

Revolutionising Energy Efficiency in Social Housing: Observations from the Frontlines

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An Ghníomhaireacht
Tithíochta
The Housing Agency

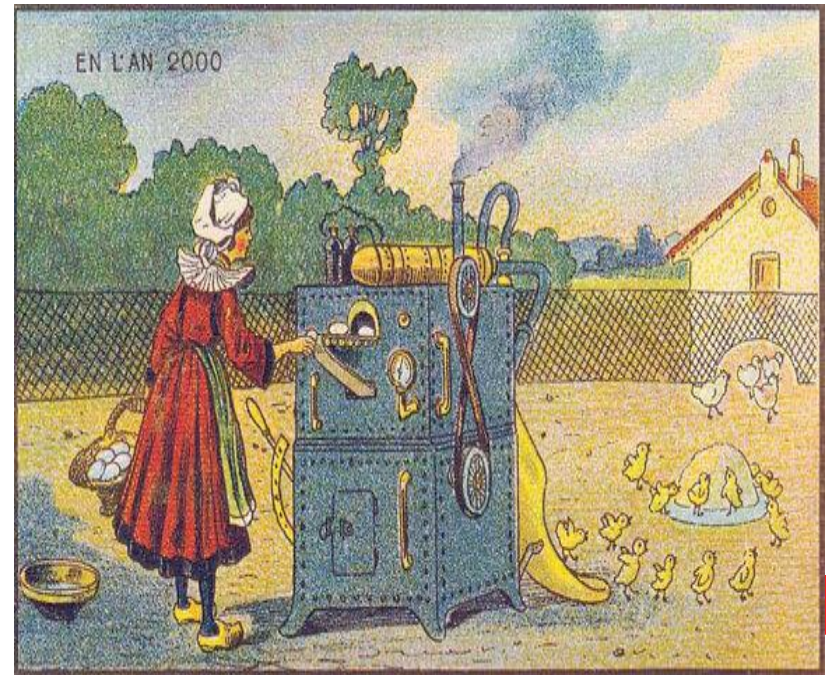
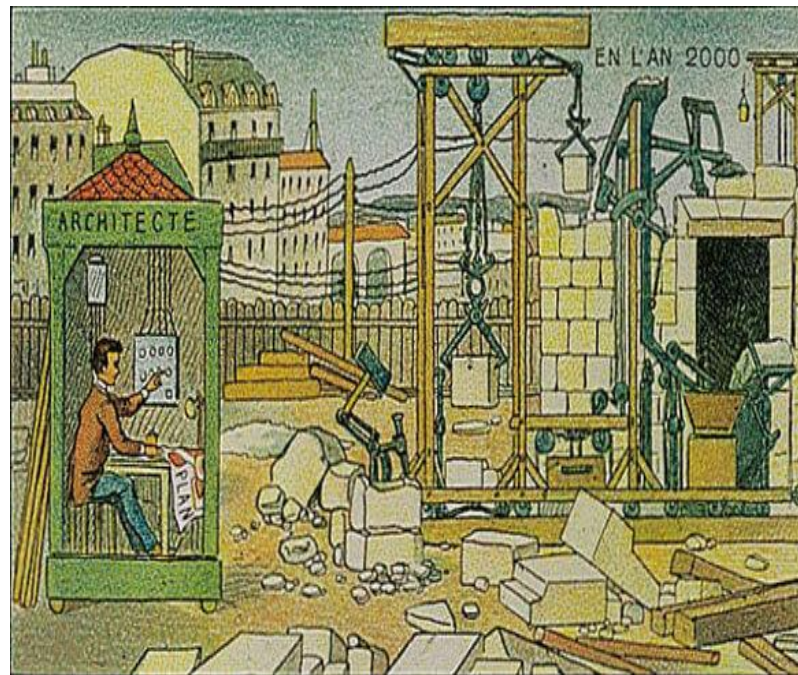
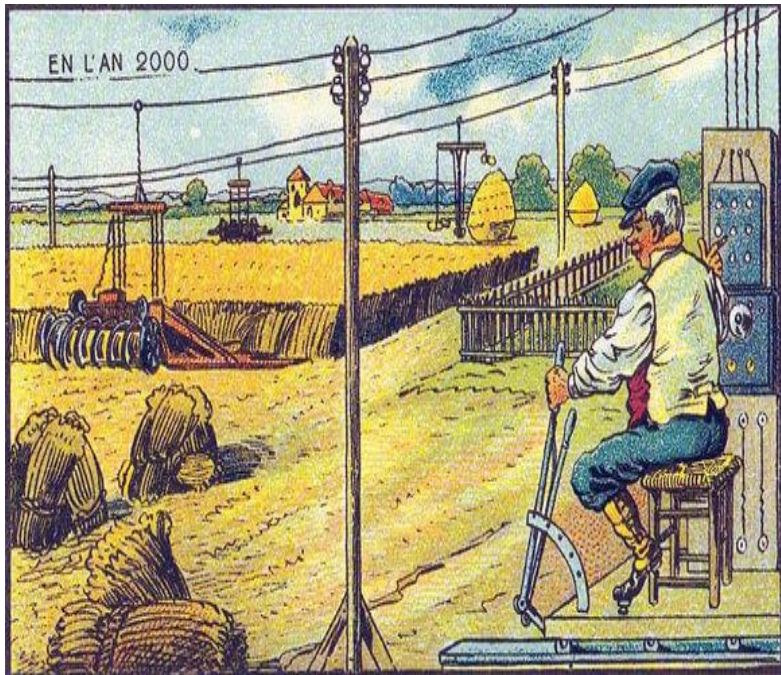
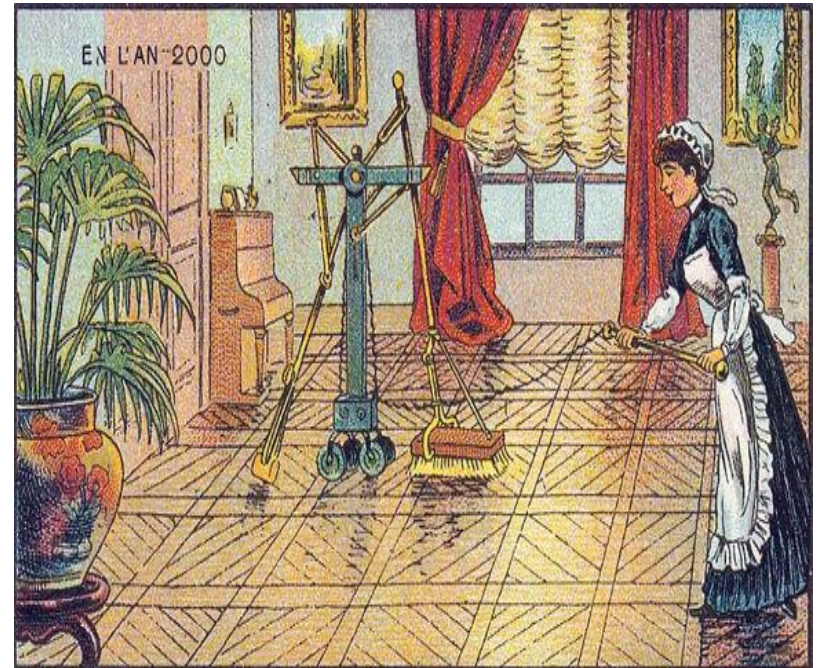
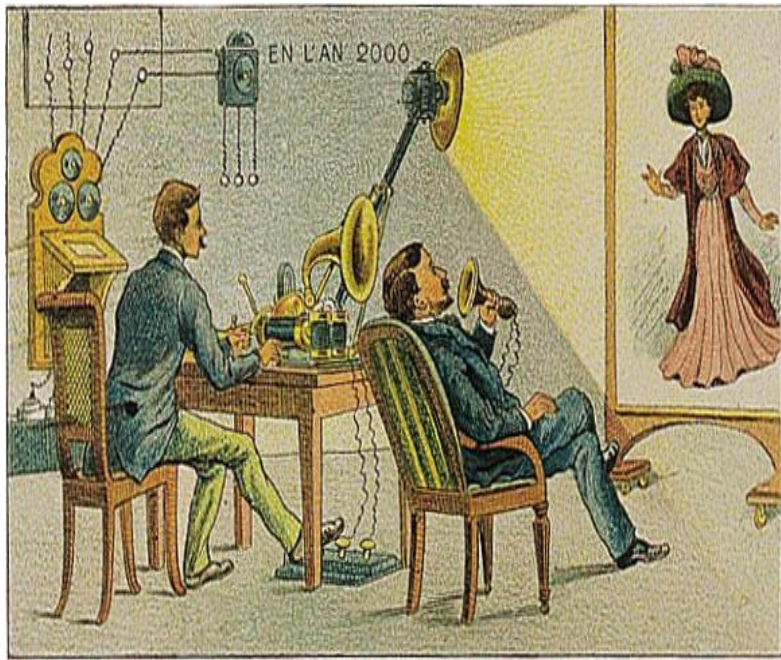


