Welcome to our Deep Retrofit Community of Practice: Highly ambitious regions and projects across Europe webinar

Wednesday 9th of June 10:00 - 12:30 CET

EU GREEN WEEK 2021 PARTNER EVENT

ZERO POLLUTION

#EUGreenWeek

for healthier people and planet
A few notes about Zoom
(the online platform that we are using):
Follow-up package to attendees (Webinar recording and presentations):
Seamus Hoyne
Dean of Flexible and Work Based Learning & Principle Investigator for the Sustainable Development Research Institute at LIT.
Chair of the Board of Tipperary Energy Agency and Secretary General of FEDARENE

#EUGreenWeek
2021 PARTNER EVENT
Vincent Feuillette
Operational Director, Regional Agency for Energy and Climate (AREC)
Renov Occitanie Region (FR)

Francisco Puente
General Manager, Escan Energy Consulting, presenting the Region of Madrid (ES)

Seamus Hoyne
(FEDARENE, LIT, TEA)

#EUGreenWeek
2021 PARTNER EVENT

10:10 - 10:40 Panel discussion: Highly ambitious regions
Vincent Feuillette
Operational Director, Regional Agency for Energy and Climate (AREC)
Rénov’Occitanie Region (FR)

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THE AGENCY FOR TERRITORIES IN TRANSITION
Toward a positive energy region

- **Operational Tool of the Region Occitanie**
- **Neutral, with an objective vision on proposed solutions**
- **Trusted third party for the territories, acting for public interest**
- **Acting under the principle of subsidiarity**

\[ \frac{\text{Energy consumption}}{2} \times 3 = \text{Renewable energy production} \]
A projects factory for the territories

- Origination & qualification
- Strategy
- Technical set-up
- Project finance
- Social added-value
- Legal solution
- Implementation & exploitation

Renewables
Buildings retrofit
Mobility
Climate
Renov’Occitanie: a new public service for home renovation services

Public service delegation contract

40M€ dedicated capital increase

40M€ loan facility under SFSB + ELENA TA

One-stop shop for home renovation:
- Subsidized support services
- Dedicated public bank
Renov’Occitanie at a glance

- 32 Rénov’Occitanie counters setup by the local authorities → **164 dedicated counsellors**

- **2021 objectives**
  - More than 70,000 households informed
  - 4,200 energy audits
  - 1,700 deep retrofit projects supported

- **70 M€ of Renov’Occitanie loans to households until the end of 2024**
Francisco Puente
General Manager, Escan Energy Consulting, presenting the Region of Madrid (ES)

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2021 PARTNER EVENT
Deep Retrofit Community of Practice: Highly ambitious regions and projects across Europe

10:10 - 10:40 Panel discussion: Highly ambitious regions (Moderated by Seamus Hoyne)

Presenting the Region of Madrid (ES)
- and REPLACE H2020 project -

Francisco Puente
Escan energy consulting
General manager
Regional energy efficiency and renovation policies

**National**

**Law 7/2021, of 20 May, on climate change and energy transition**

Ensure compliance by Spain with the objectives of the Paris Agreement, to facilitate the decarbonization of the Spanish economy, guarantee the rational use of resources and the implementation of a sustainable development model

Article 8: The Government will encourage the renovation and rehabilitation of existing buildings to reach high energy efficiency and decarbonisation by 2050

In less than six months, the Government shall draw up a Housing Rehabilitation and Urban Renewal Plan.

**Regional**

**Energy Sustainability Law and the Energy Plan of the Region of Madrid (2021-2030)**

Transition towards a low-carbon energy model

Energy efficiency and the reduction of consumption in, industrial, commercial, administrative, educational, health, mining.

Local energy generation from RES, to reduce dependance, distributed generation and self-consumption of energy. Making energy grids more intelligent

Integration of the requirements derived from energy sustainability in the different public policies, promoting the exemplary action of the regional and local administrations

The reduction of the energy bill of families, companies and public administrations, in order to achieve a greater competitiveness of the economy.

The promotion of sustainable mobility.
Buildings energy renovation programme (PREE)

The purpose of PREE (Building Energy Renovation Programme) is to encourage and promote renovation actions in existing buildings to reduce the CO2 emissions by means of energy efficiency and the use of renewable energies.

This can be achieved through three ways:

Typology 1: Improvement of the energy efficiency of the thermal envelope.

Typology 2: Improvement of energy efficiency and renewable energies in thermal installations for heating, air conditioning, ventilation and domestic hot water.

Typology 3: Improvement of the efficiency of lighting installations.
Specific replacement programmes

Objective:
Public support (subsidy) program for the replacement of existing boiler rooms in the Region of Madrid with the aim of reducing energy consumption in the building sector, improving the safety and the environment.

Objective:
Public support (subsidy) program for the replacement of old windows by more energy-efficient ones in homes or tertiary sector buildings in the Region of Madrid.
Capacity building for energy transition

EU and National

IDAE e-learning platform

Regional

Fundación de la Energía
Cooperation in Innovation

REPLACE (H2020) – Making heating and cooling for European consumers efficient, economically resilient, clean and climate-friendly

Informing and motivating end-users to replace inefficient heating and cooling systems with efficient, economic and climate-friendly alternatives

In Spain, renovation of biomass boilers in residential sector in the Region of Castilla y León, leading to:

• end-users economic savings
• improve air quality and environment
• improve resilience through use of price-stable and regionally available renewable energy
• increase property value by installing sustainable RES energy

https://replace-project.eu/
Vincent Feuillette
Operational Director, Regional Agency for Energy and Climate (AREC)
Renov Occitanie Region (FR)

Francisco Puente
General Manager, Escan Energy Consulting, presenting the Region of Madrid (ES)

Seamus Hoyne
(FEDARENE, LIT, TEA)

#EUGreenWeek
2021 PARTNER EVENT

10:10 - 10:40 Panel discussion: Highly ambitious regions
Rocío de la Rosa Gilabert
Business Development Consultant, CTA. Presenting the HP4All Pilot region in Spain.

