



BUILD UP Skills – LITHUANIA

Analysis of the national status quo



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Further information

More details on BUILD UP Skills can be found at www.build-up.ec.europa.eu

More details on the LIFE CET programme can be found at https://cinea.ec.europa.eu/programmes/life_en

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Regional Innovation Management Center
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Construction Sector Development Agency
Vsl Skaitmenine Statyba (Digital Construction)

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ABBREVIATIONS

AIKOS – Open Information, Advice and Guidance System
AU – Australia
BA – Bachelor of Arts
BIM – Building Information Modeling
BMS – Building Management System
BREEAM – International building certification system
CEDEFOP – European Centre for the Development of Vocational Training
CI – Circularity Index
CPO LT – Lithuanian Central Purchasing Organization
CSDA – Construction Sector Development Agency
DK – Denmark
ECTS – European Credit Transfer and Accumulation System
EEA – European Economic Area
EE – Electrical Engineer
ENEA – National Agency for New Technologies, Energy and Sustainable Economic Development
EPD – Environmental Product Declaration
EQF – European Qualifications Framework
ERVK – Classification of Economic Activities
ESFA – European Social Fund Agency
ETET – Electrical and Telecommunications Engineering Technology
EU – European Union
EUR – Euros
EUROSTAT – European statistics
FI – Finland
FR – France
GCS – Generating Consumers Scheme
GDP – Gross domestic product
HIA – Health Impact Assessment
HU – Hungary
HVAC – Heating, Ventilation, and Air Conditioning
ID – Identity Document
IEC – International Electrotechnical Commission
IEE – Intelligent Energy Europe
ISO – International Standard Organization
IT – Italy
JSC – Joint Stock Company
KTU – Kaunas University of Technology
LACE – Lithuanian Association of Civil Engineers
LAEMHE – Lithuanian Association of Environmental Management and Hydromechanics Engineers

“LCA” – Lithuanian Construction Association; (Previous name - “Lithuanian Builders Association - (LBA))

LCA – Life Cycle Analysis

LQF – Lithuanian Qualifications Framework

LT – Lithuania

LV – Latvia

MA – Master of Arts

NL – Netherlands

NO – Norway

NZEB – Nearly Zero Energy Buildings

PhD – Doctorate of Philosophy

PL – Poland

PPS – Public Procurement Service

QVETDC – Qualifications and Vocational Education and Training Development Centre

RIVC – Regional Innovation Management Centre

RL – Republic of Lithuania

RRF – Recovery and Resilience Facility

SDG – Sustainable Development Goals

SGEI – Services of General Interest

SKST – VšĮ „Skaitmeninė statyba“ (Digital Construction)

SLI – State Labor Inspectorate

SQA – Status Quo Analysis

SODRA – State Social Insurance Fund Board under the Ministry of Social Security and Labour

SRI – Smart Readiness Indicator

SSVA – Construction Sector Development Agency

STRATA – The Government Strategic Analysis Center

UK – United Kingdom

UPC – United States and Canada

VET – Vocational Education and Training

VILNIUS TECH – Vilnius Gediminas Technical University

ZEB – Zero Emission Buildings

0. Executive summary

This status quo analysis (SQA) of the national construction sector features a qualitative and quantitative assessment of different fields that have an impact on the development of the sector. Other parts of the analysis include an overview of the national legislation and measures to achieve the EU targets of sustainable development and have a direct bearing on the construction market; an analysis of the intrinsic indicators of the buildings and energy sectors; a general quantitative and qualitative analysis of the construction sector and its workforce; an analysis of the activities of institutions that provide training and studies in the field of construction, covering both formal and informal education and all levels of qualifications. This was done to determine the demands for specialists involved in the entire lifecycle of the building and their qualifications to achieve the 2030 EU targets in the field of energy and climate change.

The key findings:

- In 2021, the level of annual energy consumption in Lithuania was 66.59 TWh, with roughly 40 % of this volume consumed in buildings. Whereas Directive 2012/27/EU on energy efficiency stipulates that by 2030, Lithuania must reach the 27.279 TWh as the target for the end-use of energy.
- The 2021–2030 National Energy and Climate Change Action Plan of the Republic of Lithuania provides for measures to improve energy efficiency. The main measures are:
 - renovation of apartment buildings, which would bring in an energy efficiency of 3.6 TWh;
 - replacement of boilers with more efficient technologies, which would bring in an energy efficiency of 11 TWh;
 - other actions (see Table 3.6).
- In 2021, renewable energy sources accounted for 28.10 % of the total volume of the end-use of energy (of which 48.62 % was used for heating and cooling in the end-use of energy, and 20.92 % accounted for the total consumption of energy). Thus, RES amounted to 25% of the end-use of energy. Recently, the biggest breakthrough has been observed in the sector of consumers that generate electrical energy from solar power: between 2021 and February 2023, the aggregate installed power of energy-producing consumers went up from 146.947 MW to 430.753 MW.
- The National Energy Independence Strategy provides that by 2030, the share of renewable energy sources in the end use of energy will amount to 45 % (a top ambition in the field of RES development on the EU scale), including 45 % of electricity and 90 % of energy in the central heating sector produced from RES. Moreover, at least 30 % consumers will make electricity to accommodate their own needs. The share of production of local energy in Lithuania will go up from 35 % to 70 %.
- According to SODRA's data, as of March 2022, the number of employees involved in the construction, design, and maintenance of buildings was 54,904, of which:
 - 37,157 are classed as blue-collar workers,
 - 17,747 as white-collar specialists.

A detailed breakdown of professions for workers is presented in Table 4.4, for specialists, in Table 4.5.

- The volume of workforce involved in building construction is expected to grow by 0.6 % annually until 2030:
 - the highest growth rate is forecast for specialists skilled in the application of BIM methodology (+7.67 % for LQF level 6–7 specialists),
 - engineering systems specialists (+5.99 % for LQF level 6–7 specialists and +2.17 % for LQF level 2–4 specialists),
 - structural engineers (+3.41 % for LQF level 6–7 specialists).

- To achieve the 2030 targets of sustainable construction, a total of 5,356 persons should be trained every year, including:
 - 730 persons at LQF level 2;
 - 1,046 persons at LQF level 3;
 - 1,630 persons at LQF level 4;
 - 1,194 persons at LQF level 6;
 - and 756 persons at LQF level 7.
- To achieve the 2030 targets of sustainable construction, the aggregate annual number of hours spent developing qualifications must amount to 107,120 academic hours, including:
 - 14,600 academic hours for LQF level 2 employees;
 - 20,920 academic hours for LQF level 3 employees;
 - 32,600 academic hours for LQF level 4 employees;
 - 23,880 academic hours for LQF level 6 employees;
 - and 15,120 academic hours for LQF level 7 employees, with an emphasis on the competences of the recycling and reuse of materials (circular construction) and the digitalisation of the construction process.

1. Introduction

Information about the project

BUILD UP Skills is a strategic initiative initiated by the European Commission in 2011 under the Intelligent Energy Europe programme. The primary aim of the initiative has been to increase the number of trained and qualified building professionals across Europe to deliver building renovations offering high-energy performance as well as new nearly zero-energy buildings.

As part of this initiative, the BUILD UP Skills - Lithuania project ("Training and qualification development initiative for Lithuanian construction professionals to improve the energy efficiency of buildings and structures at national level") was implemented in 2012-2013. This project resulted in the creation of a platform for stakeholders to develop competences in the construction sector, a status quo analysis (SQA) and the development of guidelines for the qualification of Lithuanian construction workers to meet the EU 2020 energy efficiency targets.

As the European Union's political ambitions for 2030 have evolved, the main objective of Build UP Skills has also expanded. It takes into account new trends in the construction sector, but goes beyond energy efficiency and renewable energy sources in buildings. There is an emerging need for competences in the construction sector related to the sustainability of buildings in a broader context, both in terms of buildings and in relation to the whole life cycle of a building and its environmental impact.

Build Up Skills LT2030 (2022-2024) aims to achieve two objectives: 1. To revitalise the national platforms established in the first phase of the BUILD UP Skills initiative, bringing together all key national stakeholders involved in sustainable construction; and 2. To update the SQA and the National Action Plan to reflect the new reality of the construction sector. Similar objectives are being pursued in each of the countries participating in the initiative through the development of National Action Plans, which include the identification of competence areas relevant to sustainable construction, the forecasting of the scope of competence needs and the assessment and planning of the potential to develop these competences.

The Lithuanian Construction Association ("LCA") with partners Vilnius Gediminas Technical University (VILNIUS TECH), Kaunas University of Technology (KTU), Regional Innovation Management Centre (RIVC), Construction Sector Development Agency (SSVA) and Vsl Skaitmenine statyba (Digital Construction) implement the project. The project consists of four work packages ensuring a smooth and well-founded development of a competence development plan (roadmap) and its presentation to stakeholders.

Project work plan

The project consists of four work packages, described below.

Work Package 1 - Project management and coordination

Project management and coordination activities include the implementation of a common project delivery strategy, the organisation of meetings between project participants, the creation of a common data space and the monitoring of the progress of project activities. Regular remote meetings of the work package activity groups and all project participants are organised throughout the project, during which individual tasks and deadlines are planned and mid-term evaluation of the results and corrections are made.

Work Package 2 - Analysis of the status quo

The status quo analysis was grounded on official statistics, legislation, publicly available information from different institutions and databases, surveys, and information supplied by institutions in reply to inquiries. The demands of the people employed in the field of sustainable construction and the trends for their development are predicted following the general CEDEFOP forecast and the results of the survey and interviews of companies from the construction sector and providers of the relevant training and education services. After the data so collected had been summarised and the context of the activities in the construction sector had been evaluated, the quantitative requirements for qualifications development and the main fields of employees of different areas and levels of qualification that are involved in the sector of buildings construction (considering all stages of the lifecycle of the building) were identified in the report. The report closes with summative conclusions and a list of potential barriers

that may impede the achievement of the expected indicators and targets, taking account of the situation on Lithuania's construction market and labour market in general.

For the purposes of drawing this report, people employed in the Lithuanian construction sector were profiled against the 143 economic activities that had been identified to employ specialists involved in the lifecycle of the building, with the underlying analysis covering companies involved in the manufacture and sale of construction materials and equipment; companies involved in the process of design and construction; companies involved in the development, sale, and maintenance of real estate. Companies that do not have a direct relationship with construction were included as well, considering that they employ specialists from the construction sector who carry out the maintenance of buildings. The growth of the sector is predicted with the political context in mind: the planned national policy measures in the areas of energy and RES to achieve sustainable development targets include nearly EUR 10 billion worth of investments over the period between 2021 and 2030, which will call for additional competences in the fields of energy efficiency, renovation, construction of nearly zero-energy buildings, and application of RES. This phase consists of an analysis of the status quo in terms of sustainable construction competences, their development and their needs. The report of this work package provides a basis for discussions with stakeholders on the current gaps, future needs and necessary actions to achieve the 2030 Sustainable Development Goals to which the construction sector is linked. The analysis includes an analysis of the competences of blue collar and white collar professions. For this purpose, a comprehensive assessment of the results of the implementation of the actions foreseen in the previous roadmap up to 2022 is carried out, which allows to assess the most successful actions and their scope. The work package also includes an analysis of national policy measures to achieve the 2030 EU energy and climate change targets, an overview of key indicators in the country's buildings and energy sectors, a review of the state of education and science related to sustainable construction, and ongoing projects to improve construction competences. The analyses are carried out and conclusions are formulated using descriptive-evaluative research, desk research, surveys and interviews. The surveys gather relevant views and insights from market actors on these areas of sustainable construction competences:

- digitalisation of the construction process and Building Information Modelling (BIM);
- application of energy saving/efficiency measures in buildings;
- integration of renewable energy source (RES) technologies into buildings;
- sustainable renovation of building constructions and their engineering systems (to achieve energy and environmental benefits);
- nearly zero-energy buildings (NZEB) and zero-emission buildings (ZEB) construction;
- increasing of buildings' (new and existing) smartness (automation);
- green procurement;
- renovation of cultural heritage buildings;
- building Management Systems (BMS) and their data analysis;
- life cycle analysis (LCA) of buildings and their components;
- recycling and reuse of materials (circular construction);
- application of modular (prefabricated) building structures.

The results of the different research methods are synthesised to provide forecasts, insights and analysis of the workforce, competences and information systems needed to achieve the 2030 goals, as well as potential barriers to their achievement.

Work Package 3 - Developing a roadmap

This phase of the work package will include stakeholder consultation events and the preparation of an updated Action Plan.

Work Package 4 - Activities for sustainability, replication and use of project results

The activities in this work package will include initiatives to ensure the integration and use of the project results at national, regional and international level and to ensure the continuity of the project activities.

The work package will aim to enhance the cooperation between different stakeholders in achieving the 2030 Sustainable Development Goals, and will organise a conference to present the project results. This work package will also include the presentation of the results of the work in joint meetings of the countries involved in the Build Up Skills initiative.

Status quo analysis

This report presents the status quo analysis (SQA), which consists of a main body, which is written in English and Lithuanian, and annexes, which support the summary data, presented in the main body of the report and are written in Lithuanian. The SQA consists of 8 chapters, including an introduction and conclusions.

Chapter 2 of the report presents the methodology for the project and status quo analysis, the results of the surveys and interviews of construction sector participants and training providers, the methodology for forecasting the sector's workforce needs, and the methodology for the identification of competency gaps and barriers.

An analysis of the national legal environment in relation to the EU's energy and climate targets for the construction sector up to 2030 is carried out in Chapter 3. It presents the strategic documents and concrete measures, with their associated funding, which influence the sustainable development of the construction sector and enable its decarbonisation. At the end of the chapter, the link between national policy measures and competence areas relevant to sustainable construction is presented.

Chapter 4 presents the overall situation of the buildings and energy sectors and the dynamics of the indicators. It presents an overview of statistics on the main indicators of the Lithuanian construction sector for the period 2013-2022, covering the sector's construction volumes, the share of GDP in the country's economy, the volume and structure of enterprises and employees in the construction sector, as well as analysing other relevant aspects, such as the digitalisation of the sector and the circularity index. It provides statistics on the situation of building renovation and energy efficiency in Lithuania, energy consumption in buildings and the use and production of renewable energy (producing users) in buildings. It also identifies the economic activities related to the life cycle of a building and profiles the construction sector workers employed in them.

Chapter 5 presents the current state of education and training in construction, covering vocational training and higher education, non-formal education training in sustainable construction and certification of construction actors. The numbers of graduates from various training programmes in sustainable construction over the last three years are compiled and presented, covering different professions and qualification levels.

Chapter 6 selects and briefly introduces national and international projects in Lithuania aimed at improving the skills of construction workers or their teachers.

Chapter 7 is devoted to identifying gaps in workforce and competences by 2030. Here, using surveys of construction sector participants and general trends in the sector; it identifies and presents forecasts of the labour and skills needs of individual construction occupations and needs for skills development. Table 7.5 and 7.6 of Section 7.2 *Forecast of the demand for competences and skills* of the report show the demand for developing individual sustainable construction competences in workers and specialists, considering separate professions and levels of qualification. Gaps and needs for skills monitoring are analysed.

Chapter 8 describes the barriers to the development of competences in sustainable construction.

2. Objectives and Methodology

2.1. Objectives

The necessary methods to prepare the status quo analysis (SQA) has been identified in the light of the project's goals and the SQA objectives. The project aims to achieve two goals. The first goal of the project is to revitalise the national platforms developed during phase one of the BUILD UP Skills initiative by mustering all the key national stakeholders involved in the process of sustainable construction. The second goal of the project is to update the SQA and the national action plan to reflect the new realities of the construction sector.

The second-phase SQA addressed the SQA and the national action plan prepared during the project implemented during the first phase of the BUILD UP Skills initiative (2012–2013). This was done to identify the level of achievement of the goals of the national action plan from phase one of BUILD UP Skills as measured by the degree of implementation of individual measures. The outcomes of this analysis will be used in drawing a revised and updated national action plan.

The SQA and the national action plan from the first phase of BUILD UP Skills were geared towards construction site workers and craftsmen (blue-collars). These documents are being revised to extend their scope and include white-collar specialists and add new content to specify the skillset requirements for white-collar professions (such as architects, designers, engineers, building operators, manufacturers of products, and so on).

The research focuses on the areas of sustainable construction relating to digital technology, smart buildings, efficient use of resources, circular economy, integration of renewable energy technologies, lifetime assessment, as well as a number of others, considering the broader context of the goals of sustainable construction.

As a result, based on the project goals, research for the purposes of the SQA was been split in two parts (Fig. 2.1). Part three analyses the national action plan developed in phase one of BUILD UP Skills and looks into the level of implementation of the measures envisioned in said plan based on the physical implementation indicators set for each measure. This research involved conducting a qualitative analysis of the envisioned measures and an assessment of the effectiveness thereof. A quantitative analysis of the physical implementation indicators was performed as well by collecting numeric information about the physical indicators of measure implementation. Lessons learned were identified to streamline the preparation of a new action plan.

The analysis of the first national action plan undertaken in the first part of the research was conducted in parallel with market research and data collection. The purpose of this research was to identify the gap between the existing situation and the need for relevant competences in the areas of sustainable construction until the year 2030. The research included surveys of employers and providers of informal education services, targeted interviews, and analysis of data from secondary sources. The results of this research will shed more light on the needs of the market and will facilitate the choice of the necessary actions in drafting a new action plant. That way, the SQA results mould prerequisites for the choice of actions and are used as starting data for the activities scheduled for the next phase of the project.

2.2. Methodology

The second-phase SQA involved much the same methods that were used in the SQA of the first phase. The only difference was in the methodology used to predict the need for specialists.

The initial SQA stage consisted of descriptive–evaluative and desk researched geared towards adding new knowledge without accentuating the resolution of specific hands-on problems. As a case in point, it involved collecting information about the key indicators of the buildings and the energy sectors and generalising the disclosures. The descriptive–evaluative research identified and compared facts without taking a deep dive into the underlying causes by, among other things, analysing the indicators from the national action plan of the first phase of BUILD UP Skills that had been achieved and comparing them with the objectives outlined in this action plan.

The desk research analysed a lot of secondary sources of information. This research: identified the specifics of the construction sector; analysed national policies and strategies by screening statistical data on the construction and the energy sectors; analysed the statistics of the buildings sector; analysed

the existing framework of vocational education and training, the current training programmes and educational establishments involved in training sustainable construction specialists; evaluated the achievement of the goals of the previous milestone; and collected other data required for SQA purposes.

The applied research was conducted to address a specific problem, aiming to gain more insights into the landscape of the construction sector, identify the concrete indicators of vocational education and training, informal education, and their development trends. This research consisted of (employer and training provider) surveys and interviews. The purpose of this research was to eliminate the uncertainty of the solutions planned, identify the market needs, help determine the appropriate tactic and strategy for the development of the milestone for the next phase of the project.

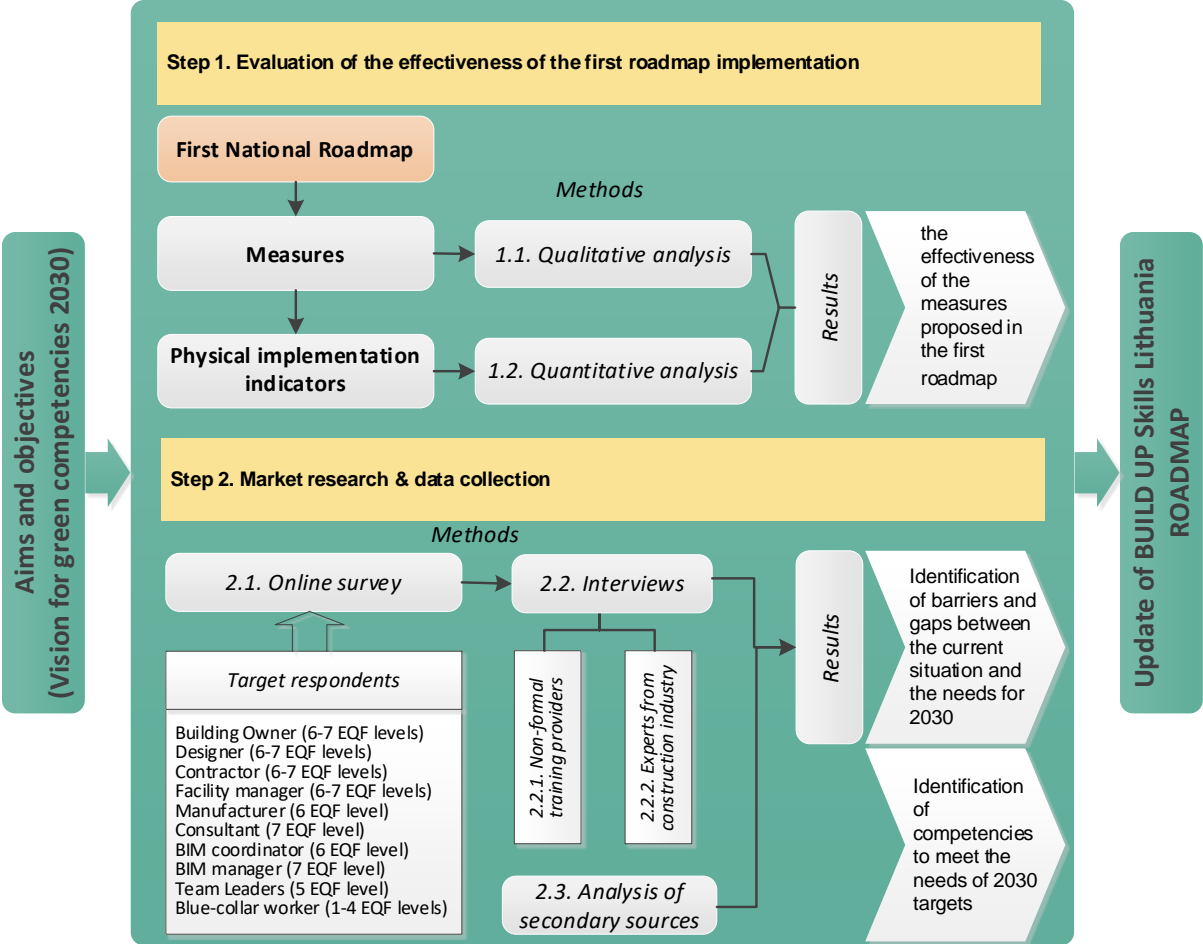


Fig. 2.1. Methodological diagram of the SQA (Source: project application)

There were a total of two surveys: one for companies in the construction business, the other, for the providers of training in the area of sustainable construction. The sample of the interviews consisted of 15 construction experts.

Survey of companies in the construction sector

A stratified randomised survey of companies in the construction sector (employers) and educational establishments produced the initial set of data about the need for the workman professions and qualified specialists in the construction sector that were required for the purposes of the research. The stratification (grouping) of the employers surveyed was done on the basis of the role they play in the lifecycle of buildings. The parties surveyed were split into the following groups: clients, designers, surveyors, experts, producers/suppliers, contractors, building supervisors.

An online survey form of two parts was devised for the purposes of the survey¹. The general part contains information about the company and the respondent, the company’s lines of business and types

¹ Study of competence needs in the field of sustainable construction. 2023. Online survey.

of services (the list was made on the basis of the classification of economic activities²). Part two features questions about raising employee competencies, the need for employee competences in the areas of sustainable construction covered by the project, the market needs for specialist and workman professions necessary for sustainable construction over the period of next five years, drawing young people and women to the construction sector, and other matters.

The purpose of the project was to survey at least 100 respondents from companies engaged in the construction business. This number was identified considering the amount of entities (construction companies, suppliers, manufacturers, and so on) operating in the construction sector. According to the data from Statistics Lithuania³, there were 9,364 entities actively operating in the construction sector in 2021. The necessary sample (100) was determined a computational tool⁴ with a 9.75 % confidence interval and a 95 % confidence level. The resultant value of the sample (100 respondents or more) was obtained by including respondents from construction sector associations. The online survey form was sent out to more than 3,300 companies engaged in the construction sector. Answers were received from a total of 123 companies. This number reflected the true sample size and was used to revise the confidence interval (Fig. 2.2).

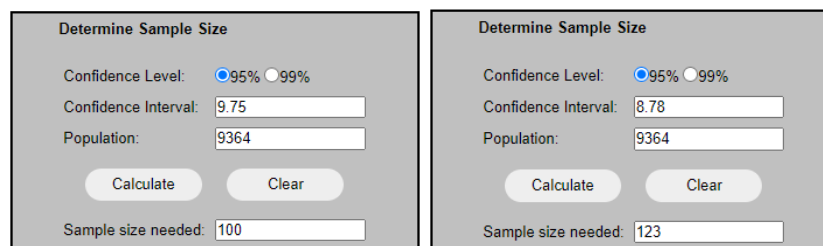


Fig. 2.2. Confidence intervals for the sample size of 100 respondents (left) and 123 respondents (right)

The necessary and real sample sizes were determined at a confidence level of 95 %, which is normally used for the purposes of research. Expanding the real sample size (by polling more respondents than planned) produced a better confidence interval of 8.78 %.

Interviews

The main goal of the meetings (interviews) with the respondents (employer representatives) was to make sure that the survey results were reliable by analysing the reliability of the information gathered and revise the answers presented. On top of that, efforts were made to sum up the stance on the needs for specific training, identify problems, collect suggestions and recommendations, pinpoint gaps and bottlenecks.

To collect as many opinions as possible and ensure the ease of participation, the interviews were held using tools of telecommunication (such as Teams and Zoom) and flexibly adapting to the requirements of individual interviewees by holding interviews over the phone and in person. The remote and in-person interviews were transcribed by recording the interview on the platform of choice or otherwise, subject to the interviewee's consent. The records of the interviews were saved to the Dropbox project files directory. The information gathered during the interviews was summarised and is presented in the relevant section of the SQA.

For the purposes of the interviews, companies of informal training service providers and construction experts were screened as per project application. The companies that were selected for the interviews were the companies surveyed that had identified themselves as providers of training services (out of the 123 respondents, 56 said they provided training). The screening was done considering the respondents' roles in the lifecycle of the building, aiming to ensure that the interviews covered experts from companies representing different roles.

The objective of the interviews with the chosen 15 companies was to determine how relevant this subject was and to identify other issues that had not been covered by the survey. The representatives of the chosen companies were asked questions to narrow down the findings of the survey.

² State Enterprise Centre of Registers. 2008. [The basis of the classification of economic activities](#)

³ Official Statistics Portal. 2023. [Database of Indicators](#)

⁴ Creative Research Systems. 2012. [Sample Size Calculator](#)

Surveys of training providers

The project also included a number of surveys of providers of different levels of training services for the purpose of collecting additional data about the conformity of the existing training programmes or content and the relevant competences of sustainable construction. Separate yet comparable, content-wise, surveys were prepared for vocational education and training providers, higher education establishments, and providers of professional development courses. The surveys were made separate to avoid different groups having to read irrelevant questions and to save the respondents' time spent completing the survey. The surveys were conducted using a three-part online form. In part one, the respondents were asked to evaluate the extent to which the training provided by the relevant institution contributes to developing sustainable construction competences; in part two, they were asked to give their opinion on the effectiveness of the measures geared towards improving the quality of the training; in part three, they had to provide insights into the needs for relevant training and ways to promote the engagement of young people and women into the sector of sustainable construction. The survey of providers of vocational (formal and informal) education and training was sent out to 48 respondents, the survey of higher education providers, to 11 respondents, the survey of providers of professional development courses, to 63 respondents. The lists of respondents were made in reliance on the AIKOS database and the results of a prior survey of construction sector companies.

3. The National Policies and Strategies to Contribute to the 2030 EU Energy and Climate Targets in the Construction Sector

The single document outlining the course of Lithuania's development in 2021–2030 to achieve the EU goals of sustainable development is called the **National Progress Plan**⁵, while the achievement of individual targets is covered by area-specific documents as presented below.

3.1. The national policies and strategies on energy and renewable energy resources

The vision of the Lithuanian energy sector is defined in the **National Strategy of Energy Independence**⁶. According to this strategy, in 2050, the Lithuanian energy sector will be producing 80% of the energy from clean (low-emission) sources, will be supplying energy safely and at competitive prices, and will be contributing to the development of the domestic economy, while energy sources will consist of renewable energy resources and environment-friendly technologies, and consumers will be allowed to generate the energy necessary to satisfy their own needs. In 2018, while the strategy was still in the process of preparation, the amount of investments to be made to achieve the vision of the Lithuanian energy sector was estimated at under EUR 2.4 billion by 2020, and under another EUR 10 billion of public funds, including EU moneys, and private funds in 2021–2030.

The **National Strategy of Energy Independence** is part of the **2021–2030 National Energy and Climate Change Action Plan of the Republic of Lithuania**⁷ (the 'Action Plan'), which was drafted within the framework of implementation of the 2018 EU Energy Union Governance Regulation. This Action Plan also includes the **National Strategy of the Policy on Climate Change Control**⁸ and the **National Plan to Minimise Air Pollution**⁹ as approved in April 2019. Currently new update of the Action Plan is being underway.

The Action Plan combines the elements of the policies on energy and climate change control through 5 intertwined policy dimensions, including the following two that have the strongest bearing on the construction sector: (1) reducing dependence on fossil fuel and employment of renewable energy resources; and (2) energy efficiency. The Action Plan outlines the measures aimed at achieving the goals in these areas, which measures are anchored in the effective policy, and proposes packages of

⁵ Resolution of the Government of the Republic of Lithuania. 2020. The National Progress Plan ([TAR, 2020-09-16, No. 19293](#)).

⁶ Resolution of the Seimas of the Republic of Lithuania. 2012, 2018. The National Strategy of Energy Independence ([TAR 2018-06-30, i. k. 2018-10958](#)).

⁷ Ministry of Environment of the Republic of Lithuania. 2019. [The 2021–2030 National Energy and Climate Change Action Plan of the Republic of Lithuania](#).

⁸ Resolution of the Seimas of the Republic of Lithuania. 2019. [The National Strategy of the Policy on Climate Change Control](#).

⁹ Resolution of the Government of the Republic of Lithuania. 2019. The National Plan to Minimise Air Pollution ([TAR, 2019-04-26, No. 6860](#)).

additional measures to be included in the future policy to ensure the complete achievement of the national goals.

The current measures to be applied in the electricity sector of renewable energy resources (RES) by 2030 as identified in the Action Plan are outlined in Table 3.1.

Table 3.1. *The current policy measures to be implemented in the RES electricity sector by 2030*

Measure	Planned volumes and results/impact	Period of implementation
Support scheme for electricity produced from RES (RES-E)	Annual increase in RES-E by 2.5 TWh till 2025	2020–2025
Financial support for electricity consumer-generation (EU support)	Annual increase in RES-E by 0.075 TWh till 2024	2018–2024

The measures envisioned in the Action Plan as implementable in the RES electricity sector by 2030 are outlined in Table 3.2.

Table 3.2. *Planned policy measures to be implemented in the RES electricity sector by 2030*

Measure	Planned volumes and results/impact	Period of implementation
Financial support for investments in small power plants	Annual increase in RES production by 0.03 TWh	2022–2025
RES development in the Baltic Sea	Additional RES capacity from 350 MW to 1400 MW	2019–2030
RES for industrial use (70 % electricity, 30 % heat)	Additional RES capacity 42 MW	2021–2027
RES for public and residential buildings (EU support)	Additional RES capacity 50 MW	2021–2030
Financing solutions for the generation and storage of energy from RES, including consumer-generation, RES communities (EU support)	Annual increase in RES production by 0.81 TWh	2021–2027
Integration of RES into transmission and distribution networks	Integration of additional RES-E installed capacity of 1944.5 MW into existing electricity transmission and distribution networks	2021–2030

The current measures to be applied in the heating sector of renewable energy sources (RES) by 2030 as identified in the Action Plan are outlined in Table 3.3.

Table 3.3. *The current policy measures to be implemented in the RES heating sector by 2030*

Measure	Planned volumes and results/effects	Period of implementation
Retrofit and/or replace worn-out biofuel boilers with other RES-based technologies	Improving incentive regulation to enable heat supply companies to accumulate the necessary funds for modernisation. The nominal (rated) thermal output of the replaced installations is 600 MW	2018–2030
Promote the use of RES for heat generation in district heating systems by assessing the potential of solar technologies, heat pumps and heat storage in district heating systems	Newly installed installations have a rated (nominal) thermal input of 200 MW	2021–2030

The measures envisioned in the Action Plan as implementable in the RES heating sector by 2030 are outlined in Table 3.4.

Table 3.4. *Planned policy measures to be implemented in the RES heating sector by 2030*

Measure	Planned volumes and results/effects	Period of implementation
New biofuel combustion plants in the district heating sector	Biofuel boilers - additional capacity of 70 MW by 2030	2021–2030
Promote the use of RES in the district heating sector (using solar technologies, heat pumps and/or heat storage)	Rated thermal output for new installations of 200 MW by 2030	2021–2030
Promote the use of waste heat from industry, the waste sector or cooling energy in the district heating sector	Waste heat in district heating will amount to 0.45 TWh (15 % of potential) per year by 2030.	2021–2030
Renewable energy in industry (70 % electricity, 30 % heat)	Additional RES heat generation capacity of 18 MW	2021–2030
Replacing boilers with more efficient technologies	By 2030, 50000 boilers will have been replaced in households and other thermal energy efficiency measures, including heat pumps, will have been adopted, resulting in savings of at least 200 GWh per year	2021–2030
Modernisation of the heat metering system	All heat meters must be replaced by remote reading type meters by 2027.	2021–2027

The current measures to be implemented in the sector of energy efficiency as identified in the Action Plan are outlined in Table 3.5.

Table 3.5. The current measures to be implemented in the sector of energy efficiency by 2030

Measure	Planned volumes and results/effects	Period of implementation	Energy savings in TWh 2021-2030
Agreements with energy suppliers on consumer education and advice	Energy suppliers will ensure the implementation of the scope of consumer education and advice and the measures provided for in agreements between them or through others (including the roll-out of smart meters)	2021–2030	3 TWh 300 kt
Exemption for industrial companies for SGEIs (services of general interest)	A support mechanism that will finance the implementation of energy efficiency improvement measures in all major Lithuanian industrial companies. It is planned that energy efficiency measures will be installed annually, saving around 100 GWh of energy	2021–2030	5.5 TWh 550 kt
Energy saving agreements with energy companies	Energy companies will save energy in accordance with the energy levels specified in the energy saving agreements (by themselves or through others) by applying economically sound energy efficiency improvement measures at the end-users' premises (installations, equipment, transport)	2021–2030	5.5 TWh

The measures envisioned in the Action Plan as implementable in the energy efficiency sector by 2030 are outlined in Table 3.6.

