

CEN Workshop Agreement TRAIN4SUSTAIN and its digitalisation on the Skills Registry Platform



What's a CEN Workshop Agreement (CWA)?

The CWA is a regulatory document that works as prestandardization process, leading to get a technical deliverable which can be the basis for a European or international standard at a later stage.

The CWA is valid for 3 years after which, participants are asked to:

- Confirm it for 3 years more (the maximum validity is 6 years);
- Revise it;
- Withdraw it.





TRAIN4SUSTAIN CEN Workshop Agreement

A party interested in developing a CWA reaches out to a CEN Member or to CEN CENELEC Management Centre (CCMC).























CEN/WS TRAIN4SUSTAIN

The title of the CEN/WS of TRAIN4SUSTAIN:

"TRAIN4SUSTAIN Competence Quality Standard"



CEN/WS TRAIN4SUSTAIN N 15

CEN/WS TRAIN4SUSTAIN "TRAIN4SUSTAIN Competence Quality Standard"

Secretariat: UNI

Secretary: Rossi Fabio Mr







CEN/WS TRAIN4SUSTAIN: topic

CEN/WS "TRAIN4SUSTAIN Competence Quality Standard"



The TRAIN4SUSTAIN project aims to foster a common understanding of sustainability competences (degree of utilization of knowledge and skills) across Europe by implementing a transnational Competence Quality Standard (CQS) to evaluate, scoring and report in a comparable way the level of competence, skills and knowledge of professionals and craftsmen.

To this end, comparability of qualifications and competences is key for increased transparency and penetration power in the market, avoiding confusion and uncertainty.





The CQS' framework is **structured in 4 modules** (Dimensions) and subsequent sub-modules:

Level 1 – Thematic Fields

Level 2 – Macro Areas of Expertise

Level 3 – Areas of Expertise

Level 4 – Learning Outcomes

Three of them are "vertical" and correspond to the dimensions of sustainable development as identified in the Agenda 2030 of United Nations: Environment, Society and Economy.

The fourth dimension, Process, is "horizontal" and deals with the competences necessary to design, construct and operate a sustainable building.





LEVEL 1 – THEMATIC FIELDS

Thematic Fields represent macro sustainability subjects in relation to the 4 Dimensions of the framework.

	Environment			
Г	EN	Energy		
	WA	Water		
	MA	Materials		
	НА	Habitat		
	Society			
	CO	Comfort and well being		
	SA	Safety		
	AC	Accessibility		
	МО	Mobility		
	Services			
	AD	Adaptation and resilience to climate		
		change		

Econ	Economy			
EQ	Economical Quality			
Proce	ess			
BD	Sustainable Building Design			
ID	Innovative digital solutions			
SC	Sustainable construction			
MN	Maintenance and operating			
BE	Built Environment Certification systems			
IS	Interdisciplinary Skills			
LD	Listed Buildings			



LEVEL 2 – MACRO AREAS OF EXPERTISE

Macro Areas of Expertise represent a particular aspect pertaining to the Thematic Fields.

	Environment				
Ц	EN	Energy			
	EN1	Energy Performance Assessment			
	EN2	Energy Management			
	EN3	Energy Production			
Ш	EN4	Energy Reduction			
	WA	Water			
П	WA1	Water efficiency			
Ц	WA2 Effluents management				
	MA	Materials			
П	MA1	Design for Deconstruction, reuse and recycling			
	MA2	Sustainable materials			
Ц	MAS	Solid waste			
	НА	Habitat			
П	HA1	Land Use			
HA2 Biodiversity					

Society	Society			
СО	Comfort and well being			
CO1	Indoor air quality			
CO2	Thermal comfort			
CO3	Visual comfort			
CO4	Acoustic comfort			
CO5	Electromagnetic pollution			
CO6	Ergonomics			
SA	Safety			
SA1	Fire protection			
SA2	Earthquake			
AC	Accessibility			
AC1	Barrier free accessibility			
МО	Mobility			
MO1	Alternative mobility			
SE	Services			
SE1	Communication			
SE2	Services for inhabitants			
AD	Adaptation and resilience to climate change			
AD1	Climate change resilient buildings			





LEVEL 2 – MACRO AREAS OF EXPERTISE

Macro Areas of Expertise represent a particular aspect pertaining to the Thematic Fields.

