



Architects Council of Europe - Energy day

Quality Architecture for sustainable and high-performing buildings

9:00 – 15:30

WiFi network
Science 14 Free WiFi



Bringing solutions together: Voluntary certification schemes and other approaches in support of deep renovation of buildings



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18/06/2019



INTRODUCTION

EU funded projects **ALDREN, Fit-to-NZEB, HAPPEN, iBROAD, TripleA-reno**

Speakers:

Olivier Greslou, (CSTB) – ALDREN

Dragomir Tzanev, (Eneffect) – Fit-to-NZEB

Luca Laghi, (CertiMaC) – HAPPEN

Alexander Deliyannis, (Sympraxis Team) – iBRoad

Simona d'Oca (Huygen) – TripleA-reno

Moderator:

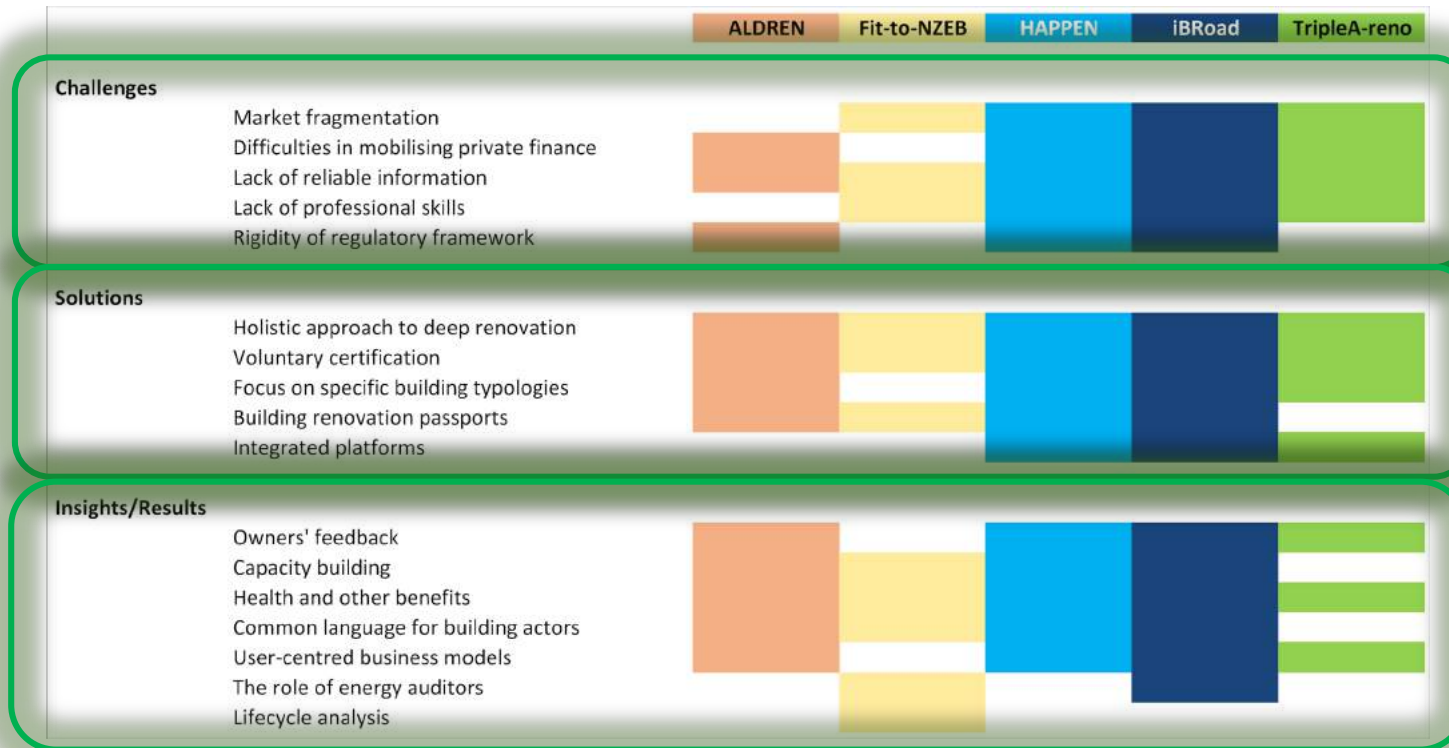
Peter Wouters - Director certification & standardisation at BBRI - Manager of INIVE EEIG



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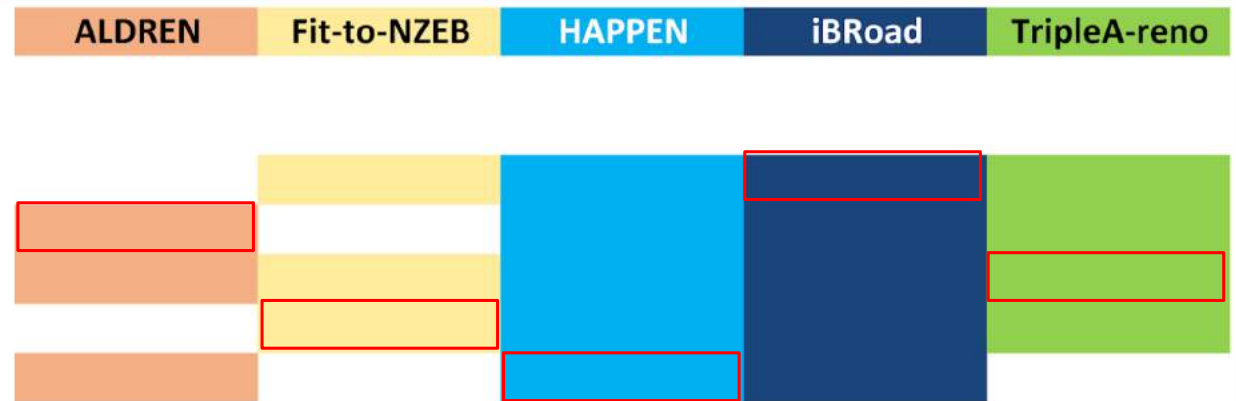


INTRODUCTION - COMMON TOPICS OF INTEREST





Challenges



- Market fragmentation
- Difficulties in mobilising private finance
- Lack of reliable information
- Lack of professional skills
- Rigidity of regulatory framework





Challenges



MARKET FRAGMENTATION

iBRoad



- *Fragmentation of building sector*
- *Fragmentation of renovation processes*
- *Fragmentation of energy market*
- *Fragmentation of financing*
- *Fragmentation of knowledge and regulations*
- *Fragmentation of innovation*



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Challenges



MARKET FRAGMENTATION (continued)

iBRoad

- **Fragmentation of building sector** -> holistic solutions to deep renovation not offered at attractive price & quality
- **Fragmentation of renovation processes:** different installers, construction companies, financing institutes, experts etc.
- **Fragmentation of energy market:** too many roles taken up by too many stakeholders with lack of cross-sectional impact -> Lack of long-term & integrated planning for owners -> Complicated planning processes
- **Fragmentation of financing** schemes & incentives
- **Fragmentation of knowledge and regulations** & lack of management capacity to handle all aspects of the process (including multidisciplinary skills)
- **Fragmentation of innovation** in construction sector -> change and disruption are harder



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Challenges



DIFFICULTIES IN MOBILISING PRIVATE FINANCE

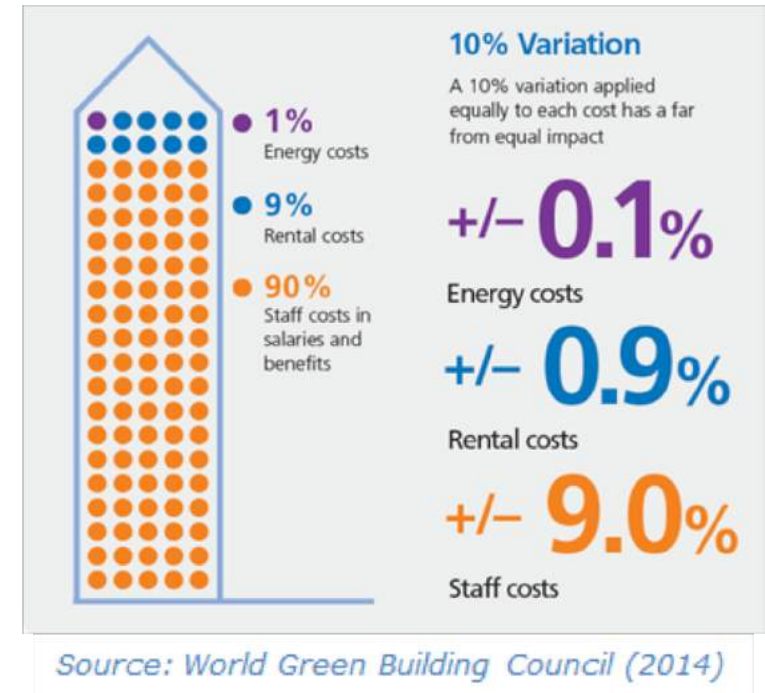
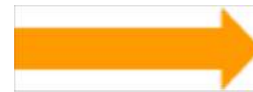
ALDREN

