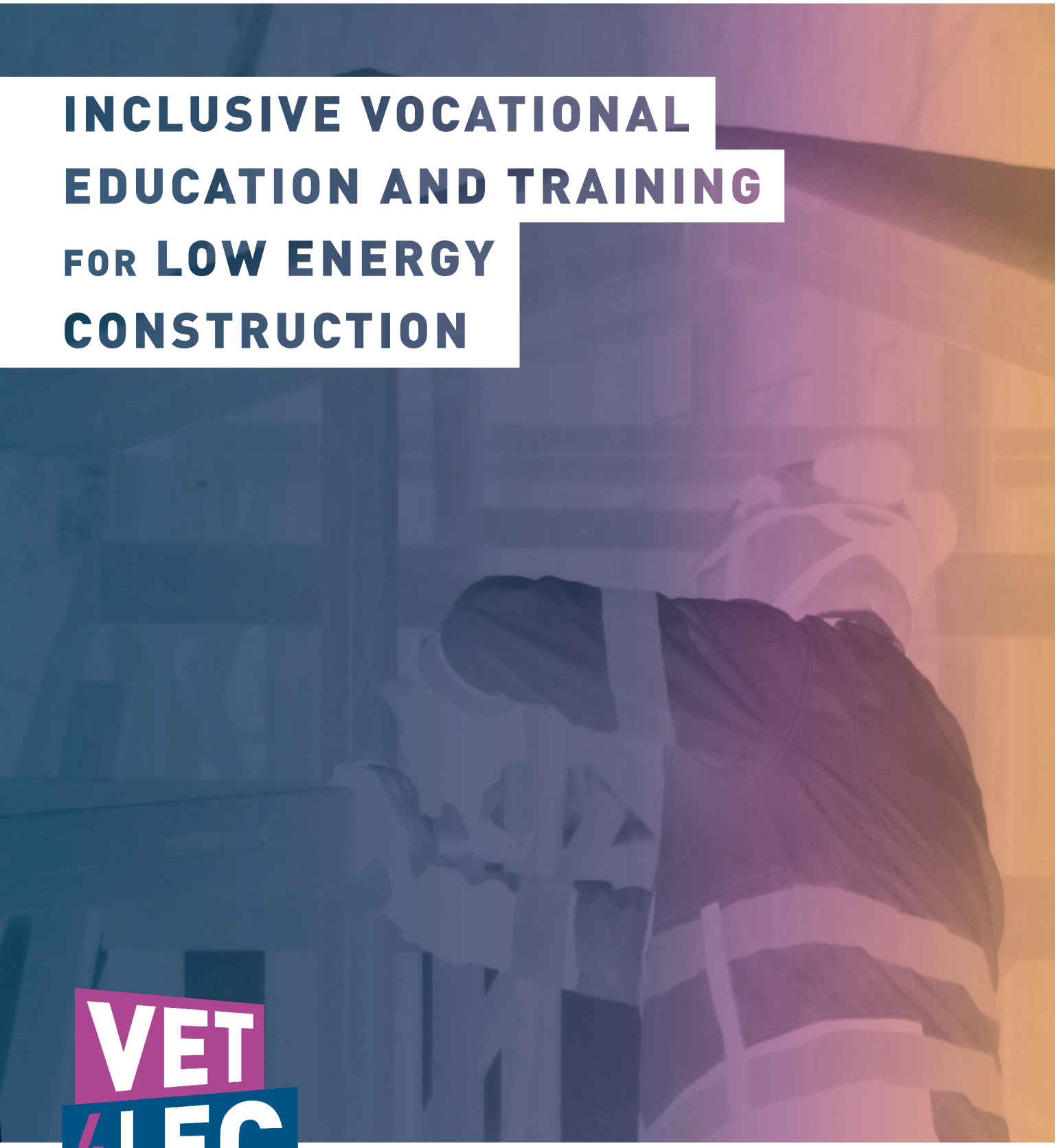
INCLUSIVE VOCATIONAL EDUCATION AND TRAINING FOR LOW ENERGY CONSTRUCTION



VET 4LEC

COUNTRY SUMMARY POLAND
FEBRUARY 2019

European Federation
of Building
and Woodworkers

EFBWW

FIEC

THIS SUMMARY was prepared by the research team,
based on the Polish national report produced by Budowlani.

