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Aktuelle Entwicklungen im Bereich neuer Materialien für Wärmedämmputze „Wall-ACE“ und „EASI ZERo“

Sievert Baustoffe SE & Co. KG | Laudenbacher Weg 8, 97753 Karlstadt | Tel. +49 9353 9855143 | Tina.Oertel@sievert.de| sievert.de

Aktuelle Entwicklungen im Bereich neuer Materialien für Wärmedämmputze „Wall-ACE“ und „EASI ZERo“

Dr. Tina Oertel, Senior Teamleiterin F & E - Fassadensysteme

Bamberg, 12.09.2023

Agenda

1. Einleitung
2. Wall-ACE Project … Novel Wall Insulation Systems
3. EASI ZERo System … Building Envelope System For Efficient Zero Energy Renovation

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1/3 Einleitung

VDPM Roadmap zur Klimaneutralität

Abbildung 58: Der Weg zur Klimaneutralität für die Dämmsystem-, Putz- und Mörtelindustrie auf einen Blick.

https://www.vdpm.info/wp-content/uploads/2023/04/Downloads-0011_roadmap-a4_korr.pdf , Seite 74

Mit Umsetzung dieser Maßnahmen sind Innovationen in der Branche verbunden

Phrase of the day

„Ich habe gelernt, dass man nie zu klein dafür ist, einen Unterschied zu machen.“

