



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Energy efficiency of buildings in Estonia

Raiko Puustusmaa

Department of construction and housing

23.02.2021

Prerequisites



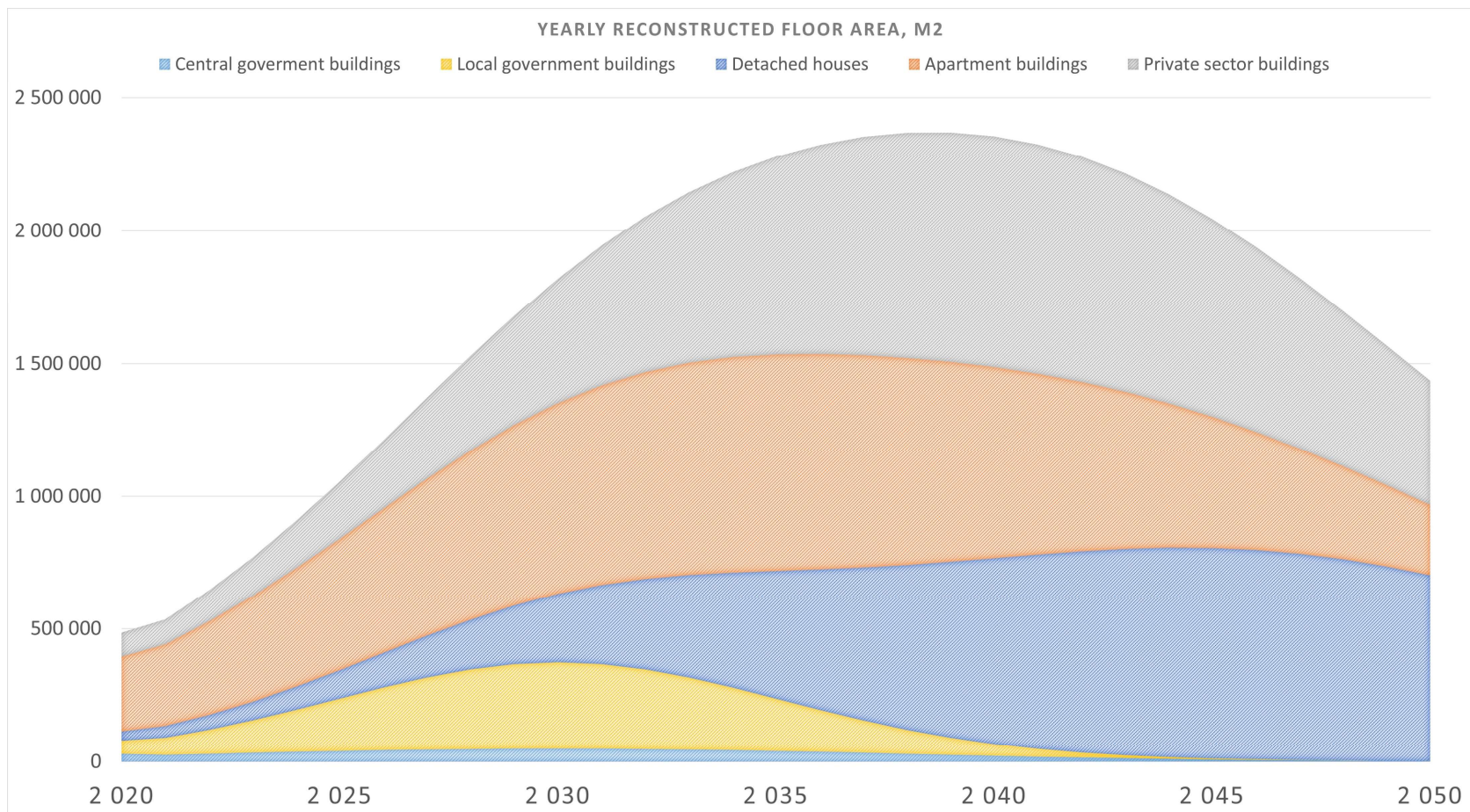
REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

- **National Development Plan of the Energy Sector (until 2030)**
- **National Long-Term Renovation Strategy (2020)**
- **New government's coalition programme (2021)**
 - We will continue with energy efficiency programmes for buildings.
- **Country reports by European Commission (2019, 2020)**
- **Green Deal and Renovation Wave Strategy (2020)**