Table 3.6. *Planned policy measures to be implemented in the sector of energy efficiency by 2030*

Measure	Planned volumes and results/effects	Period of implementation	Energy savings in TWh. 2021-2030
Renovation/modernisation of multi-apartment buildings	Upgrade an apartment building to Class C and save 40 % of energy. By the end of 2030, around 5000 apartment blocks should be renovated, or nearly 500 blocks every year	2023–2030	3.6 TWh
Renovation of public buildings	Upgrading public buildings to Class C, which will result in about 960000 m ² of public buildings being upgraded by 2030	2023–2030	0.36 TWh
Replacing boilers with more efficient technologies	By 2030, 50000 boilers in households will have been replaced and other thermal energy efficiency measures will have been applied, resulting in savings of at least 200 GWh per year	2021–2030	11 TWh
Modernisation of internal heating and hot water systems in multi-apartment buildings	A financial instrument that will encourage building owners to upgrade old elevator-type heat points to a newer independent scheme heat point. Up to 30 % of the investment costs will be reimbursed and around 250 heat points will be upgraded each year, saving 10 GWh of energy annually.	2021–2030	0.55 TWh
Improving energy efficiency in enterprises	A financial instrument that enables companies to implement energy efficiency measures identified in an energy audit. It is planned to provide subsidies for the energy savings achieved, resulting in annual savings of around 100 GWh	2021–2030	5.5 TWh
Renovation of individual houses	Financial incentives for owners of individual houses to renovate their individual houses. 1,000 individual houses renovated each year, saving 13.5 GWh of energy each	2021–2030	0.74 TWh
Modernisation of street lighting systems	Modernisation of street lighting systems	2023–2030	0.039 TWh

The key items of legislation relating to the energy efficiency of buildings are the **Law on Construction**¹⁰ and **Design and Certification of the Energy Performance of Buildings, a Construction Technical Regulation**¹¹. These documents define the mandatory nature of a certain degree of energy performance of buildings and the methodology of evaluation of energy performance.

3.2. The national policies and strategies on continuous teaching/learning

Based on the **National Progress Plan**, on 1 December 2021 the Government of the Republic of Lithuania adopted a resolution approving the **Educational Development Programme**¹² for the period of 2021–2030. For the purposes of this programme, the main objective of developing the construction sector through continuous teaching/learning is to *'deploy an effective and efficient system of lifelong learning for the adults to harmonise personal skills and qualifications with the needs of a person, the labour market, and the environment.'*

The Educational Development Programme formulated the indicators by which the achievement of the objective would be measured, refined the problems pertaining to their achievement, and established measures aimed at making progress. The indicators of achieving this objective that have a direct bearing on the construction sector are formulated on the basis of the assessment of the percentage of persons engaged in learning activities over the past four weeks: in 2020, this portion was 10.5 % in the age group of 25–34 and 3.3 %, in the age group of 55–74; the target is that by the year 2025, these percentages should stand at 12.5 % and 5.5 %, and by 2030, at 15 % and 8 %, accordingly. According to the programme, one problem potentially aggravating the achievement of this objective is that there is no structured stimulus for adult individuals to develop their general and professional competences in Lithuania, and the underlying causes of this problem can be distilled as follows:

- The system of lifelong learning for the adults is ineffective and fragmented and does not have an overarching model for its implementation;
- There is no one-stop-shop online system in place to allow persons to find relevant learning options.
- There is no mechanism of financial incentivisation in place catering to those who seek engagement in activities geared towards developing their competences and no adequate variety of institutions that provide the appropriate services as colleges are excluded.
- The quality of educational services for the adults is inadequate and there is no system for the identification of priority fields of competence development.
- The system of competence recognition is underdeveloped.
- The options available to groups less prone to learning are underdeveloped (requiring an expansion of learning options for senior citizens (third-age universities) and improvement of the comprehensive education system for the adults).

One recommended solution to the above problems is setting up a one-stop-shop for career planning and skills development. The plan is that the one-stop-shop for career planning and skills development will also improve the conformity between the competences that can be obtained through the educational system and those that allow one to adapt to the labour market and the changing environment. Achieving this objective requires appropriate legal regulation to anchor the model of a unified lifelong learning system, as well as an allocation of funding from the Recovery and Resilience Facility and the European Social Fund, earmarked for building learning possibilities. The financial projection set aside for the overall achievement of the objective stands at EUR 79,263 thousand.

To reinforce and overhaul vocational education and training, in March 2022 the Ministry of Education, Science, and Sports established the **Working Group for the National Platform of Vocational education and training**. The working group files suggestions regarding the strategic pillars of developing vocational education and training, improving its governance, as well as raising the quality and awareness of this kind of training.

On 30 December 2022, the bill on the amendment of the **Law on Informal Education and Continuous Learning of Adults** concerning the framework of personal learning accounts was submitted for official approval. The law was passed in 2014 and had never been revised since. The Ministry of Education,

¹⁰ The Law on Construction of the Republic of Lithuania. 1996, 2016. ([No. XII-2573, 2016-06-30, TAR 2016-07-13, i. k. 2016-20300](#)).

¹¹ *Order of the Minister of Environment of the Republic of Lithuania*. 2016. Design and Certification of the Energy Performance of Buildings, a Construction Technical Regulation STR 2.01.02:2016 ([TAR, 2016-12-01, No. 27896](#)).

¹² *Resolution of the Government of the Republic of Lithuania*. 2021. The 2021–2030 Educational Development Programme ([TAR, 2021-12-06, No. 25242](#)).

Science, and Sports intends to finalise the regulations governing the framework of personal learning accounts and the implementation thereof by June 2023. The model of personal learning accounts is expected to create a broader demand for lifelong learning activities among the adult population.

3.3. The national policies and strategies on the digitalisation of the construction sector

Until now, the field of digitalisation of the construction sector has been governed by **two resolutions from the Government of the Republic of Lithuania** and a **decree from the Minister of the Environment**.

The resolution dated 8 December 2021¹³ anchors the application, effective 28 February 2022, of methods of building information modelling (BIM) for the purposes of designing, building new buildings, designing structures classified as special constructions, designing, outfitting, reconstructing low- and medium-voltage electrical grids, low- and medium-pressure gas supply pipelines, systems of communication lines and cables and cable ducts when the amount of the investment is EUR 5 million or more for buildings, or EUR 10 million for engineering structures, or EUR 5 million for city block modernisation projects. The very same resolution anchored a provision that as of 1 January 2024 and 1 January 2026 the threshold of investment requiring the application of BIM methods would be reduced as follows:

- to EUR 3 million for buildings as of 1 January 2024;
- to EUR 1.5 million for buildings as of 1 January 2026;
- to EUR 5 million for engineering structures and movable things as of 1 January 2024;
- to EUR 3 million for engineering structures and movable things as of 1 January 2026;
- to EUR 3 million for modernisation of blocks of urban territories as of 1 January 2024;
- to EUR 1.5 million for modernisation of blocks of urban territories as of 1 January 2026.

On top of that, the resolution from the Government of the Republic of Lithuania dated 8 December 2021¹⁴ authorises the Ministry of the Environment of the Republic of Lithuania to approve the procedure of criteria for the application of building information modelling methods, and on 24 February 2022, the Minister of the Environment put these criteria into law¹⁵, anchoring the client information requirements. The client information requirements set forth the client's requirements for the project of a building being implemented through building information modelling. The client information requirements prescribe the specific measurable technical, organisational, management requirements for the information content and process of building information modelling. The contents of the client information requirements depend on the type and scope of the building project, the client's requirements regarding the extent and contents of the application of building information modelling technologies and methodologies in the building project, the application of the expected outcomes of the building project during the different stages of the building lifecycle.

The contents relating to the application of BIM methodology that cover the drafting of normative BIM documents and BIM procurement methodological documents, the devising of the methodology for the assessment and monitoring of the benefits offered by BIM, and the preparation of the national construction information classification are created within the framework of project No 10.1.1-ESFA-V-912-01-0029 Development of Measures to Improve the Effectiveness of Life-cycle Processes for Buildings in the Public Sector through the Application of Building Information Modelling (the 'BIM-LT Project')¹⁶. The project is funded with moneys earmarked for *Efficient Public Administration*, priority axis 10 of measure No 0.1.1-ESFA-V-912 *Promoting National Reforms and Improving the Activities of Public Administration Bodies* under the Operational Programme for EU Structural Funds Investments for 2014–2020. The runtime period of the BIM-LT Project is between 10 January 2019 and 31 August 2023. The BIM-LT Project will also include training in relation to the application of the methodology for the assessment and monitoring of the set of draft stipulations of the BIM normative documents, the

¹³ *Resolution of the Government of the Republic of Lithuania*. 2021. Requirements and/or criteria for mandatory application of building information modelling methods ([TAR, 2021-12-14, No. 25772](#)).

¹⁴ *Resolution of the Government of the Republic of Lithuania*. 2021. Implementation of the Law of the Republic of Lithuania on Public Procurement and the Law of the Republic of Lithuania on Procurement by Procuring Entities in the Field of Water Management, Energy, Transport or Postal Services ([TAR, 2021-12-14, No. 25773](#)).

¹⁵ *Order of the Minister of Environment of the Republic of Lithuania*. 2022. Customer Information Requirements ([TAR, 2022-02-24, No. 3543](#)).

¹⁶ *Ministry of Environment of the Republic of Lithuania*. 2019. [The 'BIM-LT Project'](#) (project No 10.1.1-ESFA-V-912-01-0029 Development of Measures to Improve the Effectiveness of Life-cycle Processes for Buildings in the Public Sector through the Application of Building Information Modelling).

classification, proposals concerning the methodological documents on the implementation of public procurement, the set of draft stipulations of standard agreement forms for BIM, and the benefits offered by BIM. The training will be provided to at least 200 specialists in the public sector whose activities are related to the field of construction.

3.4. The national policies and strategies on smart buildings (including e-mobility)

The definition of the smart building primarily focuses on the automation of the building's engineering systems to tailor the operation of the building to the needs of its users. How smart a building is can be measured or the requirements for the level of its automation can be set objectively and in line with Directive 2018/844¹⁷ based on the building's smart readiness indicator (SRI); however, the definition of the smart building or smart readiness indicator is yet to be fixed in the Lithuanian legislation. One aspect contiguous with the sphere of smart buildings that pertains to more specific requirements for building engineering system automation is rooted in the building technical regulation **STR 2.09.02:2005 Heating, Ventilation, and Air Conditioning** (revision of 28 July 2022). This revision of the regulation sets forth the requirement to install, if technologically possible and economically feasible, automation and control systems in non-residential buildings with the overall nominal output of heating or ventilation system in excess of 290 kW. Furthermore, the revision narrows down the requirements for the functionalities of the automation and ventilation systems. Ventilation and automation systems must accommodate ongoing monitoring of energy consumption, data collection and analysis, and the possibility to control energy consumption and read and transmit data remotely; comparative analysis of energy consumption in the building, making records of changes in the efficiency indicators of the heating, ventilation, and air conditioning systems in place and notifying the building management personnel about the possibilities to control the energy consumption levels.

The national policy on the development of e-mobility may be seen as targeting several areas relating to e-mobility: promoting the acquisition of electric vehicles and promoting the installation of electric vehicle charging stations. **The Law on Alternative Fuels of the Republic of Lithuania**¹⁸ defines the key terms and guidelines of promoting the use of electrical power in transportation. In an effort to promote the use of electricity in transportation, this law stipulates that by 2025, the volume of M1 class electric vehicles should account for at least 10 %, and class N1, at least 30 % of total annual procurement transactions; that by 2030, the volume of M1 class electric vehicles should account for at least 50 %, and class N1, 100 % of total annual procurement transactions. As of 1 January 2030, class N1 vehicles equipped with internal combustion engines, other than class N1 vehicles fuelled by alternative fuel, will no longer qualify for registration. Financial assistance in purchasing electric vehicles and/or installing or renovating the necessary charging infrastructure will continue to apply in the manner designated by the government until class M1 and N1 electric vehicles account for at least 10 % of all vehicles.

Expansion of charging stations has a more direct bearing on the construction sector per se, for charging stations are often installed on the building's structures and constitute part of the building's power supply system. According to the information for May 2022, there were nearly 600 public electric vehicle charging points in Lithuania, and the Ministry of Transportation expects that the number of public and semi-public charging points will grow to 6,000 by 2030¹⁹. The total number of electric vehicle charging points to be available by 2030 is 60,000.²⁰ Achievement of the national public electric vehicle charging infrastructure expansion goals and compliance with the regulatory requirements has funding earmarked from the 2021–2027 EU investment programme, the Recovery and Resilience Facility, the Sustainable Mobility Fund, and other sources. The Ministry of Transportation intends to allocate a total of some EUR 86 million to promote the deployment of public and semi-public electric vehicle charging points.

3.5. The national policies and strategies on circular construction

Considering that most of the materials used in the construction sector are tied up in the economy for at least 30 years, it is critical that buildings be designed with a lasting sustainability vision in mind. In this case, unified application of the principles of circular economy in the sector of construction calls for a new

¹⁷ Regulation (EU) [2018/848](#) of the European Parliament and of the Council. 2018.

¹⁸ The Law on Alternative Fuels of the Republic of Lithuania. 2021. ([TAR, 2021-04-08, No. 7413](#)).

¹⁹ *Ministry of Transport and Communications of the Republic of Lithuania*. 2022. [Development of the Lithuanian public electric vehicle charging infrastructure until 2030](#).

²⁰ *Ministry of Transport and Communications of the Republic of Lithuania*. 2023. [The Development of infrastructure of electric vehicle](#).

systemic approach, one that covers the assessment of the impacts of the building lifecycle and the entire construction value chain. In terms of circular economy, the possibilities to improve the efficiency of resources in the construction sector are linked with increasing the lifecycle of buildings through modernisation or repurposing, as well as expansion of modular buildings.

To achieve this purpose, the Ministry of the Environment has developed **Draft Action Plan for Lithuania's Transition to Circular Economy by 2035**²¹, whereby circular construction is identified as one of the six directions of intervention where efforts will be made to embed more sustainable practices of using resources through the application of the principles and strategies of circular economy. Table 3.7 highlights planned measures to be deployed in relation to the expansion of circular economy in the sector of construction. All of the activities listed in the table fall within the responsibility of the Ministry of the Environment.

Table 3.7. Measures of the Action Plan for Lithuania's Transition to Circular Economy by 2035 relating to the expansion of circular economy in the sector of construction

Order No.	Title of the objective, target, measure	Period of implementation	Financial projections, thousand euro	Funding source	Instrument type
1.	Establish a coherent framework for the transformation of the construction sector				
1.1.	Develop a long-term agenda for the transition to circular construction	*	*	*	Analytical
2.	Enhancing the knowledge and competences of construction professionals to apply circular design principles				
2.1.	Develop a methodology for life cycle modelling of buildings and adopt it by order of the Minister of the Environment	2023–2024	2,941	EU, other funds	Regulatory
2.2.	Incorporate circular and eco-design competences into training programmes for construction professionals	*	*	-	Regulatory
3.	Promote the use of more environmentally friendly construction products				
3.1.	Requirement of environmental impact declarations for construction products	*	*	-	Regulatory
4.	Promote the renovation/modernisation of buildings using standardised modular constructions made of organic renewable materials				
4.1.	To finance the implementation of pilot projects for the renovation/modernisation of buildings using standardised modular constructions made of organic renewable materials and, on the basis of these pilot projects, to develop recommendations for the mass application of these solutions	*	*	*	Investment

²¹ Ministry of Environment of the Republic of Lithuania. 2022. [Draft Action Plan for Lithuania's Transition to Circular Economy by 2035](#).

4.2.	Financing the development of production capacity for standardised modular structures made of organic renewable materials	*	*	*	Investment
4.3.	Updating the legislation by laying down technical requirements for the renovation/modernisation of buildings, taking into account the use of standardised modular constructions made of organic materials and other technological solutions	*	*	-	Regulatory
5.	Improve resource and energy efficiency through continued building renovation programmes				
5.1.	Financing the renovation/modernisation of multi-apartment buildings	*	*	*	Investment
5.2.	Financing the renovation of public buildings	*	*	*	Investment
5.3.	Providing financial incentives for renovation of individual houses	*	*	*	Investment
5.4.	Financing the renovation of individual houses	*	*	*	Investment

*- this information was scrutinised and revised as the plan was being developed.

The Ministry of the Environment's **State Plan on Waste Prevention and Management**²² provides for the period of 2021–2027 that the system of managing construction waste should be organised so that at least 70% of non-hazardous construction waste (by volume), other than the waste specified in the Rules on Waste Management as approved by the Minister of the Environment, be recycled and prepared to reuse, processed and utilised otherwise. Efforts have to be made to ensure convenient collection of such waste from the general public – this can be achieved by expanding the network of oversized waste collection sites. Table 3.8 shows the implementing measures for the plan in the area of construction waste (some of the measures cover several areas).

Table 3.8. Implementing measures for the 2021–2027 State Plan on Waste Prevention and Management (handpicked for the area of construction waste)

Order No.	Title of the objective, target, measure	Period of implementation	Responsibility	Financial projections, thousand euro	Funding source	Instrument type
1.	Avoiding waste, reducing the amount of waste generated and the amount of harmful substances in raw materials and products					
1.4.	Promote eco-design of products, buildings and business models for waste prevention					
	Develop a methodology for life cycle modelling of buildings and adopt it by order of the Minister of the Environment	2023–2024	Ministry of the Environment	2,941	EU structural funds, other funding	Regulatory

²² Resolution of the Government of the Republic of Lithuania. 2022. State Plan on Waste Prevention and Management for the period of 2021–2027 ([No. 573, TAR 2022-06-01, i. k. 2022-11887](#)).

2.	Separating waste at their occurrence site that could be prepared for reuse or recycling					
2.1.	Raising people's environmental awareness and responsibility for waste sorting					
	Publicity campaigns to promote the separate collection of waste (especially food, textiles, construction, furniture, packaging, tyres, hazardous waste)	2022–2026	Municipalities, producer and importer organisations	–	EU funds, state and municipal budgets	Communicative
3.	Encourage the preparation of waste for re-use					
3.1.	To make products or components of products which have become waste while inspection, cleaning or repair, to be fit for use again without initial processing					
	Assessing the feasibility of returning unused leftover materials (including building materials) to outlets and purchasing them for others	2024–2025	Ministry of the Environment	20	State budget funds	Analytical
4.	Use of waste to produce products or materials for the same or other purposes					
4.1.	Promote the preparation and recycling of waste					
	Assess the possibility of establishing the manufacturer's responsibility for construction and other products and, if necessary, the manufacturer's responsibilities and tasks	2024	Ministry of the Environment	20	State budget funds	Analytical
4.2.	Promote the use of recycled materials					
	Financing the introduction and development of technologies that make it possible to use more recycled materials in production	2023–2027	Ministry of the Environment	28,000	EU funds, state budget funds	Investment
5.	Other uses of waste: use of non-recyclable waste to reduce the impact of waste on the environment and public health, and reduce the amount of waste going to landfill					
5.1.	Ensuring that waste with energy value that is no longer suitable for recycling or reuse is used for energy recovery					
	Develop legislation to strengthen the requirements for the use of waste for energy recovery, including requirements for the waste used for energy recovery and criteria defining the recyclability of waste	2024	Ministry of the Environment	–	–	Regulatory

Some of the stipulations laid down in the State Plan on Waste Prevention and Management have already been rooted in the wording of the **Law on Waste Management of the Republic of Lithuania**²³ effective

²³ The Law on Waste Management of the Republic of Lithuania. 1998, 2002. ([No. IX-1004, 2002-07-01, Žin., 2002, No. 72-3016](#))

as of 31 January 2023. Under this law, the general public must be provided a possibility to recycle construction waste produced in households (such as wood, mineral waste (concrete, bricks, ceramics, and so on), metals, glass, plastic, plaster) and to delivery such waste for collection separately to oversized waste (including construction waste) collection sites, also arranging for other ways to collect oversized waste.

3.6. The national policies and strategies on green procurement

Green procurement is the type of procurement where the contracting party aims to purchase goods, services, or works that have the least environmental impact possible throughout the lifecycle of the product, which closely relates to the development of sustainable construction. In Lithuania, the field of green procurement in relation to the construction sector is governed by one law and a number of resolutions and orders that are outlined below.

Following the Resolution **On the Establishment and Achievement of Green Procurement Targets** from the Government of the Republic of Lithuania dated 21 June 2021²⁴, as of 2023, all governmental procurements shall be fully green.

The Law on Public Procurement of the Republic of Lithuania²⁵ envisions that the central contracting body must routinely provide the Public Procurement Office with information about the centralised procurements of contracting bodies, to be accompanied by information about the green procurements completed, stating their values and the application of the energy efficiency requirements.

The Description of the Procedure for the Application of Environmental Protection Criteria in Green Procurements²⁶, as approved by Order No D1-508 from the Minister of the Environment of the Republic of Lithuania dated 28 June 2011 (effective wording as of 1 January 2023) stipulates that purchasing building design services and construction works and materials (timber and its products, paint, insulation materials, drywall, tiles, windows, skylights, and glazed exterior doors) by way of public procurement will be subject to minimum environmental protection criteria. The relevant criteria are listed in Annex 2 to the same document and mainly include the threshold values of prohibited substances and materials, the threshold amount of processed materials in the product, and the requirements for the mandatory application of certain standards.

The List of Products other than Motor Vehicles that are Subject to Energy Efficiency Requirements for the Purposes of Public Procurement and Procurement by Contracting Bodies²⁷, as approved by Order No 1-154 from the Minister of Energy of the Republic of Lithuania dated 18 June 2015 (effective wording as of 24 December 2022) prescribed the efficiency requirements for ventilation, cooling, hot water preparation, indoor heating equipment and boilers of heating systems.

To promote green procurement, on 20 July 2021, the Minister of the Environment of the Republic of Lithuania issued Order No D1-448 approving **The 2021–2025 Roadmap for the Implementation of Green Procurement**; some of the measures laid down in the plan have already been implemented as per execution document²⁸ (Table 3.9).

²⁴ *Resolution of the Government of the Republic of Lithuania*. 2021. On the Establishment and Achievement of Green Procurement Targets ([TAR, 2021-06-21, No. 14034](#))

²⁵ *The Law on Public Procurement of the Republic of Lithuania*. 2017. ([TAR, 2017-05-04, No. 7550](#))

²⁶ *Order of the Minister of Environment of the Republic of Lithuania*. 2011, 2022. The Description of the Procedure for the Application of Environmental Protection Criteria in Green Procurements ([No. D1-401, TAR 2022-12-13, i. k. 2022-25384](#))

²⁷ *Order of the Minister of Energy of the Republic of Lithuania*. 2015, 2022. The List of Products other than Motor Vehicles that are Subject to Energy Efficiency Requirements for the Purposes of Public Procurement and Procurement by Contracting Bodies ([No. 1-466, 2022-12-19, TAR 2022-12-23, i. k. 2022-26614](#))

²⁸ *Order of the Minister of Environment of the Republic of Lithuania*. 2021. [The 2021–2025 Roadmap for the Implementation of Green Procurement](#).

Table 3.9. The 2021–2025 Roadmap for the Implementation of Green Procurement.

Instrument of implementation	Responsibility	Deadline for implementation
Objective 1. <i>Improve the green procurement competences of contracting authorities, contracting entities and entities which are not contracting authorities but which are implementing progress measures and/or projects funded by the progress funds, using progress funds, and ensure adequate consultations on green procurement issues</i>		
On the basis of the Green Procurement Training Programme developed by the European Commission and/or the Green Procurement Training Programme approved by the order of the minister of the environment of the Republic of Lithuania (3 March 2008 No D1-122 "On the Approval of the Green Procurement Training Programme"), in accordance with the needs of the procuring entities, to organise specialised trainings-workshops for the procuring entities in relation to the issues related to the green procurement at least once a quarter and to share the above-mentioned information with suppliers	PPS	2021-2025
Perform consultations on green public procurement issues	PPS	2021–2025
Develop and disseminate guidance and methodological material on green public procurement to procurers and suppliers, and develop and publicise information on good practice in green public procurement;	PPS	2021–2025
Keep the Green Procurement website up-to-date with information on green procurement and other useful information on green procurement for procurers, suppliers and other stakeholders	PPS	2022-2025
Objective 2. <i>Improve the legal framework for green procurement*</i> <i>*Measures already implemented and no new from 2024 are planned</i>		
Objective 3. <i>Promote the dissemination of information on green procurement and strengthen cooperation with market players (procurers, suppliers)</i>		
Produce a newsletter for procurers, to be distributed at least quarterly, providing information on green procurement issues	PPS, Ministry of the Environment	2021–2025
Implement the Green Procurement dissemination and communication strategy	PPS, Environmental Project Management Agency	2022–2025
Inform suppliers in the Central purchasing organisation (CPO LT) catalogue of developments in the field of green procurement and advise on the inclusion of such products in the catalogues	Central purchasing organisation	2021–2025
Develop a network of green procurement practitioners to share information on developments in green procurement.	Ministry of the Environment	2021–2025
Objective 4. <i>Improve information systems for public procurement and ensure that information on green procurement is properly collected and organised*</i> <i>**Measures already implemented and no new from 2024 are planned</i>		
Objective 5. <i>Monitor progress on green procurement</i>		
Conduct a survey of procurers via the e-citizen or other information system to assess the effectiveness of the green procurement system	Ministry of the Environment	Q4 of each year
Report to the Ministry of the Environment on the progress of green procurement in the previous calendar year	PPS	by 30 April each year
Provide the Government with structured information on the progress of green procurement when submitting annual reports on the activities of the Public Procurement Office	PPS	by 30 April each year

Provide the Ministry of the Environment with structured information on green procurement carried out by non-procuring organisations in the previous calendar year in the implementation of projects financed by the Progress funds	Environmental Project Management Agency	Q1 of each year
Provide the Government with information on green procurement carried out by non-procuring organisations in the previous calendar year in the implementation of projects financed by the Progress Funds;	Ministry of the Environment	Q2 of each year
After receiving of information from the Public Procurement Office on insufficient compliance with the Resolution of the Government of the Republic of Lithuania No 1133 of 21 July 2010 "On setting and implementing the objectives of Green Procurement" point 1, to submit to the Government proposals for additional mandatory measures to promote green procurement and improve the system within one month	Ministry of the Environment	2021–2025
Organise awards to recognise the purchasers who have made the most green purchases	Ministry of the Environment	Q2 of each year
Prepare and submit information and reports on green procurement issues to the United Nations, the Organisation for Economic Co-operation and Development, the institutions of the European Union and the Republic of Lithuania, and other entities	PPS, Ministry of the Environment	2021–2025
Participate in working group meetings of the European Commission and other international institutions on green procurement issues, as appropriate	Ministry of the Environment	2021–2025

In an effort to promote public green procurement by the contracting bodies defined in the Law on Public Procurement of the Republic of Lithuania and the related competences, on 6 February 2018, the Minister of the Environment issued Order No D1-85 approving **The Green Procurement Training Programme**²⁹.

3.7. The links between the national policy measures and competence areas relevant to sustainable construction

The national policy guidelines covered above are directly and indirectly linked to the competences that are relevant to sustainable construction. A summary of the planned measures and the underlying area that are affecting and will affect the need for additional competences is based on the expert opinion of the authors of this report and is provided in Table 3.10 (with direct links between a particular competence and policy field labelled as ‘++’, and indirect links, as ‘+’).

These links will be considered for the purposes of assessing the need for employees with the relevant competences that contribute to the achievement of the 2030 targets (Section 7 *Competences and skills gaps between the current situation and the expected needs for 2030*).

²⁹ Order of the Minister of Environment of the Republic of Lithuania. 2018. The Green Procurement Training Programme ([TAR, 2018-02-08, No. 2002](#)).

Table 3.10. The links between the national policy measures and the competences in areas relevant to the achievement thereof

Areas of competences	The policy area				
	<i>Energetics and renewable energy sources (investment projection 2021-2030 - up to EUR 10 billion)</i>	<i>Digitalisation of the construction sector (no investment projection identified)</i>	<i>Smart buildings (including e-mobility) (investment projection for e-mobility alone ~ EUR 86 million)</i>	<i>Circular construction (investment projection currently under preparation)</i>	<i>Green Procurement (no investment projection identified)</i>
Application of energy saving/efficiency measures in buildings	++		+		
Application of modular (prefabricated) building structures				++	
Sustainable renovation of building constructions and their engineering systems (to achieve energy and environmental benefits)	++			++	++
Nearly Zero-Energy Buildings (NZEB) and Zero-Emission Buildings (ZEB) construction;	++		++		+
Integration of renewable energy source technologies (RES) into buildings	++		+		+
Digitilisation of the construction process and Building Information Modelling (BIM)		++	+		
Increasing of buildings' (new and existing) smartness (automation)		+	++		
Building Management Systems (BMS) and their data analysis		+	++		
Renovation of cultural heritage buildings	++			+	
Life Cycle Analysis (LCA) of a building and its components				++	++
Recycling and re-use of materials (circular construction)				++	++
Green procurement				++	++

4. Key Indicators of Building and Energy Sectors

4.1. Overview of the statistics of the key indicators of the Lithuanian construction sector in 2013–2022*

Just like with any other country, construction is an integral part of the economy of Lithuania, and the volumes and economic indicators of construction are directly impacted by the development of the national economy. One job in the construction sector is connected to 3 to 4 other jobs in other sectors³⁰. The recent developments, such as the COVID-19 pandemic, the inflation of energy prices, and the war in Ukraine, have brought about a variety of changes in the construction sector. The end of the pandemic in late 2021 was followed by a rapid recovery of the global economy, which affected the construction sector and pushed every indicator upwards. However, the outbreak of the war in Ukraine in early 2022 and the resultant energy crisis and the crisis of supplies and raw materials as well as the pronounced inflation had its own impact on the 2022 performance results of the sector and are still putting balanced growth in 2023 at serious risk.

Table 4.1 showcases the statistical data of the key indicators of the construction sector and the economy in Lithuania for 2013–2022. This table shows that in 2021, Lithuania's GDP stood at EUR 56.2 billion at current prices. Whereas the construction sector's share of the Lithuanian GDP used to vary from year to year and in 2022 amounted to **7.03 %**.

Table 4.1. Dynamics of the key indicators of the construction sector

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Share of the construction sector in the national economy										
LT GDP (billion EUR)	35.0	36.6	37.3	38.9	42.3	45.5	48.9	49.8	56.2	66.9
Construction work carried out within the country (billion EUR)	2.1	2.4	2.5	2.3	2.6	3.0	3.4	3.3	3.6	4.7
% of GDP	6.00	6.56	6.70	5.91	6.15	6.59	6.95	6.63	6.41	7.03
Construction work carried out abroad (billion EUR)	-	-	0.200	0.230	0.280	0.310	0.390	0.396	0.449	0.590
Enterprises in the construction sector										
Number of construction enterprises (units) ³¹	-	-	6,987	7,315	7,749	8,029	8,778	9,362	9,675	10,714
Employees in the construction sector										
Number of employees (total in country) (thousands)	1,296	1,323	1,341	1,372	1,362	1,380	1,388	1,367	1,383	1,453
Number of people employed in the construction sector (thousands) ³²	89.38	99.07	99.07	105.43	103.97	100.32	103.50	106.93	101.64	104.94
Of which women (thousands)	-	-	-	-	12.9	13.0	12.8	15.9	16.8	-
% of all employees	-	-	-	-	12.41	12.96	12.37	14.87	16.53	-
Average gross salary in the construction sector (EUR/month)	-	-	714	774	840	924	1296	1378	1620	-

³⁰ Order of the Minister of Environment of the Republic of Lithuania. 2015. Guidelines for the Expansion and Development of the Lithuanian Construction Sector in 2015-2020 ([TAR, 2015-11-10, Nr. 17869](#)).

³¹ Official Statistics Portal. 2023. [Database of Indicators](#).

³² Eurostat. 2023. Data Browser: [Employment by A*10 Industry Breakdowns](#).

YEAR	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Labor productivity in Lithuania (Gross value added per person employed) - thousand euro ³³	36.3	32.9	27.8	30.2	34.2	37.0	35.6	39.2	-	-
Labor productivity in the construction sector (Gross value added per person employed) - thousand euro	11.4	13.1	13.0	13.6	14.4	16.2	17.4	18.2	-	-

*some of the 2022 statistical data were not available at the time of the research – as a result, the data are preliminary.

Note: Some of the comparable statistical information of the Lithuanian construction sector is only available for periods from 2015 onwards, because that was the year when part of the framework for the grouping of data compiled at a national level was altered. In this table, the statistical data for the construction sector from EUROSTAT and the Official Statistics Portal are presented under section F of the Classification of Economic Activities (ERVK) v2: Construction, which covers the activities of all types of entities and contractors involved in all spheres.

The construction sector is closely connected to other areas: mining and quarry operation, processing, the supply of electricity, gas, steam, and air conditioning, the supply of water, wastewater processing, waste management and regeneration, transportation and warehousing, information and communications, real estate transactions, professional, scientific, and technological activities including the activities of building design, architecture, constructional computations, geological surveys, and various other construction engineering activities and services). The classification of activities could cause some irregularities in presenting data on the number of persons employed in the construction sector.

Dynamics of construction volumes

In 2022, the value of construction works complete in Lithuania was EUR 4.7 billion, marking a 23.4 % increase from 2021; this includes EUR 590 million worth of construction works performed abroad, up by 31 % from 2021 (Fig. 4.1).

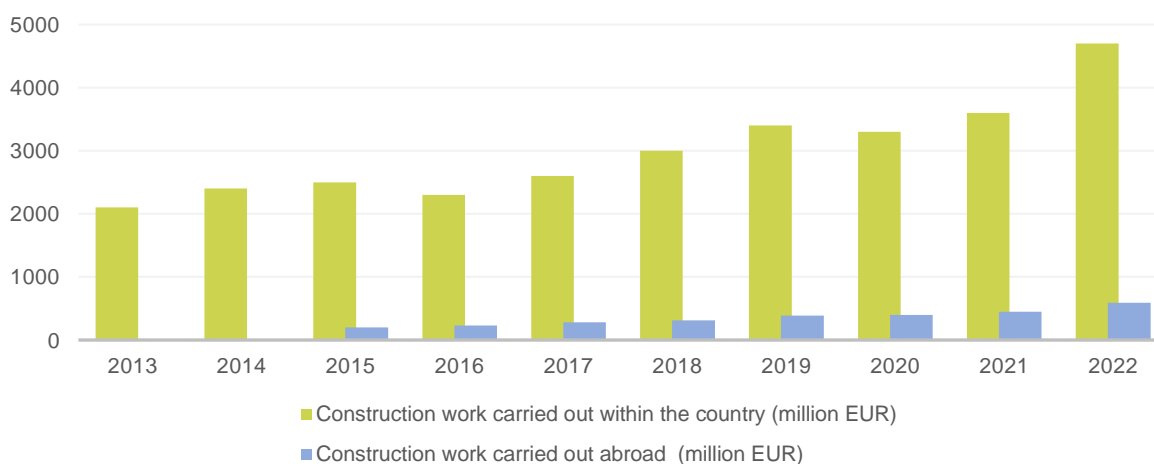


Fig. 4.1. The volumes of construction works and the foreign share thereof³⁴

Over the year (by December 2021 compared to December 2020; Fig. 4.2), the construction input price had increased by 10 %. This was the product of the economy recovering after the shock of the pandemic, with producers around the world were facing higher prices of raw materials and semiconductors: the prices of building materials and products had increased by 12.7 %, the average gross salary, by 6.2 %, the hourly rates of machines and installations, by 3.7 %. For buildings, the biggest leap of 13.8 % had been observed in the costs of construction of non-residential buildings over the year. The costs of construction of residential buildings had increased by 10.2 %, engineering structures, by 6 %. The

³³ Eurostat. 2023. Data Browser: [Apparent labour productivity by NACE Rev. 2.](#)

³⁴ Official Statistics Portal. 2023. Database of Indicators: [Construction.](#)

biggest change in prices was recorded in April 2022, when the prices of construction cost elements went up by 21.1 % compared to the same month of 2021. The rapid jump in energy prices due to the war in Ukraine played a major role in that regard.