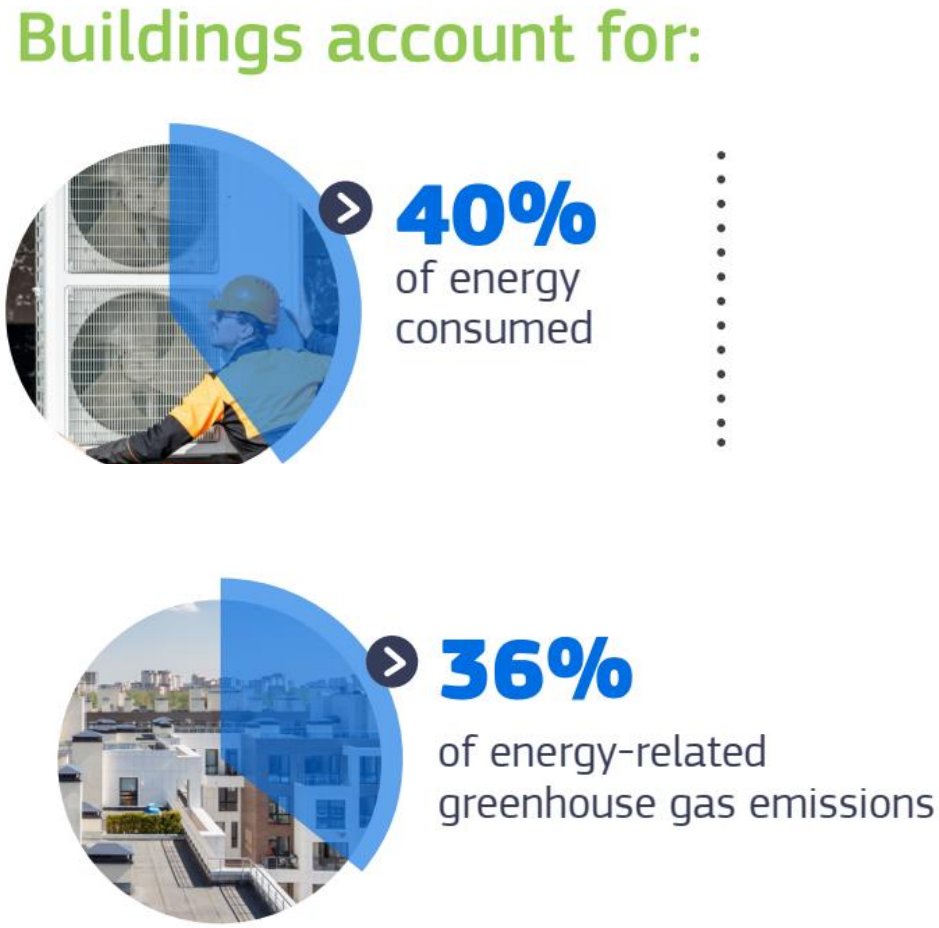
Zitat: Greta Thunberg

2/3 Wall-ACE Project … Novel Wall Insulation Systems

Focus on the building envelope

- Buildings are part of the European Green Deal since…

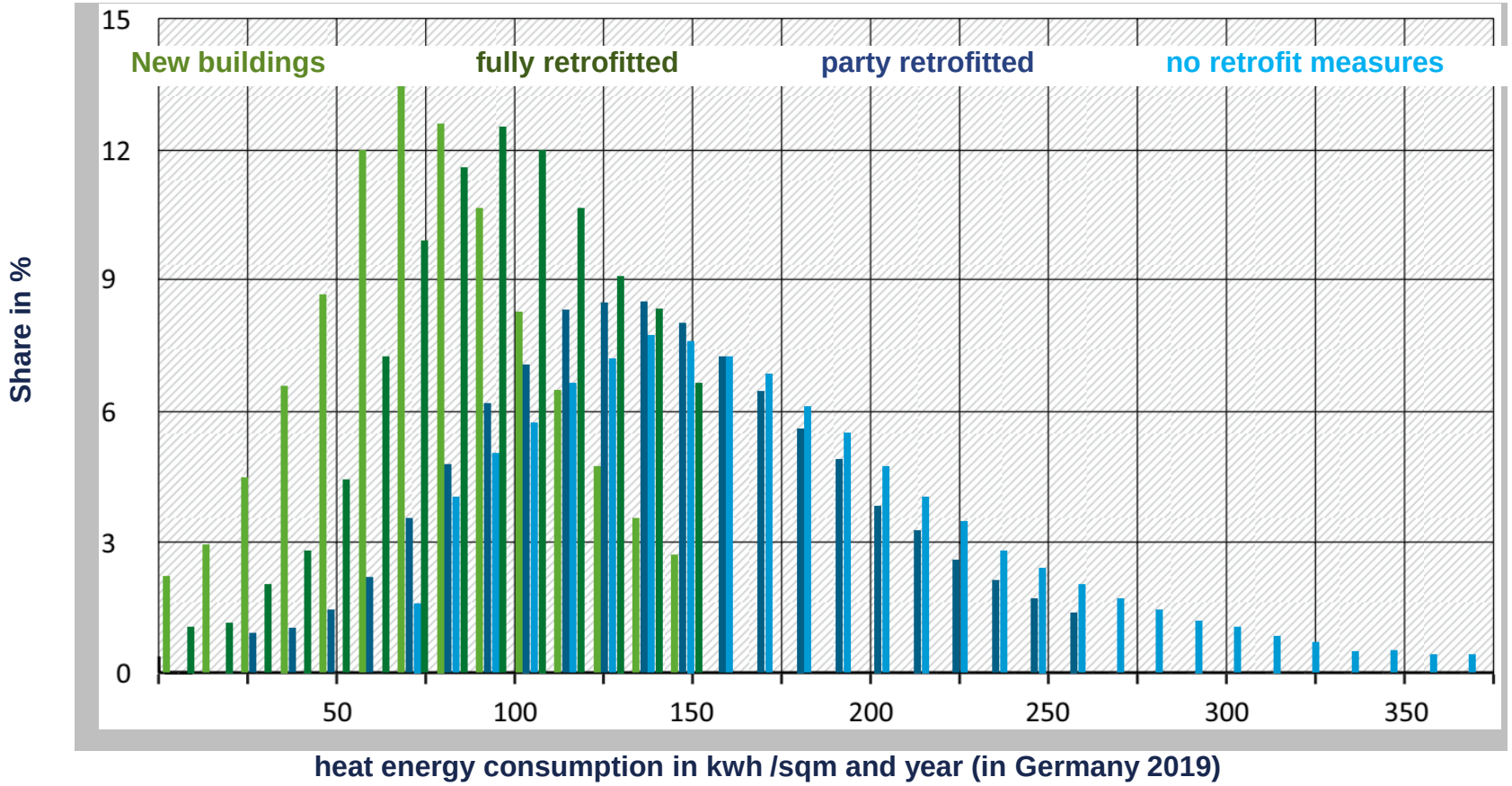
- The german association for ETICS, renders and mortars (VDPM) concludes that we need to make our home “low temperature ready” before we think about improving the heating installation
- Therefore, we have to improve the building envelope and the materials being used to build it



