of the corridor	BOWI participation	required (at least 1)	online training (3)	30/09/2022 11/11/2022 10/03/2023	**Harri Kuusela** Laura van Veen Maria Roca
M16	**Evaluation and reporting**	BOWI participation	required	online training	10/02/2023	**Harri Kuusela**

The human is the key component to a functioning structured and sustainable corridor

➔ **We are launching the DIHnet Academy to developed the skills for innovation ecosystems' cross-border cooperation**

Our conclusions

- here is a diversity of approaches to address the human-centric aspects of the twin-transition, these are exciting opportunities for a RTO
- We addressed the cross-border innovation ecosystems but more aspect can be considered (orchestrating innovation, adaptive governance, …)
- We are launching the DIHnet Academy to support decision and policy makers in supporting the cross-border cooperation for the twin transition (widening…)

& recommendations

- Orchestrating innovation needs to be considered in every project.
- We call for dedicated support in the coming innovation funding programmes and policies with appropriate fundings

Bedankt voor uw aandacht

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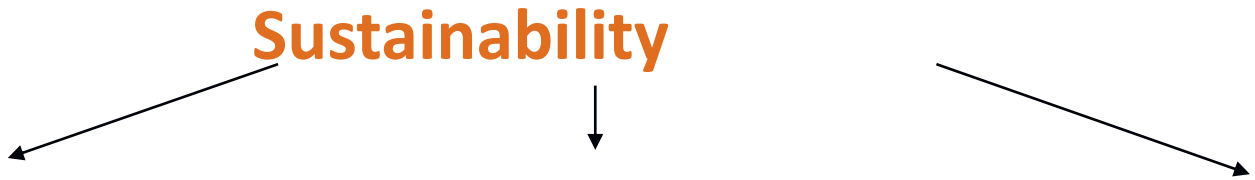
Commission Priorities (2019-2024)

- ***A European Green Deal***
- ***A Europe fit for the digital age***
- *An economy that works for people*
- *Protecting our European way of life*
- *A stronger Europe in the world*
- *A new push for European democracy*

*'..a once-in-a-generation opportunity to ensure Europe leads the way on the **twin ecological and digital transitions**'.*

Digitalisation and the 3 Dimensions of Sustainability



Economic

Economic resilience,

decent jobs, Growth,

Social

Equity and Social Justice, Poverty Alleviation, Education,

Lifelong learning, Health/well-being, Inclusion, culture

Social cohesion, Resilience and disaster preparedness

Environmental

Climate change

Pollution

Biodiversity loss

Is Digitalisation in the service of sustainability or driven by other priorities?

Can digital solutions such as smart grids, connected mobility, teleworking, precision farming deliver a triple win: environmental, social well-being, and economic development?

SKILLS - the critical success factor of any transition

1) for 59% of firms lack of availability of **staff with the right skills** negatively impacted their investments in the green domain https://data.eib.org/eibis/graph

2) for 60% of municipalities **lack of digital skills** is preventing climate change projects from progressing. https://www.eib.org/en/publications/online/all/investment-report-2022-2023

3) **half of young people** feel either “not confident at all” or only “somewhat confident” that their current skills would guarantee them a dignified job in the next 5-10 years. https://www3.weforum.org/docs/WEF_Davos_Lab_Youth_Recovery_Plan_2021.pdf

European Commission

Conflicts

- ICT footprint: 2.1 and 3.9% of total emissions; eWaste- fastest growing waste category

- Green funds may not support digitalisations or create roadblocks and measures against current practices such as built-in obsolescence, blockchain mining, single use electronics, etc.

European Commission

Synergies

- **WHAT DIGITAL CAN DO FOR GREEN:**

Digital transformation for climate neutrality. It can reduce 15-20% of total GHG emissions

- **WHAT GREEN CAN DO FOR DIGITAL:**

Green transition for sustainable financing and new jobs in green digital transformation

The nexus of Green transition & Digital Transformation

Conflicts are measurable (energy and material consumption, eWaste)

Synergies are so far expressed as ‘potential’ figures of enablement

To realise such potential we need science based & standardised **metrics**.

This will enable

- Sustainable finance for digitalisation (see EU Taxonomy Delegated Act on Climate mitigation)
- Green Public Procurements – GPP criteria exist for datacentres
- Market growth of green digital solutions in major sectors such as energy, transport, construction, agriculture, ..

European Green Digital Coalition Declaration

39 CEOs of ICT companies, with 2040 Net Zero targets, have committed to take action in the following areas:

- Investing in the **development and deployment** of green digital solutions with significant energy and material efficiency that achieve a net positive impact in a wide range of sectors.

- Developing **methods and tools** to measure the net impact of green digital technologies on the environment and climate by joining forces with NGOs and relevant expert organizations.

- Co-creating, with representatives of other sectors, **recommendations and guidelines** for green digital transformation of these sectors that benefits environment, society and economy.

https://www.greendigitalcoalition.eu/

39 Coalition members

EU countries commit to leading the green digital transformation

24 Member States and Norway and Iceland have signed a declaration to accelerate the use of green digital technologies for the benefit of the environment. They will deploy and invest more green digital technologies to achieve climate neutrality and accelerate the green and digital transitions in priority sectors in Europe, for example by using the NextGenerationEU and InvestEU funds.


DIGITALDAY2021
March 19th

A Green and Digital Transformation of the EU

Ministerial Declaration

Smart use of clean digital technologies can serve as a key enabler for climate action, environmental sustainability, and reaching the UN Sustainable Development Goals by improving energy and resource efficiency and facilitating circular economy, reduced emissions, pollution, biodiversity loss and environmental degradation, and improved resilience to climate change impacts. At the same time, the ICT sector should **ensure the environmentally sound design and deployment of digital networks and technologies and products**. Europe can compete globally in the green tech market, particularly by promoting innovative technologies, low-power electronics and environmental sustainability of ICT solutions.

In this context, **we welcome the establishment of the European Green Digital Coalition** that will accelerate the ICT sector's transition towards a sustainable, climate neutral, circular and zero pollution economy while at the same time contributing to innovative, sustainable, inclusive and resilient society and economy. We stand ready to engage with industry to contribute to the success of the Coalition.

Our goal is to accelerate and take the global lead on the green digital transformation, building on the Council Conclusions of 17 December 2020 on "Digitalisation for the Benefit of the Environment", as well as on the Digital Strategy [COM/2020/67 final].

We therefore will work together to use the significant potential of the Recovery and Resilience Facility and the earmarking of expenditure on reforms and investments to support the mutually reinforcing green (at least 37% of funding) and digital transitions (at

Example of commitments made:

- Making **green public procurement** the default option overall;
- Support the **deployment of green digital solutions** that accelerate the decarbonisation of energy networks, enable precision farming, decrease pollution, combat the loss of biodiversity and optimise resource efficiency;
- Propose permits for deployment of networks and **data centres** that comply with the highest environmental sustainability standards;

https://digital-strategy.ec.europa.eu/en/news/eu-countries-commit-leading-green-digital-transformation

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Towards sustainable robots with self-healing materials

prof dr ir Bram Vanderborght
Brubotics, Vrije Universiteit Brussel & imec

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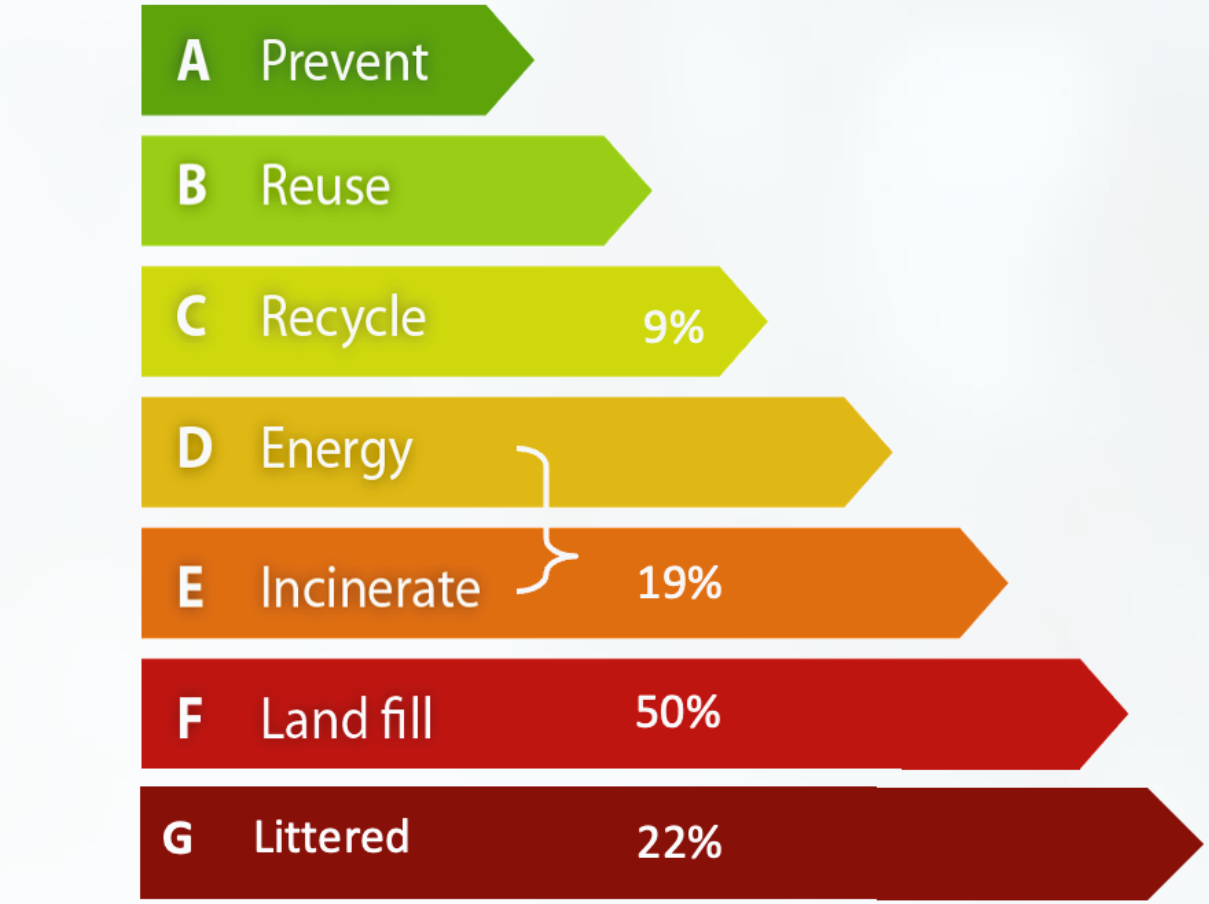
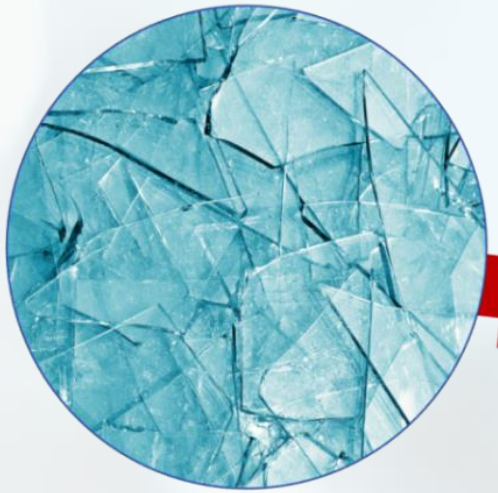
Unsustainable life cycle of plastics

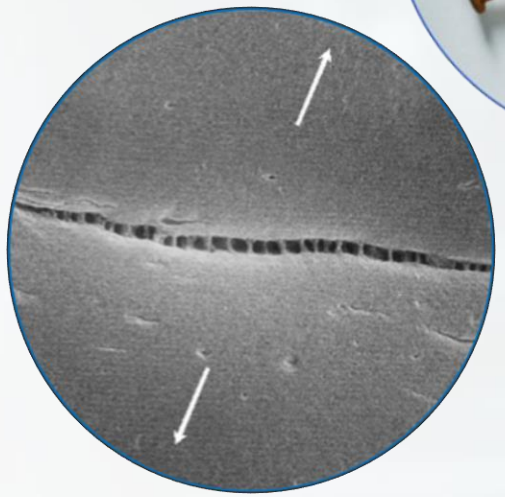


Implementation of heavy gear deburring use case for Hankamp

BruBotics Brussels
31st May 2023

HANKAMP GEARS · imec · VUB VRIJE UNIVERSITEIT BRUSSEL





Self-Healing Soft Gripper for Universal Adaptive Grasping under Hazardous Environment

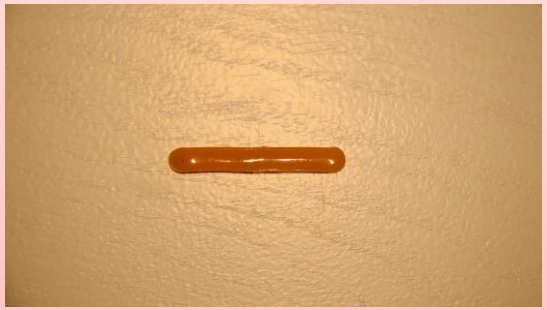
Huijiang Wang [1,*] Seppe Terryn [2,3] Zhanwei Wang [2] Bram Vanderborght [2]
Guy Van Assche [3] and Fumiya Iida [1]

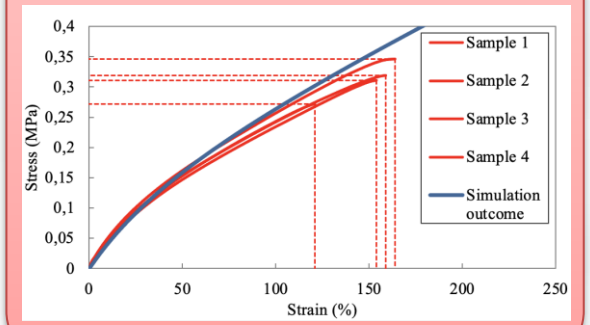
1: Department of Engineering, University of Cambridge, Trumpington Street, Cambridge CB2 1PZ, UK
2: Robotics and Multibody Mechanics (RMM), Vrije Universiteit Brussel, Brussels, Belgium
3: Physical Chemistry and Polymer Science (FYSC), Vrije Universiteit Brussel, Brussels, Belgium
* Corresponding Author: hw567@cam.ac.uk

Technical breakthroughs

Material Level

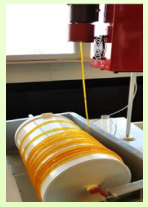
Portfolio of
sustainable self-healing
polymers/composites





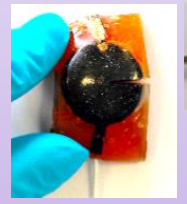
Manufacturing Level

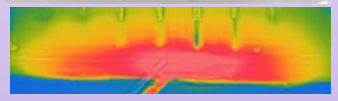
Formative and Additive manufacturing
of (multi-material) self-healing parts



Sensor Level

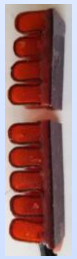
Self-healing flexible electronics
Sensors and heaters

