

Curriculum and Training Modules

Cir-Eco Professional Profile in Household Appliance Sector

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1 AIM, TARGET GROUP AND ADMISSION REQUIREMENTS

1.1 INTRODUCTION

The Circular Economy model offers an opportunity to reinvent economy, making it more sustainable and competitive. In this context, entrepreneurship, as a transversal competence, is key to sustainable development and to meet the demands of a proactive culture of innovation.

1.2 AIM

The aim of this training is to make the participants aware of the possibilities of Circular Economy and sustainable entrepreneurship. By including Circular Economy principles, the existing European and national legislation and supporting documents the course provides a comprehensive framework and enables participants to get the whole picture about the topic.

. By providing an extensive framework, the participants will also be able to distinguish the differences between Linear- and Circular Economy.

This training introduces the participants to the concept of green entrepreneurship as one of the main engines towards a circular economy model. They will go through a set of learning scenarios. In these scenarios the general competence of entrepreneurship is put forward. In each scenario, there is an additional and important focus set on green entrepreneurship.

Further in this training the participants learn about the different types of equipment, the materials they are made of and their characteristics. This basic knowledge is taught so that they will be able to analyse the different types of appliances, identifying the parts susceptible to maintenance, reuse, recycling, reconditioning and the most relevant characteristics of them.

The participants have to identify whether or not a household appliance is eligible for repairing/refurbishing or if it should be dismantled. For each household appliance the participants will have the specific knowledge of the different types and brands and they will know their function.

To repair and/or refurbish household appliances in a proper way, participants first have to master basic electricity perfectly, which will be taught in one of the units.

The participant is able to clean, refurbish and repair any household appliance. He or she knows about the technical regulations of electrical household appliances and has knowledge of the general health and safety regulations at the workplace.

If a household appliance can no longer be repaired, it must be dismantled so that the components end up in the circular economy. Household appliances are made of very diverse components such as plastics with different additives, metal, glass, etc. In addition, these elements have different characteristics and therefore, they need to be treated in a different way. Because if this, the recycling of household appliances is a complex and challenging task. Another goal for the participants is to determine a correct classification and separation of the materials in order to get success in the dismantling process.

1.3 TARGET GROUP AND ADMISSION REQUIREMENTS

Prior to the start of the course, the participants should have already obtained:

- A minimum Level: EQF 3.
- A basic knowledge of environmental protection, including waste management regulations.

Target group:

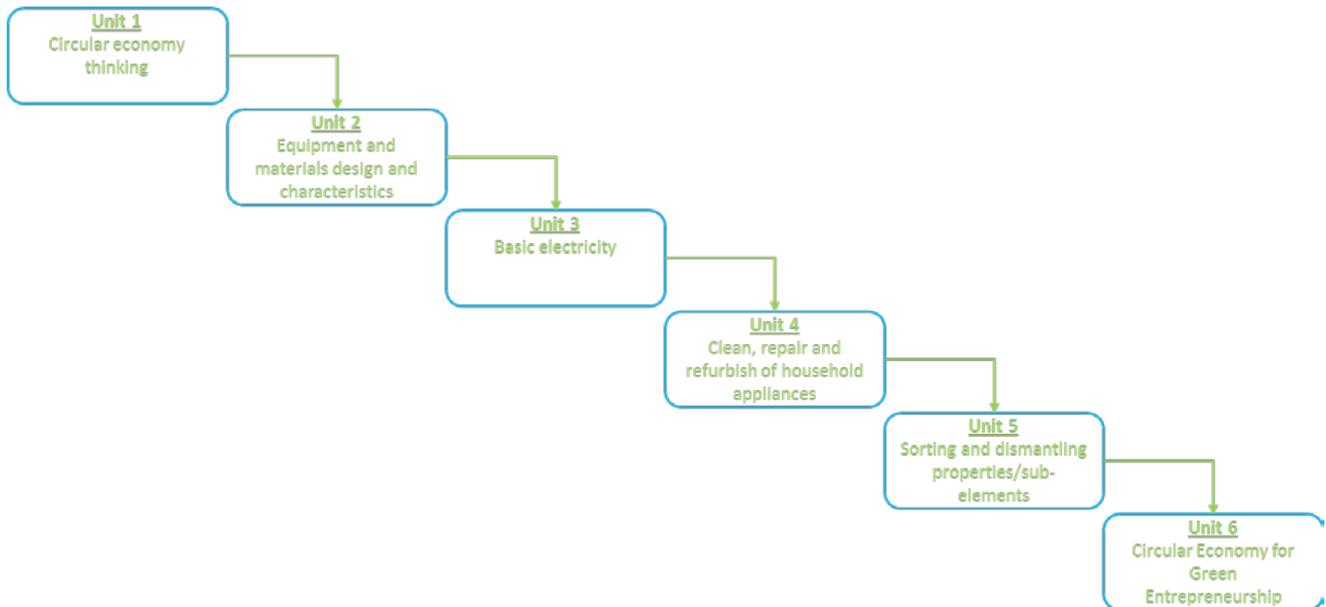
- Unemployed people who are looking for a way to be employed in this field.
- Employees that need to re-orientate their careers to get a stable job.
- Employees within companies of the Household Appliance Sector, that need to make the shift from lineal to circular economy.
- VET students.



2 FORMULA

The course is divided into 6 units, with each unit subdivided into different sub-units. The entire training entails 228 hours, including evaluation and online learning.

The units must be followed in a logical order as such:



The theoretical learning content can be taught in on or more of the following ways, preferable by a mix of the below teaching methods:

- classroom teaching
- video supported teaching microteaching
- a divers approach to assignments: group / individually
- research, development and team work
- online learning
- use of didactic exercise boards
- quizzes
- ...

The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.

The more theoretical modules are taught in order to raise awareness of the topic and to provide the participants with the knowledge they need for the practical content.

All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.

Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers.

Agreements are made about cleaning and maintaining the workshop and the efficient use of machinery and tools. The guidelines for sorting and storing waste and residual material are also clearly communicated.



3 CURRICULUM

3.1 CURRICULUM STRUCTURE

There is an introduction per unit in which the objective of the unit is described. The number of hours per training (online, in-class, evaluation) is indicated here as well.

Each unit (except unit 1) is subdivided into sub-units. The objective, content, the resources and the learning outcomes are described in the unit of competence for each sub-unit.

The directions to the trainer are included in this document, as well as how the evaluation should be done.

3.2 COMPETENCES AND COURSE CONTENTS

Unit 1 – Circular Economy thinking

Introduction: In this unit, we aim to raise awareness and knowledge about the principles of Circular Economy. We have also included a chapter on the existing legislation regarding Circular Economy. The learning content is taught as much as possible to raise awareness and knowledge of students about the principles of the Circular Economy and existing legislation regarding it.

