



**SECTORAL STRATEGIC  
APPROACH TO COOPERATE  
ON SKILLS IN THE  
CONSTRUCTION INDUSTRY  
WP2  
STATUS QUO AND SECTORAL  
SKILLS STRATEGY**  
Complementary  
Status Quo



Co-funded by the  
Erasmus+ Programme  
of the European Union



**All.Construction**

# **Skills Blueprint for the Construction Industry**

Duration:

**01/01/2019-31/12/2022**

Project Number:

**600885-EPP-1-2018-1-ES-EPPKA2-SSA-B**



Co-funded by the  
Erasmus+ Programme  
of the European Union

## ERASMUS+ Programme

### Key Action 2 | Call 2018

COOPERATION FOR INNOVATION AND THE EXCHANGE OF GOOD PRACTICES  
SECTOR SKILLS ALLIANCES FOR IMPLEMENTING A NEW STRATEGIC APPROACH  
("BLUEPRINT") TO SECTORAL COOPERATION ON SKILLS

**Project number:**

**600885-EPP-1-2018-1-ES-EPPKA2-SSA-B**

PARTNERSHIP		
VET PROVIDERS	SECTORAL REPRESENTATIVES	COUNTRY
FLC (COORDINATOR)	CNC	SPAIN
IFAPME	EMBUILD	BELGIUM
SATAEDU	--	FINLAND
CCCA-BTP	FFB	FRANCE
BZB	ZDB	GERMANY
BFW-NRW		
AKMI	PEDMEDE	GREECE
TUS	--	IRELAND
FORMEDIL	ANCE	ITALY
VSRC	LSA	LITHUANIA
CENFIC	--	PORTUGAL
SCKR	CCIS CCBMIS	SLOVENIA
	BUDOWLANI (TRADE UNION)	POLAND
	FIEC	EU
	EFBWW	EU
	EBC	EU

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

# Index

---

Introduction	
Pact for skills for the construction sector	8
Estimation of workers that should be trained	9
Belgium	9
Ireland	10
Finland	12
France	13
Greece	15
Germany	17
Italy	19
Lithuania	22
Portugal	23
Poland	23
Slovenia	28
Spain	31
Discrepancy between current and future skills	34



## Introduction

The present document has been elaborated as a complement to the Status Quo report on sectoral skills, that was developed in the first phase of the Construction Blueprint project, to depict an overview of the construction sector in the countries participating in the project, as well as the main skills gaps and training needs identified in them.

According to the project application form, it was required to include in this document the following information:

- (1) Analysis of the discrepancy between current and future skills, to establish the training needs of workers in the short and medium term.
- (2) Estimating the number of workers that should be trained as well as in which vocational profiles.
- (3) Measures, recommendations, actions, etc. for the Blueprint.

Point (3) has been embodied in a Roadmap and Action Plan, a document that comprises the main strategic measures, activities, milestones and results to be applied to adapt the demand for skills and the current training offer.

However, for points (1) and (2) it has been necessary to wait until the end of the project to get results, because it required to carry out previous research. And even at this stage, it has not been always possible to find out the exact number of workers that should be trained.

The following pages provide information that may help to define this number.

## **Pact for skills for the construction sector**

The Pact for Skills is one of the flagship actions of the European Skills Agenda, aiming to support public and private organisations with upskilling and reskilling, so they can thrive through the green and digital transitions.

National, regional and local authorities; companies; social partners; cross-industry and sectoral organisations; chambers of commerce; education and training providers; employment services – they can all become members of the Pact for Skills. All members of the Pact sign up to the Charter and agree to uphold its four key principles:

1. Promoting a culture of lifelong learning for all.
2. Building strong skill partnerships.
3. Monitoring skill supply/demand and anticipating skill needs.
4. Working against discrimination and for gender equality and equal opportunities.

The Pact for Skills in Construction, launched in February 2022, has been developed by FIEC, EFBWW and EBC, to mobilise a concerted effort among private and public stakeholders for quality investment in Vocational and Educational Training (VET), knowledge, skills and competences to benefit the European construction sector, for all working age people across the EU. Stakeholders' commitments will revolve around 5 key principles:

1. Building strong partnerships, including with VET institutions.
2. Monitoring occupational supply/demand and anticipating KSC needs.
3. Working against discrimination.
4. Attracting more young people and women in the sector.
5. Promoting a culture of lifelong learning for all, supported by adapted incentives.

This specific initiative aims at upskilling and reskilling the construction workforce in particular as regards green and digital skills.

## **Estimation of workers that should be trained**

Although the situation varies significantly from one country to the other, the ambition of the Pact for Skills of the construction sector is to upskill and reskill overall at least 25% of the workforce of the construction industry in the next 5 years (from 2022 to 2026), to reach the target of 3 million workers. The training provided differs from country to country and it can comprise of short-time and long-time courses.

This calculation has been made taking into account the number of workers in the sector in different Member states, and the approximate estimate of workers potentially in need of training to meet the challenges of the sector.

Some of the participant countries in the Construction Blueprint project, have shown also additional information to that provided by the Pact for Skills for the construction sector; however, not all the participant countries have been able to provide concrete and official figures regarding the number of workers to be trained, and from which occupational profiles and occupations, therefore, no comparable information can be offered, since different approaches and sources have been used.

In other cases, countries have only provided figures on number of workers needed in the national construction industry, which may provide clues on how many future workers will need to be trained, and for which occupational profiles.

## BELGIUM

### Training needs

The paritarian fund for the construction sector, Constructiv, conducted a study about the training needs for the construction sector. The table below summarizes the information collected.

Année de formation/ Year of training	Objectif nombre d'heures et jours de formation Construction/ Target number of hours and days of training		Nombre d'heures de formation réalisées/ Number of training hours completed		Coût réalisé (17-21) et estimé (21-26)/ realised (17-21) and estimated (21-26) cost	ouvriers formés (réalisés et estimés)/ trained workers (completed and estimated)
	Heures de formation/ Hours of training	formation/ Days of training	formation/ Hours of training	Formation/ Days of training		
<b>2007-2018</b>	720.000	90.000	832.682	104.085	€ 45.797.510,00	42.086
<b>2018-2019</b>	756.000	94.500	932.025	116.503	€ 54.261.375,00	45.770
<b>2019-2020</b>	793.800	99.225	881.294	110.162	€ 48.471.170,00	44.164
<b>2020-2021</b>	833.490	104.186	952.568	119.071	€ 52.391.240,00	40.739
<b>2021-2022</b>	875.165	109.396			€ 48.134.075,00	39.690
<b>2022-2023</b>	918.923	114.865			€ 50.540.765,00	41.675
<b>2023-2024</b>	964.870	120.608			€ 53.067.850,00	43.758
<b>2024-2025</b>	1.013.114	126.639			€ 55.721.270,00	45.946
<b>2025-2026</b>	1.063.769	132.971			€ 58.507.295,00	48.244
					Coût estime sur base des heures de formations réalisés/ Estimated cost based on hours of training completed	Nombre d'ouvriers formé en réelle/ Number of workers trained in real terms
					Coût estime sur base des heures de formations réalisés/ Estimated cost based on target hours of training	Nombre d'ouvriers estimé sur base de l'objectif du nombre d'heures de formation/ Number of workers estimated on the basic of the target number of training hours

## Number of workers to be trained

According to this study, it is estimated that 219,312 workers will need to be trained between September 2021 and 2026. These estimates started in September and therefore do not include the period January-September 2021.

This will represent an estimated cost of €265,971,255 for a total of 4,835,841 hours of training.

The table includes the following elements:

- The sectoral objectives in terms of training hours and training days (720,000 hours for 17-18 with a 5% growth each year).
- The achievements in hours and days in recent years.
- The estimated cost to companies of these achievements and targets (on average estimated at €35 salary cost and €20 training cost).
- In the last column the number of workers in training for the years 17-21 and an estimate of the number of workers for the next years (target in hours divided by the average number).

## IRELAND

In Ireland, the Build Up Skills Ireland 2030 (BUSI2030) initiative is currently carrying out a Status Quo Analysis where further findings on this subject will be collected.

However, some figures can be indicated for the country, until updated data are available.

## Number of workers required

The Report on the Analysis of Skills for Residential Construction & Retrofitting, 2023 to 2030 from the Department of Further and Higher Education, Research, Innovation and Science, Published on 22 December 2022 states: "To deliver the Government's targets in housing and retrofitting and to continue to engage in general repair and maintenance, it is estimated that **50,831** new entrants will have to be recruited in managerial, professional, skilled, and semi-skilled occupations over the period 2023-2030."

The three different forecasts are presented in the report:

- the skills required to build an average of 33,000 houses annually over the nine-year period; 2022-2030. The forecasts include an additional 6,000 houses to compensate for an anticipated shortfall in 2022;
- the skills required to retrofit 446,300 houses over the same period;
- the skills required for the general repair and maintenance of the housing stock.

## Where workers are required

The SOLAS 'difficult-to-fill-vacancies' shows what vacancies are hard to fill, so that would mean there needs to be more trained in that field.