DCU
BUSINESS
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The Future Fallacy





The EU building stock currently accounts for a major portion of energy consumption and greenhouse gas emissions:

40% of the EU's energy consumption and 36% of greenhouse gas emissions can be attributed directly to the EU building stock


11% of Europe's population still experiences energy poverty due to poor building quality and thermal inefficiency

The European Commission estimates that approx. 75% of the EU's existing building stock has poor energy performance

WHAT IS NEEDED

A **WIN-WIN-WIN** FOR TACKLING CLIMATE CHANGE, ENERGY POVERTY & KICKSTARTING GREEN JOB CREATION



1. 


AT LEAST 3% DEEP RENOVATION RATE

2. 

MINIMUM ENERGY PERFORMANCE STANDARDS

3. 

ADEQUATE FINANCE & FUNDING

4. 

PRIORITISE LOW-INCOME HOUSEHOLDS



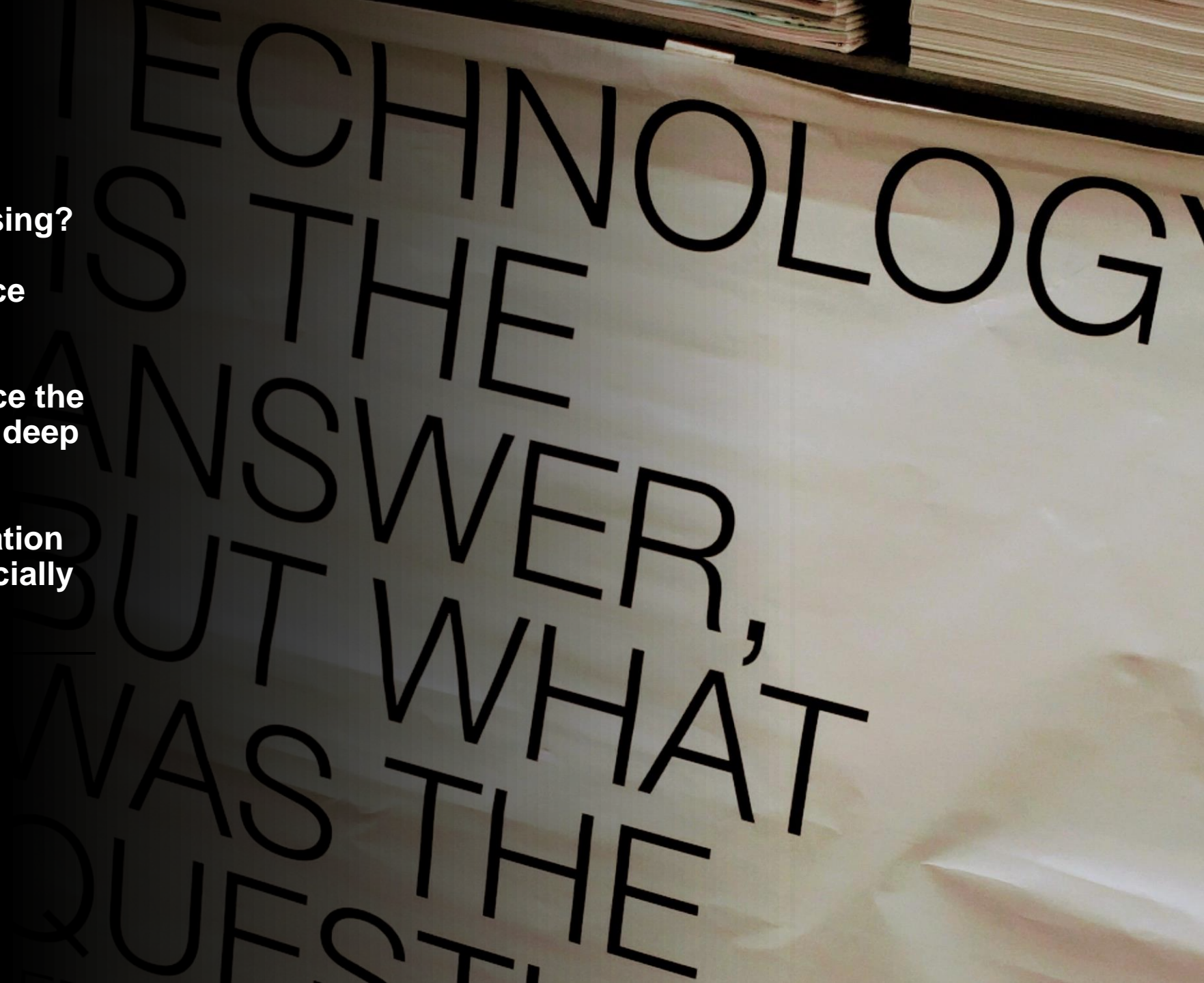


How do we reduce the environmental impact of housing?

