WeConnect #3

The Power of Energy Refurbishment

26th February 2025

Fellow Cities

Exchange Programme

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PEOPLE-CENTRIC SUSTAINABLE NEIGHBOURHOODS

Exploring a holistic approach to Energy Refurbishment

Connecting all key components for sustainable transformation

Energy Renaissance: A Croatian & Zagreb Perspective:
Marko Zlonoga (REGEA)

***Innovative* Energy Refurbishment & Lessons from Europe :**
Bard Rama, PhD (ICLEI)

How Łódź is Powering Urban Regeneration:
Aleksandra Trzcinska (City of Łódź)

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Agenda

Time	Topic
10:00 - 10:10	Welcome everyone!
10:10 -10:25 10:25 -10:30	***Innovative* Energy Refurbishment & Lessons from Europe :** Bard Rama, PhD (ICLEI) Q/A
10:30 - 10:45 10:45 -10:50	**Energy Renaissance: A Croatian & Zagreb Perspective:** Marko Zlonoga (REGEA) Q/A
10:50 - 11:05 11:05 -11:10	**How Łódź is Powering Urban Regeneration:** Aleksandra Trzcinska (City of Łódź) Q/A
11:10 -11:15	Comfort Break
11:15 -12:00	Split, connect and create: **breakout style**!
12:00 -12:25	Wrap up and open floor discussion
12:25 - 12:30	Closing remarks & Next Steps

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Innovative Energy Refurbishment & Lessons from Europe :

Bard Rama, PhD (ICLEI)

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Energy Refurbishment in Urban Regeneration

- **Urban Regeneration Context -** Sustainable urban regeneration aims for holistic neighbourhood transformation.
- **Climate Goals -** Achieving climate neutrality is a crucial objective for sustainable cities.
- **Energy in Buildings -** Buildings are major energy users in cities – Refurbishment is essential for climate goals.
- **European Policy Context -** The revised EPBD and zero-carbon targets are shaping the future of building renovation in Europe.

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Defining "Innovative" Energy Refurbishment in Urban Contexts

- **More than just insulation -** It's not only about better windows and wall insulation (though important!).
- **Holistic Approach -** Integrating technology, finance, social aspects, policy.
- **People-Centricity -** Solutions that benefit residents directly, improve quality of life, address energy poverty in regenerated neighbourhoods.
- **Systemic Change -** Refurbishment as part of wider urban transformation – mobility, green spaces, local economy within urban regeneration schemes.

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Technological Innovation - Smarter Buildings, Better Performance & EPBD Ready

- **Advanced Materials & LCA -** High-performance materials with focus on Life Cycle Assessment (LCA) and embodied carbon, moving towards zero-carbon goals.

- **Smart Building Technologies for Optimization & EPBD Reporting -** BMS, smart meters, etc. – emphasize their role in monitoring & verifying energy performance for EPBD compliance and achieving zero-carbon operation.

- **Renewable Energy Integration for Zero-Carbon -** Prioritize on-site renewables (solar PV, heat pumps) to drive towards zero-carbon building operation as per EPBD.

- **Focus on Deep Renovation & Zero-Carbon Pathway -** Aiming beyond NZEB, towards zero-carbon ready buildings, aligning with long-term EPBD targets.

