WP3. “Setting the professional skills”

Report of PEDMEDE (Greece)

January 2024

Project No: 2022-1-ES01-KA220-VET-000087862

BuildOffsiteEU

Content

Synthesis of the findings of survey on skills in national context

Executive Summary

This report is a brief analysis of the national survey in Greece for the “new” skills and competences of employees in industrialized construction, necessary for the improvement in the areas of energy efficiency and circular economy. The findings of the survey identified and established links and gaps between skills of traditional profiles and those required by industrialised construction. Moreover, provides accurate information for the construction workers re-skilling needs in this innovative field.

On this ground, 20 professionals participated in this study from the Construction and Building industry as well as the Energy efficiency and Environmental sector. The sample consisted of 16 males and 4 females, the majority of whom were civil engineers. The online survey provided a brief introduction related to the scope and the project’s objectives and it was conducted between December and January 2023 and 2024 respectively.

Key areas of investigation	National findings of the answers collected from focus groups/ interviews
1: Profile of the participants in the National survey	Participants demographics are as follows: **35%** are Civil Engineers working primarily in the Construction industry. **40%** are Employers/managers/employees of industrialised companies while 20% work as Experts in Construction and Environmental related field. **78,9%** were males at the age of 47+.

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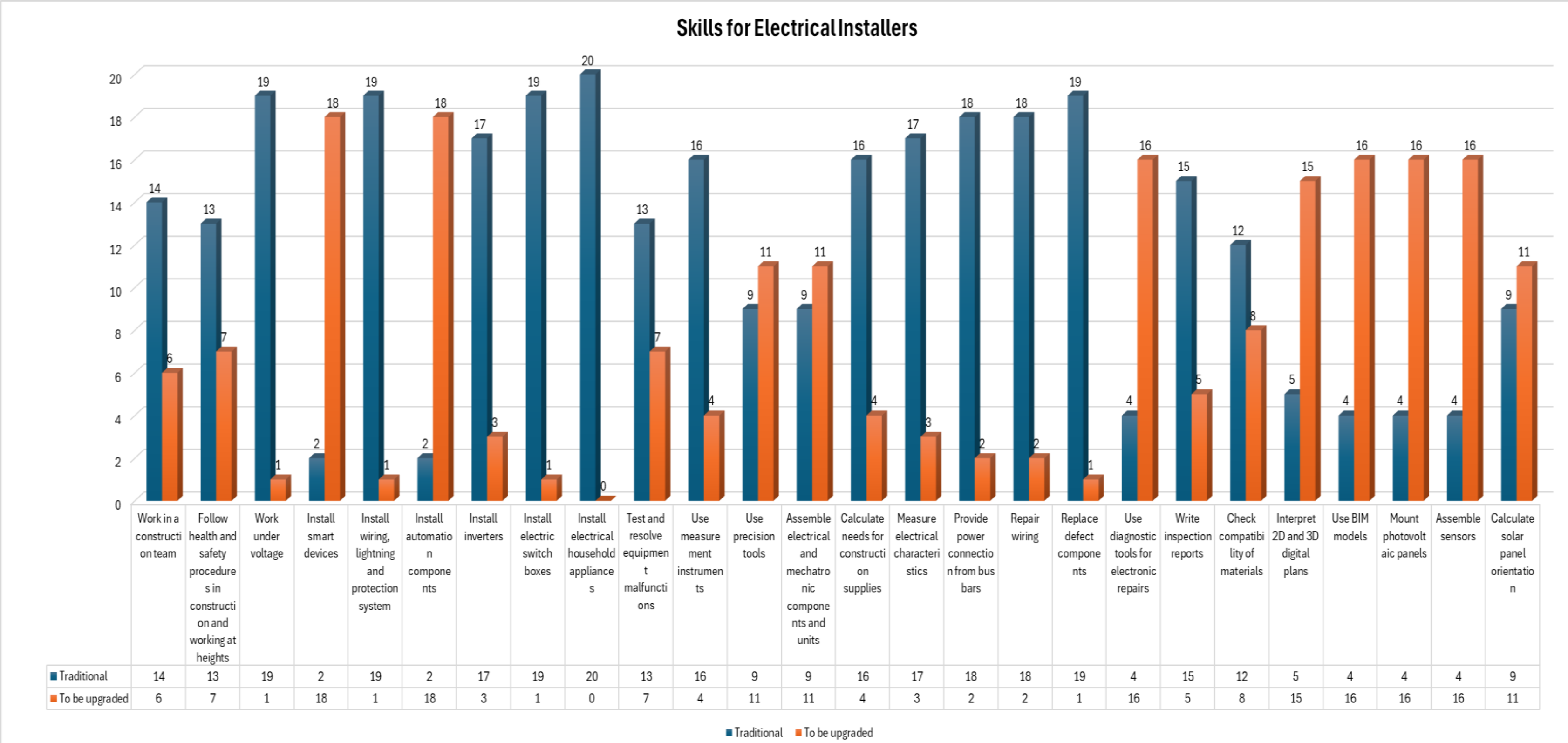
ΠΑΝΕΛΛΗΝΙΑ ΕΝΩΣΗ ΔΙΠΛΩΜΑΤΟΥΧΩΝ ΜΗΧΑΝΙΚΩΝ ΕΡΓΟΛΗΠΤΩΝ ΔΗΜΟΣΙΩΝ ΕΡΓΩΝ
PANHELLENIC ASSOCIATION OF ENGINEERS CONTRACTORS OF PUBLIC WORKS