How do we significantly reduce energy consumption?

How do we significantly reduce the time, effort, and disruption of deep renovation projects?

How do we make deep renovation more cost effective and financially attractive?



The RINNO Project

A €5m Horizon 2020 project that aims to accelerate the rate of deep renovation in energy inefficient buildings around Europe, resulting in through



**Innovative
Technologies**



**Innovative
Processes**

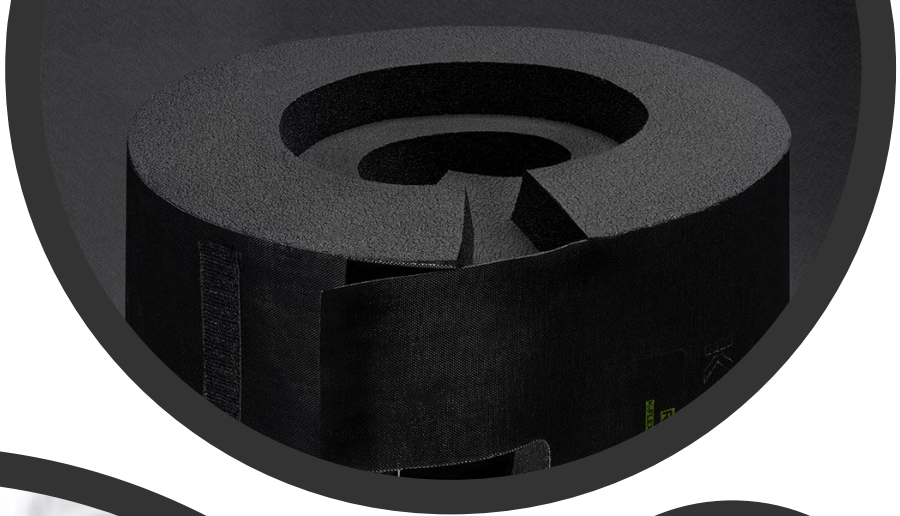


**Innovative
Business Models**

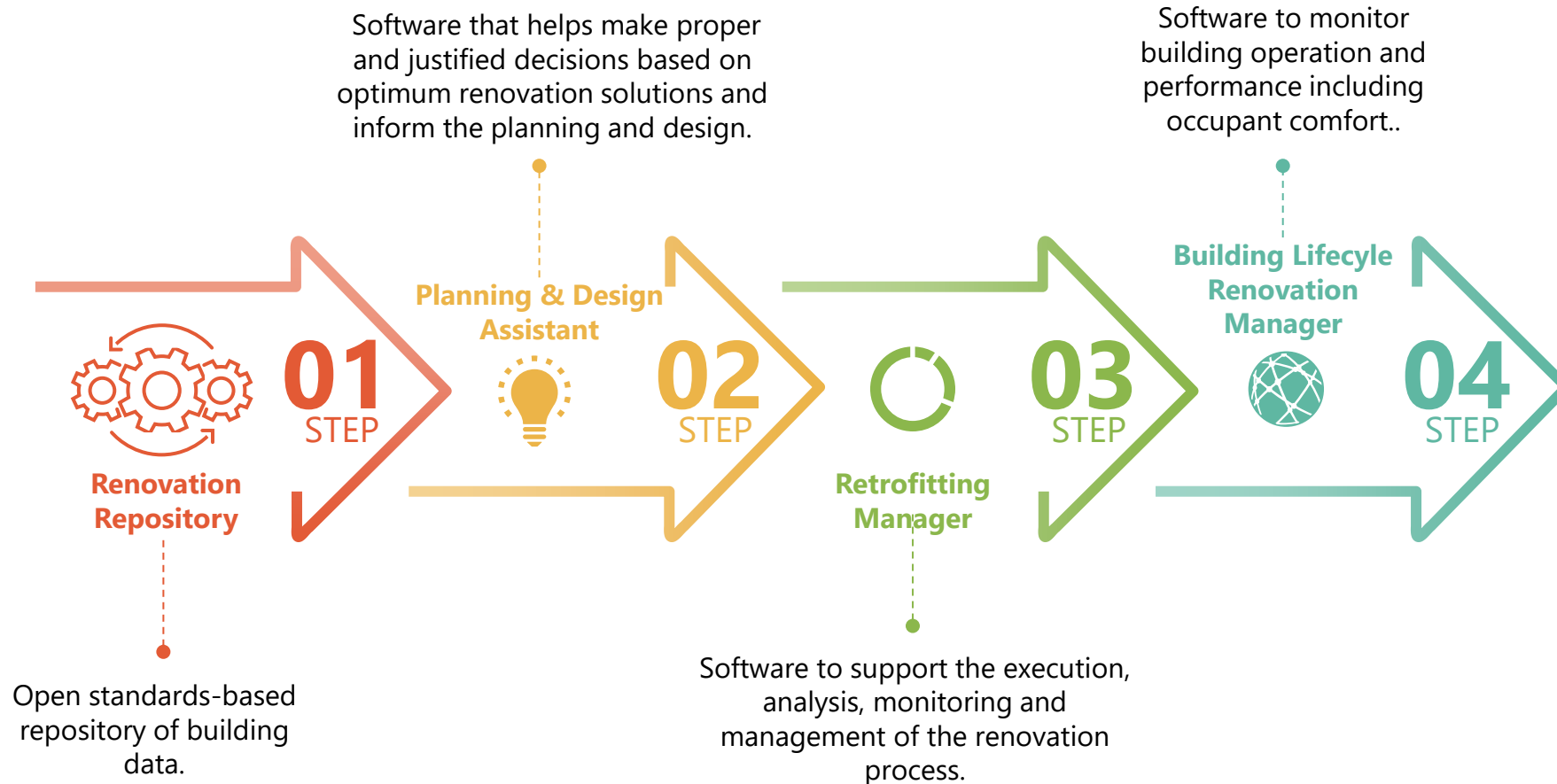
The background is a dark blue gradient with a futuristic, digital aesthetic. It features a grid of hexagonal shapes, some containing icons like a globe, a clock, a group of people, a fingerprint, a magnifying glass, and a house. A hand in a white shirt sleeve is holding a smartphone in the lower-left corner. The overall theme is technology and artificial intelligence.

AI IS NOT THE ANSWER

**BUT IT IS PART OF
THE SOLUTION**



RINNO has designed a set of intelligent processes that when working together provide a system, repository, marketplace and enabling workflow process for managing deep renovation projects from inception to implementation.





Residence Sarrazins, Lille, France

Innovation through novel renovation technologies, work duration reduction and optimized energy, indoor air quality and comfort monitoring.

- Integration of renewable sources