Copyright European Comission, p. 1, 2021: “Buildings_Factsheet_EN_final.pdf”

Focus on the building envelope

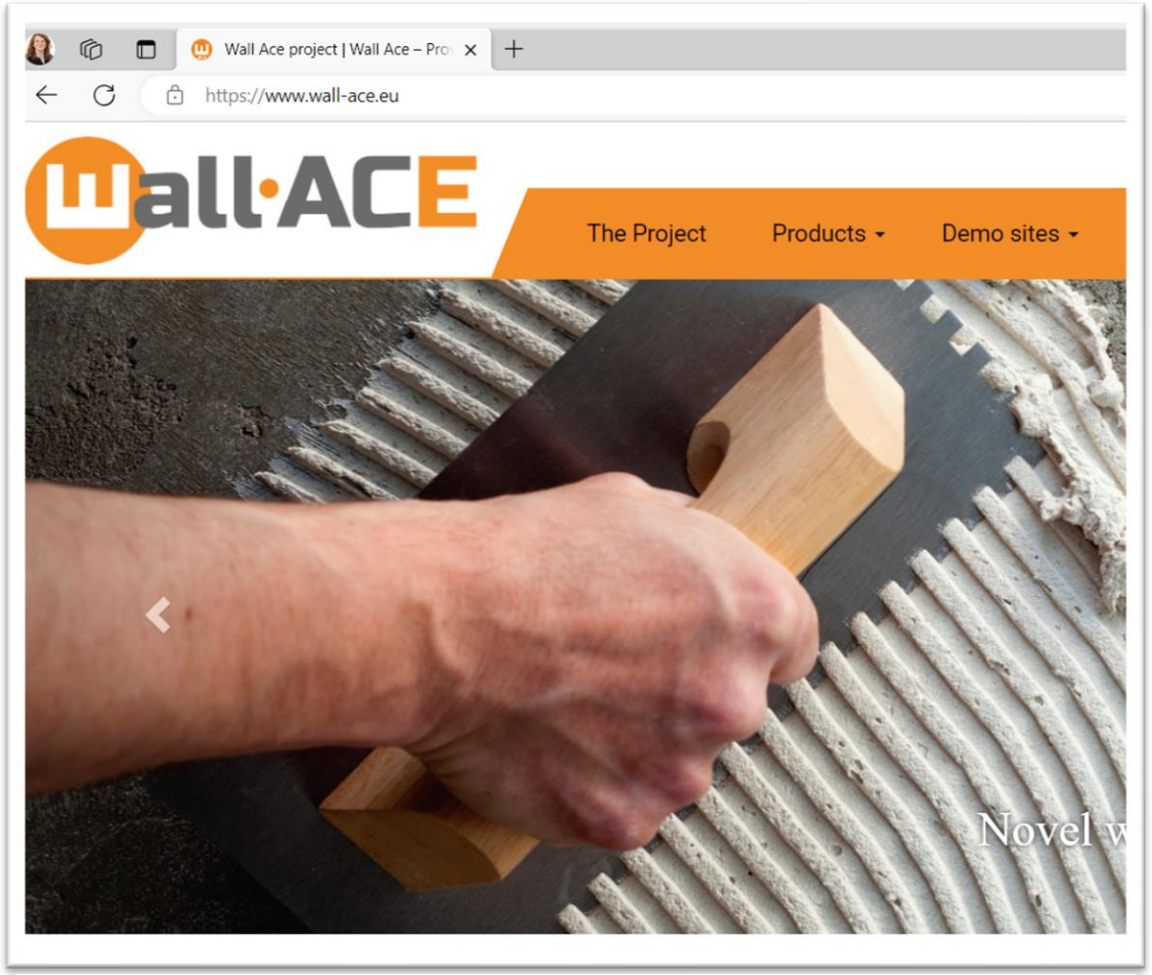
- A huge number of poorly insulated buildings exist in Europe
- Up to 35% heat loss of a building is caused through poor wall insulation (25% roof, 10% windows)
- The objective of the project is the development of a system of new advanced sustainable insulation products that help to improve the insulation properties of the building envelop