- **Context**

- *Insufficient levels of investment to achieve Europe's energy efficiency targets*
- *Only around 15% of building refurbishments incorporate significant energy efficiency improvements*

- **Challenges**

- *Non-energy benefits constitute dominant costs of running buildings*
- *Engineer's approach of sustainability topics in buildings ⇔ Financial analyst's understanding of real estate assets*



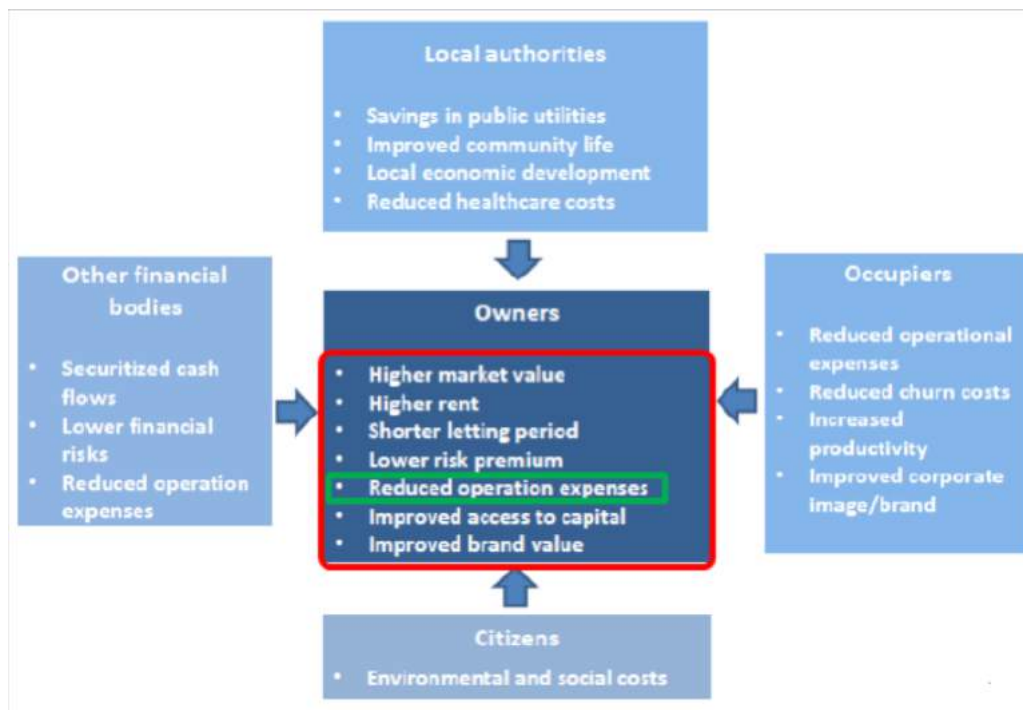
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Challenges



DIFFICULTIES IN MOBILISING PRIVATE FINANCE (continued)



Addressing financial market players with their own language : targeting all financial benefits from renovation for building owners

- **Direct benefits** : costs savings with direct impacts on cash flows
- **Indirect benefits resulting from benefits to other stakeholders** : increased asset attractiveness, higher rents, risks mitigation ...





Challenges



LACK OF RELIABLE INFORMATION

Triple A-reno

- The European renovation market top-down and supply-driven
- Mismatch between offered renovation products/packages and what end-users' need/can afford.
- Lack of attractive tools on decision-making for them to start or to be involved in a deep renovation process.
- The renovation market is deeply fragmented making consumer navigation painful to master.
- A brokerage service that builds transparently the supply chains could facilitate the process.
- Lack of clear view on the total performances in practice (i.e. energy, indoor environmental quality, health)
- Lack of a solid quality control of the renovation process and a fully qualified and equipped workforce.
- Lack of data on the real building performance after the renovation process



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Challenges



LACK OF PROFESSIONAL SKILLS

Fit-to-NZEB

2030 / 2050 objectives
represent a major challenge

Understanding the benefits and
stimulating market demand for
nZEBs

**READINESS OF CONSTRUCTION SECTOR
TO DELIVER HIGH LEVEL ENERGY
RENOVATIONS AND nZEB**

Accessibility and quality
of educational programmes

Increase of the number
of construction specialists
at all levels



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Challenges



RIGIDITY OF REGULATORY FRAMEWORK

HAPPEN

HAPPEN...FACING THE REGULATORY FRAMEWORK TOWARD AN IMPROVEMENT FOR SOUTHERN EUROPE

- **TECHNICAL RIGIDITY:** Calculation approach mainly based on “steady-state” typical of winter season within severe climates usual in North and Central EU. This approach doesn’t fit perfectly with southern EU climate and energy needs.
- **TECHNICAL/FINANCIAL RIGIDITY:** Refurbishment approach focused on “all-in-one” solution, from building “as it is” to “deep retrofitting or nZEB” without considering alternative approaches such as “step-by-step”, balancing energy demand reduction and investments. This approach is suitable where “low incomes” and “financial capacity” are a barrier to the retrofit market uptake.
- **MISMATCHES WITH LOCAL MARKETS:** Market approach doesn’t fit well with local value chain intrinsic typicity, characterised by fragmentation and multi-property. A lack of regulatory instruments supporting local market frameworks has to be faced.



[ALDREN]



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Challenges



RIGIDITY OF REGULATORY FRAMEWORK (continued)

HAPPEN

EU MED Area is well represented in HAPPEN...



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Challenges



RIGIDITY OF REGULATORY FRAMEWORK (continued)

HAPPEN

MEDZEB...THE APPROACH PROPOSED BY HAPPEN for MED AREA FACING THE RIGIDITY OF REGULATORY FRAMEWORK

Aim of the MedZEB approach is to bringing “flexibility” within a “rigid framework” so to foster the market uptake of residential buildings retrofitting and to influence the regulatory evolution

TAILORED	TRANSPARENT	HOLISTIC	ADAPTIVE
MED area (residential)	HAPPEN platform	Engagement&Training	to persons: focus on well-being
		Financing& Regulation	to relations: living lab methodology
	MedZEB protocol	Optimal solutions	to resources: step-by-step approach
			to situations: alternative investment options
			to environment: district scale design
			to context: smart integration



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Solutions



	ALDREN	Fit-to-NZEB	HAPPEN	iBRoad	TripleA-reno
Holistic approach to deep renovation	Yes	Yes	Yes	Yes	Yes
Voluntary certification	Yes	Yes	Yes	Yes	Yes
Focus on specific building typologies	Yes	No	Yes	Yes	Yes
Building renovation passports	Yes	Yes	Yes	Yes	No
Integrated platforms	No	No	Yes	Yes	Yes



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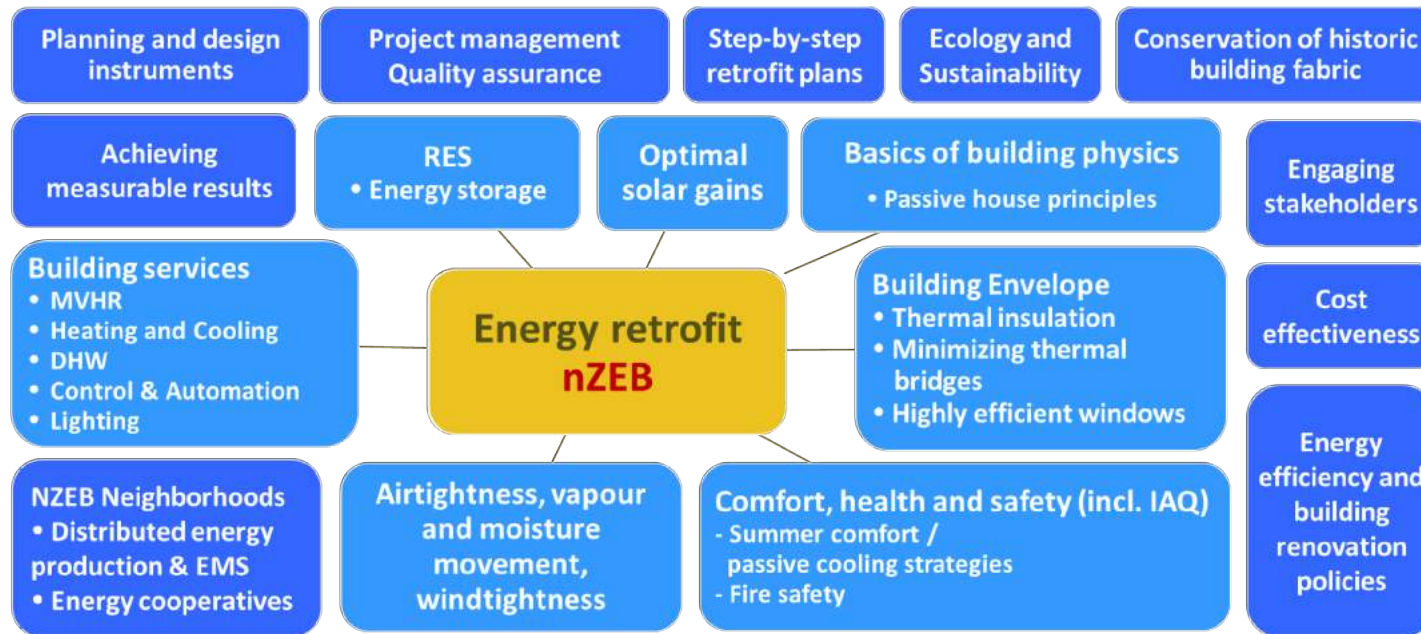