Linear economy, which is mostly present nowadays, relies on the take – make – dispose flow. In the sense of sustainable acting and development, the economy should become circular. This means that materials and products remain in use and function as long as possible. To start thinking in a circular rather than a linear way, the European Commission regulates impacts on the environment through legislative acts.

Workload [hours]	
<u>Classroom learning</u>	<u>4 hours</u>
<u>Evaluation</u>	<u>1 hour</u>

Sub-Unit 1	
1. Circular Economy thinking	Total duration: 5 hours
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Distinguish differences between linear and circular economy. • Outline relevant legislation and supporting documents regarding circular economy. • Outline the advantages and disadvantages of the maintenance, reuse, recycle and recondition of household appliances. Understand when to do them, why and how. 	
3. Content <ul style="list-style-type: none"> • Circular Economy principles. • Circular Economy thinking: in the field of production, distribution, consumption and 	

<p>waste management.</p> <ul style="list-style-type: none"> The existing European and national legislation and supporting documents regarding Circular Economy. 					
<p>4. Resources:</p> <ol style="list-style-type: none"> Supporting documents of Circular Economy. Relevant legislation of Circular Economy. Legislation of WEEE. Legislation of hazardous wastes. Standards. Website. 					
<p>5. Learning Outcomes</p> <p>Upon completion of this learning unit the participant will be able to:</p> <table border="1"> <thead> <tr> <th data-bbox="175 694 742 750">Skills</th> <th data-bbox="742 694 1372 750">Autonomy and responsibility</th> </tr> </thead> <tbody> <tr> <td data-bbox="175 750 742 1108"> <p>Distinguish between linear and Circular Economy.</p> <p>Outline relevant legislation and supporting documents regarding Circular Economy.</p> </td> <td data-bbox="742 750 1372 1108"> <p>The participant/employee is capable to distinguish the differences between linear and Circular Economy.</p> <p>He or she is aware of relevant legislation and supporting documents regarding Circular Economy.</p> </td> </tr> </tbody> </table>		Skills	Autonomy and responsibility	<p>Distinguish between linear and Circular Economy.</p> <p>Outline relevant legislation and supporting documents regarding Circular Economy.</p>	<p>The participant/employee is capable to distinguish the differences between linear and Circular Economy.</p> <p>He or she is aware of relevant legislation and supporting documents regarding Circular Economy.</p>
Skills	Autonomy and responsibility				
<p>Distinguish between linear and Circular Economy.</p> <p>Outline relevant legislation and supporting documents regarding Circular Economy.</p>	<p>The participant/employee is capable to distinguish the differences between linear and Circular Economy.</p> <p>He or she is aware of relevant legislation and supporting documents regarding Circular Economy.</p>				
<p>6. Methodological approach</p> <p>This sub-unit consists of 4 hours of classroom learning.</p> <p>The content is theoretically oriented. The teacher uses different forms of teaching:</p> <ul style="list-style-type: none"> classroom teaching microteaching 					
<p>7. Evaluation</p> <p>Written examination – a questionnaire prepared by the teacher.</p>					

Unit 2 – design and characteristics of equipment and materials.

Introduction:

Household appliances include different types of equipment, from white goods to small electrical appliances. These products have a different design and are produced using a big range of materials. In this competence unit, trainees will learn about the different types of equipment and the materials they are made of as well as their main characteristics.

Workload [hours]	
Presential Learning	6hr
Online Learning	14
Evaluation	1 hr

Sub-Unit 1 Types of Household Appliances	
Types of Household Appliances	Total duration: 4hrs
<p>2. Objectives of the sub-unit:</p> <ul style="list-style-type: none"> • To list the different types of white good and describe its operation, types of white goods (cold, washing and cooking), analyzing their characteristics and describing the function they perform. • To relate the elements (cards, motors, solenoid valves, among others) of which are the functional blocks of the white-line appliance, with the function they perform. • To match the representation symbols of the elements that they make the appliance with the real element. • To interpret the diagrams describing the operation of the elements. 	
<p>3. Content</p> <ul style="list-style-type: none"> • White range appliances: typology and elements. • Cooking Appliances: <ul style="list-style-type: none"> • Ovens: conventional, multifunction, pyrolytic, steam, ovens • Microwave oven. • Kitchens: vitroceramic, induction, electric and gas. • Bells: classic and decorative. • Cold Appliances: <ul style="list-style-type: none"> • Freezers: vertical and horizontal. • Air conditioning: laptops, monosplit and multisplit, • Washing appliances: <ul style="list-style-type: none"> • Washing machines: front loading, top loading and washer-dryer. • Dishwasher. • Dryers: evacuation and condensation. • Electrical and electronic elements common to the range of household appliances • Common electrical and electronic elements of household appliances of cooking: Induction coils, Fans and extractors, Magnetron, • Security elements (mechanical and electrical thermostats). • Common elements of gas cooking appliances: Valves and taps, Electronic ignition systems, Injectors, diffusers and burners 	



- Common elements of washing appliances.
- Hydraulic system
- Anti-overflow and water treatment system
- Heating system
- Electronic and electromechanical programmers
- Common elements of cold generation domestic appliances.
- Compressor
- Condenser
- Evaporator
- Expansion systems: capillaries
- Four-way valves
- Cables and driving systems: types and characteristics

4. Resources:

- Hand tools (pliers, screwdrivers, among others). Tools with electrical insulation. Measuring instruments (isolation meter, multimeter, ammeter, among others). IT tools Equipment and elements of protection. Maintenance management software.

5. Learning Outcomes

Upon completion of this learning unit the learner will be able to describe the different types of equipments, the materials they are made of and their characteristics.

The trainee is able to analyze the different types of appliances, identifying the parts susceptible to maintenance, reuse, recycling, reconditioning and the most relevant characteristics of them.

Skills	Autonomy and Responsibility
Differentiate the parts of a household appliance depending on the possibility of repairing, reconditioning, reusing or recycling it or part of it.	Demonstrate autonomy in the selection of the appliance or parts of it that can be repaired, reused, refurbished or recycled.