2: **Graph 1**: Existing skills named as "traditional", and skills to be upgraded for E**lectrical Installers**



	Work in a construction team	Follow health and safety procedures in construction and working at heights	Work under voltage	Install smart devices	Install wiring, lightning and protection system	Install automation components	Install inverters	Install electric switch boxes	Install electrical household appliances	Test and resolve equipment malfunctions	Use measurement instruments	Use precision tools	Assemble electrical and mechatronic components and units	Calculate needs for construction supplies	Measure electrical characteristics	Provide power connection from bus bars	Repair wiring	Replace defect components	Use diagnostic tools for electronic repairs	Write inspection reports	Check compatibility of materials	Interpret 2D and 3D digital plans	Use BIM models	Mount photovoltaic panels	Assemble sensors	Calculate solar panel orientation
Traditional	14	13	19	2	19	2	17	19	20	13	16	9	9	16	17	18	18	19	4	15	12	5	4	4	4	9
To be upgraded	6	7	1	18	1	18	3	1	0	7	4	11	11	4	3	2	2	1	16	5	8	15	16	16	16	11

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2.1: Explanation of Graph 1.	16 skills are considered traditional (61%), while 10 skills as deemed to be upgraded.
2.2: Identification of “traditional” skills for electrical installers.	1. Work in a construction team 2. Follow health and safety procedures in construction and working at heights 3. Work under voltage 4. Install wiring, lightning and protection system 5. Install inverters 6. Install electric switch boxes 7. Install electrical household appliances 8. Test and resolve equipment malfunctions 9. Use measurement instruments 10. Calculate needs for construction supplies 11. Measure electrical characteristics 12. Provide power connection from bus bars 13. Repair wiring 14. Replace defect components 15. Write inspection reports 16. Check compatibility of materials
2.3: Identification and ranging the skills to be upgraded for electrical installers.	**Ranged skills to be upgraded (1 max., 10 min.)** **1.** Install smart devices **2.** Install automation components **3.** Use diagnostic tools for electronic repairs **4.** Use BIM models **5.** Mount photovoltaic panels **6.** Assemble sensors **7.** Interpret 2D and 3D digital plans **8.** Use precision tools **9.** Assemble electrical and mechatronic components and units **10.** Calculate solar panel orientation
2.4: Identification of main skills for electrical installers that need to be upgraded in the country related to industrialized construction, improving energy efficiency and circular economy.	• Install smart devices • Install automation components • Use BIM models • Mount photovoltaic panels • Interpret 2D and 3D digital plans