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HOLISTIC APPROACH TO DEEP RENOVATION

Fit-to-NZEB



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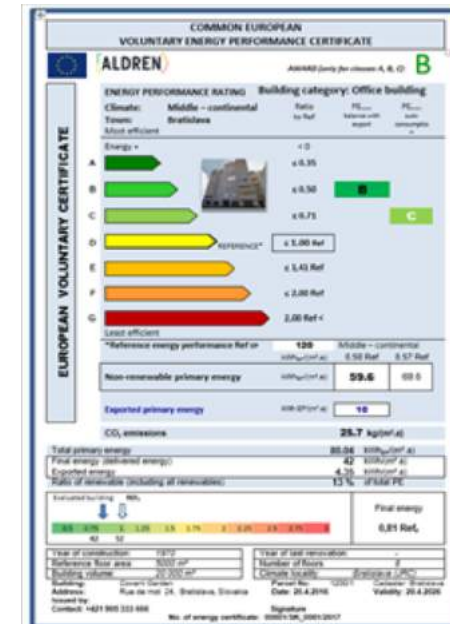
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VOLUNTARY CERTIFICATION

ALDREN

- **ALDREN's European Voluntary Certificate (EVC) in a nutshell :**
 - **Harmonised calculation methodology** based on new CEN standards
 - **Harmonised and transparent consideration of the innovative solutions** - all technical systems in the same way
 - Brings together **societal and building owner interests** (energy, health and well-being, financial risks)
 - **Advisory tool** for building owners, tenants, financial institutions and policy makers - Before and After Renovation
 - Can **stand alone** or be included as an energy **module in other existing schemes**



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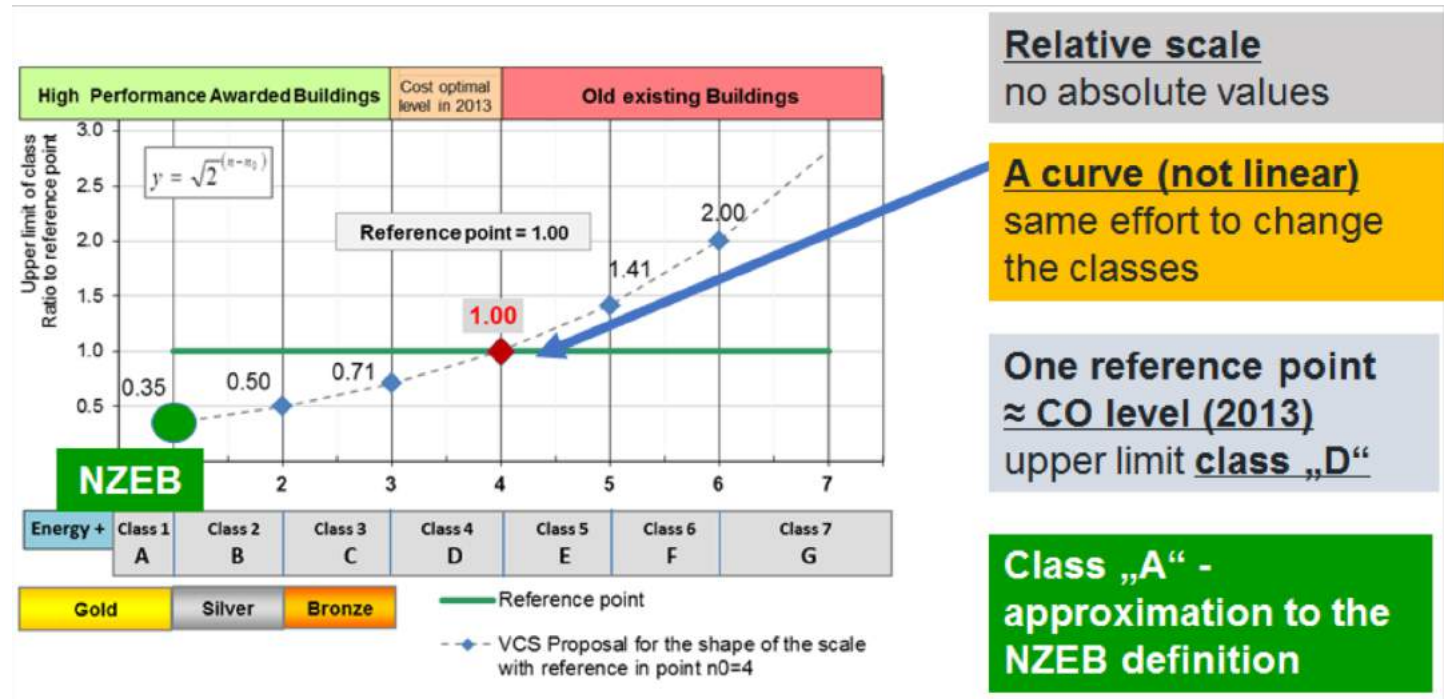


VOLUNTARY CERTIFICATION (continued)

ALDREN

ALDREN scale :

EU wide comparability of buildings, not based on energy consumption, but on energy performance related to cost-optimality



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VOLUNTARY CERTIFICATION (continued)

ALDREN

- **Uptake of the EVC : what applications ?**
 - *facilitating the harmonisation*, comparability, transparency of EP assessment across EU (quality of EPC)
 - *motivation of investors* towards deep renovation by :
 - increasing the reliability and proof of energy savings
 - increasing investors confidence, reduce risk in EE investment
 - linking EVC to the asset valuation
 - facilitating *adoption of voluntary common EU certification schemes* for non-residential buildings

⇒ supporting the revised EPBD implementation



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FOCUS ON SPECIFIC BUILDING TYPOLOGIES

HAPPEN

WHY DIFFERENT INSTRUMENTS ARE RELEVANT FOR DIFFERENT “BUILDING TYPOLOGIES”?

The existing regulatory framework is comprehensive, and considers different “final intended uses”, but there are relevant market challenges related to each specific building typology that require dedicated tools to be developed



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FOCUS ON SPECIFIC BUILDING TYPOLOGIES (continued)

HAPPEN

The HAPPEN challenge on RESIDENTIAL BUILDINGS...why?

- **ROLE OF RESIDENTIAL BUILDINGS**

The comparative trend-lines regarding the EU 2020 policy evolution in Med countries show a significant gap at 2020 (almost 5.7%) with respect to energy savings, rising up to 9.6% with reference to the sole residential stock, which alone accounts for the 27% of overall energy EU consumptions.

- **RESIDENTIAL MARKET PECULIARITIES**

In MED area there is a clear predominance of “private property” (Source EUROSTAT: south-east EU ≈80% with a positive trend) and “property fragmentation” (multi-property within apartments blocks) that constitute relevant bottlenecks to the market uptake. It is necessary and strategic to intervene especially on this building typology.