A survey conducted by the SOLAS Skills and Labour Market Research Unit (SLMRU) and subsequent report 'Difficult-to-fill vacancies survey'[1], surveyed Irish recruitment agencies on the vacancies for occupations in October 2022 of which:

- 39% of difficult to fill vacancies in Science, Engineering and Technology Sector were:
  - a) ICT – this includes software developers, automation engineers, IT quality management, and data scientist to name a few.
  - b) Life Sciences.
  - c) Engineering – this includes Process, Quality management, mechanical, manufacturing, environmental, and health and safety workers.
  - d) Other – This includes regulatory and compliance, and analytical scientist workers.
- 28% of difficult to fill vacancies in Construction Sector were:
  - a) Project / Site Managers
  - b) Civil Engineers
  - c) Quantity Surveyors
  - d) BIM
  - e) M&E engineers
  - f) CNC programmers
  - g) Welders
  - h) Electricians
- 11% of difficult to fill vacancies in Transport and Logistics Sector were:
  - a) Transport Management
  - b) Drivers
  - c) Procurement / Sales
  - d) Regulatory and Compliance

## Methodology

The Irish Government took the number of workers in the sector and the annual retrofits and building construction over the past few years, and seeing as we are not hitting the target of 33,000 homes a year, roughly 27,000 houses will be completed in 2022. They made a calculation based on the deficit of homes per year. This is only in the Residential market.

## FINLAND

### Training needs

Main training needs are related to sustainability and understanding the low-carbon circular economy for the whole building construction sector and also other fields of the construction industry, especially for graduate students and teachers in building construction, as well as other operators in the built environment.

#### Skills needed

- Understand the importance and interdependencies between the objectives of sustainable construction and the low-carbon circular economy.
- Be able to assess the impact of different measures.
- Willing to adopt low-carbon circular economy thinking and practices.
- Willing to work with others to increase, develop and support the low carbon circular economy.

In Finland, the heat pump activity is an important sector. There are more than one million heat pumps installed in the country and around 5,000 people are employed in the sector. Today's professionals are mainly trained by industry and heat pump operators. In recent years, the heat pump-related modules of the basic and vocational qualifications in building services engineering have also started to be trained in part of the sector in some secondary vocational schools.

In the current mandate and in the 2017-2020 mandate, the Built Environment Pre-Accession Group has highlighted the skills needs of the green transition, which this initiative aims to address. All sectors of the heat pump industry are experiencing significant growth. The number of heat pumps growth in Finland was around 80% in the period Jan.-Sept. 2022. In Europe, the growth target is to increase from 15 million units to 50 million heat pumps by 2030 (RepowerEU).

The Built Environment Pre-Accession Group makes the following proposals for action:

- Motivating VET providers and higher education institutions to organise.
- Encourage higher education institutions and universities to promote training pathways leading to the heat pump sector for all professional groups (installers, entrepreneurs, designers, salesmen, well drillers, project managers, etc.) at national level.
- Clear intensification of the cooperation between the training providers and heat pump operators in the sector at local and national level.
- Increasing the attractiveness of the significantly growing heat pump sector through concrete measures (communication, campaigns, cooperation with educational institutions, training providers, etc.).
- Providing training at university level for the heat pump sector.
- Improve the image factor for the sector.

## Workers required

The heat pump industry needs a large number of new graduates in a wide range of professions. The need for skills will be concentrated on HVAC project staff mainly. Particularly, a wide range of university-level thermal and renewable energy skills are needed. In universities and universities of applied sciences, the field of heat pumps has in practice been confined to final theses, which have.

Around 1000-1500 new installers for Air-Source Heat Pump are needed in Finland.

## Methodology

The information provided for Finland is derived from the Skills Anticipation Forum, which is working under the Finnish National Agency of Education. Skills Anticipating Forum consist of wide expertise throughout the field of technology and built world. All results are public and free to use. They gather to meeting and they have the latest information from their fields of expertise.

## FRANCE

In France, no study has been conducted to determine the training needs of workers in the construction sector. Indeed, such an approach is difficult -if not impossible- to carry out as several parameters can influence these needs:

- Changes in the economic situation: companies tend to train their employees during periods of economic downturn. It allows them to strengthen the skills of their employees while avoiding laying them off due to lack of activity.
- Changes in the construction markets, with a downward trend in new construction in favour of energetic renovation of buildings.
- Changes in national and European regulations, which may have an impact on the qualification requirements for employees and on the content of training courses.
- Changes in techniques and technologies, which require adaptation and mastery of tools.

However, although it is not possible to estimate the training needs of workers in the construction sector, it is possible to analyse past and current training trends in the building industry by trade and by region.

NB: The data provided in this note concern only training financed by the construction skills operator (OPCO - Constructys). It, therefore, addresses compulsory and recommended training. Construction companies contribute to the financing of the OPCO up to 1% of the wage bill for companies with more than 10 employees and 0.55% of the wage bill for companies with less than 10 employees. In addition, since January 2019, only companies with fewer than 50 employees can benefit from OPCO funding for their skills development plan. Companies with 50 or more employees must finance it themselves.

Thus, these data do not cover training courses paid directly by companies or training actions under the skills development plan of companies with more than 50 employees.

**TABLE 1: NUMBER OF EMPLOYEES IN CONTINUOUS TRAINING IN THE BUILDING**

**INDUSTRY PER 100 EMPLOYEES IN 2021**

PACA	24%
Grand- Est	24%
Auvergne- Rhône- Alpes	23%
Hauts- de- France	23%
Bretagne	23%
Occitanie	23%
Nouvelle- Aquitaine	22%
Bourgogne- Franche Comté	22%
Normandie	22%
pays de la Loire	21%
Centre- Val de Loire	18%
Île- de - France	10%
<b>FRANCE</b>	<b>20%</b>

According to the data collected, 20% of construction workers are trained each year on average in France.

**TABLE 2: DISTRIBUTION OF THE NUMBER OF EMPLOYEES IN CONTINUOUS TRAINING IN THE BUILDING INDUSTRY BY TRADE IN 2021**

MAÇONNERIE ET GROS ŒUVRE	AUVERGNE- RHÔNE- ALPES	BOURGOGNE- FRANCHE- COMTÉ	BRETAGNE	NOUVELLE AQUITAINE	OCCITANIE	CENTRE- VAL DE LOIRE	PROVENCE- ALPES-CÔTE D'AZUR	ILE-DE- FRANCE	HAUTS- DE- FRANCE	RÉUNION	GUADELOUPE	NORMANDIE	PAYS-DE- LA LOIRE	GRAND EST	FRANCE	POURCENTAGE EN COLONNE
Electricité (Bâtiment)	5.371	1.913	2.265	4.557	5.064	1.216	5.942	6.787	3.993	1.007	-	2.277	2.662	3.145	46.199	22,26%
Chauffage et génie climatique	4.544	1.096	1.563	2.739	3.215	827	2.822	3.522	3.203	966	-	1.588	1.672	3.062	30.819	14,85%
Menuiserie	3.436	915	903	2.614	2.396	765	1.553	3.386	2.223	115	-	1.065	1.556	2.627	23.554	11,35%
Couverture	2.561	608	1.283	1.781	1.008	571	939	1.030	1.289	95	-	1.158	1.919	1.323	15.565	7,50%
Metallerie	2.060	698	1.550	1.416	1.084	800	828	1.233	2.091	124	-	1.574	1.166	1.789	16.413	7,91%
Charpente	1.999	397	813	1.011	1.146	426	1.004	1.271	865	144	-	938	761	1.320	12.095	5,83%
Installations sanitaires	1.824	469	412	847	604	274	406	197	197	25	-	290	669	380	6.594	3,18%
Peinture	1.714	319	650	1.036	956	684	867	1.334	522	70	-	484	921	936	10.493	5,06%
Travaux de construction spécialisés	1.582	275	571	1.173	913	428	1.095	1.867	1.289	284	-	793	948	1.047	12.265	5,91%
Terrassement	765	263	250	382	353	121	484	453	513	68	-	259	348	528	4.787	2,31%
Plâtrerie	717	221	317	499	586	279	818	282	429	198	-	239	190	482	5.257	2,53%
Carrelage	698	140	357	618	468	91	224	264	298	69	-	51	210	343	3.831	1,85%
Autres travaux d'installation	452	96	239	231	246	87	298	413	182	5	-	128	275	371	3.023	1,46%
Electricité réseaux	369	13	52	122	144	42	180	339	223	8	-	100	38	60	1.690	0,81%
Autres travaux de finition	166	13	-	171	85	10	73	127	61	153	-	11	-	52	922	0,44%
Canalisations	124	53	180	258	88	62	179	304	116	3	-	31	87	51	1.536	0,74%
Génie civil	89	10	95	158	113	-	68	13	3	44	-	-	10	134	737	0,36%
Construction de routes	52	12	28	26	91	12	35	90	109	46	-	2	29	54	586	0,28%
Promotion immobilière	12	-	-	3	7	-	3	4	9	20	-	14	-	56	128	0,06%
Autres	3	-	-	21	2	2	-	62	-	-	-	7	-	3	100	0,05%
<b>Total</b>	<b>5.366</b>	<b>-</b>	<b>-</b>	<b>3.805</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1.808</b>	<b>-</b>	<b>-</b>	<b>10.979</b>	<b>5,29%</b>

Unit: number of trainees/ Source: Constructys + Data processing: CERC network

The proportion of employees having received training in 2021 varies according to trade and region. Thus, it emerges that employees in masonry / structural work (22.26%) and electricity (14.85%) represent the most significant share having received training among the trades listed.