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A SOCIAL DIALOGUE PROJECT (REF.: VS2016/0404) UNDERTAKEN BY

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COVER PHOTO: Carpentry trainee at Vantaa Vocational College/Finland

Project carried out with the financial support of the European Commission.

This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

POLAND

Construction Industry

The Construction industry generated 6.1% of GDP in 2016, a figure that has fluctuated in the last 10 years between 6% and 8%. The value of the market is €26 billion. Non-residential construction represents 43% of the value of construction works, engineering 33% and residential construction 24%. The estimated rate of undeclared work is very high. Construction companies number approximately 480,000 (2015), though this changes constantly as micro companies are not sustainable for long periods. Nearly 98% of companies employ fewer than nine people, only 1,300 employ over 49,200 over 250. There are no more than 10-12 companies able to coordinate the execution of large contracts.

Construction workforce

According to 2016 figures, the construction sector employs 853,000 people, including 630,000 employed 'on the basis of an employment contract'. The characteristics of the workforce are:

- *Gender:* About 9% are women, found mostly in administration, finance, HR and middle and higher supervision positions. 88,700 workers are employed in finishing works[1].
- *Migrants:* There are 260,000 migrant workers, 98% of whom are from Ukraine. They are legally employed, usually on the basis of an employment contract. Ukrainians include highly qualified workers, but their qualifications are not recognised in Poland.
- *Skill shortages:* There is a chronic shortage of workers and 10,000 specialists are needed, a figure considered to be an underestimate. Around 200,000 Polish construction workers work in other European Union countries where wages are much higher and employment more stable. During periods of high activity, around 150,000 additional workers – both skilled and unskilled, Polish and Ukrainian – work in the industry with no regular employment relationship.
- *Qualification levels:* Those with qualifications acquired in vocational schools hold only an estimated 30% of jobs requiring Level 3 and 4 qualifications.

Vocational Education and Training (VET) system

Initial Vocational Education and Training (IVET) is the responsibility of the Ministry of National Education, which sets out the policy. Other ministries are responsible for specific occupations in their field. The management and administration of VET operates at three levels: national (ministries), regional and district authorities. Social partners can be invited to give their opinion on planned changes but their involvement is limited. In 2017, the Sectoral Council for Competence in the Construction Industry, operational since 2017, represented 26 institutions including employer organisations and the trade union *Budowlani* and is expected to enhance joint working and develop a framework for improving VET in the sector as well as contribute to policy formation. The council led the development of a Sectoral Qualifications Framework (SQF) in Construction, focused mainly at level 4 and above, and aimed to strengthen project management and supervisory capacity in a way suitable for LEC. Currently this framework, developed by the social partners, awaits government recognition

Formal VET is provided at upper-secondary and post-secondary non-tertiary levels and is mainly school based, combining general and vocational education. There is a very small dual-apprenticeship stream. In 2016, only 2,085 graduates from vocational schools entered the industry. VET is not popular because it is a relatively long, theory based education with little financial returns (pay is low in the industry and no better for those with qualifications compared to those

1 Detailed data on all construction occupations are not available. A 2014 survey provides data on 'construction and related workers', which exclude electricians, and cover those involved in 'raw state works' and 'finishing'.

without), and employers, in turn, claim that VET schools do not prepare students for the construction site. There is permeability between pathways (VET and general education). VET schools have some autonomy to choose one of two optional curricula; a subject oriented or a modular one. A register of occupations classifies and defines separate qualifications for every occupation at upper secondary and post-secondary level. There is a need to increase employer engagement in organising practical training in VET. Since 2016, the VET system has undergone structural changes. Two different types of VET schools are being created: a two-stage industry school of 2/3 years and a five-year technical college. The number of EQF Level 3 and Level 4 qualifications will be limited and more higher level qualifications created. The small dual apprenticeship element will also be developed, to be provided by the Polish Craft Association.

CVET provision is fragmented and limited. Poland has one of the lowest rates of adult lifelong learning in the EU. IVET schools now also offer courses to adults. Other options include occupational skills courses for specific learning outcomes or courses organised in cooperation with labour offices. Introduced in 2015, the Integrated Qualifications System (IQS) enables the recognition of all types of learning, provided these non-formal courses meet the criteria in the Polish Qualifications Framework.

