

Session: Scaling up sustainable renovations – AEGIR perspectives

Agenda:

- Sustainable renovations based on solutions coming from the AEGIR project (Tecnalia)
- Integration of active technologies in envelope (CEA with support of Fraunhofer and DualSun)
- AEGIR integrating digital technologies and a constellation of services (CSTB)
- Designing for Impact: Modular and Digital Innovations in Sustainable Renovations (UNStudio)
- A Roadmap to circular renovation solutions: Integrating urban mining and reuse strategies in the design and construction of facade renovation system (TU Delft)
- Open dialogue: Scaling Up Sustainable Renovations with AEGIR Solutions (ICLEI)
- Interactive part of the session



Kanton Bern
Canton de Berne



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ADVANCED
BUILDING SKINS

Title:

DigitAl and physical incrEmental renovation packaGes/systems
enhancing envlronmental and energetic behaviour and use of
Resources.

WebPage: <https://aegirproject.eu/>

GA N°: 101079961 Start: 01/10/2022; End: 30/09/2026

AEGR consortium

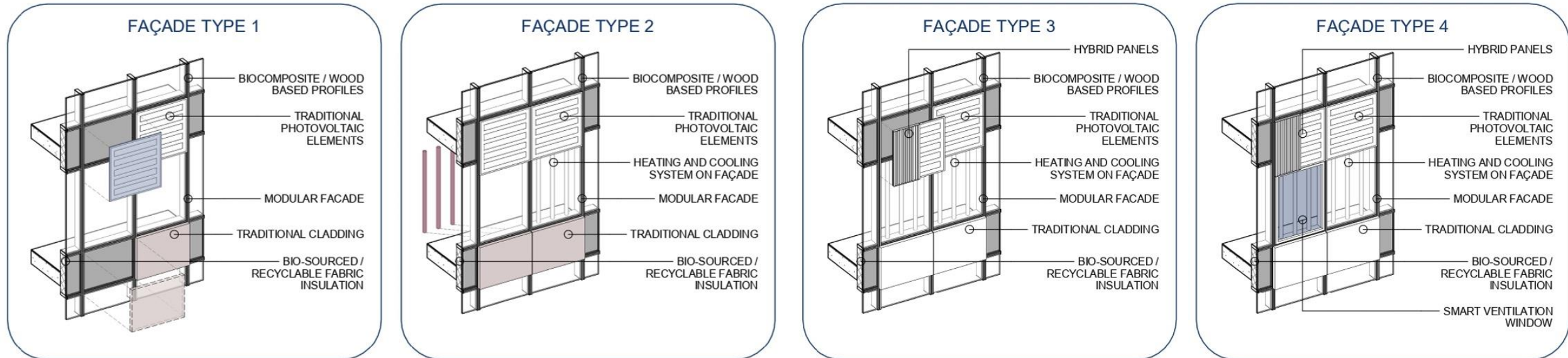
MATERIALS	COMPONENTS	SYSTEMS	DIGITAL	DESIGN	CONSTRUCTION	DEMOS	ASSOCIATIONS / DISSEMINATION	RTOS
  	   	 	 	 		   	    	     

- Partners: 29; Countries: 9
- Duration: 48 Months
- Start: 01/10/2022; End: 30/09/2026



1. AEGIR develops modular and industrialized solutions for energy-efficient building renovation, reducing costs and time.
2. It integrates renewable components and smart energy management to optimize energy use and enable nearly Zero Energy Buildings (nZEB).
3. Based on four renovation packages, the solution is adaptable to different building types and climates across Europe.
4. A comprehensive ecosystem of digital tools and services ensures a seamless process from design to operation.
5. Sustainability-first approach, using bio-based, recycled materials and circular economy principles to reduce embodied carbon and environmental impact.
6. User-centric design, ensuring affordability, improved indoor comfort, and engagement of end-users in energy efficiency and resource-conscious living.

1.- Design multifunctional (passive & active) scalable building energy renovation envelope packages to answer to a different range of needs.