Christiane Egger
Deputy Director OÖ Energiesparverband and Manager Cleantech-Cluster Energy, Upper Austria. Presenting the HP4All Pilot region in Upper Austria.

Padraig O’Reilly
Researcher, LIT Development Unit in Ireland. Presenting the HP4All Pilot region in Ireland.

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10:40 - 11:10 Panel Discussion: Introducing the HP4ALL Regional Implementation Plans
Padraic O’Reilly
Researcher, LIT Development Unit in Ireland. Presenting the HP4All Pilot region in Ireland.

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2021 Partner Event
LIT Development Unit
Thurles

Padraic O'Reilly
Senior Project Officer
Sustainable Energy

E: padraic.oreilly@lit.ie

W: https://lit.ie/rdi/development
ABOUT THE PROJECT

HP4ALL will enhance, develop and promote the skills required for high quality, optimised Heat Pump installations within residential/non-residential sectors.
Heat Pump evolution

Figure 1.1: Sales development by type ("H" indicates primary heating function)

- H-ground/water
- H-air/water
- Reversible air-air w/ heating
- Exhaust air
- Sanitary hot water

Source: EHPA, 2020
OBJECTIVES

- Develop a Heat Pumps competency framework
- Enable end users/clients to demand high quality solutions and service
- Increase the number of skilled workers
- Replicate the project at national and EU-level
Primary energy savings
2 GWh/year

Renewables production
1.95 GWh/year

Reduction of
628 tCO2/year

400 People trained

1 Heat pumps benchmarking tool
WP1 Coordination & Project Management (M1-M30)

WP2 HP Value Chains – Barriers & Skills Analysis (M1-M8)

WP3 HP Skills Competency & Excellence Framework (M1-M28)

WP4 Increasing End User Demand for HP Skills (M1-M24)

WP5 Boosting HP Skills Demand in 3 pilot regions (M12-M30)

WP6 EU Level Replication (M12-M30)

WP7 Communication, Dissemination and Exploitation (M1-M30)
Skills Analysis

- Review best practice initiatives that have increased skills in the energy sector
- Create panels of experts & conduct surveys and interviews
- Review policy & legislation

Objective: assist with the development of skills and capacity in the HP sector
## Example of Best Practice Initiatives

<table>
<thead>
<tr>
<th>Country</th>
<th>Initiative</th>
<th>TYPE</th>
<th>Learning Points to HP4ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria/ Upper</td>
<td>Energy Advice Service of the OÖ Energiesparverband</td>
<td>Service</td>
<td>This one-stop-shop service reaches householders while they are in an actual decision-making process, so it is important that energy advisers have accurate information about HPs; product independence is important to build trust; advice that is embedded in a wider framework of incentives, information, and regulation has greatest impact in increasing the demand for skills.</td>
</tr>
<tr>
<td>Austria</td>
<td></td>
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</tr>
<tr>
<td>France</td>
<td>MaPrimeRenov</td>
<td>Public incentive</td>
<td>Drives citizens to choose a recognized registered professional, thus driving the skills in the construction sector.</td>
</tr>
<tr>
<td>Germany</td>
<td>House turnaround</td>
<td>Public campaign</td>
<td>This is an online resource giving people information and advice on improving energy efficiency of their homes. Having a large register of trained experts was essential to the success of the service. Taking into account of national and regional differences in demand for renovation and creating working networks that stay active even after end of project is important. A large marketing effort was required to make sure the online service was well known and used.</td>
</tr>
<tr>
<td>Country</td>
<td>Initiative</td>
<td>TYPE</td>
<td>Learning Points to HP4ALL</td>
</tr>
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<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ireland</td>
<td>NSAI SR 50-4</td>
<td>National Standard recommendation / policy</td>
<td>Developing national and/or international standards for installation/design requirements of HPs can help to determine the content of any training that is required. Standards can be used as a reference guide for all actors in the HP industry.</td>
</tr>
<tr>
<td>Norway</td>
<td>Enova’s Energy Challenge</td>
<td>Education</td>
<td>This creates primary/secondary education activities for a responsible approach towards the energy issues. Education activities in schools can be a useful way of raising general awareness of the population of energy efficiency activities. Train the trainer, in the form of training school teachers, acts as a multiplier to ensure a lasting impact.</td>
</tr>
<tr>
<td>Spain</td>
<td>Andalusian Sustainable Construction Development Plan</td>
<td>Strategic plan</td>
<td>This project shows how a combination of regulatory actions, training and financial incentives, boosts demand for skills which has a significant impact on the local economy. It is important for HP4ALL to consider how to leverage these existing schemes and target the right market actors to boost HP skills.</td>
</tr>
</tbody>
</table>
D2.1 Report of best practice initiatives designed to increase the skills in the energy sector

A collection of 49 initiatives from across Europe

H2020-LC-SC3-EE-2019
HEAT PUMPS SKILLS FOR ÑZEB CONSTRUCTION (HP4ALL)

