Data-enabled architecture for a step-change in building performance.

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Attractive Acceptable Affordable

deep renovation by a consumers orientated and performance evidence based approach

Acronym: TripleA-reno
Project ID: 784972
Starting date: 2018-05-01
Ending date: 2021-04-30, ongoing project
Total cost: EUR 2 000 011,75
EU contribution: EUR 1 999 968
Coordinated in: Netherlands
Call for proposal: H2020-EE-2017-CSA-PPI
Funding scheme: CSA - Coordination and support action
Topic: EE-11-2016-2017 - Overcoming market barriers and promoting deep renovation of buildings
EE-11: Overcoming market barriers and promoting deep renovation of buildings

Challenge:
Increase renovation rate
Improve energy performance of renovations
Environmental sustainability, health and well-being

Barriers to overcome:
Non-technological, value-chain based (expl.: packages, finance, performance guarantees)

Expected Impact:
Increased rate of renovation
Increased number of individual deep renovation
Energy Savings and RE triggered
Environmental sustainability
Compliance

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Where it Started

HE – PROF/TRAC conference – Getting our homes future ready
In many presentations the role and of the end-user was emphasized, condensed in the barriers for deep renovation from an end-user’s point of view:

• 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
TripleA-reno

Building upon results of previous projects

Technologies:
• MORE-CONNECT, BERTIM, iNSPiRe, ProGETonE, P2Endure etc. etc.

Market barriers:
• REFURB, ABRACADABRA, ENERFUND

Quality control, labeling:
• QUALiCHECK, ALDREN, INSITER, BIMplement

CPD, training and skills:
• BUS and CS projects (PROF/TRAC etc.)

User awareness, behavior change:
• MOBISTYLE, encompass, TRIBE, TRIME, etc.

TripleA-reno will bring the most important results together:
✓ giving access to recent relevant project results
✓ ‘translating’ these valuable results for practical application
✓ involving different kinds of end-users in the gamified platform and for community building of residents

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Data-enabled architecture for end-users

The overall aim of TripleA-reno is to make acceptance and decision making on deep and nZE renovation attractive for residential consumers and end-users.

TripleA-reno will achieve this by:

• clear, unambiguous and meaningful data-enabled information and communication
• real, proven performances on energy, Indoor Environmental Quality and personal health
• consumer centred business models

Demand side:
• condominiums
• social housing companies/municipality owned - tenants
• privately owned single family dwellings – occupant/owner

Supply side:
• ESCO’s and construction companies as potential investor
• concept developers for individual house owners
• architects

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The TripleA-reno Road Show

5 EU umbrella organisations
4 Awareness raising events each throughout Europe.

Reach min 750 stakeholders with increased competencies on energy issues, building their capacities and skills

Meetings with Member Association representatives, seminars/webinars
National trainings or demonstrators organised by Member Associations
**The TripleA-reno Road Show**

<table>
<thead>
<tr>
<th>Architects</th>
<th>How to guarantee the performance in use and close the performance gap, while raising the architectural value during the energy retrofit.</th>
<th>Architects approach to a retrofit from a holistic point of view, not only EP and IAQ, but also looking at flexibility and adaptability of design to the occupants’ needs.</th>
<th>This large group of 600 000 EU architects is covered by ACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architect chambers</td>
<td>Awareness of quality control aspects in design process. Understanding of roles of other trades in realizing quality in relation to architectural design. BIM is an important tool for architects to combine it with quality control.</td>
<td>Direct communication with ACE, as consortium partner</td>
<td>European (ACE), National by ACE members, i.e. 44 regulatory and associations in 31 countries</td>
</tr>
</tbody>
</table>
The TripleA-reno Gamification Platform

**Level 1**
- **Design-phase**: gamified and social design by co-creation

**Level 2**
- **Construction-phase**: gamified realization of proven quality in interaction with end-users and a deep renovation community

**Level 3**
- **In-use-phase**: gamified in-use platform for ensuring sustainable quality of building and user experience

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Visual design guidelines to be implemented into the gamification engine.

**Design-phase**: gamified and social design by co-creation

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The game engine triggers, facilitates, and rewards sense-making dialogues.

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Data-enabled architecture supported by user-centric ICT tools

Training and qualification schemes should ensure that worker qualifications keep pace with the technical complexity of renovation process of the buildings and building components

TripleA-reno will focus on:

- Using just in time and just in place learning tools to deliver self-instruction content and to foster self-inspection
- Triggering and encouraging workers and professionals to use the data collected to enable learning loops
- Create awareness of workers and professionals about each other’s responsibilities and required skills
- Make sure that workers are tuned to technological development also educational seminars.
TripleA-reno
Data-enabled architecture addressing the performance gap

Implementing a general approach for quality improvement enabled by CPD and qualification schemes

TripleA-reno will tackle this issue by:

• involving the occupants/consumers in the project and collect real performance data in use
• implementing methodologies on enhanced quality control of related projects (IEE QUALiCHECK)
• Implementing (digital) tool (Model nZEB Cross-trade Quality, BIM-Skills Matrix)
• employing existing labelling schemes (LEVEL, WELL)
• deriving (voluntary) labelling schemes (ALDREN)
## TripleA-reno
### Expected Impacts

**Increased rate of renovation in the residential sector**

**Proven performances on energy, IEQ and health**

**11% of existing dwellings in the EU**

**Min 60% primary energy saving**

<table>
<thead>
<tr>
<th>7 Demonstration project, Country</th>
<th>Number of units</th>
<th>Total net floor area for renovation (m²)</th>
<th>Energy use in existing situation (kWh/m² y)</th>
<th>Energy use after deep renovation (kWh/m² y)</th>
<th>Percentage of primary energy saving by deep renovation</th>
<th>Renewable energy production (GWh/y)</th>
<th>Amount of primary saving by deep renovation (GWh/y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peristeri GR</td>
<td>24</td>
<td>2040</td>
<td>160</td>
<td>64</td>
<td>60</td>
<td>0.04</td>
<td>0.20</td>
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<tr>
<td>Valencia ES</td>
<td>32</td>
<td>3069</td>
<td>127</td>
<td>51</td>
<td>60</td>
<td>0.02</td>
<td>0.23</td>
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<tr>
<td>Reggio Emilia IT</td>
<td>12</td>
<td>631</td>
<td>190</td>
<td>72</td>
<td>62</td>
<td>0.01</td>
<td>0.07</td>
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<tr>
<td>Zagorie SI</td>
<td>51</td>
<td>2960</td>
<td>148</td>
<td>59</td>
<td>60</td>
<td>0.01</td>
<td>0.26</td>
</tr>
<tr>
<td>Tilburg NL</td>
<td>20</td>
<td>2400</td>
<td>215</td>
<td>26</td>
<td>88</td>
<td>0.05</td>
<td>0.45</td>
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<tr>
<td>Brasov RO</td>
<td>16</td>
<td>1120</td>
<td>140</td>
<td>56</td>
<td>60</td>
<td>0.01</td>
<td>0.09</td>
</tr>
<tr>
<td>Pest County HU</td>
<td>60</td>
<td>3887</td>
<td>283</td>
<td>92</td>
<td>67</td>
<td>0.05</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>215</strong></td>
<td><strong>16107</strong></td>
<td><strong>min 60%</strong></td>
<td><strong>2.04</strong></td>
<td></td>
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</tbody>
</table>
Thank you for the attention
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