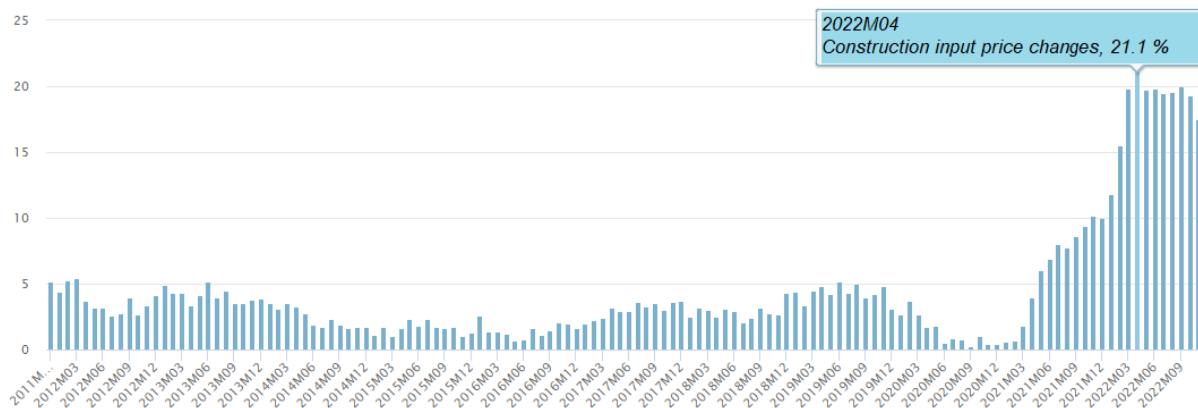


Fig. 4.2. Construction input price changes, year-on-year³⁵

Non-residential construction works amounted to EUR 1.75 billion in 2022 (37.4 % of the national total) and EUR 1.4 billion in 2021, accounting for 38.2 % of the national total, or 14.8 % more than a year earlier, mainly due to an increase in the construction input prices. Meanwhile, residential construction works amounted to EUR 1.01 billion in 2022 (21.7 % of the total construction works in Lithuania) and EUR 0.77 billion in 2021 (20.6 % of the total), or 8.6 % more than in 2020, after removing the impact of working days. This is due to an increase in the volume and cost of construction work. Civil engineering works (i.e. construction of roads, streets, railways, bridges and viaducts, airport structures, utilities, etc.) amounted to EUR 1.91 billion in 2022, representing 40.9 % of the total national construction works, compared to EUR 1.6 billion in 2021 (41.2 % of the national total), a decrease of 4.9 % from 2020 when the impact of the number of days worked is excluded.

Companies in the construction sector

In 2022, the number of companies operating in Lithuania's construction sector increased to 10.714 (by 10.7% against 2021). As the growth of the number of employees in this sector over this period was not proportionate to that of the number of companies and stood at 3.2 % only, this shows that the company growth was affected by the **trends of company downsizing**, the development of new construction and energy industries (such as renewable energy sources and so on), new technologies, the increase in productivity, and the various initiatives and incentives to promote the growth of small- and medium-sized business. Taking a broader look at the change in the number of companies that have their activities closely intertwined with the construction sector, a look that covers a longer period of time, it needs mentioning that between 2010 and 2020, the growth rate (230.0 %) had been recorded in the number of construction companies, followed by companies involved in real estate (192.6 %), architecture and engineering (125.8 %), and manufacturing (42.1 %) (Fig. 4.3).

³⁵ Official Statistics Portal. 2023. Database of Indicators: [Price Indices, Changes and Prices](#).

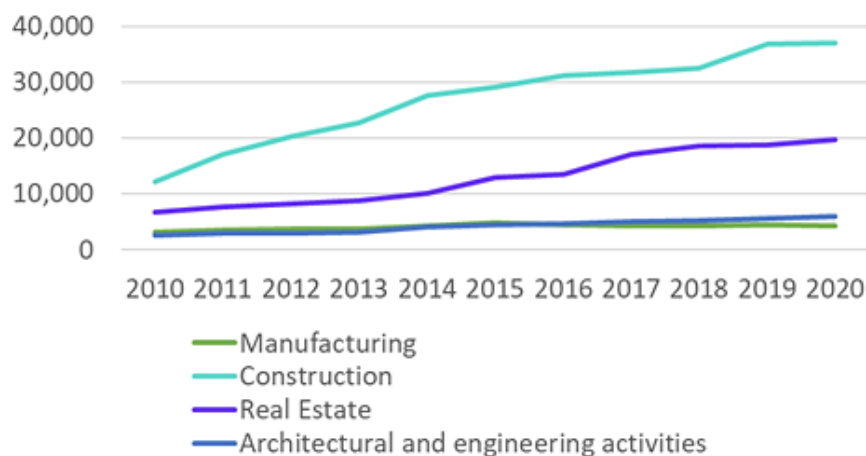


Fig. 4.3. The number of companies in Lithuania's construction sector, 2010–2020.³⁶

Employees in the construction sector

At the end of 2022, the number of people employed in the construction sector in Lithuania had grown by nearly 3.2 %: up to 104,940 compared to 101,640 in 2021. In 2022, employees in the construction sector accounted for about 7.22 % of Lithuania's workforce. Since 2013, this share had increased by around 17 %. The number of women working in the construction field is increasing as well: in 2017, women's share of the construction sector workers was 12.41 %, and in 2021, it was 16.8 % already. There has been a pronounced increase in productivity in the sector as well: between 2013 and 2020, it had gone up by nearly 60 %, although it is still well behind the EU average and has a vast untapped potential to grow.

Analysis of the structure of employment by profession reveals that more than one-half of the persons employed in construction business are skilled workers and craftsmen, even though their share had been following a downward path over the past few years³⁷ (Fig. 4.4). This decrease could be caused by the deficit of skilled construction workers on the market and the ongoing overall shortage of workforce. According to the outcomes of the survey of companies and institutions (covering a sample of 2.6 thousand respondents), the companies see shortage of personnel as a key challenge in 2023 as well. The biggest deficit by jobs available can be observed amidst skilled specialists and workers, while there is virtually no shortage of unskilled labour³⁸. In May 2023, skilled builders were still among the professions that enjoyed the greatest demand (with the biggest number of jobs available)³⁹, which stands to prove the fears of the companies polled in the construction sector survey.

The deficit of employees can be offset to an extent by boosting productivity, which increases with technological advancement and digitalisation and process automation. Depending on the specifics of the products or services, investments into new processes and software tip the balance of the capital in use and the employees.

Considering that of all the people employed in the Lithuanian construction sector, nearly **40 % will retire by the year 2030**, steps must be taken to ensure the education and engagement of the young generation in different engineering educational programmes and projects at all levels, from vocational education and training to colleges to universities.

³⁶ European Commission. 2021. [European Construction Sector Observatory, Country Profile Lithuania](#).

³⁷ The Employment Service. 2019. [Trends in the Construction Sector](#).

³⁸ The Employment Service. 2021. [Labour Market in the Construction Sector](#).

³⁹ The Employment Service. 2023. [Professions in Demand](#).

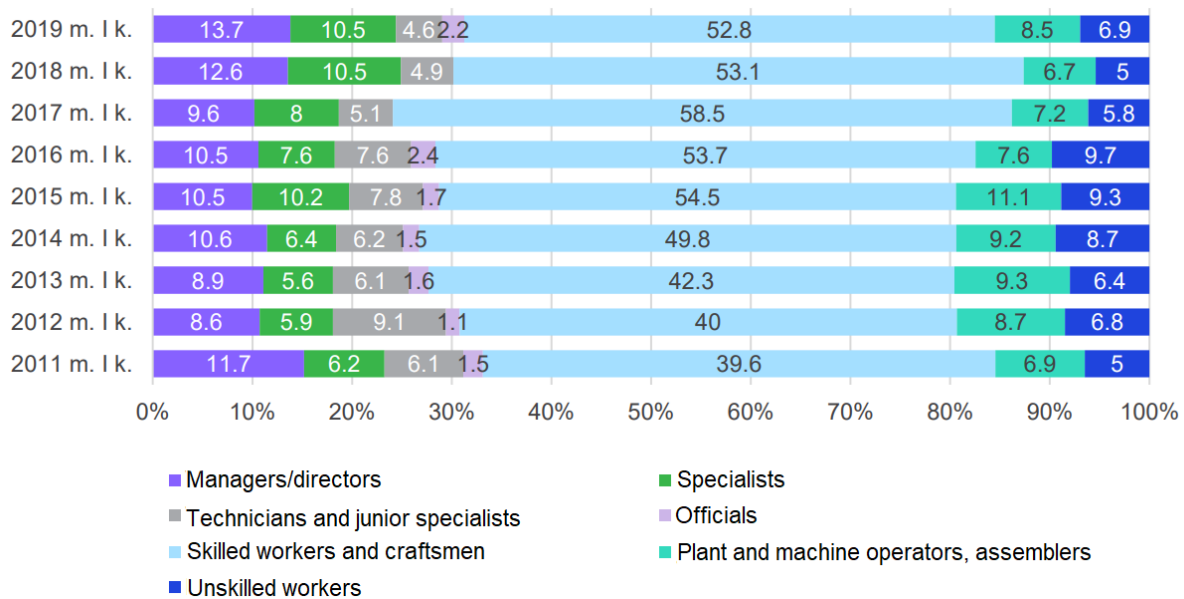


Fig. 4.4. Persons employed in the construction sector by group of professions

Migrants and illegal labour

The construction sector in Lithuania is still among those plagued by illegal labour and a high number of immigrant workers the most. According to the latest report from the Special Investigations Service⁴⁰ (2021), during the 1st half of 2019, the number of third-country individuals illegally employed in the construction sector accounted for 11.88 % of all the workers found to be employed illegally in this sector. Over the past few years, the growth of the extent of illegal foreign labour has been affected by a number of factors, such as the geopolitical situation in Ukraine and the growing shortage of skilled labour. A tendency has been observed for the past several years where Polish companies engaging in the construction sector would dispatch workers from Ukraine to Lithuania. With the help of brokers, Ukrainian workers would travel directly to Lithuania. Oblivious of their rights and possessing zero language skills, some of them live and work in horrendous conditions and are being underpaid for their work. Out of the 102 foreigners who were found to be working illegally in the 1st half of 2019, 69 worked at companies without any employment contract, and 27 foreigners were self-employed without any kind of registration, providing services to private individuals: usually building private homes or doing repairs on houses and flats. Around 73 % of the foreigners found to be working illegally were Ukrainian nationals. Notably, the largest number of illegal workers from Ukraine was found in the construction sector (Fig. 4.5).

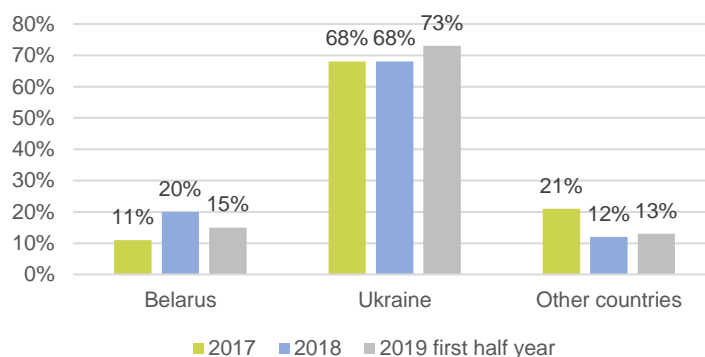


Fig. 4.5. Illegal work by third-country nationals in the construction sector by country⁴¹

⁴⁰ Special Investigation Service. 2021. [Corruption risk analysis.](#)

⁴¹ Special Investigation Service. 2021. [Corruption Risk Analysis.](#)

Acting on the SIS's recommendations regarding the control of illegal foreign labour, the State Labour Inspectorate (SLI) began deploying new preventive measures by launching transparent worker IDs and combined checks of cargo transport at border checkpoints. The SLI focused its inspections of construction sites (especially those of private homes) and took further steps to raise the public's awareness of ID cards and the harm of illegal labour in general. In 2023, the SLI intends to continue its efforts in improving the transparent worker ID system by working with the Construction Inspectorate and improving the operation of the INFOSTATYBA information system⁴². In 2022, the share of construction site workers with electronic IDs accounted for 61 % already.

Table 4.2. Indications of illegal labour⁴³

Sector of the economy		Total number of inspections carried out to control illegal employment (illegal employment investigation reports issued)		Identification of illegal, undeclared and undocumented workers employed in breach of the procedures for employing foreigners					
				business entities	persons				
					total	total		persons under 18	foreigners
						number	%		
In 2021, 01-12 month									
0	Total	3,881		1,442	3,390		27	883	
41...43	Construction	2,184	56.27	886	1,453	42.86	5	523	
In 2022, 01-12 month									
0	Total	4,217		1673	3,833		40	1463	
41...43	Construction	2,677	63.48	968	1,601	41.77	5	692	

Table 4.2 shows that amidst the checks made by the State Labour Inspectorate across all sectors, the construction sector has a lot of indications of illegal labour. With the companies audited in 2021, the percentage of illegal workers was 42.86 %, remaining nearly unchanged in 2022: 41.77 %. Nearly one-third of the illegal workers were foreigners.

To sum up, the Lithuanian construction sector can be said to still be possessed of the highest volume of illegal labour, yet the problem is known and is being addressed through tighter controls and preventive measures, their impact most probably becoming apparent over the next few years.

Public procurement in construction

Speaking of the construction sector in Lithuania, it is critical to assess the impact of public procurement and lowest bid, including the development of competences and productivity. The value of public procurement in Lithuania stands at nearly EUR 6 billion every year, which amounts to roughly 12 % of the country's GDP. The amount spent on public procurement in the construction sector varies between 40 % and 50 % of all domestic public procurement spending every year, adding up to around 4.7 % of the country's GDP.

The share of public procurement in the construction sector, measured as a portion of the national GDP, was decreasing between 2019 and 2021, amounting to 5.6 % in 2019, 4.8 % in 2020, and 3.8 % in 2021.

⁴² State Labour Inspectorate. 2023. [2022 Activity Report](#).

⁴³ State Labour Inspectorate. 2023. [Information of Illegal Workers](#).

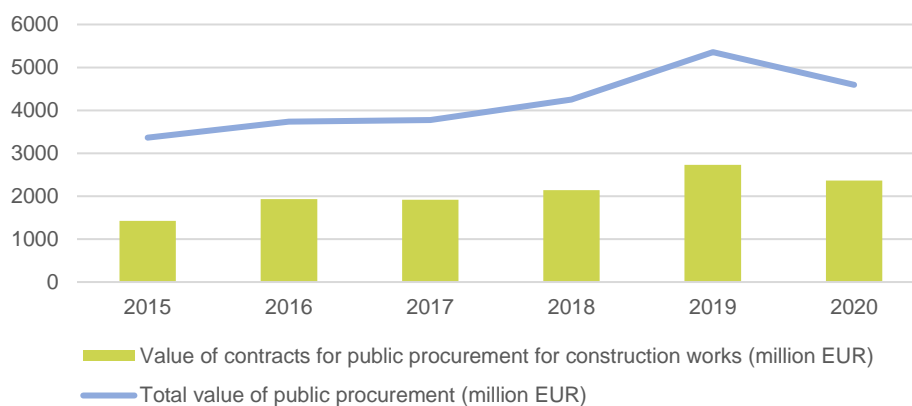


Fig. 4.6. The volumes of public procurement for construction works in Lithuania⁴⁴

The pursuit of one-time, instant gain during public procurement dooms the society to live and work in the environment of an unsustainable infrastructure. It dooms future generations to sometimes be forced to repair and maintain buildings that were designed and built without any aim of achieving any effect from their operation. The lowest-bid principle in purchasing services, the unreasonable demands of contracting bodies, the fuzzy interpretation of joint venture and subcontract and other issues are plaguing the construction sector today. The product of this imperfect process of public procurement is an unsustainable infrastructure and national design and construction companies that lack motivation to innovate. This tendency makes organisations (and the whole Lithuanian construction sector, the driver behind the development of the infrastructure of Lithuania's economy) to lose their competitive edge, for they are unable to invest into new technologies and specialist trainings due to their limited profit margins. The low profitability on the construction market is driving builders to migrate to other European states. That is why improvement needs to be made to the working conditions of business by initiating changes in the rules and regulations governing public procurement. The Lithuanian Construction Association and partners have secured an approval from the Public Procurement Office regarding the development of a directory of the criteria of generally accepted qualifications and economic efficiency for the purposes of public procurement of contractor services.

Digitalisation of the construction sector in Lithuania

Responding to the needs of businesses to ensure effective control of information in construction projects and improve the efficiency and competitiveness of the sector, the Lithuanian Builders' Association in partnership with its colleagues from other associations has assumed national leadership in digitalising the Lithuanian construction sector. Together with business companies, science and education establishments actively engaged in the underlying activities. Governmental bodies were constantly invited to list this subject as a priority area for the development of the Lithuanian construction sector and asked to allocate the necessary resources and establish incentivisation mechanisms.

In its pursuit of this subject, the Lithuanian Builders' Association, working together with partners from other associations and a team from science and education establishments, has started promoting the development of topics relevant to the digitalisation of the Lithuanian construction sector. The key results achieved over the period of 2012 to 2023 were as follows:

- **The first international conference titled Digital Construction 2012** was held in Vilnius in 2012. The conference featured a presentation of the hands-on results of CUNECO CCS, the creation project on Denmark's national construction information classification system and its market applications⁴⁵. Since then, conference Digital Construction. Vilnius has become an annual event.
- In 2014, 13 associations and unions in the Lithuanian construction sector **established VšĮ "Skaitmeninė Statyba" (Digital Construction)** nonprofit organization: www.skaitmeninestatyba.lt (www.digitalconstruction.lt).

⁴⁴ Public Procurement Office. 2022. [Public Procurement of the Construction Sector in 2019-2021](#).

⁴⁵ MOLIO

- In 2015, the **first almanac titled Digital Construction 2015 was issued**, to become an annual periodical.
- The **first “Lithuania’s Best BIM Project 2016” awards** competition was held in 2016. A system of criteria for the evaluation of BIM projects was developed. The contest has been held annually since then. <https://skaitmeninestatyba.lt/projektai/>
- In 2016, the team of VšĮ “Skaitmeninė Statyba” (Digital Construction) conducted, on order from the Ministry of the Environment “**A feasibility study for the digitalisation and funding of the Lithuanian construction sector**” and published report.⁴⁶.
- In 2016, the **Lithuanian Standardisation Department (LSD) established a TK88 BIM Committee**, the national mirror Committee of the CEN442 Committee, to actively engage in the activities of the CEN442/WG3/TG2 work group.
- In 2017, VšĮ “Skaitmeninė Statyba” (Digital Construction) (SKST), published its **first package concerning BIM methodology and its application** (BIM Execution Plan (BEP), LOD, Stages of BIM Project and BIM uses, Descriptions of competences of BIM Manager, BIM Coordinator, and BIM Specialist roles). In 2018, SKST methodology was expanded to include the first version of the Exchange of Information Requirements (EIR), recommendations for the classification of information under ISO81346 standard, and a number of other BIM templates. The SKST BIM methodology templates have already been tested in various construction design and building public procurement tenders in the public sector. The documents of the SKST BIM methodology are available at <https://skaitmeninestatyba.lt/dokumentai/>.
- In 2018, the first SKST **BIM methodology training programs, BIM I, BIM II, and BIM III, were developed**. The programs were accredited following the procedure established by the Ministry of the Environment, and the trainings were launched. By 2023, more than 500 representatives of construction market and science and education organisations have been trained under these programs.
- In 2018, the registry of competences of the Lithuanian construction sector at www.STATREG.lt was launched within the scope of the outcomes of BuildUpSkills ENERGOTRAIN, a project funded by the EU.

The Lithuanian construction sector is taking giant strides towards its digitalisation, with initial decisions to promote this digitalisation adopted at the government level. The specific governmental decisions and the related legislation are described in more detail in Section 3.3. The application of building information modelling methods and BIM-related measures on a national scale can improve the quality of the projects being implemented by the companies in the Lithuanian construction sector and help address the deficit of skilled labour. However, this will require continued efforts on the part of the government and business, as well as investments to reskill the specialists across the market, including established practitioners and new learners, and to develop the necessary ITC infrastructure.

The circularity index in the construction sector

The assessment of the progress made in the country’s transition to circular economy is based on the extent of usage of secondary raw materials, also known as the circularity index (CI), which shows the ratio between the volume of secondary raw materials and the total volume of materials used representing the amount of raw materials in the economic cycle that the country processes and reuses. The higher the CI value, the more primary raw materials are replaced with processed (secondary) raw materials.⁴⁷

Lithuania’s low CI value is the product of the insufficient amount of waste reused or processed to produce secondary raw materials, the growing rate at which this waste is produced, and the high and growing rate of domestic consumption of materials. In 2021, 21.1 tons of materials were consumed per capita in Lithuania, which is 50.4 % above the EU average. According to a STRATA report, changing the consumption of non-metallic minerals, which accounts for the largest part of domestic consumption

⁴⁶ the Ministry of the Environment, 2016. [“Study on the digitisation of the Lithuanian construction sector and recommendations for a strategy”](#)

⁴⁷ STRATA. 2022. [Assessing the structure of the circularity index and identifying the spheres affecting the dynamics of the index](#). Government Strategic Analysis Center.

of materials, most of such materials consumed in the construction sector, should be considered and the possibilities offered by bio-economy utilised. One of the reasons behind our low CI value is the lack of social awareness of and interest in the application of circular economy principles – in other words, the absence of knowledge and motivation, whereas for Lithuania to reach the EU CI average, the amount of waste reused or processed to produce secondary raw materials should be four times higher.

In 2019, the construction sector was among the top five sectors by source of waste, producing 10.9 % of the country’s waste. As the sector grew, so did the amount of waste. The ratio of processing and reusing construction and demolition waste in Lithuania is 79.5 %, while in other countries it stands in excess of 90 %.

4.2. Building construction volumes

In 2021, permits were issued for the construction of 19,480 dwellings in residential houses, their total useful area amounting to 2.1 million sq. m. Compared to 2020, the amount of permits for new dwellings had increased by 29.7 %, their useful area, by 38.5 %. In the meantime, 10,951 dwellings were completed (Fig. 4.7), their useful area standing at 1.2 million sq. m. Compared to 2020, the number of completed dwellings had dropped by 21.1 %, their useful area, by 15.6 %. Most of the dwellings built in the country were private homes, accounting for 68.3 % of all new residences.

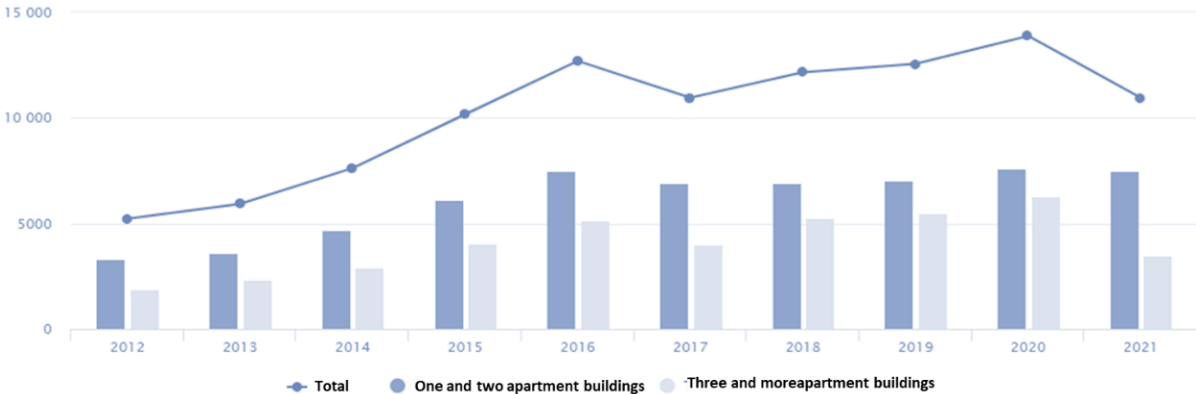


Fig. 4.7. The number of completed dwellings

In 2021, the gross area of new non-residential properties authorised for construction was 1.5 million sq. m, or 4.4 % more than in 2020. By gross area, most of the permits were issued for the construction of industrial buildings and warehouses (41.1 %) and buildings of retail, hospitality, and catering (20.8 %). In 2021, the gross area of completed non-residential buildings was 1.0 million sq. m, down by 16.8 % from 2020. By gross area, most of the completed properties were industrial buildings and warehouses (364.1 thousand sq. m) and buildings of retail, hospitality, and catering (216 thousand sq. m). Changes in the construction volumes of non-residential buildings of each function since 2012 are shown in Figure 4.8.



Fig. 4.8. The dynamics of the construction volumes of non-residential buildings of different functions

In 2021, construction of 16,568 new dwellings was launched (with permits issued for 19,480 new projects), of which 52.3 % were being built in private homes. The useful area of new dwellings under construction is 1.6 million sq. m.. Compared to 2020, the number of new dwellings under construction had increased by 8.1 %, their useful area, by 24.3 %. The gross area of new non-residential properties that had their construction launched in 2021 is 1.3 million sq. m, or 26.7 % more than in 2020. By gross area, the largest number of new construction was that of industrial properties and warehouses (433 thousand sq. m) and buildings of retail, hospitality, and catering companies (240 thousand sq. m). The summary chart presented below (Fig. 4.9) shows that the volumes of construction have a general tendency to grow: this growth was particularly pronounced in 2019–2021, and compared to the recession of 2017, the number of new buildings under constructions had even doubled.

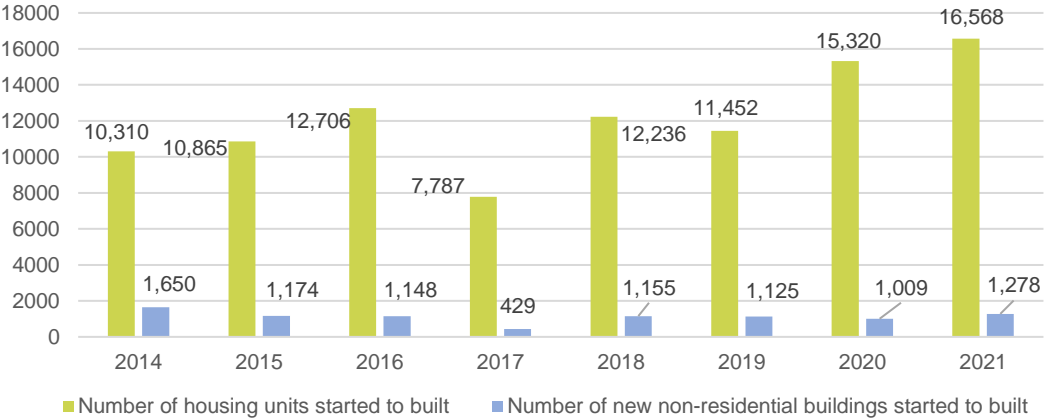


Fig. 4.9. The number of new dwellings and non-residential buildings under construction

4.3. Statistics of the sector of the existing buildings

According to the data available in the Real Property Register (RPR)⁴⁸, there are 588,475 residential buildings, 18,884 mixed-function buildings, 188,668 non-residential buildings, 1,772,958 auxiliary buildings (garages, storage sheds, and so on), and 58,069 garden buildings registered in Lithuania at this time (January 2023) (Fig. 4.10). By area, non-residential and residential buildings dominate, while auxiliary buildings, albeit massive in number, account but for a fraction of the gross area of the buildings pool (Fig. 4.11).

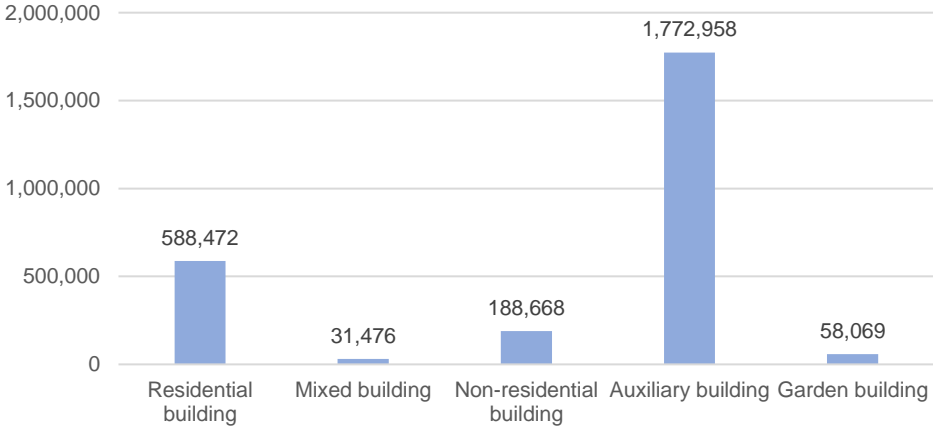


Fig. 4.10. The number of buildings by type of property (units)

⁴⁸ State Enterprise Centre of Registers. 2023. Open data in the Real Property Register: [Registered objects - Buildings](#).

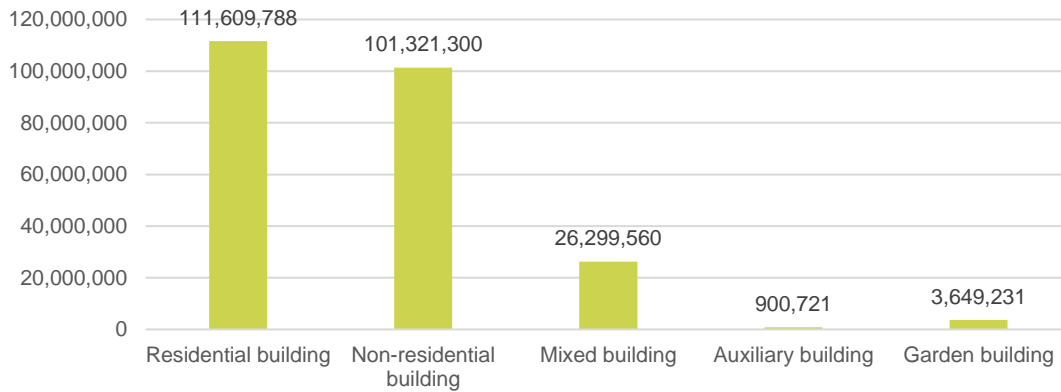


Fig. 4.11. Areas of buildings by type of property (sq. m)

When buildings are broken down by use (Fig. 4.12), the country is dominated by agricultural buildings (67.35 %), residential (22.75 %) and other purposes (6.63 %). Buildings for manufacturing, industrial, commercial, service, storage and administrative purposes account for the remaining 3.27 %.

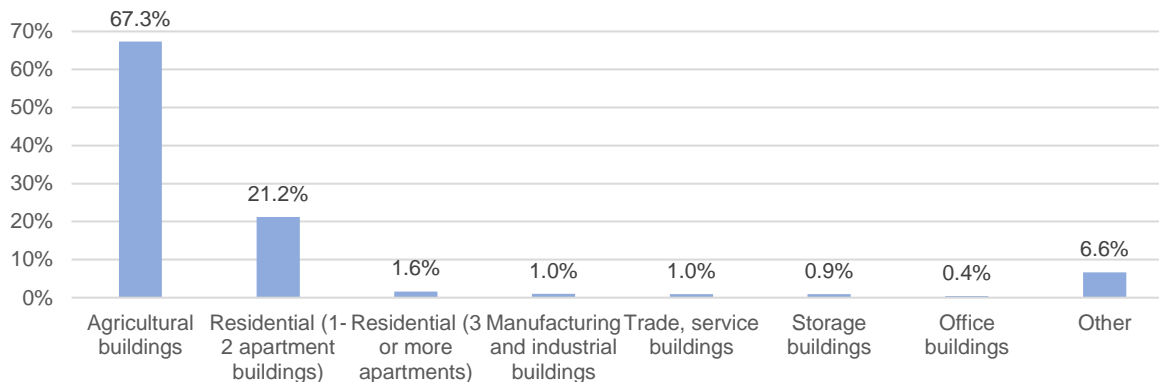


Fig. 4.12. Breakdown of buildings by the purpose of use

According to the RPR data⁴⁹ there are 41,632 apartment buildings (consisting of two dwellings or more) registered in Lithuania at this time. Comparing this number to the data from the Programme for the Renovation (Modernisation) of Apartment Buildings⁵⁰ suggests that most of the apartment buildings were built to the technical norms of construction that had been in effect until 1993 (Fig. 4.13).

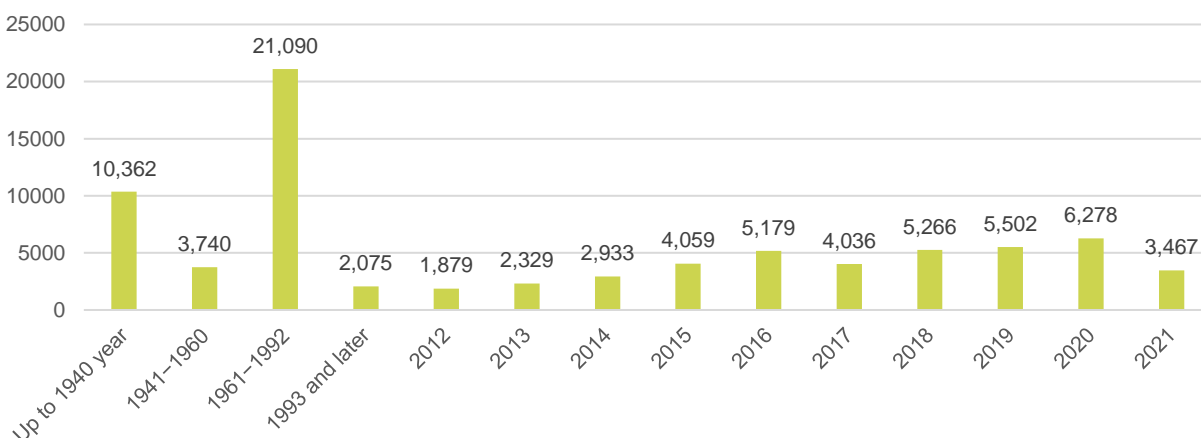


Fig. 4.13. The pool of apartment buildings by year of construction

⁴⁹ State Enterprise Centre of Registers. 2023. Open Data in the Real Property Register: [Registered objects - Buildings](#).

⁵⁰ Resolution of the Government of the Republic of Lithuania. 2004, 2008, 2011. The Programme for the Renovation (Modernisation) of Apartment Buildings. [Summary version of the legal act](#).

According to the data of Lithuania's long-term building renovation strategy^{51 52}, 77 % of all apartment buildings registered in the category of residential buildings are below energy class D. Residential buildings with the energy efficiency class D and lower consume nearly one-half (47 %) of the entire primary energy in the buildings pool, which is why Lithuania's long-term building renovation strategy envisions that 74% of apartment buildings must be renovated by 2050.

Between 2005 and December 2022, a total of 4,554 apartment building renovation projects were completed in Lithuania⁵³, accounting for as little as 12 % of all eligible apartment buildings, and the efforts to modernise apartment buildings are set to continue.