Source: https://www.wall-ace.eu/ and Broschure Umweltbundesamt Germany " Wohnen und Sanieren Empirische Wohngebäudedaten seit 2002" , p.12, 2019

Overview

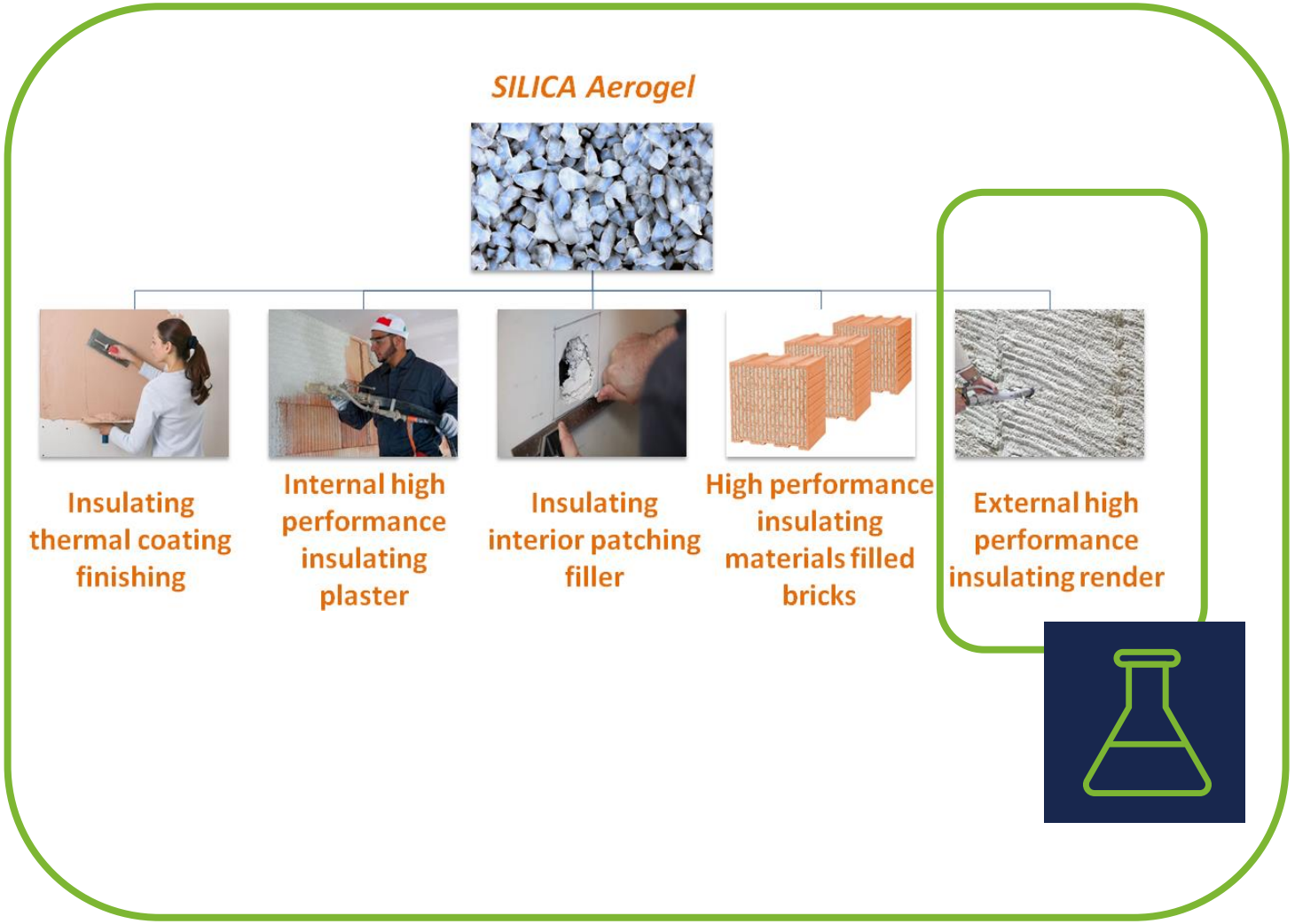
Vorstelungsvideo: https://www.youtube.com/watch?v=3fIugMCr9G0