6. Methodological approach:

- Videos
- Exercices, multiple choice...
- Case studies

Sub-Unit 2 Electronic and electrical appliances	
1. Title of the sub-unit: Electronic and Electrical appliances	Total duration: 6 hrs
2- Objectives of the sub-unit: <ul style="list-style-type: none"> • Describe the typology and characteristics of the faults that occur in white-line appliances (cold, washing and cooking), determining the cause of them and their effects on the equipment. • Describe the diagnostic, localization, measurement, and white midrange techniques. 	
3. Content Electrical and electronic elements common to high-end appliances: Power supplies, Sensors, Control panel, Electronics power. - Common electrical and electronic elements of household appliances of cooking: Induction coils, Fans and extractors, Magnetron, security elements (mechanical and electrical thermostats).	
4. Resources: Hand tools (pliers, screwdrivers, among others). Tools with electrical insulation. Measuring instruments (isolation meter, multimeter, ammeter, among others). IT tools Equipment and elements of protection. Maintenance management software.	
5. Learning Outcomes Upon completion of this learning unit the learner will be able to describe the different types of electric and electronic elements. The trainee is able to analyze the different types of appliances, identifying the parts susceptible to maintenance, reuse, recycling, reconditioning and the most relevant characteristics of them.	
Skills	Autonomy and Responsibility
Describe the operating logic of the appliance in reference to the elements that make up each circuit, using the electrical diagrams and check it through the functional analysis of the equipment.	Demonstrate autonomy in the selection of the elements that make up each circuit, using the electrical diagrams and check it through the functional analysis of the equipment.
6. Methodological approach - Videos - Exercises, multiple choice... - Case studies	
7. Evaluation Questionnaires and self reflections exercises	

Sub-Unit 3- Materials that compose the household appliances	
1. Title of the sub-unit: Materials that compose households appliances.	Total duration: 4 hrs
<p>2. Objectives of the sub-unit:</p> <ul style="list-style-type: none"> • Identify the elements of the appliances by interpreting the technical documentation and relating the real elements with the symbols that appear in the diagrams. • Describe the operating logic of the appliance in reference to the elements that make up each circuit, using the electrical diagrams and checking it through the functional analysis of the equipment 	
<p>3. Content</p> <p>Common elements of washing appliances.</p> <ul style="list-style-type: none"> • - Hydraulic system • - Anti-overflow and water treatment system • - Heating system • - Electronic and electromechanical programmers <p>Common elements of cold generation domestic appliances.</p> <ul style="list-style-type: none"> • - Compressor • - Condenser • - Evaporator • - Expansion systems: capillaries • - Four-way valves <p>- Cables and driving systems: types and characteristics</p>	
<p>4. Resources:</p> <p>Hand tools (pliers, screwdrivers, among others). Tools with electrical insulation. Measuring instruments (isolation meter, multimeter, ammeter, among others). IT tools Equipment and elements of protection. Maintenance management software.</p>	
<p>5. Learning Outcomes</p> <p>Identify the different types of functional blocks that make up the different types of white goods (cold, washing and cooking), analyzing their characteristics and describing the function they perform.</p>	
Skills	Autonomy and Responsibility
Determine the variation that occurs in the operation of the equipment assuming modifications in the parameters of the different elements (resistance of the sensors, environmental conditions, among others) and checking functionally.	Demonstrate autonomously in the different variations in the equipment assuming modifications in the parameters of the different elements (resistance of the sensors, environmental conditions, among others) and checking functionally
<p>6. Methodological approach</p> <ul style="list-style-type: none"> - Videos - Exercices, multiple choice... - Case studies 	
<p>7. Evaluation:Questionnaires and self reflections exercises</p>	

Sub-Unit 4- When, why, and how do the maintenance, reuse, recycle and recondition of household appliances	
1. Title of the sub-unit: When, why, and how do the maintenance, reuse, recycle and recondition of household appliances	Total duration: 5 hrs
<p>2. Objectives of the sub-unit: Verify the operation of repaired appliances of white range following the established technical procedures and response time, in quality and safety conditions, environmental respect and complying with current regulations.</p>	
<p>3. Content Type of breakdowns in white-line appliances.</p> <ul style="list-style-type: none"> • - Mechanical breakdowns: <ul style="list-style-type: none"> • - Engines • - Bearings. • - Shock absorbers. • - Compressors • - Transmissions: Belts and pulleys. • - Leaks in taps and valves. • - Obstructions. - Electrical faults: <ul style="list-style-type: none"> • - Connections • - Driving • - Consumption • - Solenoid valves • - Bombs • - Spotlights. - Hydraulic breakdowns: <ul style="list-style-type: none"> • - Water leaks • - Pressure switch • - Flow meter • Conduits 	
<p>4. Resources:</p> <ul style="list-style-type: none"> • Hand tools (pliers, screwdrivers, among others). Tools with. Electrical isolation. Measuring instruments (isolation meter, multimeter, ammeter, among others). IT tools Equipment and elements of protection. Maintenance management software. 	
<p>5. Learning Outcomes Upon completion of this earning unit the learner will be able to apply techniques of localization and diagnosis of dysfunctions and breakdowns in white-line appliances, determining the causes that produce them, in conditions of safety and quality</p>	
Skills	Autonomy and Responsibility

Describe the techniques of diagnosis, location, measurement, and the specific means used in the troubleshooting of white-line appliances.	Define the procedure to determine the causes that produce the fault Locate the element responsible for the fault in the estimated time
<p>6. Methodological approach</p> <ul style="list-style-type: none"> - Videos - Exercices, multiple choice... - Case studies 	
<p>7. Evaluation</p> <p>Questionnaires and self reflections exercises</p>	

Unit 3 – basic electricity

The objective of this module is that the participants have knowledge of the essential basic concepts and laws related to electricity. The participant is also aware of basic safety rules and protective equipment, has knowledge of series and parallel circuits and is capable of measuring circuits and resistors.

Workload [hours]	
Classroom learning	[40h]
Evaluation	[1h]

Sub-Unit 1	
1. Electrical principles and laws	Total duration: 24
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Learn about the basic principles and laws of electricity. • Connect series and parallel circuits. • Measure electrical components. 	
3. Content <ul style="list-style-type: none"> • Essential basic concepts and laws: <ul style="list-style-type: none"> ○ voltage, current and resistance ○ Ohm's Law • Series and parallel circuits: <ul style="list-style-type: none"> ○ connect ○ combination • Labour and power • Measure the different electrical parameters with a multimeter 	
4. Resources: <ol style="list-style-type: none"> 1. Syllabus 2. Didactic exercise boards 3. PC 4. Beamer 5. Catalogues 6. Multimeter 7. Schemes 8. Manual tools 	
5. Learning outcomes <p>Upon completion of this earning unit the learner will be able to:</p>	

Skills	Autonomy and Responsibility
<p>Define the basic concepts and laws related to electricity and name the symbol, the unit, the properties and types.</p> <p>Measure voltage and current.</p> <p>Explain the function of resistors, knowledge of what the current density is.</p> <p>Explain how resistance can be measured and in what circumstances.</p> <p>Explain Ohm's law and Pouillet's law and give examples of applications.</p> <p>Explain how resistors can be switched.</p> <p>Explain what series or parallel circuits or mixed circuits are and how they can be calculated and executed.</p> <p>List the basic components of a circuit.</p>	<p>Comply with procedures previously established.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The content is mainly theoretically oriented. The teacher uses different forms of teaching:</p> <ul style="list-style-type: none"> - classic way - use videos - have a lesson prepared by a student who then gives the next lesson - assignments group / individual - ... <p>After every part of theory, there are exercises on didactic exercise boards. The students use their theoretical knowledge to measure correctly, to execute electrical circuits, ...</p>	
<p>7. Evaluation</p> <p><i>There is a theoretical evaluation of the whole unit. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module. The theoretical questions are prepared by the teacher.</i></p>	