Currently, 4,554 apartment buildings have been renovated in Lithuania, of which 3,604 were renovated under the Apartment Building Renovation (Modernisation) Programme, and 950 were renovated under other programmes. A total of 362 projects were completed between 1996 and 2004, with the CPMA acting as the programme administrator. Between 2005 and 2012, the programme was implemented at the initiative of the owners of the dwellings and a total of 419 projects were completed.

According to one proposal, renovation of apartment buildings to energy class B and higher should be encouraged by providing loans from the loan fund set up on the basis of the 2021–2027 EU fund investment programme moneys and by raising private financial resources. State grants for renovation would be provided from the national budget and the 'Next-generation Lithuania' plan of the Recovery and Resilience Facility (RRF). Grants for the renovation of municipal public buildings are expected to come from the Modernisation Fund.

These activities aim to reduce the consumption of primary energy by nearly 870 thousand MWh annually and to cut greenhouse gas emissions by around 87 thousand CO₂ tonnes per year. These targets will be achieved once nearly 4,600 apartment and public buildings have been renovated, their area covering over 6.8 million sq. m.

Lithuania publishes data on renovated apartment buildings on the renovation map, where the data can be accessed both as a whole and by municipality (Fig. 4.14). The pace of renovation in Lithuania is quicker in small towns, including the resort towns of Birštonas and Palanga, which spearhead the renovation effort with a ratio of 60 % and 37 % renovated apartment buildings, respectively.

In July 2022, the description of Promoting Building Renovation, the progress measure of the Programme for the Development of Environmental Protection and Climate Control Change by the Ministry of the Environment of the Republic of Lithuania, the body in charge of managing the 2022–2030 development programme, was submitted for discussion. The description provides that by 2029, the amount of investments into the renovation of apartment buildings will stand at EUR 2.35 billion, and municipal public buildings, EUR 20 million.

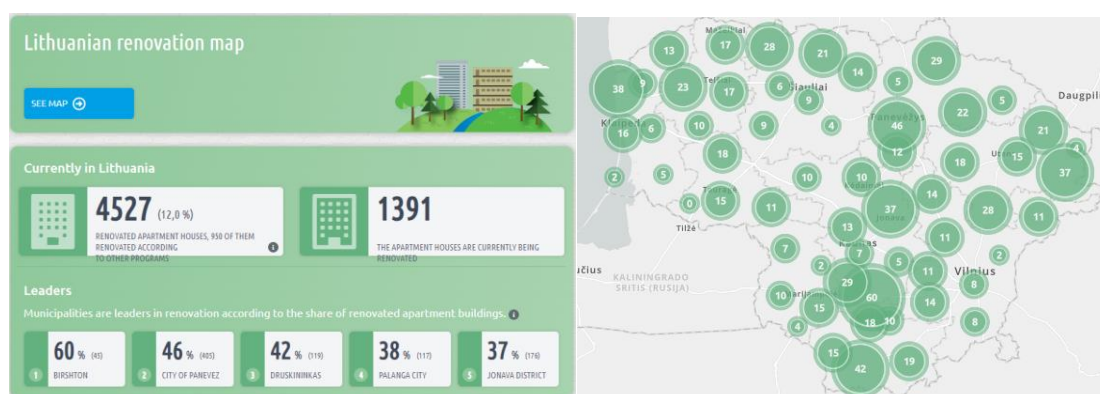


Fig. 4.14. The Lithuanian map of renovation⁵⁴

⁵¹ Ministry of Environment of the Republic of Lithuania. 2022. [More than €2.5 billion is proposed for the renovation of blocks of flats and public buildings by 2029.](#)

⁵² Ministry of Environment of the Republic of Lithuania. 2021. [Lithuanian's Long-term Building Renovation Strategy.](#)

⁵³ The Environmental Projects Management Agency. 2022. [Program for Renovation \(Modernization\) of Apartment Buildings.](#)

⁵⁴ The Environmental Projects Management Agency. 2023. [Program for Renovation \(Modernization\) of Apartment Buildings. The Lithuanian Map of Renovation.](#)

4.4. Nearly zero-energy buildings (NZEB)

In Lithuania, according to the regulation STR 2.01.02:2016 "Design and Certification of Energy Performance of Buildings", Nearly Zero Energy Buildings (NZEBs) are considered to be A++ energy performance class buildings.

According to the Building Energy Performance Certification Register⁵⁵, 1082 A++ class buildings have been certified in Lithuania by 2023-01-17. The distribution by types of the buildings is shown in (Table 4.3). Their floor area ranges from 45 to 48179 m² (average 798 m²), heating energy demand ranges from 0 to 122 kWh/m²/year (average 14 kWh/m²/year), and CO₂ emissions range from 0 to 74 kg/m²/year (average 15 kg/m²/year). The table shows that in terms of volume, the largest number of certified buildings are Residential, which is natural in view of the previous analysis of construction volumes, where Residential buildings also dominated by an absolute majority in terms of amount.

Table 4.3. A++ (NZEB) certified buildings by type

Residential (1-2 apartment) buildings	82%
Multi-apartment buildings	5%
Buildings for public use	4%
Garage and industrial buildings	3%
Buildings for storage purposes	2%
Service buildings	1%
Other buildings	3%

In certified A++ buildings, air-source heat pumps dominate as the main heat source (80.6 %). 11 % of A++ buildings also have a second heat source. Air-source heat pumps also dominate as a second heat source (33.9 %), but electric heating is slightly behind (31.4 %) (Figure 4.15).

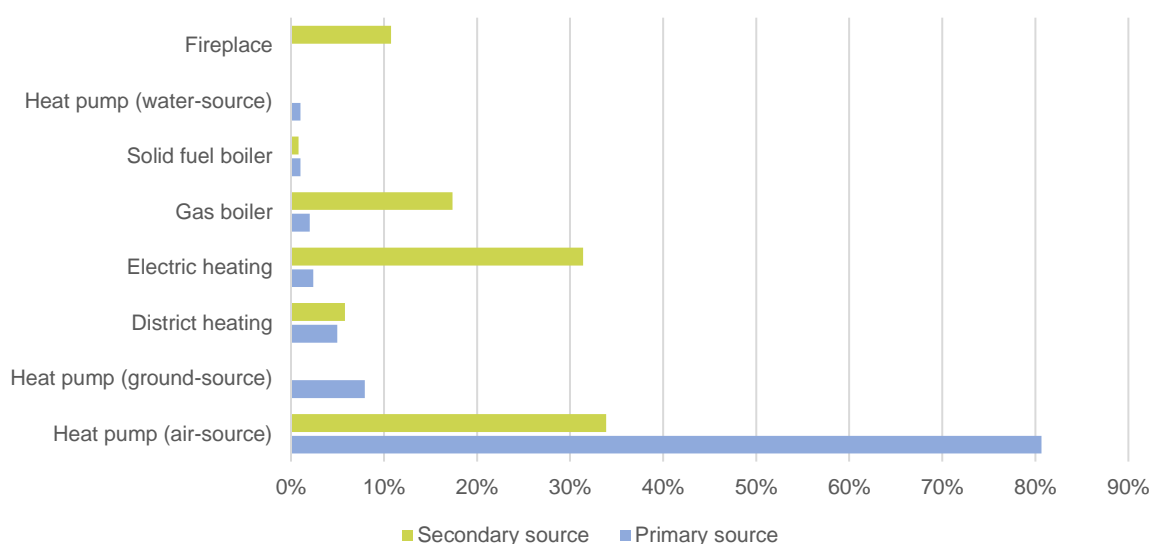


Fig. 4.15. Distribution of heat sources in A++ class buildings

Although the first A++ building certificates in Lithuania were approved in 2016, the number of A++ buildings in Lithuania is growing rapidly and trends show that by 2023, there will be more A++ buildings approved than there are currently (around 1500).

⁵⁵ Construction Sector Development Agency (SSVA). 2023. [The Building Energy Performance Certification Register](#).

4.5. Dynamics of building certification⁵⁶

By 2023-01-17, 355,000 buildings of different energy performance classes were certified in Lithuania (Fig. 4.16). Most of these buildings (52 %) were G class dwellings, which were given the lowest class without undergoing a certification procedure (usually to sell an apartment when certification is mandatory). However, in terms of heating area, the largest share of buildings certified was in class B (25 %) and class C (19 %), which is most likely related to buildings under renovation (in which case the certificate is mandatory). The number of certificates for energy efficient class A buildings (A, A+, A++) represented only 5 % of the total number of certificates, while in terms of heated area these buildings accounted for 8 %.

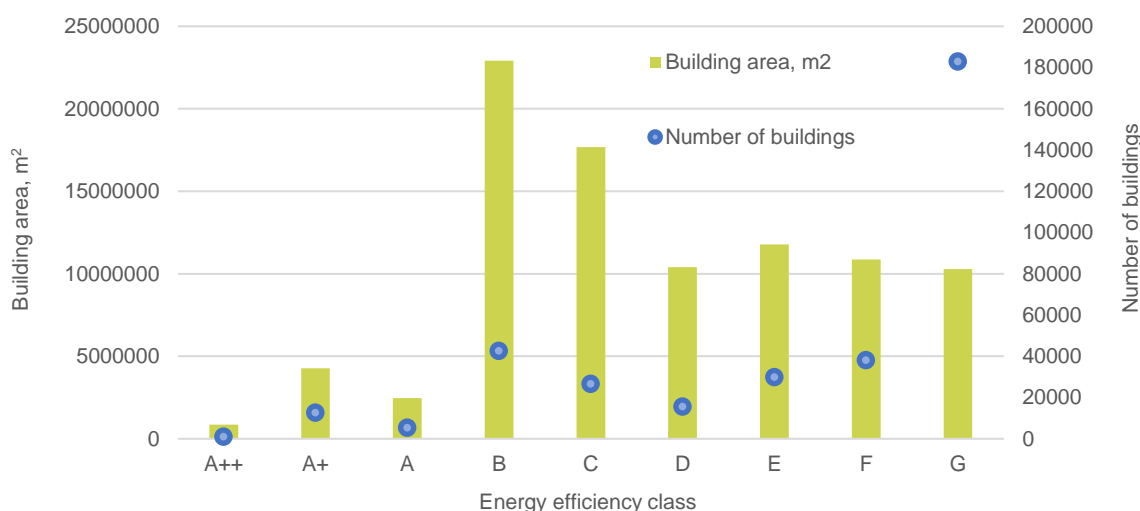


Fig. 4.16. Number of issued certificates

Until 1 February 2012, the energy performance certificate only indicated the total energy consumption (kWh/m²/year), i.e. the calculated total energy consumption per square metre of the useful floor area of the building, while the energy consumption for heating of the building (kWh/m²/year) has been introduced since 1 February 2012, following the entry into force of a new version of STR 2.01.09:2005. For class A++ buildings, only the energy consumption for heating of the building is reported and the total consumption is zero. The total energy consumption of buildings in the different classes ranges from 0 to 349,044 kWh/m²/year, the energy consumption for heating ranges from 0 to 349,019 kWh/m²/year, and the CO₂ emissions range from 0 to 8456 kg/m²/year (Fig. 4.17).

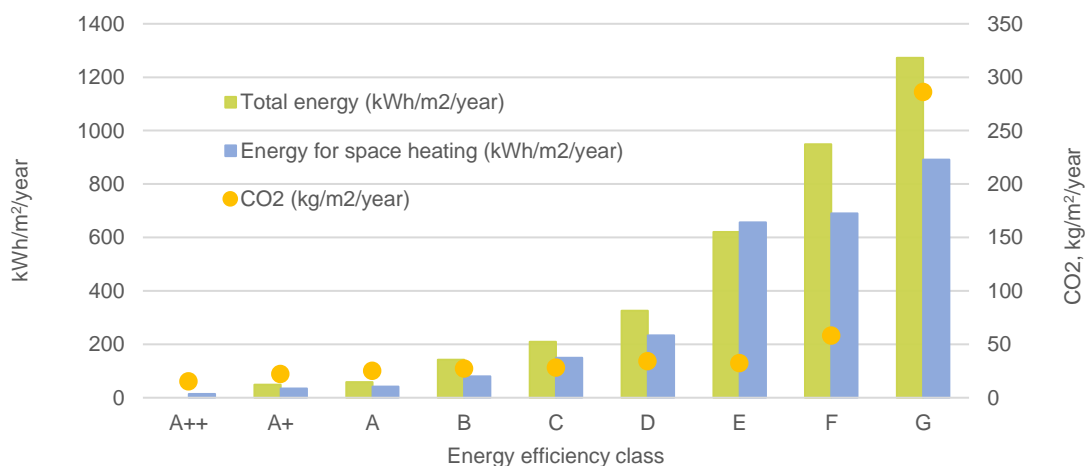


Fig. 4.17. Averages of the results of energy efficiency certificates for buildings (2007-2023)

⁵⁶ Construction Sector Development Agency (SSVA). 2023. [Building Energy Performance Certification Register](#).

The number of energy performance certificates prepared for buildings varies considerably from year to year (Fig. 4.18). This has been influenced by the mandatory entry into force of certain classes of buildings, changes in the energy requirements for buildings under construction or renovation, and the number of housing sales. Since 2013, it has become compulsory in Lithuania to obtain an energy performance certificate to be handed over to the buyer when selling a home. A standard apartment certificate (SAC), which indicates the lowest energy performance class, can be ordered through a notary, which is the cheapest and fastest solution for a homeowner to sell or rent an apartment. This is why most of the old homes for sale have not even been certified, and are automatically issued with the lowest energy performance class certificate without being counted. Of the total number of certificates issued, such certificates still account for 49 %.

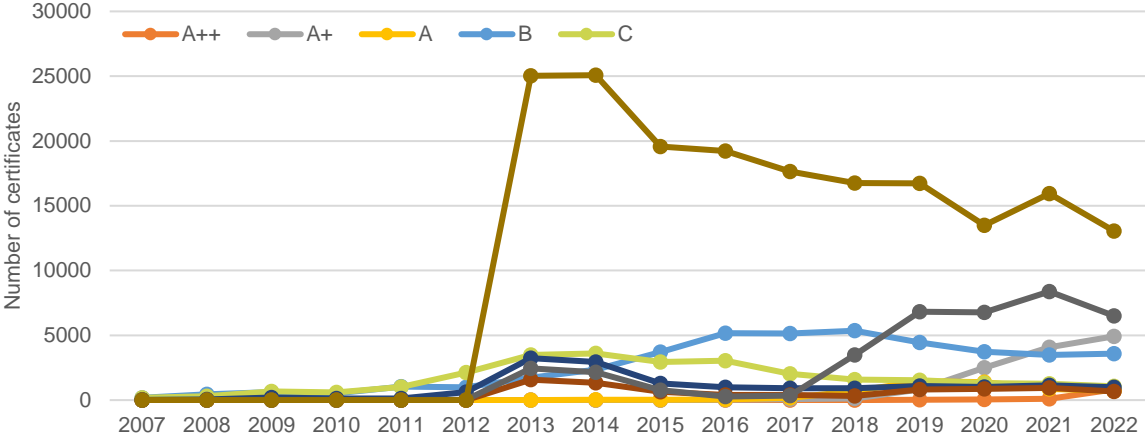


Fig. 4.18. Dynamics of preparation of building energy efficiency certificates

Excluding certificates issued by notaries from the statistics, the dynamics of the actual production of G-class certificates changes significantly, with the total number of certificates produced so far exceeding only A, A+ and A++ certificates (Figure 4.19).

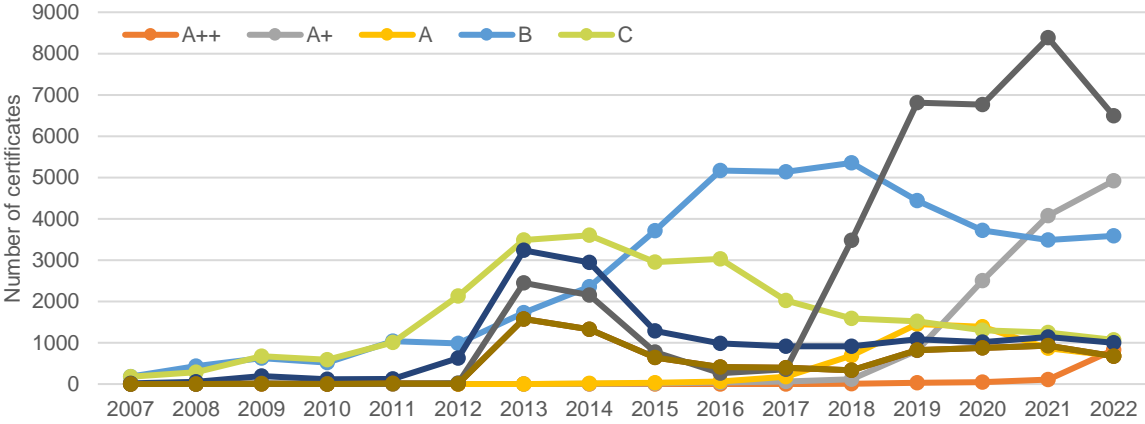


Fig. 4.19. Dynamics of preparation of building energy efficiency certificates (prepared according to the certification methodology)

4.6. Energy consumption in the building sector

The final energy consumption in Lithuania in 2021 was 66.59 TWh⁵⁷. Meanwhile, Lithuania has a mandatory target of 27.279 TWh of final energy consumption by 2030, as part of the implementation of Directive 2012/27/EU on energy efficiency.

In terms of final energy consumption, buildings (households and service sector) accounted for around 40 % of total final energy consumption in 2021 (Fig. 4.20). According to Eurostat data, Lithuania has an

⁵⁷ Official Statistics Portal. 2023. Database of Indicators: [Energy balance](#).

energy intensity of 517.7 kg o.e. per person, which, when compared to the EU level, indicates that Lithuania has a lower energy intensity than many EU countries.

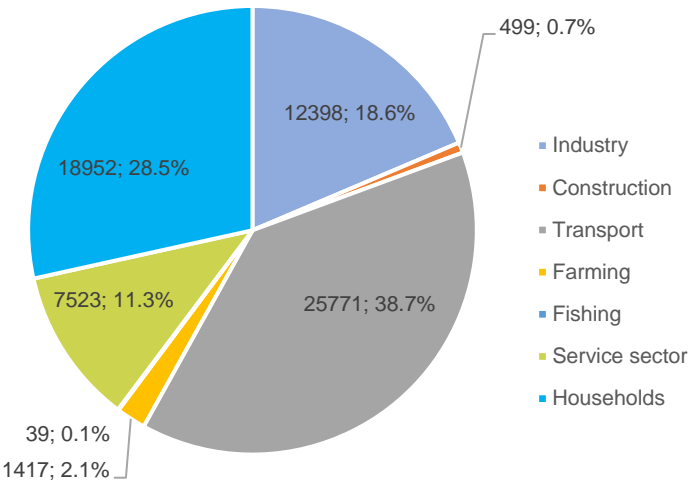


Fig. 4.20. Final energy consumption in various sectors

In 2021, 25.2 % of primary energy in Lithuania was generated from RES (Fig. 4.21)

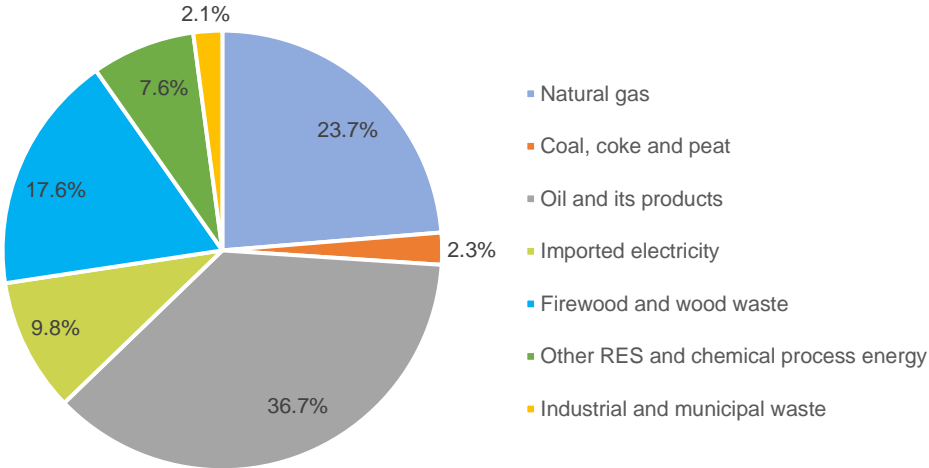


Fig. 4.21. Primary energy consumption in Lithuania

The statistics from the State Data Agency include detailed information only on household energy consumption by different energy sources and purposes (Fig. 4.22). In residential buildings, **the majority (68 %) of energy resources** in 2021 **were used for space heating**. Correspondingly, lighting and electrical appliances accounted for 14 %, hot water for 12 % and cooking for 6 % of energy resources. **RES used in households** (firewood, wood and agricultural waste, ambient thermal energy used in heat pumps) **accounted for 31 % of total energy resources**. The origin of the heat and electricity used in households was not indicated in this case.

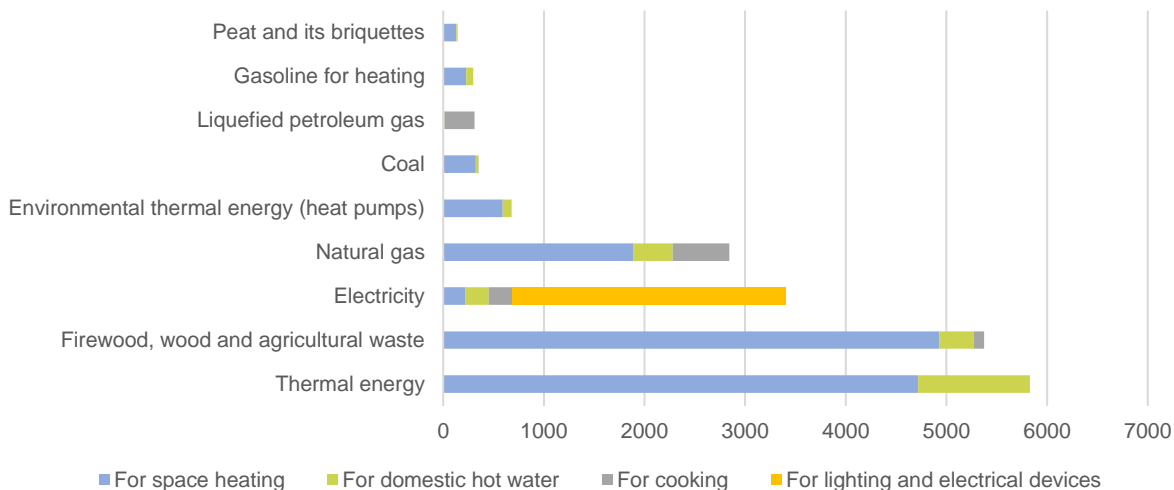


Fig. 4.22. Consumption of energy resources in households in 2021 (GWh)

In addition to households, the buildings sector includes the services sector, which accounted for 28 % of the energy consumption of the buildings sector in 2021. **RES used in the service sector** (firewood, wood and agricultural waste, biogas, ambient thermal energy used in heat pumps) **accounted for only 6 % of total energy resources in this sector**. Thus, **in the buildings sector as a whole, RES accounted for 25 % of final energy consumption** (Fig. 4.23).

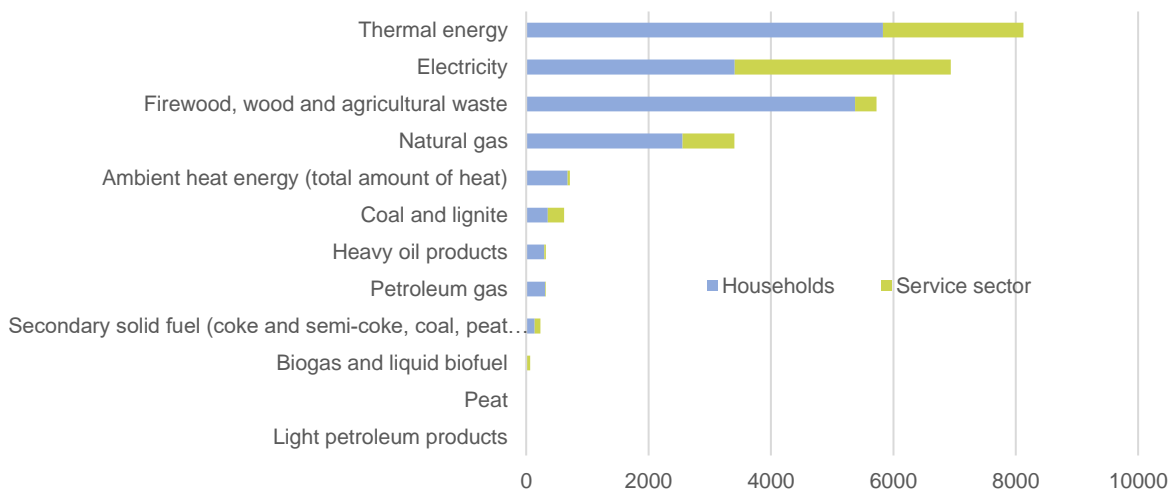


Fig. 4.23. Consumption of energy resources in the building sector in 2021 (GWh)

In reality, the share of RES in the energy balance of buildings is much higher, as the thermal energy consumption in buildings (31 %) corresponds to the amount of heat supplied from district heating systems and consumed in buildings. In 2021, 67.3 % of district heat supplied in Lithuania was produced from RES. Almost all of this renewable energy was produced from the combustion of solid biofuels (wood and wood waste) (Fig. 4.24).

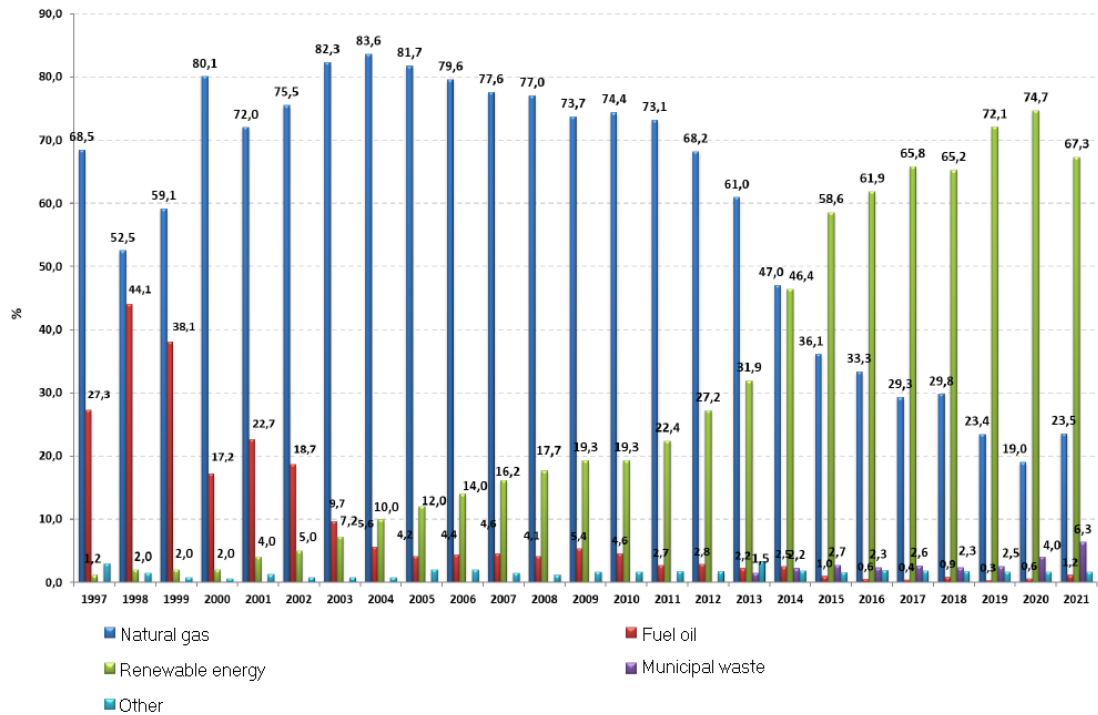


Fig. 4.24. The structure of primary fuel in the Lithuanian district heating sector in 1997–2021⁵⁸

Thus, summarising the energy consumption patterns in the Lithuanian building sector, it is clear that buildings still consume about 40 % of the total final energy, but that households (residential buildings) cover a significantly higher share of their energy needs with renewable energy, especially for heating, as there is a large potential for biofuels in Lithuania. In addition, statistics show that the number of consumers producing electricity (prosumers) is also growing significantly (Fig. 4.25).

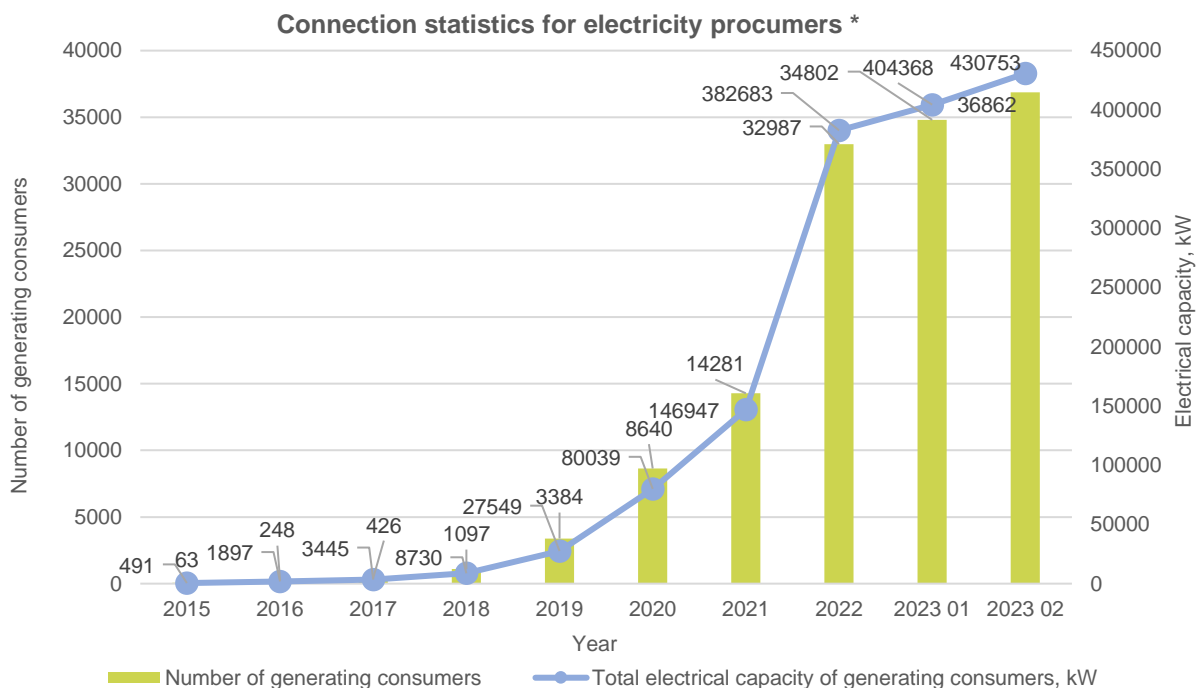


Fig. 4.25. Number of prosumers⁵⁹

⁵⁸ The Lithuanian District Heating Association (LŠTA). 2021. [Lithuanian District Heating Sector](#).

⁵⁹ National Energy Regulatory Council. 2023. [Renewable Energy](#).

In order to encourage active participation of electricity consumers in the market and to increase the share of renewable energy sources in the electricity sector, the Generating Consumers Scheme (GCS) was established in 2015. The long-term targets of the scheme are to have 30 % of generating consumers in relation to the total number of electricity consumers by 2030 and 50 % by 2050.

There is also an increase in the cumulative capacity of electricity generating consumers, driven by the installation of emerging remote solar farms. The Generating Consumer Scheme is open to all electricity consumers and provides financial support for the installation of small-scale solar power plants.

4.7. Analysis of the professions employed in the sector

The total number of people employed in the entire construction sector was given in summary Table 4.1 at the beginning of Section 4. Since said figure does not relate merely to the construction of buildings and does not cover any of the adjacent sectors that have to do with the building lifecycle, the experts relied on the **official data of SODRA⁶⁰ and identified 143 economic activities that employ specialists connected to the lifecycle of a building**; to that end, they analysed companies engaged in the manufacture and sale of construction materials, the process of building design and construction, real estate development, sale, and maintenance. The analysis also covered companies that do not have a direct connection with construction, considering that they employ specialists from the construction sector who are tasked with building maintenance. The list of economic activities so analysed is presented in Annex 1 (available at Lithuanian version of the SQA).

Table 4.4. The number of workers employed in the building construction sector

EQF levels 1-5 ('blue collars')	Employees
Concrete workers	5,007
Steel workers	2,676
Bricklayer	1,633
Carpenter	2,769
Plumber	3,120
Electrician and electromechanics	6,257
Roofer	886
Plasterer	3,028
Glazier	214
Insulation technician	1,414
Modular construction installer	40
Tinner/roller	317
Welder	2,990
Heating, ventilation and air conditioning systems installer/cooling equipment installer	255
Builders, installers and workers in related professions not elsewhere classified	5,195
Unskilled building construction workers	1,221
TOTAL	37,022

It is noted, that in Table 4.4 the low number of HVAC installers is due to the introduction of a new vocational training programme for HVAC installers in 2019, so the profession is very new. Until then, such workers were trained and classified in other general groups of workers (e. g. plumbers, locksmiths or workers not elsewhere classified). In addition, in the SODRA system, and thus in a construction company, workers with HVAC installation skills may be employed in more general positions (e. g. plumbers) due to the diversity of activities in the company. Because of this reason in further analysis of the future demand the professions are grouped based on the functions they can perform (Table 7.2). In Lithuania HVAC installers also cover DHW and thermal RES systems installation. e. g. heat pumps. The new HVAC installers program was initiated by companies (represented by Lithuanian Association of Heat Pumps and Ventilation Systems) with a goal to increase the number of HVAC installers and to

⁶⁰ The State Social Insurance Fund Board under the Ministry of Social Security and Labour (SODRA). 2023. [Statistical Data Website](#).

correspond to demand of the market. Training of HVAC installers is intensively provided by 8 vocational training institutions, but it is not possible to identify the number of this particular group of workers on the labour market, but the number of trained installers from 2020 (265 according to data of 28th of November 2023) is approx. equal to the number of registered in SODRA, taking into account that just approx. 75-80 % of the students after the training continue working in the construction sector.

Table 4.5. *The number of specialists employed in the building construction sector*

EQF levels 6-8 ('white collars')	Employees
Architects	1,513
Designers	34
Civil engineers	3,291
Structural engineers	403
Electrical engineers	353
Mechanical engineers	526
Building services engineers	359
Building site inspectors	5,351
Building surveyors	413
Building Managers	122
Energy Assessors	320
Buildings sustainability assessors (BREEAM certified)	16
Developers of apartment building modernization projects (investment plans)	135
BIM specialists	449
Environmental engineer	25
Logistics engineer	4
Healthy Building Inspector	30
Engineer geologist	159
Engineer	687
Consultant	45
Landscape specialist	59
Modeler	314
Technologist	757
Lawyer	229
Manager	1,502
Construction foremen	786
TOTAL	17,882

The total number of employees identified to be connected with building construction and maintenance stands at 54,904 and does not include self-employed natural persons working with self-employed certificate or under a business licence, as it is not possible to identify which part of them is also employed by enterprises. Such parallel employment in an enterprise and individually is a common practice, which is not prohibited by the laws of the Republic of Lithuania.