Polish Build Up Skills – LEC training needs

The Build Up Skills Status Quo Analysis (SQA) estimated that over 60,000 workers need to be trained by 2018, 20,000 in energy efficiency and 43,400 in RES. There are some significant barriers to achieving these targets. Following the closure of vocational schools in the 1990s, the existing provision of vocational education provided in general profile schools is too fragmented to amount to a national VET system. In terms of content, the courses on offer and the materials used are out of date. Schools do not have the resources to keep up with developments in EE and RES. There is limited cooperation between schools and businesses with insufficient internship/practical placement opportunities. Further education opportunities are limited and the existing courses are not standardised. Short courses are popular with employers and employees, but these are difficult to monitor. The Roadmap recommends that quality standards should be introduced for the entire VET system that should be more interdisciplinary, include more practical training, and be better financed so that training in EE and RES can be developed or acquired abroad. Training of teachers should also be improved. These VET-related measures need to be supported by broader economic and institutional measures such as setting up a national registry of qualified workers and companies and systems for monitoring skills needs and quality standards, as well as institutionalising the enforcement of NZEB implementation.

VET for LEC developments

The national report advises that two low energy related qualifications are currently available in Poland in the formal education pathway: Installation of Equipment and Systems for Renewable Energy; and Operation of Equipment and Systems of Renewable Energy Sources (EQF Level 3). The core curricula, introduced in 2012 and intended to be strengthened in the re-structured VET, take into account energy efficiency for bricklayers, plasterers, insulation fitters, metal workers, construction technicians, drywall system installers and chimney sweeps. The SQF in Construction under development will define qualifications related to energy efficiency in buildings, at Levels 2-8. There are short, further education courses that are popular with employers and employees, but these are difficult to monitor. Courses provided by other organisations can enter into the Integrated Qualifications System (IQS), provided they meet the criteria set out in the IQS Act. Examples include: Certified Passive House Construction Master, Installer of Insulation Systems, Modern technologies in Building Industry and Execution of External Wall Insulation. Not all courses by private companies will be eligible, for example, courses by manufacturers of construction products. Courses defined by the SQF will enter onto IQS, resulting in a more unified and transferable qualifications framework.

POLAND – NZEB definition

OFFICIAL STATUS	In official document
RESIDENTIAL/NON-RESIDENTIAL	✔
SINGLE FAMILY HOUSES	✔
APARTMENT BLOCKS	✔
OFFICES	✔
EDUCATIONAL BUILDINGS	✔
HOSPITALS	✔
HOTELS/RESTAURANTS	✔
SPORT FACILITIES	✔
WHOLESALE AND RETAIL	✔
BUILDING TYPOLOGY	New/retrofit
BUILDING CLASS	Private/public
BALANCE	-
PHYSICAL BOUNDARY	Building unit
HEATING DHW	✔
VENT, COOL, A/C	✔
AUXILIARY ENERGY	✔
LIGHTING	✔
PLUGS, IT, APPLIANCES	-
CENTRAL SERVICES	-
ELECTRIC VEHICLES	-
EMBODIED ENERGY	-
ON-SITE RES	✔
OFF-SITE RES	✔
EXTERNAL GENERATION	✔
CREDITING	-
PRIMARY ENERGY INDICATOR (kWh/m²/y)	✔

Source: based on European Commission (2016a) *Synthesis Report on the National Plans for Nearly Zero Energy Buildings*, JRC Science for Policy Report

Initiatives related to VET for LEC

BROAD (2015-2017) is an EU funded project in which Poland participated. The project was led by FILLEA CGIL (Federation of Wood, Building and Allied Industry Workers) of Italy, which sought to develop social dialogue in the construction sector with a view to supporting the green transformation of the construction industry in Italy and Europe as a whole. The project involved a review of the development of green building in the partner countries of Italy, Poland, Spain, Belgium and Germany with a focus on similarities and divergences in regulatory aspects, policies and economic and construction sector employment contexts and industrial relations experiences. It also developed suggestions and recommendations for strengthening the role of social dialogue in the transition to a low-carbon economy.

National NZEB definition

According to the European Commission's Joint Research Centre for Policy Report (EC 2016a), Poland's NZEB definition has been included in an official document.

In its definition, Poland defines NZEB for both residential and non-residential buildings and includes eight specific subcategories: single family houses, apartment blocks, offices, educational buildings, hospitals, hotels and restaurants, sport facilities, and wholesale and retail (ibid: 16: Table 4).

In terms of building typology, classification, balance type, and physical boundary, Poland refers to new buildings and renovations, private and public buildings, (does not specify), and building unit respectively (ibid: 17-18: Figure 3).

