

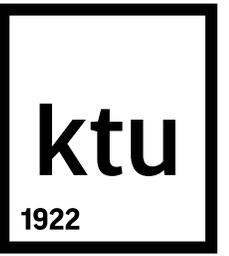
“Master Degree in Innovative Technologies in Energy Efficient Buildings for Russian & Armenian Universities and Stakeholders”

# Future education / research directions on EEB-Energy Efficient Buildings

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# Energy-efficient Buildings (EeB)



- Since buildings use 40 % of total EU energy consumption and generate 36% of greenhouse gases in Europe, reducing its CO<sub>2</sub> emissions by at least 80% and its energy consumption by as much as 50%, the construction sector is today on a critical path to help decarbonise the European economy by 2050.
- The multiannual roadmap for the years 2014-2020 sets a vision and outlines routes towards a high-tech building industry, which turns energy efficiency into a sustainable business. This roadmap proposes research and innovation priorities openly agreed amongst a wide community of stakeholders across Europe, after an extensive public consultation.

The European Construction, built environment and energy efficient building Technology Platform (ECTP's) proposal for the next FP9 is to enlarge the scope of RDI activities and

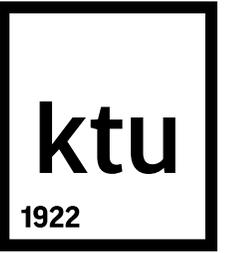
to move **from (passive) Energy Efficient Buildings to (active) Low-Carbon Built Environments,**

i.e. extending the considered dimension from buildings to blocks of buildings and districts, and embracing the larger Built environment as an enabler for innovation integration (e.g. recyclable, bio-based materials, intelligent and digital technologies, smart grids for optimized interaction with the environment, circular economy models...) for enhanced sustainability in districts and cities.

# EU Research priorities in **EEB-Energy Efficient Buildings** field:

- **Buildings and block of buildings, including retrofitting uptake:** to increase the retrofitting market uptake.
- **Active Utility Nodes:** to integrate renewables and storage and facilitate more active customer (prosumer) engagement.
- **Digital transformation:** to seamlessly collect data from new and existing buildings on IoT and cloud based platforms to which stakeholders of the value chain have access facilitating design processes, renovation and operation & maintenance issues;
- **Performance optimization through monitoring and intelligent management platforms:** to effectively measure the impact achieved and to trigger the replication potential of innovations developed;
- **Interfacing with the built environment:** to link buildings with the surrounding transport system (including multi-modal transport hubs and transport infrastructures), future smart energy grids (including thermal and electrical energy networks), as well as to fully integrate the circular economy principles in the built environment and the construction sector;
- **Integration and cross-cutting issues:** to ensure stakeholders' engagement, users' awareness on energy efficiency, new business models and financial schemes, systemizing integration and market uptake.

# These challenges also contribute to the UN Sustainable Development Goals



Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 12: Ensure sustainable consumption and production patterns

Goal 13: Take urgent action to combat climate change and its impacts

## 7 AFFORDABLE AND CLEAN ENERGY



- Increase the share of RES
- Double the rate of energy efficiency
- Enhance international cooperation
- Integration of RES in the built environment
- Better energy performance of buildings
- International presence of the sector

## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



- Quality, sustainable and resilient infrastructure
- Upgrade infrastructure and retrofit
- Enhance technological capabilities
- Construction and maintenance of resilient and reliable transport infrastructures
- Smart maintenance and operation of infrastructures

## 11 SUSTAINABLE CITIES AND COMMUNITIES



- Adequate, safe and affordable housing
- Accessible and sustainable transport
- Inclusive sustainable urbanization
- Safeguard of cultural and natural heritage
- Reduce people affected by disasters
- Universal access to green public spaces
- Sustainable and resilient buildings utilizing local materials
- Resilient buildings, cities and infrastructures
- Cost effective retrofitting and new construction
- Multimodal accessible transport networks
- Citizen's oriented urban planning
- Technologies for long term maintenance of cultural heritage
- Nature based solutions for the built environment
- Recovering vernacular architecture

12 RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION

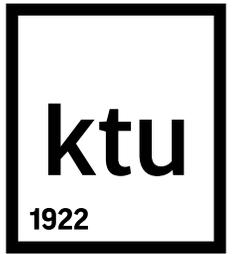


- Efficient use of natural resources
- Waste minimization through prevention, reduction, recycling and reuse
- Sustainable public procurement practices
- Extension of life and reuse of existing buildings
- Integration of construction and industrial waste into building materials
- Green procurement in construction



- Strengthen resilience and adaptive capacity to climate-related hazards
- Resilient built environment

# Kaunas University of Technology (KTU) activities



- The Master’s study programme “Sustainable Management and Production” (APINI)
- The Master’s study programme “Sustainable and Energy-efficient Buildings” (Faculty of Civil Engineering and Architecture)
- PhD program “Environmental engineering” (for sustainable industries). Double degree with Bologna University (Italy).
- International projects:
  - ✓ Interreg Europe project LOCARBO “A New Role for Regional and Local Authorities in Changing Energy Consumer Behaviour Through Low Carbon Technologies” (2016–2020, Prof Dr J. Dvarionienė) [more about LOCARBO](#)
  - ✓ Interreg Europe project EV ENERGY “Electric Vehicles in Urban Renewable Energy Systems” (2017-2021, Prof Dr J. Dvarionienė) [more about EV ENERGY](#)
- Research on “Smart/sustainable cities”