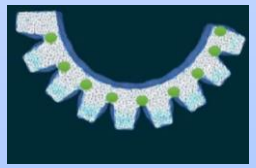




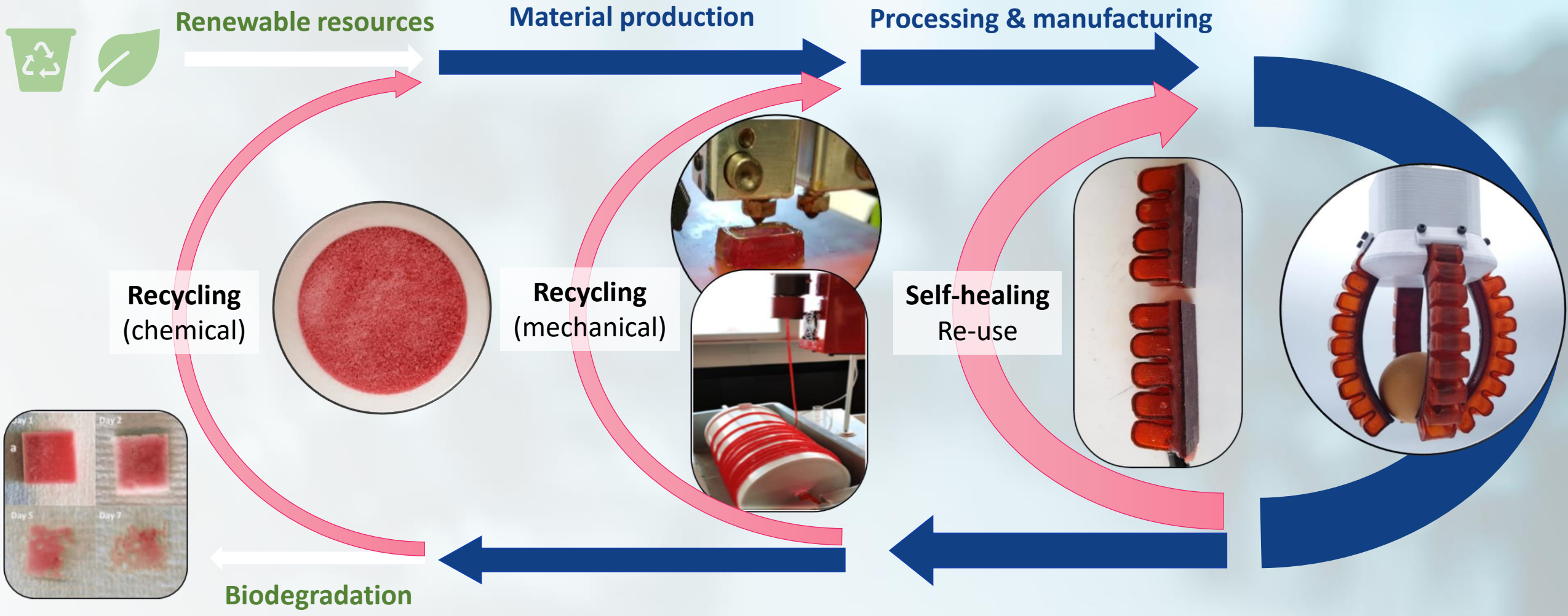
Robotics Level

Sensorized healable
soft grippers and bionic hands

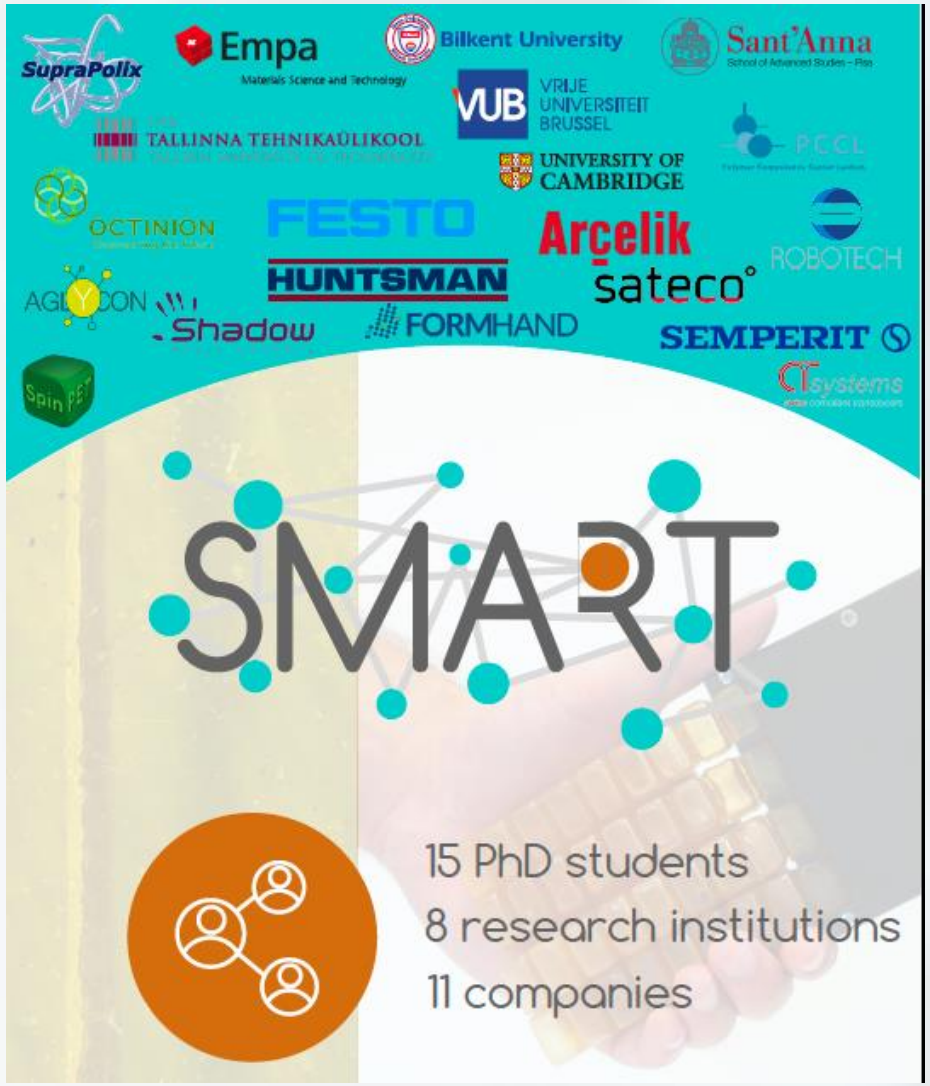




Sustainability and circular economy



EU Marie Curie training network SMART



FESTO

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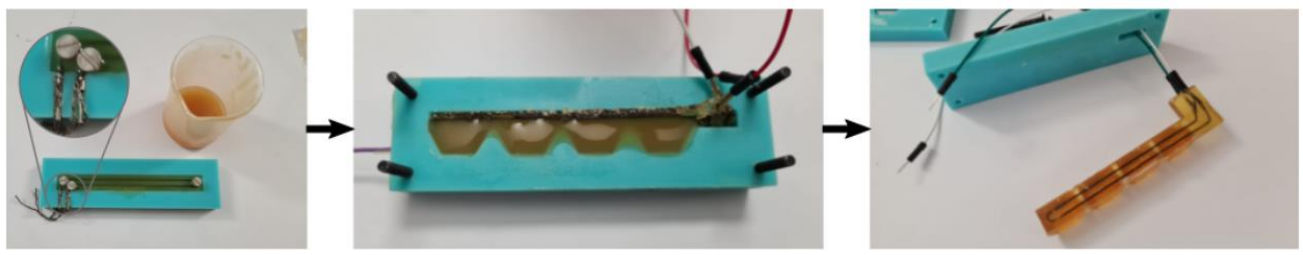
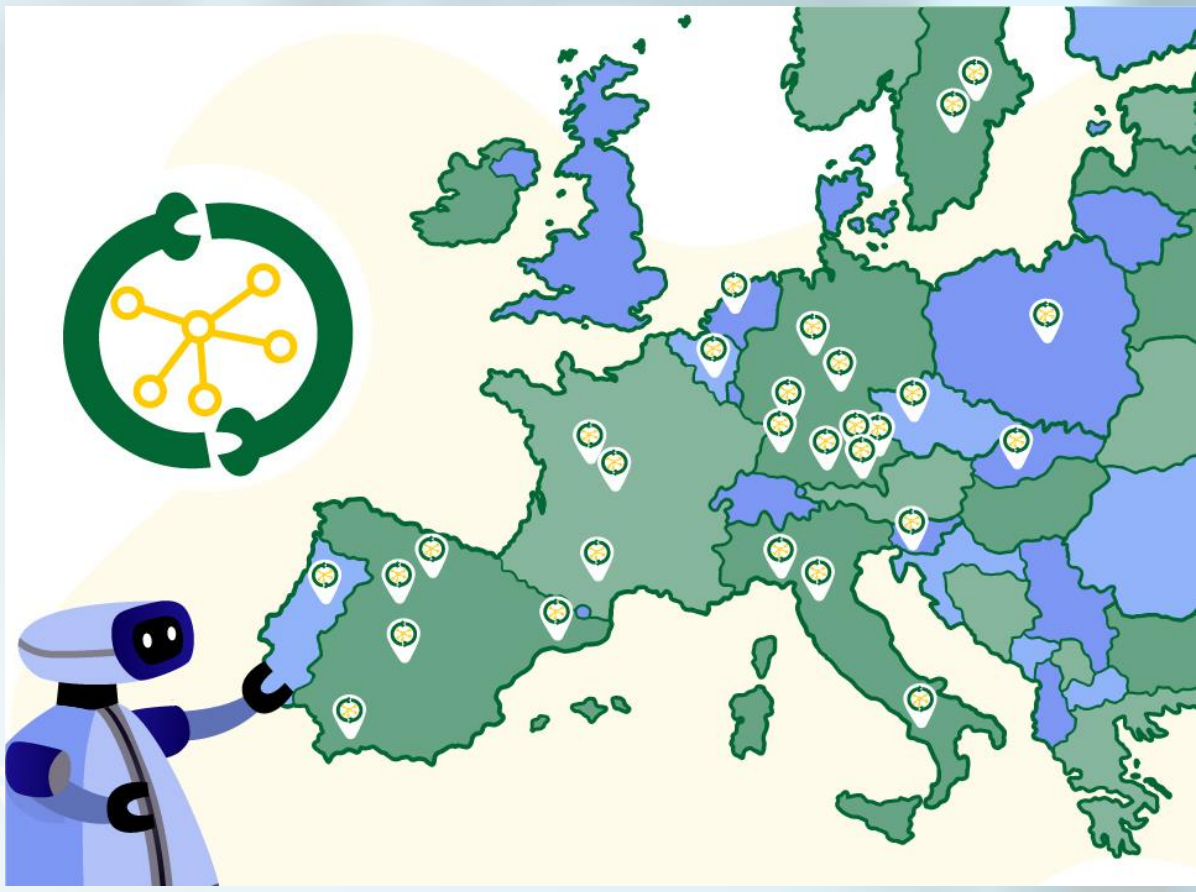
Accelerating research by reproducible research



euROBIN

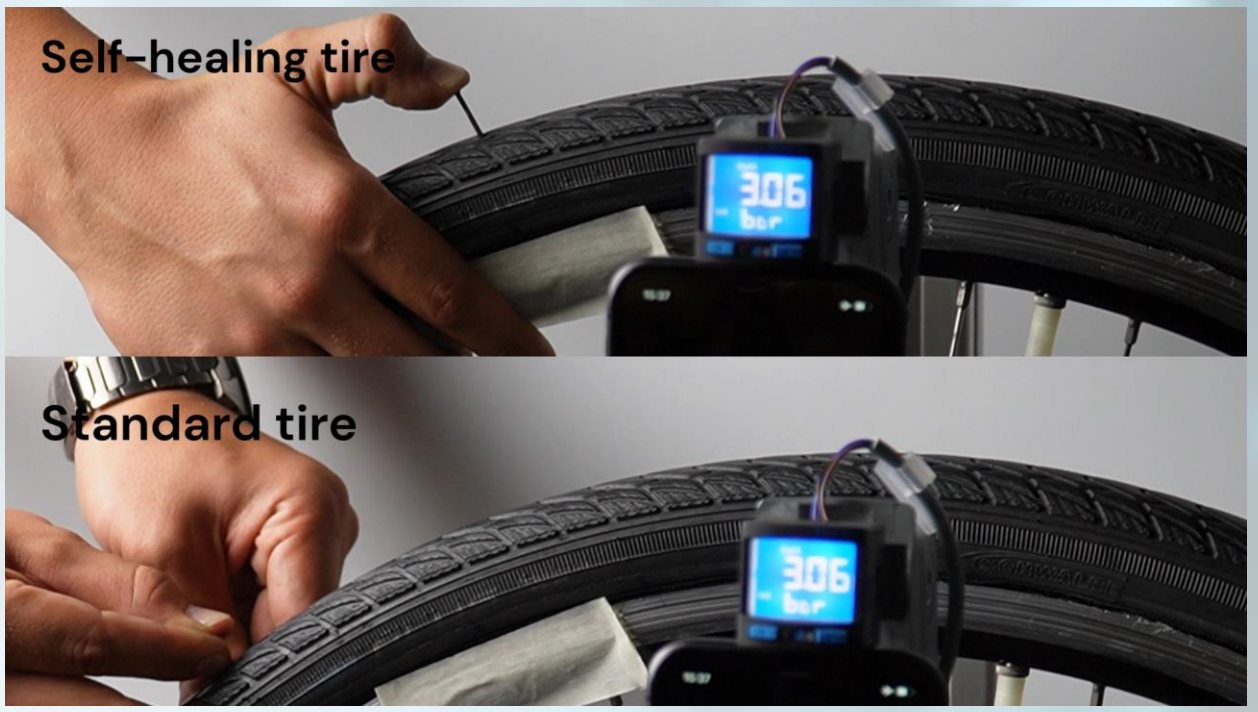
THE EUROPEAN EXCELLENCE NETWORK
ON AI-POWERED ROBOTICS



Science outreach

EIC Transition: crossing valley of death

Applications



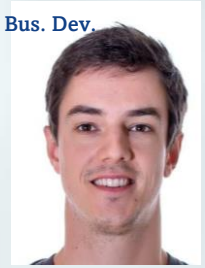
Self healing robotics team

Bram Vanderborght

Guy Van Assche

Laurent Vancaillie

Anastasia Klimenko



Simon Beckers

Hamed Abdolmaleki

Seppe Terryn

Joost Brancart

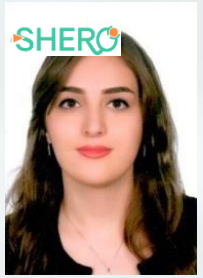
Fatma Demir

Ellen Roels

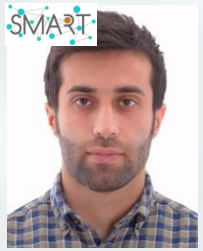
Huaijin Chen

Zhanwei Wang

Marwa Eldiwiny



Fatemeh Sahraee Azartamr



Seyedreza Kashef Tabrizian

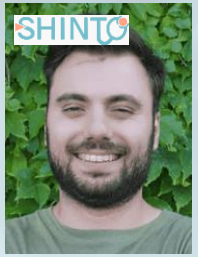
Francesca Furia

Aleix Costa Cornellà

Ali Safaei

Niklas Steenackers

Hendrik Cools



Pasquale Ferrentino


European Innovation Council
SHERO
SMART
SHINTO
euROBIN
brubotics
erc
fwo
FYSCA
imec
VUB
VRIJE UNIVERSITEIT BRUSSEL

RESEARCH TO REALITY

DIGITAL SOLUTIONS TO EUROPEAN CHALLENGES

beEU

Flanders State of the Art

Wallonie service public SPW

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European Commission

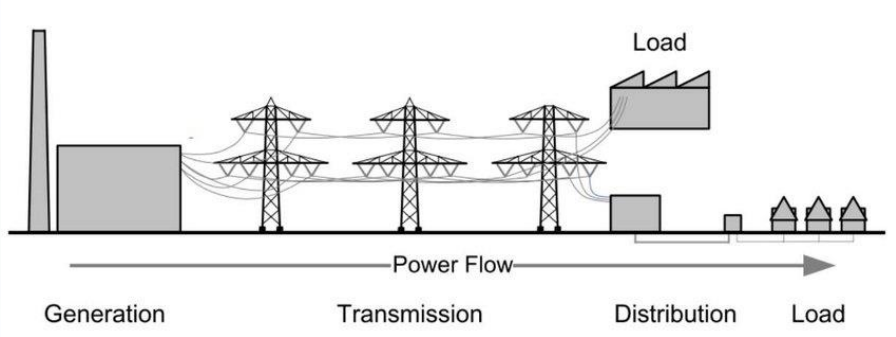
Smart Energy Grids

Univ.-Prof. Antonello Monti
(RWTH Aachen University – Fraunhofer FIT)