Poland's definition includes four types of energy use: heating DHW; ventilation, cooling and A/C; auxiliary energy; and lighting (ibid: 18-19: Table 5).

With regard to the specification of generation boundaries, Poland's definition considers on-site, off-site, and external generation. Crediting has not been considered (ibid: 20-21: Table 6).

The numeric indicators of energy performance below, expressed as primary energy (kWh/m²/y) have been specified in Poland's definition (EC, 2016a: 23-26, Table 7).

POLAND – Energy performance expressed as primary energy (kWh/m²/y)

RESIDENTIAL BUILDINGS (kWh/m²/y)		NON-RESIDENTIAL BUILDINGS (kWh/m²/y)		
NEW	EXISTING	NEW	EXISTING	NOTES
65-75	n/a	45-70-190	n/a	Depending on building type.

POLAND – Intermediate targets

ALL NEW BUILDINGS			ALL NEW BUILDINGS OCCUPIED AND OWNED BY PUBLIC AUTHORITIES		
QUALITATIVE 2015 TARGET	QUANTITATIVE 2015 TARGET	NOTES	QUALITATIVE 2015 TARGET	QUANTITATIVE 2015 TARGET	NOTES
On 1st of January 2017 the technical requirements (Uvalues) and the requirements related to primary energy demand (by building category) to be increased (e.g. to 85-95 kWh/m²/y for residential buildings). Intermediate targets are specified by dates.	n/a	Reference: Ministry of Infrastructure Ordinance of 12 April 2002. It did not lead to any official register concerning the number of NZEB.	At 1st of January 2017 the technical requirements (Uvalues) and the requirements on primary energy demand (by building category) to be increased (e.g. to 60-290 kWh/m²/y for public buildings)	n/a	As other new buildings

Intermediate targets

Poland has set the intermediate targets above for all new buildings, and all new buildings occupied and owned by public authorities.

Case studies

The two Polish case studies are both non-residential, a school and an office block with ground floor retail. The following observations complement, and should be read in conjunction with, the information contained in the National Report. The report does not provide a definition for NZEB nor the primary energy performance but both case studies exhibit aspects of design expected of NZEB.

FOR CASE STUDY 1, Akademia High School, there are architect's photographs and reference to LEED Platinum. However, the High School does not appear in the LEED (Leadership in Energy and Environmental Design) database. The only reference to LEED that can be found is: 'The intention was also to obtain the highest level of certification in the LEED certification system': https://www.archdaily.com/889061/akademeia-high-school-in-warsaw-medusagroup-studio/.

CASE STUDY 2, Dominikański project Wroclaw, listed as Gold in the LEED database: https://www.usgbc.org/projects/skanska-office-dominikanski

Its LEED scores for 'Energy & Atmosphere' are shown below:

- Optimize energy performance – lighting power 0 / 5
- Optimize energy performance – lighting controls 0 / 3
- Optimize energy performance – HVAC 10 / 10
- Optimize energy performance – equipment and appliances 1 / 4
- Enhanced commissioning 5 / 5
- Measurement and verification 5 / 5
- Green power 0 / 5

The LEED scores show that the majority of 'Energy & Atmosphere' points were gained through a highly efficient HVAC system, enhanced commissioning and measurement/verification. The total score for 'Energy & Atmosphere' is just 57% of maximum points available. No information is available for fabric energy performance and no renewables (green power) were installed.

1000046233, Wroclaw, Wroclaw

Skanska Office Dominikanski

LEED ID+C: Commercial Interiors (v2009)

GOLD, AWARDED DEC 2016

SUSTAINABLE SITES — AWARDED: 17 / 21

SSc1	Site selection	5 / 5
SSc2	Development density and community connectivity	6 / 6
SSc3.1	Alternative transportation - public transportation access	6 / 6
SSc3.2	Alternative transportation - bicycle storage and changing rooms	0 / 2
SSc3.3	Alternative transportation - parking availability	0 / 2