Homepage: https://www.wall-ace.eu/

Project objectives

- Develop high energy efficient mineral based materials
- Strongly reduce the energy consumption and CO_2 emission
- Improved indoor air quality, durability and sustainability
- Develop affordable and high replication potential for Europe
- Test and asset the products and systems in real condition and at building scale
- Certification and standardization of highly efficient new systems
- The products should be applicable for new buildings as well as in retrofitting buildings



Products developed in the Wall-ACE project [image from https://www.wall-ace.eu/the-project/]

External High Performance Insulating Render

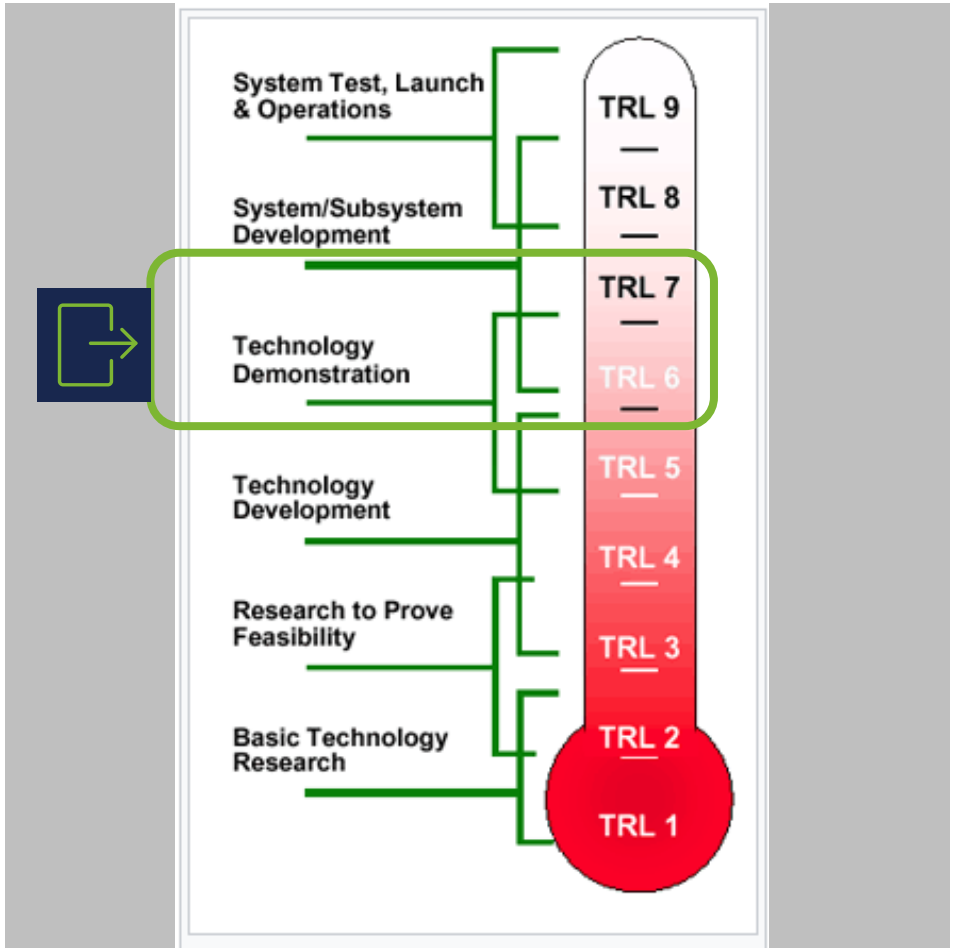
- premixed
- ready to use
- highly insulating
- sprayable mortar
- based on silica-aerogel and inorganic binders

Close-up, fresh mortar, dfresh ~ 350 kg/m^3

TRLs - Technology readiness levels

- **Level 5** – Component validation in relevant environment
- **Level 6** – System/subsystem model or prototype demonstration in a relevant environment
- **Level 7** – System prototype demonstration in practice

✓ **At the end of the project the external insulation render achieved technical readiness level (TRL) 7.**



https://web.archive.org/web/20051206035043/http://as.nasa.gov/aboutus/trl-introduction.html