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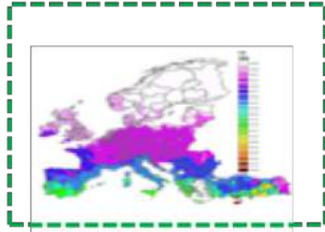
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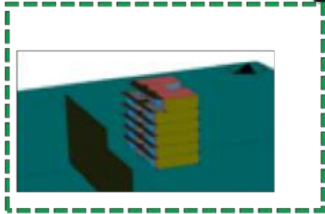
FOCUS ON SPECIFIC BUILDING TYPOLOGIES (continued)

HAPPEN

Reference Climate



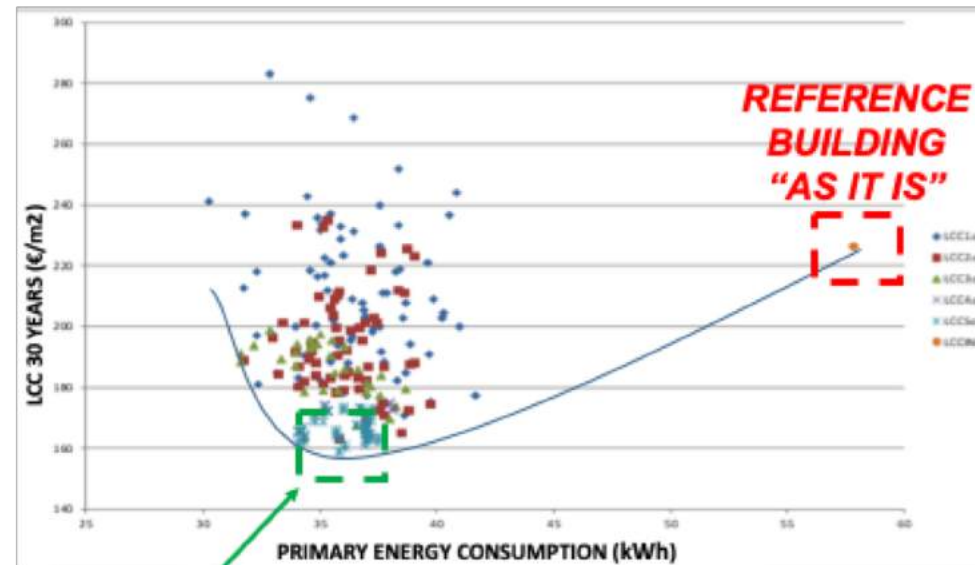
Reference Building



Abacus of Renovation Measures



HAPPEN METHODOLOGY FOR MED AREA OPTIMAL PACKAGES OF SOLUTIONS





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FOCUS ON SPECIFIC BUILDING TYPOLOGIES (continued)

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METHODOLOGY APPLIED IN 10 DIFFERENT PILOTS FROM 7 EU MED COUNTRIES



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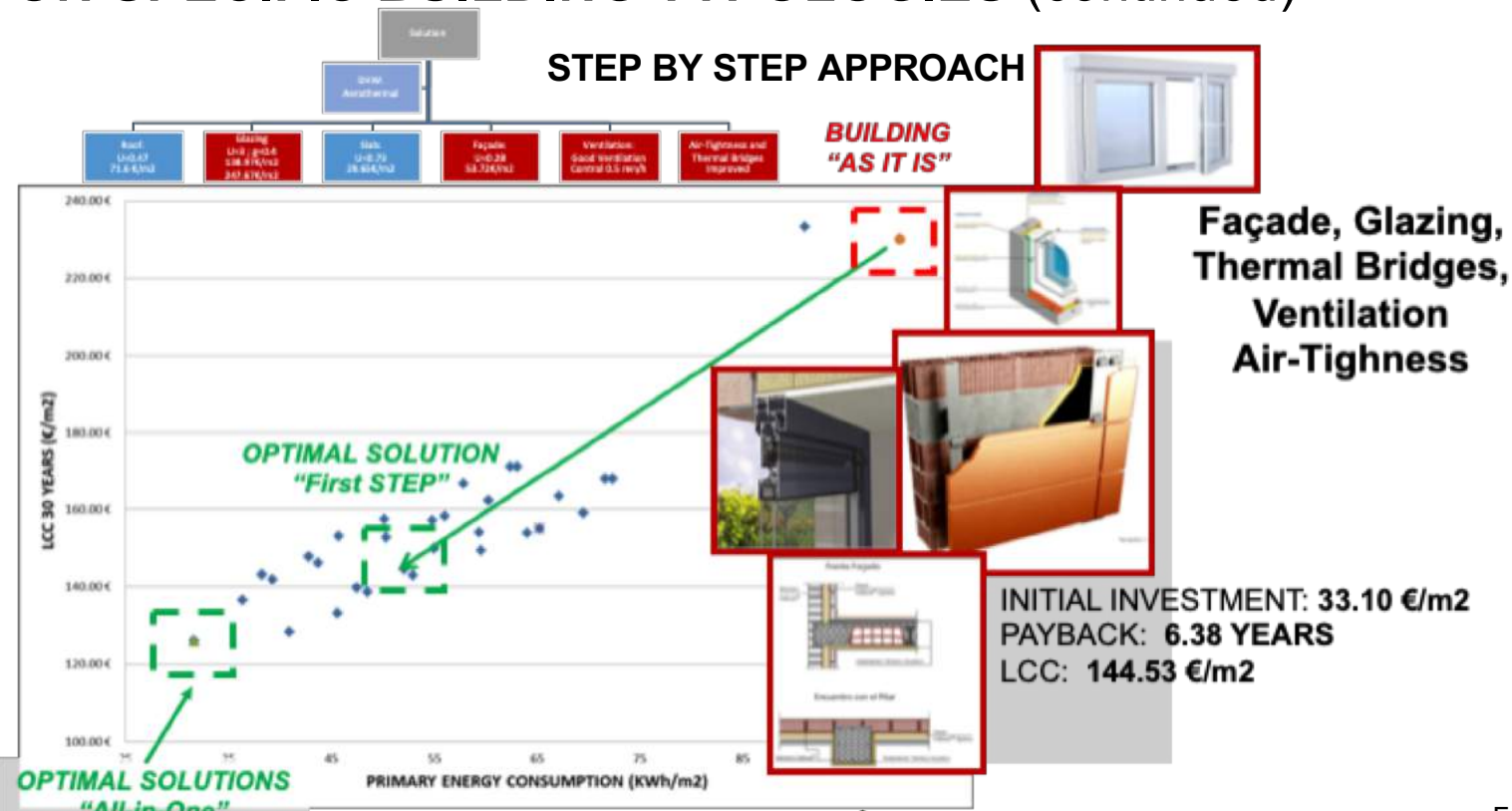


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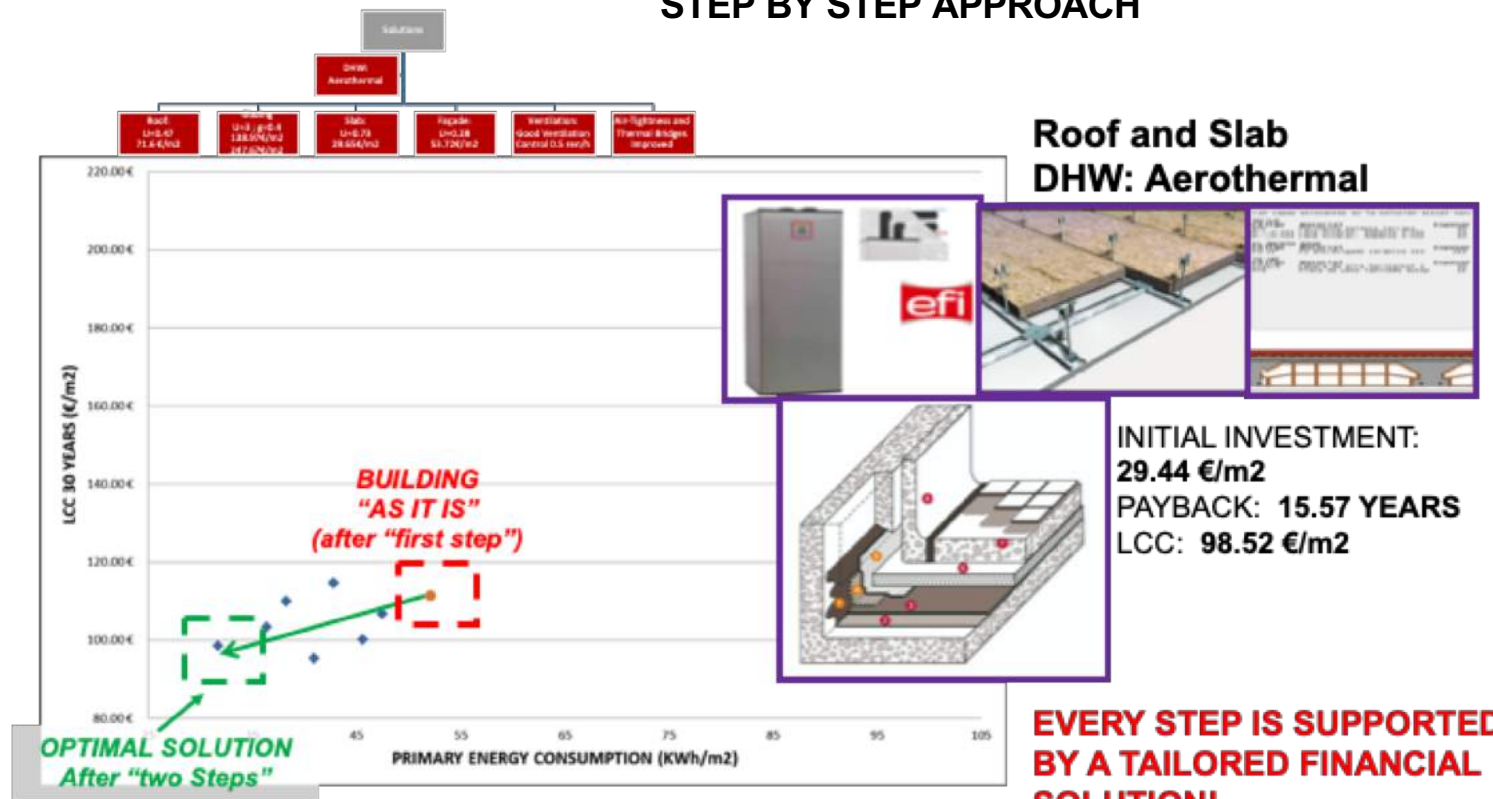
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FOCUS ON SPECIFIC BUILDING TYPOLOGIES (continued)