National Long-Term Renovation Strategy

- National strategy adopted in 2020 (residential and non-residential buildings)
- The main goal of the Estonia's Long-Term Renovation Strategy is to **deeply renovate the whole housing stock by the year 2050** (2030, 22%; 2040, 64%; 2050, 100%):
 - **100,000** detached houses with a total area of 14 million m²
 - **14,000** apartment buildings with a total area of 18 million m²
 - **27,000** non-residential buildings with a total area of 22 million m²
- Analysis of the current situation and proposals for further action

Cumulative need for renovation

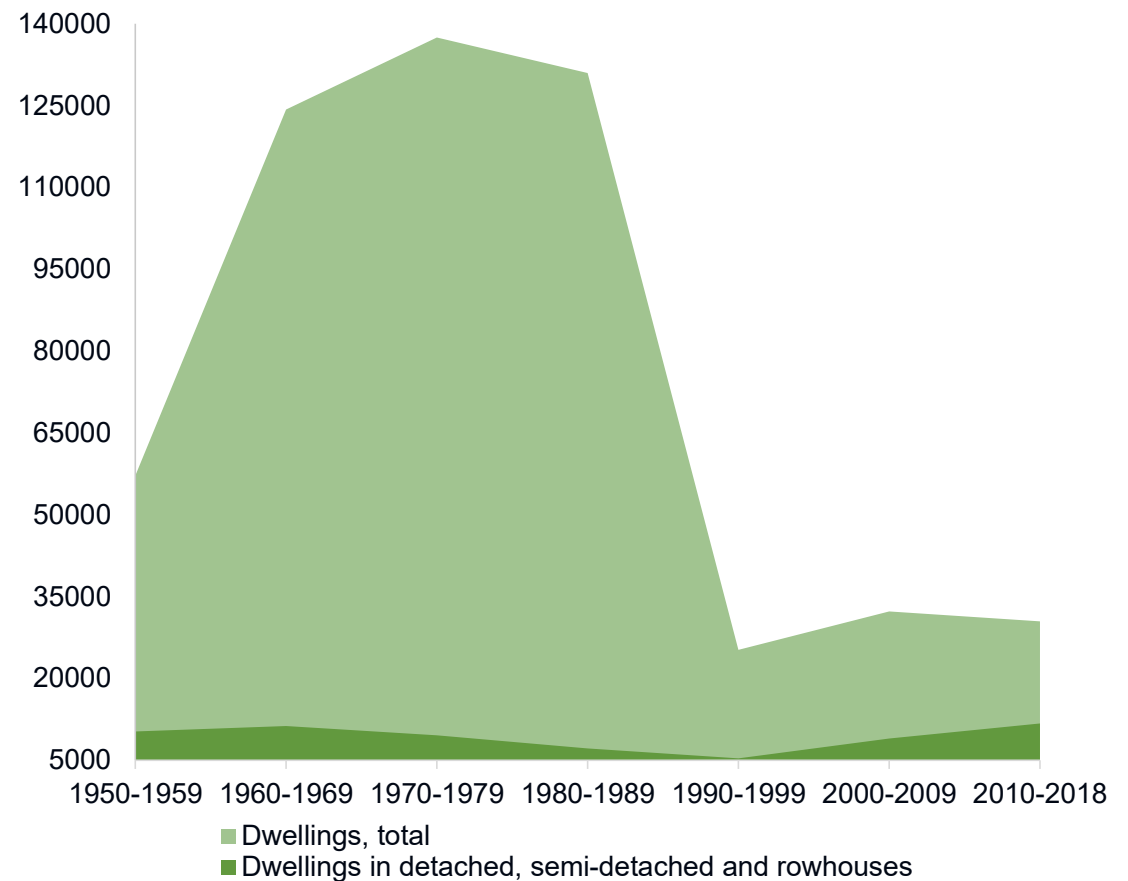


Residential Buildings



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

- 706 000 dwellings, of which 70% apartments in ca 24 000 buildings (14 000 to be renovated)
- 98% dwellings privately owned
- Managed by Apartment Associations (legal body, non-profit, 50%+1 simple majority)
- 10% of existing dwellings built after 2001
- About 6% of dwellings are renovated with support measures



KREDEX Fund

All EE measures are implemented by KredEx, foundation set up by the Ministry of Economic Affairs and Communications in 2001 (one-stop-shop)