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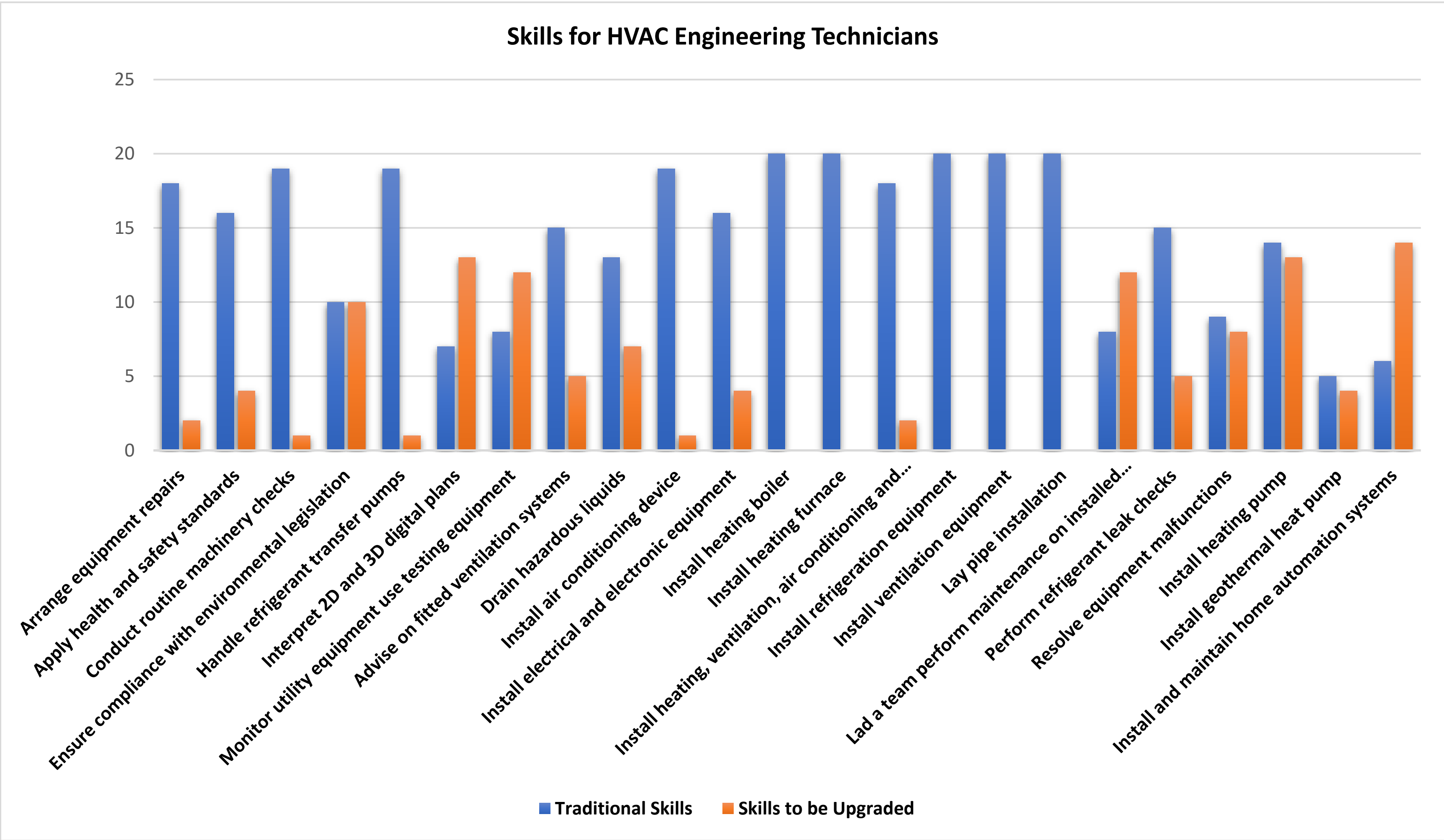
3: **Graph 2**: Existing skills named as “traditional”, and skills to be upgraded for electrical installers **HVAC Engineering Technicians**