HAPPEN

STEP BY STEP APPROACH





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BUILDING RENOVATION PASSPORTS

iBRoad

Building renovation passport
(according to iBRoad)

=

Building renovation roadmap
(not just for energy)

+

Building logbook
(not just for energy or renovation)



Source: Energiesprong

Source: ifeu

Measure	Estimated Cost	Estimated Energy Savings
1. Solar panels	15,000 - 18,000 €	1,000 kWh
2. Insulation	40,000 - 100,000 €	2,000 kWh
3. Energy-efficient windows	20,000 - 30,000 €	1,000 kWh
4. Energy-efficient doors	10,000 - 15,000 €	500 kWh
5. Energy-efficient lighting	5,000 - 10,000 €	200 kWh



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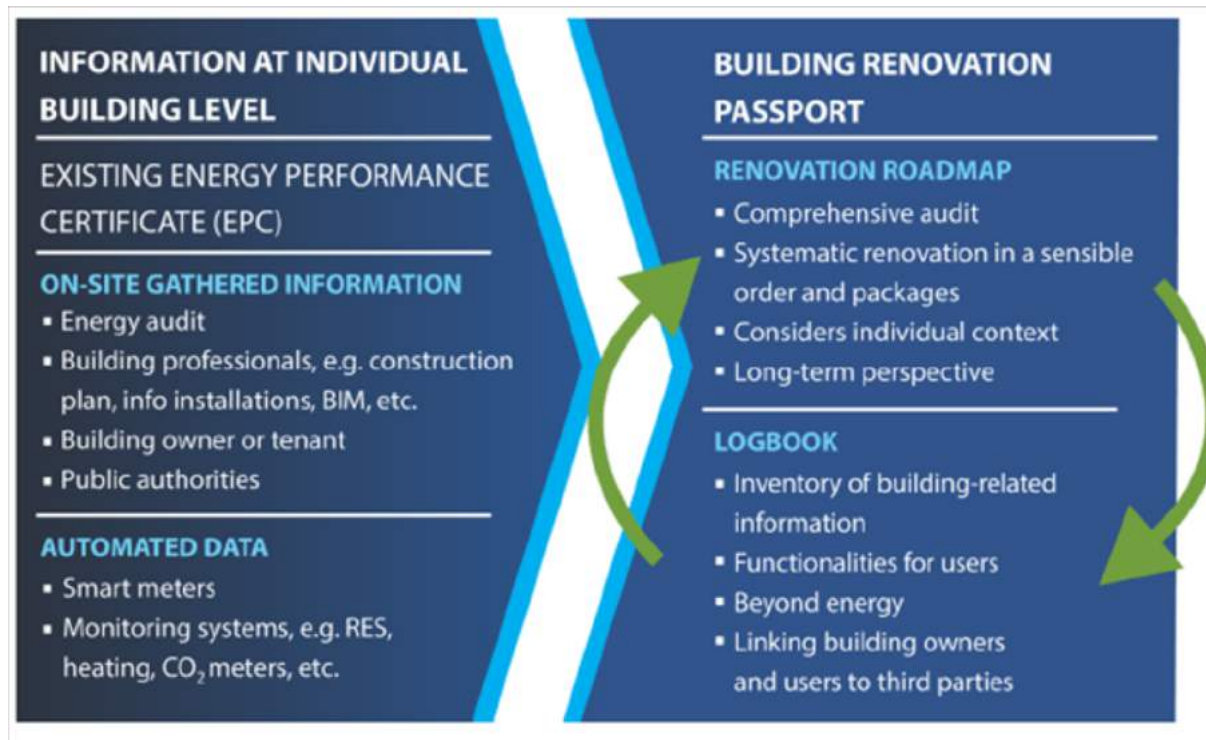


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BUILDING RENOVATION PASSPORTS (continued)

iBRoad



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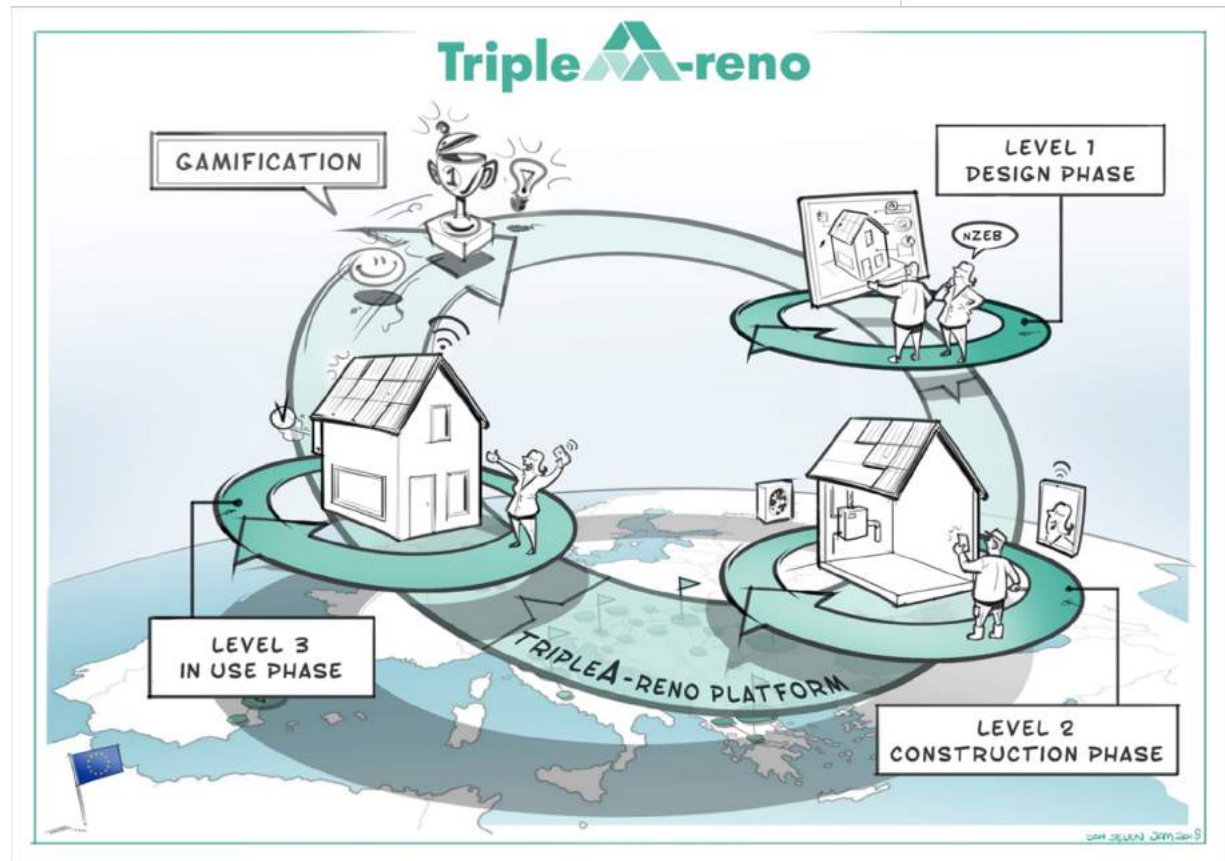
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INTEGRATED PLATFORMS

