

SURVEY QUESTIONNAIRE (draft version)

Current and future developments in the field of modern buildings and their systems bring in new requirements of skills and competencies of the building maintenance operators and technicians. The project GeTinVET aims to identify the skills required for these employees and to develop cross-trade learning situations to teach these skills.

We would be thankful if you could contribute to the attainment of this goal by critically revising the current and future skills needs by answering the questionnaire below.

Part 1 – General Questions

1. Which areas is your company active in? (multiple answers possible)

- Designing and planning of buildings
- Construction of buildings
- Repair and maintenance
- Installation of technical building equipment (TGA)
- Technical building management

2. Which specific area is your company focused on? (multiple answers possible)

- Electricity
- Facades
- Plumbing
- Heating Systems
- Cooling Systems
- Heat pumps
- Roof works
- Ventilation
- Windows
- Doors
- Producers/Suppliers
- Others

3. How many employees does your company employ?

- 1-9 employees
- 10-49 employees
- 50-249 employees
- more than 250 employees

4. Where is your company located

- Finland
- Germany
- Italy
- Lithuania
- Netherlands

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- Spain

Part 2 – The importance of networking and collaboration between different trades in building services

1. Does your company network and collaborate with other trades on the construction site and / or providing building services?

- Yes
- No
- Don't know

2. If yes, with which trades do you work closely?

- plumber
- electrician
- construction
- woodworking
- architects
- plant mechanic
- bricklayer
- roofer
- painter
- Other (please enter)
- Don't know

3. To what extent your collaboration with other trades is productive? Please assess in the scale from 1 to 10 (where 1 – the lowest score and 10 is the highest score)

1	2	3	4	5	6	7	8	9	10
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4. How important are the following interdisciplinary and cross-trade competences for your employees:

Statement	Important	Neither important nor unimportant	Unimportant	Don't know
The ability to recognize and understand relationships, to analyse complex systems, to deal with uncertainty				
A basic knowledge about the different technical systems in a building and their interconnection				
Understanding multiple disciplines including engineering, computer science, electronics and control systems				
Combining expertise in different trades to implement innovation				
The ability to integrate and automate various building systems				
The ability to identify, analyze and resolve complex technical tasks				
The ability to collect, analyze and interpret data from various sensors to optimize building performance				
The ability to communicate and collaborate with employees from other trades				
<i>Please give other examples of interdisciplinary and cross-trade competences in the field of building service engineering:</i>				

5. Do you think there are benefits and opportunities in a more integrated approach?

- Yes
- No

If yes, give examples:



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Part 3 - Professional situations and work processes

1. Please select a professional situation (or several professional situations) that are typical for your company and answer corresponding survey questions.

Professional situations	Characteristics of professional situation	Survey question
1. Installation of hybrid heating system	During the energy refurbishment of an existing building, a hybrid heat pump for heating and hot water production is to be installed and set into operation.	<ol style="list-style-type: none"> 1. Is the installation of hybrid heating systems relevant for your company? • Yes • No • Don't know 2. Do you need people from different professions to install the hybrid heating system? • Yes • No • Don't know 3. Can this be performed by one profession with multidisciplinary knowledge? • Yes • No, this work requires different professions • Don't know 4. If yes, do you encounter these obstacles? <ol style="list-style-type: none"> a. Legal constraints b. Lack of people in labour market c. Lack of education d. Labour costs e. Work time flexibility f. Other (add comment)
2. Renewable energy	For the energy-efficient heat supply of a new residential building, a heat pump should be properly dimensioned, selected and procured, installed and optimized by adjusting the control parameters during ongoing operation.	<ol style="list-style-type: none"> 1. Is the installation of heat pump systems relevant for your company? • Yes • No • Don't know 2. Do you need people from different professions to install the heat pump systems? • Yes • No • Don't know