- Biological insulation of external facades and renovation of the energy system
- Installation of energy efficient windows

- Heat recovery of exhaust air
- Implementation of a more efficient energy production system
- On-site and off-site assembly of prefabricated solutions using cobots/robots and 3D printing



Deep Energy Renovation of a residential building according to the Passive House Premium standard

- Heat pumps used for heating/cooling
- Solar panels used for DHW and heating,
- PVs on top and on walls used for electricity,
- Triple glazing, low-e with high g-Value and additional shading

- Ventilation systems with heat recovery and enthalpy, low noise, with smart sensors for CO2, humidity and temperature, air-flow control
- Exterior Insulation and Finish Systems (EIFS) with sustainable



Improvement of thermal comfort and reduction of energy use and costs of residential dwelling

- Installation of 25 kWp PV panels to cover the electricity demand of common areas and partially drive the heat pump
 - More efficient DHW storage
 - Hybrid ventilation
 - Thermal insulation from recycled materials (0.15 W/m²K)
 - Double glazing (U=0.9 W/m²K)
-



Renovation of a Building in Deep Need of Maintenance

- BIPV in façade modules (Komproment) and InVentilate ventilation system.
- K-flex biobased insulation of technical installations and/or IsoCell paper wool insulation.
- BIM model



Slagelse, Denmark

What is the catalyst that made you adopt.....