The classification of professions has been found to exclude specific professions related to the design, sale, or installation of sources of renewable energy, fail to identify less-common professions, and store information at the level of profession subgroup rather than profession (and in the nearest future it is not planned by responsible institutions to collect information at profession level), which often makes it impossible to identify the exact functions that a person performs and the competences that they need, based on the official statistics alone. Furthermore, there is no information about the level of an employee's qualifications officially available either. That is why there is reason to propose registering new professions that would clearly point to the functions that a person performs. To that end, the Application Form to Register a Profession will be filled out and delivered to the responsible department

of the Ministry of Economy.⁶¹ The registration of new professions is carried out in accordance with the Description of the procedure for maintaining the Lithuanian classification professions (<https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.422335>).

These figures will be further used in predicting the need for employees and the training thereof going all the way to 2030.

5. Existing Situation in the Field of Education and Training in the Construction Sector

5.1. Background

The education system in Lithuania consists of three tiers⁶²:

- General (kindergarten, pre-school, primary, basic, secondary) education;
- Vocational education and training;
- Higher education.

The full length of general education in Lithuania is 12 years: four years of primary education, six years of basic education, and two years of secondary education. Education is compulsory until a person turns 16 (grades 1 to 10, age 7 to 16). Completion of basic education entitles the student to study under secondary curriculum or enrol in a vocational school. Basic and secondary education may be acquired under the curriculum of vocational education and training as well, provided said curriculum integrates the basic or the secondary curriculum. Basic and secondary education is part of the Lithuanian Qualifications Framework (LQF⁶³) and stands at levels three and four thereof, which corresponds to levels three and four of the European Qualifications Framework. General education does not have a profile. The graduation certificate is the only qualification in the Lithuanian system of general education entitling its holder to higher education at a higher education establishment (university or college) or any profile.

Vocational education and training is primary and continuous. Primary vocational education and training awards a primary professional qualification and can only be formal. The curriculum is open to persons aged 14 and up.

Primary vocational education and training covers the following curricula:

- Curricula for persons who do not have and do not aim to acquire basic education;
- Curricula for persons who do not have and aim to acquire basic education;
- Curricula for persons who have basic education and do not aim to acquire secondary education;
- Curricula for persons who have basic education and aim to acquire secondary education;
- Post-secondary level curricula for persons with secondary education.

Completion of primary vocational education and training curricula awards the graduate qualifications at level 2–4 of the Lithuanian Qualifications Framework (level 2–4 of the European Qualifications Framework). Completion of vocational education and training curricula awards the graduate a **vocational education and training diploma**.

Continuous vocational education and training is designed to help a person to raise their existing qualifications or obtain a new qualification or competences necessary to be able to perform a certain job/function. **Continuous vocational education and training can be formal and informal.** Completion of continuous vocational education and training curricula awards the graduate qualifications at level 1–4 of the LQF (level 1–4 of the European Qualifications Framework). The purpose of the qualifications of vocational education and training is to enable a person to engage in a professional activity. The competences so acquired can be credited as part of a different level of vocational education and training curricula. By contrast to the general education graduation certificate, these qualifications do not entitle their holder to study at a college or university. Completion of formal continuous vocational education and training curricula awards the graduate a **certificate of qualification/profession/vocational education and training achievement**, and completion of

⁶¹ The Lithuanian Classification of Occupations. [LPK 2012](#).

⁶² Centre for Quality Assessment in Higher Education (SKVC). 2023. [The education system in Lithuania](#).

⁶³ Resolution of the Government of the Republic of Lithuania. 2019. Description of the Lithuanian Qualifications Framework ([TAR, 2019-07-25, No. 12291](#)).

informal continuous vocational education and training curricula, a **certificate of informal training** from the educational establishment certifying the completion of the curriculum and the qualifications acquired.

Developing a vocational education and training curriculum or a module thereof can be initiated and/or pursued by a provider of vocational education and training⁶⁴, a citizen of the Republic of Lithuania or another Member State, a legal entity of the Republic of Lithuania or another Member State or another unincorporated body, and divisions thereof. A formal and informal vocational education and training curriculum is developed on the grounds of competences, the **professional standard of the relevant sector**⁶⁵ and will be revised if the standard changes. To initiate the development of a formal vocational education and training curriculum or a model thereof, the author must file an application to the Centre for the Development of Qualifications and Vocational education and training⁶⁶. Any revisions to a vocational education and training curriculum or a module thereof are coordinated and/or made by the Centre for the Development of Qualifications and Vocational education and training based on the data of the monitoring of implementation of vocational education and training curricula, external evaluation of vocational education and training institutions, and external evaluation of vocational education and training curricula, upon receipt of suggestions from the providers of vocational education and training, the authors, the Ministry of Education, Science, and Sports of the Republic of Lithuania, sectoral vocational committees, or other bodies or aiming to bring the formal vocational education and training curricula as registered in the Register of Studies, Curricula, and Qualifications in line with the approved or updated professional standards.

Currently, vocational education and training curricula are being implemented and short-cycle curricula are being launched at LQF level 5.

The Lithuanian Qualifications Framework is in line with Recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning (Text with EEA relevance) (2008/C 111/01) and the 8 levels of the qualifications framework rooted in it. The provisions of the description of the Lithuanian Qualifications Framework apply for the purposes of:

- Managing the Register of Studies, Curricula, and Qualifications, other governmental and departmental registers, governmental information systems;
- Approving professional standards and descriptions of fields of studies;
- Implementing vocational education and training or studies curricula, shaping the results of teaching/learning under general education curricula;
- Evaluating competences (or part of competences) acquired formally, informally, or via self-learning, granting and recognising a qualification;
- Evaluating and recognising qualifications acquired under educational curricula of foreign states and international bodies;
- Issuing qualification certifications to persons and specifying the degree of qualification therein.

Higher education⁶⁷ grants qualifications at LQF level 6–8 (European Qualifications Framework level 6–8). Lithuania operates a **binary higher education system** that consists of non-university (college, which is high education non-university studies - LQF 6 level) and university studies. The non-university sector was the product of the reform of the former system of higher education.

College studies are provided by three colleges. Under the Law on Science and Studies of the Republic of Lithuania⁶⁸; university-type higher educational establishments can provide college studies in exceptional cases. College studies are conducted during the first stage of the studies and are rather focused on preparing students for professional activities, allowing individuals to acquire qualifications grounded on applied research and/or applied scientific activities.

University studies are organised on three tiers and are provided by university-type higher schools. Depending on the level of the studies that have been completed, a certain degree – BA, MA, PhD – is awarded.

⁶⁴ *Order of the Minister of Education, Science and Sport of the Republic of Lithuania*. 2018. Description of the Procedure of Drafting and Registration of Vocational education and training Curricula ([TAR, 2018-11-22, No. 18816](#)).

⁶⁵ *Order of the Director of the Center for Qualifications and Vocational Education and Training Development*. 2019. The Professional Standard of the Construction Sector ([TAR, 2019-07-12, No 11554](#)).

⁶⁶ Qualifications and Vocational Education and Training Development Centre ([KPMPC](#)).

⁶⁷ *Centre for Quality Assessment in Higher Education (SKVC)*. 2023. [Higher Education](#).

⁶⁸ *The Law on Science and Studies of the Republic of Lithuania*. 2009, 2017, 2022. [Summary version of the legal act](#).

Studies at higher schools are split into majors. The list of majors and groups of majors and the framework of degrees awarded are approved by Order No V-1075 Regarding the Procedure of Approval and Modification of the List of Majors and Groups of Majors for the Purposes of Studies at Higher schools and the Principles of Forming the Framework of Qualifying Degrees and the Curricula of Studies from the Minister of Education and Science of the Republic of Lithuania dated 1 December 2016. The studies can be permanent and/or extended. Completing different forms of curricula grants a comparable level of education.

Completion of tier one of college studies awards a professional bachelor's degree or a professional bachelor's degree and a professional qualification. The scope of college studies can amount to 180–240 ECTS credits (3–4 years of studies). The studies are available to holders of general school graduation certificates or comparable qualifications. The professional bachelor's degree entitles its holder to enrol into postgraduate studies. It ranks at level six of the Lithuanian Qualifications Framework (LQF), which matches level six of the European Qualifications Framework (EQF).

Completion of tier one of university studies awards a bachelor's degree or a bachelor's degree and a professional qualification. The scope of the studies can amount to 180–240 ECTS credits (3–4 years of studies). The studies are available to holders of general school graduation certificates or comparable qualifications. It ranks at level six of the LQF (EQF level six).

Completion of tier two of university studies awards a master's degree or a master's degree and a professional qualification. Postgraduate studies are available to holders of at least a bachelor's or professional bachelor's degree or a comparable qualification obtained through higher education, who satisfy the requirements prescribed by the higher school. The scope of the studies amounts to 90–120 ECTS credits (1.5–2 years). The master's degree ranks at level seven of the LQF (EQF level seven).

A master's degree can also be obtained upon completion of integrated studies, which cover tier one and two of studies. Integrated studies are available to holders of a general school graduation certificate or a comparable qualification. The scope of such studies amounts to 300–360 credits (5–6 years).

Tier three of studies consists of doctoral studies. Completion of doctoral studies and a successful defence of a dissertation (or an art project) awards the graduate a doctoral degree. Doctoral studies are available to holders of a master's degree of a comparable qualification obtainable through higher education. Doctoral degrees rank at level eight of the LQF (EQF level eight).

Completion of the college curriculum awards a **professional bachelor's diploma**; completion of tier one of university curriculum, a **bachelor's diploma**; completion of the integrated or postgraduate curriculum, a **master's diploma**. Persons who have completed doctoral studies and defended a doctoral dissertation (or an art project) are awarded a **doctor's diploma**. Table 5.1 shows qualification certificates by LQF level.

Table 5.1. Qualification certificates by LQF level.

LQF level (EQF-compliant)	Documents proving qualifications
8	PhD diploma
7	Master's degree diploma Residency certificate
6	Bachelor's diploma Professional Bachelor's degree diploma
5	Certificate of studies Vocational training diploma
4	Vocational training diploma General school graduation certificate
3	Vocational training diploma Certificate of basic education
2	Vocational training diploma
1	Vocational training diploma

The eight LQF levels match the eight levels of the European Qualifications Framework.

The quality of general education is assured by applying blanket state-level requirements to primary, basic, and secondary curricula, as well as enforcing accreditation of secondary education curricula, certification of teacher competences, and so on.

The quality of vocational education and training⁶⁹ is assured by applying internal vocational education and training quality assurance systems of the vocational education and training institutions' choice, external assessments and/or accreditations grounded on the stipulations of the European Quality Assurance System for Vocational Education and Training. The external assessment of vocational education and training establishments is organised by the Qualifications and Vocational Education and Training Development Centre⁷⁰, a qualifications management body, at least once in every five years. The external assessment of other providers of vocational education and training is performed on the manner prescribed by the Minister of Education, Science, and Sports by the qualifications management body or another body authorised by the Minister of Education, Science, and Sports in association with sectoral professional committees. The external assessment of vocational education and training curricula covers the analysis of the quality of implementation of vocational education and training curricula based on a self-analysis by the provider of vocational education and training and monitoring data, in association with sectoral professional committees, with possible involvement of external experts.

The quality of higher education is assured centrally and on a state level. The studies quality assurance system is enforced through:

- external assessment and accreditation of the curricula (both current and pending);
- external assessment and accreditation of higher schools;
- assessment of Lithuanian institutions and branches of foreign higher schools in Lithuania when they seek to obtain a permit to launch studies and/or related activities in Lithuania.

The assessment is carried out by a team of experts from the Centre for Quality Assessment in Higher Education⁷¹. The decision to make an assessment of and issue accreditation to a higher school is made by the Centre for Quality Assessment in Higher Education. Subject to a favourable assessment of its activities, the higher school is issued accreditation for a period of seven years. When the results of the assessment are negative, the school is issued accreditation for a period of three years. After the expiry of the three-year period, a second assessment of the school's activities is performed. If the second assessment produces an unfavourable outcome, no further accreditation is extended and the Minister of Education, Science, and Sports of the Republic of Lithuania adopts a decision to revoke the school's licence to offer studies.

5.2. The vocational education and training system for construction specialists

Vocational education and training in Lithuania is governed by the Law on Vocational Education and Training of the Republic of Lithuania⁷². This law defines the general goals and principles of vocational education and training (VET), the framework of vocational education and training qualifications, the arrangement of vocational education and training, the quality assurance system, the award and assessment of competences, the rights and obligations of participants in vocational education and training, and the funding and management of vocational education and training. The requirements and guidelines for the contents of the vocational education and training curriculum are grounded on the concept of recognition of qualifications and competences, which defines the qualifications (and competences) laid down in professional standards should be acquired by students in the course of vocational education and training so they are prepared to work on their own. Vocational education and training is delivered under formal and informal vocational education and training curricula. To ensure a high quality of vocational education and training, the requirements and guidelines for the contents are subject to routine revision, based on hands-on feedback, changing conditions of the labour market, and other relevant factors.

The purpose of the vocational education and training curriculum is to award qualifications registered in the Register of Studies, Curricula, and Qualifications. The procedure of developing and registering vocational education and training curricula is defined by the Minister of Education, Science, and Sports. Formal vocational education and training and the activities related thereto may be delivered by legal entities, other unincorporated bodies of another Member State, as well as their divisions in the Republic of Lithuania, or private individuals who exercise their rights of mobility across the Member States under

⁶⁹ The Law on Vocational Education and Training of the Republic of Lithuania. 1997, 2018. [Summary version of the legal act.](#)

⁷⁰ Qualifications and Vocational Education and Training Development Centre ([KPMPC](#)).

⁷¹ Centre for Quality Assessment in Higher Education ([SKVC](#)).

⁷² The Law on Vocational Education and Training of the Republic of Lithuania. See 67. 1997, 2018. [Summary version of the legal act.](#)

the legislation of the European Union and hold a licence of formal vocational education and training, entitling them to provide formal vocational education and training curricula or modules thereof as registered for the legal entity or private individual in the Register of Licences.

In Lithuania, vocational education and training is provided by state schools and vocational education and training centres, offering a variety of vocational education and training curricula pertaining to different fields; by training centres of the labour market (offering specialist training to those who want to acquire certain skills or learn certain professions that are in demand on the labour market) and private schools and other participants (such as higher schools and colleges).

Following the reform of the system of vocational education and training establishments aiming to streamline the use of resources and harmonise the vocational education and training curricula of vocational education and training establishments in a particular region and the requirements of companies in that region, as of 1 September 2022 the number of state vocational education and training establishments is 44⁷³, of which 34 offer curricula relevant to the construction sector:

1. Alytus Vocational Training Centre;
2. Biržai Centre for Technology and Business Training;
3. Dieveniškės Technology and Business School;
4. Elektrėnai Centre for Vocational Education and Training, a public body;
5. Jonavos Polytechnic School;
6. Joniškis Agricultural School;
7. UAB Kauno Petrašiūnų Darbo Rinkos Mokymo Centras;
8. Kaunas Technology Education and Training Centre;
9. Kėdainiai Vocational Training Centre;
10. Kelmė Vocational Training Centre;
11. Klaipėda Ernestas Galvanauskas Vocational Education and Training Centre;
12. Klaipėda Paulius Lindenau Education Centre;
13. Kupiškis Technology and Business School
14. Marijampolė Vocational Training Centre;
15. Mažeikiai Polytechnic School;
16. Aukštaitija Vocational Training Centre;
17. Panevėžys Education Centre;
18. Plungė Technology and Business School;
19. Profesijų Spektras, a public body;
20. Radviliškis Technology and Business Education Centre;
21. Rokiškis Vocational Education Centre;
22. Šiauliai Technology Education Centre;
23. Šilutė Vocational Education Centre;
24. Simnas Agricultural School;
25. Skuodas School of Crafts and Services;
26. Švenčionys Vocational Training Centre;
27. Telšiai Regional Vocational Education Centre, a public body;
28. Ukmergė Technology and Business School;
29. Utena Regional Vocational Education Centre;
30. Vilnius Builders Training Centre, a public body;
31. Vilnius Utilities School;
32. Žirmūnai, a vocational education centre;
33. Vilnius Technology and Engineering Education Centre;
34. Zarasai Vocational School.

With the big cities (Vilnius, Kaunas, and Klaipėda), the focus is on a broader specialisation of vocational schools and development of sectoral hands-on education centres for different branches of the economy, while regional seats are dominated by vocational schools catering to the economic needs of the region, and in rural areas have a consolidated network of vocational schools. VET establishments or their departments operate in nearly every municipality.

Every provider of primary vocational education and training also offers continuous VET in line with the Lithuanian Qualifications Framework. Level one, two, three, and four qualifications can be obtained in all counties. VET curricula are designed for people with different (primary, basic, and secondary)

⁷³ Association of Lithuanian Higher Education Institutions for Centralised Admissions (LAMA). 2022. [Overview of the results of general admission to Lithuanian vocational training institutions.](#)

educational backgrounds. There are also curricula for people with special educational needs. VET is organised as school work and apprenticeship. As of 2019, apprenticeship is available both under formal and informal vocational education and training curricula.

Curricula that award qualifications must be aligned with the qualifications that are defined in the professional standards. The professional standards are revised and updated at least once in every five years, after the findings of sectoral professional committees have been obtained. The drafting and revision of a professional standard is done by the Qualifications and Vocational Education and Training Development Centre (QVETDC), a body in charge of managing qualifications. The development of curricula and any updates thereto are organised by the Qualifications and Vocational Education and Training Development Centre. It can to initiate updates to the curricula in response to an initiative to draft and revise the professional standards, technological innovation, processes taking place on the labour market, new developments in the voce field, and so on, and/or in reliance on monitoring data for the implementation of vocational education and training curricula and data from the external assessment of vocational education and training establishments and vocational education and training curricula. The description of the procedure for the development and registration of vocational education and training curricula stipulates that the right to initiate the development of a vocational education and training curriculum or a module thereof and/or to develop said curriculum or module lies with a provider of vocational education and training, a citizen of the Republic of Lithuania, a legal entity, or any other unincorporated body and their divisions.

The Professional Standard of the Construction Sector of Lithuania⁷⁴ envisions the following sectoral qualifications by different level of qualification:

A. LQF level two:

1. Assistant environmental management specialist
2. Assistant concrete worker
3. Assistant carpenter
4. Assistant painter
5. Assistant façade insulation technician
6. Assistant railway builder
7. Assistant road worker
8. Assistant construction installer
9. Assistant bricklayer
10. Assistant scaffolding installer
11. Assistant tile installer
12. Assistant plumber
13. Assistant tinner
14. Assistant roofer
15. Assistant plasterer
16. Assistant pipe-layer

B. LQF level three:

1. Interior finisher
2. Environment management specialist
3. Concrete worker
4. Carpenter
5. Painter
6. Façade insulation technician
7. Railway builder
8. Road worker
9. Construction installer
10. Assistant oven builder
11. Bricklayer
12. Scaffolding installer
13. Tile installer
14. Plumber
15. Tinner

⁷⁴ Order of the Director of the Center for Qualifications and Vocational Education and Training Development. 2019. [The Professional Standard of the Construction Sector.](#)

16. Roofer
17. Heating, ventilation, air conditioning system installer
18. Plasterer
19. Pipe-layer

C. LQF level four:

1. Interior finisher
2. Environment management specialist
3. Concrete worker
4. Carpenter
5. Painter
6. Façade insulation technician
7. Railway builder
8. Road worker
9. Construction installer
10. Oven builder
11. Bricklayer
12. Scaffolding installer
13. Tile installer
14. Plumber
15. Tinner
16. Roofer
17. Heating, ventilation, air conditioning system installer
18. Plasterer
19. Pipe-layer

D. LQF level five:

1. Master interior finisher
2. Master environment management specialist
3. Master concrete worker
4. Master carpenter
5. Master painter
6. Master façade insulation technician
7. Master railway builder
8. Master road worker
9. Master construction installer
10. Master oven builder
11. Master bricklayer
12. Master scaffolding installer
13. Master tile installer
14. Master plumber
15. Master tinner
16. Master roofer
17. Master heating, ventilation, air conditioning system installer
18. Master plasterer
19. Master pipe-layer

The professional standard of the construction sector defines the competences of, and competence limits for, all of the above qualifications. The standard provides that construction specialists of every level of qualification must follow the principles of sustainable construction in their work, without exclusion of individual aspects of sustainable or cohesive construction.

Competences in the energy sector have relevance to the field of sustainable construction as well, even though the professional standard of the energy sector is yet to be approved: instead, the standard approved by the Sectoral Professional Committee on Energy and Environmental Protection (under the auspices of the Qualifications and Vocational Education and Training Development Centre) is currently in place. This approved standard envisages the following sustainable construction-relevant qualifications of the energy sector by different level of qualification, which are inherent in the sector of architecture and construction:

A. LQF level four:

1. Electrician (the electrical energy sub-sector)
2. Mechanic of renewable energy machinery (the electrical energy sub-sector)
3. Metalworker of natural gas systems (the sub-sector of natural and liquefied petroleum gas)
4. Heat transfer network operator (the thermal energy sub-sector)
5. Boiler operator (the thermal energy sub-sector)

B. LQF level five:

1. Cable line installation supervisor (the electrical energy sub-sector)
2. Natural gas system technician (the sub-sector of natural and liquefied petroleum gas)
3. Boiler supervisor (the thermal energy sub-sector)
4. Boiler tuner (the thermal energy sub-sector)
5. Heat transfer network technician (the thermal energy sub-sector)

The descriptions of competences in the energy sector do not identify any competences of sustainable construction as relevant to one or the other qualification level of this field.

A subjective assessment of the competences of sustainable construction awarded through the current vocational education and training curricula is carried out as part of the survey/interview undertaken within the framework of the project. The complete survey form is presented in Annex 2 *Survey of Educational Service Providers* (available at Lithuanian version of the SQA). A summary of the survey is presented in Section 7 *Competences and skills gaps between the current situation and the expected needs for 2030*.

The data on the number of graduates who completed different formal vocational education and training curricula in 2020–2022 as collected by the National Agency for Education⁷⁵ are presented in Table 5.2.

Table 5.2. *The number of graduates who completed formal (primary and continuous) vocational education and training curricula in 2020–2022. A detailed table is presented in Annex 3 (available at Lithuanian version of the SQA).*

Field of analysis (education sub-field) LQF level	Total	% of women	Total	% of women	Total	% of women
	2022		2021		2020	
Total (general construction sector)	689	8.1	885	7.9	806	8
Including (general construction sector) Level 2	169	6.5	177	6.8	219	8.2
Including (general construction sector) Level 3	189	10.1	22	0	18	0
Including (general construction sector) Level 4	331	7.9	686	8.5	569	8.0
Total (engineering systems sector)	165	1.8	226	1.8	76	2.6
Including (engineering systems sector) Level 3	107	0.9	25	4.0	0	0
Including (engineering systems sector) Level 4	58	3.4	201	1.5	76	2.6
Total (renewable energy sector)	278	5.8	253	2	238	5.9
Including (renewable energy sector) Level 4	278	5.8	253	2	238	5.9
Total Level 2. 3. 4	1,132	6.63	1364	5.79	1,120	7.14

Additional professional competence can be obtained through informal education curricula as well. Informal education of adults is regulated by the Law on Informal Education of Adults and Continuous Learning⁷⁶. Informal education and continuous learning of adults can be provided by any school delivering formal curricula, freelancing teacher, or any other provider of education (such as a library,

⁷⁵ National Agency for Education (NŠA). 2023. [Data of National Agency for Education](#).

⁷⁶ The Law on Informal Education of Adults and Continuous Learning of the Republic of Lithuania. 1998, 2015. [Summary version of the legal act](#).

museum, third-age university or establishment, body that does not have education as its main line of business). Schools that deliver formal education curricula can both offer informal education curricula for adults and recognise competences obtained by persons through informal education and self-education. The quality of informal education and continuous learning of adults is the responsibility of the provider of informal education and continuous learning of adults. The quality of informal education and continuous learning of adults is assured through monitoring of informal education and continuous learning of adults, surveys, and self-assessment and external assessment of providers of informal education and continuous learning of adults.

The following informal vocational education and training curricula pertaining to the field of construction are available in Lithuania (the name and level of the qualification pursuant to the Lithuanian Qualifications Framework are given in brackets):

- Building renovation works (façade insulation technician, LQF 3)
- Installation of tile on a surface (tile installer, LQF 3)
- Installation of plumbing systems in a building (plumber, LQF 3)
- Soil excavation and installation of beds (road worker, LQF 3)
- Painting metal constructions (construction installer, LQF 3)
- Drywall installation (finisher, painter, tile installer, plasterer, LQF 3)
- Repair and finishing works (painter, tile installer, LQF 3)
- Application of finishing solutions in a dwelling (painter, tile installer, plasterer, LQF 3)
- Decorative painting of buildings (painter, LQF 3)
- Wastewater system supervision and repairs (water treatment and water preparation equipment supervisor, LQF 4)

The scope of informal education curricula in credits is highly variegated, the scope of the above curricula ranging between 2 and 29 credits. The teaching content is designed to the relevant professional standard.

Summarising, in Lithuania, 10 different non-formal vocational training programmes are offered in areas related to sustainable construction, but they are run by almost all vocational schools (out of the 34 in Lithuania) rather than by a single vocational school. These programmes can also be delivered by other education providers (companies, organizations), so the supply of non-formal education is considered to be higher than the existing demand. It is difficult to estimate the exact volume of non-formal education, as it can be provided by both the public and the private sector, and no statistical data on the number of graduates who have completed informal education curricula are being collected by any state-level register. It would be useful to create a common database of competences and to assess the volume, need and relevance of non-formal education on the basis of aggregated data.

5.3. The system of higher education of construction specialists

The higher education system covers the following areas relating to the competences of sustainable construction: **architecture, construction engineering, and energy engineering**. The general requirements for professional bachelor's, bachelor's, and post-graduate studies are defined by the Law on Science and Studies of the Republic of Lithuania (RL), the Description of the General Requirements for the Delivery of Studies as approved by the RL Minister of Education, Science, and Sports, and the descriptions of the relevant fields of studies that define the learning outcomes relevant to each field. The higher education curricula are devised independently by each higher school based on the effective legislation, with the government exercising centralised supervision of the quality of the studies.

Architectural studies in Lithuania are provided by three institutions: Vilnius Academy of Arts (Vilnius and Kaunas), Vilnius Gediminas Technical University (Vilnius), Kaunas University of Technology (Kaunas). All three institutions offer 300 credits worth of integrated architectural studies that award qualifications at LQF level seven and are required, if one is to obtain the qualification certificate of an architect and engage in the activities envisioned in the RL Law on Architecture, RL Law on Construction, RL Law on Spatial Planning, RL Law on the Protection of Immovable Cultural Heritage, and RL Law on Protected Territories. Kaunas University of Technology and Vilnius Gediminas Technical University also offer 120 credits worth of architectural post-graduate studies that are available to those who have previously obtained a bachelor's degree through those institutions.

Under the effective description of the architectural field of studies (revised and approved as of 13 February 2023), no separate competences related to the principles of sustainability of construction are currently identified, yet, broadly speaking, the mastery of the principles of sustainability of construction can be considered to cover the social skills that should be achievable by architect, which skills indicate that the person who has graduated architectural studies 'is capable of assuming social responsibility: evaluating and predicting the long-term social consequences or architectural practice, and understands the architect's social responsibility towards the society.'⁷⁷

University studies in construction engineering in Lithuania are provided by four institutions: Vilnius Gediminas Technical University (Vilnius), Kaunas University of Technology (Kaunas), Klaipėda University (Klaipėda), and Vytautas Magnus University (Kaunas).

The university studies in Lithuania consist of 15 construction engineering post-graduate curricula that range between 90 and 120 credits in scope and award qualifications at LQF level seven:

- Geotechnics (Vilnius Gediminas Technical University)
- Innovative road and bridge engineering (Vilnius Gediminas Technical University)
- Smart city engineering (Vilnius Gediminas Technical University)
- Roads and railways (Vilnius Gediminas Technical University)
- Road safety management (Vilnius Gediminas Technical University)
- Building information modelling (Vilnius Gediminas Technical University)
- Building constructions (Vilnius Gediminas Technical University)
- Construction product engineering (Vilnius Gediminas Technical University)
- Construction technology and management (Vilnius Gediminas Technical University)
- Construction structure and product engineering (Kaunas University of Technology)
- Sustainable and energy-efficient buildings (Kaunas University of Technology)
- Construction management (Kaunas University of Technology)
- Integrated design and construction management (Kaunas University of Technology)
- Hydro-technical construction engineering (Vytautas Magnus University)
- Port buildings (Klaipėda University)

According to the current description of the fields of engineering studies⁷⁸ (revised and approved as of 12 January 2017) and its requirements for tier-two university studies, the following achievable skills relating to the competences of sustainable construction can be objectively identified: 'understand the importance of social, health, occupational, and fire safety, environmental, and commercial requirements'; 'possess knowledge and skills in the area of building information modelling'; 'be aware of the ethical, environmental, and commercial requirements applicable to engineering practice'; 'have a holistic understanding of the impact engineering decisions have on the society and the environment, follow the norms of professional ethics and engineering practice, understand the responsibility for engineering practice'.

In Lithuania, university studies consist of six engineering baccalaureate curricula, each 240 credits in scope, awarding LQF level six:

- Road, railway, and urban engineering (Vilnius Gediminas Technical University)
- Building information modelling (Vilnius Gediminas Technical University)
- Construction engineering (Vilnius Gediminas Technical University)
- Construction engineering (Kaunas University of Technology)
- Construction engineering and port buildings (Klaipėda University)
- Construction and real estate management (Vilnius Gediminas Technical University)

According to the current description of the fields of engineering studies⁷⁹ and its requirements for tier-one university studies, the following achievable skills relating to the competences of sustainable construction can be objectively identified: 'possess knowledge and skills in the area of building information modelling'; 'understand and evaluate the ethical, environmental, and commercial aspects of engineering practice'; and 'have a holistic understanding of the impact engineering decisions have on the society and the environment, follow the norms of professional ethics and engineering practice, understand the responsibility for engineering practice'.

⁷⁷ Centre for Quality Assessment in Higher Education (SKVC). 2013. [Description of the Architectural Field of Studies](#).

⁷⁸ Order of the Minister of Education, Science and Sport of the Republic of Lithuania. 2015. Description of the Group of Fields of Engineering Studies ([TAR, 2015-09-11, No. 13746](#)).

⁷⁹ [Description of the group of fields of engineering studies](#).

Non-university studies (LQF 6) of construction engineering in Lithuania are provided by five institutions: Vilnius College of Technologies and Design (Vilnius), Kaunas University of Applied Engineering Sciences (Kaunas), Klaipėda State College (Klaipėda), Šiauliai State University of Applied Sciences (Šiauliai), and Panevėžys College (Panevėžys).

In Lithuania, non-university (college) studies (LQF 6) consists of seven construction engineering baccalaureate curricula 180 credits in scope, awarding LQF level six:

- Road engineering (Kaunas University of Applied Engineering Sciences)
- Building engineering systems (Vilnius College of Technologies and Design)
- Construction (Vilnius College of Technologies and Design)
- Construction (Šiauliai State University of Applied Sciences)
- Construction engineering (Kaunas University of Applied Engineering Sciences)
- Construction engineering (Klaipėda State College)
- Construction engineering (Panevėžys College)

According to the current description of the fields of engineering studies (revised and approved as of 12 January 2017) and its requirements for college studies, the following achievable skills relating to the competences of sustainable construction can be identified: 'possess knowledge and skills in the area of building information modelling'; 'understand and evaluate the ethical, environmental, and commercial aspects of engineering practice'; 'understand the impact engineering decisions have on the society and the environment, follow the norms of professional ethics and engineering practice, understand the responsibility for the outcomes of engineering practice'.

University studies of energy engineering in Lithuania are provided by three institutions: Vilnius Gediminas Technical University (Vilnius), Kaunas University of Technology (Kaunas), and Vytautas Magnus University (Kaunas).

In Lithuania, university studies consist of four energy engineering post-graduate curricula between 112 and 120 credits in scope, awarding LQF level seven:

- [Energy technologies and economy](#) (Kaunas University of Technology);
- [Building energy engineering](#) (Vilnius Gediminas Technical University);
- [Thermal engineering](#) (Kaunas University of Technology);
- [Sustainable energy](#) (Vytautas Magnus University).

In Lithuania, university studies also consist of two energy engineering baccalaureate curricula 240 credits in scope, awarding LQF level six:

- [Building energy](#) (Vilnius Gediminas Technical University);
- [Renewable energy](#) (Kaunas University of Technology).

Non-university studies of energy engineering in Lithuania are provided by one institution: Vilnius College of Technologies and Design (Vilnius). For non-university studies, this college offers two energy engineering baccalaureate curricula 180 credits in scope, awarding LQF level six:

- Renewable energy engineering;
- Energy engineering.

Energy engineering does not have an approved description of fields of studies, and the design of curricula follows the general requirements for engineering studies (the description was last revised and approved on 12 January 2017). The descriptions of separate post-graduate curricula highlight that a graduate of tier-two university studies majoring in energy engineering: 'is able to apply their knowledge and understanding to analyse the impact of the traditional and new technologies of energy production, transmission, distribution, and consumption on sustainable development'; 'understands the importance of the requirements of sustainable development, environmental protection, policy on climate change control, energy efficiency, and economy'; 'is able to apply innovative methods to achieve sustainable development of energy systems, development of renewable energy sources, integrate economy knowledge and make decisions in the absence of detailed and well-defined information'; 'is able to make engineering decisions when facing multi-faceted problems in the field of expansion of the energy sector, sustainability, efficiency, among other things, that lack technological definition and accurate description'; 'is aware of the technical and non-technical requirements of engineering practice relating to the impact that energy technologies have on the environment and the society'; 'has a holistic understanding of the impact engineering decisions have on the society and the environment, follows the norms of professional ethics and engineering practice, understand the responsibility for engineering practice'; 'is able to

analyse and evaluate the efficiency of buildings and their energy systems and propose measures to increase it through smart solutions'; 'is able to apply their knowledge and understanding to identify and address problems of smart building energy systems in practice'.

According to the descriptions of the curricula, a graduate of tier-one university studies in the field of engineering: 'is able to apply the principles of sustainable development in energy, make holistic, innovative engineering decisions by taking into consideration costs, benefits, safety, quality, reliability, and environmental impact'; 'has consistent knowledge in the fields of automated control, thermodynamics, heat and mass exchange, energy electronics, machines that run on electricity from renewable sources, the economics and market of electrical market, and other areas relevant to their majors'; 'has profound knowledge of smart electrical systems and their control, wind and water technologies, which they apply for the purposes of developing smart electrical systems and renewable sources of electric energy'; 'has profound knowledge of energy generation systems, thermal power plants, the theory of combustion, thermal processes, which they apply for the purposes of developing sustainable thermal energy systems'; 'is able to apply their knowledge and understanding to formulate and analyse renewable energy problems'; 'is able to choose and apply the right analytical and modelling methods to address renewable energy issues'; 'understands and evaluates the ethical, environmental, and commercial aspects of engineering practice'; 'has a holistic understanding of the impact engineering decisions have on the society and the environment, follows the norms of professional ethics and engineering practice, understands the responsibility for engineering practice'.