External insulation render achieved insulation target

- The thermal conductivity value of the external render is 0.030 W/(m*K).
- Aerogel content of 49 wt% and 30 wt% has been used.
- The external insulation render samples have been produced on a commercial scale manufacturing line.
- No serious material defects such as segregation or excessive attrition of the lightweight components were observed after production.
- Installation test at construction site in Karlstadt under real conditions:
  - 80m²
  - Wet mixing and spraying of the render on façade with PFT G4 plastering machine was successful
  - Plaster showed good processing properties

Addition of binders and light-weight aggregates to the plant mix

Application test at real building

External insulation render ready for application tests

- Sensor based measurements of single components an the whole HONEST- sytem have been done at test facilities of our project partners.
- Bench marks at Agitec Switzerland
- EOTA chamber tests at University Stuttgart
- Performance tests at the FACT-cell from CEA-INES
- **P**seudo **A**diabatic **S**hell tests at PASSYS-test cell to evaluate thermophysical parameters at CEA-INES

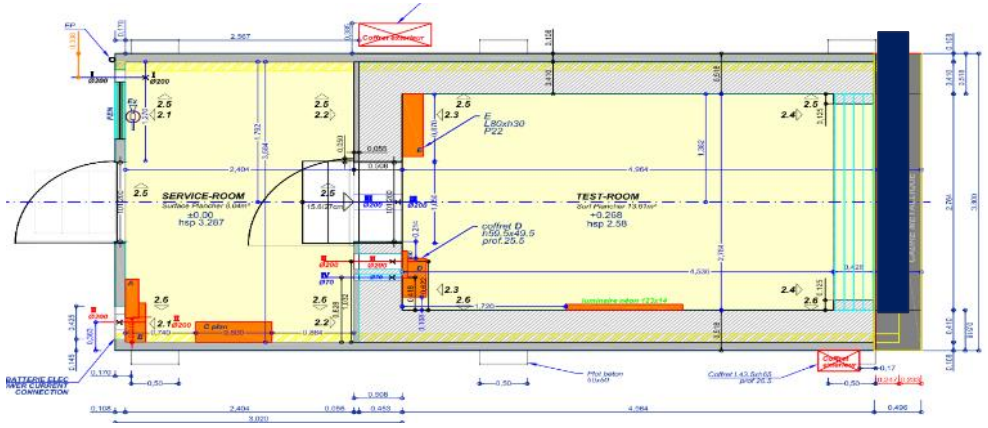
Switzerland

Germany

France

Overview of demo sites

Setup PASSYS test cell



Aerogel filled bricks installation

External insulating render

5 different patching fillers

Conclusions

- To achieve significant better insulation properties, the wall has to be considered as a system. Single component optimization will lead to limited improvements.
- Utilization of high-tech materials may lead to remarkable technical performance e.g. $\lambda_{10,\ dry,\ mat} < 30$ mW/m*K for an external thermal insulation render.
- High GWP values (global warming potential) of raw materials used in the recipes will be compensated over a lifetime of +30 years by saving heating energy.
- Renders containing a lot of air voids to improve insulation properties may require a surprisingly long time to evaporate moisture and hence to provide their full insulation properties.
- European building material standards may need to become modified to allow new material to enter the market.
- Replication potential is high for renovation market. For new buildings the application might be limited due to competing systems in the market.

Consortium members

No	Name	Short name	Country
1	QUICK-MIX PUTZTECHNIK GMBH & CO. KG	QUICK-MIX	Germany
2	ENERSENS SAS	ENERSENS	France
3	TOUPRET SA	TOUPRET	France
4	VIMARK SRL	VIMARK SRL	Italy
5	LEIPFINGER-BADER KG	LeipfingerBader	Germany
6	UNIVERSITAET STUTTGART	USTUTT	Germany
7	POLITECNICO DI TORINO	POLITO	Italy
8	COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA	France
9	EFFINART SARL	EffinArt	Switzerland
10	BUILDING RESEARCH ESTABLISHMENT LTD	BRE	United Kingdom
11	AGITEC AG	AGITEC AG	Switzerland
12	AGENZIA TERRITORIALE PER LA CASA DEL PIEMONTE CENTRALE	ATC Torino	Italy
13	WAVESTONE ADVISORS	Wavestone	France