Econon	Economy		
EQ Economical Quality			
EQ1	Cost planning and management		
EQ2	Green value		
EQ3	Financing schemes and business models		
EQ4	Operative costs		

	Process				
	BD	Sustainable Building Design			
	BD1 Integrative design				
	ID	Innovative digital solutions			
	ID1	Building Information Modelling			
	ID2	District Information Modelling			
	ID3	GIS Systems			
	ID4	Lean Management			
	ID5	Measuring			
	ID6	Digital Twins			
	SC	Sustainable construction			
	SC1	Sustainable construction management			
MN Maintenance and operating		Maintenance and operating			
MN1 Maintenance		Maintenance			
	BE	Built Environment Certification systems			
	BE1	Building sustainability certification			
	BE2	Small urban scale assessment systems			
	IS	Interdisciplinary Skills			
	IS1	Procurement			
	IS2	Quality assurance			
	IS3	Collaboration and Communication			
	IS4	Information management			
	IS5	Safety Assurance			
	LD	Listed Buildings			
	LD1	Improving energy performance of listed			
n	ovation prog buildings ler grant agreement No 894514.				



LEVEL 3 – AREAS OF EXPERTISE

Areas of Expertise represent the specific subjects belonging to each Macro Area of Expertise.

They are 108.

Societ			
CO	Comfort and well being		
CO1	Indoor air quality	CO1.1 CO1.2 CO1.3	Low Emitting materials Indoor air pollutants management Outdoor air pollutants management
CO2	Thermal comfort	CO2.1 CO2.2	Indoor Thermal Comfort Outdoor Thermal Comfort
CO3	Visual comfort	CO3.1 CO3.2 CO3.3	Daylighting Indoor lighting Outdoor lighting
CO4	Acoustic comfort		Sound insulation Room acoustics Indoor noise management Environmental noise management
CO5	Electromagnetic pollution	CO5.1 CO5.2	Management of indoor exposure to ELF magnetic fields Management of indoor exposure to RF/MW electromagnetic fields
CO6	Ergonomics	CO6.1	Ergonomic and Active Furnishing
SA	Safety		
SA1	Fire protection	SA1.1	Risk to occupants and facilities from fire
SA2	Earthquake	SA2.1	Risk to occupants and facilities from earthquake
AC	Accessibility		
AC1	Barrier free accessibility		Accessibility of public spaces Design for All
MO	Mobility		
MO1	Alternative mobility	MO1.1	Sustainable mobility strategies
SE	Services		
SE1	Communication	SE1.1	Communication services
SE2	Services for inhabitants	SE2.1 SE2.2	Functional mix Infrastructure and connectivity
AD	Adaptation and resilience to climate change		
AD1	Climate change resilient buildings	AD1.1 AD1.2 AD1.3 AD1.4 AD1.5	





LEVEL 4 – LEARNING OUTCOMES

Learning Outcomes (LOs) are the elementary units of the CQS.