Tier-one non-university studies have little emphasis of the principles of sustainability, stating that the graduate of these studies will 'understand the ethical, environmental, and commercial aspects of engineering practice'.

A subjective assessment of the competences of sustainable construction awarded through the current higher education curricula is carried out as part of the survey/interview undertaken within the framework of the project. The complete survey form is presented in Annex 2 *Survey of Educational Service Providers* (available at Lithuanian version of the SQA). A summary of the survey is presented in Section 7 *Competences and skills gaps between the current situation and the expected needs for 2030*.

Table 5.3. *The number of higher school graduates in 2020–2022 (n.d.c. – no data collected). A detailed table is presented in Annex 3 (available at Lithuanian version of the SQA).*

Field of analysis (education sub-field) LQF level	Total	% of women	Total	% of women	Total	% of women
	2022		2021		2020	
Level 7 of the LQF						
Total (architecture sector) Level 7	86	n.d.c	111	n.d.c.	33	n.d.c.
Total (general construction sector) Level 7	164	20	187	25	175	22
Total (engineering systems sector) Level 7	44	30	41	34	35	34
Total (heat production sector) Level 7	11	6	16	13	17	9
Total (renewable energy sector) Level 7	23	30	24	17	35	12
Total (building maintenance sector) Level 7	6	0	1	0	15	27
Total Level 7	334	appr.24	380	appr.29	310	appr.28
Level 6 of the LQF						
Total (Architecture sector) Level 6	0	0	0	0	6	33
Total (general construction sector) Level 6	416	18	467	17	493	22
Total (Engineering Systems sector) Level 6	22	5	45	7	39	15

Total (Energy engineering sector) Level 6	60	10	71	21	67	13
Total (building maintenance sector) Level 6	0	0	0	0	12	42
Total Level 6	498	16	583	17	617	21

Universities and colleges also organise informal learning of adults, providing adult individuals with conditions to pursue lifelong learning, satisfy their learning needs, improve their qualifications, and acquire additional competences. Higher education establishments organise informal refresher courses that, once completed, award the person a certificate; another popular practice is to study a separate subject (module) offered by a university that, once completed, awards the person an academic certificate. Universities and colleges are also open to suggestions from potential clients and adjust their informal education programs to the market's needs. Enrolment to informal education programs is often subject to a threshold of students. A summary of informal education offered by higher schools is presented in Table 5.4.

Table 5.4. Informal education studies offered by higher schools in the field of sustainable construction.

Name of the higher education institution	Title of the non-formal education programme	Volume in hours	Scope
Kaunas University of Technology	Sustainability in the Construction Sector	5 hours	General Construction
	Building Information Modeling (BIM)	16 hours	
Vilnius Gediminas Technical University	Qualification Improving Program for Engineering Information Modeling and Management of Buildings Life Cycle (BIM)	8 hours	General Construction
	Qualification Improving Program for Structural Integrated Project Preparation (BIM 3D)	8 hours	
	Building and Infrastructure Maintenance Information Modelling (BIM 6D/7D) qualification development programme	8 hours	
Vilnius College of Technology and Design	BIM modeler training	60 hours	General Construction
Panevėžio kolegija/State Higher Education Institution	Fundamentals of building design of A++ energy efficiency class building	20 hours	General Construction

Higher schools currently offer courses that mirror the competences of sustainable construction in the field of general construction and the fact that many of them point out that the launch of the course is conditional on the availability of a sufficient number of students rather than a timetable is indicative of the low degree of popularity of courses of informal education by higher schools.

Summarising, the least detailed competences concerning sustainable constructions are highlighted in the regulatory documents for architecture and vocational training, and it is therefore suggested that the planning of the roadmap measures should include the updating of the curriculum of architecture studies, as well as the updating of the professional standards, to include and clarify the areas of competences relevant for sustainable construction.

Energy engineering studies do not yet have an approved description of fields of studies, but the relevance of individual study programs in this field is sufficient to meet the needs of sustainable construction competences. According to the distribution of competences among occupations in Lithuania, energy professionals and workers are more active in the field of sustainable energy production and distribution (till the building and in the building), while architects, civil engineers and construction workers are more involved in the design and construction of sustainable buildings. The involvement of energy professionals is more present in the formulation of the energy sector's task of reducing carbon emissions from energy production, but without specifying the design of the buildings, and the SQA authors consider that this synergy is sufficient and the most beneficial for the efficiency of

each of these sectors (energy and construction). Detailed descriptions of separate energy engineering study programs could be found using relevant hyperlink in the study program list provided above.

5.4. Certification of construction specialists

Activities that involve a higher degree of responsibility may only be pursued by certified specialists in Lithuania. Certification of **construction specialists** and recognition of their entitlement is part of the procedure whereby the construction engineer has their qualifications appraised to determine their readiness to supervise the main fields of the technical activity of building special and non-special buildings and is granted a right to practice this kind of activity. Certification and recognition is carried out under the Law on Construction of the Republic of Lithuania and the construction technical regulation STR 1.02.01:2017 The Description of the Procedure for the Certification and Recognition of Entitlement of Construction Practitioners.

Similar requirements are imposed on the activities of **architects**, with architect certification done in compliance with The Description of the Qualification Requirements for and Certification Procedure of Architects.

Energy workers (people employed in the spheres of renewable resources, gas, electricity, thermal energy, water resources, and waste management) up to 2024 were certified in line with the requirements of the Lithuanian standard LST EN ISO/IEC 17024:2012 Assessment of Compliance. General Requirements for Employee Certification Bodies (ISO/IEC 17024:2012) or The Description of the Procedure of Certification of Builders and Operators of Energy Facilities and Installations.

During the end of 2023 the certification scheme of energy workers was upgraded. The State Energy Regulatory Council (VERT) has approved the General Scheme for the Certification of Energy Workers by its resolution No. O3E-1686 of November 17, 2023, "On Amendments to the Resolution of the State Energy Regulatory Council No. O3E-1458 of December 18, 2020, "On Approval of the General Scheme for the Certification of Energy Workers."

The key provisions of the scheme are as follows:

- Establishment of general and specialized qualification requirements for energy workers.
- Setting out the qualification development requirements for each category of energy workers.
- Regulation of certification procedures and granting of rights to energy workers to carry out installation or operation work of energy facilities.

The General Scheme for the Certification of Energy Workers will enter into force on January 1, 2024.

Experts in certification of building energy performance are certified under the construction technical regulation STR 1.02.09:2005 The Description of the Procedure for the Obtainment of a Right to Exercise Certification of Energy Performance of Buildings.

Certification of different specialists is the responsibility of the following bodies:

- construction specialists and experts in building energy performance: The Construction Sector Development Agency, a public body;
- architects: The Architects' Chamber of Lithuania, a professional governance body for certified architects in Lithuania;
- energy workers: accredited certification bodies (the Certification Department of the Energetikų Mokymo Centras, a public body; the certification body of the Engineering Department at UAB SDG; the Certification Department at Nauja Kvalifikacija, a public body; the energy worker certification body of TUVLITA, a Lithuania–Germany private limited company; the Certification Department at UAB Kita Kompetencija; the certification body of UAB Verslo Aljansas).

Certification of specialists includes the assessment of their original qualifications and the ongoing development thereof. All of the above specialists are obligated to attend at least 20 hours of qualification development training courses in every 5 years, following training programs approved by higher schools, associations, or educational establishments, subject to prior coordination with the Ministry of the Environment.

There are 22 authorised bodies that organise/are able to organise trainings for **construction specialists**:

- Vilnius Gediminas Technical University offers training under 14 qualifications development programs. These courses cover topics from general design principles to building lifecycle engineering information modelling and management, among other things (for a full list it is provided in Annex 3, available at Lithuanian version of the SQA). The length of this program is 6–8 hours.
- Lithuanian Association of Civil Engineers (LACE) offers training under 11 programs in 9 regional communities (LACE – Kaunas county community, LACE – Klaipėda community, LACE – Panevėžys county community, LACE – Telšiai county community, LACE – Vilnius county community, LACE – Alytus county community, LACE – Marijampolė community, LACE – Utena county community, and LACE – Šiauliai county community) in partnership with the Quality Management Centre at VGTU, a public body. The length of the courses is between 20 and 92 hours, depending on the content of the curriculum.
- Lithuanian Association of Environmental Management and Hydrotechnics Engineers (LAEMHE) offers 13 qualifications development programs focusing on groups of engineering buildings of other functions and transport communications and engineering systems. Each of the LAEMHE training courses is 8 hours long.
- Energetikų Mokymo Centras, a public body, offers training under 5 qualifications development programs in relation to installation of electricity supply and distribution equipment, building of electrical grids, installation of electrical engineering systems in a building, building of heating supply systems, installation of heat-production equipment, installation of building heating, ventilation, and air conditioning engineering systems, and gas pipelines as part of the construction design project. The length of courses covering different topics ranges between two and 34 hours, averaging six.
- Qualifications development courses for fire safety as part of the construction design project are offered by the National Fire Safety Association (five qualifications development programs in total) and the Lithuanian Fire Safety Association (four qualifications development programs in total).
- The Lithuanian Association of Water suppliers offers four qualifications development programs focusing on water supply and wastewater removal as part of the construction design project, the length of the courses ranging between 8 and 9 hours.
- Other providers (such as the Construction and Architecture Faculty at Kaunas University of Technology, the Lietuvos Keliai association, Klaipėda State College, the Lithuanian Association of Engineers of Security Technologies, the Lithuanian Society for Informatics, Communications, and Electronics, the Lithuanian Plumbers' Association, the Lithuanian Construction Association, the Lithuanian Association of Engineers of Thermal Machinery, the Lithuanian Association of Heat Suppliers, the Association of Small Design Companies, the Association of Transport and Construction Engineers, the Vilnius Jeruzalė Labour Market Training Centre, a public body) offer one or two types qualifications development courses that vary in length.

Construction specialists can hold more than one qualification certificates. Around 350 persons take certification and obtain their first supervisor certificates and nearly 1,950 specialists pursuing qualifications development, adding new qualifications to or renewing their certificates every year. The year 2013 saw the introduction of mandatory formal qualifications development and measurement of persons pursuing qualifications development should take account the fact that a surge in certified specialists takes place once in every five years. As a result, the number of specialists enrolling in a qualifications development course in 2023 may be significantly larger.

The designated education and training bodies for **building energy performance experts** are the Institute of Architecture and Construction at Kaunas University of Technology and the Quality Management Centre at Vilnius Gediminas Technological University, a public body. Each of these institutions offers the following comparable courses and seminars: a training course for experts in energy performance certification of new buildings (47 hours) and a qualifications development course for experts in energy performance certification of buildings (7 hours).

Around 20 persons take certification to practice as experts in energy performance of buildings and some 50 specialists enrol in a qualifications development course on average every year.

The following approved training programs are available to **architects** who wish to develop their qualifications:

- The qualifications development program for architects (project managers, supervisors of the architectural part of the construction design project) by the National Passive Building Association;

- The qualifications development program for certified architects (supervisors of the key areas of technical construction activities and spatial planning) by the Architectural Quality Development Association;
- The qualifications development program for certified architects (supervisors of the key areas of technical construction activities and spatial planning) by Kaunas Council of Experts in Architecture and Urban Development, a public body;
- The qualifications development program for certified architects (supervisors of spatial planning and the key areas of technical construction activities) by Archlegis, a public body;
- The qualifications development program for certified architects (supervisors of the key areas of technical construction activities and spatial planning, and designers) by the Lithuanian Council of Green Buildings;
- The qualifications development program for certified architects (supervisors of spatial planning and the key areas of technical construction activities) by the Lithuanian Architects' Chamber.

Nearly 30 persons take certification to become practicing architects and some 260 specialists enrol in a qualifications development course on average every year.

5.5. Informal education and training: training offered by providers of non-educational services

There are a plethora of relevant courses on the market that are provided by companies that often are not primarily engaged in training but rather in manufacture or sale of particular construction products, software development or distribution. A number of courses are also offered by non-profit organisations, NGOs representing certain groups of interests. There is no statistic for graduates of such training course compiled on a national scale, and the volumes of such courses are a commercial secret of the company providing them as often as not. UAB Agacad, a major player in the field, declares that over 8,000 have completed its courses since 2008, amounting to 500 per year on average. Some of the courses are free and have to do with the correct application of particular products and are marketing stunts in nature, yet at the same time they offer a swath of fundamental knowledge about the latest products on the market. An inquiry about this type of training was made during the survey of the participants of the construction market conducted for the purposes of this report: out of the 123 respondents, 54 companies noted that they offer courses to specialists, and another 25, to blue-collar workers. Another part of informal education and training constitutes paid courses related to improving the working efficiency of specialists in the construction field and so on, with most of the courses available on the market offered in the areas of construction digitalisation and sustainability (Table 5.5).

Table 5.5. Informal education offered by providers of non-educational services in the field of sustainable construction (paid courses).

Institution	Title of the non-formal education programme	Volume in hours
Lithuanian Green Buildings Council	Continuous professional qualification improvement program for sustainable buildings	16.5
Lithuanian Real Estate Development Association	Principles of Sustainability in Buildings and their Environment	according to request
Vsi Skaitmenine Statyba (Digital Construction)	Building Information modelling (BIMI, BIMII, BIMIII accredited programs)	16; 16; 16
UAB Infoera	>35 training topics related to the use of construction digitisation software tools	5-26
UAB Agacad	>11 training topics related to the use of construction digitisation software tools	according to request
UAB Avevera	New trends in construction. building operation. project management. News related to the European Green Deal. The present and future of BIM	40
UAB Intelligent BIM Solutions	BIM management	according to request

In 2024, as the result of the project "Establishment of the Integrated Sustainability Technology Laboratory in VILNIUS TECH" (see Table 6.1), new interdisciplinary study programmes will be launched for the training of sustainability professionals - one first cycle bachelor's study programme (240 ECTS) and one second cycle master's study programme (120 ECTS). It also includes the development of 10 optional courses on sustainability for students from different fields; the development of 10 micro-credit courses on sustainability available for all the professionals working in the field to raise their competences.

6. Relevant Building Skills Projects

An analysis of various project funding databases identified previous or ongoing projects aimed at improving the competences of Lithuanian construction sector actors. The table below shows projects with a total value of at least EUR 100,000, as projects with smaller budgets are usually Erasmus+ projects for smaller target groups.

The main projects are listed in Table 6.1. A total of 15 such projects were identified. The table shows that the Build Up Skills Phase 1 project had a high added value, as it was followed up by several other projects such as ENERGOTRAIN and NET UBIEP and BIMplement. The latter two projects show that there has been a strong focus on improving competences in BIM. Even two projects were funded by the 2014-2020 Operational Programme for the European Union Funds Investments in Lithuania have focused on improving the competencies of VET teachers.

Other projects have been funded by Erasmus+ program and are related to the areas covered by this project. In particular, Erasmus+ projects have focused on improving competences in timber construction, but a number of projects also focus on circular economy and the principles of "greenness".

EU Construction Blueprint⁸⁰ project

The Erasmus+ program-funded project Construction Blueprint in Lithuania (2019-2022) is particularly related to the Build Up Skills project. It is related to the identification of competency needs in sustainable construction and that is partly overlapping with the objectives of Build Up Skills LT. The Construction Blueprint project analysed occupations and competence needs in three areas of sustainable construction: energy efficiency, digitalisation and circular economy. In the context of this project, only blue-collar occupations were analysed. The Build Up Skills LT project goes beyond blue-collar occupations and looks at the broader spectrum of competences for sustainable construction throughout the life cycle of a building.

The main objective of Construction Blueprint is to develop a new sectoral strategic approach to cooperate on skills in the Construction industry, and support a better matching between skills need of companies and skills provided by training centres. To achieve this goal successfully, the project gathers three Sectoral European Organizations, along with nine National Sectoral representatives and twelve Vocational Education and Training (VET) and Higher Education providers from twelve European Union countries.

No projects specifically aimed at attracting women to the construction or renovation sectors have been identified in Lithuania, as well as no projects aimed at reskilling fossil fuel related workers.

Table 6.1. *Projects related to competences in sustainable construction*

Projects funded by Intelligent Energy Europe (IEE) programme

⁸⁰ European project [Construction Blueprint](#).

1	<p>Project title: BUILD UP Skills Lithuania – rebooting the National Construction Platform and Roadmap (BUILD UP Skills – LT) Duration: 2012 - 2013 (18 months) Project budget: € 205,576 Project partners: Certification Center of Building Products; Lithuanian Builders Association; Vilnius Gediminas Technical University; Kaunas University of Technology; Regional Innovation Management Centre Main results: The project has resulted in the creation of a national platform and guidelines for the qualification of Lithuanian construction workers to meet the EU 2020 energy efficiency targets.</p>
2.	<p>Project title: Build UP Skills ENERGOTRAIN Duration: 2014 - 2016 (30 months) Project budget: € 609,868 Partners: Regional Innovation Management Centre; Lithuanian Builders Association; Certification Center of Building Products; National Association of Passive House; Vilnius Gediminas Technical University; Centre of Training for Energy Specialists; Vilnius Builders Training Centre; Vilnius Jeruzales Labour Market Training Centre Main results: The project developed a system for the acquisition and recognition of qualifications for the construction, renovation, operation and installation of high energy efficiency houses and renewable energy sources, including the development of voluntary vocational training programmes, the training of teachers, and the testing of the training. New training programmes for workers in different construction specialisations have been developed, and workers and vocational trainers have been trained in pilot training.</p>
Projects funded by Horizon 2020 programm	
3	<p>Project title: Network for Using BIM to Increase the Energy Buildings Performance (NET-UBIEP) Duration: 2017 - 2020 (30 months) Project budget: € 995,022 Partners: ENEA – Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (IT); Gruppo CS (IT); ViaEuropa (SK); UVS Institute for Adult Education and Services (ES); Fundación Laboral de la Construcción (ES); Spanish National Research Council; VšĮ "Skaitmeninė statyba" (LT); Vilnius Gediminas Technical University (LT); University of Zagreb – Faculty of Civil Engineering (HR); ISSO Dutch Knowledge Institute for the buildings and building sector (NL); „Balance and Result“ (NL); Tallin University of Technology (EE); ETET – Eesti Tõmmitud Ehituse Tugirühm (EE) Main results: Competency development and recognition models have been developed to bridge the skills gap between professionals working on BIM projects. The project has implemented the competence development model through various training activities in six professional areas: BIM Manager, BIM Coordinator, BIM Expert, BIM Assessor, BIM User and BIM Building Manager.</p>
4	<p>Project title: BIMplement Duration: 2017-2020 (36 months) Project budget: € 999,620 Partners: Alliance Villes Emploi (FR); ASTUS Construction (FR); ISSO Dutch Knowledge Institute for the buildings and building sector (NL); Huygen (HIA) (NL); Regional Innovation Management Centre; Lithuanian Builders Association; Instituto Valenciano de la Edificación (ES); Mostostal Warszawa S.A. (PL); Architects' Council of Europe (BE). Main results: The project aims to improve the quality of construction and renovation processes aimed at energy-efficient buildings by using BIM as a versatile information-gathering tool for project-based and inter-project learning. The BIMplement project has developed a BIM-encompassing qualification framework that describes the competences, skills and knowledge needed to link existing knowledge to the BIM model, the construction process and the actors involved. The results will be applied to 50 experimental sites, where the training intervention practically tested with 710 white collars and 752 blue collars.</p>
Projects funded by 2014-2020 Operational Programme for the European Union Funds Investments in Lithuania⁸¹	
5	<p>Project title: Improving the technological competences of Lithuanian teachers in the construction sector Nr. 09.4.2-ESFA-K-714-01-0009</p>

⁸¹ [Projects funded by 2014-2020 Operational Programme for the European Union Funds Investments in Lithuania](#)

	<p>Duration: 2017-2020 (33 months) Project budget: € 610,728 Implementer: Lithuanian Builders Association Main results: 15 programmes to upgrade the technological competences of vocational teachers were updated or newly accredited, using the facilities of construction companies and sectoral practical training centres. The programmes include the Building Insulation Technological Competence Development Programme, the Building Restoration Technological Competence Development Programme, the Construction Machinery Management Technological Competence Development Programme, the Design Using AutoCAD or equivalent Technological Competence Development Programme, etc.</p>
6	<p>Project title: Improving the technological competences of vocational teachers in the sector "Architecture and Construction" Nr. 09.4.2-ESFA-K-714-01-0013 Duration: 2017-2020 (33 months) Project budget: € 311,352 Implementer: Vilnius Industry and Business Association Main results: The project concerns the development of technological competences of vocational teachers. The project has updated 13 VET teacher programmes and programme training materials and developed one new programme and training material. 85 vocational teachers improved their competences in state-of-the-art enterprises in the sector.</p>
Projects funded by Erasmus+ programm, KA2 Action	
7	<p>Project title: EU Construction Blueprint Duration: 2019-2022 (48 months) Project budget: € 4,000,000 Partners: Fundación Laboral de la Construcción (ES), Vilnius Builders Training Centre (LT), Lithuanian Builders Association (LT), etc. Total 24 partners from 12 countries. Main results: The project addresses blue-collar sectoral skills gaps in energy efficiency, digitalisation and the circular economy through vocational training programmes. An important outcome of the project is the creation of the Skills Observatory, a tool for tracking and monitoring the needs of competences identified by construction companies in different EU countries, allowing users to get a closer look at competences foresight at national/European level.</p>
8	<p>Project title: Sustainable Public Buildings Designed and Constructed in Wood Duration: 2018-2020 (28 months) Project budget: € 274,737 Partners: Vilnius Gediminas Technical University (LT); Hameen Ammattikorkeakoulu OY (FI), VšĮ „Study and Consulting Center“ (LT), Coventry University (UK), Via University College (DK), Rigas Tehniska Universitate (LV), State Enterprise Centre of Registers (LT) Main results: The project aims to train all participants (students, teachers, entrepreneurs) in sustainable wooden construction. It also developed a new module on sustainable timber construction to improve the competences of both teachers and students in innovative learning methods.</p>
9	<p>Project title: Development of environmentally-friendly (green) training for specialists in the construction sector Duration: 2019-2022 (28 months) Project budget: € 146,591 Partners: Daugavpils būvniecības tehnikums (LV), Lithuanian Builders Association (LT), Vilnius College of Technology and Design (LT), Järvamaa Kutsehariduskeskus (EE), Inercia Digital S.L. (ES), Latvijas Būvnieku Asociācija (LV) Main results: The project mainly involves researchers, teachers/lecturers and practitioners from construction sector. Project was aimed to develop and consolidate an environment-friendly (green) culture of work in the construction sector and to increase the supply of the qualified labour staff for the construction sector, which suffers from the workforce shortage and to help to match skills for the job, cover skill gaps as well as "green" skill deficits through efficient training. The project involved the development of new modules in the context of creating a green working culture.</p>

10	<p>Project title: Circular Economy in Wooden Construction Duration: 2020-2022 (24 months) Project budget: € 210,919 Partners: Vilnius Gediminas Technical University (LT); Riga Technical University (LV), Häme University of Applied Sciences (FI), University of Palermo (IT), Laurea University of Applied Sciences (FI) Main results: Developed 12 ECTS trans-disciplinary innovative module “Circular Economy in Wooden Construction”, which is addressed to MSc students of the planning disciplines: architecture, civil engineering and building site management.</p>
11	<p>Project title: Virtual and Intensive Course Developing Practical Skills of Future Engineers Duration: 2016-2019 (28 months) Project budget: € 283,653 Partners: Politechnika Bialostocka (PL); Universidad De Cordoba (ES) Vilnius College of Technology and Design (LT); Polski Związek Inżynierów i Techników Budownictwa Oddział w Białymstoku (PL) Main results: Enhancing the competences of future professionals (engineers) in the field of innovative and sustainable HVAC systems through innovative training.</p>
12	<p>Project title: Advanced Digital Design course ON modern buildings developing SKILLS for young engineers Duration: 2021-2023 (24 months) Project budget: € 261,018 Partners: Politechnika Bialostocka (PL); Universidad De Cordoba (ES); Vilnius College of Technology and Design (LT); Rezeknes Tehnologiju akadēmija (LV); Università degli Studi di Firenze (IT); Polski Związek Inżynierów i Techników Budownictwa Oddział w Białymstoku (PL) Main results: The project is aimed at teachers and students of higher technical education institutions to improve their competences in the design of modern, intelligent and environmentally friendly buildings using modern learning methods.</p>
13	<p>Project title: Design and Construction of Environmental High Performance Hybrid Engineered Timber Buildings Duration: 2020-2023 (36 months) Project budget: € 413,083 Partners: Via University College, project coordinator (DK); Vilnius Gediminas Technical University (LT); The Universitat Politècnica de Catalunya BarcelonaTech (UPC) (ES); Riga Technical University (LV); TU Wien (AU); VšĮ “Study and Consulting Center” (LT); Gremi Fusta I Moble (ES) Main results: The project aims to meet the future needs of higher education students through the design and construction of high environmental performance hybrid engineered timber buildings, using interdisciplinary and innovative student-centred learning approaches</p>
14	<p>Project title: Management and Technologies of Water, Waste Water, Waste and Circular Economy – WWW&CE Duration: 2019-2021 (24 months) Project budget: € 941,365 Partners: Hanse-Parlament (DE); Panevėžys Chamber of Commerce, Industry and Crafts (LT); Vilnius Gediminas Technical University (LT); Vilnius Builders Training Centre (LT), Hungarian Association of Craftsmen’s Corporations, (HU); Kontiki Vocational Center (HU), Chamber of Craftmanship and Enterprise in Białystok (PL); Białystok Foundation of Professional Training (PL); Vocational Educational Centre South (DK); Nordic Forum of Crafts (NO); Satakunta University of Applied Sciences (FI) Main results: An initiative to increase the number of highly skilled professionals and strengthen the competitiveness of small and medium-sized enterprises (in the fields of construction, installation, equipment maintenance, etc.) in the fields of water, waste water, waste and the circular economy.</p>

15	<p>Project title: Knowledge Alliance for Sustainable Mid-Rise and Tall Wooden Buildings</p> <p>Duration: 2018-2024 (40 months)</p> <p>Project budget: € 964,530</p> <p>Partners: Via university college (DK); Vilnius Gediminas Technical University (LT), House habitat casa pasiva sl (ES), VšĮ „Study and consulting center“ (LT), Board of governors for the Southern Alberta institute of technology (CA), State Enterprise Centre of Registers (LT), UAB Idea statika (LT) , Universitat politecnica de Catalunya (ES) , The university of Westminster (UK), Teknologisk institut (DK), Warringtonfire testing and certification limited (UK)</p> <p>Main results: The project will foster collaboration and innovation between European higher education institutions, researchers, business partners, associations, networks and the wider community, promoting the design and construction of medium and tall timber buildings.</p>
NextGenerationEU	
16	<p>Project name: Establishment of Integrated sustainability technology laboratory at VILNIUS TECH</p> <p>Project duration: 2022 - 2024 (15 months)</p> <p>Project budget: € 2 117 400</p> <p>Project partners: ATHENA University Network.</p> <p>Main results: The project aims to establish an Integrated Sustainability Technology Laboratory with its experimental learning areas, a laboratory management area and open, hybrid learning areas, and to carry out infrastructure upgrades, ensuring the creation and development of a study environment linked to the activities of European university networks. In addition, mobility of teachers and students, administrative staff, participation of students in international activities, attraction of foreign students, teachers and researchers will be promoted, high-level training on sustainability for teachers and administrative staff will be organised, new interdisciplinary curricula will be developed, the creation of study subjects and microcredit courses will be foreseen, the testing of the content of studies will be tested, and the management of the activities of the Networks of European University Networks (ATHENA) will be managed.</p>

7. Competences and Skills Gaps Between the Current Situation and the Expected Needs for 2030

The general trends regarding the number of specialists in the construction sector and their competences are affected by the overall political landscape in the EU and the national strategic plans that mirror them and the general tendencies of development of the country and its economy. The biggest impact on the profile of competences in the construction sector will come from the goals to reduce the use of fossil fuel, the digitalisation of the construction sector, the expansion of e-mobility, the development of circular economy and green procurement, while the effective policy on continuous teaching/learning should facilitate the growth of competences in this field a lot.

The gaps in competences and skills between the current situation and the expected needs for 2030 are analysed by evaluating the needs and extent of new competences relevant to individual areas of the construction sector. The analysis covers the following fields: architecture, general construction, engineering systems, heat production, renewable energy, and building operation and follows the methodology described in Section 2.2 of the report.

7.1. Analysis of the Need for Workforce to Achieve the 2030 Targets

7.1.1. The current profile of human resources

Since 2014, the overall number of people employed in the Lithuanian construction sector has been fluctuating around 100,000 (including the construction of buildings and structures; for details, see Section 4). The employee profile of the sector can be identified best in reliance on data from the Social Security Fund Board under the Ministry of Social Security and Labour of the Republic of Lithuania (SODRA); however, SODRA's database does list all specialities that are identified as relevant for the achievement of the 2030 targets – as a result, their analysis is carried out as part of the surveys undertaken within the framework of the project. Furthermore, SODRA's data do not make it possible to measure workforce by phase of the building's lifecycle (design, construction, operation, or demolition): it can only be done by separately evaluating the specifics of each speciality and assigning it to one or several phases of the lifecycle. Within the scope of this report, the workforce in the construction sector is not broken down by individual lifecycle phases, instead assuming that the competences relevant to

the achievement of the 2030 targets are usually closely connected to the entire lifecycle of a building, and once one competence is achieved, it can be easily applied across the whole of the lifecycle. On top of that, compiled and stored at a national level, SODRA's data do not include the exact qualifications of a person under the LQF, which may obstruct the reskilling potential of the people employed in the construction sector.

Current data include the statistics for nearly 54 thousand people employed in the lifecycle of buildings in the construction sector (with data for the fields of building design, construction, and operation picked out of the general statistics) and allow identifying the groups of workers and specialists, their in-depth data presented in Table 4.4 and 4.5. Another 22 thousand individuals or so are engaged in construction business on a self-employed basis, their practice falling into a certain category of economic activity (as per classification of economic activities of Lithuania, F Construction: F41 Construction of buildings; F42 Construction of engineering buildings; F43 Specialised construction activities), yet nearly all individuals who are self-employed in the field of construction fall into category F43 of economic activity with no detailed statistics for sub-categories are available. Another reason why people self-employed in construction are not profiled at length for further analysis is that most of them are also employed under an employment contract and therefore make part of SODRA's statistics. This tendency rather applies to the sector of white-collar specialists rather than blue-collar workers, but with no in-depth data available, any predictions of the dynamics of the groups of specialists and workers alike are done in reliance on the data from SODRA.

A comparison of the professions defined in the requirements laid down for SODRA's data and for the project report shows that when it comes to Lithuanian statistics, the designation of professions is rather summative. The professions recommended for the report are hidden in the existing categories. For example, heating, ventilation and air conditioning systems installer/cooling equipment installer installs solar collector systems, heat pump systems or biofuel systems. Existing classifiers are not harmonized and provide different inaccurate information. Moreover, companies provide inaccurate data to SODRA, making it difficult to analyse and identify specific occupations according to the classification. Pairing of existing skills categories was used in order to estimate a more accurate generalized group of specialists instead of very detailed, but inaccurate estimation.

Follows the pairing of more specific blue-collar professions and specialists and the professions listed in statistical data (profession according to the SODRA statistics + professions paired as per recommendations for the report):

- electrician / electrical mechanic + installer of elements of solar systems, installer of automation and electronic systems, installer of wind power plants;
- builders and installers + installer of plastered facades, installer of ventilated facades, installer of glazed facades, finisher, builder (that uses unconventional materials), installer of hydroinsulation;
- plumber + pipeline insulation technician;
- bricklayer + chimney builder/repairman;
- insulation technician + barrier seal installation technician;
- heating, ventilation and air conditioning systems installer/cooling equipment installer + installer of solar collector systems, installer of heat pump systems, installer of biofuel systems;
- building site inspector + project manager, supervisor of part of design project, supervisors of project expertise, site inspector for general construction work, site inspector for special construction work, supervisors of building expertise;
- civil engineer + cost estimator, design engineer;
- manager + sales manager, procurement manager;
- structural engineer + surveyor of building constructions;
- HVAC engineer + surveyor of building engineering systems;
- building manager + property manager.

The professions were identified in detail during the survey conducted for the purposes of this report.

When it comes to analysing the profile of the labour market, it is important to measure the portion of people that enter the market every year. The general tendency is that workforce aged 20–24 accounts for nearly 16 % of the labour market and this tendency is predicted to survive until 2030. It means that **around 4.0 % of new workforce enters the labour market every year**, amounting to 2,200 individuals or so for the construction sector. Compared to the total number of persons trained to qualifications at LQF level 2–7 (1,891 high school or university graduates majoring in construction), even if all of them

start a career in construction, the number of new workers and specialists trained would still be inadequate. According to a survey published by the *Kur Stoti* magazine in 2017⁸², only 65 % of graduates go on to practice their trade; taking this and the above trends into consideration, if the size of the construction market remains steady, **the volume of education and training in the area of construction should increase nearly twofold.**

7.1.2. General development trends of the construction sector

The overall development of the Lithuanian construction sector is predicted on the basis of forecasts from the European Centre for the Development of Vocational Training (CEDEFOP). CEDEFOP plays a role in drafting and implementing the EU vocational education and training policy, keeping an eye on the tendencies of the labour market. According to the forecasts from this source, between 2021 and 2030, the number of people employed in the construction sector in Lithuania is expected to grow by 0.6% year-on-year. At the same time, **the overall CEDEFOP forecast shows that the size of the domestic workforce aged 65 and more will grow by 5.8 %, and the number of workers aged 20–34 will decrease by 0.8 % on average every year.** For the construction sector, it means an increase in the need to broaden/develop qualifications as the number of graduates under the latest curricula entering the construction sector will be increasing smaller. As the construction sector and the field of building operation are partially responsible for climate change, this sector is the target of a lot of initiatives to control climate, which are outlined in Section 3 National Policies and Strategies to Contribute to the 2030 EU Energy and Climate Targets in the Construction Sector, and their implementation will put a demand for new skills on the construction sector, which is rather static in nature. Analysis of the workforce dynamics by level of qualification allows making a prediction that when it comes to the construction sector, the biggest drop will be seen in the number of employees with average qualifications, accounting for 78 % of the total volume of reduction, while the decrease in the number of employees with high and low qualifications will stand at 15.8 % and 6.2 %, respectively.

7.1.3. Trends predicted by the participants of the construction market

To assess the current situation of the participants of the Lithuanian construction market and the subjective predictions of market development, a survey and interview titled 'A Study of the Need for Competences in the Field of Sustainable Construction' was carried out in early 2023. The survey and interview form and a full report of the results are presented in Annex 4 and Annex 5 (available at Lithuanian version of the SQA).

The survey was aimed at conducting an analysis of the needs of construction specialists, considering the respondents' roles in the lifecycle of a building. As most of the respondents consider themselves performing a number of roles in the lifecycle of a building, analysis by role was based on a question pertaining to the need for specialists in that role. The analysis of the replies to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered a total of 12 respondents who consider themselves to be in the role of the **client**. They believe that the biggest deficit will exist for **construction project managers** and **civil engineers** (58 % of all replies for each), as well as **BIM information managers** and **BIM managers** (42 % of all replies for each). The respondents believe that the shortage of architects and procurement agents (managers) will be the lowest (17 % and 0 % of the replies, respectively).

