RINNO

Transforming energy efficiency in European building stock through technology-enabled deep energy renovation

RINNO 2020

RINNO is a Horizon 2020 project that aims to deliver a set of processes that when working together give a system, repository, marketplace, and enabling workflow process for managing deep renovation projects. RINNO's main objective is to dramatically accelerate the rate of deep renovation in the EU by reducing the time, effort and cost of deep renovation while improving energy performance and stakeholder satisfaction.

AT A GLANCE

Project Title: An augmented intelligence-enabled stimulating framework for deep energy renovation delivering occupant-centered innovations.

Project Co-Ordinator: RINA Consulting S.p.A.

Partners: Bouygues, Ekolab, European Green Cities, Greenstruct, K-FLEX, RINA-C, Pink, Regenera, CERTH-ITI, Circe, Dublin City University, University of Northumbria Newcastle, VTT, Avedøre Boligselskab, HPHI, Motivian, NAPE
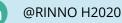
Duration: 06.2020 - 06.2024

Total Cost: €4.8m

Programme: H2020-LC-SC3-2018-2019-2020

Further Information:

🌐 rinno-h20

in @RINNO H2020

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CONTEXT & MOTIVATION

Approx. 77% of EU residential buildings were constructed before 1990 and 11% of Europe's population still experiences energy poverty due to poor building quality and thermal inefficiency. The European Commission estimates that a renovation rate of 3% p.a is needed to achieve the EU's energy efficiency and environmental ambitions in a cost-effective manner. Based on current renovation rates of 0.4% - 1.2% (depending on the country), it could take more than 100 years to renovate all EU building stock.

CHALLENGE

RINNO aims to address the following challenges faced by building renovation including:

- The need for renovations to become more attractive to all relevant stakeholders;
- More reliable in terms of performance;
- Less disruptive for occupants (especially in residential buildings) and less time-consuming;
- Less energy-intensive from a life cycle perspective;
- More environmentally friendly regarding applied materials;
- More cost-effective (in terms of e.g. return on investment) and financially-attractive (in terms of cash-flow).

APPROACH

RINNO will develop a comprehensive range of standards-based, web-native, on-demand application services and APIs for deep renovation stakeholders of all sizes that support the three main phases of deep renovation – (1) Planning & Design, (2) Retrofitting, and (3) Monitoring. RINNO will be underpinned by a novel business model and financing strategies enabled by next generation technologies.

KEY STAKEHOLDERS

Building Professionals (i.e. Engineers, Architects, Designer)

Innovation professionals (Technology providers/organizations)

BUSINESS MODEL INNOVATIONS
- Attractive private financing for energy-efficient retrofitting of building
- "One stop shop" (OSS) Approach
- De-risking of energy efficiency investments in deep renovation
- Circular economy principles

Building users/owners/managers

Finance Institutions and Investors

Energy Auditors

Lack of awareness regarding benefits of energy efficiency

Gap between designed and actual performance

Disruption
No access to finance
Lack of incentives
Complicated processes

PLANNING - DESIGN

RETROFITTING

Product Innovations
- Envelope Solutions
- RES, Hybrid & Storage Solutions

Process Innovations
- Immersive Building Capturing & Mapping
- Cobots/Robots
- 3D-printing
- Prefab/Plug&Play
- Drones

RINNO ICT-Enabled Accelerated Framework (OPRAT)
- RINNO Planning & Design Assistant (RPDA)
- RINNO Retrofitting Manager (RRM)
- Renovation Workflow & Transactions Manager (RWTM)
- RINNO Building Lifecycle Renovation Manager
- RINNO Renovation Repository (RRR)

MONITORING

Environmentally friendly
Less time consuming
High quality of life

More attractive
Less disruptive
Reliable
Cost effective
High levels of comfort
Less energy-intensive

DATA INFORMATION GATHERING (ON-SITE/AUTOMATED)

RINNO OPTIMIZED RENOVATION ROADMAP

EXPECTED LONG-TERM BENEFITS

Reduced Time and Costs to Source Finance
Reduced Human Support & Training Costs
Reduced OPEX and CAPEX
Improved Clarity on Costs
Reduced Working Time and Effort

Expand product and service portfolio
Provide superior products and services
Achieve heightened market penetration
Develop & deploy services quickly
Increased Customer Satisfaction

Faster Real-time Decision Making
End-to-end Process and Project Observability
Greater Control of Construction Process
Improved Work Quality
Improved Security & Resilience

Increased Energy Performance
Cultivate Organisational Learning
Relationship Infrastructure
Cost-efficient and agile
Digital service innovation

Decrease Cost
Increase Revenue
Increased Quality & Control
Competitive Necessity

RINNO Strategic Alignment Model

- Contributing to an ambitious annual renovation rate of 3.5%.
- Primary energy savings of 165 Gwh/year.
- A reduction of electricity cost by at least 30%.
- A total cost / time reduction in comparison with typical renovation by more than 30% and 40% respectively.
- An estimated reduction of 40,400 tons CO2-eq/year