Sub-Unit 2																	
1. Safety aspects	Total duration: 12																
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Learn about the possible danger of electricity. • General regulations for electrical installations. 																	
3. Content <ul style="list-style-type: none"> • Hazards: persons, environment. • Electrostatic charge. • Electrocution. 																	
4. Resources: <ol style="list-style-type: none"> 1. PC 2. Beamer 3. Syllabus 4. Videos 																	
5. Learning Outcomes <p>Upon completion of this learning unit the participants will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Skills</th> <th style="width: 50%;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Comply with the rules on safety, health and the environment.</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td>Use protective equipment according to the specific regulations, adapted to the working conditions.</td> <td>Report any irregularities or faults.</td> </tr> <tr> <td>Follow the general regulations for electrical installations.</td> <td></td> </tr> <tr> <td>Describe the dangers for people and the environment.</td> <td></td> </tr> <tr> <td>Explain what electrostatic charge is.</td> <td></td> </tr> <tr> <td>Describe the dangers of electrostatic charge.</td> <td></td> </tr> <tr> <td>Protect himself or herself against the effects of electrocution.</td> <td></td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Comply with the rules on safety, health and the environment.	Comply with procedures previously established.	Use protective equipment according to the specific regulations, adapted to the working conditions.	Report any irregularities or faults.	Follow the general regulations for electrical installations.		Describe the dangers for people and the environment.		Explain what electrostatic charge is.		Describe the dangers of electrostatic charge.		Protect himself or herself against the effects of electrocution.	
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<p>6. Methodological approach</p> <p>The content is mainly theoretically oriented. The teacher uses different forms of teaching:</p> <ul style="list-style-type: none"> - classic way - use videos - microteaching - assignments group / individual - ... 	
<p>7. Evaluation</p> <p><i>There is a theoretical evaluation of the whole unit. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module. The theoretical questions are prepared by the teacher.</i></p>	

Sub-Unit 3							
1. Machines and tools	Total duration: 4						
<p>2. Objectives of the sub-unit:</p> <ul style="list-style-type: none"> • Select and use the necessary machines and tools. • Use machines and tools correctly. 							
<p>3. Content</p> <ul style="list-style-type: none"> • Correct use of machines and tools. 							
<p>4. Resources:</p> <ul style="list-style-type: none"> 7. Didactic exercise boards 8. PC 9. Beamer 10. Catalogues 11. Multimeter 12. Manual tools (pliers, screwdrivers,...) 							
<p>5. Learning outcomes</p> <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Use of appropriate machines and tools.</td> <td></td> </tr> <tr> <td>Recognize and name different tools and machines.</td> <td></td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Use of appropriate machines and tools.		Recognize and name different tools and machines.	
Skills	Autonomy and Responsibility						
Use of appropriate machines and tools.							
Recognize and name different tools and machines.							

<p>Safe and efficient use of the various tools and machines.</p> <p>Clean and maintain machines and tools.</p>	
<p>6. Methodological approach</p> <p>The content is mainly theoretically oriented. The teacher uses different forms of teaching:</p> <ul style="list-style-type: none"> - classic way - use videos - ... 	
<p>7. Evaluation</p> <p><i>There is a theoretical evaluation of the whole unit. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module. The theoretical questions are prepared by the teacher.</i></p>	

Unit 4 – Cleaning, repairment and refurbishing of reusable/ re-employable household appliances

The final goal of this module is that the participant has knowledge about the different types and brands of household appliances. The student knows the characteristics, design, construction and function of each appliance. He or she is aware of the workflow for cleaning, repairing and refurbishing.

The spare parts market doesn't have any secrets for the course participant.

The trainee is able to clean, refurbish and repair any household appliance. He or she knows about the technical regulations of electrical household appliances and has knowledge of the general health and safety regulations at the workplace.

Workload [hours]	
Classroom learning	124
Evaluation	4

Sub-Unit 1	
1. Measuring is knowing	Total duration: 8
2. Objectives of the sub-unit:	
<ul style="list-style-type: none"> • Measuring electrical components of household appliances. • Analysing errors through measurements. 	
3. Content	
<ul style="list-style-type: none"> • Analyse errors through measurements. • Measure the different electrical parameters with a multimeter. • Calculate the profile of electrical wires and necessary fuses. • Use a multimeter judiciously as a diagnostic tester. • Recognise the different types (analogue, digital and mixed) electrical signals and analyse them. 	
4. Resources:	
<ol style="list-style-type: none"> 1. Didactic setups of household appliances 2. PC 3. Beamer 4. Multimeter 5. Schemes 6. Manual tools 7. Supporting documents (syllabus, ppt presentations,...) 	
5. Learning outcomes	

Upon completion of this earning unit the learner will be able to:

Skills	Autonomy and Responsibility
Measure different electrical parameters with a multimeter.	Decide if a household appliance is eligible for repairing or refurbishing.
Interpret schematic diagrams.	Report any irregularities or faults.

6. Methodological approach

The learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.

All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.

Prior to the (practical) assignments, the course participants receive information about working in and maintaining the workshop. They are informed of the safety aspects and dangers.

Agreements are made about cleaning and maintaining the workshop, the efficient use of machinery, tools, ... The guidelines for sorting and storing waste and residual material are also clearly communicated.

7. Evaluation

there is no evaluation of this sub-unit in particular. Measurements and the use of the multimeter is also covered in the evaluation of the following sub-units.