CO1.1	Low-emitting materials					
LO code	LO Description Knowledge		Skill			
CO1.1.1	Understanding the importance of low-emitting materials	Minimal knowledge of: - air pollution and its impact on human health; - hazardous substances emitted by insulation and fit-out materials.	Participating in discussions within a design team to select low- emitting materials for building insulation and fit-out products and how can be introduced into the design process.			
CO1.1.2	Selecting low-emitting materials for building insulation and fit-out products	Basic knowledge of: - air pollution and its impact on human health; - Total VOCs emitted by insulation and fit-out materials; - main standards on Indoor Air Quality (IAQ); - main ecolabel schemes for low-emitting materials certification; - simple assessment methods (selection based on product datasheets).	Selecting low-emitting materials for building insulation and fit-out products considering the emission classes declared in technical datasheets with respect to VOCs and other hazardous substances.			
CO1.1.3	Proposing source control strategies with respect to building insulation and fit-out products	Medium knowledge of: - air pollution and its impact on human health; - metrics on Total VOCs, CMR VOCs, formaldehyde; - main standards on Indoor Air Quality (IAQ) and air pollutants emission from construction materials/products; - main ecolabel schemes for low-emitting materials certification; - design strategies to control indoor pollution sources.	building area) and user expectation levels related to IAQ.			
CO1.1.4	Engineering source control strategies with respect to building insulation and fit-out products	Advanced knowledge of: - air pollution and its impact on human health; - state-of-the-art on metrics for Total VOCs, CMR VOCs, formaldehyde; - all relevant standards on Indoor Air Quality (IAQ) and air pollutants emission from construction materials/products; - all relevant ecolabel schemes for low-emitting materials certification; - design strategies to control indoor pollution sources based on ventilation methods, occupancy behaviour and selection of low-emitting products; - advanced software based on CFD models for assessing air pollutant concentration.	Engineering strategies to control indoor pollution from building insulation and fit-out products, defining the most effective solution with respect to building constraints (e.g. renovation projects), cost/benefit analysis, standard requirements on IAQ. Achieving concentration reductions of TVOCs and other hazardous substances with natural or mixed ventilation techniques besides the selection of low-emitting materials. Performing IAQ analysis by means of dynamic simulations based on Computational Fluid Dynamic (CFD) models.			
CO1.1.5	Optimising source control strategies with respect to building insulation and fit-out products	In-depth knowledge of: - air pollution and its impact on human health; - state-of-the-art on metrics for Total VOCs, CMR VOCs, formaldehyde; - all relevant standards on Indoor Air Quality (IAQ) and air pollutants emission from construction materials/products; - all relevant ecolabel schemes for low-emitting materials certification; - design strategies to control indoor pollution sources based on ventilation methods, occupancy behaviour and selection of low- emitting products; - advanced software based on CFD models for assessing air pollutant concentration.	Optimising the design strategies to reduce indoor pollution from fit- out products with respect to indoor comfort and building energy performance. Experimenting nature-based solutions (e.g. green fit-out products, green insulation materials) and innovative systems for natural ventilation to reduce concentrations of VOCs and other hazardous substances.			



LEVEL 4 – LEARNING OUTCOMES

The level of competence of a white or blue collar in relation to a specific Area of Expertise depends on the Learning Outcomes acquired through both formal, informal and non-formal training.

Learning Outcomes provide the information concerning what are the knowledge and skills necessary to achieve a certain competence's levels in relation to a specific sustainability subject (Area of Expertise).





LEVEL 4 – LEARNING OUTCOMES

For each Area of Expertise, Learning Outcomes have been developed in relation to the following aspects of knowledge and skills:

- > Fundamentals and metrics
- > Technical standards and regulations
- > Technical solutions
- > Calculation and simulation
- > Installation / Construction
- > Measurement and verification
- Operation and maintenance





LEVEL 4 – LEARNING OUTCOMES

For each LOs is reported additional information concerning:

- The concerned Work Field (white and/or blue collars)
- The **project's stage** in which it is used (concept, design, construction and in use)
- The **level of competence** for which it is requested (score from 1 to 5)

EN4.6	Energy saving strategies for lighting					
LO code	LO Description	Knowledge	Skill	B/W	Comp.	Project's
					Level	stage
EN4.6.1	Understanding the importance of energy saving for lighting	Minimal knowledge of: - artificial lighting for indoor spaces and its integration with daylight; - user needs and technical standard requirements.	Participating in discussions for the feasibility study of energy saving for lighting within a design team.	W, B	1	Со
EN4.6.2	Applying basic solutions of energy saving for lighting	Basic knowledge of: - photometric quantities and metrics on visual comfort; - photometric and energy performance of main light sources and luminaires; - simple calculation methods (LENI simplified calculation method, EN standard compliant).	Performing simplified calculation to assess energy saving in relation to different lighting systems.	В	2	D
EN4.6.3	Proposing conceptual solutions of energy saving for lighting	Medium knowledge of: - metrics on visual comfort in indoor workplaces; - all relevant standards on energy performance for lighting; - photometric and energy performance of light sources, luminaires and control systems; - commercial software for lighting design.	Selecting and proposing alternative lighting systems, considering the most energy efficient lamp/luminaire combination and indoor space configuration. Assessing energy performance of the lighting system by means of commercial simulation tools.	В	3	Co, D