RESEARCH TO REALITY

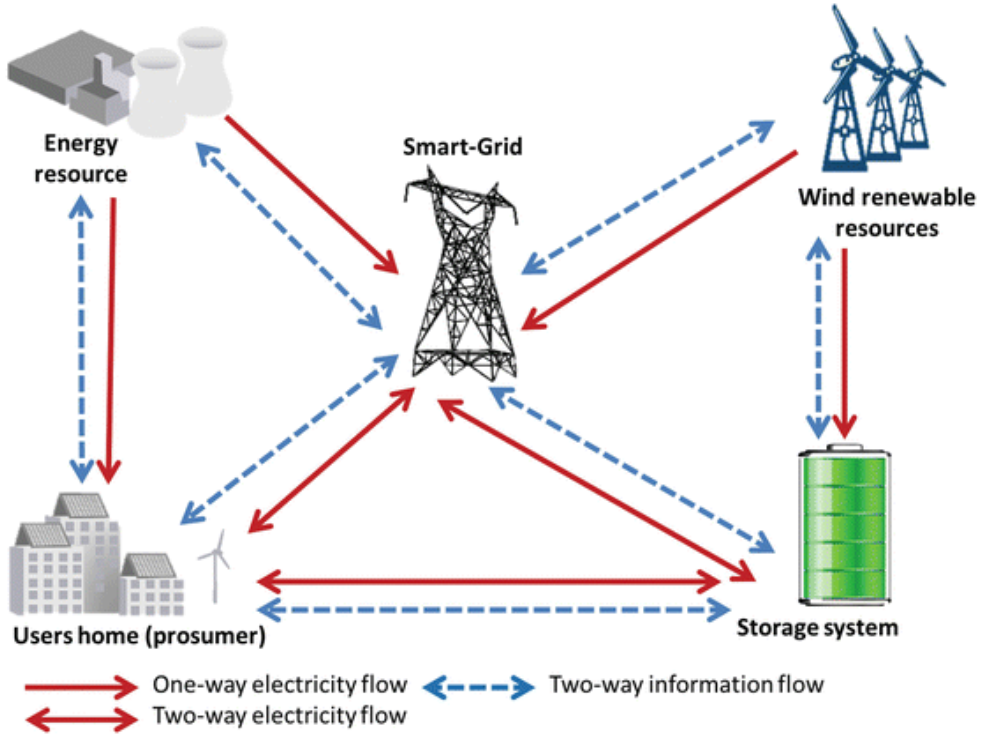
Motivation:
Challenges of the energy transition

From unidirectional

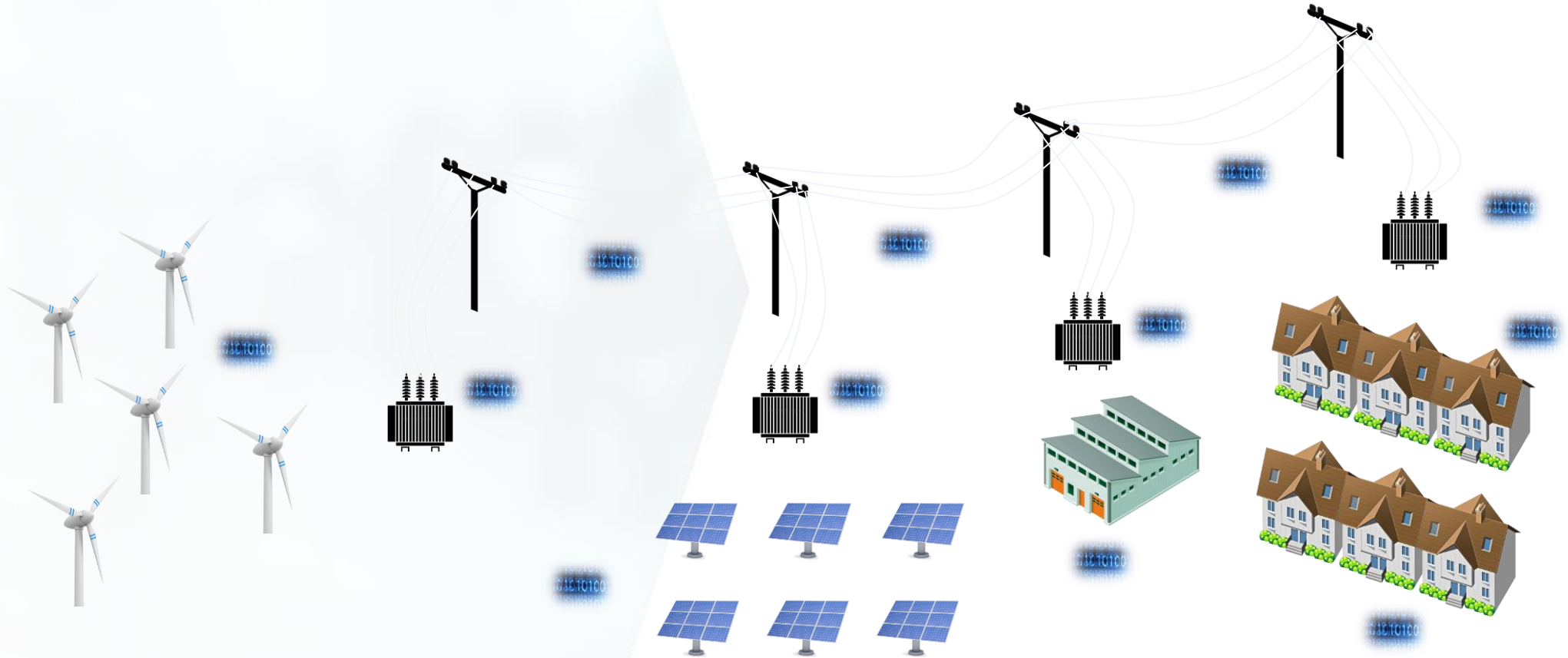


Source: https://www.agora-energiewende.de/

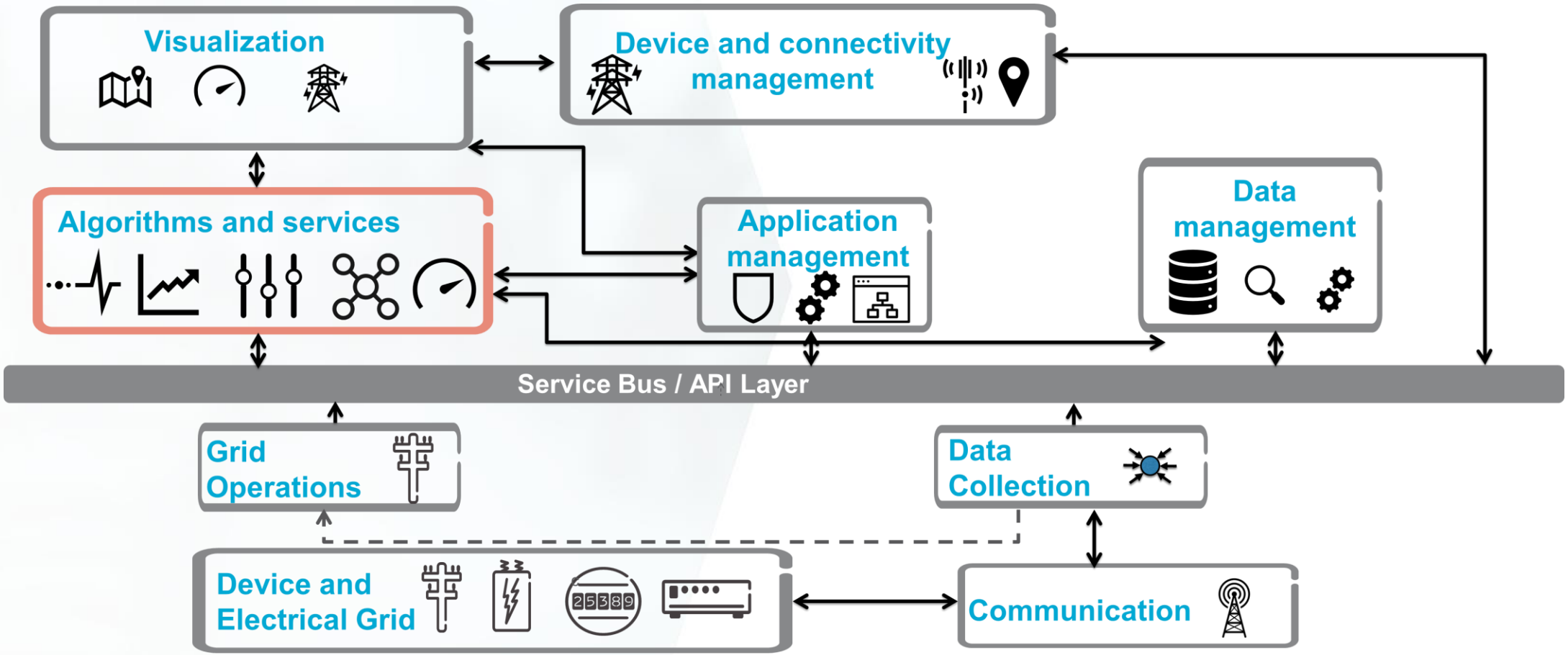
To multi-directional



The new role of edge and distribution grids:
more data from more points



A complex flow of energy and data



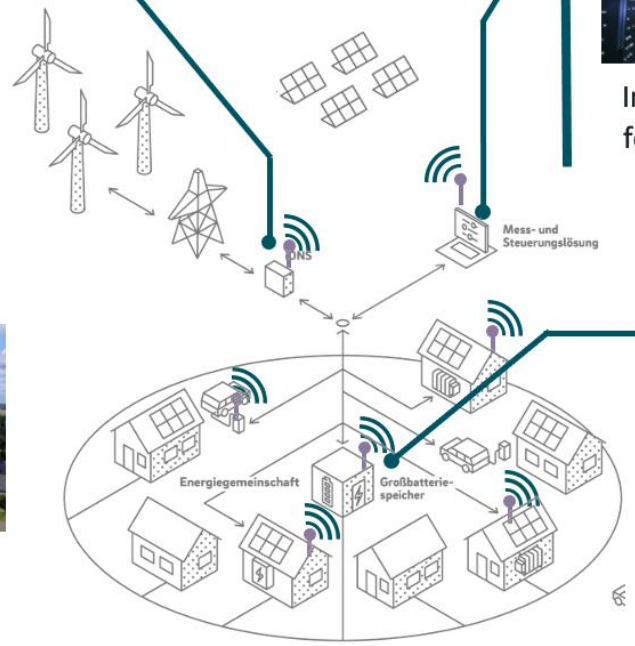
Empowering local energy communities in cooperation with local grid operator: Twistringen

Digital Substation

Grid monitoring with on state-of-the-art sensors and communication devices

Community Abbenhausen

89 resident households with high share of roof-top photovoltaic systems



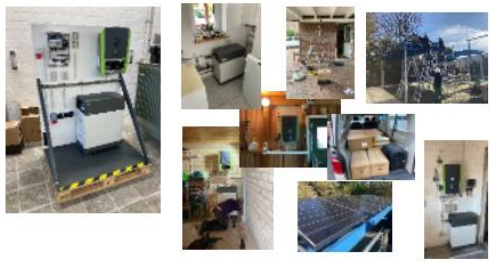
Energy Management System

Implementation of monitoring, forecasting and local balancing features

Battery Storage System

Provision flexible power and storage capacity

Customer Engagement & Customer Involvement



- 21 responses with interest for participation
- Equipment of 5 Households and implementation of 1 Prototype System

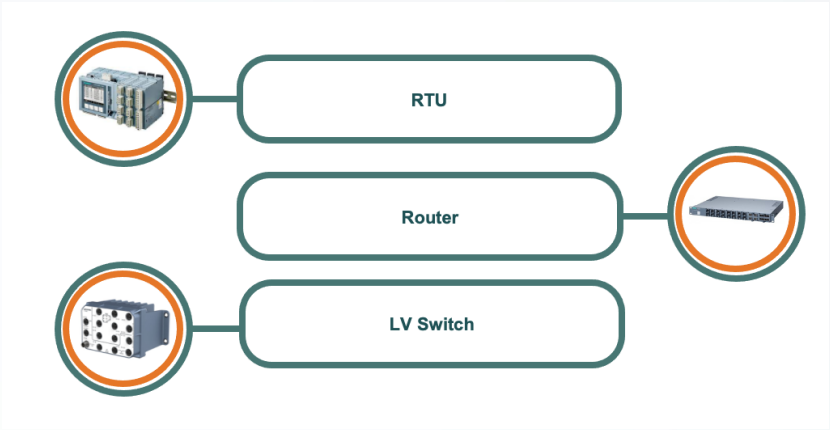
Energy Management System in Distribution Grid | Platone – Energieplattform Twistringen

Platone

Transforming the city of Rome

Several secondary substations already able to communicate with areti central system

Grid issues detection process is improved.



Platone

RomeFlex

areti

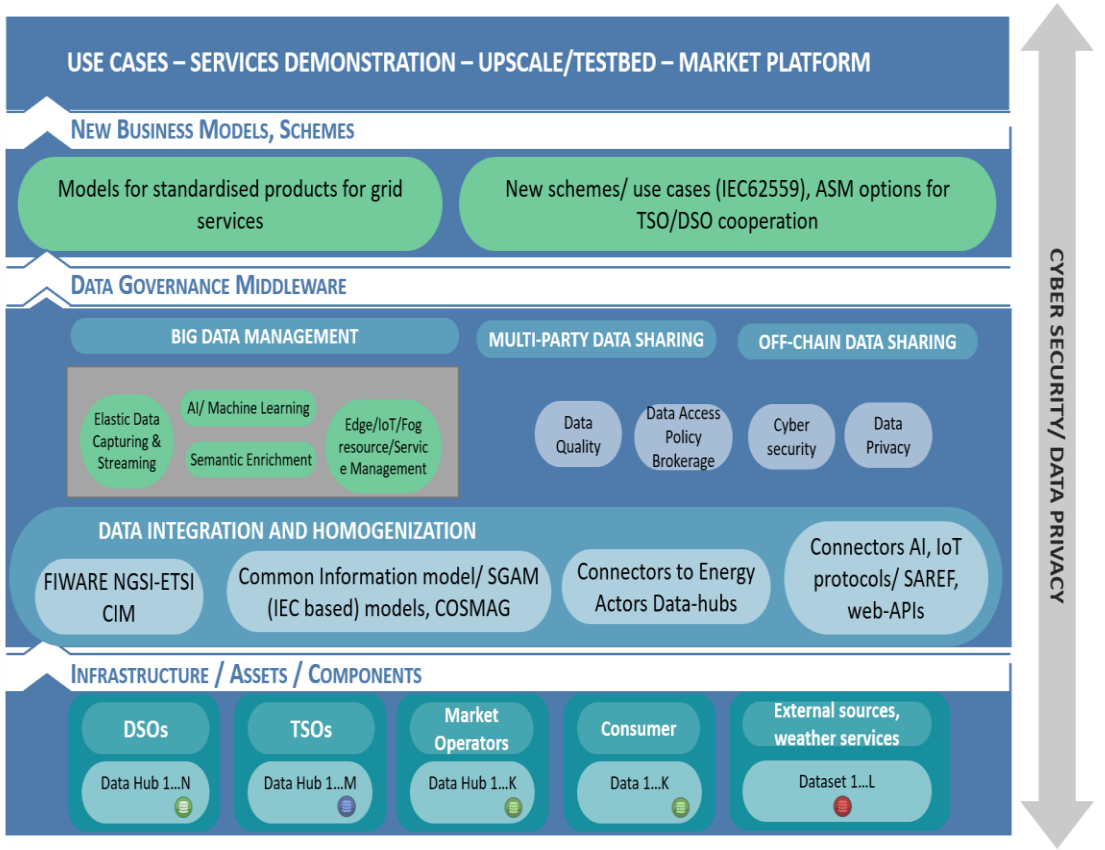
Reshaping **O**perational **Me**thod to run grid **Flex**ibility