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3.1: Explanation of Graph 2.	74% of the responses qualified as traditional 15 skills for HVAC engineering technicians while only 8 were qualified as the ones to be upgraded.
3.2: Identification of "traditional" skills for HVAC engineering technicians	1. Lay pipe installation (100%) 2. Install ventilation equipment (100%) 3. Install refrigeration equipment (100%) 4. Install heating furnace (100%) 5. Install heating boiler (100%) 6. Install air conditioning device 7. Handle refrigerant transfer pumps 8. Conduct routine machinery checks 9. Install heating, ventilation, air conditioning and refrigeration ducts 10. Arrange equipment repairs 11. Install electrical and electronic equipment 12. Apply health and safety standards 13. Perform refrigerant leak checks 14. Advise on fitted ventilation systems 15. Install heating pump
3.3: Identification and ranging the skills to be upgraded for HVAC engineering technicians	**Ranged skills to be upgraded (1 max., 8 min.)** **1.** Drain hazardous liquids **2.** Ensure compliance with environmental legislation **3.** Resolve equipment malfunctions **4.** Monitor utility equipment use testing equipment **5.** Lead a team perform maintenance on installed equipment **6.** Interpret 2D and 3D digital plans **7.** Install and maintain home automation systems **8.** Install geothermal heat pump
3.4: Identification of technical challenges/barriers and corresponding skills required for the workforce of industrialized systems, regarding the compliance in principles of circular economy and energy efficiency	16. Drain hazardous liquids 17. Ensure compliance with environmental legislation 18. Interpret 2D and 3D digital plans 19. Install and maintain home automation systems 20. Install geothermal heat pump

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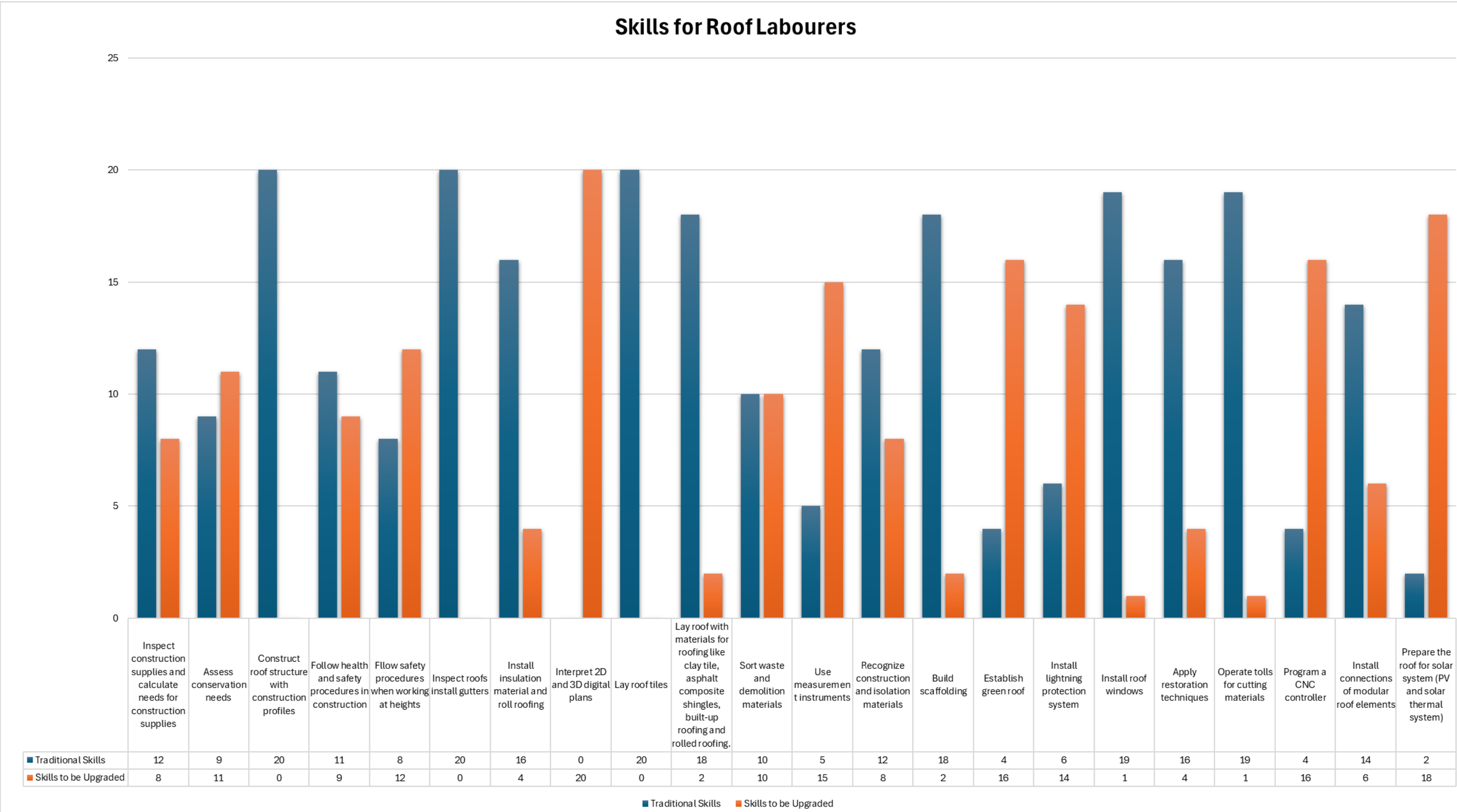
4: **Graph 3**: A-Existing skills named as “traditional”, and B-skills to be upgraded for **Roof Labourers**