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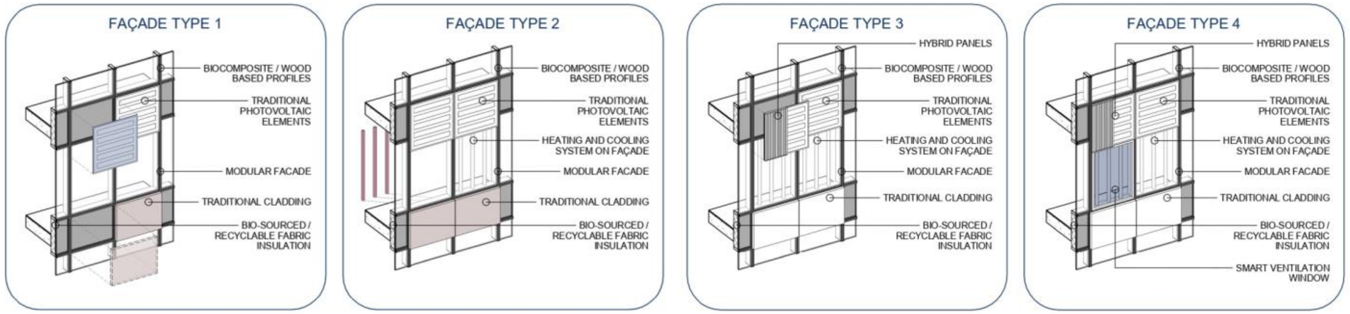
Case studies: AEGIR project

AEGIR

AEGIR Project objectives:

- Design multifunctional (passive & active) scalable building energy renovation envelope packages to answer to a different range of need.
- Develop and implement an ecosystem of digital services in a common data environment.
- Demonstrate AEGIR technical solution through its implementation and monitoring in four different building typologies (residential, office and educational) located in different climatic zones.

Develop modular, renewable, and industrialized building envelopes for energy renovation



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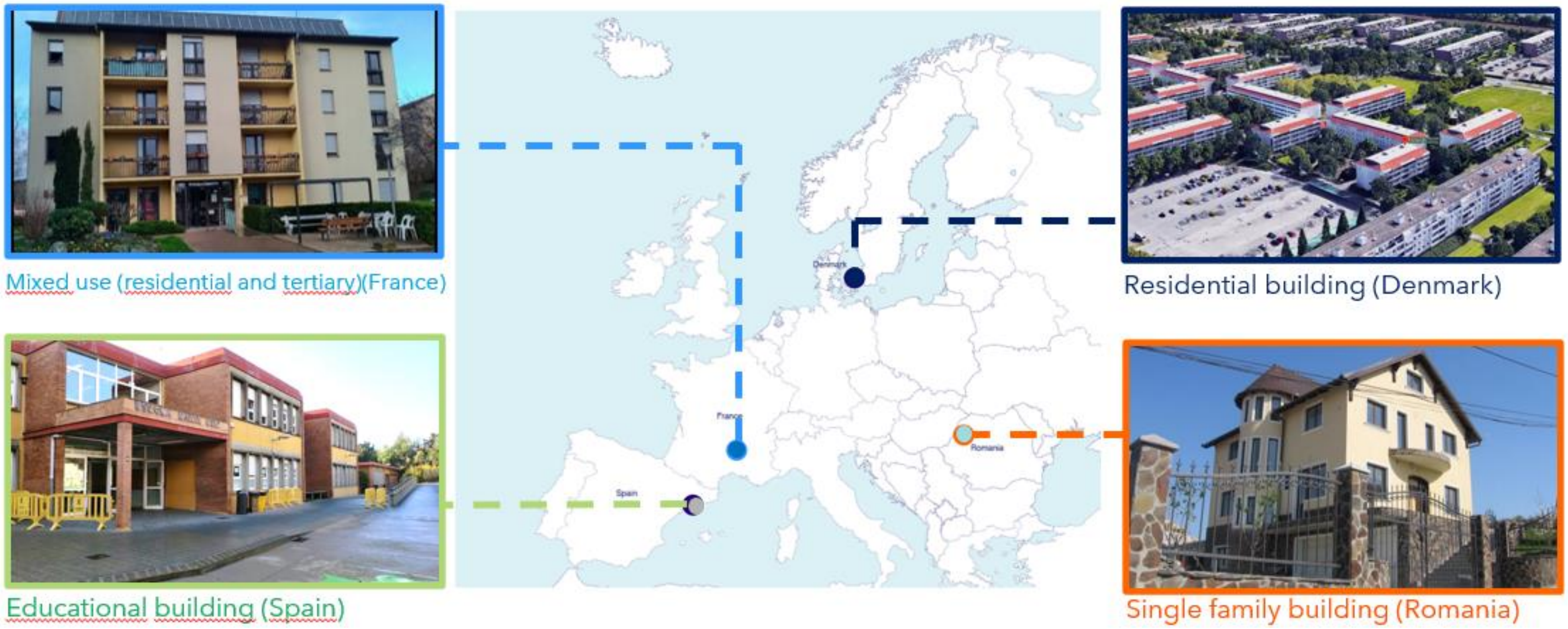
Case studies: AEGIR project