WATER EFFICIENCY — AWARDED: 8 / 11

WEp1	Water use reduction	REQUIRED
WEc1	Water use reduction	8 / 11

ENERGY & ATMOSPHERE — AWARDED: 21 / 37

EAp1	Fundamental commissioning of building energy systems	REQUIRED
EAp2	Minimum energy performance	REQUIRED
EAp3	Fundamental refrigerant Mgmt	REQUIRED
EAc1.1	Optimize energy performance - lighting power	0 / 5
EAc1.2	Optimize energy performance - lighting controls	0 / 3
EAc1.3	Optimize energy performance - HVAC	10 / 10
EAc1.4	Optimize energy performance - equipment and appliances	1 / 4
EAc2	Enhanced commissioning	5 / 5
EAc3	Measurement and verification	5 / 5
EAc4	Green power	0 / 5

MATERIAL & RESOURCES — AWARDED: 5 / 14

MRp1	Storage and collection of recyclables	REQUIRED
MRc1.1	Tenant space - long-term commitment	1 / 1
MRc1.2	Building reuse - maintain interior nonstructural elements	0 / 2
MRc2	Construction waste Mgmt	2 / 2
MRc3.1	Materials reuse	0 / 2
MRc3.2	Materials reuse - furniture and furnishings	0 / 1
MRc4	Recycled content	1 / 2
MRc5	Regional materials	1 / 2
MRc6	Rapidly renewable materials	0 / 1
MRc7	Certified wood	0 / 1

INDOOR ENVIRONMENTAL QUALITY — AWARDED: 8 / 25

EQp1	Minimum IAQ performance	REQUIRED
EQp2	Environmental Tobacco Smoke (ETS) control	REQUIRED
EQc1	Outdoor air delivery monitoring	1 / 1
EQc2	Increased ventilation	1 / 1
EQc3.1	Construction IAQ Mgmt plan - during construction	1 / 1
EQc3.2	Construction IAQ Mgmt plan - before occupancy	0 / 1
EQc4.1	Low-emitting materials - adhesives and sealants	1 / 1
EQc4.2	Low-emitting materials - paints and coatings	1 / 1
EQc4.3	Low-emitting materials - flooring systems	1 / 1
EQc4.4	Low-emitting materials - composite wood and agrifiber products	0 / 1
EQc4.5	Low-emitting materials - systems furniture and seating	0 / 1
EQc5	Indoor chemical and pollutant source control	0 / 1
EQc6.1	Controllability of systems - lighting	0 / 1
EQc6.2	Controllability of systems - thermal comfort	0 / 1
EQc7.1	Thermal comfort - design	1 / 1
EQc7.2	Thermal comfort - verification	1 / 1
EQc8.1	Daylight and views - daylight	0 / 2
EQc8.2	Daylight and views - views	0 / 1
EQpc123	Designing with Nature, Biophilic Design for the Indoor Environment	REQUIRED
EQpc124	Performance-based IAQ design and assessment	REQUIRED

INNOVATION — AWARDED: 3 / 6

IDc1	Innovation in design	2 / 5
IDc2	LEED Accredited Professional	1 / 1

REGIONAL PRIORITY — AWARDED: 4 / 4

EAc1.2	Optimize energy performance - lighting controls	0 / 1
EAc1.3	Optimize energy performance - HVAC	1 / 1
EAc2	Enhanced commissioning	1 / 1
EAc3	Measurement and verification	1 / 1
WEc1	Water use reduction	1 / 1

TOTAL	66 / 110

40-49 Points	50-59 Points	60-79 Points	80+ Points
CERTIFIED	SILVER	GOLD	PLATINUM

CASE STUDY 2: LEED Scores
Source: https://www.usgbc.org/projects/skanska-office-dominikanski

CASE STUDY 2: Dominikanski
Source: https://group.skanska.com/projects/140284/Dominikanski

VET for LEC visit to Poland: Summary Report

The visit to Poland took place 29-31 January 2018, involving interviews at:

- Budowlani, construction trade union
- Gypsum Employers Association
- Skanska HQ in Warsaw
- Institute for Renewable Energy
- Siniat Training Centre, outside Warsaw

Partitioning and insulation in Siniat training centre

VET for LEC developments

The construction trade union Budowlani, which has 11,000 members and also organises workers in wood, forests and in environmental activities, leads the Construction Sectoral Qualification Framework (SQF). This is a project in partnership with the construction employers' association and through government contract, aiming to establish an integrated qualification system, formal and non-formal together, and ultimately an (occupational) labour market. Construction SQF is being constructed by a body of 26 members, including the Chamber of Civil Engineers, teachers, and private trainers, under the supervision of the ministry. Though focused on curricular requirements at EQF 4+ and going up to level 8, the SQF will provide a template for curriculum design throughout construction, with LEC requirements also embedded in levels 2- 3. The government has the authority to establish formal pathways for qualifications (14-15 in construction) from EQF levels 3-5. On the agenda are also the training of LEC competences and retraining (CVET) experienced workers to become energy building auditors, advising homeowners and preparing funding applications.