	Inspect construction supplies and calculate needs for construction supplies	Assess conservation needs	Construct roof structure with construction profiles	Follow health and safety procedures in construction	Fllow safety procedures when working at heights	Inspect roofs install gutters	Install insulation material and roll roofing	Interpret 2D and 3D digital plans	Lay roof tiles	Lay roof with materials for roofing like clay tile, asphalt composite shingles, built-up roofing and rolled roofing.	Sort waste and demolition materials	Use measuremen t instruments	Recognize construction and isolation materials	Build scaffolding	Establish green roof	Install lightning protection system	Install roof windows	Apply restoration techniques	Operate tolls for cutting materials	Program a CNC controller	Install connections of modular roof elements	Prepare the roof for solar system (PV and solar thermal system)
Traditional Skills	12	9	20	11	8	20	16	0	20	18	10	5	12	18	4	6	19	16	19	4	14	2
Skills to be Upgraded	8	11	0	9	12	0	4	20	0	2	10	15	8	2	16	14	1	4	1	16	6	18

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4.1: Explanation of Graph 3.	10 skills are considered traditional by 60% of the respondents, while 12 skills as deemed to be upgraded.
4.2: Identification of "traditional" skills for Roof Labourers.	1. Construct roof structure with construction profiles (100%) 2. Inspect roofs install gutters (100%) 3. Lay roof tiles (100%) 4. Install roof windows 5. Operate tolls for cutting materials 6. Lay roof with materials for roofing like clay tile, asphalt composite shingles, built-up roofing and rolled roofing. 7. Build scaffolding 8. Install insulation material and roll roofing 9. Apply restoration techniques 10. Install connections of modular roof elements
4.3: Identification and ranging the skills to be upgraded for Roof Labourers.	**Ranged skills to be upgraded (1 max., 12 min.)** **1.** Interpret 2D and 3D digital plans **2.** Prepare the roof for solar system (PV and solar thermal system) **3.** Establish green roof **4.** Program a CNC controller **5.** Use measurement instruments **6.** Install lightning protection system **7.** Follow safety procedures when working at heights **8.** Assess conservation needs **9.** Sort waste and demolition materials **10.** Follow health and safety procedures in construction **11.** Inspect construction supplies and calculate needs for construction supplies **12.** Recognize construction and isolation materials
4.4: Identification of technical challenges/barriers and corresponding skills required for the workforce of industrialized systems, regarding the compliance in principles of circular economy and energy efficiency.	• Interpret 2D and 3D digital plans (100%) • Prepare the roof for solar system (PV and solar thermal system) • Establish green roof • Program a CNC controller • Sort waste and demolition materials • Recognize construction and isolation materials