Triple A-reno

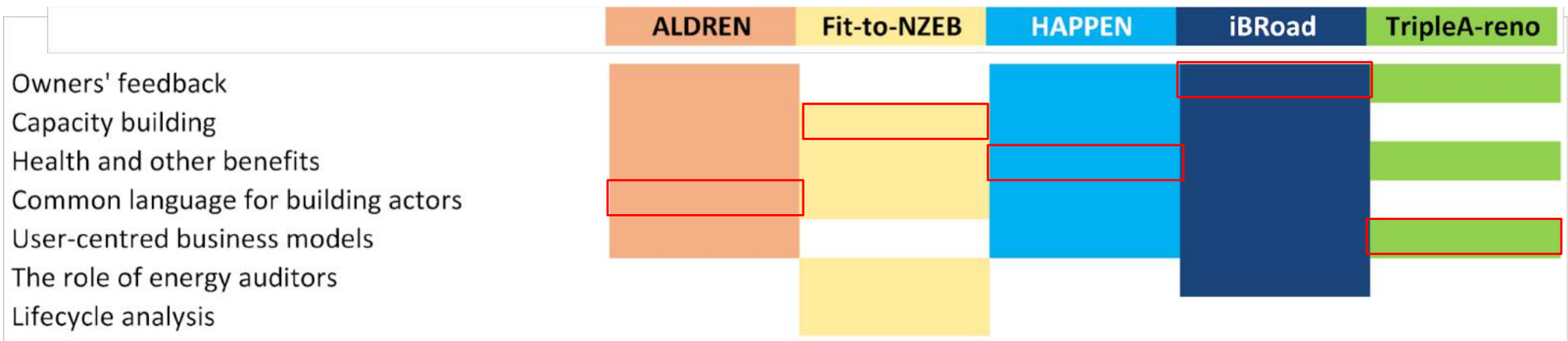
- Involve the occupants/consumers in the project and collect real performance data in use (MOBISTYLE)
- Implement methodologies on enhanced quality control of related projects (IEE QUALICHECK)
- Implement (digital) tool (BUS Advisory App, BIM-Skills Matrix)
- Employ existing labelling schemes (LEVELS, WELL)
- Derive (voluntary) labelling schemes (LEVELS)



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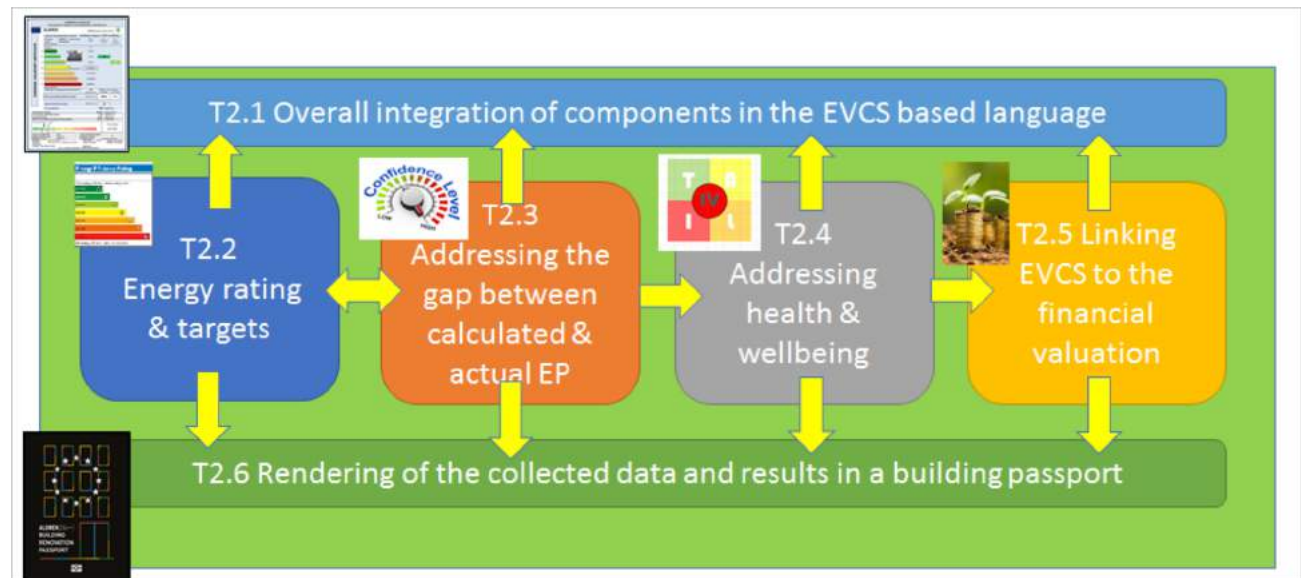
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COMMON LANGUAGE FOR BUILDING ACTORS

ALDREN

- **Finding a common language between ALDREN partners: adjusting a holistic approach**
- Setting the **scopes** of energy and IEQ performance evaluations
- **Translating energy and IEQ performance into economic and financial benefits** : choice of indicators / qualitative vs quantitative assessments
- Defining the **interactions between the EVC and the Building Passport** : building stock benchmarking / building operation and renovation management / data and indicators management through time / help in renovation decision-making ...



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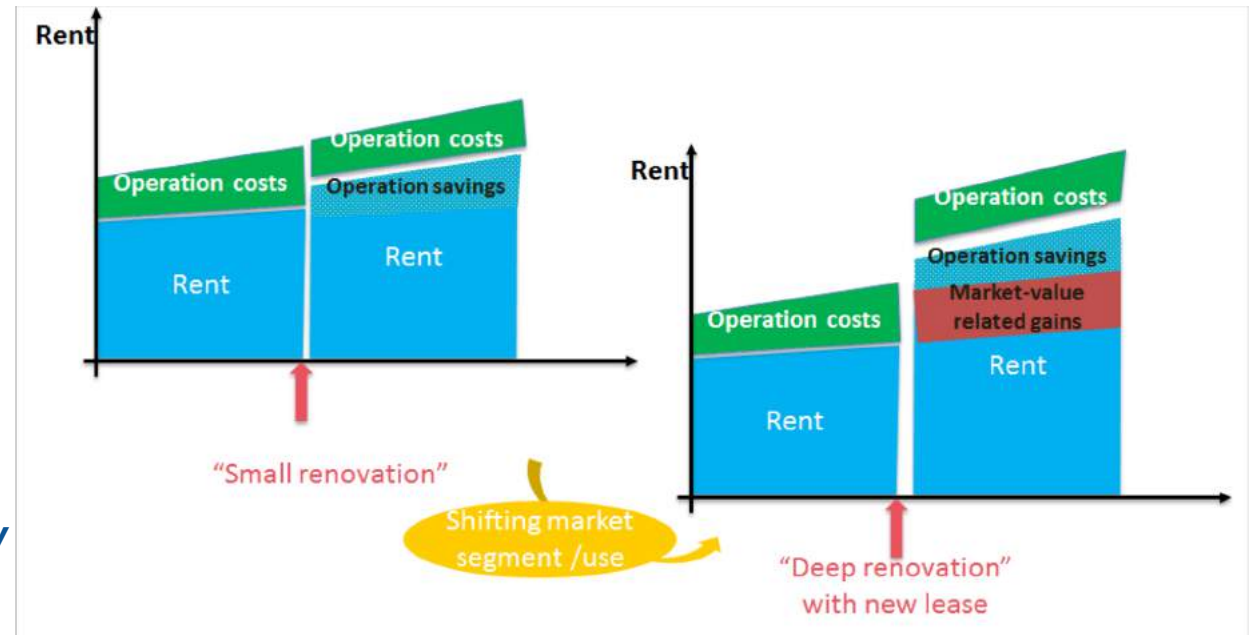
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COMMON LANGUAGE FOR BUILDING ACTORS (continued)

ALDREN

- **Finding a common language with external actors: feedback from real estate companies**
- Speaking the language of **risks assessment**
- New constraints arising from **evolutions in national regulatory frameworks** (Ex: French Decree for the EE of the tertiary sector)
- ALDREN-related environmental priorities : **well-being** over energy, lack of knowledge of potential health impacts
- Deep Renovation opportunities :
 - Lease renegotiation opportunities
 - Potential shifts in market value : **improving the building's overall quality of services**



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HEALTH AND OTHER BENEFITS

HAPPEN ***OTHER than energy BENEFITS, including health, are put into practice through HAPPEN Project. How?***

In MED culture the “home” is conceived as a solid and stable investment over time, one in which families were traditionally used to store the most of their savings (e.g. MED area has the highest rate of private property in buildings). From 2008 on, as consequence of the global crisis, the economical value of buildings dropped in many areas, deeply affecting also the perceived added value associated to requalification.