D2.1 – Report of best practice initiatives designed to increase the skills in the energy sector

Lead Contractor: International Energy Research Centre (IERC)

Author(s): Andreea Le Cam, Jo Southernwood

Date: 27 January 2021

https://hp4all.eu/documents/#downloads
Training Review

- Clear understanding of all training provided in the regions
- Current and future training
- Minimum qualifications/competencies
- Identification of gaps
- Develop a Competency Framework

Objective: Ensure that EE gains afforded by HPs are realised
• HP Competency Framework to facilitate the recognition of skills
• Knowledge Hub for end users providing information
• A benchmarking tool to assist in the procurement process
Supply side:
- Suppliers & manufacturers
- Designers and Installers

Demand side:
- Building users
- Building owners
- Public sector

Objective: Increase the demand for skills
Validated in 3 pilot regions

- Ireland – domestic & non-residential market
- Upper Austria – large scale heat pumps
- Andalusia – Public sector, upgrades and new installations

Ambitions

- Drive market change
- Influence end-user decisions
- Plan for new innovations
Conclusion – Keys to increasing skills

• HP incentives that drive the demand for skills
• Embed HP skills into existing training
• Flexible, adaptable HP specific training programs

• Regulations that require HP designers / installers to have specific qualifications
• Register of designers / installers

• Awareness campaigns promoting HP’s and competent, qualified HP designers and installers
Regional Implementation Plan
IRELAND
Padraic O’Reilly, LIT Development Unit Thurles
padraic.oreilly@lit.ie
Domestic Heat Pumps

- Domestic heat pumps, new build & retrofit
- Climate Action Plan targets: 600,000 HPs, 400,000 in retrofit
- Unprecedented change in technology
- Huge scope for EE and CO2 savings, but high risk of poor performance
- Installation capacity already struggling to meet current demand – this demand must increase 5-fold to meet CAP targets
New National Code of Practice

- LIT on the committee that drafted the document
- Development activities to promote the standard
- Wide range of industry contacts: end-users, installers, suppliers & policy makers
Case studies and best practice guides to reinforce National Standard
Non-Domestic Heat Pumps

All Public Sector Buildings to have BER B Rating by 2030
Opportunity for Heat Pumps

- Oil systems easier to justify
- BER target will drive more replacement of Gas systems
Rocío De la Rosa Gilabert
Business Development Consultant, CTA.
Presenting the HP4All Pilot region in Spain.

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Regional Implementation Plan

SPAIN

Rocío de la Rosa, Corporación Tecnológica de Andalucía

rocio.rosa@corporaciontecnologica.com
Geographical distribution matters, and cooling household applications largely pre-empt
By and large, aerothermal supply is the predominant source (N Units & power supply)
<table>
<thead>
<tr>
<th>Andalusia/Spain</th>
<th></th>
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<tbody>
<tr>
<td><strong>Specific challenge to address</strong></td>
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<tr>
<td>• Facilitate the uptake of advanced HP technologies by public authorities or public building owners.</td>
<td></td>
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<tr>
<td>• Encourage product development by manufactures clusters aligned with public bodies.</td>
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<tr>
<td>• Highlight the advantages and opportunities of HP technologies to installers and citizens.</td>
<td></td>
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<tr>
<td>• Mobilise targeted HP related education and training resources for practitioners and workers</td>
<td></td>
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<tr>
<td><strong>Opportunities related to HP4ALL project</strong></td>
<td></td>
</tr>
<tr>
<td>• HP4ALL will provide enhanced visibility to HP technologies. Although referred to in the current legal and financial framework, HPs are not specifically prescribed.</td>
<td></td>
</tr>
<tr>
<td>• HP4ALL will pave the way for future (innovative) greener public procurement initiatives specifically devoted to HP technologies uptake.</td>
<td></td>
</tr>
<tr>
<td>• HP4ALL will try to foster bundled specific education &amp; training packages for less qualified workers</td>
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</table>
### HP4ALL Pilot Region Spain

<table>
<thead>
<tr>
<th>Andalusia/Spain</th>
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</thead>
<tbody>
<tr>
<td><strong>Relevant Stakeholders</strong></td>
</tr>
<tr>
<td>Mainly public building owners / public authorities (market leverage effect)</td>
</tr>
<tr>
<td>• Organisations that own residential &amp; non-residential buildings</td>
</tr>
<tr>
<td>• Policy making public bodies</td>
</tr>
<tr>
<td>• HP manufactures &amp; installation companies</td>
</tr>
<tr>
<td>• Manufacturing, EP&amp;C and ESCO clusters and professional associations</td>
</tr>
</tbody>
</table>

| **Strategies to ensure the target group** |
| • Key stakeholders and gatekeepers approach |
| • Local, Regional and State Housing & Energy Agencies |
| • Municipalities Federation |
| • Clusters and professional Associations High Level Representatives. |
## HP4ALL Pilot Region Spain

<table>
<thead>
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<tbody>
<tr>
<td><strong>Proposed Actions</strong></td>
<td></td>
</tr>
<tr>
<td>• Public authorities awareness raising campaign.</td>
<td></td>
</tr>
<tr>
<td>• Dissemination and communication activities for manufacturer clusters.</td>
<td></td>
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<tr>
<td>• Draw up case studies to facilitate the former.</td>
<td></td>
</tr>
<tr>
<td>Through:</td>
<td></td>
</tr>
<tr>
<td>• 2 webinars about project results (1 for policy makers, 1 for the private sector)</td>
<td></td>
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<tr>
<td>• 3 regional events:</td>
<td></td>
</tr>
<tr>
<td>• 1 for all stakeholders present project results, promote resources in the hub</td>
<td></td>
</tr>
<tr>
<td>• 1 for policy makers, professional associations, VET schools to discuss public policies assessment and recommendations, discussions between policy makers and education sector</td>
<td></td>
</tr>
<tr>
<td>• 1 for private sector capacity building: universities/ researchers present trends</td>
<td></td>
</tr>
</tbody>
</table>
Christiane Egger
Deputy Director ÖÖ Energiesparverband
and Manager Cleantech-Cluster Energy,
Upper Austria. Presenting the HP4All Pilot
region in Upper Austria.