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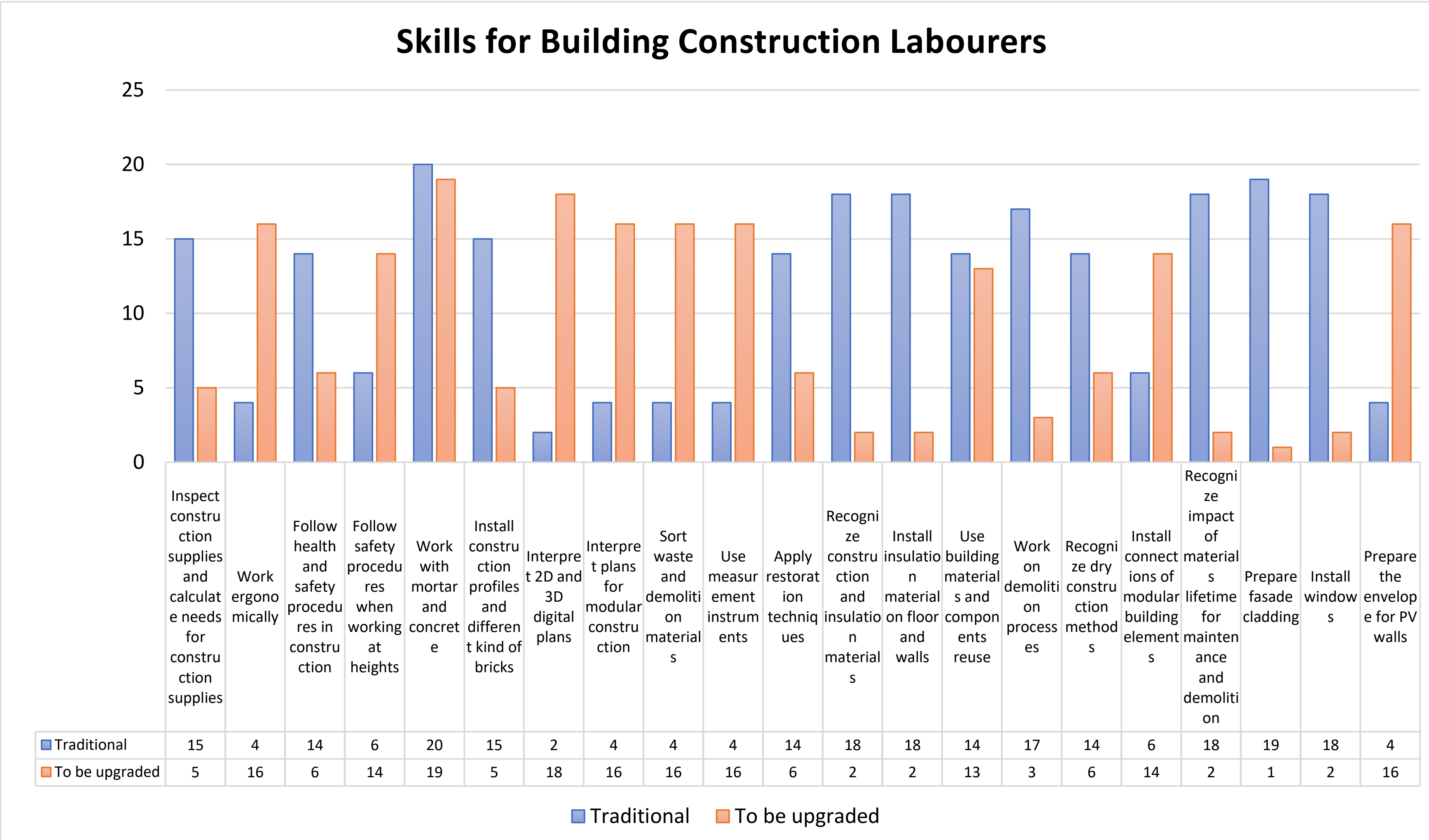
5: **Graph 4**: A-Existing skills named as “traditional”, and B-skills to be upgraded for **Building Construction Labourer**



	Traditional	To be upgraded
Inspect construction supplies and calculate needs for construction supplies	15	5
Work ergonomically	4	16
Follow health and safety procedures in construction	14	6
Follow safety procedures when working at heights	6	14
Work with mortar and concrete	20	19
Install construction profiles and different kind of bricks	15	5
Interpret 2D and 3D digital plans	2	18
Interpret plans for modular construction	4	16
Sort waste and demolition materials	4	16
Use measurement instruments	4	16
Apply restoration techniques	14	6
Recognize construction and insulation materials	18	2
Install insulation material on floor and walls	18	2
Use building materials and components reuse	14	13
Work on demolition processes	17	3
Recognize dry construction methods	14	6
Install connections of modular building elements	6	14
Recognize impact of materials lifetime for maintenance and demolition	18	2
Prepare fasade cladding	19	1
Install windows	18	2
Prepare the envelope for PV walls	4	16