TECHNICAL

- *SAVINGS in terms of energy demand/consumptions reduction (Cost-optimal solutions with dedicated financial support),*
- *WELLBEING in terms of thermo-hygrometric conditions, indoor air quality and district effects oriented solutions, including the enhancement of behavioural aspects*

SOCIAL (family savings)

- *SAVINGS in terms of “protection of families provisions” fostering the market uptake and the creation of a flexible market into MED area.*



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HEALTH AND OTHER BENEFITS (continued)

HAPPEN

Through ongoing Living Labs several feedbacks were obtained in terms of benefits and added values expected from deep retrofitting:

1. Reduction of energy bills

- *Cost-Optimal applied to packages of Solutions*
- *Innovative Financial solutions*

2. Investments on retrofitting has to keep its value over the time

- *MedZEB Protocol and VCS (Voluntary Certification Scheme)*

3. Flexibility of the investment plan over the time to cope with real life conditions

- *Step-by-step financial solution*

4. Improvement of overall quality to foster comfort and indoor wellbeing

- *Monitoring Standard during/after the retrofit intervention*

5. Spill-overs on Environment in terms of GHG reduction and other benefits

- *Holistic impact analysis (LCA, etc.)*
- *Awareness raising through Platform*



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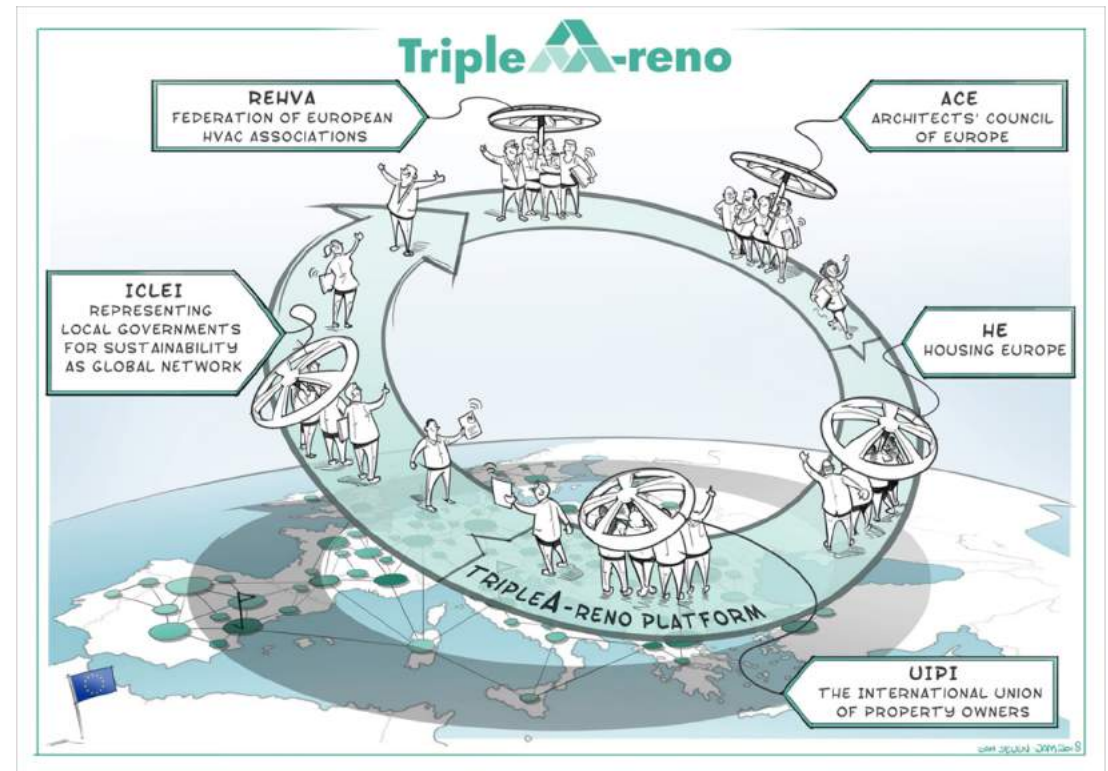


USER-CENTRED BUSINESS MODELS

Triple A-reno

Objective of the TripleA-reno exploitation plan is to develop a **[gamified] platform** that serves a **service for key stakeholders** involved in the **renovation journey**.

Aim is this **platform-based service [business] model** is to facilitate understanding, communication exchange, decision making, practices among the TripleA-reno ecosystem.



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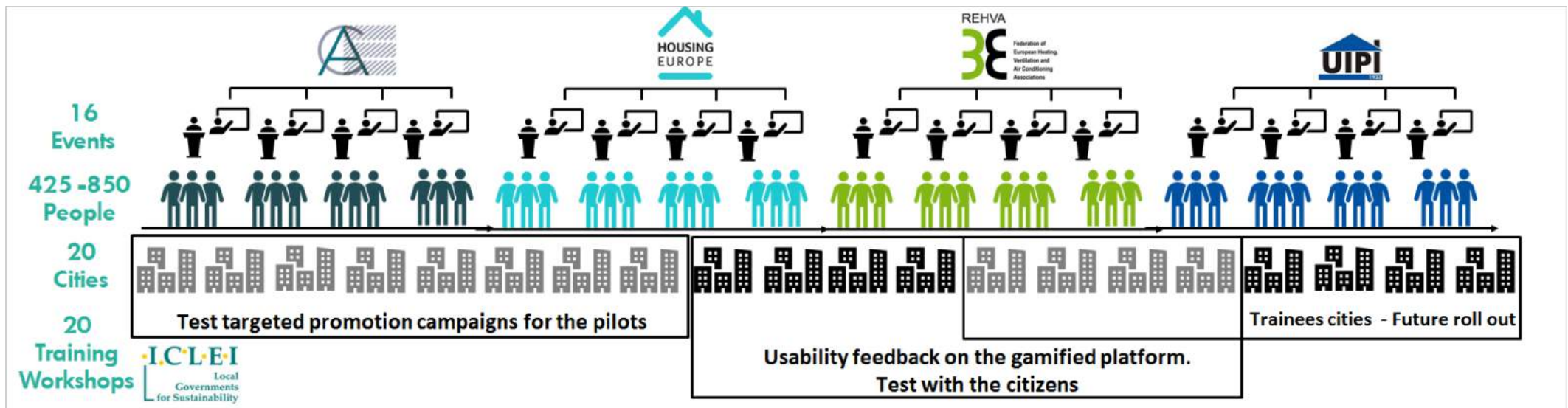


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USER-CENTRED BUSINESS MODELS (continued)

Triple A-reno



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Insights / Results



CAPACITY BUILDING

Fit-to-NZEB



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OWNERS' FEEDBACK

iBRoad

- Majority of households in BG, PT and PL (>75%) finds it **essential to have a plan** to renovate over time to overcome problems
- **Trust in EPCs** for advice on renovation measures is very low in BG (9%), but much higher in Portugal (47%)
- In Poland most building owners plan to **finance the renovation with own savings** (84%)
- One in two Polish households is **interested** in a BRP, but **not willing to pay**
- One in two Portuguese households is **more concerned** about having a **warm and comfortable home** than saving energy



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OWNERS' FEEDBACK (continued)

iBRoad

	ENERGY CLASS G	ENERGY CLASS E	ENERGY CLASS D	ENERGY CLASS B	ENERGY CLASS A
	Your Building Moment of delivery	Renovation Step 1 When Boiler needs to be exchanged	Renovation Step 2 2023 - 2028	Renovation Step 3 2026 - 2035	Renovation Step 4 2035 - 2040
Measures		Measures • Add a thermal solar system	Measures • External Wall Insulation	Measures • Substitution of the old windows • Roof insulation	Measures • Installation of a heat recovery unit • Substitution of the heating system by a heating pump
Energy Use	Primary Energy Demand 250 kWh/m ² a	Primary Energy Demand 210 kWh/m ² a	Primary Energy Demand 160 kWh/m ² a	Primary Energy Demand 100 kWh/m ² a	Primary Energy Demand 100 kWh/m ² a
	Main Energy Source Natural Gas	Main Energy Source Natural Gas	Main Energy Source Natural Gas	Main Energy Source Natural Gas	Main Energy Source Electricity
	Final Energy Demand Main Source 200 kWh/m ² a	Final Energy Demand Main Source 200 kWh/m ² a	Final Energy Demand Main Source 150 kWh/m ² a	Final Energy Demand Main Source 80 kWh/m ² a	Final Energy Demand Main Source 30 kWh/m ² a
	Final Energy Demand second Source 0 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a	Final Energy Demand second Source 15 kWh/m ² a
CO ₂	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity	Auxiliary Energy Source Electricity
	Final auxiliary Energy Demand 30 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a	Final auxiliary Energy Demand 15 kWh/m ² a
	Energy Bill 4800 €/a	Energy Bill 2300 €/a	Energy Bill 1800 €/a	Energy Bill 1100 €/a	Energy Bill 800 €/a
Costs	Carbon Emissions 40 kg/m ² a	Carbon Emissions 30 kg/m ² a	Carbon Emissions 20 kg/m ² a	Carbon Emissions 10 kg/m ² a	Carbon Emissions 10 kg/m ² a
		Investment Costs for Renovation Step 10000 € Included Costs for Maintenance 15000 €	Investment Costs for Renovation Step 2500 € Included Costs for Maintenance 20000 €	Investment Costs for Renovation Step 25000 € Included Costs for Maintenance 40000 €	Investment Costs for Renovation Step 26000 € Included Costs for Maintenance 26000 €