- Gives initial advisory service and recommendations to the appliers of EE measures
- Guarantees private housing loan for buying to renovate or renovating housing and to reduce down payment obligation
- Provides loan guarantee for apartment associations who want to take a bank loan, but banks evaluate risk higher than normal (a high share of people are in debt, the apartment building is in an area with low property values or in a monofunctional settlement, the investment per square metre is significantly higher than normal)
- Offers apartment building renovation loan to apartment associations that have received a negative response to their renovation loan application from a bank or an offer with unreasonable terms (very short-term loan, an interest rate that is significantly higher than usual)

Renovation Grant



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

- Alltogether **1100 apartment buildings reconstructed** (2010-2020), **2/3** in heavily populated areas
- From 2010-2014 **661 apartment buildings** with a total area of 1.6 million m² were reconstructed
- From 2015-2020 **453 apartment buildings** have received a positive decision with the total area of 1.2 million m²
- Average cost of renovation is **250-300 €/m²** which together with the 40% support is around 10,000 € for a 50 m² apartment generally paid in the form of loan payments over an extended period of time.
- Until 2019 grants were provided with the rates of **15%**, **25%** and **40%** with the rate being **10%** higher in Ida-Viru County
- From 2019 grant allocation in rural areas up to **50%**, large settlements up to **40%**, Tallinn and Tartu **30%**



Renovation Grant Principles

Reduce the energy consumption with comprehensive renovation projects, renovation aimed at **energy class „C“** (some cases „D“)

- Open-call scheme with verification control and evaluation process (**listed by energy consumption and floor area**)
- Required activities and documents:
 - Procurement through the public procurement register
 - More complex building design documents (energy efficiency calculation)
 - Expertise for building design documents
 - Compulsory technical consultants
 - Measurements protocols of ventilation and heating systems
 - Agreements for post-maintenance
 - Measured energy label year after completion of the project

