

# Tartu: Retrofitting Package

## Overview

The main idea of Tartu's lighthouse project was to turn *khrushchyovkas* (a type of panel buildings that were constructed during the reign of Nikita Khrushchev starting from the 1950s) into *smartovkas* (i.e. high-quality living environments that inspire the community to make environmentally aware decisions and to change their patterns of consumption behavior) with a drastic reduction in the energy use of the buildings. With an average life cycle of 30-40 years, many of the *khrushchyovkas* have already outlived their time, meaning that the shortcomings in quality are becoming increasingly evident and might even pose a threat to their residents. Hereby, the SmartEnCity approach proceeds from an understanding that new buildings are constructed according to high contemporary standards and are thus energy-efficient anyways – the true challenge is how to retrofit the old panel buildings that have great energy saving potential.

Tartu will pilot a series of retrofitting solutions in 18 *khrushchyovkas* in the city center. Increasing the energy. The solutions will include insulating all outer walls of the buildings, replacing all windows with triple-glazed, Replacing all front doors to reduce heat loss; Insulating and reconstructing the roofs; Installing a ventilation system with heat exchangers; Reconstructing the central heating system and installing thermostatic valves; adding low-temperature cooling systems to complement the district heating system; installing 400-500 kWp PV panels to provide additional energy for the buildings; applying art solutions on the facades to increase the aesthetic appeal of the buildings and setting up a smart home system .



TARTU Process

Assessing the baseline situation of the pilot area

Discussing retrofitting with residents and housing associations

Organizing technical consultations with building designers

Preparing necessary construction documents (incl. energy audits)

Launching tender processes and selecting the contractors

Retrofitting the buildings and monitoring performance

## Benefits

- Increased resource and energy efficiency, smaller energy bills
- Better interior climate (adjustable temperature, fresh air, controlled CO2)
- Autonomy from fossil fuels and independence of energy supply
- Stable long-term return on investment
- Improved data availability, simple monitoring and energy consumption feedback
- New business opportunities
- Increased comfort, behavioural change and social integration (community feeling)
- Increase in the value of the pilot buildings as real estate
- Increase in the quality of the living environment

## Citizen Engagement

Besides increasing the energy efficiency of the pilot area buildings, one of the main aims of the retrofitting activities is to encourage behavioural changes in the way residents consume energy and adapt to new technologies. There are not a lot of changes that can be implemented without cooperation of the users. Therefore, several measures have been taken into use, including regular information meetings, technical consultations, study trips to similar construction sites and forum discussions.

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## Stakeholders

<b>Owner(s)</b>	Property/private Owners
<b>Service/Technology Provider</b>	Contractors and technology providers tbs.
<b>Users</b>	Pilot area residents, property owners
<b>Investors</b>	H2020, housing associations, KredEx Foundation

## Investment/Finance

Total investment for 18 buildings – 15.6 million EUR  
 Investment per apartment – 24,800 EUR  
 Investment per m<sup>2</sup> – 445 EUR

## Replication Potential

The planned retrofitting package tackles one of the greatest challenges of Europe’s existing building stock – quickly deteriorating precast panel apartment buildings that were quickly produced in response to housing shortages. The market and replicability of the respective solutions is enormous, evidenced by the variety of panel buildings in different countries. It is estimated, for example, that 3.5 million people in the Czech Republic and 1.7 million people in Hungary live in these types of apartments. In Estonia alone, there are ca. 6,000 *khrushchyovka*-type apartment buildings that were constructed between 1961-1990. Tartu, also having a wealth of panel and *khrushchyovka*-type apartment buildings, aims at piloting the retrofitting package in its central area, after which best practices could be transformed to its residential areas and anywhere else in Europe and beyond.

## Contact

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## More Details:

<https://smartency.eu/about/solutions/tartu-retrofitting-package/>