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Regional Implementation Plan
Upper Austria
Christiane Egger, OÖ Energiesparverband
christiane.egger@esv.or.at
www.energiesparverband.at, www.cleantechcluster-energie.at
The region of Upper Austria

Capital: Linz
Population: 1.5 million

Upper Austria
56 % of all space heating renewable

- Electricity production: 73%
- Space heating: 56%
- Total heating: 44%
- Primary energy consumption: 31%
- Mobility: 9%
HP4ALL Pilot Region Upper Austria

Starting point

• Well established market for building renovation and renewable heating in the residential and public sectors

• Good growth rates for the HP market

• Strong policy framework for phasing out fossil heating (regulatory/financial/information measures)

• Stringent quality criteria for renewable heating systems (performance, emissions, noise)
HP4ALL Pilot Region Upper Austria

Focus on HPs in business and industry
• Low levels of market development of the mid-/large-scale HP market for companies
• Low levels of awareness, lack of required skills by planners and installers

Objectives and activities
• Work across the value chain!
• Increase skills, awareness and demand for efficient HP solutions among all key actors (manufacturers, planners, business end users, policy makers)
• Planned activities:
  - Information material
  - Best-Practice-Case examples
  - Events, training
11:10 - 12:15 Project examples: Renovation and One Stop Shop initiatives + Q&A

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Janet Doyle
Finance & Project Coordinator, Superhomes. Presenting the SuperHomes2030 Horizon 2020 Project

Jose Ramón López
Energy Agency of the Basque Government. Presenting the OpenGela Horizon 2020 Project

Federica Fuligni
Energy Systems & Sustainability Business Development, RINA Consulting. Presenting the SunHorizon Horizon 2020 Project

Dan Stefanica
Head of Projects, EHPA
Janet Doyle
Finance & Project Coordinator, SuperHomes. Presenting the SuperHomes2030 Horizon 2020 Project

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Superhomes2030
Deep Retrofit Community of Practice: Highly Ambitious Regions & Projects across Europe

Janet Doyle, Superhomes Ireland, janet@superhomes.ie, 9/06/2021

Superhomes.ie
Progress

- Deep Retrofit Service for Residential Buildings in Ireland since 2015
- Turnover growth rate of c. 80%-100% last 4 years
- 30+ contractors, 10 delivering multiple homes
- 14 Staff; technical competence increasing
- Pipeline of homes
How to turn this map Green?
Superhomes

- The Product people purchase
  - Warm comfortable healthy home
  - Low bills, insulated from fuel price rises
  - Environmental assurance “being green”

- The service we supply:
  - Knowledge of what to do & how to do it
  - Easy route to public subsidies
  - Good Contractor access; supervision signoff
  - Quality Assurance & Certainty.
  - In the future: Market Leading Finance
Superhomes One-Stop- Shop for Clients

Awareness & Marketing
- Engage:
  - Retrofit awareness raising
  - Knowledge transfer
  - Homeowner’s experience and memoires

Design & Tender
- Design to meet B2 and HLI standard using cost optional retrofit model

Consideration & Sales
- Trusted independent retrofit advisor
- The correct measures to undertake.
- Which Trades and Contractors to use

Advocacy
- Educate: Showcase best in practice
- Engage: Open door events
- Engage: Show others the retrofit process works

Quality control
- Quality Assurance & Certainty
- Good Contractor access
- Feedback to contractors
Superhomes
One-Stop-Shop

Route to Engage
Advice, PM, Q&A
Project Works
Finance
Climate Action Plan

Buildings

500,000 existing homes to upgrade to 'B2' equivalent BER by 2030

600,000 heat pumps installed by 2030
(of which 400,000 will be in existing buildings)

New retrofitting delivery model, which will group retrofits together, leverage smart finance, and ensure easy pay-back methods
Aim of Superhomes2030

**Aim:**
- Dramatically scale the Superhomes offer in Ireland:
- Move from a model completing 100/€6m p.a. worth of retrofit to 500/€36m p.a. by 2023
- Expand & Improve the Superhomes service offering
- 48 GWh savings between 2020-2023 (nearly double the BAU scenario)

**Development of:**
- 4 Regional Superhomes One Stop Shops
- Contractor Development & Training
- Attractive Finance Solutions independent of public finances
- Technical Standards, tools, analysis and design systems and solutions
- Open-source energy performance data platform (Superhomes Digital Hubs) demonstrating the value of nZEB retrofits in the market
Growth Strategy & Business Plan will be developed which will inform Innovative Business Models, based on concept of regional 'one stop shop'.

Deep Retrofit Community of Practice (CoP) across Europe where leading experts, practitioners and agencies involved in Deep Retrofit will share experience, knowledge and competency thus driving the retrofit agenda.

