



# ARV

Contributing to the wide scale implementation of Climate Positive Circular Communities (CPCC) where people can thrive and prosper for generations to come.



The e-marketplace serves as the gateway to the innovative services, products, and knowledge developed within the ARV project.

These resources will help you plan, design, and set-up Climate-Positive Circular Communities across various climates, regions, and markets in Europe.



Discover the innovations for circular district renovation demonstrated in real-life projects!



Support



Technologies and building systems



Local resources



Providers



# Karvina, Czech Republic

Integrated circular and resilient design for zero-emission building refurbishment



A digital twin tool supports the entire design process, from initial stages to completion, enabling the building to potentially reach the CPCC level. This method, periodically reported, culminates a design guideline that effectively documents experiences and drives future building projects. The guideline assists decision-making in CPCC and nZEB design processes, providing a complex approach for replication.



# Sønderborg, Denmark

## Leanheat intelligent heating control system



The Danfoss Leanheat Building is an AI-based software that optimizes the heating system in buildings. It improves upon traditional static heating systems by using an adaptive dynamic model. This model incorporates weather predictions and indoor temperature measurements to determine the optimal heating supply temperature without sacrificing comfort. It addresses the challenge of reducing uncontrolled heat losses and emissions, achieving 5-7% energy savings without compromising comfort.



## Trento, Italy

Urban energy geostructure in former highway tunnels as seasonal storage



This innovation involves retrofitting existing tunnels to serve as energy geostructures, contributing to clean, renewable thermal energy production. This system utilizes a network of pipes to transport heat transfer fluid, transforming abandoned tunnels into heat exchangers for road de-icing and building heating/cooling. By harnessing low enthalpy geothermal energy, this technology mitigates climate change by reducing reliance on fossil fuels, which dominate Europe's heating and cooling energy supply. It can be applied to various underground structures, potentially integrated into low-temperature district heating and cooling networks. Additionally, it offers an opportunity to refurbish aging tunnels sustainably, enhancing their structural and environmental performance.



# Utrecht, the Netherlands

## Social renovation process

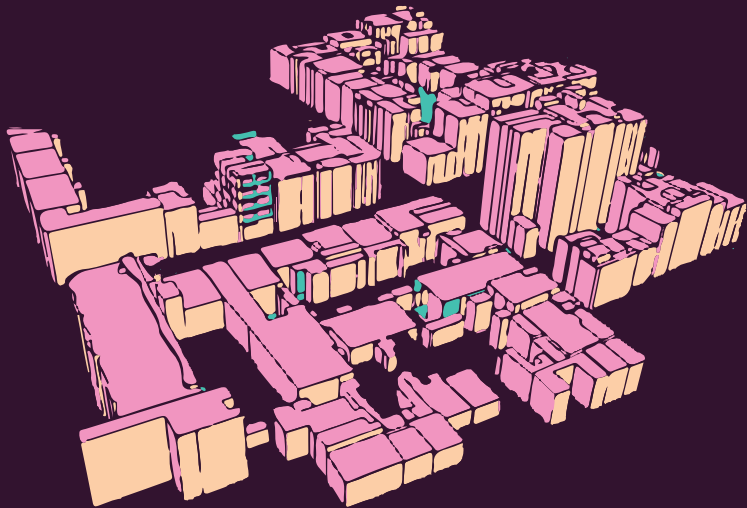


Before, during and after the renovation, we engage with tenants to explore and deal with social challenges (e.g., debt, poverty, health issues) and identify opportunities to create a more engaged community. This will focus on the post-renovation follow-up of the social renovation activities. The expected impact is a greater degree of citizen empowerment, and support for the renovation, as well as improvements to both, the social and physical living environment.



## Palma, Spain

### Comfort-driven ventilation system in social housing



This innovation aims to make buildings adaptable to external climate conditions through bioclimatic elements to regulate ventilation in summer and heat conservation in winter. CO<sub>2</sub>, temperature, and humidity sensors installed in each room will control motorized windows to maintain optimal comfort levels. It reduces energy losses during air renewal and lowers energy demand, automating the system to minimize user effort.



## Oslo, Norway


Raising climate awareness through education and local community engagement




Raising climate awareness among citizens, particularly the youth, requires a multifaceted approach. Living Labs facilitate participatory urban planning, fostering mutual learning and engagement with stakeholders and decision-makers. This initiative involves the local community through exhibitions and open events on energy and circularity, and explores innovative tools like AR and VR to engage digital-native youths. The approach addresses the challenge of including young people's perspectives in sustainable neighborhood transformations, acknowledging their limited mobility and access to decision-makers.

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 Norwegian University of Science and Technology  
Høgskoleringen 1, 7491 Trondheim, Norway

## OUR PARTNERS



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DISCOVER ALL THE  
ARV INNOVATIONS!