**TABLE 3: EVOLUTION OF THE NUMBER OF EMPLOYEES IN CONTINUOUS TRAINING IN THE BUILDING INDUSTRY**

	Auvergne- Rhône- Alpes	Bourgogne- Franche- Comté	Bretagne	Nouvelle Aquitaine	Occitanie	Centre- Val de Loire	Provence- Alpes- Côte d'Azur	Ile-de- France	Hauts- de- France	Réunion	Guadeloupe	Normandie	Pays-de- la Loire	Grand Est	France	Evolution
2007	20.638	-	8.428	16.301	13.450	7.302	10.112	25.351	16.467	1.847	-	10.949	13.965	18.862	165.679	
2008	21.754	-	10.074	19.202	16.087	7.895	10.729	28.026	18.350	3.418	-	12.044	17.114	20.257	186.958	12,84%
2009	22.632	-	9.980	18.408	15.153	8.229	11.066	27.472	18.052	3.235	-	12.820	16.676	20.944	186.676	-0,15%
2010	22.947	-	10.411	18.649	16.100	8.826	11.661	26.006	16.968	2.506	-	11.994	17.556	19.693	185.327	-0,72%
2011	23.026	-	10.576	19.050	15.498	8.870	11.597	29.054	17.896	2.399	-	11.764	16.648	20.205	188.594	1,76%
2012	27.919	-	12.070	21.507	17.417	8.787	15.109	29.663	19.170	2.678	-	13.789	19.303	22.414	211.838	12,32%
2013	29.036	-	12.080	21.810	18.081	10.131	15.693	32.177	20.663	3.567	-	13.858	19.071	23.247	221.427	4,53%
2014	32.350	-	13.414	22.960	19.516	10.869	16.699	34.478	21.051	3.171	-	14.205	20.145	24.705	235.577	6,39%
2015	23.407	-	9.990	18.389	15.348	7.666	12.009	28.461	16.285	2.285	-	11.622	14.212	17.910	179.599	-23,76%
2016	31.141	-	13.595	21.188	20.514	8.620	15.131	35.279	20.333	3.770	-	13.720	17.996	21.332	224.635	25,08%
2017	32.990	-	12.898	23.197	20.625	9.145	15.099	37.746	19.947	3.760	-	13.559	17.164	23.968	232.115	3,33%
2018	34.377	-	14.078	24.163	21.528	10.438	15.295	38.379	21.903	3.480	-	16.187	19.377	24.686	245.909	5,94%
2019	31.089	-	15.064	23.653	22.170	8.582	16.912	32.227	19.127	3.482	-	14.391	18.920	22.186	229.822	-6,54%
2020	30.319	-	12.202	20.332	21.049	7.174	16.291	28.850	18.498	3.602	-	12.937	17.364	18.854	209.492	-8,85%
2021	33.904	-	14.291	23.468	-	7.919	21.532	27.406	20.494	4.501	-	12.817	16.005	21.212	205.570	-1,87%

*Unit: number of trainees/ Source: Constructys + Data processing: CERC network*

The evolution of the number of salaried people sent to training in the construction industry since 2007 can also be observed. However, this evolution must be put into perspective due to several factors, such as the reforms of vocational training in France on January 1st, 2015, and January 1st, 2019, and the Covid-19 pandemic.

## GREECE

After a long period of decline caused by the financial and economical crisis, Greece faces a new boom in the construction industry. Many factors contribute to the increased construction activity, such as:

- The Greek government's efforts to attract foreign investment and create a more business-friendly environment.
- The government has also been investing in infrastructure projects such as roads, bridges, and ports, which has helped to create jobs and stimulate economic growth.
- The increase in demand for housing has led to a rise in property prices in some parts of Greece, particularly in Athens and other major cities.
- There has been a growing trend towards sustainable building practices in Greece, with more developers and builders adopting green building standards and technologies.
- The achievement of ESG goals has been highly on the agenda of large construction companies.
- There are signs of “brain gain”, with hundreds of high-qualified professionals in the construction sector who migrated to other countries, and returned bringing back valuable expertise and know-how.

Based on the Hellenic Statistical Authority, there is an annual increase in the construction sector up to 20.7%. On top of that, researches of the Foundation for Economic & Industrial Research and National Technical University of Athens expect a significant increase within the next years, with more than 200.000 to 250.000 new job positions to be expected within the next three years.

The creation of new job positions in the construction sector in Greece though raises worries regarding how they are to be covered, by the existing workforce in Greece. The Technical Chamber of Greece supports that over 100.000 workers are missing from raising residential buildings and up to 127.000 from the constructions. The lack of workforce in Greece is both present in blue collars and white collars. The construction sector seems to gain the number of professionals it needs from other sources such as the tourism sector, and the facilitation of the employment of workers from abroad.

Besides the tremendous needs of new workers entering the construction sector, there is also an intensive need to upskill and reskill the existing workforce. The need is underlined by the development of a series of regulations and laws (at national and EU level) regarding the energy efficiency of the building, as well as the direction of large construction companies to ESG. Moreover, the undertaking of large projects by foreign companies and the brain gain, have accelerated the use of modern technologies and techniques such as BIM systems and the Circular economy. These fields are an area of skill development for both the current and future workers in the sector, in both short and medium terms.

### **Workers to be trained, and in which profiles**

Based on the current needs and the expected increase of the construction sector through the next 3 years, it is safe to estimate that more than 300.000 construction workers will be in need to be trained, identified in three main groups:

a) Current workers (blue and white collars) who need to be introduced to the use of modern techniques and technologies (Digitalisation, Energy Efficiency, Circular Economy). This group represents all the Occupational Profiles in Greece such as: craftsman working on the restoration & maintenance of historic and traditional building, operator of mobile machines of public and industrial works, glass technician – glazier, technician of plumbing installations, aluminium and metal constructor, works machinery technician, installer - superintendent of burners, central heating installer/engineer, foreman on construction sites, frontline supervisor, carpenter craftsman, quality department executive, technical construction planner, insulation technician, welding and metal cutting technician, refrigeration and air conditioning technician, gas technician, combustion gas technician, dry constructing systems technicians, plasterers, stone technician, small hydroelectric power station operators, etc.

b) Newcomers in the construction sector. Either newly graduated professionals (mechanics, architects, electricians, plumbers, etc.) or unqualified staff (with no previous experience in construction work). In this group, foreign workers (especially blue collars) are also included. They all need a better access to training that will allow them to enter the construction sector.

c) Returning staff, mostly blue collars, who have left the sector during the recession period of the construction sector, to be occupied in other sectors. These professionals need to be re-introduced to the sector and acquire new skills that will allow them to enter the sector more easily, claiming better positions and benefits compared to their current occupation.

A large number of the above-mentioned groups should be young people, since many of the workers in the construction industry are expected to retire in the coming years. The sector needs to recover the lost number of workers between the ages of 15-24, to ensure sustainability of the sector and avoid future lack of staff. At the same time, the opening up of the construction industry

to women (both for positions related to blue-collar and white-collar jobs) is also an explicit solution that should be taken into consideration. Meaning that among the 300.000 construction workers to be trained, a good number of them should be women.

While a large number of workers is in need of training in Greece, it is important to underline that not all of them are to be trained through structured vocational and educational training. Most of them are expected to be trained on the job, creating doubts on the quality of the competences they will acquire. This conclusion is based not only to the mindset prevailing in Greek companies due to the training of their staff (present also in the construction industry), but it is also linked to the fact that the training of staff is a procedure met usually by large companies. Most construction businesses in the country (96.8% in 2019) are very small businesses (individual businesses, self-employed, businesses with fewer than 10 employees). Only 15 companies in Greece employ more than 250 employees.

On the other hand, the number of the construction workers to be trained within the next years in structured VET increases, considering the continuous investment in the development of human resources implemented by the government through training programmes for the workers and unemployed people, and the emphasis given to the capacity of the workforce in the framework of the National Recovery and Resilience Plan Greece 2.0. Finally, it is necessary to take into account the increase of training as the result of eLearning in both national and European level.

## Methodology

The estimation for the number of construction workers that will need training in Greece in short and middle term, has been based on multiple resource usage, such as:

- Data from the National Statistical Authority and Eurostat.
- Research from Greek Universities and Research Foundations,
- Statements of representatives of construction industry associations and the government.
- Articles from financial journals and papers.
- National strategies and legislation.
- Analysis of specific trends in the construction market and the VET sector.