Opportunities to expand the Superhomes model outside of Ireland will be explored, using linkages created through the European Heat Pump Association and FEDARENE.
500 Deep Retrofits per year by 2023
Project Objectives

1. Develop a network of 80 high performing contractors across Ireland, supported by 3-4 regional Superhomes OSSs, to deliver high quality deep retrofits.

2. Develop the Superhomes approach as a trusted model in the Irish Deep Retrofit Market with 500 retrofit completions per annum.

3. Expand the Superhomes Solution Regionally to cover 60% of the population and optimize business processes thereby improving efficiencies by 10-15%.

4. To design and pilot an innovative deep retrofit finance solution which aligns with market demand and policy objectives and supports €10m of residential investments by 2023.

5. To ensure that Superhomes adopts and implements best practice solutions and technologies in line with innovation in technology and processes.
What is involved in operating an OSS?
Task 6.2
Superhomes2030
Business & Exploitation Plan

- Description of the services and products provided
- Strategic Analysis showing how the Superhomes expansion will occur
- Estimation of resources needed to develop the service
- Revenues from services provided
- Financing plan
- Corporate structure, human, technical and other resource requirements
- Governance, risk assessment and mitigation
Electric Ireland Superhomes

Electric Ireland Superhomes is a new Joint Venture established by TEA and ESB born out of a strong synergy with TEA bringing proven engineering technical expertise and experience, and ESB bringing experience in terms of achieving scale, operational systems, and marketing experience with national reach.
We look forward to dramatically increasing the delivery of our service and retaining our focus on whole-house, multi-measure deep retrofits to work with homeowners right across Ireland, helping them to improve the comfort, warmth and energy efficiency of their homes while also playing a leading role in the delivery of Ireland’s climate targets.

Electric Ireland
Superhomes

TEA
50%

ESB
50%
Thank you

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 890492 (Superhomes2030)

Follow us on Twitter, Facebook, Instagram & Youtube to get the latest updates.

Janet Doyle, Superhomes Ireland, janet@superhomes.ie
Jose Ramón López
Energy Agency of the Basque Government. Presenting the OpenGela Horizon 2020 Project

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THE OPENGELA MODEL:

PEOPLE-CENTRIC URBAN REGENERATION IN THE BASQUE REGION

JOSÉ RAMÓN LÓPEZ
EVE – ENTE VASCO DE LA ENERGÍA
• 2.1 M people - 7.234 km² - 300 inhabitants / km²
• 251 municipalities, 3 urban nodes: blurred urban-rural boundaries
• High degree of policy-making autonomy, but need for multi-level governance

Small, “compact” territory

• 65% of buildings >40 years age
• 93% privately-owned - 77% multi-family buildings
• 75% of buildings lack accessibility
• Relatively warm climate: Energy Efficiency is not the main trigger for building renovation

Building stock: Old, Urban, Private-owned

• 31% of population living in “vulnerable” districts – 2020 study
• 10% in risk of energy poverty

Social challenges

• High life expectancy (85.4 & 78.9 years)
• Low fertility rate (1.2%)
• 23% >65 years old - 26% by 2025 – 33% by 2050

Demographic challenge
Urban Agenda for the Basque Country

Validation: Two pilot-projects
Replication: Regional-National-EU
Building renovation interventions

• **Type of measures**: non-energy (accessibility, safety, etc.) + energy measures (passive + active, heaters, insulation, windows, etc.)

• **Range of investments**: between 5,000 and 70,000 EUR - depending renovation depth, size, intervention typology, etc.

• **Monthly payment capacity**: depending on economic level, it goes from 40€ to 500€ monthly.
...is financing really an issue?

YES – Although not the only one

Financing is a barrier to building Renovation (and urban regeneration) due to:

• **High initial investment** (average 40.000 € / dwelling in vulnerable areas)
• **Lack of awareness** on benefits
• **Lack of critical mass** for projects
• **Difficulties for Banks** to provide long-term finance to those who lack of financial capacity
• **Incapacity to stimulate demand**

...but at the same time, integral urban regeneration is the cornerstone of energy and green transition policies in the EU, and central to 2050 climate and energy goals.

**Financing and Technical assistance** are part of the solution
Financing building renovation

As of today, banks provide financing...:
- With inadequate loan terms (3-6 years)
- With high interest rates
- Demanding guarantees that not everybody can cope with

This translates into:
I. **High monthly quotas** (higher than salaries)
II. **No offering for vulnerable citizens**

**Market failure** - Not adequate financing

**Environment policy failure** in the residential sector

**Social failure** - Green transition discriminates the most vulnerable citizens
What about vulnerable citizens?

<table>
<thead>
<tr>
<th>Consumer Finance</th>
<th>Annual Percentage Rate 19.50%</th>
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<table>
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<tr>
<th>Credit card</th>
<th>Nominal interest rate 26.40%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>116,57 €/m.</strong></td>
<td>in 12 months Monthly interest 2.20%</td>
</tr>
<tr>
<td><strong>82,63 €/m.</strong></td>
<td><strong>Highlighted</strong> in 18 months Monthly interest 2.20%</td>
</tr>
<tr>
<td><strong>65,80 €/m.</strong></td>
<td>in 24 months Monthly interest 2.20%</td>
</tr>
</tbody>
</table>
The Formula

TA
(Technical Assistance)
Easy

AF
(Affordable Found)
Affordable

SF
(Smart Feasable)
Fair

T2R
(Trust to Renovate)
Trust-worthy
TECHNICAL SUPPORT: PPP
Our solution: MAS Opendela (Social Support Scheme)

Incomes are too low to access Ordinary Bank Loans
Currently they can only access subsidies and / or predatory credits

The majority of the population is excluded

AF 
(Affordable Found)
Affordable

SF  
(Smart Feasable)
Fair

Easy Access to financing from banks.
Ordinary Bank Loans do not represent an optimal solution, but if they want to renovate, they can do it.
SPECIAL 30 YEARS

100% INVESTMENT

LOANS (REFUNDABLE IN 10 YEARS)

INDIVIDUAL LOANS

WEIGHTED INCOME

MAS OPENGELA FINANCING (1:4)
Benefits?