Renovated Apartment Buildings

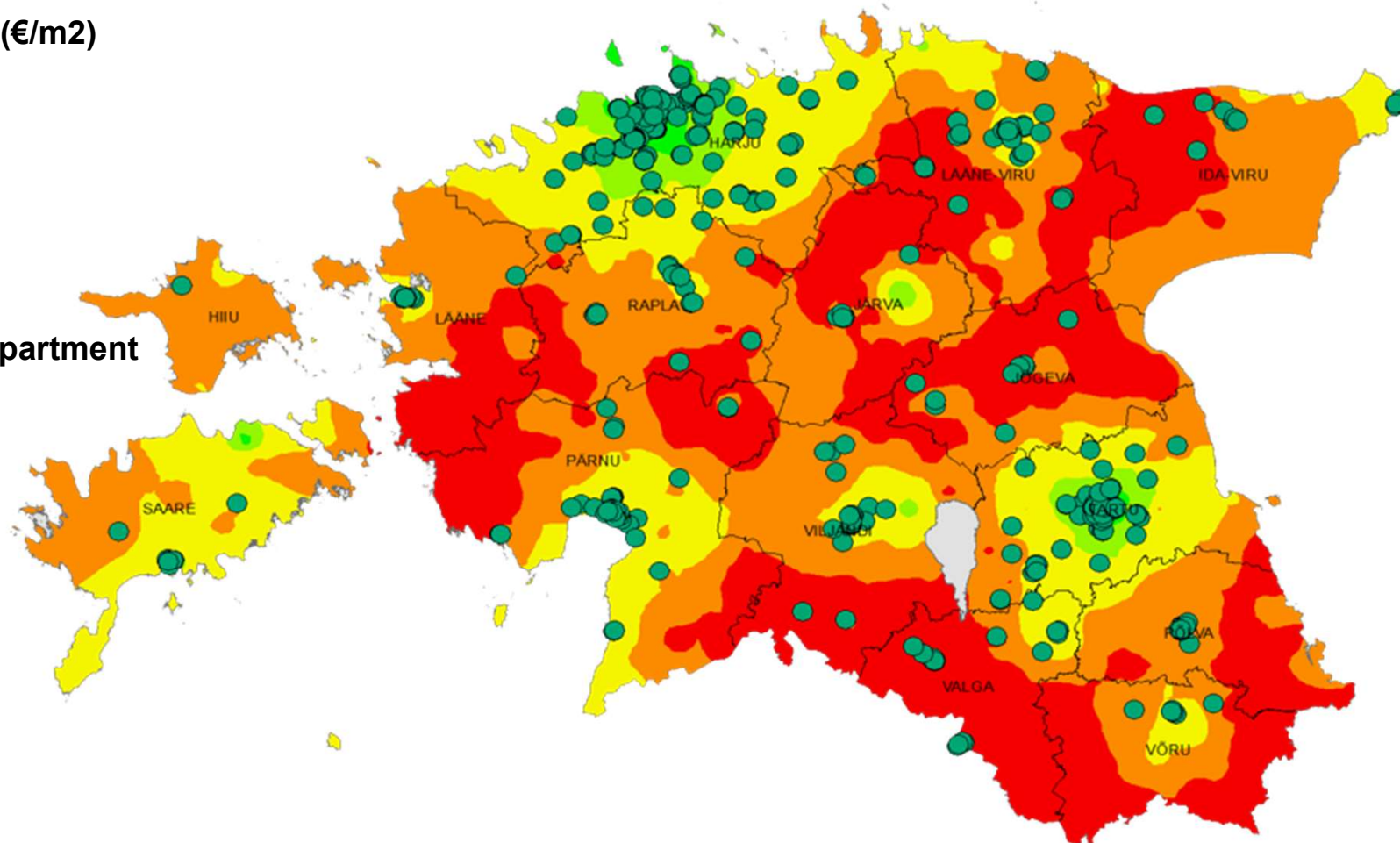


REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Value zones (€/m²)

- < 100
- 101-200
- 201-500
- 501-900
- > 901

Renovated apartment
buildings





Renovation Challenges

In terms of energy efficiency renovations, the main challenges are:

- Dependence on the economy, the forecast of economic growth or decline and the assessment of the economic cycle
- Increasing volumes, current investment rate is too low, and it should raise from around 200 million € up to **900 million € per year**
- buildings are renovated not because of energy savings but, for example, to improve only the indoor climate, functionality or aesthetics
- property owners do not have the financial capacity to renovate their building to the **energy efficiency class C** of the energy label
- property owners don't consider sustainability, health and energy efficiency in the long term (20-30 years) as part of the renovation and have a legitimate expectation of state support to achieve national goals

A rustic wooden cabin with a brick chimney, surrounded by lush greenery and flowers. The cabin has a dark shingled roof and a small window to the left of the open wooden door. A wooden bench sits in front of the door. The scene is set in a garden with various plants and flowers, including pink and yellow blooms on the left and purple flowers on the right. The sky is overcast and grey.

Future outlook

Five Steps For Energy Efficiency

- **Main activities to promote energy efficiency investments**

- **Introduction of new technological solutions.** Renovation of common apartment buildings with factory-produced elements, digital tools to create energy measurements (audits) and visualisation tools showing the results of the renovation.
- **Research and development.** National databases development, analysis of the renovation motivation, renovation impact assessment, technical advisory development.
- **Awareness raising.** Creation of the instructional materials and information sharing.
- **Demolition of decommissioned buildings.** Due to urbanization, inefficient buildings in rural areas are decommissioned and need demolition for the coherent spatial planning and safety.
- **Financing measures.** Providing incentives for renovation through loans, loan guarantees and grants. (SF21+, Modernisation Fund, emissions trading revenue, other)

Energy Efficiency Pilots



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Apartment building renovation with prefabricated elements:

- **Growth in construction volumes** - European Commission's renovation strategy envisages at least a doubling of reconstruction over the next ten years
- A lot of **standard project apartment buildings** in the housing stock - 70% of the dwellings are in the apartment buildings
- **Unused resource of wooden house manufacturers** - pre-fabrication experience and production of elements
- **Minimization of adverse effects on the environment** - better quality of controlled conditions, specified material consumption calculations, wood as biomass and CO2 storage (building life cycle)
- **Strong and determined R&D sector (TalTech)** - technical solution developments, completed and ongoing renovation projects