The estimated number is also analysed in specific target profiles, providing a clear picture on the target groups that the Construction Blueprint project should focus on, and apply its foreseen action to engage them to its training materials and other activities.

## GERMANY

According to the KOFA-Study from 2021 for the construction sector, at the level of individual occupations, there is a shortage of skilled workers with completed vocational training. In construction electricians alone, there would be a shortage of 13,877 skilled workers on average in 2020, to fill all vacancies. At the specialist level, there was a shortage of mainly Supervisors in building construction as well as in plumbing, sanitary, heating and air-conditioning technology.

Supervisors in civil engineering are particularly difficult to find, as in 2020 there were on average

only 17 unemployed persons per 100 vacancies. Among experts in construction planning and supervision as well as in civil engineering, the skilled labour gap is the previous year despite the Corona crisis. These are also the areas with the greatest shortages in relative terms. On average, there were only about 15 unemployed persons per 100 vacancies.

The table below (from the report *Fachkraeftesituation\_Bauberufe.pdf* (kofa.de) shows the numbers as regards specific construction branches (average levels 2020):

**TABELLE 1 TOP-5 BAUBERUFE NACH FACHKRÄFTELÜCKE UND ANFORDERUNGSNIVEAU**  
**DURCHSCHNITTSWERTE FÜR DAS JAHR 2020**

	Berufsgattung	Fachkräftelücke	Offene Stellen	Engpassrelation*	Veränderung der Fachkräftelücke (in Prozent)
<b>Fachkräfte</b>	Bauelektrik	13.877	18.137	24	-19,5
	Sanitär-, Heizungs- und Klimatechnik	10.636	14.434	26	-15,3
	Garten-, Landschafts- und Sportplatzbau	2.252	5.953	62	-28,7
	Dachdeckerei	1.693	4.323	61	-10,8
	Kältetechnik	1.313	1.602	18	-16,1
<b>Spezialisten</b>	Aufsicht- Hochbau	1.023	1.628	37	-5,9
	Aufsicht- Klempnerei, Sanitär-, Heizungs- und Klimatechnik	837	1.242	33	-2,6
	Aufsicht- Tiefbau	702	848	17	-4,3
	Sanitär-, Heizungs- Und Klimatechnik	510	677	25	-5,4
	Bauplanung und- Überwachung	447	597	25	-17,3
<b>Experten</b>	Bauplanung und- Überwachung	5.678	6.714	15	15,6
	Aufsicht und Führung- Bauplanung und- Überwachung, Architektur	2.147	4.052	47	-6,5
	Architektur	1.867	4.417	58	-21,2
	Hochbau	1.479	1.984	25	-2,8
	Tiefbau	915	1.041	12	6,3

## Methodology

The KOFA - Kompetenzzentrum Fachkräftesicherung, which supports SMEs in shaping their human resources work since May 2011, carried out a project on behalf of the Federal Ministry of Economics and Climate Protection (BMWK) to forecast the skills need in construction. The KOFA is based at the Institute of the German Economy (IWW).

The KOFA analysed the situation based on data on reported vacancies and unemployed construction workers registered at the Federal Employment Agency (BA – Bundesagentur für Arbeit) on the basis of the Classification of Occupations 2010 (KldB). For the calculation of vacancies information is included on registration rates, i.e. the share of reported vacancies of all vacancies

from a job survey and on the share of temporary jobs. The reporting rate for skilled workers and specialists is about 50%, that for experts is about 30%. Furthermore, temporary jobs are only taken into account about half, since these do not always reflect a real demand for labour. The job surplus ratio (SUQ - Stellenüberhangsquote) describes the share of vacancies for which arithmetically there are no suitably qualified workers available in relation to all vacancies. The bottleneck ratio (EPR - Engpassrelation) indicates the number of suitably qualified unemployed workers per 100 vacancies. If the EPR is below 100, the occupation is a bottleneck occupation.

More details regarding the methodology: Die Messung des Fachkräftemangels - Institut der deutschen Wirtschaft (IW) (iwkoeln.de)

As a result, labour supply and demand are compared by using the unemployed as an indicator of unused labour supply and vacancies as unmet labour demand. The unemployment and job statistics of the Federal Employment Agency (BA – Bundesagentur für Arbeit) are the central data basis for the concrete calculation of the key figures, as these data are available in large numbers of cases and according to the 1,286 occupational categories of the KldB (Classification of Occupations of 2010). The fine occupational differentiation is central to the significance of the results.

Regarding the reported vacancies from the BA job statistics, it is important to consider differences in reporting behaviour. On the one hand, this concerns the particularities in the reporting behaviour of temporary employment agencies. Since there are indications of an over-reporting of real economic demand by temporary employment agencies in the BA job statistics, a weighting factor is introduced to correct this and prevent an over-subscription of labour demand.

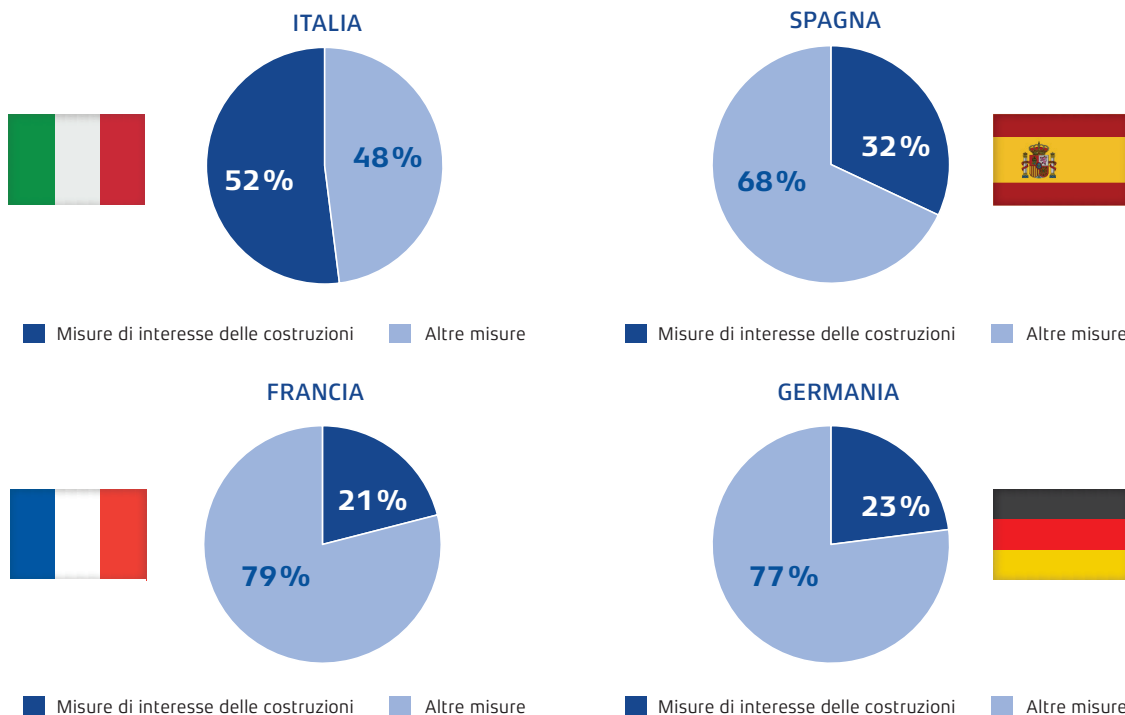
On the other hand, differences in reporting behaviour become apparent depending on the qualification level of the job to be filled. It becomes apparent that jobs for highly qualified persons in particular are reported to the employment agencies less frequently than jobs for skilled workers with a training qualification. From the IAB job survey, reporting rates are known that differentiate between the four requirement levels of the KldB and can thus be used for an extrapolation of labour demand. In order to obtain an admissible extrapolation, this is carried out in a multi-step procedure so that methodological differences between the BA job statistics and the IAB job survey are taken into account. The methodology presented means that changes in the reporting rates are for the first time continuously taken into account when measuring the shortage of skilled workers.

The methodology presented in this report represents a significant advance over the previous methodology for calculating skilled labour shortages. In particular, it allows the bottlenecks of academics with a Master's degree or comparable qualification to be recorded much better. At the same time, the danger of overstating skill shortages in areas where temporary work plays a major role is reduced.

Once this methodology has been implemented in the IW skilled labour database, key indicators such as the skilled labour gap, the job overhang rate, the bottleneck ratio and the bottleneck rate can be calculated on an ongoing basis. Current results as of 30.06.2020 are presented. Since the calculations are based on moving annual averages, the effects of the Corona pandemic are only partially included.