LEVEL 4 – LEARNING OUTCOMES

Level of competence requested (score from 1 to 5)

Level of Competence	Description
1	Has little knowledge and skills with respect to the thematic area. Understands basic principles and is able to take part in project team discussions
2	Understands basic knowledge and has practical skills within the thematic area, is able to solve simple problems by selecting and applying basic methods, tools, materials and information.
3	Has comprehensive, factual and theoretical knowledge and skills within the thematic area, is capable of solving standard problems within the field
4	Has advanced knowledge involving a critical understanding of theories and principles and skills, required to solve complex and unpredictable problems in the field and is aware of the boundaries
5	Has specialized knowledge and problem-solving skills, partly at the forefront of knowledge in the field, in order to develop new knowledge and procedures and to integrate knowledge from different fields





WORK FIELDS AND PROFESSIONS

#	Work field
1	Architecture
2	Mechanical engineering (HVAC)
3	Civil engineering
4	Electrical engineering
5	Environmental engineering
6	Energy engineering
7	Construction management
8	Building management
9	Financing and procurement





WORK FIELDS AND PROFESSIONS: WHITE COLLARS

#	Work field	Reference profession(s) within the work field	Definition of the profession
1	Architecture	Architect	Architects investigate, design and oversee the implementation buildings taking into account functional, architectural, aesthetic structural, technical, regulatory, cost and contextual requirement with due regard to public health and safety. Specialization is possible on topics like construction safety, thermal performance acoustics, quality of air, daylighting.
2	Mechanical engineering (HVAC)	Mechanical Engineer	Designer of systems for HVAC and sanitary equipment, considering the limitations imposed by practicality, regulation, safety, and cost.
3	Civil engineering	Structural engineer, Civil Engineer, Construction Engineer, Service engineers	Designer of materials and structures, considering the limitation imposed by practicality, regulation, safety, and cost. Specializat is possible on topics like construction safety, thermal performance, acoustics, building physics.
4	Electrical engineering	Electrical Engineer, ICT Engineer, Building Automation Engineer, Lighting specialist	Designer of power, lighting, data and or communication installations, considering the limitations imposed by practicality regulation, safety, and cost. Designer of building automation systems, system engineer / system integrator, considering the limitations imposed by practicality, regulation, safety, and cost





APPLICABLE AREAS OF EXPERTISE PER WORK FIELD: WHITE COLLARS

Society								
СО	Comfort and well being							
CO1	Indoor air quality							
CO1.1	Low Emitting materials							
CO1.2	Indoor air pollutants management							
CO1.3	Outdoor air pollutants management							
CO2	Thermal comfort							
CO2.1	Indoor Thermal Comfort							
CO2.2	Outdoor Thermal Comfort							
CO3	Visual comfort							
CO3.1	Daylighting							
CO3,2	Indoor lighting							
CO3.3	Outdoor lighting							
CO4	Acoustic comfort							
CO4.1	Sound insulation							
CO4.2	Room acoustics							
CO4.3	Indoor noise management							
CO4.4	Environmental noise management							
CO5	Electromagnetic pollution							
CO5.1	Management of indoor exposure to ELF magnetic fields							
CO5.2	Management of indoor exposure to RF/MW electromagnetic fields							
CO6	Ergonomics							
CO6.1	Cognitive and emotional health							
CO6.2	Ergonomic and Active Furnishing							

#1 Architecture	#2 Mech. Eng.	#3 Civil eng.	#4 Electr. Eng.	#5 Envi. Eng.	#6 Energy Eng.	#7 Const Man.	#8 Build.Man.	#9 Financing	
								6t	
4	3	3	2	4	3	2	2	1	
3	4	3	2	4	4	1	1	1	
3	4	3	2	4	4	1	1	1	
3	4	3	2	3	4	1	1	1	
3	3	3	2	3	3	1	1	1	
4	3	3	3	3	3	1	1	1	
3	3	3	4	3	3	2	2	1	
3	3	3	4	3	3	2	2	1	
3	3	3	2	3	3	2	2	1	
3	3	3	2	3	3	2	2	1	
3	3	3	2	3	3	2	2	1	
2	3	3	2	4	3	1	1	1	
3	3	3	4	4	3	2	2	1	
3	3	3	4	4	3	2	2	1	
1	1	na	1	na	na	na	1	na	
1	1	na	1	na	na	na	1	na	