Sub-Unit 2													
1. Refrigeration appliances - electric part	Total duration: 4												
<p>2. Objectives of the sub-unit:</p> <ul style="list-style-type: none"> Recognize and understand start and safety systems of compressors, evaporator thermostats and components in a control circuit. (Refrigeration operations may only be carried out by a recognized refrigeration technician. Therefore this sub-unit only focuses on the electrical part of refrigerators/freezers). 													
<p>3. Content</p> <ul style="list-style-type: none"> The characteristic values of a single phase compressor. The technical documentation. The starting systems of single phase compressors. The operating principle and types of evaporator thermostats. Electric control circuits. Interpretation of the correct or incorrect functioning of a refrigerator or freezer. 													
<p>4. Resources:</p> <ol style="list-style-type: none"> Didactic setups of household appliances A variety of refrigerators and freezers PC Beamer Multimeter Schemes Manual tools Supporting documents (syllabus, PowerPoint presentations,...) Videos 													
<p>5. Learning outcomes</p> <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognise the technical specifications associated to different types of brands of household appliances.</td> <td>Decide if a household appliance is eligible for repairing or refurbishing.</td> </tr> <tr> <td>Select the appropriate tools and products to clean, repair and refurbish household appliances.</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td>Disassemble and assemble (electrical part) each type of household appliance.</td> <td>Demonstrate organisational, planning and time management skills.</td> </tr> <tr> <td>Detect and fix errors in household appliances.</td> <td>Work in a team, assuming a specific role and sharing the responsibility of decisions taken.</td> </tr> <tr> <td>Distinguish the different steps of the</td> <td>Demonstrate capacities of management taking into account customer demands, towards a</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognise the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.	Select the appropriate tools and products to clean, repair and refurbish household appliances.	Comply with procedures previously established.	Disassemble and assemble (electrical part) each type of household appliance.	Demonstrate organisational, planning and time management skills.	Detect and fix errors in household appliances.	Work in a team, assuming a specific role and sharing the responsibility of decisions taken.	Distinguish the different steps of the	Demonstrate capacities of management taking into account customer demands, towards a
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<p>repairing or refurbishing processes.</p> <p>Follow the steps of the repairing or refurbishing processes.</p> <p>Measure different electrical parameters with a multimeter.</p> <p>Interpret schematic diagrams.</p> <p>Discuss types and brands in detail using the diagrams.</p> <p>Operate the appropriate and necessary machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>quality-oriented service.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The learning content is taught as much as possible through various (practical) assignments in which different elements (material, machines and tools, activities / techniques, safety aspects) are always discussed.</p> <p>These assignments reflect as good as possible realistic situations in professional practice. You have to take into account the learning lines: when working out assignments: from simple to more complex assignments, from limited to more extensive input from course participants, from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining the workshop. They are informed of the safety aspects and dangers.</p> <p>Agreements are made about cleaning and maintaining the workshop, the efficient use of machinery, tools. The guidelines for sorting and storing waste and residual material are also clearly communicated.</p>	
<p>7. Evaluation</p> <p><i>There is a theoretical evaluation of the whole unit. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module. The theoretical questions are prepared by the teacher.</i></p>	

Sub-Unit 3									
1. Cooking appliances	Total duration: 12								
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Identify if a household appliance is eligible for repairing or refurbishing. • Disassemble the appliance. • Select the specific parts of the appliance to be repaired or refurbished. • Replace faulty parts with new ones or upgrade parts and repairing the appliance based on specific errors. • Assemble the appliance. • Check if the appliance is working properly after repairing/refurbishing process. • Cleaning the device. 									
3. Content <ul style="list-style-type: none"> • measurement of electrical components • different types and brands of cooking appliances • characteristics, design, construction and function of cooking appliances • workflow of household appliances cleaning, repairing and refurbishing processes • spare parts market • technical regulations of electrical household appliances • the general health and safety regulations at workplace 									
4. Resources: <ol style="list-style-type: none"> 1. Didactic setups of cooking appliances 2. A variety of cooking appliances 3. PC 4. Beamer 5. Multimeter 6. Schemes 7. Manual tools 8. Supporting documents (syllabus, PowerPoint presentations,...) 9. Videos 									
5. Learning Outcomes <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognize the technical specifications associated to different types of brands of household appliances.</td> <td>Decide if a household appliance is eligible for repairing or refurbishing.</td> </tr> <tr> <td>Select the appropriate tools and products to clean, repair and refurbish household appliances.</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td>Disassemble and assemble (electrical</td> <td>Demonstrate organisational, planning and time management skills.</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.	Select the appropriate tools and products to clean, repair and refurbish household appliances.	Comply with procedures previously established.	Disassemble and assemble (electrical	Demonstrate organisational, planning and time management skills.
Skills	Autonomy and Responsibility								
Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.								
Select the appropriate tools and products to clean, repair and refurbish household appliances.	Comply with procedures previously established.								
Disassemble and assemble (electrical	Demonstrate organisational, planning and time management skills.								

<p>part) each type of household appliance.</p> <p>Detect and fix errors in household appliances.</p> <p>Distinguish the different steps of the repairing or refurbishing processes.</p> <p>Follow the steps of the repairing or refurbishing processes.</p> <p>Measure different electrical parameters with a multimeter.</p> <p>Interpret schematic diagrams.</p> <p>Discuss types and brands in detail using the diagrams.</p> <p>Operate the appropriate and necessary machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>Work in a team, assuming a specific role and sharing the responsibility of decisions taken</p> <p>Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.</p> <p>All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers</p>	
<p>7. Evaluation</p> <ul style="list-style-type: none"> • Assignments: 40 • Case: 50 • Generic competences: 10 <p>Total score for this evaluation = 100</p>	

The participant is successful when he / she achieves a total of 70% for the evaluation

Assignments:

During the course, the participants receive a number of assignments. An evaluation follows after every completion of a part.

The points are awarded as follows:

- Heating appliances: 5
- Dishwashers: 10 :
- Washing machines and drying cabinets: 15
- Smart Repair: 10

TOTAL: 40

Examination

Case:

The cases are prepared by the teacher. The trainee must be able to determine the problem of the appliance and find the solution.

The theoretical questions are prepared by the teacher. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module.

TOTAL: 50

Generic competences

TOTAL: 10



Sub-Unit 4							
1. Dishwasher	Total duration: 20						
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Identify if a household appliance is eligible for repairing or refurbishing. • Disassemble the appliance. • Select the specific parts of the appliance to be repaired or refurbished. • Replace faulty parts with new ones or upgrade parts and repairing the appliance based on specific errors. • Assemble the appliance. • Check if the appliance is working properly after repairing/refurbishing process. • Cleaning the device. 							
3. Content <ul style="list-style-type: none"> • Measurement of electrical components. • Different types and brands of dishwashers. • Characteristics, design, construction and function of dishwashers. • Workflow of household appliances cleaning, repairing and refurbishing processes. • Spare parts market. • Technical regulations of electrical household appliances. • The general health and safety regulations at the workplace. 							
4. Resources: <ol style="list-style-type: none"> 1. Didactic setups of dishwashers 2. A variety of dishwashers 3. PC 4. Beamer 5. Multimeter 6. Schemes 7. Manual tools 8. Supporting documents (syllabus, PowerPoint presentations,...) 9. Videos 							
5. Learning outcomes <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognize the technical specifications associated to different types of brands of household appliances.</td> <td>Decide if a household appliance is eligible for repairing or refurbishing.</td> </tr> <tr> <td>Select the appropriate tools and products</td> <td>Comply with procedures previously established.</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.	Select the appropriate tools and products	Comply with procedures previously established.
Skills	Autonomy and Responsibility						
Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.						
Select the appropriate tools and products	Comply with procedures previously established.						