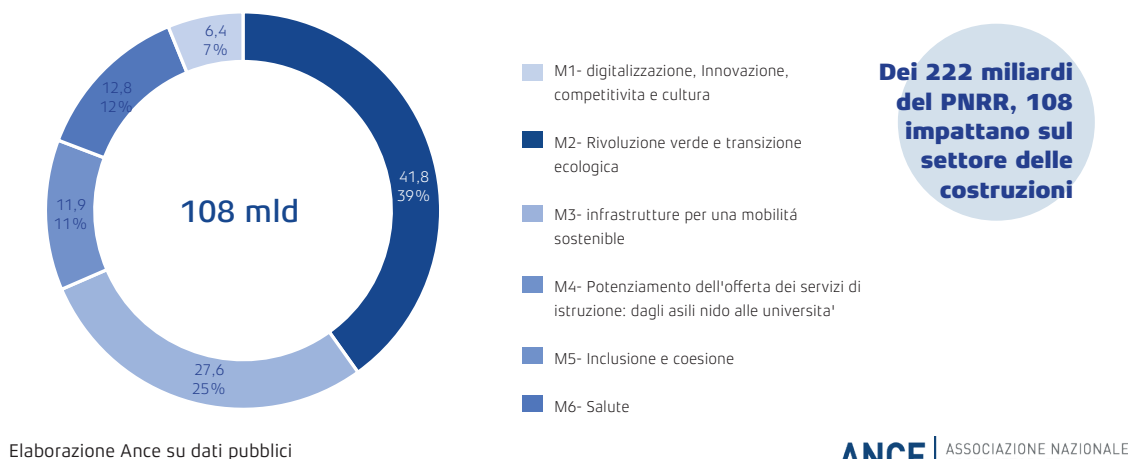
## ITALY

The Italian construction sector will play a key role in the realisation of the National Recovery and Resilience Plan (NRRP). It is estimated that 48% of the measures affect the construction sector (ANCE elaboration on public data below).



**ANCE** | ASSOCIAZIONE NAZIONALE  
COSTRUTTORI EDILI

As can be seen from the graph below, of the EUR 222 billion in the NRPP, EUR 108 billion impacts the construction sector (ANCE elaboration on public data).



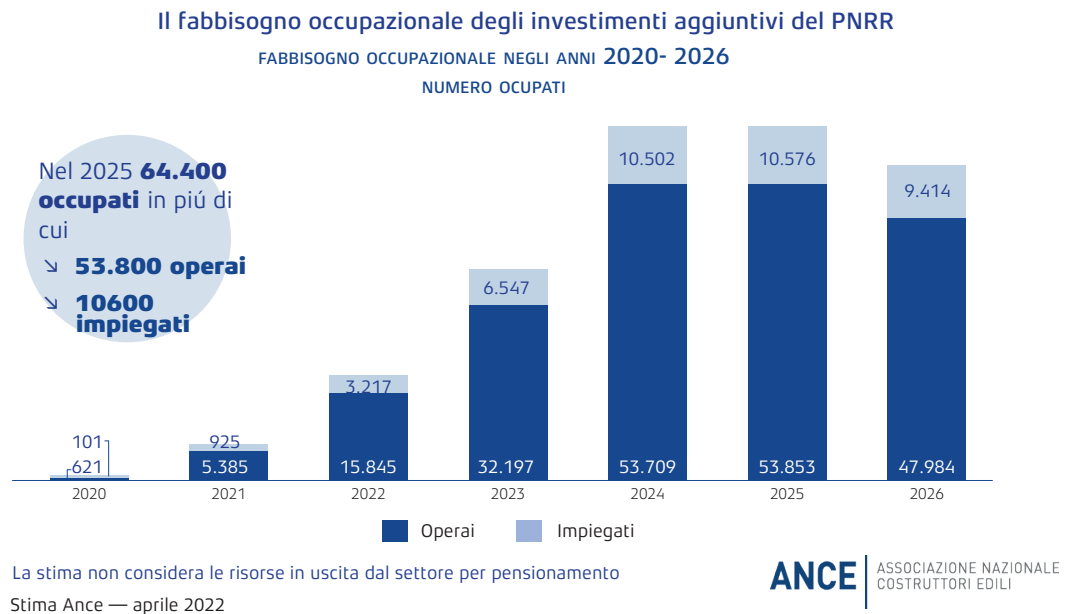
**ANCE** | ASSOCIAZIONE NAZIONALE  
COSTRUTTORI EDILI

According to the latest CNCE (the paritarian National committee for construction workers' sectoral Funds) findings, the national collective labour agreement for construction applies to approximately 720,000 blue and white-collar workers.

ANCE (Associazione Nazionale Costruttori Edili), starting from some assumptions regarding the incidence of labour costs on the works, has quantified at 64,400 units the employment needs deriving from the realisation of more than 64 billion euros of additional investments of the National Recovery and Resilience Plan (so-called additional needs).

Of this need, it is estimated that 53,800 units are to be found in the blue-collar category and the remaining 10,600 units in white-collar and middle management.

The estimate is based on some assumptions developed by ANCE regarding the incidence of labour on the total amount of works and does not consider resources leaving the sector due to retirement.



ANCE's estimate is confirmed by recent data released by the Bank of Italy. In particular, the Institute points out that the construction sector would record the highest change in employment in absolute terms, amounting to about 65,000 units in the peak year.

## Methodology and Sources

The data were extrapolated from the study "The national recovery and resilience plan: the push towards the future" presented during the XXIII National Conference of young building contractors of ANCE. The study, published in November 2022, was conducted by ANCE in April of the same year. The data were confirmed in a study conducted by the Bank of Italy and were also used by the Presidency of the Council of Ministers in the analysis of the impact of the European Recovery Plan.

The aim of the research was to illustrate the potential of the PNRR (National Recovery and Resilience Plan), examining the factors that influence its concrete realization.

In particular, the study showed that the PNRR represents an unparalleled opportunity for Italy not only for the huge resources available, 222 billion euros, but above all for the objectives that are intended to be achieved by 2026, namely, to recover the economic consequences of the pandemic crisis and remove the weaknesses that prevent the development of the country, promoting the ecological and digital transition. Objectives that can no longer be postponed, made even more evident and urgent by the ongoing climate crisis and the social and economic consequences of the Covid 19 pandemic, now further aggravated by the war conflict in Ukraine.

Italy has a chronic growth problem, compared to other developed countries, and is characterized by strong territorial, social, generational and gender imbalances.

Therefore, the Plan offers the country the opportunity to intervene on these problems and to increase development potential by leveraging the three strategic axes indicated by the European

Commission, such as digitalization and innovation, ecological transition and social inclusion. In this context, in which construction is called upon to play a leading role, it has emerged that the shortage of labor and skilled professionals risks hindering the implementation of the PNRR. It is, therefore, of fundamental importance to invest in training and safety of workers, issues on which ANCE is particularly active. The association is committed to reducing the mismatch between demand and supply of labor with the support of the bilateral construction system, initiating agreements to structure training courses for unemployed / unemployed people, immigrants, as well as already employed subjects whose skills need to be updated.

## Lithuania

The Lithuanian Construction Association (LSA) conducted in the first quarter of 2021 a survey addressed towards large companies belonging to the Vilnius region. A total of 14 large companies (with an average annual turnover of €33,499,458) were interviewed.

Companies were given a list of competences and were asked to indicate what their staffing needs were in each one.

The following table provides information on how many and what kind of workers need to be trained in Lithuania.

The general need for workers that should be trained in Lithuania is higher, but more precise information is not available.

COMPETENCY NAME	Number of workers should be trained
Installation of pavers, tiles and natural stone coverings	56
Concreting of monolithic structures	138
Installation of complex formwork	76
Preparation of reingorcement elements and reinforcement of structures	107
Bricklaying	55
Installation of modular scaffolding systems	16
Installation of frame scaffolding systems	11
Installation of pitched roofs	24
Installation of flat operational and non- operational roofs	14
Installation of plasterboard partitions- finishing	24
Installation of glass aluminum facades	3
Installation of windows and doors	2
Installations of plastered facades	15
Installations of ventilated facades	16
Insulation of pipelines	20
Painting the walls	17
Tiling	33
Installation of merchanical ventilation	2
Installation of radiator and convector heating systems	2
Installation of water supply and sewage	16
Installation of static low- voltage electrical engineering systems	13
Installation of telecommunications systems	10
Installation of telecommunications systems	5

## Portugal

According to a quarterly survey carried out by business associations in the sector, the lack of specialised labour and the increase in raw material prices are identified as the main constraints to the activity. In short, 63% of companies report a lack of labour and 55% an increase in the cost of materials.

One of the activities most susceptible to requalification is construction, which is explained by the high proportion of workers with low qualifications in this sector. About 59% of the workforce performs low-skill routine occupations; these professions are highly likely to be automated in the future.

The Construction sector needs at least 80,000 skilled workers. If all the planned works started, there wouldn't be enough staff.

Vocational training becomes a decisive issue. Taking into account the evolution and the changes they cause it is necessary to empower people for lifelong learning.

Currently, in Portugal, the National Agency for Qualification and Professional Education, I.P. (ANQEP, I.P.) is carrying out a reformulation of training references for most Activity Sectors and, in particular for the Civil Construction and Public Works Sector, which will take Digitalisation, Energy Efficiency and Circular Economy into account, as well as the eventual introduction of new professions that will dignify the sector, given the technological advances that have occurred in recent years.