Progetto RomeFlex:Flexibility services in the city of Rome

areti

OneNet

To create a **fully replicable and scalable architecture** that enables
the whole European electrical system
to **operate as a single system** in which
a **variety of markets** allows
the **universal participation of stakeholders** regardless of their
physical location – at every level from
small consumer to large producers

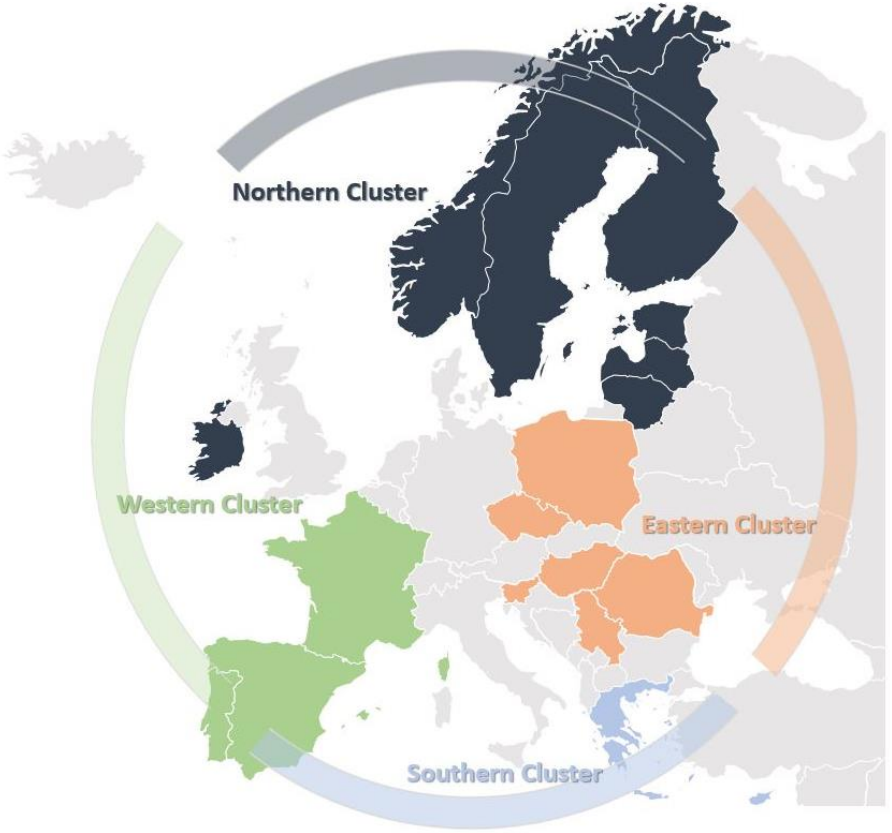


The OneNet Connector and the demo clusters

One single mechanism of data exchange to support multiple scenarios and use cases across Europe

Based on Data Space technology

Implemented already in many different countries as part of the project



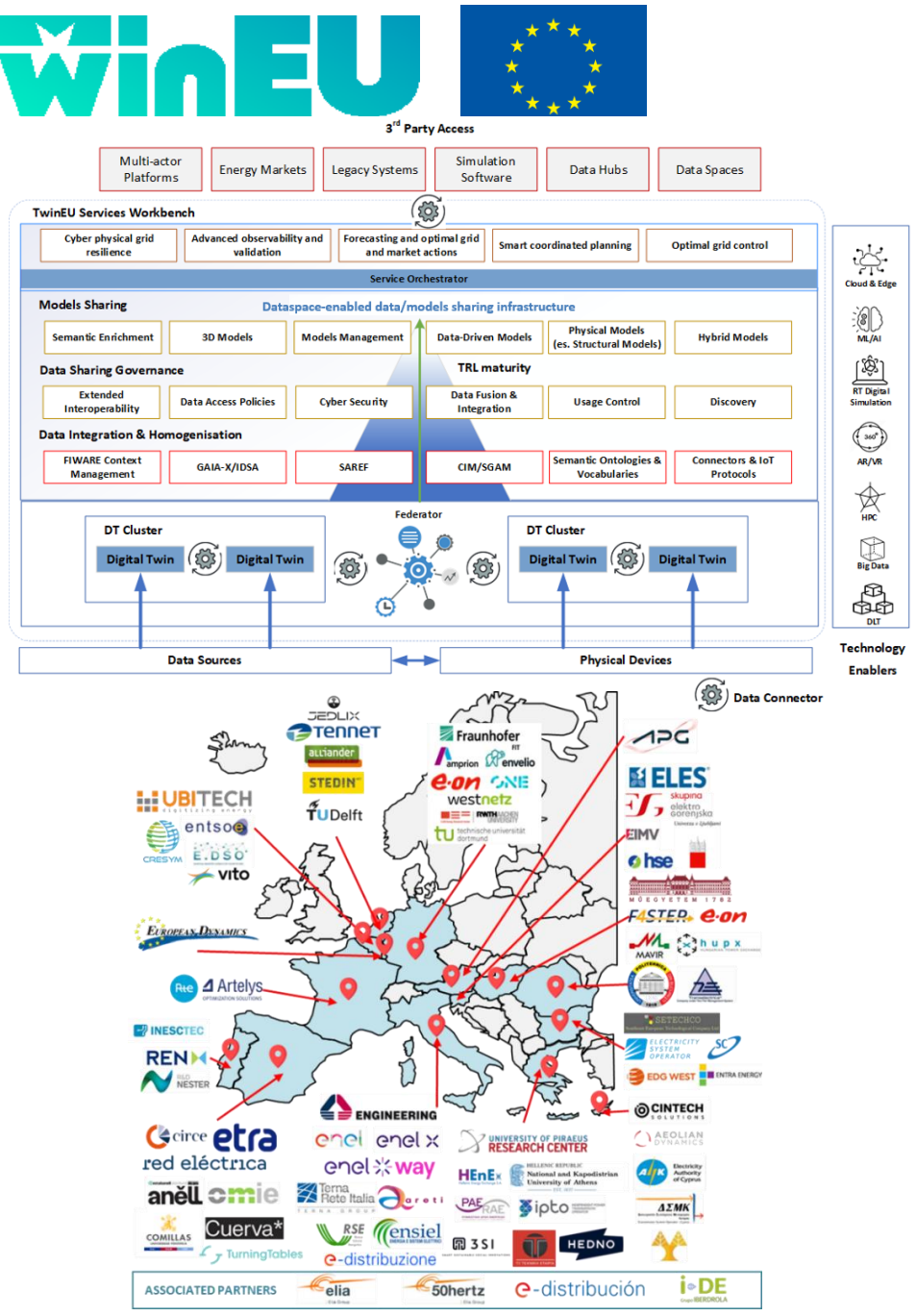
Building a European Digital Twin

Starting from mechanisms developed in OneNet

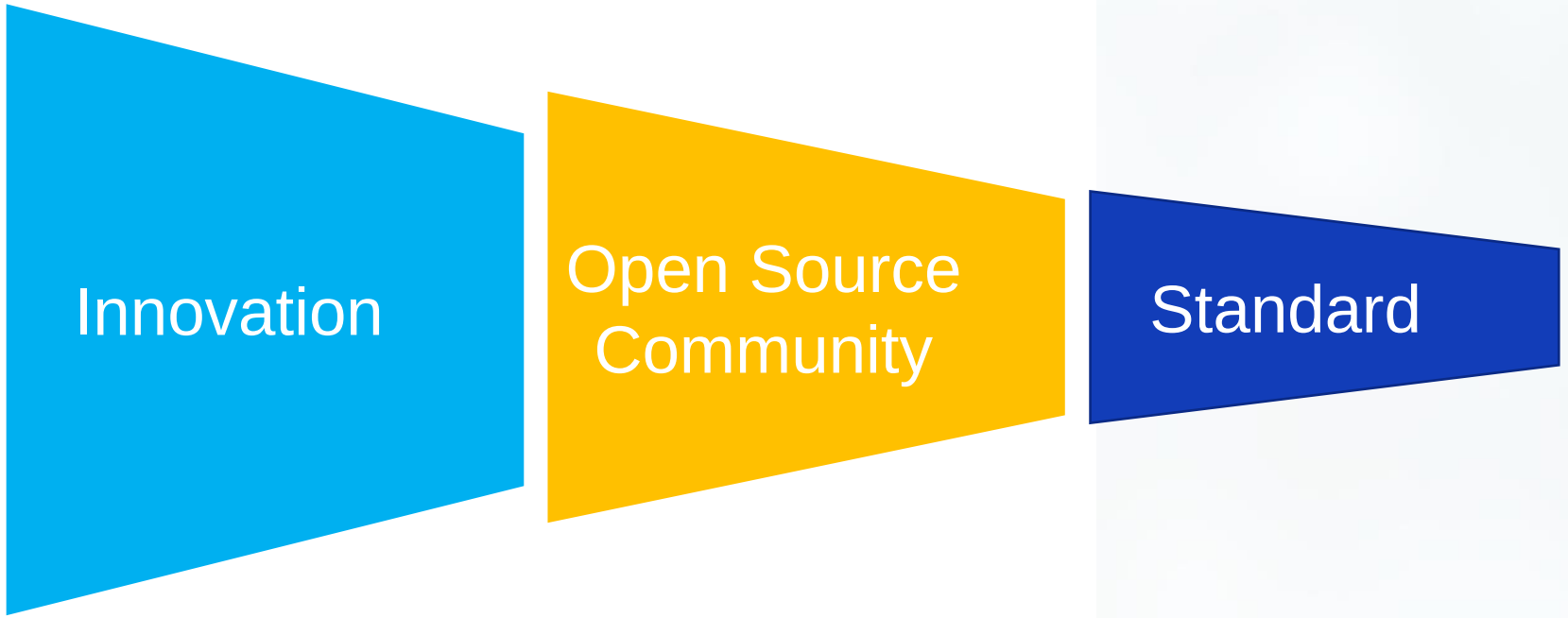
Leveraging local efforts in a federated approach (data space approach)

Creating consensus through large participation

Developing an open community to go beyond the funding period



The way forward



CRESYM

LFENERGY

Open-source and open communities as fast-moving engines of innovation

Conclusions

Role of data is growing

Digital Solutions are emerging

Data Spaces are the next revolution

Openness and cooperation as key elements for interoperability

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Digital twin – one stop shop ‘district renovation’

Content

1.Energyville

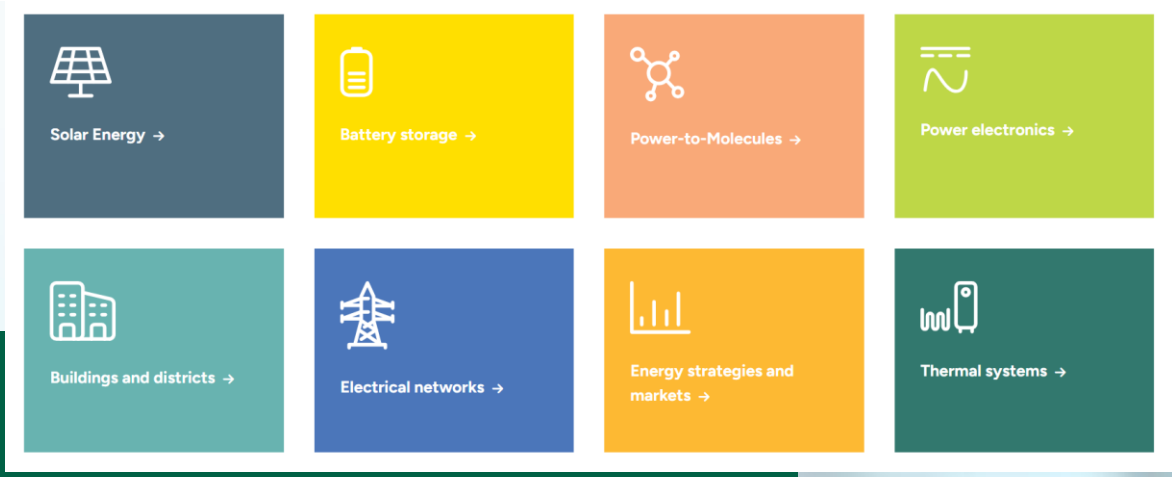
2.Context

3.From Research to Reality

4.Data Flow

5. Applications (Public and private)

1. Energyville



What can we help you with?

Ground-breaking energy research

Through fundamental, applied and industry-driven research, both theoretical and experimental, we offer new solutions to achieve a sustainable energy system. We cover both theoretical and experimental aspects and have specialised knowledge on all facets of the energy system and the integration of all systems together.

→

Innovative test facilities

In our test facilities, we turn pioneering ideas and scientific discoveries into tangible products. In our state-of-the-art laboratories, we can extensively test and optimise your services and technologies at both material and system level.

→

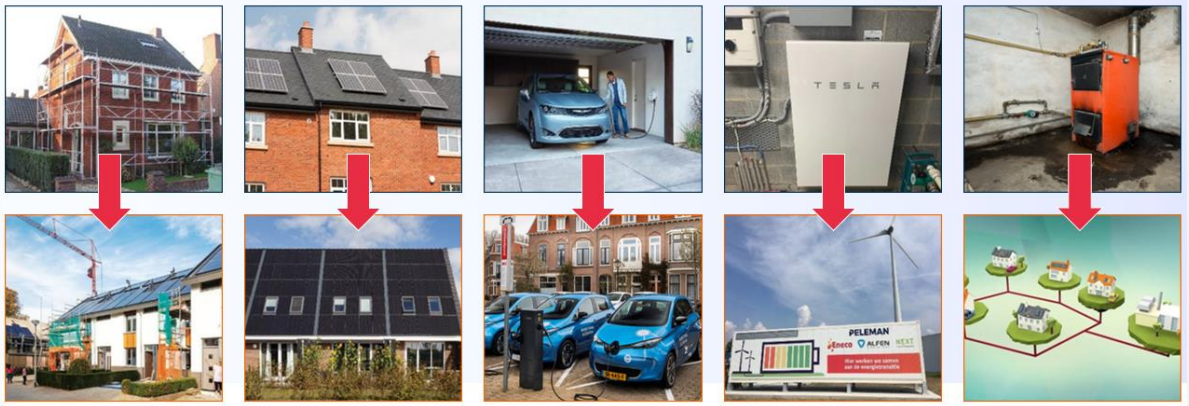
Tailormade advice & tools

We also make our new technological insights, tools for decision-making processes, evaluation methods and new business models available to you. Looking for specific insights or advice on a particular energy-related sustainability issue? At EnergyVille, you've come to the right place!