AEGIR

AEGIR demonstrators:



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Case studies: AEGIR project

AEGIR

AEGIR Project technologies:

Construction Components
1. Scalable prefabricated renovation packages approach
2. Bio-composite profile system for prefabricated modules of envelope
3. Timber profile system for prefabricated modules of envelope
4. Bio-based thermal insulation system
5. Acoustic insulation system based on recycled fabric materials
6. Ventilation ducts integration in envelope solutions for retrofitting
7. Smart Windows

Energetic components

8. Flexible PV system
9. PVT panels
10. Second life batteries

Digital eco-system

11. Common Data Environment (CDE)- digital framework.
12. Digital services for a cost-effective renovation design
13. Façade modules configuration service. Façade Cloud Configurator
14. On-site building data capture system. PointPix Reality capture
15. Automated generation of Digital Twin. Ag2DT
16. Augmented reality for execution validation
17. Energy metamodels and artificial intelligence for building O&M

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Social and Participatory Innovation - Refurbishment for Affordability and Equity

- **Co-creation and User-Centric Design –** Importance of participatory design to ensure refurbishment meets user needs and preferences, especially regarding comfort and affordability.
- **Targeted Programs for Energy Poverty Mitigation -** Specific refurbishment programs designed to drastically reduce energy bills for low-income households, addressing energy poverty directly.
- **Financial Support and Advice for Vulnerable Households -** Integrated packages including financial aid, energy advice, and practical support to ensure successful and affordable refurbishment for all.
- **Community-Based Approaches for Affordability -** Collective refurbishment schemes, energy cooperatives, and community ownership models to reduce costs and improve affordability.

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Financial Innovation and Tools for Scalable Renovation

- **EPC for District-Scale Renovation -** Using EPC models to drive large-scale, district-wide refurbishment, maximizing impact and efficiency in urban areas.
- **Aggregation and Bundling Tools -** Digital platforms and tools to aggregate smaller building projects into larger investment packages, reducing transaction costs and attracting finance for urban regeneration.
- **Decision Support Tools (DSTs) for Municipalities -** Highlighting the use of DSTs to prioritize renovation interventions across the city, optimize budgets, and track progress for strategic urban planning.

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Financial Innovation & Tools for Scalable Renovation

- **BIM for Planning and Cost Optimization -** Role of Building Information Modelling (BIM) in planning complex refurbishment projects at scale within urban regeneration, improving cost control and project management.

- **Innovative Financing Blends -** Combining public and private finance, EU funding, and citizen investment to create robust and scalable financial solutions for urban regeneration.

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Key Takeaways - Powering Sustainable & People-Centric Urban Regeneration

- **Embrace a Holistic Approach -** Integrate technological, social, financial, and policy innovation in urban regeneration projects for maximum impact.
- **Prioritize People and Co-creation** - Actively involve residents in energy refurbishment initiatives within urban regeneration schemes for equitable and successful outcomes.
- **Explore Innovative Financing -** Consider various mechanisms to overcome financial barriers in urban regeneration contexts and ensure scalability.
- **Focus on Deep Renovation -** Aim for ambitious energy savings in building refurbishment within urban regeneration, to contribute significantly to climate goals and EPBD compliance.
- **Share and Learn from Europe -** Leverage European examples and knowledge exchange to advance energy refurbishment in urban regeneration projects.

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Thank you for your attention!

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