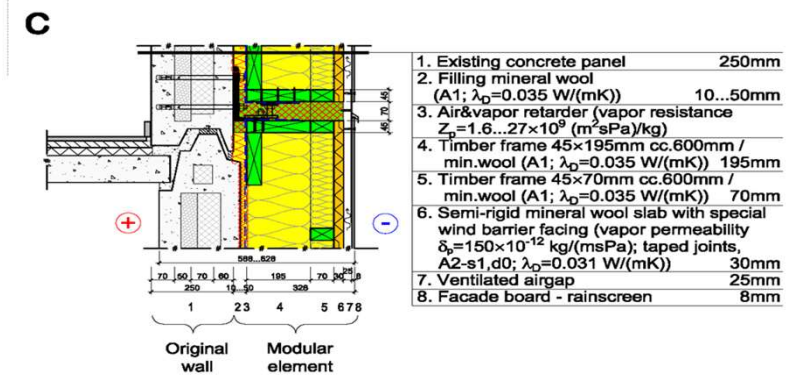
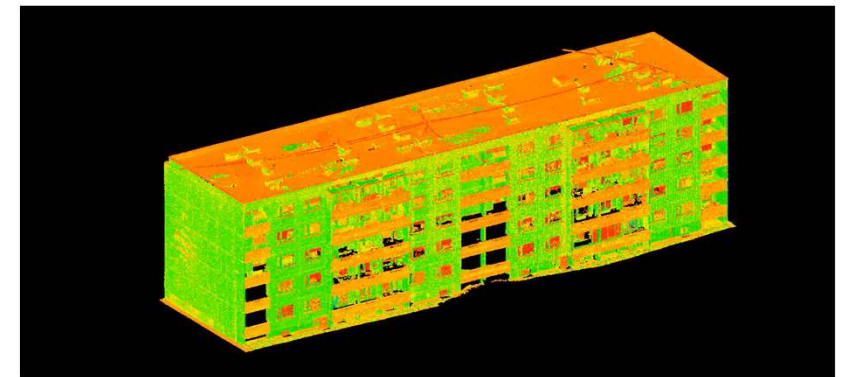
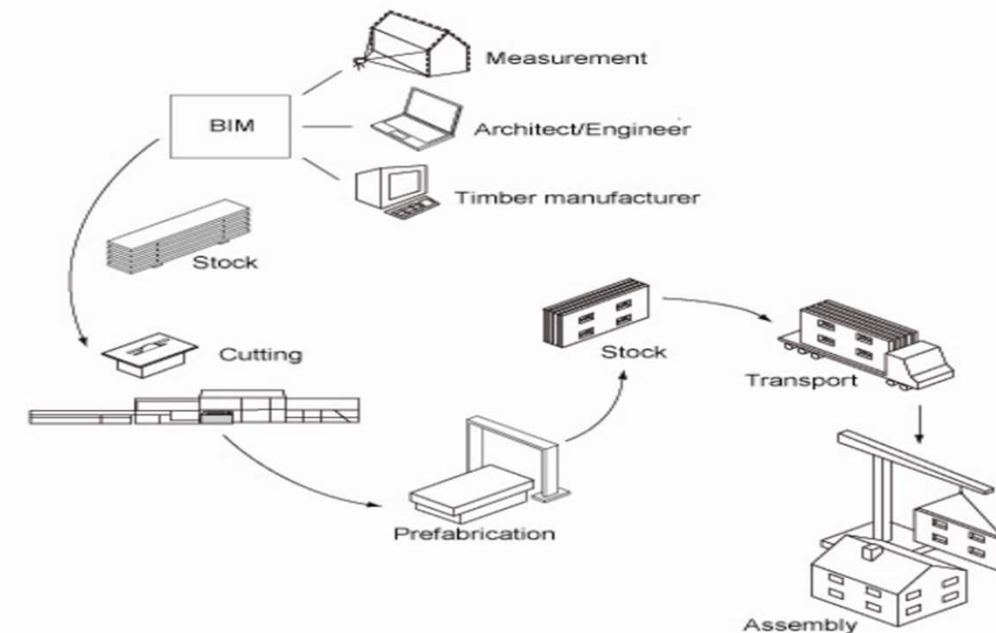


**MORE —
CONNECT**

Reconstruction of TalTech student dormitory
in Tallinn, Akadeemia tee 5a

Energy Efficiency Pilots

Apartment building renovation process with prefabricated elements:



Energy Efficiency Digitalization

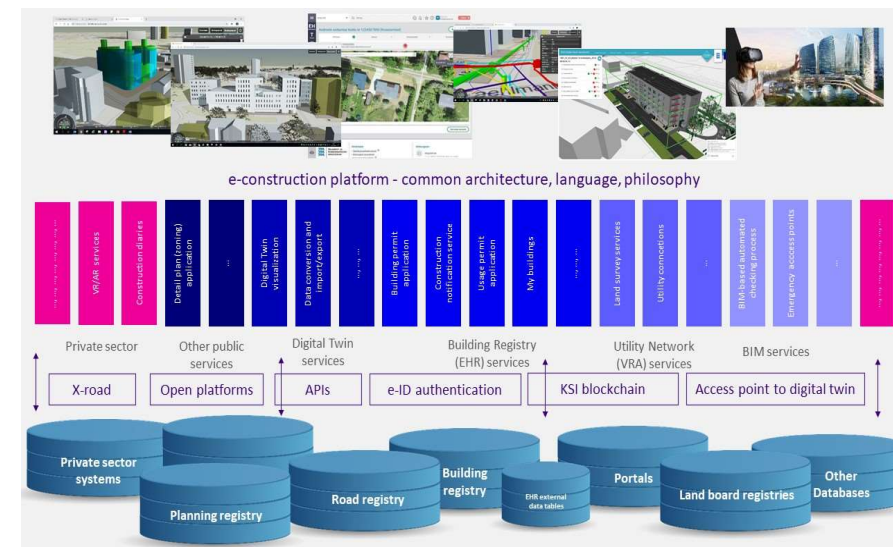
The **Building Registry** (www.ehr.ee) - technical information on buildings and documents (building permits, construction notification service, usage permits, building owner data)

- Real-time energy data, automated energy labeling, CO2 calculation calculator for buildings, compliance to the regulations and standards

Digital Twin services (<https://devkluster.ehr.ee/ui/3dtwin/v1/>) - Digital mirror of the physical world (visualization of the data and context)

- Context of the renovation, possible application of the solar panels, local government spatial planning

Building logbook and **renovation Passport** can benefit from digital development to provide owners data-based information





Energy Efficiency Promotion

The aim of the energy efficiency promotion is to cover the whole customer journey from information, technical assistance, application and advising financial support schemes to facilitate deep renovation:

- Good **availability of information** means a good web page and **digital tools** that support the decision-making process for deep renovation. That includes visualization tools for private owners and the development of the e-building platform for automated EPC and other digital calculators/tools
- **Technical assistance** will be achieved through training of the technical specialists who support the applicants in the process of preparation of the renovation projects (apartment associations)
- Due to regional disparities, **local networks are emphasized** to support the increase of renovation rates (special focus to Ida-Viru region). Local level knowledge supports local level spatial planning and quarter-based renovation projects with multiple stakeholders (local municipality, heating district manager, etc)
- **Counselling in Regional Development Centres** will help build strong project pipelines that offer integrated solutions and strong partnerships with local actors (qualified professionals, financial institutions, apartment associations, energy and building agencies, residents)
- **Eligible costs** and promotion for improvements of accessibility to address the demographical challenge and equal housing quality in the cities and rural areas



Housing Investment Fund (HIF)

Phase I (2021) – Identifying potential investors and clarifying their requirements

- decision on the type of fund structure

Phase II (2021) – Legal fulfillment of preconditions

- development of the fund structure; decision-making process (permits, government decisions); ex-ante impact assessment; setting up a fund structure (statutes, agreements, registrations)

Phase III (2022) – Financing agreements

- negotiation of investment and loan agreements; development of HIF services; procurement procedures

Phase IV (2022) – Launch of HIF

- forming an organization and getting started

Summary



REPUBLIC OF ESTONIA
MINISTRY OF ECONOMIC AFFAIRS
AND COMMUNICATIONS

Collaboration and knowledge sharing (BAUHAUS initiative)

Innovation and technological advancements (factory solutions)

Sustainability of the renovation (circular bioeconomy, material tech)

Awareness of the owners and renovation readiness (low access barrier, information sharing)

Regional development (accessibility to quality housing)

Eligible costs (electric car charging points, accessibility)

Complementarity and consistency of the financing solutions (HIF)

An aerial photograph of a modern residential complex. The buildings feature green roofs, colorful facades in shades of red, pink, and light blue, and balconies with plants. A central courtyard area is visible with a small pyramid-shaped structure and a red circular path. The surrounding area includes other residential buildings and trees.

Thank You For Your Attention!

Raiko Puustusmaa
Construction and Housing Department
Ministry of Economic Affairs and
Communications of Estonia
raiko.puustusmaa@mkm.ee
+372 631 36 09

<http://masshousing-new.strelka-kb.com/9/>