WORK FIELDS: BLUE COLLARS

Construction work	#	Work field	Definition of the profession
	10a	Bricklayers	Worker dealing with the construction of the building envelop
	10b	Carpenters	Worker dealing with wood construction
Duilding	10c	Façade Workers, Plasterer	Worker dealing with the façade construction and its finishing
Building	10d	Insulation installers	Worker dealing with the installation of thermal insulation
	10e	Roofers	Worker dealing with the construction of the building's roof
	10f	Window Installers	Worker dealing with the installation of windows or other
			transparent components of the building envelope
	11a	Electrical installers	Worker dealing with the installation of electrical equipment
	11b	Plumber	Worker dealing with the installation of water pipes and devices
	11c	Renewable Energy Systems Installers (Electric)	Worker dealing with the installation of renewable energy systems for producing electricity (e.g. Photovoltaic Panels)
Technical installations	11d	Renewable Energy Systems Installers (Thermal)	Worker dealing with the installation of renewable energy systems for producing heat (e.g. Solar thermal panels)
	11e	Ventilation and Air Conditioning Installers	Worker dealing with the installation of ventilation and air conditioning systems
	11f	Heating systems installer	Worker dealing with the installation of heating systems (boilers, heaters, etc.9





APPLICABLE AREAS OF EXPERTISE PER WORK FIELD: BLUE COLLARS

Societ	у
со	Comfort and well being
CO1	Indoor air quality
CO1.1	Low Emitting materials
CO1.2	Indoor air pollutants management
CO1.3	Outdoor air pollutants management
CO2	Thermal comfort
CO2.1	Indoor Thermal Comfort
CO2.2	Outdoor Thermal Comfort
CO3	Visual comfort
CO3.1	Daylighting
CO3,2	Indoor lighting
CO3.3	Outdoor lighting
CO4	Acoustic comfort
CO4.1	Sound insulation
CO4.2	Room acoustics
CO4.3	Indoor noise management
CO4.4	Environmental noise management
CO5	Electromagnetic pollution
CO5.1	Management of indoor exposure to ELF magnetic fields
CO5.2	Management of indoor exposure to RF/MW electromagnetic fields
CO6	Ergonomics
CO6.1	Cognitive and emotional health
CO6.2	Ergonomic and Active Furnishing

#10.a Bricklayer	#10.b Carpenter	#10c Façade W	#10d Insulation In	#10e Roofer	#10f Window In	#11a Electrical In	#11b Plumber	#11c Renewable E	#11d Renewable T	#11.e HVAC	#11e Heating
3	1	3	3	3	1	na	1	1	1	1	1
1	1	1	1	1	1	na	na	1	1	1	1
1	1	1	1	1	1	na	na	1	1	1	1
1	1	3	3	3	3	na	na	3	3	3	3
1	1	3	1	1	1	na	na	1	1	1	1
na	na	3	na	3	3	1	na	1	1	1	1
na	na	na	na	1	1	3	na	1	1	1	1
na	na	na	na	1	1	3	na	1	1	1	1
3	3	3	3	3	3	na	3	1	1	3	3
1	1	1	3	1	1	na	1	1	1	1	1
1	1	1	1	1	1	na	3	1	1	3	3
1	1	1	1	1	1	na	na	1	1	1	1
na	na	na	na	na	na	2	na	na	na	na	na
na	na	na	na	na	na	2	na	na	na	na	na
						-			-		
na	na	na	na	na	na	na	na	na	na	na	na
na	na	na	na	na	na	na	na	na	na	na	na