⁸² *Kur Stoti*. [Magazine](#).

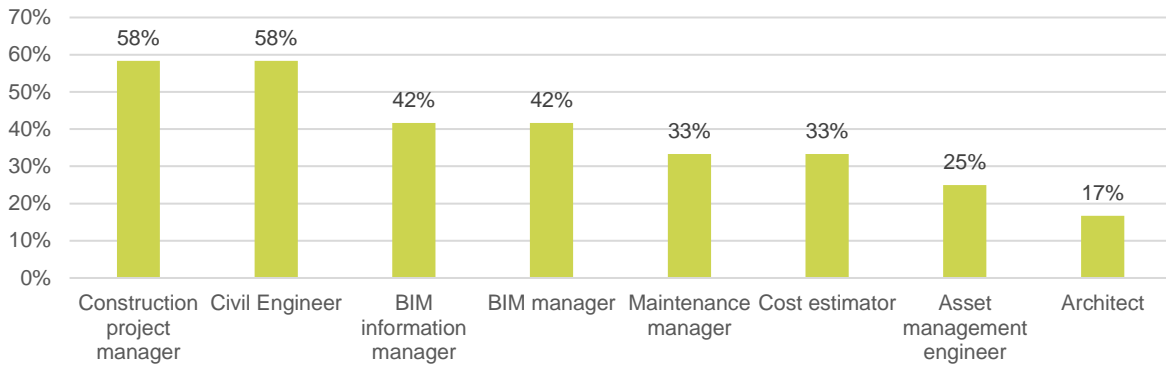


Fig 7.1. Breakdown of the clients' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 42 respondents who consider themselves to be in the role of the **designer**. The designers noted they see a pronounced deficit of **BIM coordinators** (51 %), closely followed by **HVAC engineers** and **BIM modellers** (49 % of the replies for each). There will also be a big shortage of **project managers**, **projects part's managers** (responsible for supervision of separate parts of the project), **BIM managers**, and **structural engineers**. Other specialists are in smaller demand, with the shortage of interior architects being the lowest (just 5 % of the respondents).

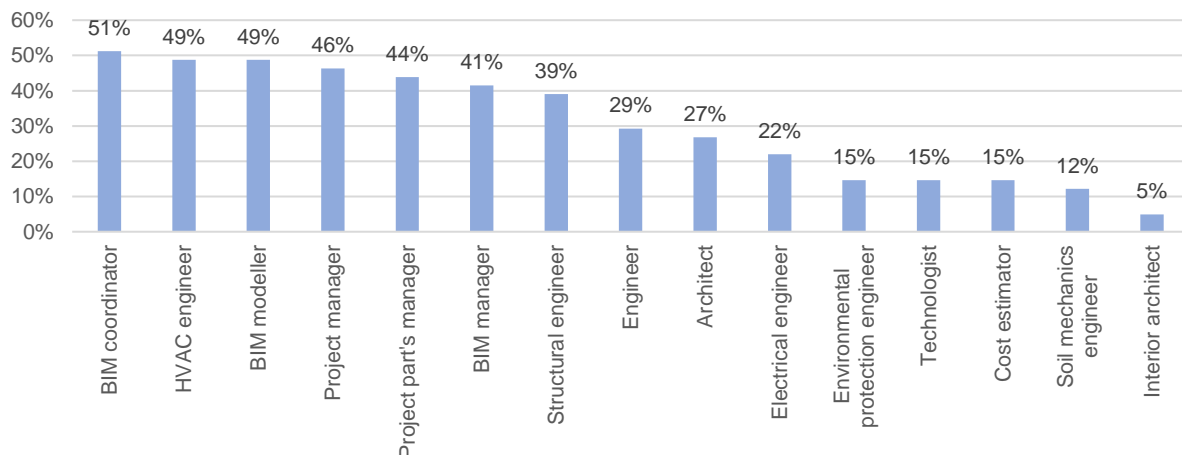


Fig. 7.2. Breakdown of the designers' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 65 respondents who consider themselves to be in the role of the **contractor**. The contractors noted that they predict a particularly large deficit of **building site inspectors** (68 %) and a very large deficit of **supervisors of special construction works** (54 %). These professions are followed by the **construction supervisor**, the **BIM coordinator**, and the **cost estimator**, each with 42 % of the responses from each respondent. The lowest demand is predicted for building surveyors and logistics specialists (managers) (just 5 % of the replies).

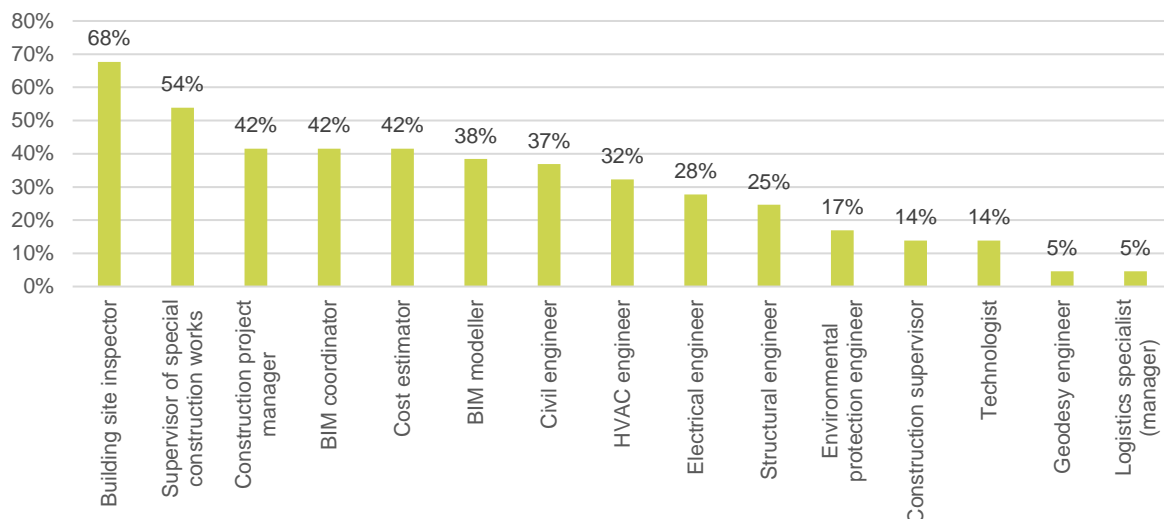


Fig. 7.3. Breakdown of the contractors' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 22 respondents who consider themselves to be in the role of **building maintenance representatives**. Building maintenance representatives see a very high demand for **HVAC engineers** (68 %); **BIM information managers** (64 %), and high demand for **electrical engineers** (50 %), **BIM modellers** (50 %), and **maintenance engineers**. Other specialists are also in demand, but the demand is lower.

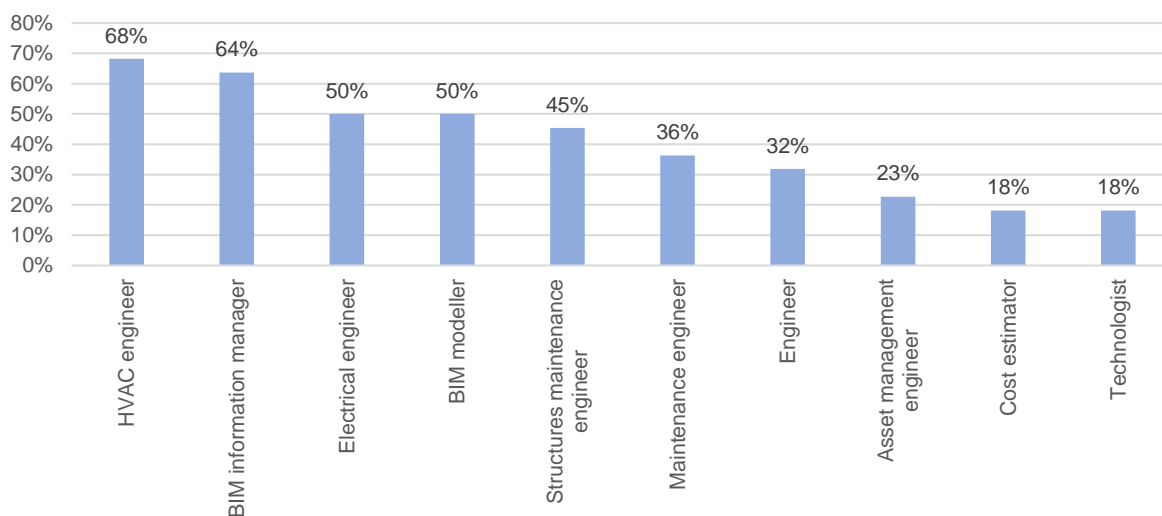


Fig. 7.4. Breakdown of the building maintenance representatives' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 25 respondents who consider themselves to be in the role of **experts**. The companies in the this role see a high demand for the **expertise manager of the project part** (48 %) and **sustainability assessors** (44 %). Other kinds of experts are also seen to be in demand, while the demand for building energy assessors is the lowest: based on the data from the Construction Sector Development Agency (CSDA), holders of valid certificates in this field currently amount to nearly 400, with over 700 experts certified in total.

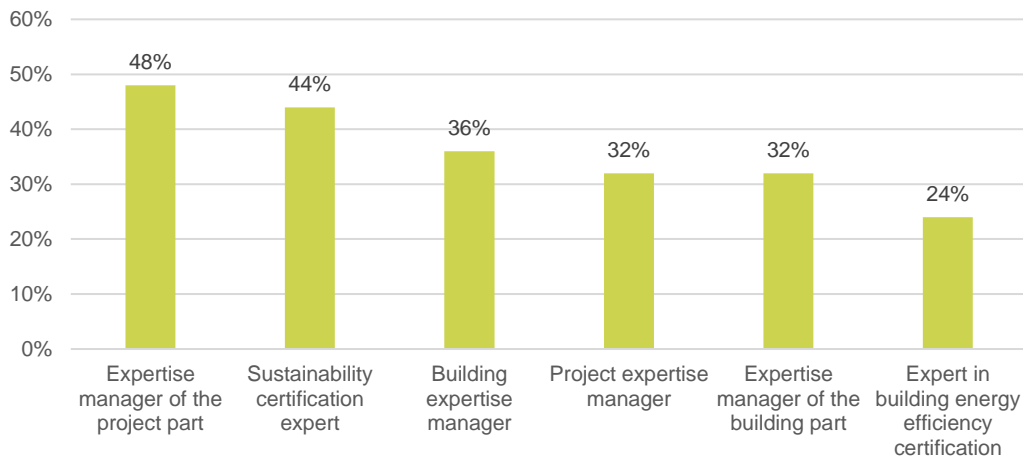


Fig. 7.5. Breakdown of the experts answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 7 respondents who consider themselves to be in the category of **surveyors**. In their opinion, there will be a critical shortage of **building construction** and **building engineering system surveyors** (86 % of all replies each). There is also set to be a very high demand for **BIM modellers** (57 %) and high demand for **measurement engineers** (or specialists) and **survey engineers (or specialists) of cultural heritage buildings** (43 %). The surveyors can see absolutely no deficit of building surveyors landscape specialists (architects).

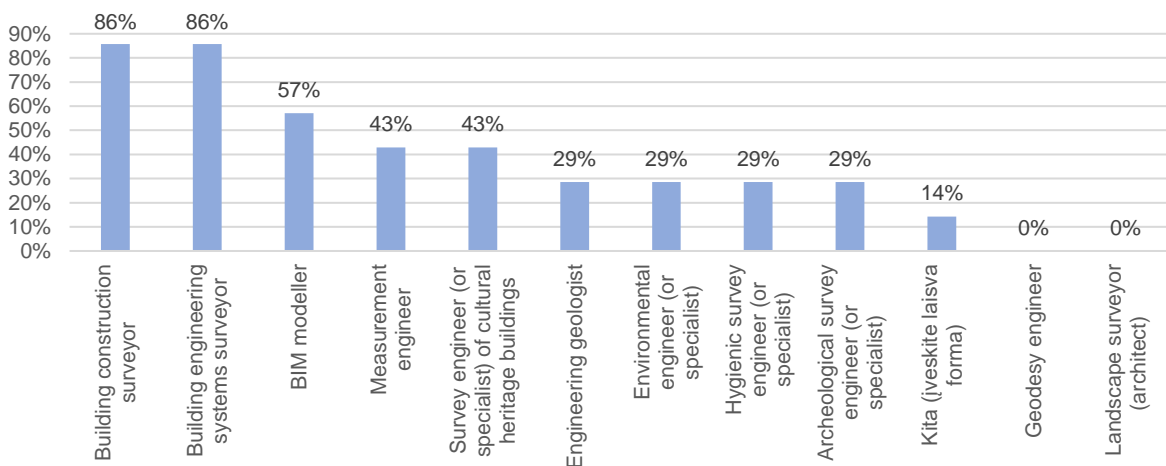


Fig. 7.6. Breakdown of the surveyors' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

The survey covered 19 respondents that represent **manufacturers and/or suppliers**. The manufacturer and supplier companies can see a very big deficit of **engineers** (68 %). Other specialists are also in demand, but the demand is much lower. Interestingly, even companies that manufacture and supply equipment and materials experience a demand for BIM modellers, even though the demand is not critical (26 %).

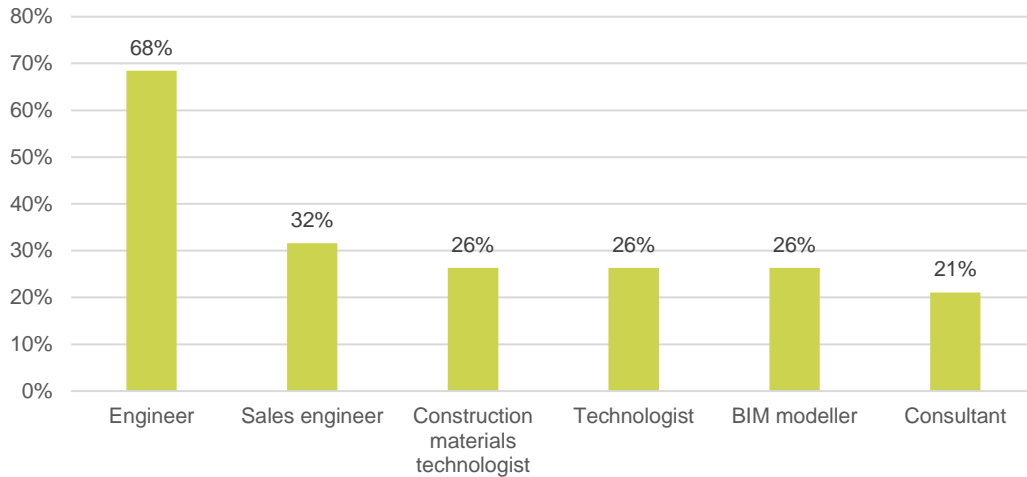


Fig. 7.7. Breakdown of the manufacturers' and/or suppliers' answers to the question of 'The specialists of which professions with qualifications relevant to sustainable constructions do you think will be in short supply on the market over the next five years?'

Table 7.1 below shows professions that the different groups of construction market participants find relevant; the professions are broken down into four intervals of needs, where 100 % means that a deficit for the specialists was indicated by all of the respondents, and 0 % means that none of the respondents can see the specialists to be in deficit over the next five years.

Table 7.1. Forecast of specialist deficit based on the survey of different groups of construction market participants.

Role	Forecasting the lack of need for specialists in the general sample of respondents			
	100-75 %	74-50 %	49-25 %	24-0 %
Customer		Construction project manager Construction engineer	BIM information manager BIM manager Maintenance manager Cost estimator Asset management engineer	Architect
Designers		BIM coordinator	Heating, ventilation and air conditioning engineer BIM modeler Project manager BIM manager Structural engineer Engineer Architect	Electrical engineer Environmental protection engineer Technologist Cost estimator Soil mechanics engineer Interior architect
Contractors		Construction manager Manager of special construction works	Construction project manager BIM coordinator Cost estimator BIM modeller Construction engineer Heating, ventilation and air conditioning engineer Electrical engineer Structural engineer	Environmental protection engineer Construction supervisor Geodesy engineer Technologist Logistics specialist (manager)

Building maintenance		Heating, ventilation and air conditioning specialist BIM information manager Electrical engineer BIM modeller	Asset exploitation engineer Maintenance engineer Engineer	Asset management engineer Cost estimator Technologist
Experts			Expertise manager of the project part Sustainability certification expert Building expertise manager Project expertise manager Expertise manager of the building part	Expert in building energy efficiency certification
Researchers	Building construction surveyor, Building engineering systems surveyor	BIM modeller	Measurement engineer Survey engineer (or specialist) of cultural heritage buildings Engineering geologist Environmental engineer (or specialist) Hygienic survey engineer (or specialist) Archeological survey engineer (or specialist)	Geodesy engineer Landscape surveyor (architect)
Manufacturers, suppliers		Engineer	BIM modeller Technologist Construction materials technologist Sales manager	Consultant Manager

The survey results outlined above suggest that even though the overall predictions for the construction sector tend to decline, the market participants expect there will be a higher demand for various BIM specialists, building engineering system specialists, potentially resulting from the general EU and Lithuanian policies in relation to the targets for the reduction of fossil fuel, the digitalisation of the construction sector, and the expansion of e-mobility.

7.1.4. Forecast of the development of the demands for labour in the construction sector

Summing up the above analysis, the overall forecast of the demands for labour (Table 7.2 and 7.3) is presented on the grounds of the original data shown in Table 4.4 and 4.5, with the subject professions grouped by type of activity. The main indicator is CEDEFOP's prediction that the rate of occupation in the construction sector will grow by 0.6 %. The increase/decrease in the demand for individual professions should not be even: it is likely that the number of employees in separate profession groups will be balanced in the light of the overall Lithuanian and EU policies pertaining to the initiatives aiming to reduce fossil fuel, digitalise the construction sector, expand of e-mobility, and develop circular economy and green procurement.

The forecast of the need for different groups of workers is grounded on the results of the survey of companies in the construction sector titled Study of the Demand for Competences in the Field of Sustainable Construction conducted within the framework of the project. The survey results were converted into a growth percentage using the following sequence and based on the following assumptions: the need for workers in individual speciality groups as indicated by the respondents was assessed; the ratio between this need and the current size of the sector was measured to determine the relative weight of a group of specialities; when the relative weight of a group of specialities is 2 % or less, it is assumed that the demand for this speciality will not grow; no change is predicted for the

professions of bricklayers and chimney builders/repairers and roofers: even though their relative weight according to the survey results was above 2 % (standing at 2.6 % and 2.8 %, respectively), any growth prospects are ruled out because the professions do not have a direct connection with climate control policy measures; the growth percentage was calculated in proportion to the expected total growth rate of the sector's workforce of 0.6 %.

The forecast of the demand for different specialist groups is also grounded on the results of the survey titled Study of the Demand for Competences in the Field of Sustainable Construction conducted within the framework of the project. The survey results were converted into a growth percentage using the following sequence and based on the following assumptions: the need for specialists in individual speciality groups as indicated by the respondents was assessed; the ratio between this need and the current size of the sector was measured to determine the relative weight of a group of specialists; when the relative weight of a group of specialists is 10 % or less, it is assumed that the demand for this speciality will not grow; due to the limited volume of the sector, no change is predicted for the groups of building managers and property managers, engineer geologists and healthy building inspectors: even though according to the survey the relative weight of these specialities was 35 %, 5 %, and 17 %, respectively, any growth prospects are ruled out because the professions do not have a direct connection with climate control policy measures; the growth percentage was calculated in proportion to the expected total growth rate of the sector's workforce of 0.6 %.

Table 7.2. Forecast of the demands for blue-collar labour in the construction sector

Profession		Number of employees in 2023	Relative annual growth forecast, %	Forecast number of employees in 2030
Workers („blue collar“)	Electrician / electromechanics + installer of solar cell systems, installer of automation and electronic systems, installer of wind turbines	6,257	+0.92	6,661
	Builders installers + installer of plastered facades, installer of ventilated facades, installer of glass facades, finisher, builder of buildings (using non-traditional materials), installer of waterproofing	5,449 (5,195+40+214)	+1.24	5,920
	Installer of prefabricated structures			
	Installer of window and (or) doors			
	Concrete worker			
	Plasterer	9,573 (5,007+3,028+1,221+317)	0	9,573
	Unskilled building construction workers			
	Tinsmith/roller			
	Water and sewage system plumber + pipeline insulator	3,375 (3,120+255)	+2.17	3,888
	Installer of HVAC systems / installer of refrigeration equipment + installer of solar collector systems, installer of heat pump systems, installer of biofuel systems			
	Welder	5,666 (2,990+2,676)	0	5,666
	Fitter			
	Bricklayer + chimney bricklayer/repairer	1,633	0	1,633
	Insulator of buildings/installer of thermal insulation/Insulator + partition sealer	1,414	+1.51	1,563
	Roofer	886	0	886
	Carpenter	2,769	0	2,769
Total:		37,022		38,560
Total forecasted growth according to CEDEFOP:			0,6	38,577

A positive relative development trend is predicted for groups of blue-collar specialities that are directly connected to the EU and Lithuanian policy; nonetheless, it should be noted that workers in these groups are also very likely to need to reskill: for instance, an installer of gas boilers may have to retrain to work as an installer of heat pumps; insulation technicians will need to do more renovation work; electricians are expected to carry out more installations of electrical energy generating and accumulating equipment in performing renovations/modernisations on buildings.

Table 7.3. Forecast of the demands for white-collar labour in the construction sector

	Profession	Number of employees in 2023	Relative annual growth forecast, %	Forecast number of employees in 2030
Engineers („white collar“)	Construction manager + construction project manager, construction project manager of special construction works, project expertise manager, building expertise manager	8,642 (5,351+3,291)	0	8,642
	Construction engineer + cost estimator, design engineer			
	Construction foremen	786	0	786
	Architect	1,606		
	Landscape researcher (architect)	(1,513+59+34)	0	1,606
	Interior architect			
	Manager + sales manager, purchasing manager	1,551 (1,502+45+4)	0	1,551
	Consultant			
	Logistics engineer			
	Technologist	757	0	757
	Engineer	1,566		
	Mechanical engineer	(687+526+353)	0	1,566
	Electrical engineer			
	BIM specialist	763	+7.67	1,173
	Modeler	(449+314)		
	Geodesy engineer	413	0	413
	Constructor + building structure researcher	403	+3.41	499
	HVAC engineer + building services systems researcher	359	+5.99	510
	Expert in building energy efficiency certification			
	BREEAM system building sustainability assessment experts	496 (320+16+135+25)	+2.92	598
Developers of apartment building modernization projects (investment plans)				
Environmental engineer (or specialist)				
Lawyer	229	0	229	
Asset exploitation engineer + asset management engineer	122	0	122	
Engineering geologist	159	0	159	
Hygienic research engineer (or specialist)	30	0	30	
	Total:	17,882		18,640
	Total forecasted growth according to CEDEFOP:		0,6	18,633

A positive relative workforce development trend is predicted for BIM specialists based on the initiatives to digitalise the construction sector, as well as the demand expectations by the participants on the construction market. No change is predicted for the largest group of building site inspectors and civil engineers; however, this group is expected to require a large number of additional competences in relation to the implementation of the BIM methodology. The demand for construction and HVAC specialists is not likely to go down, with the participants on the construction market identifying these specialities as relevant, and their practice will also have to integrate the BIM methodology, which is more time-intensive within the design cycle.

7.2. Forecast of the Demand for Competences and Skills

At this time, the portfolio of a person's competences in Lithuania is developed at a national level through the descriptions of professional standards, fields of studies, and qualifications development programs. Employees, acting on their own initiative, and employers also tend to develop employee competences informally, considering the competitive landscape of the market. The construction sector requires a lot of fundamental competences and knowledge, which places a heavier emphasis on acquiring them in the course of formal education and training, which takes longer to complete. Informal qualifications development often tends to be more dynamic and effective, when the available fundamental competences have to be adapted to the demands of the period. Documents that define the competences also need to be revised considering the overall national development strategy and policy guidelines, this in consultation with business. To determine the demands for competences and skills predicted by the participants in the Lithuanian construction sector, a **survey and interview** titled Study of the Demand for Competences in the Field of Sustainable Construction was undertaken in early 2023. The survey and interview form and a full report of the results are presented in Annex 4 and Annex 5 (available at Lithuanian version of the SQA).

7.2.1. The results of the survey titled Study of the Demand for Competences in the Field of Sustainable Construction

The employer survey on the subject of the demand for competences in the field of sustainable construction covered 123 respondents. 66 % of the respondents identified themselves, and 95 % of them provided their contact details.

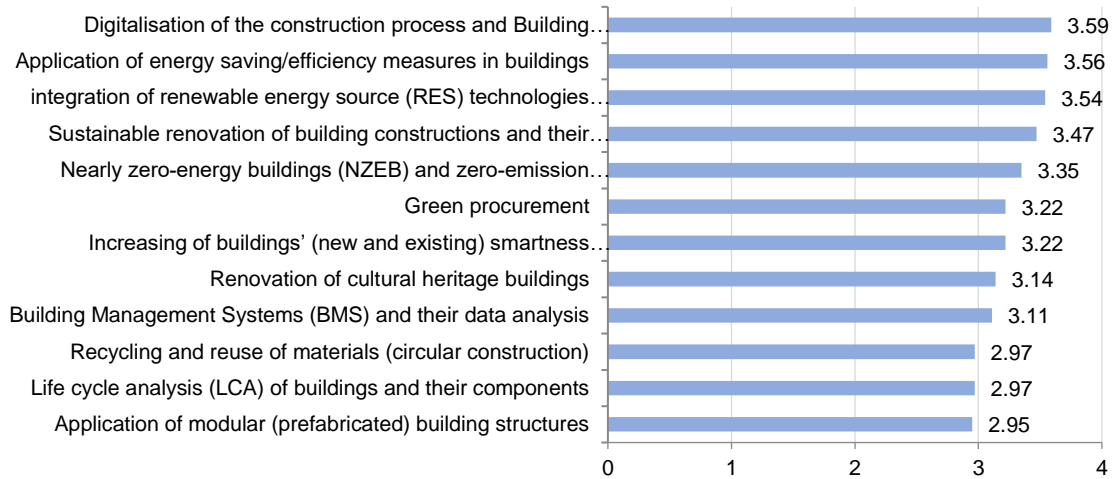
A staggering 42 % of the employers polled said their business was related to general construction, with supply/installation of engineering systems coming in second (30 %), and design of engineering systems and site technical supervision placing third with 21 % each. Most of the employers polled identified themselves as contractors (55 %), around one-third, as designers. A major part (70 %) of the companies surveyed were small and micro-companies.

As much as 41 % of the companies indicated women's share of their workforce was under 10 %, which is to an extent in line with the 2021 statistics of the Lithuanian construction sector (where the percentage of women in the construction sector was 12.8 %) ⁸³. The largest number of women was found in companies engaged in architectural business. A quarter or so of the companies polled were present in both **Lithuania and other EU states**, around 10 % were also active in third countries.

Some of the employers (around 46 %) organise/offer qualifications development course in the sphere of construction. A fifth of the respondents offer training to workers, 44 %, to skilled specialists. Then there are companies that provide training to both workers and specialists.

Considering the outlook of the next five years, the employers assessed the need for the competences of their employees in the fields of sustainable construction listed. On a scale of 1 to 5 (by relevance), **the biggest demand was reported for the digitalisation of the construction process and building information modelling (BIM), application of energy saving/efficiency measures in buildings, integration of renewable energy source (RES) technologies in buildings, sustainable renovation of building constructions and engineering systems (to achieve energy and environmental benefits), nearly zero-energy buildings (NZEB) and zero-emissions buildings (ZEB) construction.** For all practical purposes, the gaps between the individual areas are small and a demand is observable across the board.

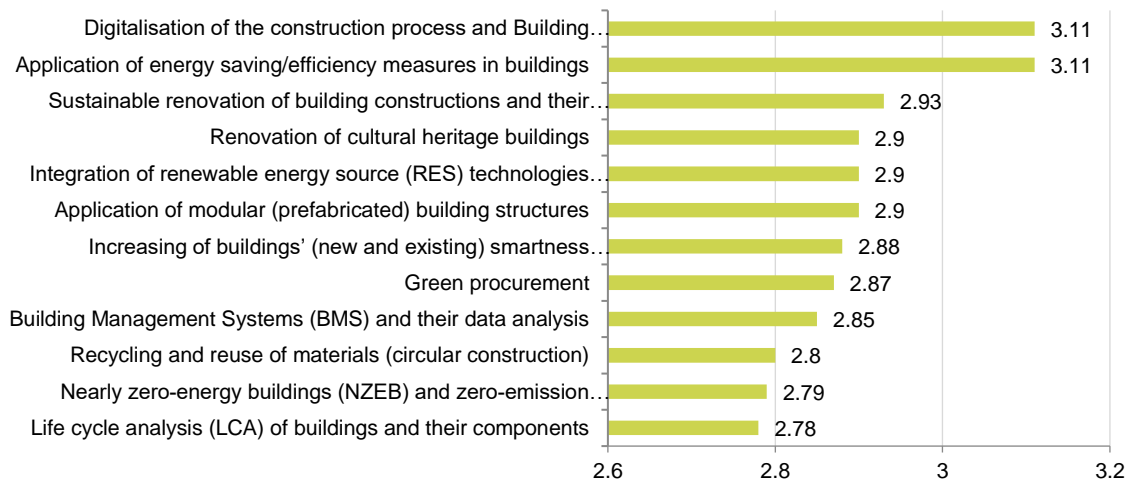
⁸³ Official Statistics Portal. 2023. Database of Indicators: [The average number of employees in the country's farm by gender and type of economic activity.](#)



The need for competences of employees of companies or institutions in the listed areas of sustainable construction in the next 5 years (average on a scale from very low (1) to very high (5))

Fig. 7.8. The need for employees' competences in the fields of sustainable construction

Considering the current **quality of programs** designed to develop competences (knowledge and skills), the employers gave their **best marks to the fields they themselves consider to be in greatest demand**, even though the average assessment of individual spheres of training did not vary by much.



Satisfaction of companies or institutions with the current quality of competence (knowledge and skills) improvement programs in the fields of sustainable construction (average on a scale from completely unsatisfactory (1) to very good (5))

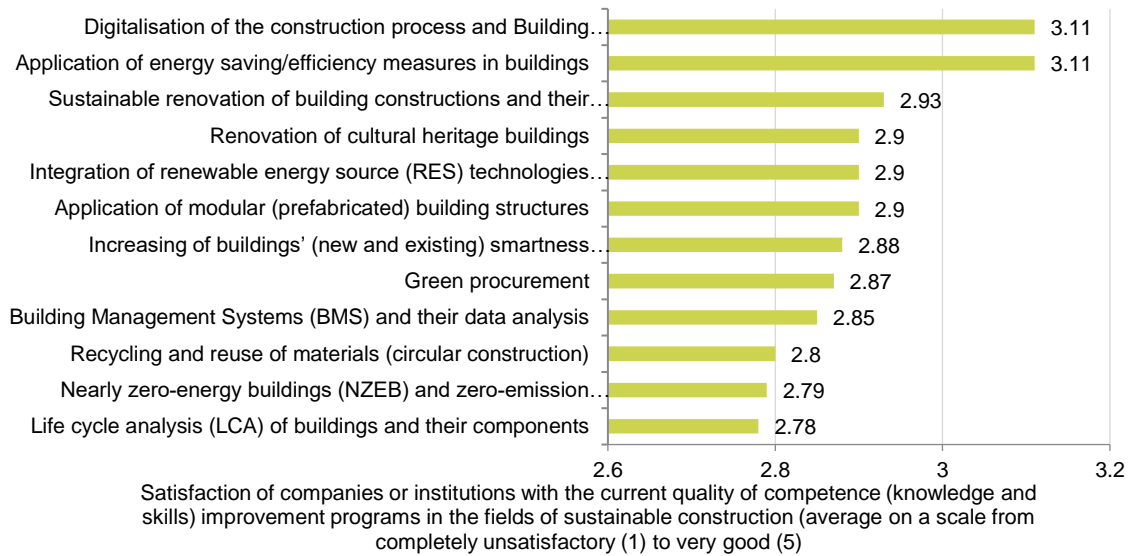


Fig. 7.9. Assessment of the quality of competences development programs in the fields sustainable construction

Considering other **blue-collar professions relevant to sustainable construction that will be in short supply** on the market over the next five years, at least 30 % of the employers said these would be: installers of automation and electronic systems (35 %), builders (that use innovative materials) (34 %), insulation technicians (33 %), installers of systems of solar elements (33 %), installers of heat pump systems (31 %), installers of heating, ventilation, and air conditioning systems (30 %).

The employers also voiced their position on the **white-collar professions with qualifications relevant to sustainable construction** that would be in short supply over the next five years. Analysis of the results of this survey is presented separately, considering the individual roles of the participants in the lifecycle of the building.

Furthermore, the employers indicated their intended methods of satisfying the need for workforce in the event the shortage of professions listed by them is realised. Most of the employers expect to find appropriately skilled employees on the market of the Republic of Lithuania (78 %) or to train their in-house staff (66 %). Only 18 % of the employers consider it possible to look for workforce on foreign markets.

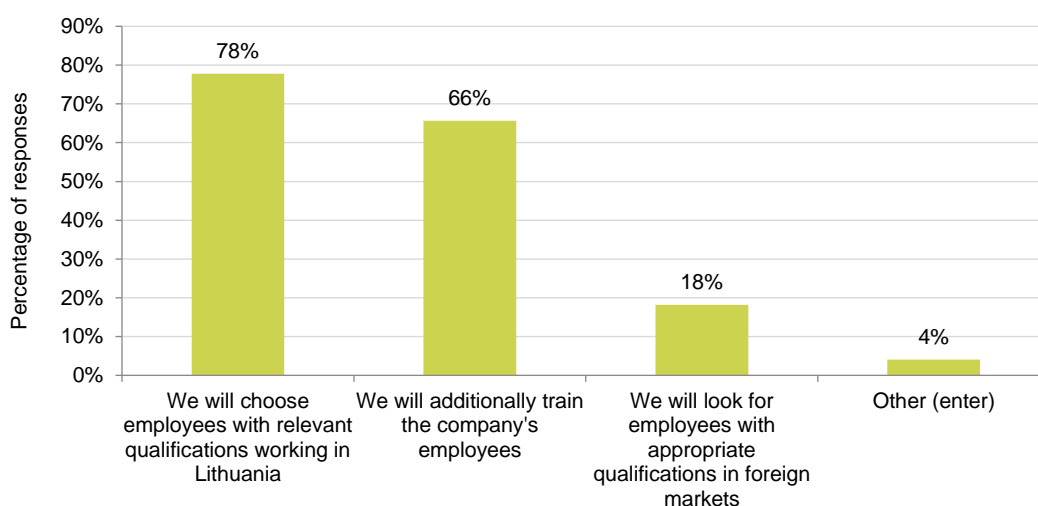


Fig. 7.10. Expected ways to satisfy the need for workforce in the fields of sustainable construction

When asked about the **measures that would best motivate employees to acquire the lacking competences** in relation to sustainable construction and give a choice of up to three measures, over 30 % of the employers pointed to the following key measures: support for specialist training/possibility

to use additional funding for training purposes (67 %); support for training of blue-collar professions/possibility to use additional funding for training purposes (43 %); extra opportunities to develop qualifications remotely (34 %); development of courses that are competitive and aligned with the market's needs (30 %).