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723574

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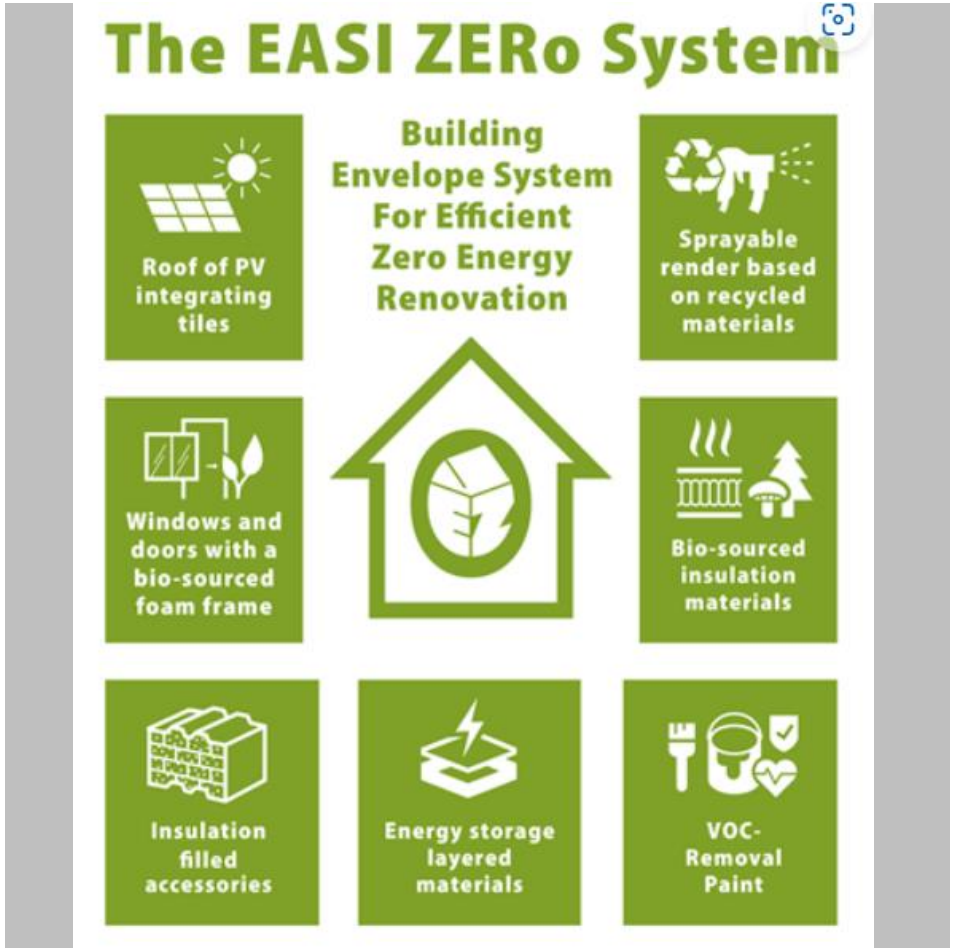
3/3 EASI ZERo System …Building Envelope System For Efficient Zero Energy Renovation