→

2. Context

The urban energy transition requires a societal optimisation



Case study on neighbourhood level
Decarbonisatie scenario's Watermolen neighbourhood Sint Niklaas (BE)

Model variant	Current situation	BAU (1%)	A-label *min. TAC*	-60% CO_2 *min. TAC per building*	-60% CO_2 *min. TAC neighbourhood renovation*	District heating + max PV
Net energy consumption *[MWh/y]*	31 080	27 450 (-12%)	14 950 (-52%)	7300 (-76%)	13 930 (-55%)	14 800 (-52%)
CO_2 *[ton/y]*	7 017	5 920 → -16%	3 800 → -53%	1754 → -77%	2 8[illegible] → -60%	3 200 → -55%
CAPEX *[M€]*	0	18.4	57.5	59.7	38.9	39.0
Energy cost *[M€/jaar]*	0.53	0.44	0.34	0.25	0.27	0.18
TAC *[M€]*	10.3	27.0	64.2	64.6	44.2	42.5

3. From research to reality

DITUR in a nutshell

3 Stepped approach

Identify

- Collecting information, analyzing it and long-term follow-up
- Detecting opportunities for (collective) renovation, sustainable heating networks
- Clustering of similar projects

Engage

- Communication to homeowners
- Show a clear step-by-step plan to convince the target group to participate
- Refine the already available data (step 1) through an audit and update the long-term plan

Execute

- Prepare quotations, sign and plan the works
- Checking the renovation works of the contractors
- Unburdening contractors in administrative and practical processes

RESEARCH TO REALITY

3. From research to reality

Stakeholders

Flemish Government

- ABB
- EWI
- Omgeving
- Digitaal Vlaanderen
- Veka
- …

Local governments

- All cities and municipalities
- Intensive collaboration with pilot municipalities

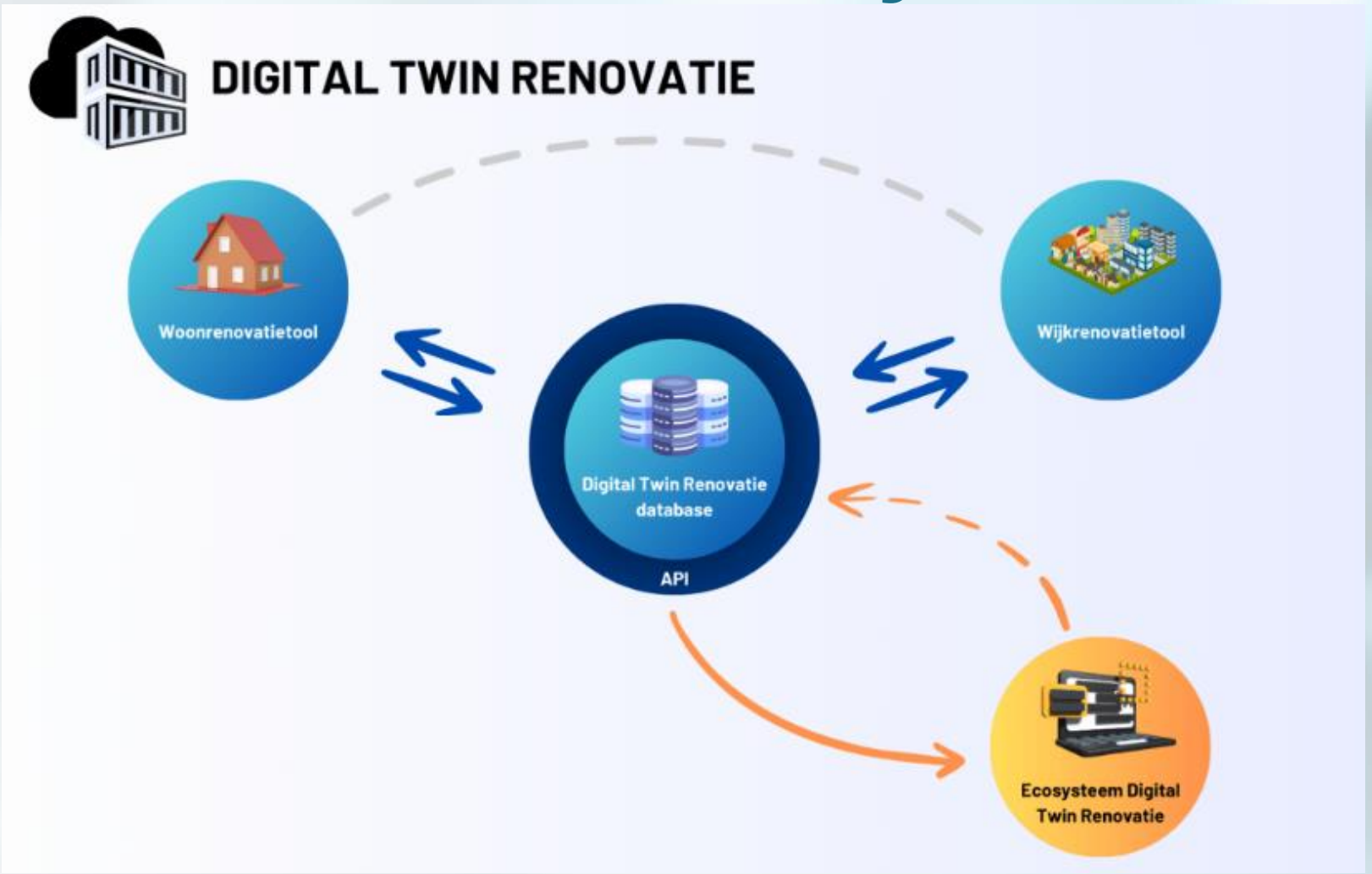
Energy Houses

- 19 Energy Houses in Flanders
- Support and advice related to energy and renovation
- Intensive collaboration with front-runners

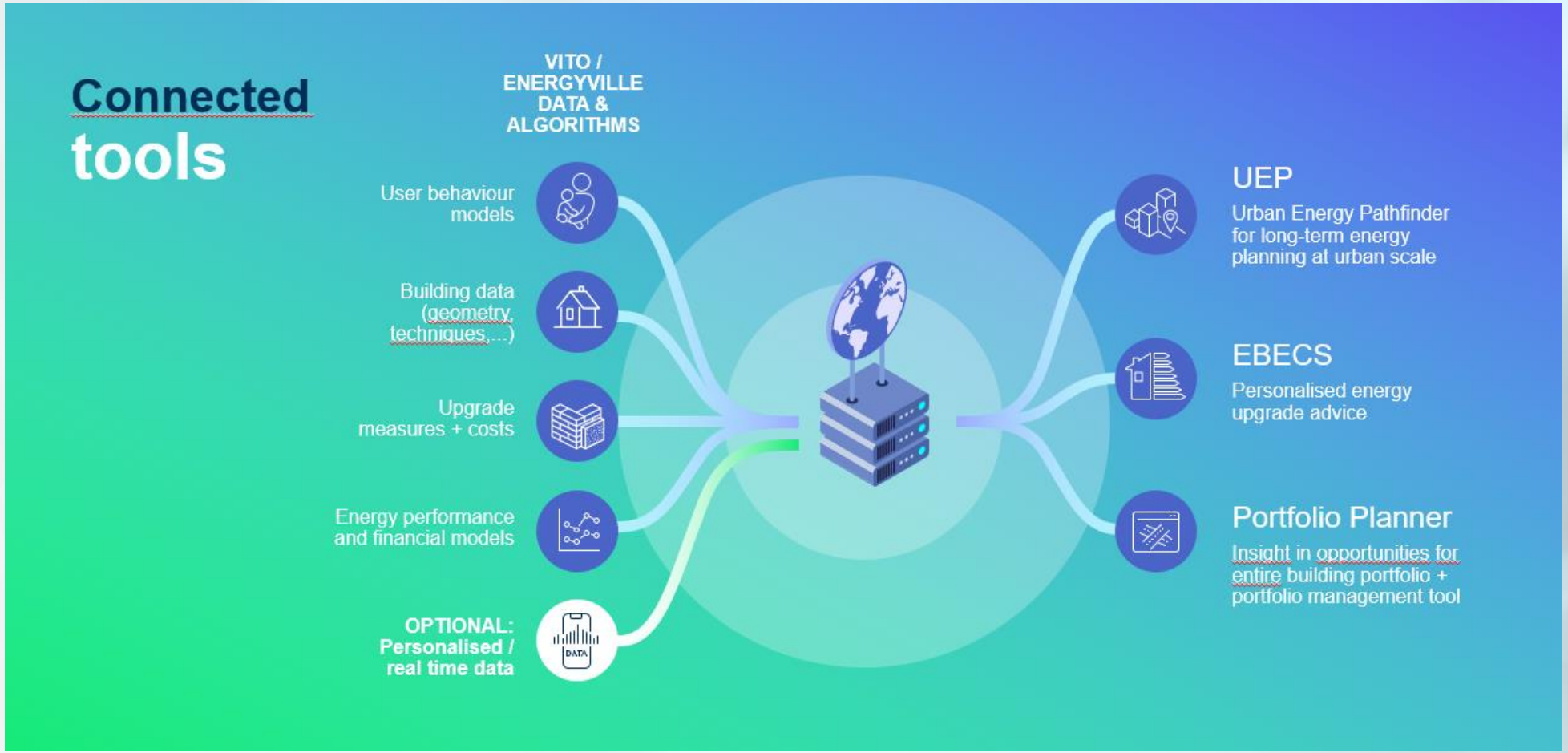
Industry players

- Consultancy
- One-stop shops
- Software suppliers (e.g. CRM systems)
- …

3. From research to reality



4. Data flow


Connected tools
VITO / ENERGYVILLE DATA & ALGORITHMS
User behaviour models
Building data (geometry, techniques,...)
Upgrade measures + costs
Energy performance and financial models
OPTIONAL: Personalised / real time data
DATA
UEP
Urban Energy Pathfinder for long-term energy planning at urban scale
EBECS
Personalised energy upgrade advice
Portfolio Planner
Insight in opportunities for entire building portfolio + portfolio management tool

4. Data flow

Data flow

Bottom up / top down

Bottom up

Verification open data sets and statistical assumptions

Calibration of real energy consumption and behavioural aspects

…

PROBABILISTIC DATA

(For existing residential neighbourhoods)

Top down

Typical
(open) data sources

Geometry: BGS & 3D-GRB (any .shp , .gml, .csv)

Consumption data: Fluvius open-data (straat & stat. sector)

Construction year: Census (+ kadaster)

Building physics: meta model trained on EPC database

Inhabitants profile:
Census / Provincie in cijfers

Street for district heating:
GRB (+ KLIP)

"Renewable energy atlas"

4. Data flow

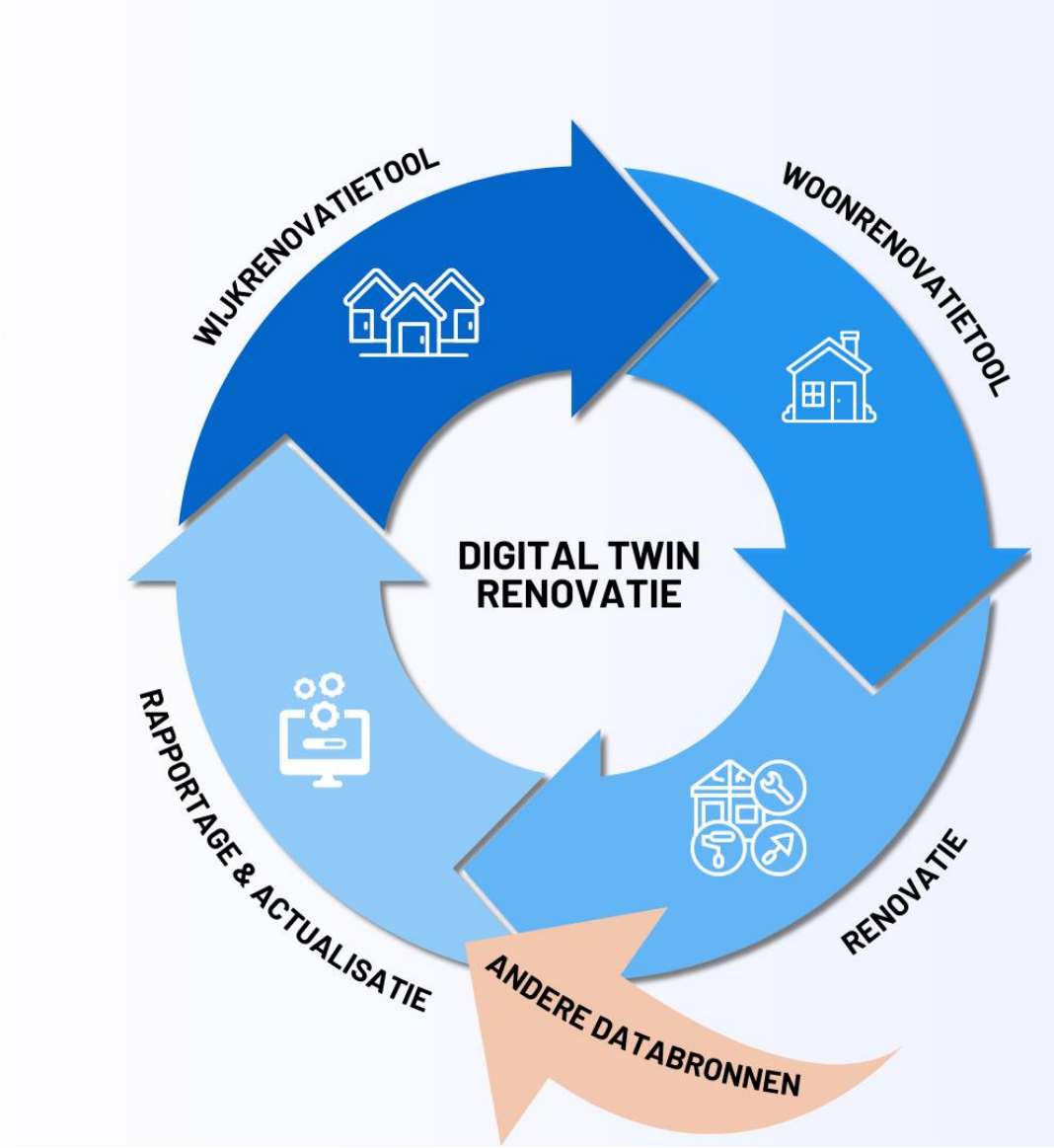
Process district renovation

District renovation tool (DRT)
Local authorities, energy houses and mandated partners analyze the potential for collective renovation and heating solutions at an aggregated level to draw up a long-term strategy and determine priorities

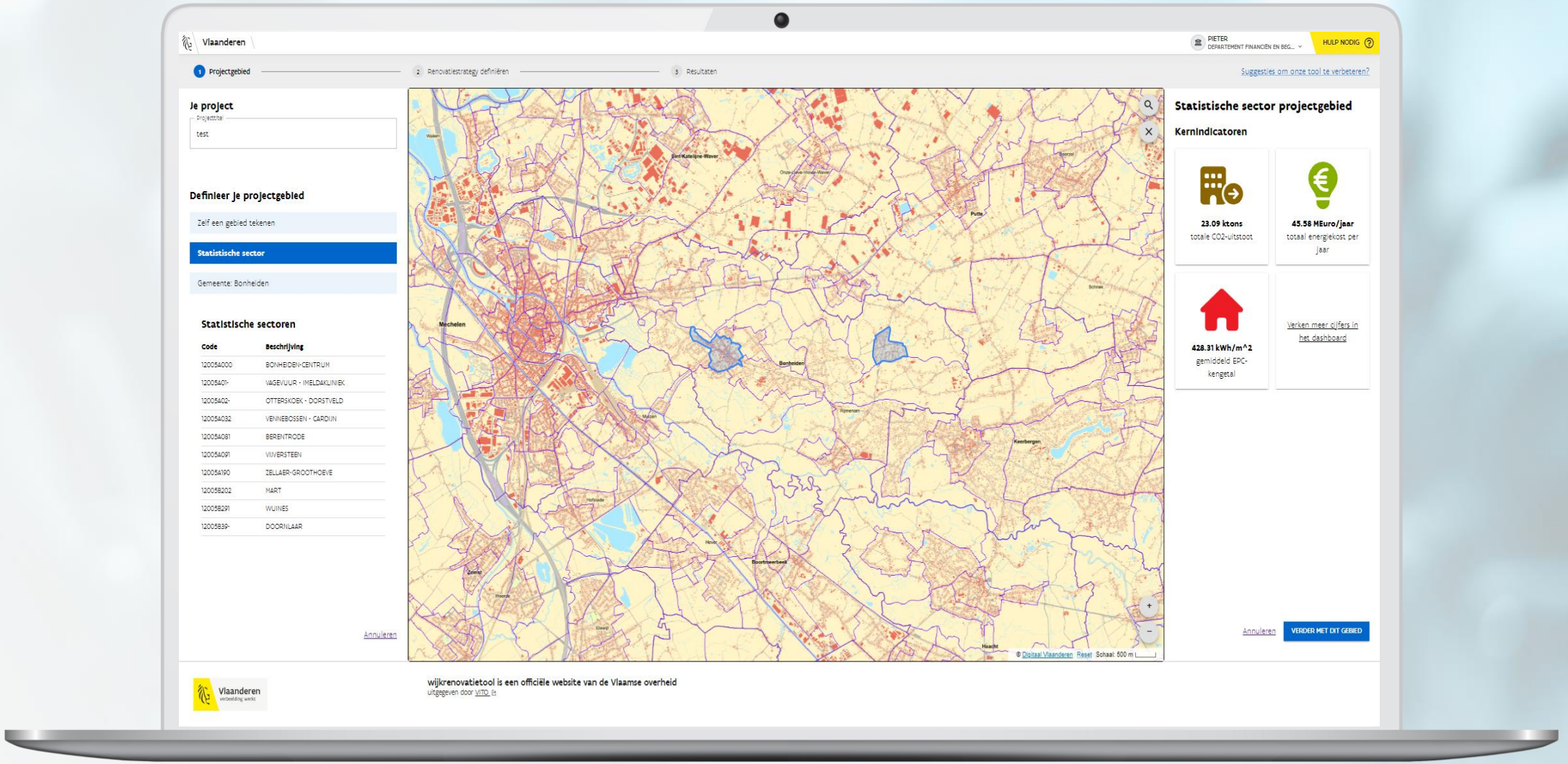
Building renovation tool (BRT)
The energy house provides individual renovation advice with the BRT and adjusts data and simulation results for dwelling and neighborhood. Based on this analysis renovation quotes can be made by contractors