**UNCERTAINTY
AHEAD**

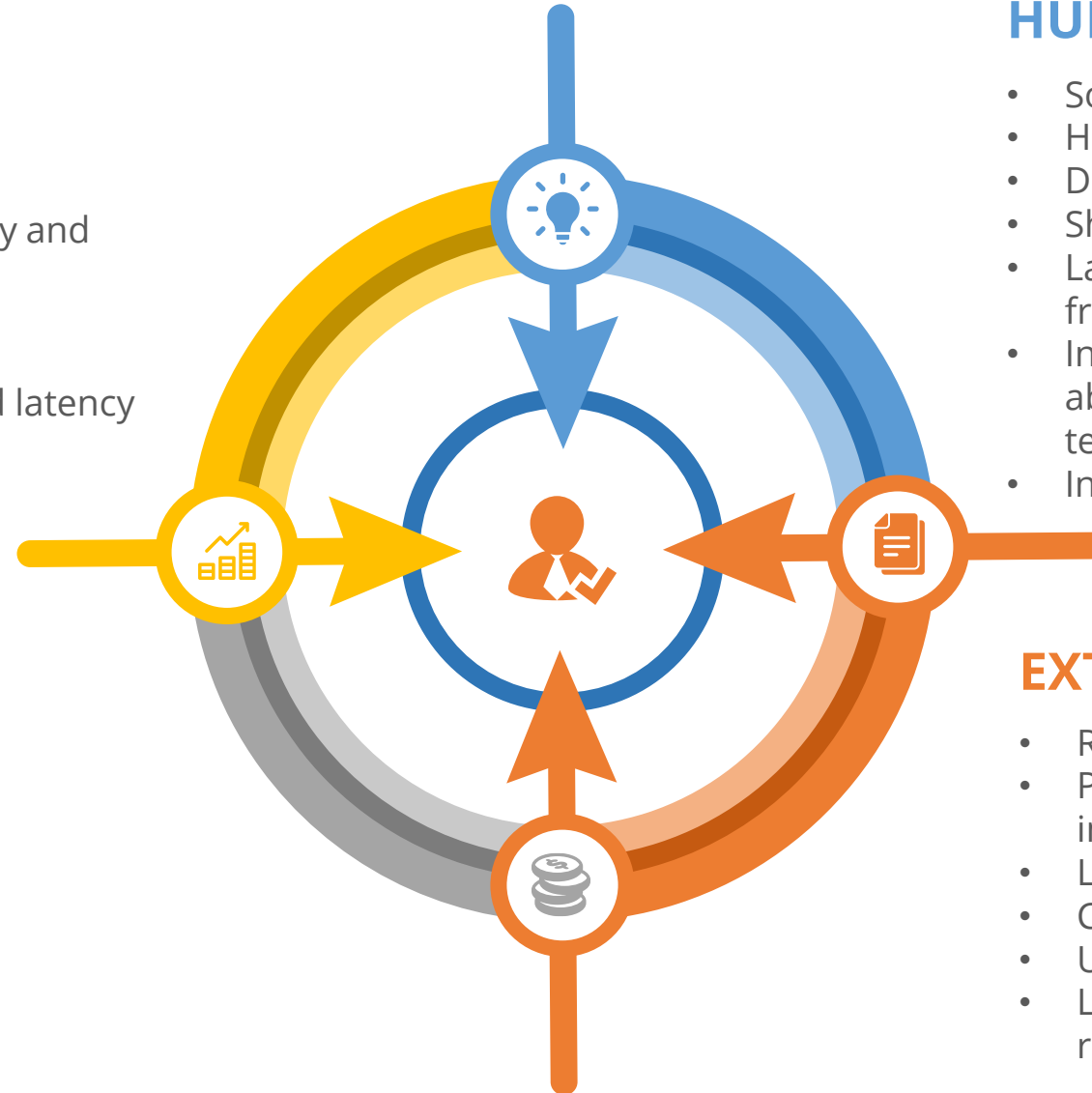
There are a lot of barriers to overcome....

TECHNOLOGICAL

- Innovation characteristics
- Availability
- Ease of use
- Compatibility, interoperability and integration
- Results demonstrability
- Quality concerns
- Poor on-site connectivity and latency
- Inconsistent data flows
- Inadequate worker skills

HUMAN

- Social norms
- Household characteristics
- Demographics
- Short-termism
- Lack of knowledge/Psychological distance from climate change
- Inadequate knowledge or reservations about the existence or use of new technologies
- Individual vs Collective



EXTERNAL ENVIRONMENT

- Regulatory compliance
- Poorly designed or limited incentives
- Limited borrowing capacity
- Complex financial schemes
- Unfavourable accounting rules
- Limited training in deep renovation practices

ORGANISATIONAL

- Resource allocation
- Financial investment
- Procurement policies
- Employee competency

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