<p>to clean, repair and refurbish household appliances.</p> <p>Disassemble and assemble (electrical part) each type of household appliance.</p> <p>Detect and fix errors in household appliances.</p> <p>Distinguish the different steps of the repairing or refurbishing processes.</p> <p>Follow the steps of the repairing or refurbishing processes.</p> <p>Measure different electrical parameters with a multimeter.</p> <p>Interpret schematic diagrams.</p> <p>Discuss types and brands in detail using the diagrams.</p> <p>Operate the appropriate and necessary machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>Demonstrate organisational, planning and time management skills.</p> <p>Work in a team, assuming a specific role and sharing the responsibility of decisions taken</p> <p>Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.</p> <p>All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers</p>	
<p>7. Evaluation</p> <ul style="list-style-type: none"> • Assignments: 40 • Case: 50 	

- Generic competences: 10

Total score for this evaluation = 100

The trainee is successful when he / she achieves a total of 70% for the evaluation

Assignments:

During the course, the trainees receive a number of assignments. An evaluation follows every completion of a part.

The points are awarded as follows:

- Heating appliances: 5
- Dishwashers: 10 :
- Washing machines and drying cabinets: 15
- Smart Repair: 10

TOTAL: 40

Examination

Case:

The cases are prepared by the teacher. The trainee must be able to determine the problem of the appliance and find the solution.

The theoretical questions are prepared by the teacher. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module.

TOTAL: 50

Generic competences

TOTAL: 10

Sub-Unit 5									
1. Washing machines and dryers	Total duration: 40								
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Identify if a household appliance is eligible for repairing or refurbishing. • Disassemble the appliance. • Select the specific parts of the appliance to be repaired or refurbished. • Replace faulty parts with new ones or upgrade parts and repairing the appliance based on specific errors. • Assemble the appliance. • Check if the appliance is working properly after repairing/refurbishing process. • Cleaning the device. 									
3. Content <ul style="list-style-type: none"> • measurement of electrical components • different types and brands of washing machines and dryers • characteristics, design, construction and function of washing machines and dryers • workflow of household appliances cleaning, repairing and refurbishing processes • spare parts market • technical regulations of electrical household appliances • the general health and safety regulations at workplace 									
4. Resources: <ol style="list-style-type: none"> 1. Didactic setups of washing machines and dryers 2. A variety of washing machines and dryers 3. PC 4. Beamer 5. Multimeter 6. Schemes 7. Manual tools 8. Supporting documents (syllabus, PowerPoint presentations,...) 9. Videos 									
5. Learning Outcomes <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognize the technical specifications associated to different types of brands of household appliances.</td> <td>Decide if a household appliance is eligible for repairing or refurbishing.</td> </tr> <tr> <td>Select the appropriate tools and products to clean, repair and refurbish household</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td></td> <td>Demonstrate organisational, planning and time</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.	Select the appropriate tools and products to clean, repair and refurbish household	Comply with procedures previously established.		Demonstrate organisational, planning and time
Skills	Autonomy and Responsibility								
Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.								
Select the appropriate tools and products to clean, repair and refurbish household	Comply with procedures previously established.								
	Demonstrate organisational, planning and time								

<p>appliances.</p> <p>Disassemble and assemble (electrical part) each type of household appliance.</p> <p>Detect and fix errors in household appliances.</p> <p>Distinguish the different steps of the repairing or refurbishing processes.</p> <p>Follow the steps of the repairing or refurbishing processes.</p> <p>Measure different electrical parameters with a multimeter.</p> <p>Interpret schematic diagrams.</p> <p>Discuss types and brands in detail using the diagrams.</p> <p>Operate the appropriate and necessary machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>management skills.</p> <p>Work in a team, assuming a specific role and sharing the responsibility of decisions taken</p> <p>Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.</p> <p>All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers</p>	
<p>7. Evaluation</p> <ul style="list-style-type: none"> • Assignments: 40 • Case: 50 • Generic competences: 10 	

Total score for this evaluation = 100

The participant is successful when he / she achieves a total of 70% for the evaluation

Assignments:

During the course, the trainees receive a number of assignments. An evaluation follows after every completion of a part.

The scores are awarded as follows:

- Heating appliances: 5
- Dishwashers: 10 :
- Washing machines and drying cabinets: 15
- Smart Repair: 10

TOTAL: 40

Examination

Case:

The cases are prepared by the teacher. The trainee must be able to determine the problem of the appliance and find the solution.

The theoretical questions are prepared by the teacher. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module.

TOTAL: 50

Generic competences

TOTAL: 10

Sub-Unit 6									
1. Coffee machines and espresso machines	Total duration: 4								
<p>2. Objectives of the sub-unit:</p> <ul style="list-style-type: none"> • Identify if a household appliance is eligible for repairing or refurbishing. • Disassemble the appliance. • Select the specific parts of the appliance to be repaired or refurbished. • Replace faulty parts with new ones or upgrade parts and repairing the appliance based on specific errors. • Assemble the appliance. • Check if the appliance is working properly after repairing/refurbishing process. • Cleaning the device. 									
<p>3. Content</p> <ul style="list-style-type: none"> • measurement of electrical components • different types and brands of washing machines and dryers • characteristics, design, construction and function of washing machines and dryers • workflow of household appliances cleaning, repairing and refurbishing processes • spare parts market • technical regulations of electrical household appliances • the general health and safety regulations at workplace 									
<p>4. Resources:</p> <ol style="list-style-type: none"> 1. Didactic setups of washing machines and dryers 2. A variety of washing machines and dryers 3. PC 4. Beamer 5. Multimeter 6. Schemes 7. Manual tools 8. Supporting documents (syllabus, PPT presentations,...) 9. Videos 									
<p>5. Learning outcomes</p> <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognize the technical specifications associated to different types of brands of household appliances.</td> <td>Decide if a household appliance is eligible for repairing or refurbishing.</td> </tr> <tr> <td>Select the appropriate tools and products to clean, repair and refurbish household appliances.</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td>Disassemble and assemble (electrical</td> <td>Demonstrate organisational, planning and time management skills.</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.	Select the appropriate tools and products to clean, repair and refurbish household appliances.	Comply with procedures previously established.	Disassemble and assemble (electrical	Demonstrate organisational, planning and time management skills.
Skills	Autonomy and Responsibility								
Recognize the technical specifications associated to different types of brands of household appliances.	Decide if a household appliance is eligible for repairing or refurbishing.								
Select the appropriate tools and products to clean, repair and refurbish household appliances.	Comply with procedures previously established.								
Disassemble and assemble (electrical	Demonstrate organisational, planning and time management skills.								

<p>part) each type of household appliance.</p> <p>Detect and fix errors in household appliances.</p> <p>Distinguish the different steps of the repairing or refurbishing processes.</p> <p>Follow the steps of the repairing or refurbishing processes.</p> <p>Measure different electrical parameters with a multimeter.</p> <p>Interpret schematic diagrams.</p> <p>Discuss types and brands in detail using the diagrams.</p> <p>Operate the appropriate and necessary machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>Work in a team, assuming a specific role and sharing the responsibility of decisions taken</p> <p>Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.</p> <p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.</p> <p>All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers.</p>	
<p>7. Evaluation</p> <ul style="list-style-type: none"> • Assignments: 40 • Case: 50 • Generic competences: 10 <p>Total score for this evaluation = 100</p>	

The trainee is successful when he / she achieves a total of 70% for the evaluation

Assignments:

During the course, the trainees receive a number of assignments. An evaluation follows every completion of a part.