The Portuguese state budget in 2022 emphasized Vocational Training in order to increase the qualification of workers in the Sector, with emphasis on the intervention of Vocational Training Centres, namely CENFIC and other Professional Education and Training (EFP) agents.

There is a need for Technological Specialization courses focused on the resilience and sustainability of infrastructures, energy efficiency and the fight against climate change.

Productivity growth is only possible by meeting the Sector's greater attractiveness in Portugal; according to the Civil Construction and Public Works Industrial Association (Associação dos Industriais da Construção Civil e Obras Públicas – AICCOPN), production in the construction sector is expected to register a real growth of 2.4% to 4.4% in 2023, to 21,782.5 million euros, after an estimated increase in production of 3.4% in 2022.

In this way, it is expected that in 2023, in line with the forecasts of the European Commission for the evolution of investment in construction, the construction sector will continue to make an important contribution to the evolution of the national economy, with production total, in real terms, at the midpoint of the forecast range, growing 3.4% and standing, in value, at 21,782.5 million euros.

## Poland

Public statistics provide little information on the need for skills in construction. The data on the demand for skills in Polish construction has not changed significantly since 2020. However, new data sources are available:

## Recommendations of the Council for Competences in Construction

Analysis of the demand for skills and qualifications in the construction industry, as well as studies containing forecasts of such demand, are prepared by the Sectoral Council for Competences in the Construction Industry. The latest analysis and recommendations are available at: <http://srkbud.zzbudowlani.pl/wp-content/uploads/2018/12/Rekomendacja-kwalifikacji-w-budownictwie-Ekspertyza-cz.-II.pdf>

Report in Polish under the name: The second part of the recommendations concerning market qualifications in the construction industry that are particularly needed, including smart specializations, requiring descriptions in accordance with the Integrated Qualifications System (ZSK). In the preparation of this report - recommendation, the Construction Blueprint methodology (including Quintuple Helix) was taken into account.

Below is a list of 34 recommended potential and future qualifications - part II of the recommendation:

- 1) Adaptation of old buildings for residential premises.
- 2) Building houses in 3D printing technology.
- 3) Digitization of the investment and construction process.
- 4) Exploitation of unmanned aerial vehicle systems - drones in construction.
- 5) Eco-design of circular buildings.
- 6) Installing biomass boilers and stoves.
- 7) Using the GIS (Geographic Information System) in the implementation.
- 8) Modernization of the internal electrical installation and internal lighting at an angle.
- 9) Modernization of heat sources, taking into account the possibility of using cogeneration.
- 10) Installation of large-area photovoltaic installations on solar farms.
- 11) Supervising the quality of workmanship and correct operation of the heat pump installation.
- 12) Designing buildings in accordance with the concept of "urban mining".
- 13) Conducting audits and creating and updating security documentation.
- 14) Keeping a construction log in electronic form (EDB system) and a building book in electronic form (EKOB system).
- 15) Carrying out inspections of the building structure and construction site with the use of mobile devices.
- 16) Preparation of the substrate and installation of insulation on the building using the light-wet method (BSO - Seamless Insulation System).
- 17) LiDAR (Light Detection And Ranging) laser scanning of building objects.

- 18) Using energy-saving solutions when replacing or renovating windows.
- 19) Using methods to reduce "grey energy" in construction.
- 20) Using modern methods of painting and wallpapering
- 21) Making insulation from the inside of the building.
- 22) Making a ventilated façade.
- 23) Performing technical insulation in thermos-modernized buildings.
- 24) Performing electrical measurements of photovoltaic (PV) systems.
- 25) Performing thermal modernization of prefabricated buildings.
- 26) Making wooden buildings (balconies and terraces).
- 27) Execution of buildings and glass elements.
- 28) The use of exoskeletons to reduce overloads and eliminate injuries of construction workers.
- 29) The use of autonomous vehicles (trucks, forklifts, excavators, bulldozers and others) on the construction site.
- 30) The use of production robots at the construction site (bricklaying, welding, 3D printing).
- 31) The use of virtual and augmented reality in designing a construction investment.
- 32) Maintaining and improving the environmental management system.
- 33) Obtaining decisions and permits necessary to implement the renewable energy source installation project (photovoltaic farms, wind farms).
- 34) Construction site management using drones and computer models.

### Workers to be trained

The Sectoral Council for Competences in Construction also recommends areas of skills and competencies for training co-financed from public funds in the construction sector. The Council also informs about the potential, estimated demand for a given area of skills - competences. On this basis, the project operator determines the costs of co-financing the training activity.

Below are the approximate numbers of people to be trained in the types of activities in the construction industry in relation to those working in the sector (recommendations of the Council for Competences in Construction no.1,2 and 3 for the project: 'Competences for sectors', PARP).

People working in construction, broken down by type of activity (data from December 2021).

	Quantity of workers	Recommended no. of trainees
<b>Construction</b>	<b>1030636</b>	
<b>Construction of buildings</b>	<b>320742</b>	
Realization of building projects related to erection of buildings	66514	
Building works related to erection of residential and non-residential buildings	254228	
<b>Civil engineering</b>	<b>179062</b>	
Works related to construction of roads and motorways	87037	
Works related to construction of railways and underground railways	12145	
Works related to construction of bridges and tunnels	7624	
Works related to construction of transmission pipelines and distribution networks	26270	
Works related to construction of telecommunications and electricity lines	25499	
Works related to construction of water projects	5240	
Works related to construction of other civil engineering projects not elsewhere classified	15247	
<b>Specialised construction activities</b>	<b>530832</b>	
Demolition	16706	2000
Site preparation	14882	
Test drilling and boring	2891	
Electrical installation	90761	10000
Plumbing, heat and air-conditioning installation	98878	20000
Other construction installation	22993	3000
Plastering	29029	4000
Joinery installation	32058	2000
Floor and wall covering	33108	4000
Painting and glazing	14192	2000
Other building completion and finishing	74516	6000
Roofing activities	31168	4000
Other specialized construction works, not elsewhere classified	69650	7000

In 2021, the first Industry Study of Human Capital in Construction was carried out. In 2023, the second edition of this study will be completed. During the study, the methodological assumptions were consulted with the Sectoral Council for Competences in Construction. The research was conducted on a representative group of employers and employees. The report from the first edition of the study can be found at the following link:

[https://www.parp.gov.pl/storage/publications/pdf/PARP-4-Raport-branza-budalternatywne-14-06-2021\\_akcept.pdf](https://www.parp.gov.pl/storage/publications/pdf/PARP-4-Raport-branza-budalternatywne-14-06-2021_akcept.pdf)

According to employers, the share of new positions in the structure of employment in the construction industry may grow significantly over the next 5 years. Mainly in terms of positions: 3D visualization designers (52% of all employers expect an increase in the share), BIM engineers (52%),

environmental protection specialists (50%) and new technology machine service technicians (49%).

Employers from the three surveyed sub-industries have slightly different predictions of the share of the increase in the share of new positions within 5 years:

- In construction companies, the increase in the share of employment is emphasized the most 3D visualization designers (52% of employers from this group expect an increase in the share), BIM engineers (51%) and environmental specialists (50%),
- In companies operating in the field of architecture and engineering, the increase in the share of employment among BIM engineers (54%) and service technicians of new technology machines (50%).
- In companies providing specialist cleaning services for buildings and facilities an increase in the share of IT and automation specialists and BIM engineers is expected (62% each).

According to the Industry Human Capital in Construction survey (I 2021 edition), employers indicate an increase in demand for the following occupations in construction (on a scale from 40% of respondents to 52%).

- Lawyers 40%
- Market analysts
- Risk specialists (risk managers)
- Accessibility specialists
- OHS experts
- Fire protection experts
- Ventilation/recuperation/air conditioning designers
- IT/automation specialists
- Specialists in renewable energy sources (including photovoltaics and wind turbines)
- Service technicians of new technology machines
- Environmental specialists
- BIM Engineers (Building Information Modelling)
- 3D visualization designers 52%

### Forecast of the demand for employees in vocational education professions

Every year, on the basis of available data and opinions of stakeholders (including the Council for Competences in Construction), the Ministry of Education and Science prepares the Forecast of the demand for employees in trade education occupations. <https://www.gov.pl/web/edukacja-i-nauka/prognoza-zapotrzebowania-na-pracownikow-w-zawodach-szkolnictwa-branzowego>

This forecast allows for higher co-financing of school education in sought-after professions.

In 2023, the classification of professions and specialties includes as many as 33 professions that will be particularly sought after on the labour market in Poland. Among them are: automation engineer, concrete fitter, carpenter, roofer, electro-mechanic, mechanic driver, mechatronic technician, construction fitter, earth and road works machinery and equipment operator, road construction technician, rail transport technician.

Importantly, this year's forecast indicates 4 professions that have not previously appeared on the national list, so this year's demand for employees is slightly different than the demand on the labour market for professions in 2021 and 2022. These new competitions (and professions) are:

- Industrial insulation fitter.
- Operator of machinery and equipment in waste management.
- Waste management techniques.
- Industrial insulation techniques.