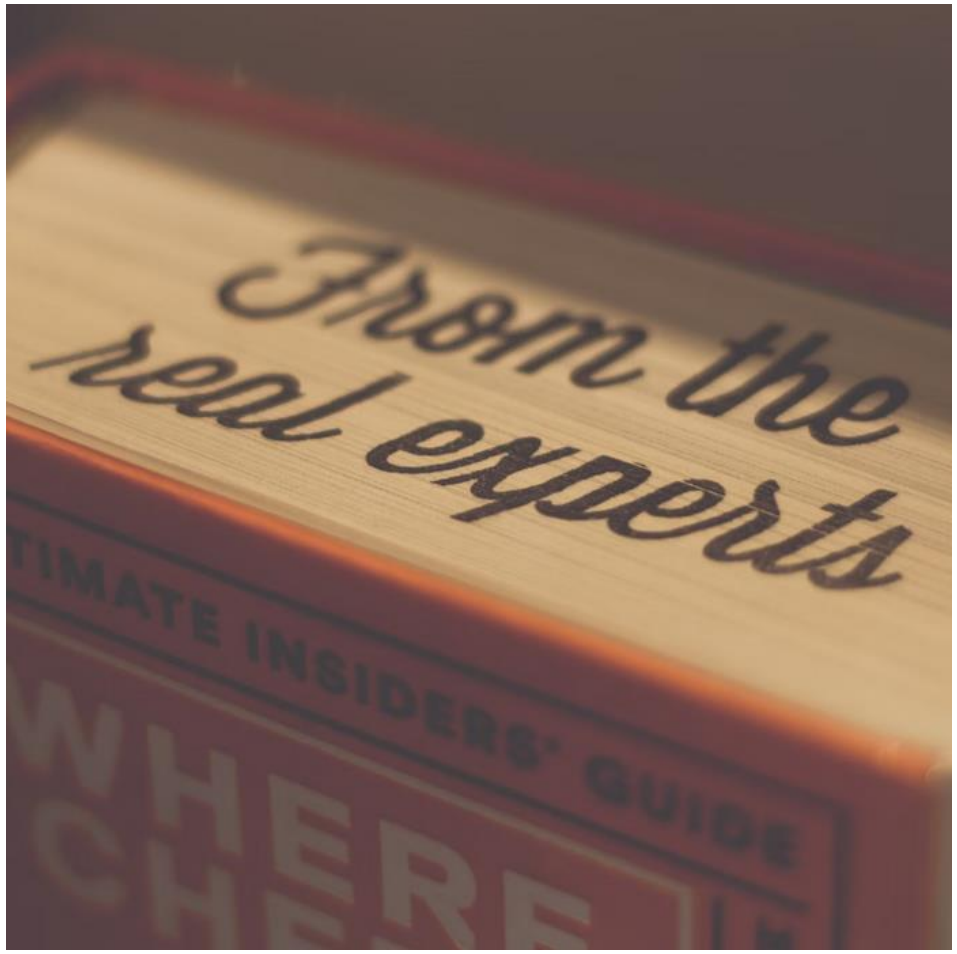
PROJECT FACTS



- Project start: December 2022
- Project end: May 2026
- 16 partners from 7 European countries
- Funded by the European Union from the European Union's Horizon Europe research and innovation program under grant agreement No. 101091531.
- Total budget: € 8,086,602.25
- EU contribution: €6,972,698.13

About (easizero.eu) [http.//easizero.eu]

Stakeholder Initiative



Rita Morais: https://unsplash.com/de/fotos/fJLyQ81u80Y

- Join the EASI ZERo community! (office.com)

Can I be a part of EASI ZERo?

Yes, we would love to have you on our team! We welcome participation of the material, construction, sustainability and other industry experts, energy sector players, architects, public authorities and academia. Our aim is to create a holistic community, which will contribute to the project with their individual areas of expertise, while benefiting from exploring and exploiting results of the EASI ZERo project. Just fill out this brief form and we'll get on our list!

By becoming an EASI ZERo expert, you will get an exclusive access to information about new, high-performing, bio-sourced, recycled materials and easy-to-install packages of for the building envelope.

Moreover, you will also have an opportunity to provide feedback on product requirements and its performance at building level in their development stage. We will grant you access and share with you non-confidential information and data.

You will have an opportunity to network with other industry leaders, discover and share experiences on innovative solutions. You will enlarge your portfolio of innovative products, and become a construction sector frontrunner by using bio-based and recycled materials.

Finally, we will be invited to EASI ZERo invitation-only events, where you will learn about other circular-economy related initiatives, get perspective on the future of the construction material industry, which can provide you with an opportunity to adjust technologies to your targeted markets.

Phrase of the day

» „Ich habe gelernt, dass man nie zu klein dafür ist, einen Unterschied zu machen.“ «

Zitat: Greta Thunberg

Haben Sie Fragen?

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Vielen Dank!

Frau Dr. Tina Oertel
Senior Teamleiterin F & E - Fassadensysteme

Tel.: +49 9353 9855143
Tina.Oertel@sievert.de
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Sievert Baustoffe SE & Co. KG
Laudenbacher Weg 8
97753 Karlstadt
www.sievert.de

sievert

Dr. Michael Fooken
Head of Technology, IP, Alliances

Phone.: +49 541 601 388
Mobile: +49 171 2283129
michael.fooken@sievert.de

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Sievert SE
Mühleneschweg 6
49090 Osnabrück
www.sievert.de