The score is awarded as follows:

- Heating appliances: 5
- Dishwashers: 10 :
- Washing machines and drying cabinets: 15
- Smart Repair: 10

TOTAL: 40

Examination

Case:

The cases are prepared by the teacher. The trainee must be able to determine the problem of the appliance and find the solution.

The theoretical questions are prepared by the teacher. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module.

TOTAL: 50

Generic competences

TOTAL: 10

Sub-Unit 7													
1. Small household appliances	Total duration: 4												
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Learn about the construction and function of the different types of irons, mixers and kitchen aids. • Explain the purpose, use and maintenance. • Understand the schematic diagram of small household appliances. • Disassemble the appliance. • Discuss the types of diagrams (during disassembly). • Recognize the distinction between the different motors. • Assemble the appliance. • Cleaning the device. 													
3. Content <ul style="list-style-type: none"> • measurement of electrical components • different types and brands of small household appliances • characteristics, design, construction and function of small household appliances • technical regulations of electrical household appliances • the general health and safety regulations at workplace 													
4. Resources: <ol style="list-style-type: none"> 1. A variety of washing machines and dryers 2. PC 3. Beamer 4. Multimeter 5. Schemes 6. Manual tools 7. Supporting documents (syllabus, ppt presentations,...) 8. Videos 													
5. Learning outcomes <p>Upon completion of this learning unit the participant will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognise the technical specifications associated to different types of brands of household appliances.</td> <td>Comply with procedures previously established.</td> </tr> <tr> <td>Measure different electrical parameters with a multimeter.</td> <td>Demonstrate organisational, planning and time management skills.</td> </tr> <tr> <td>Interpret schematic diagrams.</td> <td>Work in a team, assuming a specific role and sharing the responsibility of decisions taken</td> </tr> <tr> <td>Discuss types and brands in detail using the diagrams.</td> <td>Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.</td> </tr> <tr> <td>Operate the appropriate and necessary</td> <td></td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognise the technical specifications associated to different types of brands of household appliances.	Comply with procedures previously established.	Measure different electrical parameters with a multimeter.	Demonstrate organisational, planning and time management skills.	Interpret schematic diagrams.	Work in a team, assuming a specific role and sharing the responsibility of decisions taken	Discuss types and brands in detail using the diagrams.	Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service.	Operate the appropriate and necessary	
Skills	Autonomy and Responsibility												
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<p>machines and tools.</p> <p>Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.</p>	<p>Report any irregularities or faults.</p>
<p>6. Methodological approach</p> <p>The practical learning content is taught through various assignments in which different elements (material, machines and tools, activities / techniques and safety aspects) are discussed.</p> <p>All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.</p> <p>Prior to the (practical) assignments, the course participants receive information about working in and maintaining of the workshop. They are informed of the safety aspects and dangers</p>	
<p>7. Evaluation</p> <p>There is a theoretical evaluation of the whole unit. This examination is a theoretical questionnaire about the different household appliances. The ratio of the type of questions corresponds to the ratio of the types of household appliances of the module.</p> <p>The theoretical questions are prepared by the teacher.</p>	

This unit is not mandatory

Sub-Unit 8	
1. Smart Repair & Connectivity	Total duration: 32
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • configure a network • learn about speech technology • repair devices remotely 	
3. Content principles of a network <ul style="list-style-type: none"> • configuration of a network for the customer • integration of different appliances (oven, washing machine, dryer, ...) into a network • applications of speech technology in function of household appliances • monitoring and trouble-shooting appliances remotely 	
4. Resources: <ol style="list-style-type: none"> 1. access to a network 2. PC 3. Beamer 4. Schemes 5. Supporting documents (syllabus, PowerPoint presentations,...) 6. Applications of speech technology 	
5. Learning outcomes Upon completion of this learning unit the participant will be able to:	
Skills	Autonomy and responsibility
Monitor devices remotely. Make diagnosis remotely. Interpret schematic diagrams. Configure a network. Integrate different appliances into a network. Follow the technical regulations of electrical household appliances and the health and safety regulations in the workplace.	Decide if a household appliance is eligible for repairing or refurbishing. Demonstrate capacities of management taking into account customer demands, towards a quality-oriented service. Report any irregularities or faults.
6. Methodological approach The practical learning content is taught through various assignments in which different	



elements (material, machines and tools, activities / techniques and safety aspects) are discussed.

All of the assignments aim to reflect realistic situations in a professional practice. In order to achieve optimal learning lines the assignments must be constructed in a logical way: from simple to more complex assignments, from limited to more extensive input from course participants and from limited to extensive independent work.

7. Evaluation

- Case: 70
- Theoretical questions: 30

Examination

Case:

The cases are prepared by the teacher. The trainee must be able to determine the problem of the appliance and find the solution remotely. He must be able to configure a network as well.

Theoretical test:

The theoretical questions are prepared by the teacher.

Unit 5 – Sorting and dismantling properties/ sub-elements

Introduction: The learning content is taught as much as possible to raise awareness and knowledge of students about the principles of the Circular Economy and existing legislation regarding it.

Household appliances are made of very diverse components such as plastics with different additives, metal, glass, etc. In addition, these elements have different characteristics and therefore, they need to be treated in a different way. Hence, the great complication of the recycling of household appliances. The final goal of this module is that the student makes a correct classification and separation of these materials in order to get success in the dismantling process.

The trainee is able to identify the different elements of household appliances, their characteristics and the correct way to be sorted and dismantled.

Workload [hours]	
Classroom learning	7 hours
Online learning	11 hours
Evaluation	2 hours

Sub-Unit 1	
1. Components of household appliances and their characteristics	Total duration: 3 hours
2. Objectives of the sub-unit:	
<ul style="list-style-type: none"> Identify each of the elements that compose household appliances (e.g. plastics, metals, glass,...) 	
3. Content	
<ul style="list-style-type: none"> Distinguish the different elements of household appliances. Differentiate the reusable materials (steel, glass, plastic,...) and the hazardous materials. 	
4. Resources:	
<ul style="list-style-type: none"> – A simple guide to electronic components [video] – Opinion of the European Economic and Social Committee on the restructuring and evolution of the household appliances industry [document] – Home appliance [website] – Waste electrical and electronic equipment [website] – The composition of refrigerators and air conditioners [PPT] 	

- [DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment \(WEEE\)](#) [website]
- [The Global-E-waste Monitor 2017](#) [document]
- PC's with internet connection.

5. Learning outcomes

Upon completion of this learning unit the participant will be able to:

Skills	Autonomy and responsibility
Distinguish the different elements of household appliances	Demonstrate autonomy in selecting the right elements of household appliances.

6. Methodological approach

This sub-unit comprises a total of 3 hours of online learning.