## Occupations Barometer

Public employment services periodically prepare analyses of data from the employment market (employment offices).

<https://barometrzwodow.pl/en/module/publications?publication=national&year=2023>

Analysing the forecasts of the Occupational Barometer, it can be seen that the construction industry suffers in particular from staff shortages. Employers may have difficulties finding employees dealing with finishing in construction, as well as specific specialists in the field of, for example, bricklaying, plastering, or concreting and reinforcement.

Analyses of the demand for occupations and skills can also be found on employment portals.

Demand for construction workers in February 2023: Data on the current demand for employees in various construction specialties is provided by the following website:

[www.wielkiebudowanie.pl](http://www.wielkiebudowanie.pl)

The demand for workers fell by almost -40% y/y. In February, companies reported the greatest demand for construction workers in the finishing specialization (painter, filler, drywall fitter). More than 70% of companies in this industry are looking for workers in such professions. In second place is a bricklayer, fixer, carpenter (over 60%) of companies in this profession. And in third place are roofers and water, sewage and gas installers, i.e. nearly 60% of companies looking for workers in these professions.

## Slovenia

An effective strategy to upskill and retrain the construction workforce in Slovenia could include partnerships between national and regional authorities, construction companies, vocational and educational institutions and employment agencies. It could also include targeted initiatives to attract

more young people and women to the construction sector and to combat discrimination through inclusive policies and practises. Such an initiative would need to include specific training programmes and resources focused on developing the necessary green and digital skills for the construction workforce, including courses on sustainable construction techniques, green energy and construction technologies. Future policy initiatives should also consider the needs of third-country nationals working in the sector, including access to training and resources, and pathways to citizenship or permanent residence.

The construction sector has recovered from the last economic crisis, with a large number of construction projects, but the sector faces a shortage of skilled labour. Young people are less likely to work in construction and could be encouraged by more staff bursaries, more promotion of construction, higher wages and more incentives for parents. We have reintroduced the apprenticeship system, but we are disappointed with the results. Too few young people are taking up apprenticeships. If we want to have more employees in the construction sector, a worker should earn at least between 1000 and 1200 euros. This money is hard to come by because the market sets the price. This means a cost for the employer of about two thousand euros. The state of the Republic of Slovenia should ensure the continuity of infrastructure projects so that young people will also increasingly choose these professions. With the economic crisis, enrolments in construction professions have decreased. In the last ten years, enrolments have halved - from 903 students at the Ljubljana University of Construction in 2008 to 408 today. The sector needs to send a positive message that it is worthwhile to pursue a career in construction. Construction has the greatest need for foreign labour of all sectors, as shown by the high number of work permits issued. Due to the lack of domestic labour, construction companies are looking abroad, especially in the former ex-Yugoslavia republics, where they estimate that the labour pool is steadily emptying. They point out that instead of thinking about how to make it as easy as possible for foreigners to get work permits, they should also think about how to make the sector more accessible to young people.

CCIS CCBMIS as a social partner and signatory to the Collective Bargaining Act - KPGD, strongly supports and promotes lifelong education and training (Chapter F Education:) Article 43 - Article 47): <http://www.pisrs.si/Pis.web/pregledPredpisa?id=KOLP428> and in the current collective agreement, the possibility of setting up a social paritarian fund for lifelong learning and training for the individual EQF qualification levels of construction workers has been left open.

### Lack of EQF3-6 qualifications

The highest growth in the construction workforce in 2022 was in Slovenia. The labour force has grown the most since the beginning of 2019, when we launched the international project ERASMUS + CONSTRUCTION BLUPRINT. The largest contribution to the overall growth in the number of employed persons has long been the employment of foreigners, with the NACE sector of construction (48%) standing out in terms of the share of foreigners from third countries (outside the European Union) according to the statistical indicators in Slovenia in December 2022. This means that this group of workers needs the most attention and input for lifelong learning for the 3 priority topics addressed by the above-mentioned Erasmus+ project. We should also introduce a specific form of annual commitment for all economic operators in the construction sector, as we believe that these foreign workers do not have the skills and knowledge that the progressive and green European policy-oriented construction sector requires from Member States today. The current government will also have to publicly commit to how many dwellings will have to be built by the state through the various housing funds in Slovenia in the coming years and how, probably using energy efficient modular construction, which will meet the commitments of LEVELS (S) on the national indicators for sustainable construction \*+\* KGS. Slovenia must aim for access to adequate housing as a basic human right by 2030. Our strategic document for the implementation of housing policy, the National Housing Programme, sets four main goals for the period 2015-2025: a balanced supply of adequate housing, easier access to housing, quality and functional housing and increased residential mobility of the population. In line

with these goals, Slovenia adopted an amendment to the Housing Act in May this year. By adjusting the level of non-profit rents, adjusting the subsidy system and increasing borrowing from housing funds, we will provide more than 5000 additional public rental housing units by 2026.

It is estimated that ca. 20% of all construction workers (especially foreigners) per year should be trained, which means around 15,000 employees per year.

In Slovenia, 48% of the workers are foreigners, most of them from third countries, therefore, it is first needed to overcome the language barrier.

Furthermore, in the country work is still in progress for the establishment of a paritarian social fund for VET and compulsory vocational training, requiring a specific number of hours/qualifications per year. This would solve a lot of the perceived problems with obvious VET need common in CEE region: compulsory vocational training for construction workers.

### Lack of EQF7 qualifications

For the past 10 years, we have been observing a shortage of civil engineers (of all disciplines, especially structural engineers), mechanical engineers (energy engineers) and, more recently, electrical engineers in the field of building construction (design, supervision, construction management). At the moment, however, we are facing a slightly greater shortage of chartered engineers due to the long duration of the large-scale investment cycle. However, we expect that within five years the shortage of chartered engineers will reach a level where it will have a significant impact on the realisation of investment projects, to the point where some of them will even come to a standstill as a result. We base this estimate, among other things, on the membership statistics (5381 active chartered engineers) by year of birth. The statistics show that approximately 844 chartered engineers will meet the retirement condition within five years, that there are currently more than 450 retired chartered engineers active on the market who work on a part-time basis in accordance with the Labour Relations Act and that the younger generations of chartered engineers are less numerous. In particular, the 1985 generation and younger, in all disciplines, are significantly less numerous, due in our estimation to the economic crisis in 2008, which significantly reduced the volume of investment projects and the simultaneous near collapse of the Slovenian economy (also for other reasons), which resulted in lower enrolment in technical faculties.

It is estimated that within five years:

- 450 currently active retired chartered engineers ceased to be chartered engineers,
- of the 844 chartered engineers who will meet the retirement requirement within five years, only about 10% will remain active,
- the number of newly registered chartered engineers and the number of deleted chartered engineers, excluding those due to retire, is approximately the same (approx. 150 per year are registered, 150 are deleted).

This means that if we wanted to keep the same number of chartered engineers as we have today, we would need to have 1,210 new chartered engineers within five years. However, based on the number of graduates, we expect that only about 750 members will be enrolled within five years.

Based on the above, we estimate that a drastic shortage of engineers will start to become apparent within five years. The shortage will worsen each year, as the increase in enrolment in e.g. the two civil engineering faculties is barely perceptible or non-existent. A rough estimate in five years' time is that the number of active chartered engineers will fall from 5300 to 4100, and we therefore propose that

the State should start encouraging enrolment in technical faculties, promoting technical disciplines and engineering professions. We also propose to limit enrolment in other non-technical faculties and also in the Faculty of Architecture, as this would divert prospective students more towards engineering or civil engineering, which could reduce the shortage of chartered engineers in the future. We would also like to point out that some technical faculties are running programmes that do not provide the appropriate content needed to work as a chartered engineer. We therefore suggest that the quality and content of the study programmes of some technical faculties be reviewed.

Massive campaign following latest EC decisions and their requirements: MEPs back plans for a climate neutral building sector by 2050: MEPs back plans for a climate neutral building sector by 2050 | News | European Parliament (europa.eu)

Sources:

- <https://www.stat.si/StatWeb/News/Index/10992>
- [https://www.umar.gov.si/novice/novice/obvestilo/news/grafi-tedna-od-13-do-17-februarja-2023-bruto-domaci-proizvod-tekoci-racun-placilne-bilance-akti/?tx\\_news\\_pi1%5Bcontroller%5D=News&tx\\_news\\_pi1%5Baction%5D=detail&cHash=fa04f3ae4b7bde29c5dda46901cc964](https://www.umar.gov.si/novice/novice/obvestilo/news/grafi-tedna-od-13-do-17-februarja-2023-bruto-domaci-proizvod-tekoci-racun-placilne-bilance-akti/?tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=fa04f3ae4b7bde29c5dda46901cc964)
- <https://posvetnepremicnine.si/housing-2030/>
- <https://www.construction-europe.com/8028378.article>
- <https://siol.net/posel-danes/novice/slovenskim-gradbincem-mocno-primanjkuje-usposobljenih-delavcev-488760>
- [Trg dela v gradbeništvu: bodo slovenske domove gradili Indijci? | Svet24.si na najdi.si novicah](#)

## Methodology

The above estimations have been done via setting up of new paritarian fund, via internal company training academies, by special courses offered by some construction companies and as additional vocational qualification on 4 EQF level. Perhaps with support of the state, with financial contributing of such courses funding (as there was a case in some other EU).