Execution
The homeowner has the renovation work carried out under the supervision of the EH

Report & update
The energy house reports to the digital twin (via the BRT or the cities renovation counter) on the proper execution of the works. The new information is updated in the applications and the cities long term carbon neutrality plans

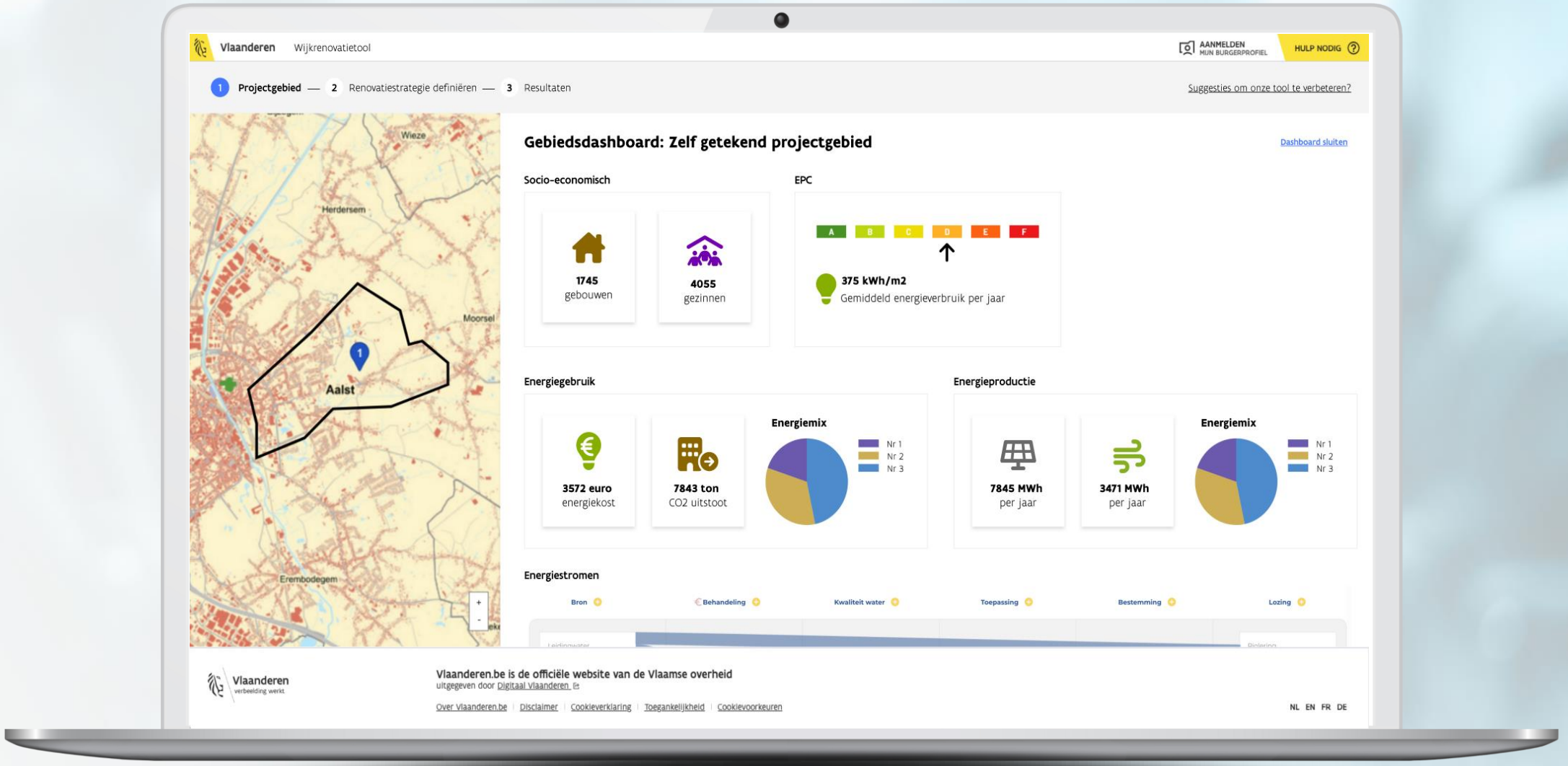


5. Applications (Public and private)



District Renovation tool

5. Applications (Public and private)



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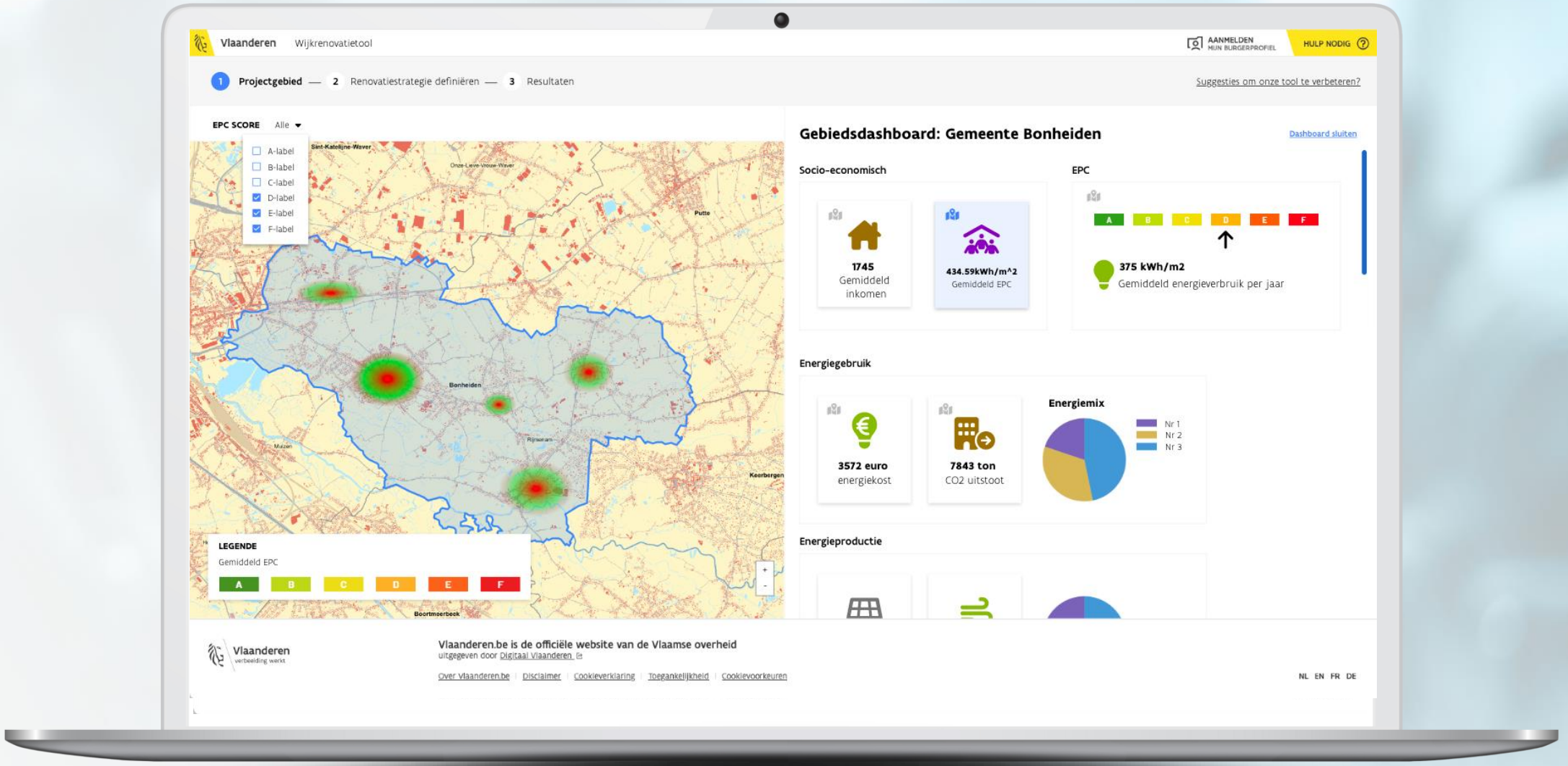

District Renovation tool

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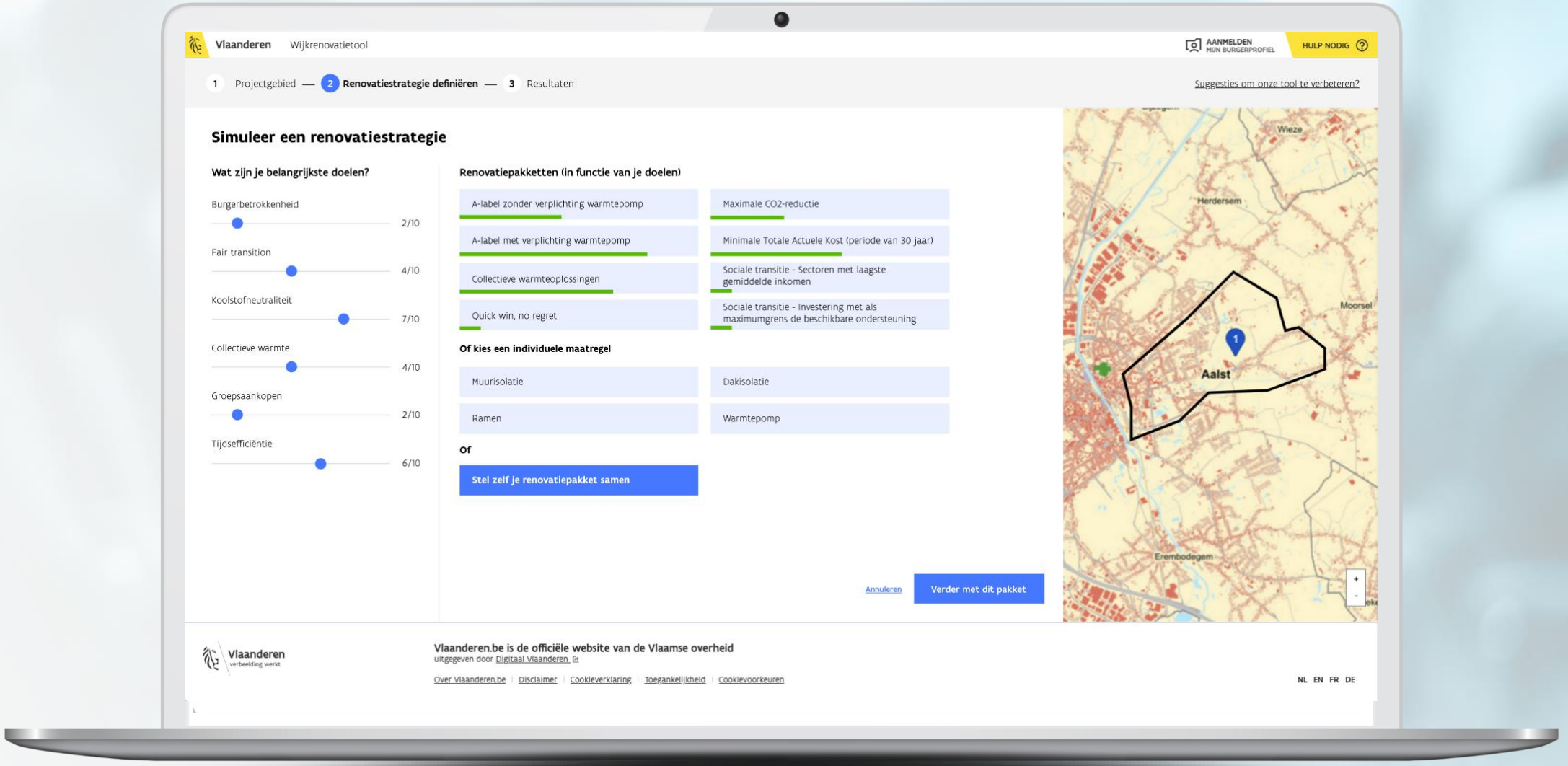

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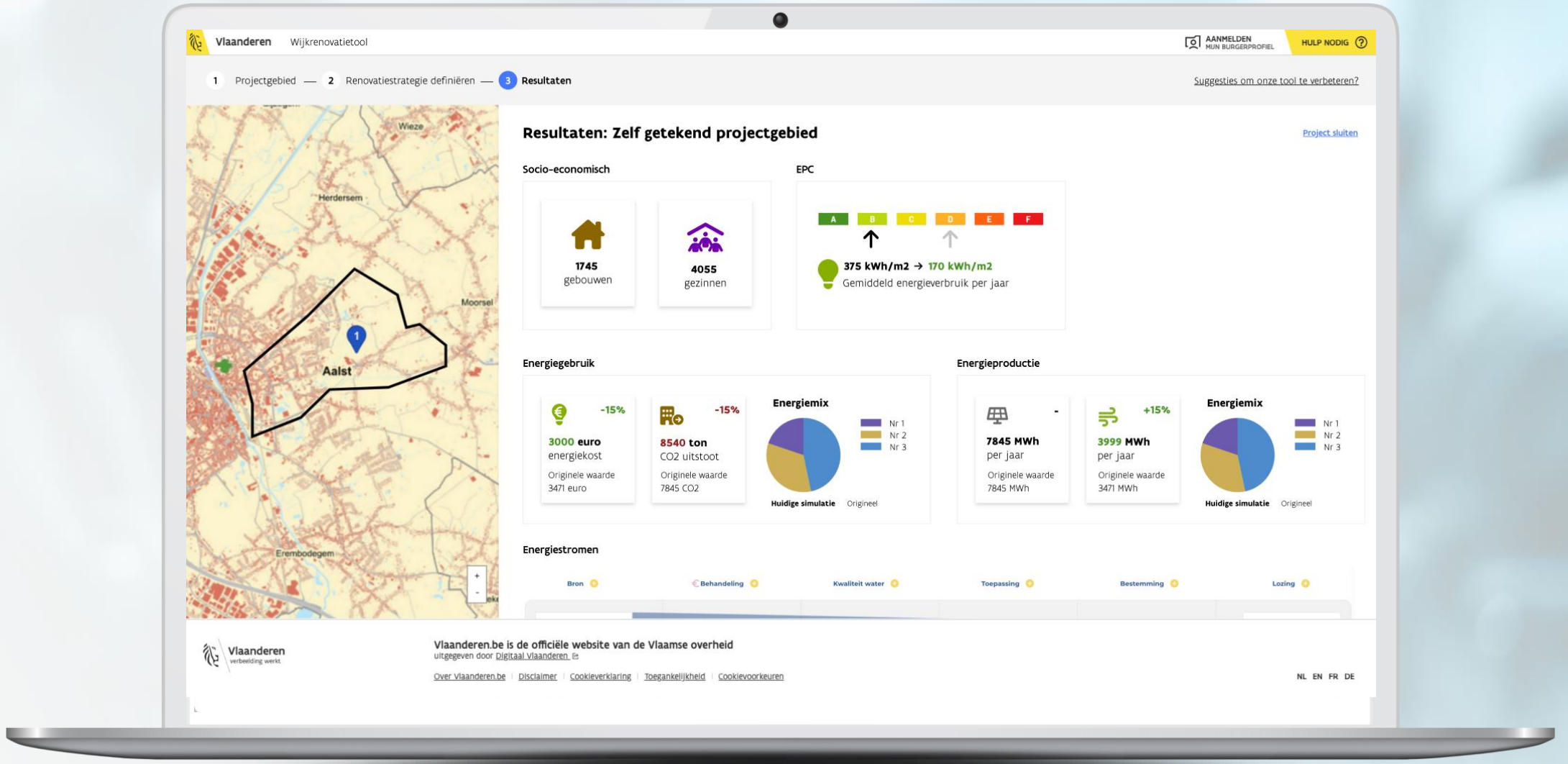