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OWNERS' FEEDBACK (continued)

iBRoad

- **Roadmap**
 - *Useful & informative instrument for auditors & homeowners*
 - *More than 60% positive response*
 - *The iBRoad roadmap takes into account individual context (preferences, financial capabilities)*
 - *iBRoad motivated homeowners to renovate*
 - *Different opinions about the layout of the roadmap*
- **Logbook**
 - *Useful instrument*
 - *The use of the logbook is more complicated*
- **Suggested improvements:**
 - *Platform could be more user friendly*
 - *Include payback time for each measure*



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Expected Impacts on the Quantity and Quality of Renovation



ALDREN



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EXPECTED IMPACTS ON THE QUANTITY AND QUALITY OF RENOVATION

ALDREN

- **ALDREN is a coordination and support actions program:**
 - *Increased rate of renovation in the non-residential building sector by renewed and reinforced communication between key market players and stakeholders*
 - *Increased number of deep renovations by delivering an enlarged framework to analyze the overall financial balance*
 - *Implementation and consolidation of the principles set for the European Voluntary Certification Scheme (EVCS)*
 - *Improved health and well-being quality of buildings by the potential uptake of the ALDREN TAIL procedure in existing environmental schemes*
 - *Increased compliance rate: ALDREN training framework of EU building professionals*



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EXPECTED IMPACTS ON THE QUANTITY AND QUALITY OF RENOVATION

iBRoad

- *In the whole value chain*
- *Provide to the user straightforward information about the status of the building & how renovation will impact building performance, energy bills, comfort & wellbeing*
- *Impact of the proposed renovation steps on: energy demand, related emissions (reduction of environmental impact of the building sector & waste) share of renewables, economic indicators and relevant co-benefits*
- *Improvements in human health, comfort and wellbeing*
- *Increase the value of the house, improve safety, reduce maintenance costs*



ALDREN



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EXPECTED IMPACTS ON THE QUANTITY AND QUALITY OF RENOVATION *HAPPEN*

The overall impact is discretized into the “Happen programme” with:

- 1. PLATFORM – marketplace*
- 2. Support to professionals during “retrofitting process into REAL LIFE”*
- 3. MEDZEB protocol – VCS, step-by-step approach and monitoring programme*
- 4. Medzeb digital COMMUNITY*



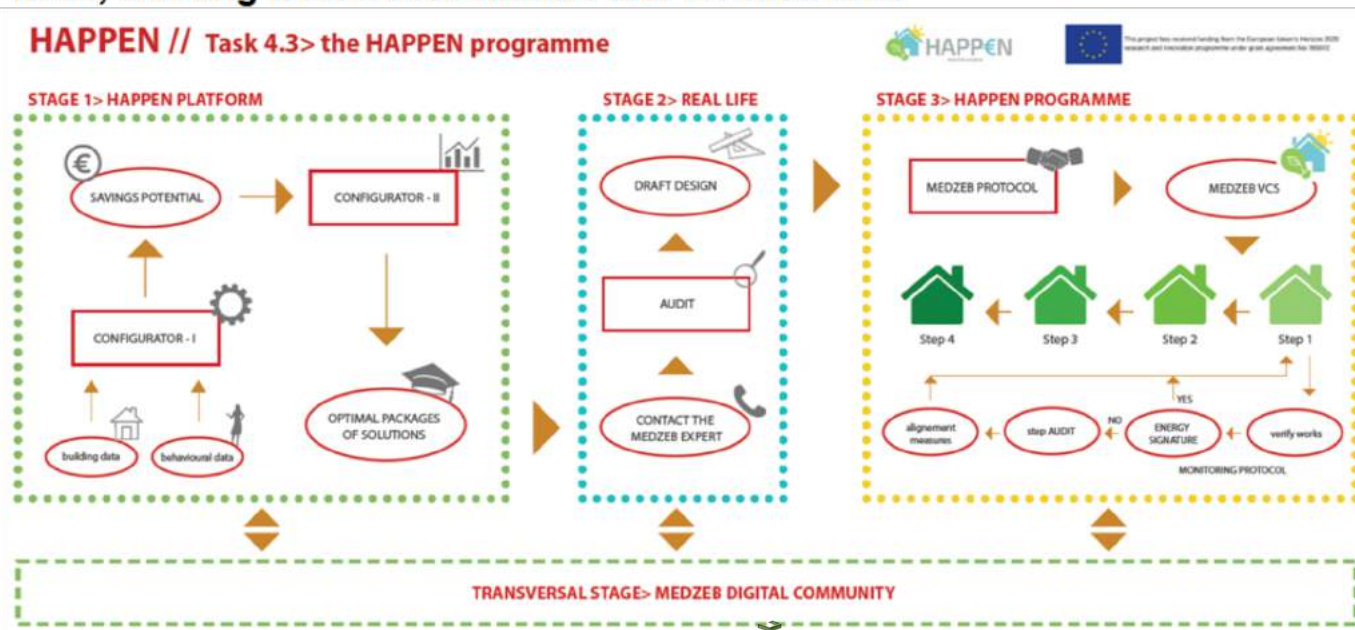
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EXPECTED IMPACTS ON THE QUANTITY AND QUALITY OF RENOVATION

HAPPEN (continued)

The implementation and promotion of this “model” along the next 20 Months is/will be the measure to maximise the impact and the exploitation of the model itself, creating a reference market tool for med area





EXPECTED IMPACTS ON THE QUANTITY AND QUALITY OF RENOVATION

TripleA-reno

TripleA-reno Game Engine

Connected engines, databases...

TripleA-reno Co-design App

User registration, project showcase
co-designer, project dashboard
user (team) dashboard

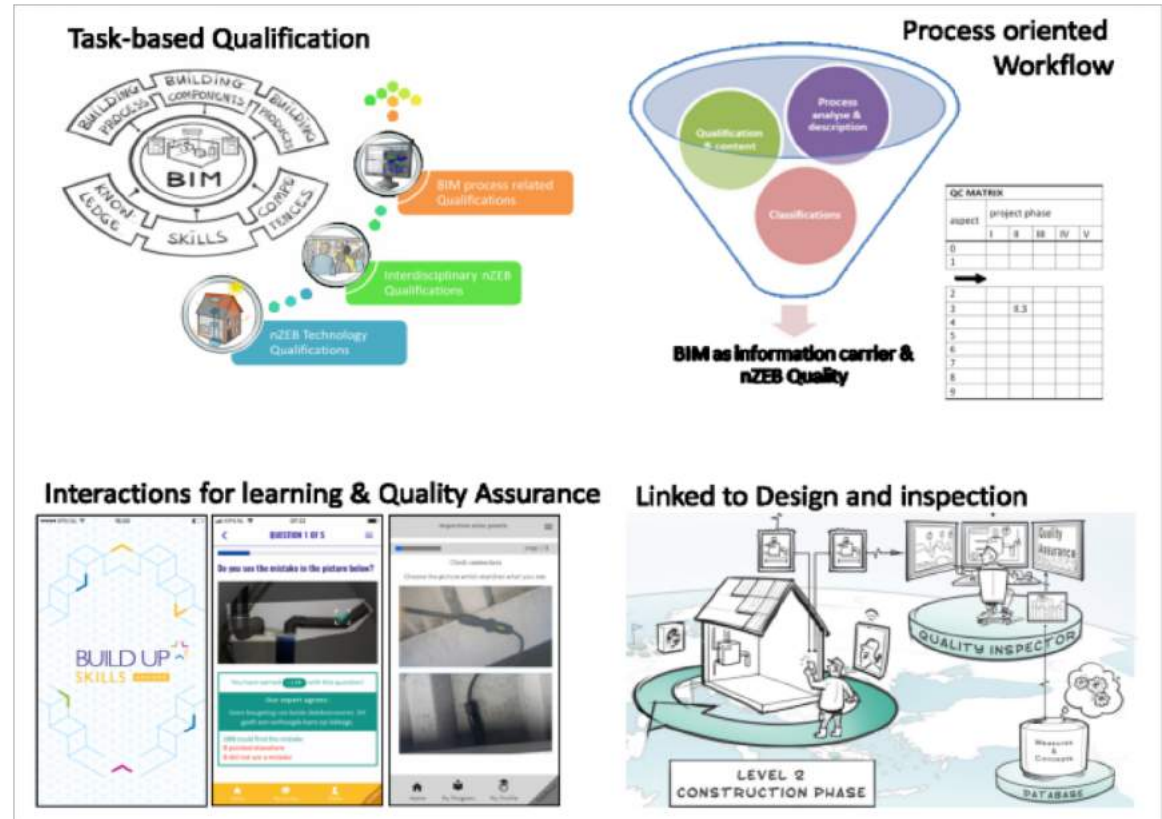
BUSkills Advisory App

Task based qualifications
Interactions for learning
Quality assurance

Community Portal

Process oriented workflow

Linked design and inspection



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QUESTIONS?

[ALDREN]



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The information in this publication does not necessarily represent the view of the European Commission.