VET Schools and Training Centres

Public VET schools tend to be organised around sectors and oriented to the local market, with obligatory practical training. VET is over 3 years, including 1,248 hours tuition time and 40% practical, which can take place in workshops. Though there is a national curriculum, the choice of the kind of training depends on schools and thus VET is organised locally to fit local labour markets rather than through formal profiles. Whilst the quality profile for LEC is broadly supported, companies want to raise standards themselves and so set up training centres to handle the issue on a firm-specific basis. There are over 300 companies in the Polish association of training companies. Skanska, for instance, has a training team to train its own workers in what they are responsible for, though no certification is issued. Subcontractors are responsible for training their own workers and every new subcontractor is inducted on site. Material producers are also leading trainers, for example Siniat, the result of the merger between the cement giants, Lafarge and Holzim, which produces gypsum products. Its training centre provides users with knowledge of its products and is chiefly aimed at builders, who do not pay for the course (typically two days, one day theory and one day practice). Both employers and employees attend the courses and altogether 2,500 have been trained here and elsewhere, including 300 teachers from vocational schools. Typical occupations

include: installers, dry wall fitters, insulators, interior design and suspended ceiling fitters, architects, project managers, quantity surveyors. There is also training for Passivhaus builders.

Labour market issues

There is good collaboration between the three unions involved in construction – Budowlani, Solidarnosc and Solidarnosc 80, which cooperate with employers and government in tripartite structures, though it is difficult to get legally binding collective agreements and easier to discuss non-binding wage arrangements related to qualifications and outside the labour code framework. There are 14 regional structures in Poland, but wage negotiations take place at company level for employers with more than 10 employees and there is a diminishing number of collective agreements. There are approximately 200,000 (25% of the total) migrants in the construction workforce, mainly from Ukraine. No more than 30% of all Polish construction workers have received formal IVET, though in large companies about 40% have formal qualifications. The majority of workers are nevertheless qualified, often through company-based qualifications. There is an unlimited range of subcontractors, but all large projects are carried out by non-Polish firms; the aim of the unions is to cap the subcontracting chain to no more than 5 levels. Poland also has a lot of companies and about 20-30 factories engaged in modular construction, but this is mainly an export market.

NZEB implementation

There are various barriers to the implementation of LEC, including local regulations, legal constraints, financial and technical barriers, and lack of investment know-how and productive capacity. There is currently a very small domestic market and the government is not touching the problem. In 2012 a National Certification Scheme for installers was introduced and in 2015 the Renewable Energy Act incorporated this requirement and made provision to certify trainers and companies responsible for the organisation of training through a course of 1-2 weeks. There are now about 2,500 heat pump installers as well as certificates for photovoltaic, heat storage and solar collector installers. However, installers find it more difficult to find work than in the past as LEC is not popular, especially in housing, and there is a need to support local producers through government subsidies for housing.

Skanska, which has both a property and a construction arm in Poland and employs a Sustainability Manager, is currently building a new headquarters in Warsaw according to LEC principles. It was the first western construction company, taking over the former state construction company and now employing 6,000 workers in Poland, mainly engineers but also some site operatives though no apprentices. Skanska is one of the few organisations with a 'green agenda', seeking to analyse how building contributes to carbon emissions and carrying out airtightness testing of prefabricated components. Skanska recycles the asphalt it produces, reuses excavated soil and excess concrete on site or elsewhere, provides induction into LEC on site, recycles component waste, and employs a designated person responsible for health and safety and the environment. Skanska initiated LEED and BREEAM standards in Poland, all offices are LEED and residential buildings BREEAM certified, assessors are employed and detailed emission data collected. Skanska is adapting EPBD standards compliant to BIM and also provides BIM training, though it is difficult to get subcontractors to use.

Heat pumps are available for water and space heating and there is now 5Gw solar capacity, though the government subsidy to extend solar capacity was discontinued in 2017. In 2015, tariffs were introduced for electricity generated through renewable methods but the government is now promoting district heating schemes, as well as coal. In 2013 35,000 people were employed in renewable energy but now only 13-17,000 because there is no market for its products.

Skanska office