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5.1: Explanation of Graph 4.	56% of the respondents consider 13 of the 21 skills as traditional while only 10 are qualified for upgrade.
5.2: Identification of "traditional" skills for Building Construction Labourers.	1. Work with mortar and concrete (100%) 2. Prepare facade cladding 3. Recognize construction and insulation materials 4. Install insulation material on floor and walls 5. Recognize impact of materials lifetime for maintenance and demolition 6. Install windows 7. Work on demolition processes 8. Inspect construction supplies and calculate needs for construction supplies 9. Install construction profiles and different kind of bricks 10. Follow health and safety procedures in construction 11. Apply restoration techniques 12. Use building materials and components reuse 13. Recognize dry construction methods
4.3: Identification and ranging the skills to be upgraded for Building Construction Labourers.	**1.** Follow safety procedures when working at heights **2.** Install connections of modular building elements **3.** Work ergonomically **4.** Interpret plans for modular construction **5.** Sort waste and demolition materials **6.** Use measurement instruments **7.** Prepare the envelope for PV walls **8.** Interpret 2D and 3D digital plans
4.4: Identification of technical challenges/barriers and corresponding skills required for the workforce of industrialized systems, regarding the compliance in principles of circular economy and energy efficiency.	• Sort waste and demolition materials • Use measurement instruments • Prepare the envelope for PV walls • Interpret 2D and 3D digital plans

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Key conclusions reached, as well as recommendations for the "skills to be upgraded" of industrialized construction and key criteria in terms of sustainability for industrialized construction.

Some **key conclusions** related to the skills to be upgraded in Greece are:

- Among the 4 occupations-target groups, Roof Labourers is the one with the need to upgrade more skills (12 selected), while for Electrical Installers 9 skills were considered as more critical according to the majority.

- For all 4 occupations, skills related to new technologies, energy efficiency and circular economy are qualified as deemed to upgrade. Namely: the management of waste and demolition materials, the installation and maintenance of PV and solar thermal systems, as well as the use of new techniques (green roofs, geothermal heat plants, 2D and 3D digital plans etc.).

- Especially for Roof Labourers, 7 out of the 12 skills to be upgraded are directly and indirectly linked to the transition towards a more sustainable offsite building.

Some **recommendations** for "new competences" in industrialized construction:

- Technical skills are outlined for upgrade and at the same time Managerial and Transversal skills are considered "traditional" for all occupations -target groups.

- The interpretation of 2D and 3D digital plans is the horizontal skill to be upgraded for all 4 occupations- target groups.

- The installation of smart devices is the most urgent skill to be upgraded for Electrical Installers. The transition to the digital tools is also prioritized for the Roof Labourers and specifically the interpretation of 2D and 3D digital plans.

- Waste management is the most relevant for HVAC Engineering Technicians and Building Construction Labourers.

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Validation process report

The validation process for the National Survey on skills in Greece, required the completion of an online questionnaire after the revision of the National report's finding on skills in Greece, analysed in the previous sections.
The 3 experts that participated, after reading the National Report, they completed the online survey and had the opportunity to commend on the findings.

The participants in the validation process were representing the following industries, age and gender:

1. Engineer, VET trainer in the construction sector. Woman 47-.
2. Civil Engineer, Building sector (NACE F- 41, 43), Employer/manager/employee of industrialized companies, Male 36-46.
3. Architect, Construction Sector (NACE F - 42), Employer/manager/employee of industrialized companies, Male 36-46.

The experts had to qualify the importance of each skill for the construction industry, where we can first notice their agreement with the participants in the National survey.

According to the 3 experts' opinion, the skills highlighted by the Survey are coinciding with the most important skills that are currently needed for the sustainability of the industrialized construction, while they underline the importance of reskilling or upgrading the existing skills for the transition in the areas of energy efficiency and circular economy.

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