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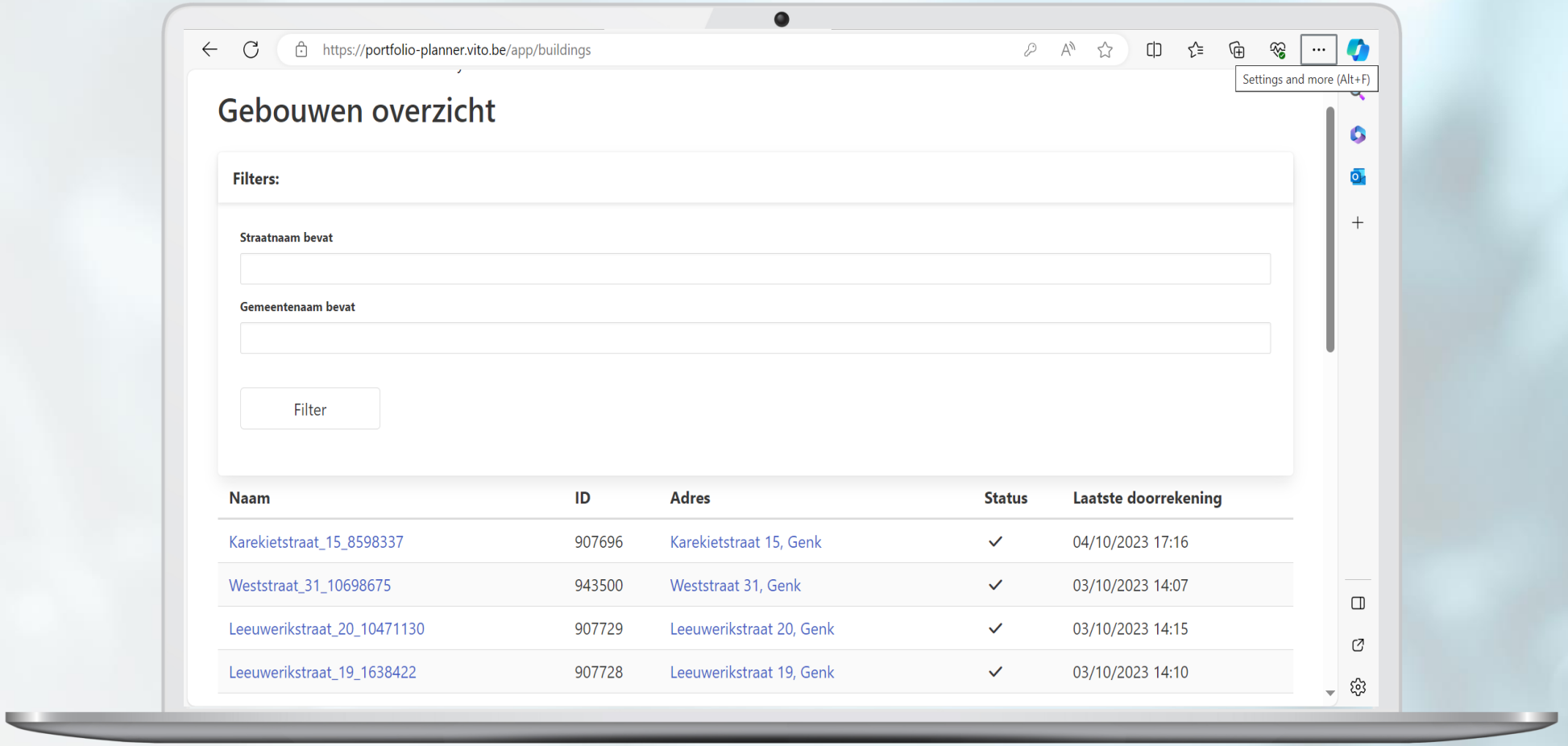
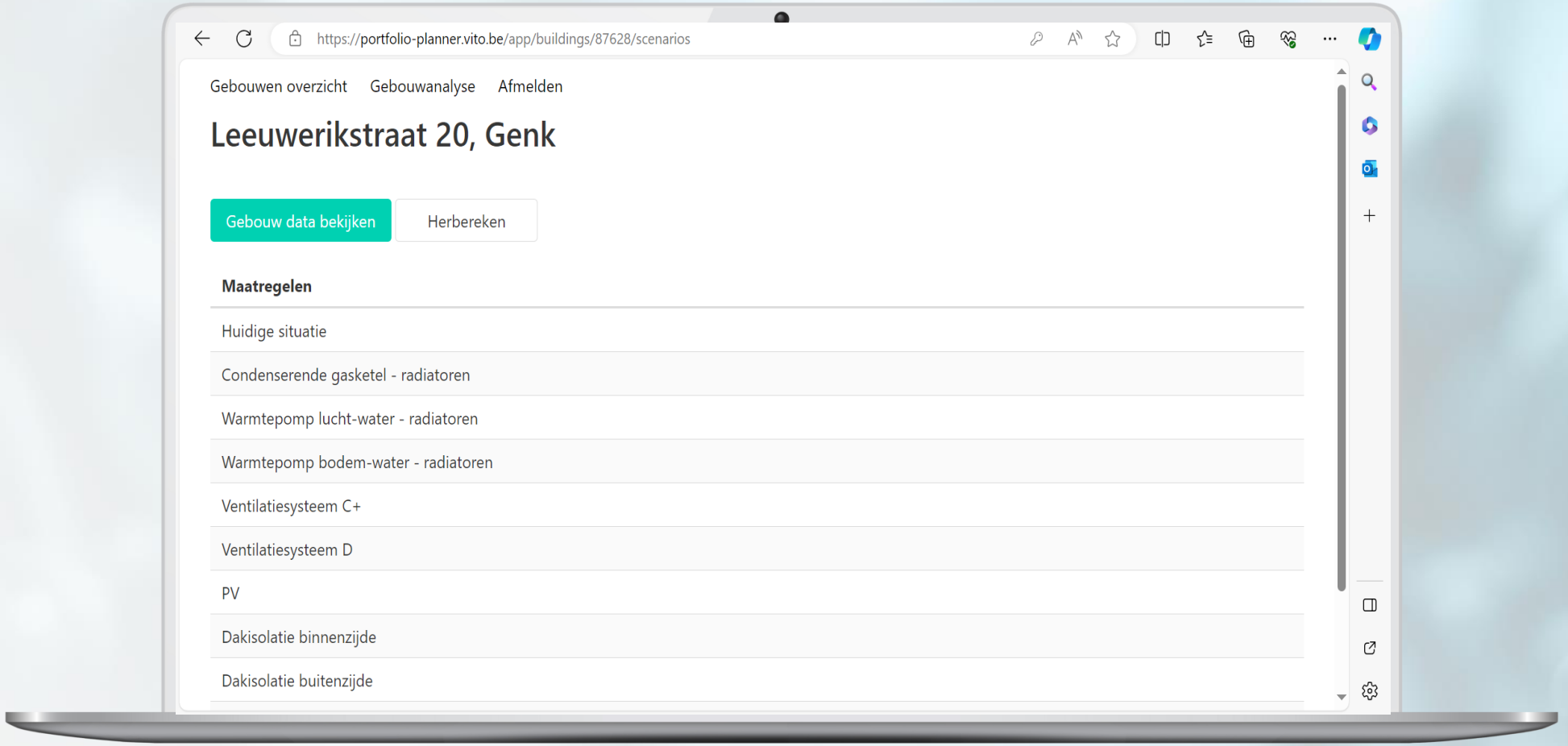


Building Renovation tool

5. Applications (Public and private)



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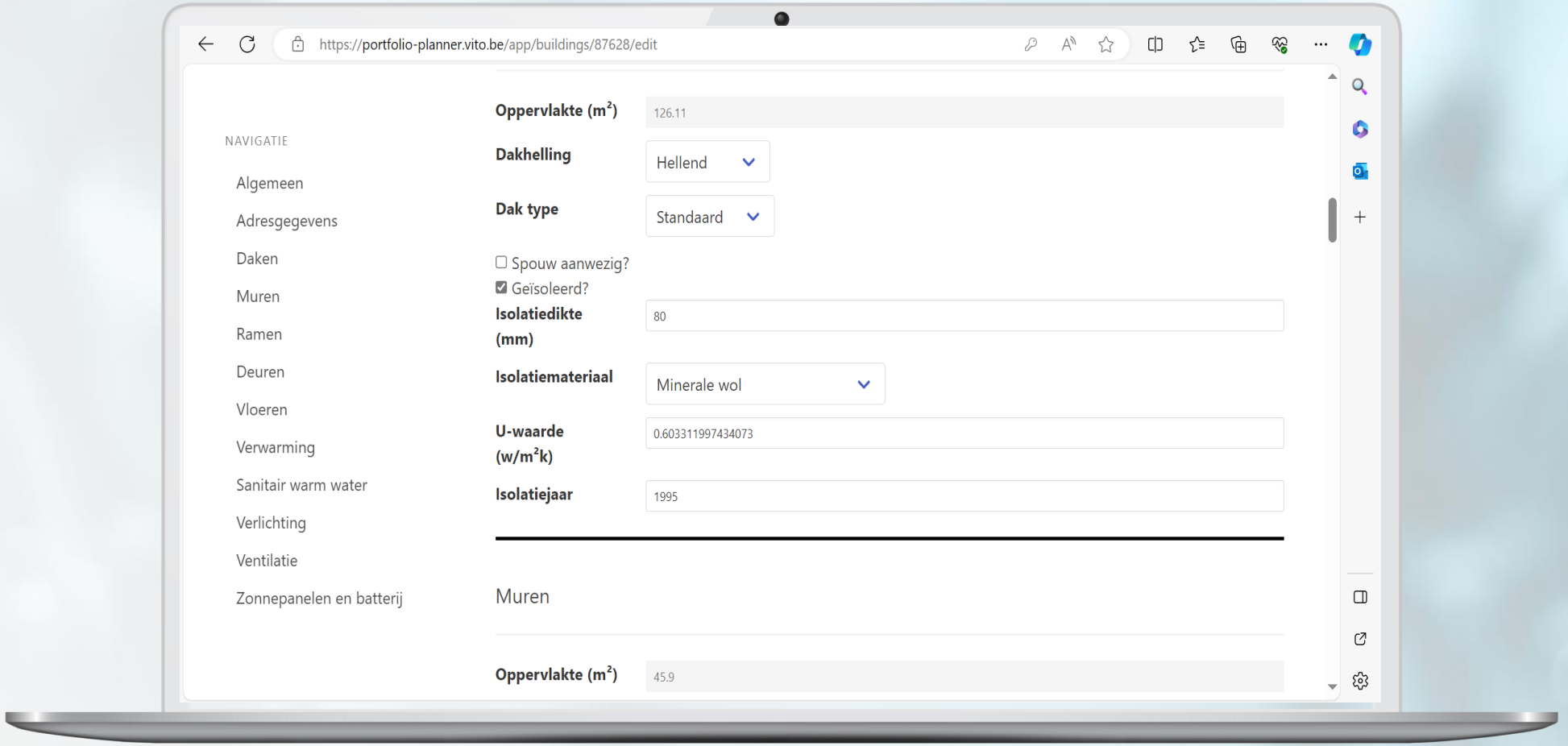

Building Renovation tool

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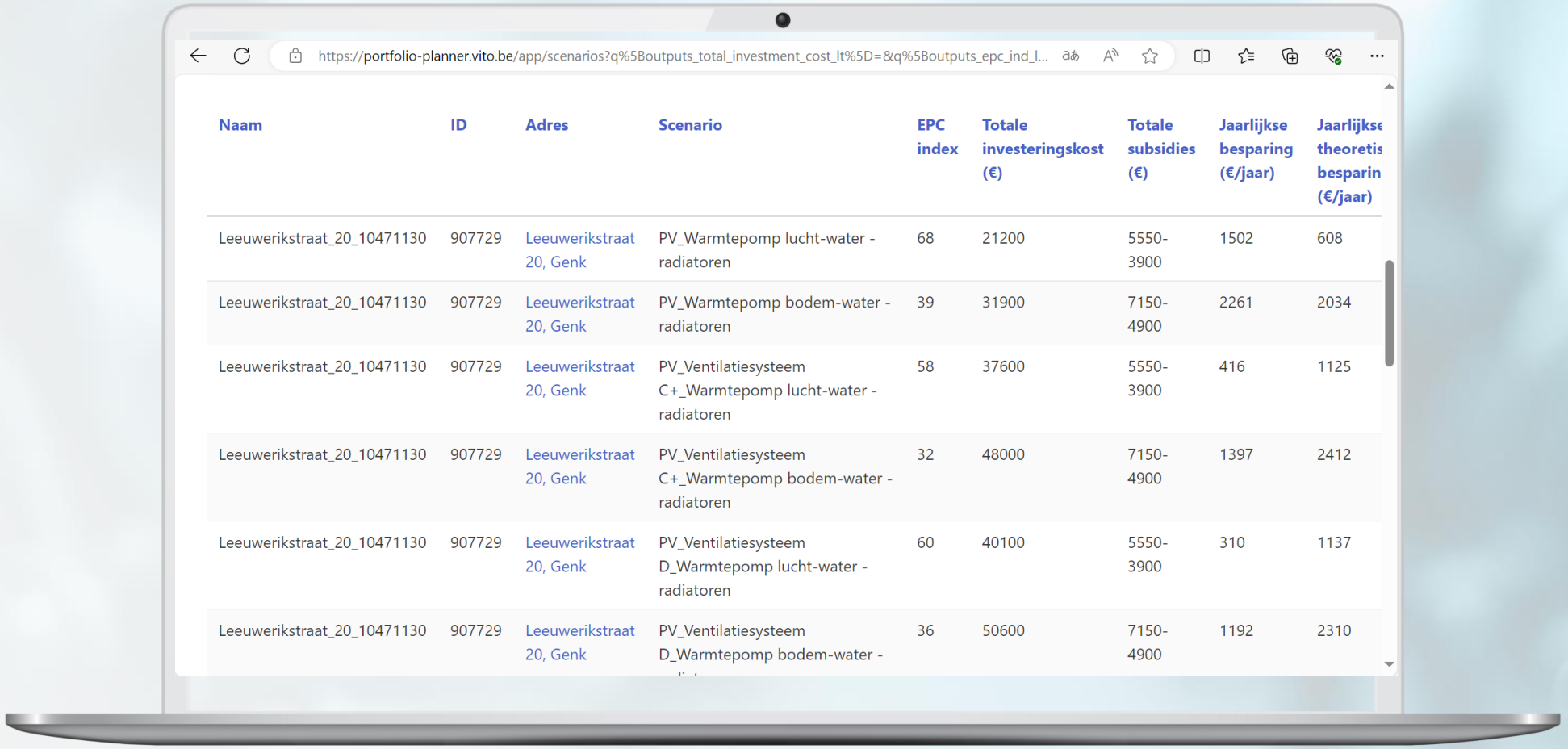
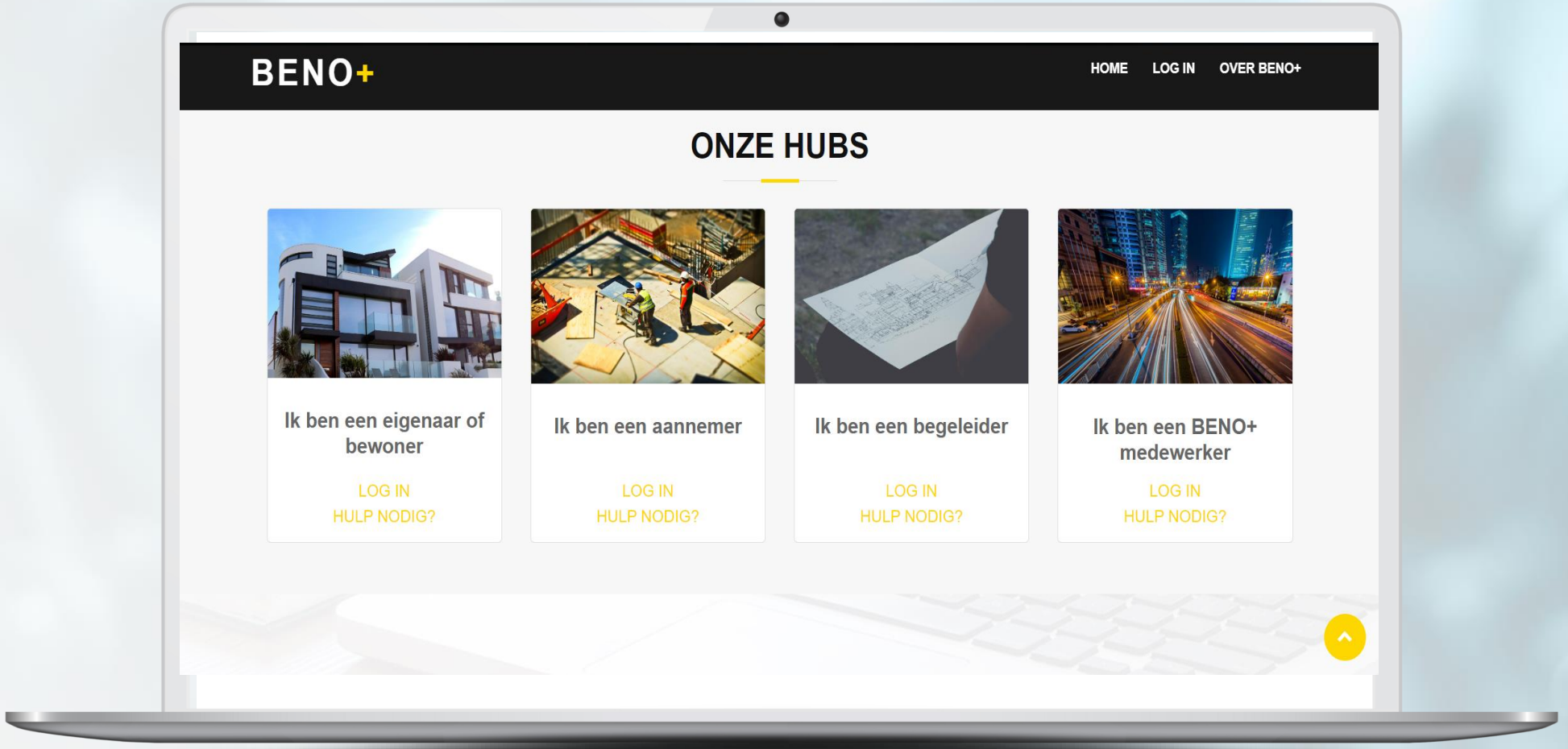