		<p>3. Can this be performed by one profession with multidisciplinary knowledge?</p> <ul style="list-style-type: none"> • Yes • No, this work requires different professions • Don't know <p>4. If yes, do you encounter these obstacles?</p> <ol style="list-style-type: none"> a. Legal constraints b. Lack of people in labour market c. Lack of education d. Labour costs e. Work time flexibility f. Other (add comment)
<p>3. Installation of solar thermal systems on the roofs of buildings.</p>	<p>Contains elements of:</p> <ul style="list-style-type: none"> ➤ Supply engineering: Installation, connection, and commissioning of solar thermal collectors. ➤ Electrical engineering: Installation and connection of pumps and electrical sensors. ➤ Construction technology: Opening of the roof to attach the collectors, openings for cable routing. ➤ Building Automation: Integration of measured parameters from the collectors into the heating control system. ➤ Information technology: Recording, processing and forwarding of measurement data and operating states, including to mobile end devices. 	<p>1. Is the installation of solar thermal systems relevant for your company?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>2. Do you need people from different professions to install solar thermal systems?</p> <ul style="list-style-type: none"> • Yes • No • Don't know <p>3. Can this be performed by one profession with multidisciplinary knowledge?</p> <ul style="list-style-type: none"> • Yes • No, this work requires different professions • Don't know <p>4. If yes, do you encounter these obstacles?</p> <ol style="list-style-type: none"> a. Legal constraints b. Lack of people in labour market c. Lack of education d. Labour costs e. Work time flexibility f. Other (add comment)

<p>4. Building automation</p>	<p>Installation and commissioning of sensors and actuators for the automation of building processes in e.g. office and commercial buildings, greenhouses, private residential buildings, etc. (Installation and configuration of a control system to check functional parameters of a greenhouse). Contains elements of:</p> <ol style="list-style-type: none"> 1. Electrical engineering: installation and connection of sensors (air temperature and humidity, soil moisture, leaf pH, natural and artificial lighting...) 2. Botany: Correct application of sensors to leaves 3. Construction technology: network cabling, cable routing and wiring system 4. Electronic engineering: installation of a microcontroller that imports and analyses data and connecting the sensors 5. Computer science engineering: microcontroller programming) 	<ol style="list-style-type: none"> 1. Is the installation and commissioning of sensors and actuators for the automation of building processes relevant for your company? 2. Do you need people from different professions to install sensors and actuators for the automation of building processes? 3. Do you think that this could be done by persons of one profession with multidisciplinary knowledge? 4. If yes, why aren't you doing it that way? <ol style="list-style-type: none"> a. Legal constraints b. Lack of people in labour market c. Lack of education d. Labour costs e. Flexibility f. Other (add comment)
<p>5. Troubleshooting in building systems and building installations.</p>	<p>The customer reports a cold room. Contains elements of:</p> <ul style="list-style-type: none"> ➤ Supply engineering: Checking the heating technology and the operating status. ➤ Electrical engineering: Check the energy supply of the building system. 	<ol style="list-style-type: none"> 1. Is the troubleshooting in building systems and building installations relevant for your company? 2. Do you need people from different professions to install troubleshoot building systems and building installations? 3. Do you think that this could be done by persons of one profession with multidisciplinary knowledge? 4. If yes, why aren't you doing it that way? <ol style="list-style-type: none"> a. Legal constraints

	<ul style="list-style-type: none"> ➤ Construction technology: Checking the building envelope for possible damage or cold bridges. ➤ Building Automation: Check the operating status of the central control system. Check the correct parameterisation. ➤ Information technology: Check the temperature sensors, check the transmission lines and the (radio)signals 	<ul style="list-style-type: none"> b. Lack of people in labour market c. Lack of education d. Labour costs e. Flexibility f. Other (add comment)
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4. Please check the below provided core work processes / competence areas. Are there any new /additional work processes of the **building system engineering operators and technicians** brought by interconnectedness of the technical installations, digitalization of the work processes in construction and maintenance of buildings, development and operation of energy-efficient and sustainable buildings? If so, please suggest such missing/needed core work process/competence areas.

No.	Core work process/competence area/	Professional situation				
		1. Installation of hybrid heating system	2. Renewable energy	3. Installation of solar thermal systems on the roofs of buildings.	4. Building automation	5. Troubleshooting in building systems and building installations.
1.	Assembling and dismantling of building systems or components					
2.	Service and maintenance of building systems or their components					
3.	Taking building systems or their components into operation					

4.	Monitoring and optimizing processes of building systems with the help of auto-mated installations and components					
5.	Creating concepts for (processes of) building systems or their component-/sub-processes					
6.	Identification, Realization and checking of legal requirements for the operation of building systems (operator responsibility)					
7.	Monitoring costs and controlling					
8.	Marketing					
9.	Personnel management					
10.	New work processes - please suggest:	<i>Enter new work processes:</i>	<i>Enter new work processes:</i>	<i>Enter new work processes:</i>	<i>Enter new work processes:</i>	<i>Enter new work processes:</i>