To determine what, in the employers' opinion, would motivate **women to seek employment in the construction sector**, they were given 11 options and had to choose three. The following five answers were the most popular: equalising the pay of men and women (37 %); promoting a higher working culture among the staff (31 %); educating young people in women's possibilities to work in this sector (28 %); better working conditions for mothers with young children (27 %); more initiatives to raise the public's awareness (23 %).

The three key **measures that would stimulate young people's engagement in the sector of construction the most** in the opinion of the employers were: including engineering studies in the list of specialities of national priority with additional financial assistance provided to the students (65 %); promoting traineeship and internship in construction companies (38 %); showcasing state-of-the-art construction tools (such as drones, digital twins, BIM models, and so on) at shows and other events for the youth, handing out free invitations (36 %).

In the employers' opinion, the biggest need for an **additional assessment of employee competences** exists in three key areas of sustainable construction: digitalisation, use of BIM (34 %); deployment of measures to boost energy efficiency (24 %); increasing the smart-readiness, automation, and management effectiveness of buildings (24 %). However, nearly one-fifth of the respondents believe that no additional assessment of competences in the above areas of sustainable construction is necessary.

When asked about the **benefits that compulsory assessment of employee qualifications can provide**, the employers leaned towards the following three answers (with multiple choice options available): it ensures steady development of employee competences (60 %); it allows clients to choose competent market players (52 %); it ensure a higher quality of buildings (37 %). Still, 12 % of the employers said that compulsory assessment of employee qualifications does not provide any benefits.

The employers also had a say on the external factors that could have the biggest effect on the need to develop the competences of the people employed in Lithuania's construction sector. The rating of these factors showed that the following three factors would be the most impactful: an energy crisis, resulting in an inflation and deficit of energy resources; digitalisation and automation (cloud computing, digital twins of buildings, BIM, and so on); the tightening of requirements for building energy performance.

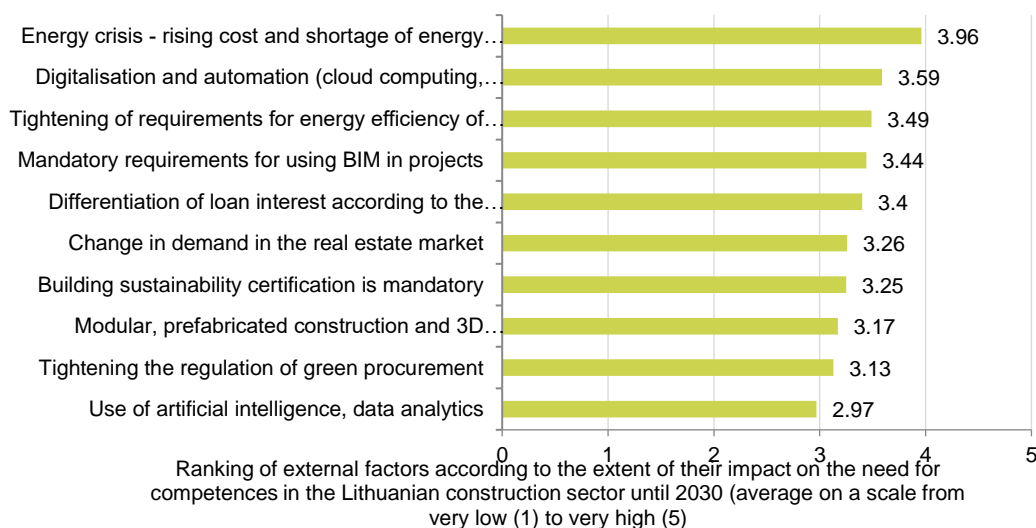


Fig. 7.11. The rating of the impact of different factors on the need for competences in the Lithuanian construction sector until 2030

A summary of the results and the main takeaways from the survey:

- Considering the **demand for employee competences** over the next five years, the employers specified a rather comparable degree of relevance (59 % to 72 %) across all fields of sustainable

construction. In their assessment of the quality of the current competences development programs, the employers gave the best marks to the areas they find the most in demand, even though the **average assessment of the quality of training** in individual fields did not vary by much (between 56 % and 62 %).

- The **deficit of blue-collar professions** over the next five years was mainly linked with installers of automation and electronic systems, builders (that use innovative materials), insulation technicians, installers of systems of solar elements, installers of heat pump systems, installers of heating, ventilation, and air conditioning systems.
- In thinking of ways to satisfy their own needs for workforce, most employers expect to find employees of necessary qualification on the domestic market (78 %), and a massive 66 % are prepared to provide training to the in-house staff, which **points to the high demand of qualifications development courses**. Only 18 % of the employers foresee a possibility to look for employees on foreign markets.
- In the opinion of the employers, things that would motivate women to seek employment in the construction sector the most would be equalising the pay of men and women; promoting a higher working culture among the staff (31 %); educating young people in women's possibilities to work in this sector (28 %); better working conditions for mothers with young children (27 %); more initiatives to raise the public's awareness (23 %).
- Most of the companies (95 %) **invest into developing the competences of their employees**, but nearly 60 % only make allocations in the amount of under 3% of the salary for that purpose.
- More than one-half of the employers do not provide qualifications development services, yet the rest of the companies **offer training** to workers (20 %), specialists (44 %), or both.
- In the opinion of the employers, **the most effective measures to motive employees to acquire the lacking competences** are financial support for employee training, remote courses, and development of courses to cater to the market's needs.
- Speaking about the need to enforce **additional assessment of employee competences**, the employers underscored the areas of digitalisation, BIM application, implementation of measures to improve energy efficiency, boosting smart-readiness, automation, and management effectiveness of buildings. Only a fraction (12 %) of the employers said that compulsory assessment of competences would offer no benefits.

7.2.2. The results of the interview titled Study of the Demand for Competences in the Field of Sustainable Construction

The research of the market needs also consisted of **interviews** with selected representatives of the companies polled in the employer survey. The purpose of the interview was to gain more details about the relevance of the subject and to make the answers provided in the survey more specific. Another aim was to summarise the stance on the need for training, identify problems, collect suggestions and recommendations, identify opportunities and obstacles.

The discussions that took place during the interviews revolved around the knowledge and skills of the current and new employees who have just graduated school or university relevant to the areas covered by the project (BIM, energy efficiency, green procurement, and so on), selection of the method of training; furthermore, the interviewees were asked about what the company management thought of the knowledge and skills of the existing workers and specialists. The interviewees were also asked about the impact changes in the market had on developing competences in the field of sustainable construction.

The **interviewees** were 15 from the construction sector (the list of interviewees is presented in Table 7.4). The interviews featured representatives of the companies covered by the general survey, who said they organised their own courses or sent their staff members to train externally (out of the 123 respondents, 56 specified they offered their own training courses). The selection process also considered the roles and was aimed to ensure that the interviews would include companies representing different roles.

Table 7.4. List of interviewees

Nr.	Company	Company representative	Date of interview
1	Kondena, JSC	Director	31/3/2023
2	Grinda, JSC	Head of the Innovation and Project Development Department	4/4/2023
3	Grinda, JSC	Head of the Department of Surface Sewage Networks	4/4/2023
4	Gilius ir Ko, JSC	Vilnius branch office manager	5/4/2023
5	VTS Vilnius, JSC	An authorized person representing the company	5/4/2023
6	NIT, JSC	Head of the company	5/4/2023
7	Pastatų sertifikavimo centras, JSC	Head of the company	7/4/2023
8	Elmitra, JSC	Project manager	7/4/2023
9	YIT Lietuva, JSC	BIM manager	12/4/2023
10	Siemens Osakeyhtio Lithuanian office	Baltic team leader	12/4/2023
11	INHUS Engineering, JSC	Head of the company	12/4/2023
12	Žilinskis ir Co, JSC	Personnel manager	12/4/2023
13	Eikos statyba, JSC	Head of the company	18/4/2023
14	VA statyba, JSC	Head of the company	18/4/2023
15	Naresta, JSC	Executive director	26/4/2023

Trainings for in-house employees

The survey conducted within the framework of the project revealed that 66 % of the respondents would train their in-house staff. The interviewees claimed that the companies they were representing provided training to their own staff. Specialists are trained in the specifics of the company's internal processes as well as general matters, for instance, if they lack knowledge to work with MS Office applications. There is also an option of specialist courses delivered by a specialist to train the relevant employee in a particular area, which is automation as often as not.

Employees often undergo training at their company by way of apprenticeship, where a new employee is given on-job training by a more experienced colleague. New employees, just off the market, often are also trained by veteran specialists who once attended training themselves and impart knowledge on new employees on the job.

Launching a new product, software package, or key changes in the products (hardware, systems and so on) used by the company call for on-job training as well. This type of training aims to teach the staff hands-on application of the product or software package. As often as not, specialists with more experience teach their colleagues by way of mentorship. On-job training is a convenient option as it allows conveying information in a concentrated manner and over a brief period of time. Some organisations sometimes invite guest lecturers to deliver on-job training, and lecturers from abroad to introduce brand-new products.

Trainings for the market

Representatives of several of the companies interviewed said they organised trainings for the market themselves. Such trainings are usually arranged by way of the company's own installers introducing some system that the company offers, as well as the technology for the installation thereof. The trainings are often organised in partnership with training and education centres, or remotely in the shape of webinars.

Participations in trainings by other organisations

The companies polled also take part in trainings delivered by other organisations in the areas of new construction materials, new building insulation systems, new regulation, occupational safety, and BIM. Specialists who require certification are referred by companies to courses organised for that purpose on the market. The interviewees accentuated the aspect of competences of the lecturers delivering the trainings. It is vital that lecturers apply the subject matter in practice (especially when it comes to BIM). When discussing digital skills and the possibilities to improve them through training courses available

on the market, emphasis was placed on the fact that participants in a construction project possess different levels of BIM knowledge and, as a result, BIM courses should be split to cater to designers, construction site specialists, property managers (building operators), and building maintenance specialists.

Even though the respondents rated the quality of competences development programs as 'average', the interviewees were very positive in their assessment of every training initiative. Trainings could be more structured and aligned with the legal base. For instance, courses in LCA, CO₂, and circular economy would be very relevant. Trainings are indeed being delivered in this field, but they are misaligned with the legislation: there is a directive, but it has to be supported by national documents, which are yet to be drafted; as a result, these topics are covered by training in a fragmented manner, and companies have not yet started to draft their EPD declarations.

Deficit of white- and blue-collar professions

The interviewees diverged in their opinions on the deficit of specialists. The interviewees said that there is enough designer engineers on the market, but there is a deficit of specialists who could supervise the construction site (site inspectors), as well as a deficit of young specialists, with most specialists aged over 50. Some interviewees said that specialists do not have enough competences and motivation to work. The overall sentiment on that market is that of despair, with the salaries of specialists and engineers falling short of the expectations.

The interviewees accentuated the shortage of skilled workers (bricklayers, roofers, carpenters, concrete workers, modular construction installers, HVAC systems installers). This deficit is currently being offset by migrant workers, at least to an extent. Yet migrants are prevented from complete integration in the market by the language barrier.

Deficit of competences and skills

The interview revealed that specialists lack knowledge of civil engineering, knowledge of the legal regulation of construction, knowledge of new materials and systems, general engineering skills (such as the skill to read blueprints), skills to operate specific equipment, and the ability to apply their knowledge in practice. The interviewees emphasised that the lifting of certification for design companies had brought no good, resulting in a sharp decline of the quality of designs.

It was noted that there is a deficit of specialists with interdisciplinary knowledge. Companies need specialists who would be able to juggle between civil engineering knowledge and IT expertise. There is a need for specialists with knowledge of civil and building engineering systems (+AEI). There is a demand for procurement managers who would be able to apply BIM models. Not enough software engineers have adequate knowledge of HVAC systems. There is a shortage of specialists who would have knowledge of civil engineering and the ability to assess the sustainability of solutions. Procurement specialists, site inspectors, and foremen lack digital skills and knowledge to be able to read BIM models.

7.2.3. Demand for additional competences

To achieve the EU and Lithuanian policy targets, the market should be injected with additional competences as soon as possible. Considering that only 4.0% new participants enter the market every year, the focus should be placed on the areas of reskilling and qualifications development. Many of the latest competences may be acquired through a cross-over of the available fundamental knowledge skills, adding to them knowledge of the latest technical–engineering solutions.

The main areas of competences that reflect the general policy guidelines and the opinions of the market participants are as follows:

- Digitalisation of the construction process and Building Information Modelling (BIM);
- Application of measures to achieve energy efficiency in buildings;
- Integration of renewable energy source (RES) technologies into building;
- Sustainable renovation of building constructions and their engineering systems (to achieve energy and environmental benefits);
- Nearly-zero energy buildings (NZEB) and zero-emissions buildings (ZEB).

Forecasts of the quantitative demand for additional competences is based on the following assumptions:

- The number of the existing workforce is reduced by 4.0 % × 5, considering that these are new graduates entering the labour market who have the latest professional competences and will not require any qualifications development for the next five years;

- The portion of workers and specialist to develop their qualifications is measured on the basis of the proportion of constructions specialists undergoing certification, with nearly 2,300 individuals obtaining/renewing their certificates every year, and SODRA's data indicating this sector to consist of some 18,000 individuals, which means that 13 % of construction specialists undergo routine qualifications development – by the same margin, a comparable proportion applies to the blue-collar sector as well. When it comes to making a qualifications development action plan, it is important to consider both the demand for additional qualifications and the age of the target group: pursuant to the Education Development Program⁸⁴, efforts are made to increase the rate at which persons aged 55–74 undertaking qualifications development (by boosting the indicator of persons who have undergone training over the past four weeks from the current 3.3 % to 8 %).

For instance: $6\,661 - 4.0\% \times 5 = 5,329$; $13\% \text{ of } 5,329 = 693$ who should development their qualifications ever year, evenly distributing this figure by relevant fields of competences depending on the specifics of professional practice. Once the overall need for qualifications development is estimated for all professions, distribution by different LQF levels is done on the basis of the proportion of persons who graduated vocational or higher schools of that field (such as general construction, engineering systems, or renewable energy sources) in 2022 by LQF level (based on the data from Section 5 *Existing Situation in the Field of Education and Training in the Construction Sector*).

The expected quantitative demand for additional competences is shown in Table 7.5 and 7.6.

⁸⁴ Resolution of the Government of the Republic of Lithuania. 2021. [2021–2030 Education Development Program](#).

Table 7.5. The expected demand for additional white-collar competences

Profession	Forecast number of employees in 2030/ the number of people raising their qualifications every year	Competences in the field of sustainable construction											
		Digitalization of the construction process and Building Information Modelling (BIM)	Application of energy saving/efficiency measures in buildings	Integration of renewable energy technologies (RES) into buildings	Sustainable renovation of building constructions and their engineering systems	Nearly Zero-Energy Buildings (NZEB) and Zero Emission Buildings (ZEB) construction	Increasing of buildings' (new and existing) smartness (automation)	Green procurement	Renovation of cultural heritage buildings	Building Management Systems (BMS) and their data analysis	Life Cycle Analysis (LCA) of a building and its components	Recycling and re-use of materials (circular construction)	Application of modular (prefabricated) building structures
Electrician/electromechanic + installer of solar cell systems, installer of automation and electronic systems, installer of wind turbines	6,661/693	-	173	173	-	-	173	-	-	173	-	-	-
Builders-installers + installer of plastered facades, installer of ventilated facades, installer of glass facades, finisher, builder of buildings (using non-traditional materials), installer of waterproofing	5,920/651	93	93	-	93	93	-	-	93	-	-	93	93
Installer of prefabricated structures	9,573/996	-	-	-	249	249	-	-	249	-	-	249	-
Installer of windows and/or doors													
Concrete worker													
Plasterer	3,888/443	74	74	74	-	74	74	-	-	74	-	-	-
Unskilled building construction workers													
Tinsmith/roller													
Water and sewage system plumber + pipeline insulator	5,666/589	196	-	-	-	-	-	-	-	-	-	196	196
Welder													
Fitter	1,633/170	57	-	-	-	-	-	-	-	-	-	57	57
Bricklayer + chimney bricklayer/repairer													
Insulator of buildings/installer of thermal insulation/Insulator + partition sealer	1,563/174	-	35	-	35	35	-	-	35	-	-	35	-
Roofer	886/92	31	-	-	-	-	-	-	-	-	-	31	31
Carpenter	2,769/288	48	-	-	48	48	-	-	48	-	-	48	48
Total:		499	202	74	425	499	74	0	425	74	0	709	425
Including 2 LQF level:		122	0	0	104	122	0	0	104	0	0	174	104
Including 3 LQF level:		137	131	0	117	137	48	0	117	48	0	194	117
Including 4 LQF level:		240	71	74	204	240	26	0	204	26	0	341	204

Table 7.6. The expected demand for additional blue-collar competences

Profession	Forecast number of employees in 2030/ the number of people raising their qualifications every year	Competences in the field of sustainable construction												
		Digitalization of the construction process and Building Information Modelling (BIM)	Application of energy saving/efficiency measures in buildings	Integration of renewable energy technologies (RES) into buildings	Sustainable renovation of building constructions and their engineering systems	Nearly Zero-Energy Buildings (NZEB) and Zero Emission Buildings (ZEB) construction	Increasing of buildings' (new and existing) smartness (automation)	Green procurement	Renovation of cultural heritage buildings	Building Management Systems (BMS) and their data analysis	Life Cycle Analysis (LCA) of a building and its components	Recycling and re-use of materials (circular construction)	Application of modular (prefabricated) building structures	
Construction manager + construction project manager, construction project manager of special construction works, project expertise manager, building expertise manager	8,642/899	82	82	82	82	82	82	82	-	82	82	82	82	82
Construction engineer + cost estimator, design engineer														
Construction foremen	786/82	9	9	9	9	9	9	9	-	9	-	-	9	9
Architect														
Landscape researcher (architect)	1,606/167	19	19	-	19	19	19	19	19	19	-	19	-	19
Interior architect														
Manager + sales manager, purchasing manager	1,551/161	-	23	23	23	23	23	23	23	-	-	-	-	23
Consultant														
Logistics engineer														
Technologist	757/79	10	10	10	10	10	10	-	-	10	-	-	10	10
Engineer														
Mechanical engineer	1,566/163	18	18	18	18	18	18	18	-	18	-	-	18	18
Electrical engineer														
BIM specialist	1,173/122	31	-	-	-	-	-	31	-	-	31	31	-	-
Modeler														
Geodesy engineer	413/43	43	-	-	-	-	-	-	-	-	-	-	-	-
Constructor + building structure researcher	499/52	7	7	-	7	7	7	-	-	7	-	-	7	7
HVAC engineer + building services systems researcher	510/53	8	8	8	8	8	8	8	-	-	8	-	-	-
Expert in building energy efficiency certification														
BREEAM system building sustainability assessment experts	598/62	6	6	6	6	6	6	6	6	6	-	6	6	-
Developers of apartment building modernization projects (investment plans)														
Environmental engineer (or specialist)														
Lawyer	229/24	-	-	-	-	-	-	-	24	-	-	-	-	-
Asset exploitation engineer + Asset management engineer	122/13	2	2	2	2	2	2	2	-	2	2	-	-	-
Engineering geologist	159/17	-	-	-	-	-	-	-	-	-	-	-	17	-
Hygienic research engineer (or specialist)	30/3	-	2	-	-	-	-	-	-	-	2	-	-	-
Total:		235	186	158	184	184	198	72	153	125	138	149	168	
Including 6 LQF level:		165	107	0	129	129	114	51	107	72	97	105	118	
Including 7 LQF level:		70	79	158	55	55	84	21	46	53	41	44	50	

7.3. Forecast of the needed volumes of training and qualifications development

This section addresses the number of hours required to attain individual competences. The reference volume of training per each of the 12 competence areas relevant to the field of sustainable construction should be 20 academic hours or more. Comparable volumes of qualifications development are currently available to many specialists in the field of construction (to be undertaken once in every five years); furthermore, the average length of one course available from a higher school, company, association among other things engaging in educational activities is currently also 20 academic hours. Trainings should differ depending on the level of employee qualifications (even in the same field), considering the specifics of work, the need to provide context, the most effective form of teaching/learning, yet the general belief is that the total length of training can be the same. When it comes to qualifications development, a special emphasis should be placed on tailoring the content of the training to the appropriate level of qualification. The current training and education market has a lot of courses in construction digitalisation and sustainability to offer, which suggests that the content of the training could be crystallised to reflect the specific demands of the market when necessary.

Considering the assumptions made in the previous section and the resultant volumes of employees to be trained, **the total annual number of hours of qualifications development is: 5,356 persons × 20 academic hours = 107,120 academic hours, including:**

- 14,600 academic hours for LQF level two employees;
- 20,920 academic hours for level three employees;
- 32,600 (-6,250) academic hours for level four employees;
- No number of hours has been determined for level five employees for lack of statistics, yet this group is expected to likely get around 20 % of the volume estimated for level four employees, which is 6,250 academic hours;
- 23,880 academic hours for level six employees; and
- 15,120 academic hours for level seven employees.

During the reporting period of 2019–2021, no persons achieved LQF level five in Lithuania; as a result, persons with this kind of qualifications were excluded from the forecast of the volumes of qualifications development for lack of objective information. Some of LQF level six and seven employees can have the content of new competences integrated into the existing compulsory qualifications development courses that one has to complete to have their certification renewed, while the rest of the participants in the labour market should be incentivised to develop their qualifications to be more competitive on the labour market.

It should also be noted that the current professional standards and descriptions of fields of study should narrow down the competences relevant to sustainable construction by providing clearer definitions of the attainable outcomes of learning or studies.

When it comes to planning qualifications development guidelines, in-person teaching should be combined with distance learning as a lot of participants in the construction market have done distance learning owing to the restrictions due to the COVID-19 pandemic and accept this method as an effective and convenient option both time- and cost-wise. Still, in-person teaching should not be abandoned altogether, for it offers a higher degree of engagement in the teaching process and provides learners with a possibility to share their good experience better.

There are 34 vocational schools offering level 2–4 (5) qualifications in the field of construction in Lithuania, with 10 higher schools offering level (5) 6–7 qualifications. On top of that, delivery of certain competences that are right now mainly taught in the private sector should be planned by tapping into the potential of the private sector. On the other hand, the potential of schools can be rather more indicative of the potential of a school's infrastructure than of the degree of readiness of its lecturers. This insight was made from the Survey of Training and Education Service Providers conducted for the purposes of this report, which showed that when it comes to the certification of qualifications development, providers of courses for manufacturers/supplier of materials and equipment consider training in the areas of integration of renewable energy source technologies into buildings, the recycling and reusing of materials (circular construction), sustainable renovation of building constructions and their engineering systems (to achieve energy and environmental benefits), building management systems and analysis of their data, and nearly zero-energy buildings (NZEB) and zero-emissions buildings (ZEB) construction to enjoy the greatest demand but are currently unable to provide it for lack

of lecturers. The planning of the volumes of qualifications development should additionally consider the possibilities of lecturers/teachers to teach the competences of a particular volume and field and, if necessary, plan for developing the competences of the lecturers first and foremost.

7.4. Forecast of the need for monitoring measures

The status quo analysis made use of open-access databases that contain data pertaining to the various information about the education, professions, and occupations of persons. It was noted that the main axis of database data is not a person or their education, competences, occupation, and so on, but rather the aggregate number of persons in a particular profession, occupation, and so on, which makes it impossible to measure the real profile of the participants in the construction markets with any convenience, if at all. The absence of a single qualifications-competences-occupation database focusing on the person complicates the possibility to exercise routine monitoring, which would allow quickly responding to the changing market needs and assessing the extent of the necessary investments into human capital. The STATREG initiative currently under development by the Lithuanian Builders' Association and its partners mirrors the concept of a database focused on the person, yet the STATREG system is still not massive enough and lacks nation-wide recognition. With a single national system focusing on the person in place, its access should be open to the Employment Service, the Ministry of the Environment, the Ministry of Education, Science, and Sports, Statistics Lithuania, and other governmental bodies that are currently involved, either directly or indirectly, in shaping Lithuania's policies on the construction sector.

8. Barriers for the Growth of Competences to Achieve the 2030 Targets

The biggest barriers in trying to achieve the development targets for the sector of sustainable construction have to do with the situation of continuous learning in Lithuania and the breakdown of the participants in the construction sector by age group. The model of personal learning accounts is still under development and is expected to increase the demand for lifelong learning amidst the adults. This matter is covered at length in Section 3.2 *The national policies and strategies on continuous teaching/learning*. Moreover, the number of persons attending vocational education and training courses in the construction sector⁸⁵ stands at 17.8 % (18.1 % men and 15.7 % women), which is below the national average of 26.4 %.

As most of the participants in the construction market predict a demand for BIM specialists, it is important to appraise the receptivity of the labour market to the use of specific software. This trait is key both for the competences of building information modelling (BIM) and for those of building and parts of building lifecycle analysis (LCA) and the area of digitalisation of the construction process. Considering the 2021 European Union statistics in this field, it is notable that the number of construction and energy employees who have specialist software competences is rather low. According to the CEDEFOP data, just 6 % of construction employees and 2 % of energy employees say they are able to use specialist software, while in the fields of comparable specifics (such as manufacture, transportation, and warehousing) this ratio stands at 14–15 %, respectively. Based on the European Union statistics, the gap between male and female competences in the field of specialist software literacy is not that big: across all fields, 12 % of women and 14 % of men know how to use specialist software. Considering the overall situation on the Lithuanian labour market, only 9 % employees are competent users of specialist software.

The expansion of digital competences at small companies with narrow profit margins is impeded by the high costs of computer hardware.

The progress in developing competences is impeded by the public procurement system that is grounded on the lowest bid and, as such, focuses on the price rather than the quality.

Another barrier in the path of qualifications development is the anticipated breakdown of employees by age group: according to the general data from CEDEFOP, Lithuania expects the size of its workforce aged 65+ to grow rapidly (+6.0 % compared to the overall labour market shrinking by 0.9 %) – it is this age group that may require most of the investments of money and time to acquire the relevant competences as the persons within this group took their formal education before anyone else.

⁸⁵ Official Statistics Portal. 2023. [Database of Indicators](#).

The construction sector is still to reach the average EU productivity indicators, and the competitive landscape and employee deficit could become additional obstacles for the companies to send their employees to train.

Engineering studies have been increasingly less popular in Lithuania, which means that the number of persons who are entering the labour market bearing new and relevant competences is also on the decline. The survey of the participants in the construction sector showed that efforts have to be made to promote civil engineering studies by showcasing state-of-the-art construction tools (such as drones, digital twins, BIM models, and so on) at shows and other events for the youth and by including engineering studies on the list of specialities of national priority and granting additional financial assistance to the students.

The market survey results have shown that recruiting foreigners seems to be a far less preferred option (18.18 %) compared to other options to cover the demand of the employees. During interviews interviewees highlighted the shortage of highly skilled workers. This deficit is currently being offset by migrant workers, at least to an extent. Yet migrants are prevented from complete integration in the market by the language barrier. Therefore, this barrier is related to highly skilled workers (blue collars) and is caused by language issues.

At the same time, the previous survey of employees⁸⁶ conducted in 2022 showed that reasons for barriers to learning in formal or non-formal education are related mainly by lack of need to learn (78 %). Also from the employee's stand-point, a barrier why they do not pursue training are the high workload on the job (8.4%), the high cost of the training (5.7%), or the lack of support from the employer (1.6%).

Another barrier preventing the monitoring of the progress in developing competences is the absence of a unified database that would allow appraising the development of competences and taking correcting action to achieve the targets in real time.

9. Conclusions

The overall trends in the construction sector

The construction sector is a vital part of Lithuania's economy, amounting to EUR 4.7 billion and accounting for **7.03 % of the national GDP** in 2022. This includes 21.7 % of residential buildings, 37.4 %, non-residential buildings, and 40.9 % of engineering structures. Compared to 2021, the volumes of construction in 2022 grew rapidly, driven by the inflation of raw material, energy prices, and wages. The Lithuanian construction sector has a tendency for its companies to become smaller, with the number of construction companies increasing by more than 50 % since 2015. The company growth was affected by the **trends of company downsizing**, the development of new construction and energy industries (such as renewable energy sources and so on), new technologies, the increase in productivity, and the various initiatives and incentives to promote the growth of small- and medium-sized business.

The number of people employed in the Lithuanian construction sector has a general tendency to grow and stood at 104,940 (7.22 % of the total workforce) in 2022, up by 3.2 % from 2021. The total number of identified employees involved with building construction and maintenance is 54,904. On top of that, the number of women working in the construction sector is growing as well and amounted to 16.8 % in 2021. The productivity of the sector is still low and amounts to 69 % of the EU average. Nonetheless, the productivity had been growing rapidly, going up by 60 % between 2013 and 2020. This points to an **untapped potential to raise the productivity levels**.

More than one-half of the people working in construction are skilled workers and craftsmen, even though their share has been diminishing for the past few years, with the **employers experiencing a deficit of skilled labour**. There is no shortage of unskilled workers on the market. **40 % of the people working in Lithuania's construction sector will retire by 2030**, besides, there is a threat of specialist deficit for educational establishments are churning out too few skilled specialists.

The Lithuanian construction sector is still among those **plagued by illegal labour the most**. Public procurement is still part of a very large portion of the Lithuanian construction sector, with the share of procurement in the construction sector accounting for 3.8 % of the national GDP in 2021. The **product of the flawed process of public procurement** based on the lowest-bid principle is an

⁸⁶ Official Statistics Portal. 2023. Database of Indicators: [Reasons for barriers to learning in formal or non-formal education](#).

unsustainable infrastructure and national design and **construction companies** that lack motivation to innovate and **ability to invest into new technology and specialist trainings due to their narrow profit margins**.

Lithuania is moving rapidly towards digitalising its construction sector, with resolutions to promote digitalisation (through regulation) adopted at a government level; plus, a lot of things are done at the initiative of non-governmental organisation, even though additional investments are required to help employees retrain, something that the government has no plans for.

Lithuania's **circularity index (CI) is still low**, and the level of processing and reusing construction and demolition waste in Lithuania stands at 79.5 %, while other countries report a ratio of over 90 %. One of the underlying reasons here is the lack of knowledge and motivation.

Main trends in the sector of buildings and energy

By floor space area, the buildings pool in Lithuania is dominated by residential and non-residential properties. There are 41,632 apartment buildings registered in Lithuania at this time, most of them most of them built to the technical norms of construction that had been in effect until 1993. **Residential buildings with the energy efficiency class D and lower consume nearly one-half (47 %) of the entire primary energy in the buildings pool.**

The construction volumes for buildings have a general tendency to grow: this growth was particularly pronounced in 2019–2021 and compared to the recession of 2017, the number of new buildings under constructions had even doubled. New buildings need to satisfy the requirements prescribed for nearly zero-energy buildings. In Lithuania, nearly zero-energy buildings are those that have the energy performance class of A++. At this time, 82 % of certified class A++ buildings are residential buildings of one or two flats. The main source of heating in the certified class A++ buildings is the **heat pump**, which generates heat from air (80.6 %).

In 2021, 25.5 % of Lithuania's primary energy was produced from RES. **RES accounted for 25 % of the total end-use of energy in the buildings sector.** In fact, the RES share of the balance of energy consumption in buildings is much larger, as the levels of heat energy consumption in buildings (31 %) represent the volume of heat supplied centrally and consumed in buildings. Lithuania's central heating supply (CHS) sector produces a lot of heat from RES. **In 2021, a staggering 67.3 % of heat supplied centrally had been generated from RES.** Nearly this entire volume of renewable energy was produced by burning solid biofuel (wood and its waste products). **The number of consumers who produce their own energy is growing rapidly** in Lithuania as well.

National policies and strategies to contribute to the 2030 targets

The national policy measures planned for the energy and RES sectors include nearly EUR 10 billion worth of investments in 2021–2030 and will require additional competences in the areas of energy efficiency, renovation, construction of NZEB, and application of RES.

The initiatives earmarked for the sphere continuous teaching/learning are focused on developing a model of personal learning accounts, which will promote the demand for lifelong learning activities amidst the adults.

A construction sector digital development project (BIM-LT) is currently underway and aims to design measures to improve the effectiveness of building planning, design, construction, operation, and maintenance in the public sector through the application of building information modelling (BIM) methodology, and to formulate the compulsory terms and conditions for its application, which will put a huge pressure on the demand for construction specialists who are able to apply this kind of methodology.

All in all, the field of smart buildings is still at the bottom of the agenda of Lithuania's policymakers; on the other hand, the expansion of e-mobility measures is higher on the list and is expected to receive some EUR 86 million of investments.

The application of circular economy principles in the construction sector will lead to a higher demand for specialists who are able to appraise the entire lifecycle of buildings and the impact of the entire construction value chain, which has to do with the relevant competences of lifecycle analysis and recycling and reuse of materials.

The situation of training and education in the field of construction

There are **34 vocational schools and 10 higher schools** pursuing the educational goals in relation to the field of construction in Lithuania. **A total of 1,132 LQF level 2–4 specialists and 759 LQF level 6–7 specialists were trained in 2022.**

There is no routine monitoring of the assessment of informal education and qualifications development on a national scale, owing to the absence of a unified and in-depth information system.

The professional standards and descriptions of fields of study forming the backbone of the curricula that currently are in the pipeline lack any specific descriptions of competences pertaining to sustainable construction.

Projects for the development of competences in the construction sector

Even though a total of 15 projects funded under various programs and aiming to promote the development of competences in areas relevant to sustainable construction have been identified in Lithuania, with the requirements growing tighter, the volumes of these projects and the related training efforts are clearly unable to cover the existing gap in competences.

The gap in competences and skills

With blue-collar professions, the demand and growth predictions for 2030 point to workers skilled in the installation of renewable energy sources, engineering systems, insulation and sealing on buildings, as well as general construction workers.

With white-collar specialists, the demand predictions for 2030 point to construction specialists skilled in the application of BIM methodology, assessment of building sustainability, design of engineering systems and building constructions.

The forecast is that for the Lithuanian market to achieve the 2020 targets for sustainable development in the construction sector, **around 107,000 academic hours** should be earmarked for the development of employee competences for all LQF levels **every year**.

The absence of a single qualifications-competences-occupation database focusing on the person complicates the possibility to exercise routine monitoring, which would allow quickly responding to the changing market needs and assessing the extent of the necessary investments into human capital.

Barriers

The potential barriers to achieving the 2030 targets are the sector's relatively low digital literacy and poor lifelong learning indicators. The analysis of national legislation and strategies has shown that there is a lack of systematic incentives for adults to develop general and vocational competences in Lithuania, as the adult lifelong learning system is ineffective and fragmented, lacks financial incentives to participate in competence development activities and does not ensure a diversity of institutions providing services (higher education institutions are excluded).

It is also noted that the above-mentioned reasons prevent the identification of priority areas for competence development, as the lack of easily accessible information on the competences of the sector's workforce does not allow real-time monitoring of the development of competences and the adjustment of actions related to competence development.

Another obstacle to the integration of sustainable construction principles into the market is the declining popularity of engineering studies and the preference of construction market players to recruit ready-made workers rather than to invest in the development of competences of existing workers.

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