Naam	ID	Adres	Scenario	EPC index	Totale investeringskost (€)	Totale subsidies (€)	Jaarlijkse besparing (€/jaar)	Jaarlijkse theoretis besparin (€/jaar)
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Warmtepomp lucht-water - radiatoren	68	21200	5550-3900	1502	608
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Warmtepomp bodem-water - radiatoren	39	31900	7150-4900	2261	2034
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Ventilatiesysteem C+_Warmtepomp lucht-water - radiatoren	58	37600	5550-3900	416	1125
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Ventilatiesysteem C+_Warmtepomp bodem-water - radiatoren	32	48000	7150-4900	1397	2412
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Ventilatiesysteem D_Warmtepomp lucht-water - radiatoren	60	40100	5550-3900	310	1137
Leeuwerikstraat_20_10471130	907729	Leeuwerikstraat 20, Genk	PV_Ventilatiesysteem D_Warmtepomp bodem-water -	36	50600	7150-4900	1192	2310

Building Renovation tool

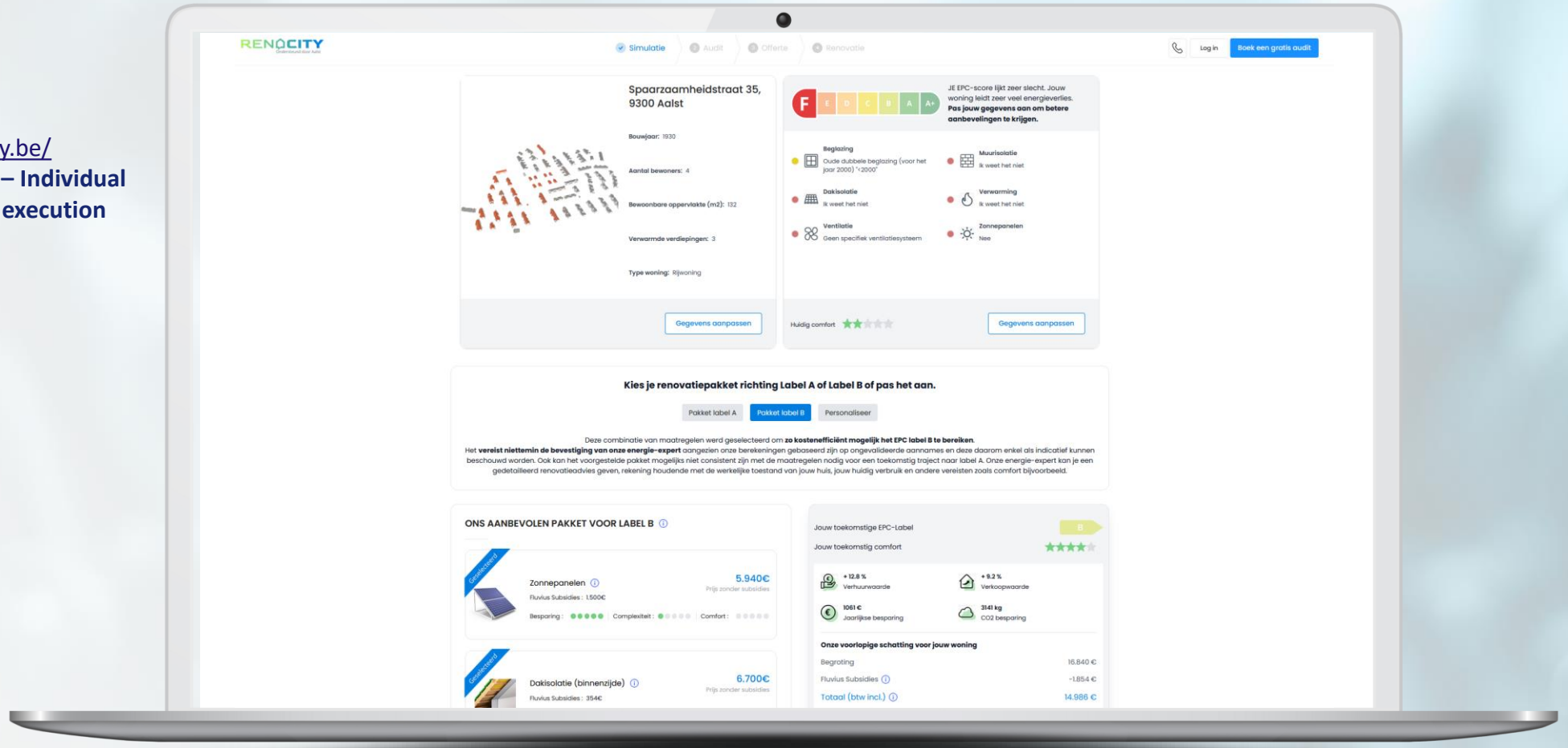
5. Applications (Public and private)



Bi – directional API

5. Applications (Public and private)

https://renocity.be/
AGC – One stop Shop – Individual advice from plan to execution



Bi – directional API

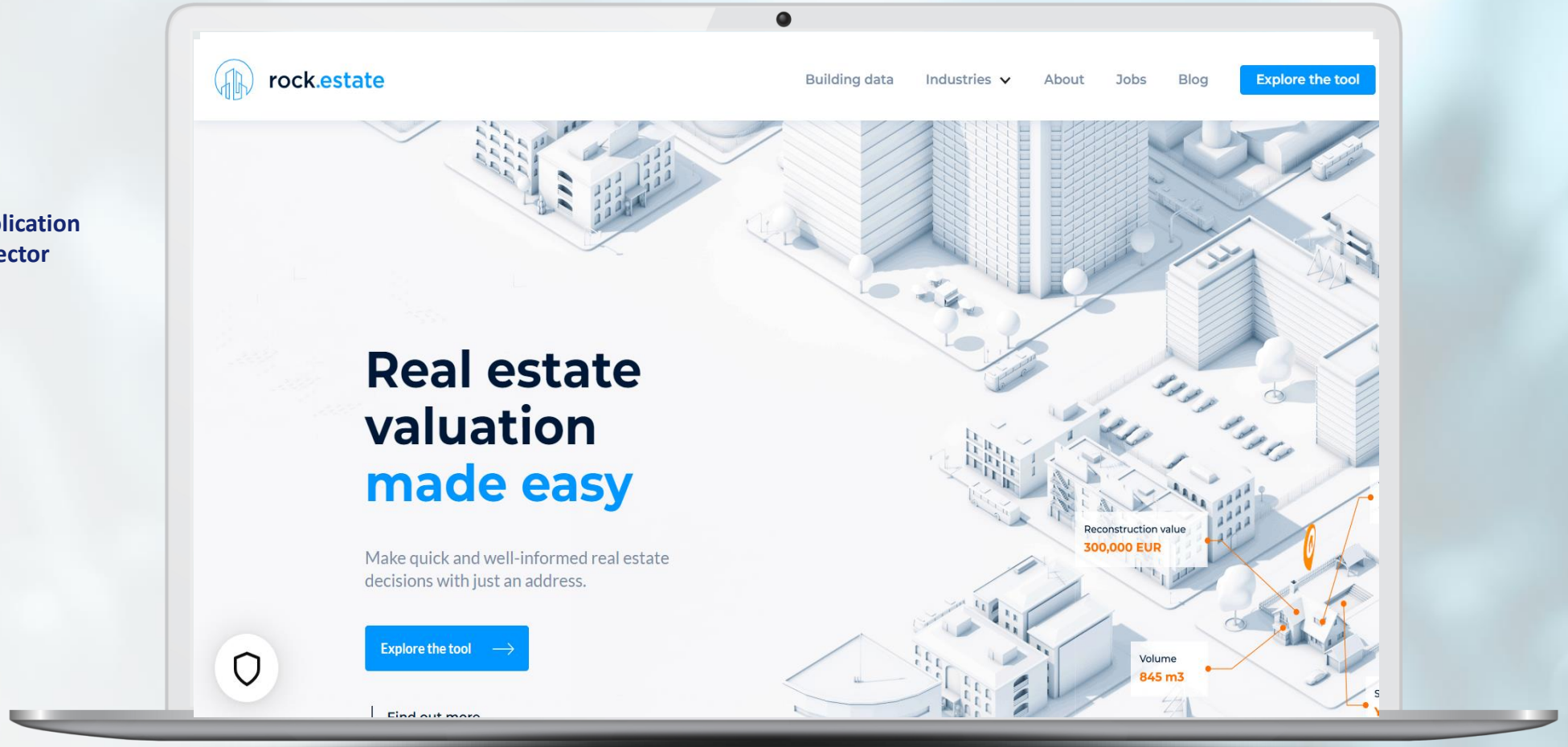
5. Applications (Public and private)

Avineon - Portfolio Management

Bi – directional API

5. Applications (Public and private)

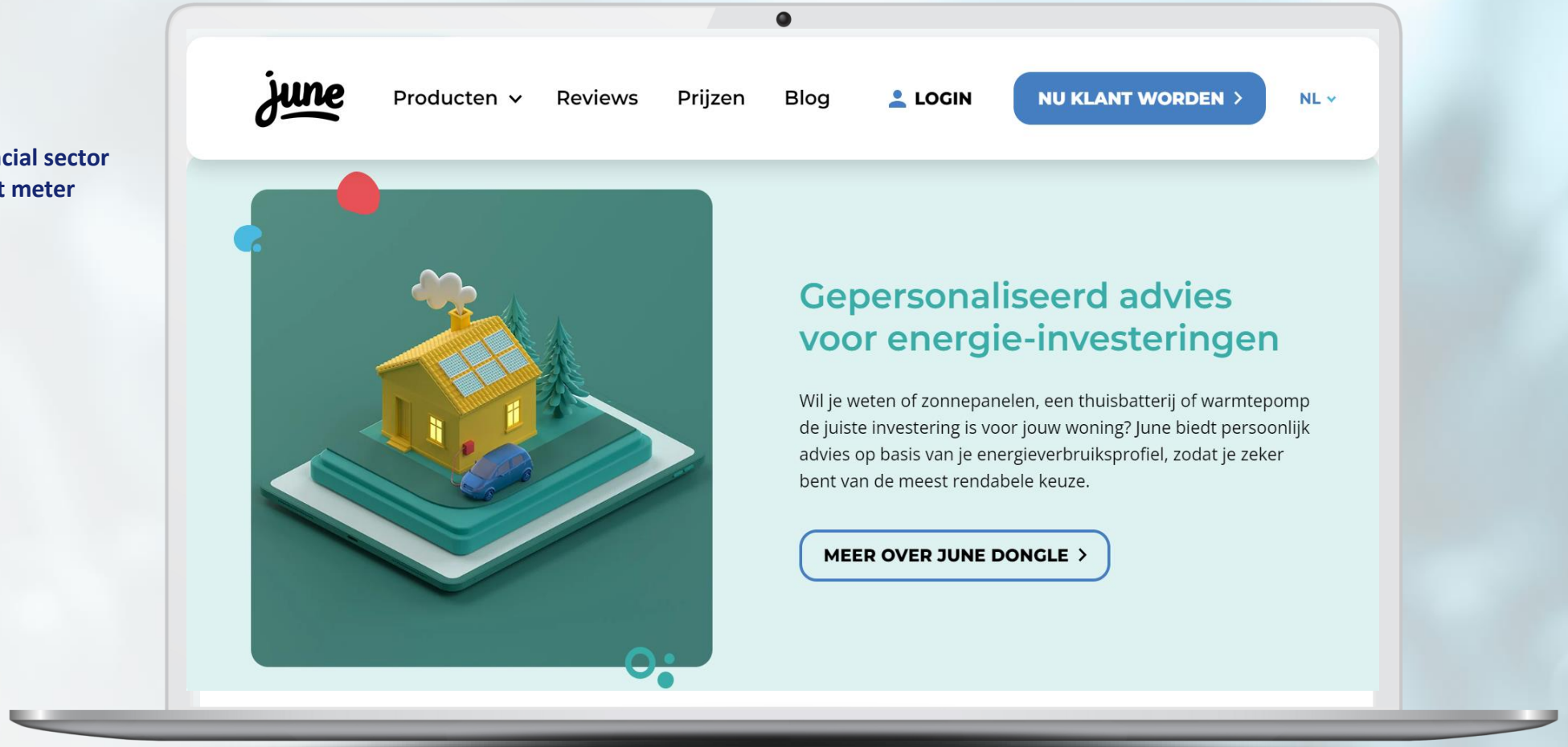
Rock.estate –application for financial sector



Bi – directional API

5. Applications (Public and private)

June Energy Financial sector and own smart meter clients



Bi – directional API

Thank you!

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