Technologies from AEGIR Project

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

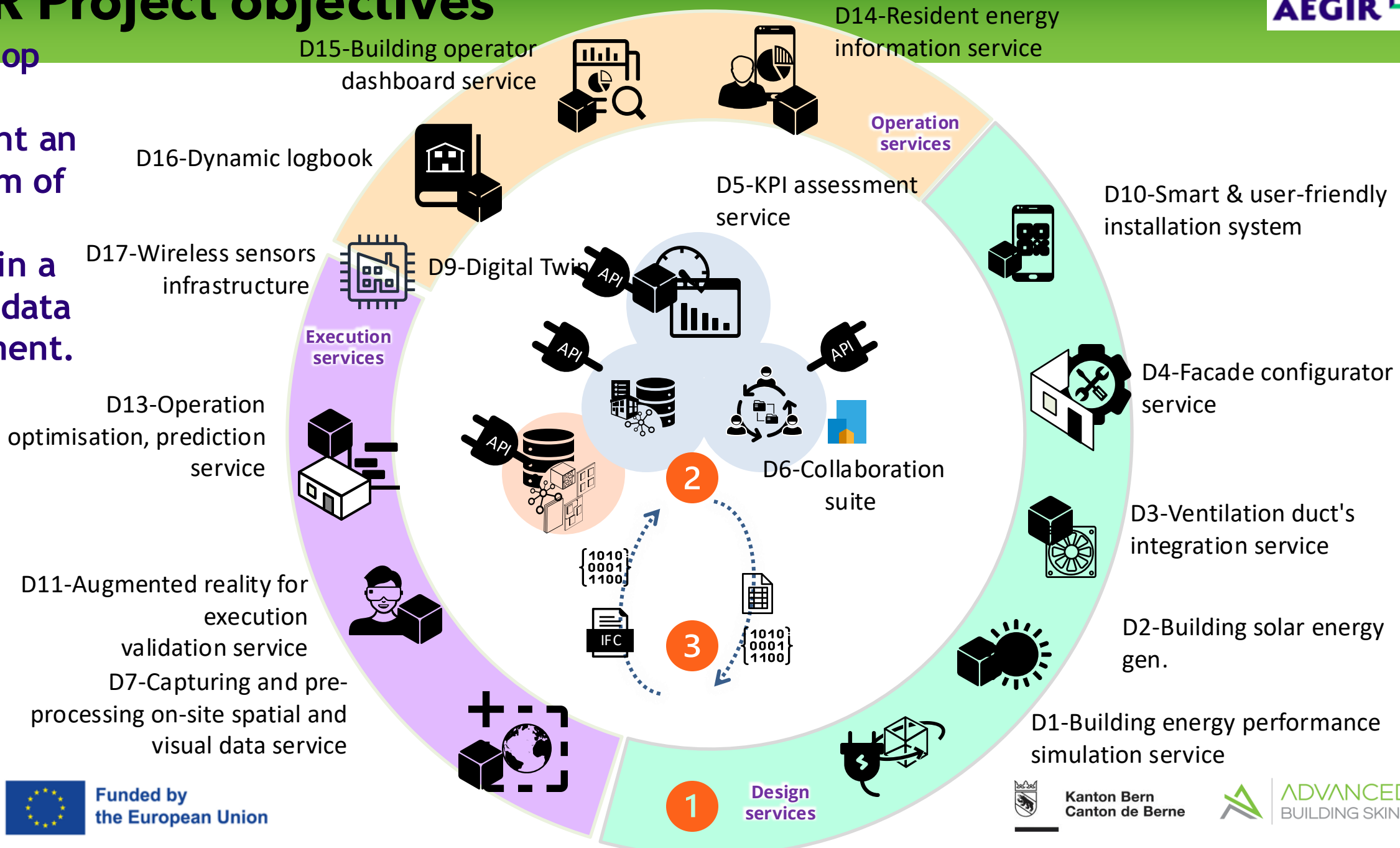
Digital eco-system

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



AEGIR Project objectives

2.- Develop and implement an ecosystem of digital services in a common data environment.



AEGR Project objectives

3.- Demonstrate AEGIR technical solution through its implementation and monitoring in four different building typologies (residential, office and educational) located in different climatic zones.



Denmark: Social housing



France: Residential homes for elderly people

AEGR Project objectives

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SPAIN: Educational building

Romania: Single family house

AEGR will improve...

& How?

1 The way we DESIGN building renovations	Using new digital services to collect the data to reduce time, ease and improve efficiency of design step . Increase of the percentage of retrofitting actions due to the system.
2 ENERGETIC AND SUSTAINABLE BEHAVIOR and investments	Using industrialized and modular systems, digital tools and new materials, renewable technologies, and systems. Based in simulations AEGIR project could contribute to trigger an additional 370 M€ in sustainable energy investments on the period 2025-2030.
3 Operational behaviour during LIFETIME	Based on digital twin models allowing the management of the energy generated at dwelling and building level.
4 DECREASE of on-site construction / renovation WORK TIME.	Reduction of time achieved by the AEGIR process can be around 50% compared with the initial time (from 19 Months to 9).
5 Improved AFFORDABILITY of sustainable renovation and RES systems in buildings	Reduction of 50% in the costs of retrofitting the building
6 Improvement of indoor environment and USER COMFORT and satisfaction	CO₂ level in the spaces can be significantly decreased from values around 2000 ppm to 500 ppm after the retrofitting. Minimum indoor temperatures rising from 17°C to 19°C in winter and maximal indoor temperatures staying below 26°C after retrofit.
7 Reduction of EMBODIED ENERGY	From 10% to 53% depending on the strategy. Higher buildings' performance with lower environmental impacts through increased rates of holistic renovations -> Long term: Emission savings between 18.000 to 46.000 kilotons CO2 equiv.
8 Use of RECYCLED AND BIOSOURCED MATERIALS	Replacing traditional materials for the structure (metals) by biocomposites components and for the insulations with recycled and biosourced insulations (using fabrics and biobased insulations)
9 CIRCULAR ECONOMY	Designing the use and installation of the different components of the system considering all the phases of the construction process (Material production, Design, Construction, Use, End of life/Recyclability)

THANK YOU FOR YOUR ATTENTION!

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