## Spain

The Spanish Government has developed the National Recovery, Transformation and Resilience Plan to channel the European aid from the Next Generation Recovery Fund between 2021 and 2026. The plan is articulated through 4 main transversal axes which guide the 10 lever policies that determine the future evolution of the country; one of these is Policy I. Urban and rural agenda, fight against depopulation and development of agriculture, which contains Component 2. Housing rehabilitation and urban regeneration plan, which is focused on promoting actions for the rehabilitation and improvement of the building stock, both in urban and rural areas, within the strategic framework of the Spanish Urban Agenda, and ensuring maximum ambition in the field of energy and sustainability. The objective is to mobilise an investment of 11.367 billion euros from 2021 to 2023, of which 60% would come from Recovery and Resilience Mechanism funds (RRM).

The government's goal is to renovate 1.2 million homes by 2030, which is an average of 120,000 homes per year. Given that, according to the Ministry of Transport, Mobility and Urban Agenda, 25,294 renovation permits were registered in 2020, this forecast would practically increase the current number of permits fivefold in this sub-sector of construction alone. The implications of this foresight

can lead to two unintended, immediate and intimately connected consequences:

1. The construction sector may find it difficult to absorb this investment due to a lack of high-demand skilled labour, such as that required, for example, for energy refurbishment activities, which is already being felt in the sector today.

2. As a result of the foregoing, there is a risk that the Autonomous Regions will not be able to apply the funds for housing rehabilitation in an operational manner, and that these funds will remain unused due to a lack of productive capacity in the different regions.

Despite very positive employment growth prospects, there is an alarming shortage of skilled labour in construction, while at the same time the Spanish youth unemployment rate is around 30%. Also, construction remains the economic sector with the lowest number of women in employment (less than 9% in Spain).

### Estimation of workers required

According to a relevant report by Manpower Group, it is foreseen a positive evolution in construction of 2%. This number indicates that, if considering that the average Social Security affiliation in the sector during 2021 was 1,271,750, it could be estimated an immediate hiring forecast of approximately 25,435 workers. On the other hand, the Association of Real Estate Developers of Madrid (ASPRIMA) had developed a forecast of employment in the sector which estimated the creation of 2.4 jobs for each new home. Given that the estimated number of new building permits for 2021 was around 90,000, 32,958 of which had already been registered in April, an extrapolation of ASPRIMA's calculation shows that, for this number of new building permits, 70,000 new jobs would be created.

However, neither ASPRIMA nor Manpower consider the effect of the arrival of funds from the RRM, which contains a very significant allocation earmarked for the energy renovation of buildings. Some forecasts, such as that made by the National Construction Confederation (CNC), determine that the construction sector would need to reach 2,000,000 employees to meet the requirements of the Recovery, Transformation and Resilience Plan in the coming years for housing rehabilitation and urban regeneration, and indirectly in other components, which would mean an additional 700,000 employees.

Similarly, the Government estimates that the Plan with the European funds that affect energy rehabilitation in the building sector in Spain will contribute to the creation of at least 188,300 direct jobs and up to 400,000 indirect jobs. These estimates are calculated by the Refurbishment Working Group, calculated on 18 jobs per million invested in energy refurbishment.

### Estimate of workers to be trained

If we take the government's direct employment estimate as true and on the basis of the planned investment up to 2023, the following number of jobs would need to be created per year:

	2021	2022	2023
MRR funding	1.151 <sup>1</sup>	3.043	2.326
Direct employment	33.241	87.882	67.175
Indirect employment	70.614	186.687	142.699
<b>TOTAL</b>	<b>103.855</b>	<b>274.569</b>	<b>209.874</b>

*The investment forecast for the year 2021 initially set for component 2 of the Recovery, Transformation and Resilience Plan was 2,036 million euros, and has been reduced by 1,151 million euros, in accordance with Royal Decree 853/2021, of 5 October, which regulates the aid programmes for residential rehabilitation and social housing of the Recovery, Transformation and Resilience Plan. The remaining amount, i.e. €885 million, has been distributed in the calculation proposed in this report between the years 2022 and 2023 on a proportional basis, based on the government's own initial forecast for component 2.*

According to the Construction Industry Observatory, 43.3% of those employed in construction have a level of education of "First stage of secondary education and similar", so it is likely that around 40% (% also determined by the European Commission's Build Up Skills project) of the people entering construction will have this level of education, which is clearly insufficient to meet the challenge of energy rehabilitation promoted by the Plan. Applying this 40% to the estimated job creation per year, it is obtained that it would be necessary to train at least 75,320 workers until 2023:

	2021	2022	2023	TOTAL
Direct employment	33.242	87.883	67.175	188.300
Workers to be trained	13.297	35.153	26.870	75.320

## Discrepancy between current and future skills

During the project implementation period, a series of skills relevant to the construction sector have been identified, especially those related to the fields of Energy Efficiency, Circular Economy and Digitalisation.

Among other activities, a detailed study developed through the conduction of dedicated surveys on training needs carried out with the VET centres of the countries of the project revealed what professional skills were needed to upgrade the skills of construction workers in the three topics.

In the category of Energy Efficiency, it was confirmed that awareness and skills are needed around the subject of nZEB and Passiv house. Knowledge is needed around thermal insulation, energy efficient building systems (HVAC), renewable energy, as well as compliance with EU and national policies around energy efficiency of buildings and certification of buildings. Energy efficient retrofitting of buildings and historic buildings was also strongly suggested

In the category of Circular Economy, waste management is the most strongly suggested topic. Other suggested topics were related to sustainable construction, LCA, green procurement, and business models for circular economy as well as national and EU legislation concerning the circular economy.

In the category of Digitalisation, it was strongly suggested by VET centres that knowledge and awareness around the BIM method is needed. Digital tools used on the construction site, BIM software, BIM for energy efficiency and use of BIM in the overall construction process were all suggested as topics. Although, it was felt by some VET centres that there is little need for high level knowledge around BIM for EQF level 4-only checking the building drawings. Also suggested were topics around digital tools for health and safety, home automation, drones, as well as Augmented Reality and Virtual Reality.

These skills have been put down on paper and have resulted in the development of three VET curricula addressed towards workers and/or students with a qualification level between 3-5 of the European Qualification Framework (EQF), that comprehensively address these skills, structured in training modules that cover all the training needs of construction workers in these three areas.

In the case of Energy Efficiency, and in order to reach a wide range of professional profiles, the training programme was adapted to different occupations (bricklayer, roofer, carpenter, plumber, plasterer, electrician) which, according to the previous researches, appeared as the ones more in need of upskilling in terms of energy efficiency. For Circular Economy and Digitalisation, the training programmes are common to all the occupations, although they may be adapted according occupational needs, and also national ones.

Furthermore, for each VET curriculum, specific training material has also been developed.

Another Skills Needs Analysis developed in the project provides a good indication of training needs (available here). A lack of professionals, consultants and workers in energy efficiency has been identified in most countries as well as a number of skill gaps in each country where training actions are needed. A lack of skills in circular economy is confirmed in the construction sector; it is felt particularly that training on the performance of management of waste should be introduced in the national VET systems as well as specific information on the impact of construction products on the environment. As regards with digitalisation, most experts and countries focused the digital transformation of the construction industry on BIM, however, it is felt that awareness is needed

beyond that, covering other digital technologies such as robots, drones, automation, 3D printers and scanners, etc., and how BIM is combined with these other technologies.

Relevant information is also available on the PESTLE Analysis: the document provides relevant knowledge about current and future trends, therefore, allowing to define in advance the skills needs that will be present in the medium term. A good number of factsheets showing relevant information related to different topics as well as the barriers, challenges and opportunities identified are provided.

Finally, in order to find out the discrepancy between the current and future skills needs, a Skills Observatory for the construction industry has been developed, available on the Construction Blueprint project website: <https://constructionblueprint.eu/observatory/>

The information provided in the Observatory derives from the results of a dedicated survey applied to almost 2000 European construction companies, which have indicated what skills they need their staff to possess in the three areas indicated, i.e. energy efficiency, circular economy and digitalisation. These results are also detailed in a complete report available [here](#).

In order to provide a more comprehensive picture about the skills needs in the construction industry, a second survey for companies has been conducted, this time focusing on transversal skills. The results of this second survey are available [here](#). Both reports will be useful to anticipate skills needs and adapt the training offer accordingly.

It is expected that the surveys will be periodically conducted, therefore, it will be possible to obtain comparable results over time, from different countries and different years. This way, the discrepancy between the current and future skills needs will be clearly established.