1. Covers up to 100% of the project
2. Quick & easy request process
3. No link to life insurances or similar
4. No cancellation fee
5. Payment deadline up to 15 years
6. Nominal interest rate: 5.95% or 6.45%, depending on energy efficiency improvement ambition
People-centric approach leaving no one behind: 5 key messages

1. 2050 decarbonisation goals require a change of scope: From buildings to neighbourhoods – leave no place behind (integral urban regeneration)

2. Need to identify the right triggers for renovation

3. Multi-level, multi-stakeholder governance

4. Management of renovation projects through district-based OSS (providing TRUST for citizens)

5. Affordable financing requires a change of scope in financial markets – Public authorities’ role is key!

www.opengela.eus/en
Thank you - Eskerrik asko!

https://opengela.eus/en
Federica Fuligni
Energy Systems & Sustainability Business Development, RINA Consulting. Presenting the SunHorizon Horizon 2020 Project

#EUGreenWeek
2021 PARTNER EVENT
SUN COUPLED INNOVATIVE HEAT PUMP

Federica Fuligni

SunHorizon Project Coordinator

Energy Systems & Sustainability Business Development
Presentation Agenda

- OVERALL PROJECT SCOPE
- TECHNOLOGIES AND DEMOSITES
- SIMULATIONS AND TESTING
- WHAT’S NEXT
OVERALL PROJECT SCOPE
Background

Key Message
As stated in EU Strategy for H&C, “large-scale demonstration projects of energy-efficient and low/zero-carbon technologies are needed to help reduce technical and market barriers by providing robust data to evaluate their performance in each market segment”.

At this purpose, SunHorizon aims to be a breakthrough demonstration to market project involving 21 partners’ expertise and 8 Demonstration Sites all around EU, focusing its activities on “reducing system costs and improving performance as well as optimising existing technologies for H&C applications and for some of the most promising market segments”.

This Project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement N. 818329
An Industry Driven Consortium

- 5 top level Academic Polytechnic Institutions (RTOs)
- 12 industrial partners:
  - ✔ 5 Large Enterprise (LE)
  - ✔ 7 Small and Medium Enterprises (SMEs)
- 4 association and stakeholders acting as demo site
SunHorizon goal

TRL 7 – Sun and HP as baseload of EU H&C systems
6 Technologies to be integrated – 5 Technology Packages – 8 Demos
3 Research Pillars based on Functional Monitoring Data exploitation

DESIGN – MANUFACTURE - CONTROL
SunHorizon Timeline

PRE-DEMONSTRATION PHASE

M1-M18

1st October 2018

We are here

M6-M24

PROTOTYPE PHASE

M30-M48

DEMONSTRATION PHASE

M1-M48

REPLICATION AND PROMOTION PHASE

31st September 2022

2023 – MARKETABILITY OF SunHorizon SOLUTIONS

This Project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement N. 818329
TECHNOLOGIES AND DEMOSITES
SunHorizon Technologies

- Hybrid PV/T panels
- Hybrid adsorption
  Compressor cascade chiller
- Hybridization of HP, solar
  thermal and PV
- Thermal Compression HP
- Vacuum solar thermal panels
- Stratified thermal storage tank
The demo site needs are supplied with 5 different technology combinations, that combines the following technologies:

- **Heat pumps**
- **Solar technologies**
- **Storage**
- **Needs**
  - Space cooling
  - Space heating
  - Pool heating
  - DHW

---

*This Project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement N. 818329*
## SunHorizon: Demosites