CEN/WS TRAIN4SUSTAIN: EXTRACT

Area of Expertise EN4.1 – Thermal insulation

EN4.1	Thermal insulation					
LO code	LO Description	Knowledge	Skill	Competence Level White Collar	Competence Level Blue Collar	Project's stage
EN4.1.1	Understanding the importance of thermal insulation	Minimal knowledge of: - fundamental principles of energy and heat transfer - energy regulations and technical standard requirements - thermal insulation materials	Participating in discussions for the feasibility study of thermal insulation within a design team.	1	1	Со
EN4.1.2	Applying basic solutions for thermal insulation	Basic knowledge of: - energy performance of building envelope (steady state - metrics related to thermal insulation - energy regulations and technical standard requirements - thermal insulation materials and simple technical solutions - simple calculation methods (rules of thumb, datasheet)	Performing simplified energy verification to assess thermal performances of alternative insulation solutions and their compliance with standard requirements.	2	-	D
EN4.1.3	Proposing conceptual solutions for thermal insulation	Medium knowledge of: - energy performance of building envelope (steady state) - metrics related to thermal insulation - thermal bridges and corrective measures - energy regulations and technical standard requirements - thermal insulation materials and technical solutions - commercial software for thermal analysis	Selecting and proposing alternative insulation solutions, focussing on thermal bridge analysis and correction. Assessing the resulting energy performance of the building envelope by means of commercial energy simulation tools."	3	-	Co, D
EN4.1.4	Engineering the insulation concept and thermal bridges	Advanced knowledge of: - energy performance of building envelope in dynamic and steady state - metrics related to thermal insulation - thermal mass effect, thermal bridges and corrective measures - energy regulations and technical standard requirements - thermal insulation materials and complex technical solutions - dynamic energy simulation software for thermal analysis - cost/benefit analysis	Engineering solutions for thermal insulation and thermal bridges correction, considering cost/benefit analysis and fulfilling standard requirements. Performing dynamic energy simulations of the building envelope by means of advanced simulation tools, assessing the impact of thermal insulation on indoor thermal comfort."	4	-	D
EN4.1.5	Developing new technical solutions and optimising the detailed design for thermal insulation	In-depth knowledge of: - energy performance of building envelope in dynamic and steady state - metrics related to thermal insulation - thermal mass effect, thermal bridges and corrective measures - energy regulations and technical standard requirements - innovative thermal insulation materials (e.g. phase change materials, thermal reflective insulation) and emerging technical solutions - dynamic energy simulation software for thermal analysis - cost/benefit analysis	Developing and experimenting innovative solutions for thermal insulation based on emerging technologies. Performing dynamic energy simulations of the building envelope by means of advanced simulation tools, optimizing the thermal insulation with respect to indoor comfort and sound insulation.	5	-	D





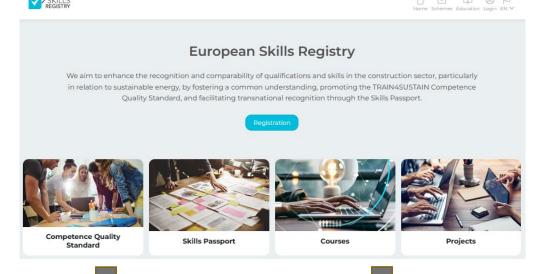
THE DIGITALISATION OF THE CEN/WS ON TRAIN4SUSTAIN PLATFORM (ESR Platform) https://skillsregistry.eu/



T4S services targeted to Specific Stakeholders



European Building
Sustainability
performance and energy
certification Hub
ECGA No 101033916
https://eubsuperhub.eu/

























T4S services targeted to Specific Stakeholders



TRAIN4SUSTAIN – Capitalisation and uptake

The Skills Registry has been linked to the national public sustainability certification system Protocollo ITACA. Around 1000 qualified experts are in the platform and their competences are reported in the Skills Passport.

The TRAIN4SUSTAIN competence quality standard is capitalised in the H2020 project EUB SuperHub to describe knowledge and skills necessary to apply the Key Performance Indicators of the next generation EPC. Training courses for professionals are delivered through the TRAIN4SUSTAIN platform. Recently around 250 professionals have been trained on the application of KPIs.

New training courses for professionals in the field of zero-emission buildings (main target of the EPBD recast) are going to be organised and delivered in Europe next year in collaboration with Cambers of Architects and Engineers. The courses will be mapped on the Skill Registry Platform and the competences reported in the Skill Passports of participants.



ECGA No 101033916 https://eubsuperhub.eu/