<table>
<thead>
<tr>
<th>No</th>
<th>Location</th>
<th>Climate</th>
<th>Building type</th>
<th>SunHorizon TP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Berlin (Germany)</td>
<td>Cold</td>
<td>Small residential</td>
<td>TP1: TVP+BH</td>
</tr>
<tr>
<td>2</td>
<td>Nürnberg (Germany)</td>
<td>Cold</td>
<td>Large residential</td>
<td>TP2: DS+BH</td>
</tr>
<tr>
<td>3</td>
<td>Saint Cugat (Spain)</td>
<td>Warm</td>
<td>Tertiary (Civic centre)</td>
<td>TP3: TVP+FAHR</td>
</tr>
<tr>
<td>4</td>
<td>Madrid (Spain)</td>
<td>Average</td>
<td>Large residential</td>
<td>TP4: DS+BDR</td>
</tr>
<tr>
<td>5</td>
<td>Piera (Spain)</td>
<td>Warm</td>
<td>Small residential</td>
<td>TP4: BDR + PV</td>
</tr>
<tr>
<td>6</td>
<td>Verviers (Belgium)</td>
<td>Average</td>
<td>Tertiary (Sport Centre)</td>
<td>TP1: TVP+BH</td>
</tr>
<tr>
<td>7</td>
<td>Verviers (Belgium)</td>
<td>Average</td>
<td>Tertiary (Swim. pool)</td>
<td>TP2: DS+BH</td>
</tr>
<tr>
<td>8</td>
<td>Riga (Latvia)</td>
<td>Cold</td>
<td>Small residential</td>
<td>TP2: DS+BH</td>
</tr>
<tr>
<td>SunHorizon TP</td>
<td>Solar-HP integration concept</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP1</td>
<td>TVP+BH</td>
<td>Parallel integration; TVP for space heating and DHW; BH to cover non-solar periods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP2</td>
<td>DS+BH</td>
<td>Mixed solar-assisted/parallel integration; BH for space heating and DHW support; DS PV-T thermal output to assist BH evaporator and cover preheating of demand; + electricity for appliances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP3</td>
<td>TVP+FAHR</td>
<td>Solar-driven HP for cooling; TVP for space heating + DHW in winter + activation of the thermal compressor of the adsorption chiller (FAHR) for space cooling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP4</td>
<td>DS+BDR</td>
<td>Parallel integration; DS PVT thermal output to cover part of space heating + DHW demand + electricity production to cover reversible heat pump electricity consumption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TP5</td>
<td>TVP+BH+FAHR</td>
<td>Mixed solar-driven/parallel integration; TVP for space heating + DHW; BH to cover non solar periods; FAHR adsorption chiller activated only by BH or also by TVP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SIMULATIONS AND TESTING
# Results from simulations

<table>
<thead>
<tr>
<th>SunHorizon TP</th>
<th>Solar-HP integration concept</th>
<th>Results from (TRNSYS dynamic) simulations:</th>
</tr>
</thead>
</table>
| TP1           | TVP+BH Parallel integration | In Berlin: 43% of primary energy savings, and 37% of costs savings for the user  
In Verviers: ~30% of primary energy and costs savings. |
|               |                             |                                           |
| TP2           | DS+BH Mixed solar-assisted/parallel integration | In Nurnberg: ~ 33% of primary energy and costs savings, 80% of el. Self consumption ratio (SCR).  
In Verviers: ~25% of primary energy and costs savings, 95.1% of SCR  
In Riga: ~37% of primary energy and costs savings, 43% of SCR |
|               |                             |                                           |
| TP3           | TVP+FA Solar-driven HP for cooling | In Sant Cugat ~35% of primary energy and costs savings** |
|               | HR                          |                                           |
| TP4           | BDR + DS Mixed solar-assisted/parallel integration | In Madrid ~76% of primary energy and 84% of costs savings, and 37% of SCR  
In Piera ~59% of primary energy and 53% of costs savings, and 47% of SCR |
|               |                             |                                           |
| TP5           | TVP+BH + FAHR Mixed solar-driven/ parallel integration | TP only tested in simulation, in 3 locations and 2 types of buildings (tertiary and apartment building) |

*Test bench simulation just completed in May ‘21*
TP4-BDR system test principles and real hardware running in semi-virtual lab.

The semi-virtual lab test of TP4 from BDR for residential heating, cooling and DHW application was performed in March-April, in T3.3, following a custom **8-days test sequence** developed by CEA for Piera demo site in Spain.

**BDR developed TP4 new concept** for maximising the overall system emissions savings and the PV electricity self-consumption through BDR 6kW reversible air source heat pump and 440L water storage, 4m² thermal and 10m² PV flat solar panels (virtually emulated) with homogeneous tilted roof integration.

The analysis of the results is under work, it is already demonstrating nearly **60% annual primary energy savings** and **45% renewable energy ratio** of the real controller and hardware, very close to the estimated values by dynamic TRNSYS simulation.
WHAT’S NEXT
The test of TP2 involves **Ratiotherm** (solar heat distribution and 1.3 m³ stratified thermal storage, controller with electricity self-consumption strategy) and **Boostheat** (20kW thermal compression gas fired CO₂ heat pump) as real hardware components while 50m² Dualsun solar **PVT panels** are virtually emulated, as well as the building and user heat and electricity demand.

**The TP2 installation in CEA INES semi-virtual lab is finished.** A custom 9-days test sequence was developed by CEA to assess TP2 performance, mainly regarding gas and electricity consumptions in Riga Sunisi demo site in Latvia. The test setup already allows gaining experience for fail proof connections and wiring recommendations of Ratiotherm and Boostheat altogether, and validating the proper operation of controllers.
The Sunhorizon demo pilots of TP3 in Sant Cugat, TP1 in Verviers and Berlin are relying on TVP solar LT power high vacuum flat solar thermal panels.

Before being demonstrated also in INES PFE professional training platform in summer 2021, CEA is about installing 8m² LT power panels on its sun tracking outdoor solar test bench to get preliminary experimental performance assessment.

Tests will happen during a few days in June with appropriate weather conditions, in Chambéry, France. The resulting LTpower performance test datasets and numerical model are to be used in forthcoming TPI semi-virtual test or further TVP solar sizing tools and performance simulations.
SunHorizon: monitoring and control

- Optimised sensoring/monitoring platform for:
  - Control purposes
  - Design under uncertainty tool to reduce CAPEX (RINA-C)
  - Predictive maintenance strategy (reduce OPEX)

- Developing an integrated smart control and surveillance system that combine
  - Monitoring
  - Decision-making strategies
  - Prediction technique
  - Self-learning
  - End-users interaction

Robust design tool developed by RINA-C
SunHorizon: A demonstration to Market Project

You are here

Key Exploitable Results

<table>
<thead>
<tr>
<th>TVP LT Solar Thermal</th>
<th>DS optimized PV/T</th>
<th>BH Thermal Compression HP</th>
<th>FAHR Adsorption HP</th>
<th>BDR Reversible HP for PZH</th>
<th>RATIO Enhanced TES</th>
<th>SE Functional Monitoring</th>
<th>SunHorizon Predictive Controller and DUU tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>5/6</td>
<td>5</td>
<td>5</td>
<td>5/6</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

SunHorizon Techs 5/6

You are here

Target Markets

EU Entry Markets

Project Begins

Non-Technological Barriers:

- Definition of best practices and measures for the installation of the SunHorizon at building level
- Standardization of control and monitoring systems protocol also for smart endpoint user interface
- Increase social acceptability also via dedicated policies/supporting schemes (SunHorizon Positioning Paper thanks to ENHR)
- Health and Safety Certification for the integrated system

Manufacturing & Installation

- Upscale the production capacity of DS, BH, TVP, RATIO, BDR, FAHR systems
- Develop a dedicated integration scheme and procedure for a standardized system for single technologies and technology packages
- Reduce installation timing and costs
- Demonstration of the SunHorizon in larger scale and with higher solar ratio
- Application in other countries (Environmental, logistics and energy market scenarios)

Further Demonstrations

- Start to promote the SunHorizon HW&SW technologies and TPs among building owners/managers, ESCOs, energy utilities, H&C manufacturers etc
- Selection of the first entry markets: Southern EU countries with high solar irradiation and presence of a robust gas grid
- Assessment of the final business model for the commercial exploitation of the SunHorizon H&C Technologies

Marketing

This Project has received funding from the European Union’s Horizon 2020 Research and Innovation Programme under Grant Agreement N. 818329

11
## Beyond SunHorizon – Key Exploitable Results

<table>
<thead>
<tr>
<th>#</th>
<th>Results</th>
<th>Main partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vacuum Solar Thermal Panels</td>
<td>TVP SOLAR</td>
</tr>
<tr>
<td>2</td>
<td>Hybrid PV/T panels</td>
<td>DS - DUALSUN</td>
</tr>
<tr>
<td>3</td>
<td>Hybrid adsorption/Compressor cascade chiller</td>
<td>FAHR, ITAE</td>
</tr>
<tr>
<td>4</td>
<td>Thermal compression HP</td>
<td>BH - BOOSTHEAT</td>
</tr>
<tr>
<td>5</td>
<td>Hybridation of HP, solar thermal and PV</td>
<td>BDR THERMEA</td>
</tr>
<tr>
<td>6</td>
<td>Stratified thermal storage tank</td>
<td>RATIOTHERM</td>
</tr>
<tr>
<td>A</td>
<td>Self-Learning and In advance controller</td>
<td>CARTIF, CEA, <strong>RINA-C</strong>, RATIO, SE, CW, IES</td>
</tr>
<tr>
<td>B</td>
<td>Smart End User Interface</td>
<td>SE, CW</td>
</tr>
<tr>
<td>C</td>
<td>SunHorizon Tool Suite and Cloud Database</td>
<td>SE, CEA, CARTIF, IES, <strong>RINA-C</strong>, EXE, H&amp;C manuf.</td>
</tr>
</tbody>
</table>

**Legend:**
- Solar Panel
- Heat Pump
- Storage
Beyond SunHorizon – Exploitation strategies

Screening of potential BM patterns after the end of the project

<table>
<thead>
<tr>
<th>Exploitation strategies at project level (technology package driven logic)</th>
<th>Exploitation strategies at partner level</th>
</tr>
</thead>
</table>

-内部 Agreement among technology providers
- Roles of partners towards clients’ engagement
- Pricing and revenue models

- Exploitation Model

Roadmap towards the commercialization of the SUNHORIZON technologies

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...QUESTIONS?

Federica Fuligni – SunHorizon Project Coordinator
Energy Systems & Sustainability Business Development
Federica.fuligni@rina.org
#EUGreenWeek
2021 PARTNER EVENT

11:10 - 12:15  
Project examples: Renovation and One Stop Shop initiatives + Q&A

Janet Doyle  
Finance & Project Coordinator, Superhomes. Presenting the SuperHomes2030 Horizon 2020 Project

Jose Ramón López  
Energy Agency of the Basque Government. Presenting the OpenGela Horizon 2020 Project

Federica Fuligni  
Energy Systems & Sustainability Business Development, RINA Consulting. Presenting the SunHorizon Horizon 2020 Project

Dan Stefanica  
Head of Projects, EHPA
Thomas Nowak
Secretary General, EHPA

#EUGreenWeek
2021 PARTNER EVENT
EU energy system integration strategy

- 10 – 15 mio office & commercial buildings
- 90 mio residential single family units
- 15 mio residential multi family units
- 65% heat pumps
- 40% heat pumps
- 7-10 mio heat pumps
- 42 mio heat pumps

+ industry approx. 200 TWh = 0.1 mio

todays HP stock \(\times 4\)

EHPA | Superhomes and HP4all joint presentation | 9.6.2021
• Decarbonisation of heating and cooling
• Double the renovation rate
• Foster deep energy renovation: schools, public buildings
• Renovate the 35 million least performing buildings by 2030
• Allow for affordable and sustainable design via New European Bauhaus
By 2050, over 85% of buildings are zero-carbon-ready, reducing average useful heating intensity by 75%, with heat pumps meeting over half of heating needs.
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