- The sub-unit can be started with a video from the “Resources” as an introduction.
- At least 2 hours of self-study.
- Exercise: The trainer shows a battery of images (30´each image) to the participants and they must identify what component is it.

7. Evaluation

A 30 question self- assessment test.

Sub-Unit 2	
1. Manual dismantling	Total duration: 6 hours
2. Objectives of the sub-unit:	
<ul style="list-style-type: none"> • Manage and treat household appliances components correctly 	
3. Content	
<ul style="list-style-type: none"> • Separate the elements that compose the household appliances, guaranteeing its proper management or treatment. • Use the appropriate tools to separate the materials. 	
4. Resources:	
<ul style="list-style-type: none"> – A new life for old electrical appliances [EU project website] – Waste electrical and electronic equipment [website] – DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE) [website] – PC's with internet connection. – Machines and tools. 	
5. Learning outcomes	
Upon completion of this learning unit the participant will be able to:	
Skills	Autonomy and responsibility
Manage and treat household appliances elements with the appropriate tools	Comply with procedures previously established.
Select and use necessary equipment and tools to develop the work of sorting and dismantling.	Report any irregularities or faults.
6. Methodological approach	
This sub-unit compromises a total of 6 hours, of which 3 hours are dedicated to classroom learning and 3 for online learning.	
<ul style="list-style-type: none"> - The trainer will give trainees a presentative demonstration of the dismantling of a specific product group. - 2 hours of self-study online. - Activity: Make small groups. Each group must identify one product group (the one the trainer has not explained in class) and present it in front of the class. They should prepare a leaflet with the main conclusions to send to the trainer. 	

- The trainer will evaluate these and share it with the rest of the groups.

7. Evaluation

The trainees will have to dismantle a household appliance in front of the trainer and answer the questions the trainer's questions simultaneously.



Sub-Unit 3					
1. Maintenance, reuse, recycling and reconditioning	Total duration: 6 hours				
2. Objectives of the sub-unit: <ul style="list-style-type: none"> • Identify current possibilities of the components and/ or materials for recycling. • Prepare components for the recycling, regarding decontamination, dangerous components to remove and management of these components. 					
3. Content <ul style="list-style-type: none"> • Extend the underlying recycling process when an appliance cannot be repaired. 					
4. Resources: <ul style="list-style-type: none"> – Waste Electronics - How they are recycled [video] – Recycling of WEEE plastics: a review [book] – Regional or global WEEE recycling. Where to go? [paper] – WEEE Recycling Process [website] – Recycling of Household Appliances with Emphasis on Reuse Options [EU project website] – Waste electrical and electronic equipment [website] – DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE) [website] – PC's with internet connection – Machines and tools – Worksheet – Transport (to access the WEEE plant) 					
5. Learning outcomes <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Skills</th> <th style="width: 50%;">Autonomy and responsibility</th> </tr> </thead> <tbody> <tr> <td>Select useful materials and mechanical parts for recovery.</td> <td>Demonstrate autonomy in selecting the recyclable materials.</td> </tr> </tbody> </table>		Skills	Autonomy and responsibility	Select useful materials and mechanical parts for recovery.	Demonstrate autonomy in selecting the recyclable materials.
Skills	Autonomy and responsibility				
Select useful materials and mechanical parts for recovery.	Demonstrate autonomy in selecting the recyclable materials.				
6. Methodological approach <p>This sub-unit compromise a total of 6 hours, of which 4 hours dedicated to classroom</p>					



learning and 2 reserved for online learning.

- The sub-unit can be started with a video from the “Resources” as an introduction.
- Visit to a WEEE plant
- 2 hours of self-study online
- Quiz: make small groups. The trainer shows participants different parts of the household appliances and the groups must write on a worksheet if it can be recycled or not and in which sector.
- The group that answers that has the most questions right, wins and as a prize gets fewer questions in the final evaluation test.

7. Evaluation

- The trainer shows different parts of the household appliances to participants and they have to say if it can be recycled or not and in which sector.

Sub-Unit 4	
1. Waste management and WEEE regulations	Total duration: 3 hours
2. Objectives of the sub-unit:	
<ul style="list-style-type: none"> To respect the applicable waste management and Waste Electrical and Electronic Equipment (WEEE) regulations 	
3. Content	
<ul style="list-style-type: none"> Follow the criteria established in the applicable regulations. Use the individual protection equipment correctly to avoid risks associated with the workplace. 	
4. Resources:	
<ul style="list-style-type: none"> Waste electrical and electronic equipment [website] DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE) [website] PC's with internet connection. 	
5. Learning Outcomes	
Upon completion of this learning unit the learner will be able to:	
Skills	Autonomy and responsibility
Knowledge of waste management and WEEE regulations.	Comply with procedures established in the regulations.
Knowledge of the general health and safety regulations at the workplace.	Report any irregularities or faults.
6. Methodological approach	
This sub-unit compromises a total of 3 hours, of which 1 hour dedicated to classroom learning and 2 reserved for online learning.	
<ul style="list-style-type: none"> 2 hours of self-study online Debate: The trainer can lead a debate, between the trainees, about the pros and cons of recycling household appliances and the applicable law (s). 	
7. Evaluation	
A 30 question self- assessment test.	

Unit 6 – Circular Economy for Green Entrepreneurship

Introduction:

The Circular Economy model offers an opportunity to reinvent economy, making it more sustainable and competitive. In this context, entrepreneurship, as a transversal competence, is key to sustainable development and to meet the demands of a proactive culture of innovation.

This unit introduces the trainee to the concept of green entrepreneurship as one of the main engines towards a circular economy model. In this unit, the trainee will go through a set of learning scenarios in order to become aware of the importance of entrepreneurship competence, in general, and green entrepreneurship, in particular. The development of this awareness regarding the importance of the entrepreneurship spirit will be explored through a set of specific exercises that will challenge the learners to think as entrepreneurs, creating a proposal for a green business in the household appliances sector.

Workload: 13h00 hours	
classroom learning	4h00
Online learning	6h00
Evaluation	3h00

Sub-Unit 1	
1. Circular Economy and Green Entrepreneurship: principles and concepts	Total duration: 4:00 hours
<p>2. Objectives of the sub-unit: In this sub-unit learners will:</p> <ul style="list-style-type: none"> • Revise the concept and principles of Circular Economy and Linear Economy introduced in “UC 1- Circular Economy Thinking”. • Learn about the differences between the concepts of “Entrepreneurship” and “Green Entrepreneurship”. • Research for case studies and best practices related to “Green Entrepreneurship”. • Relate the concepts of “Circular Economy” and “Green Entrepreneurship”. 	
<p>3. Content</p> <ul style="list-style-type: none"> • Circular Economy and Linear Economy concept and principles. • Entrepreneurship concept, considering the principles stated at the Entrepreneurship Competence Framework. • Green Entrepreneurship concept and principles. 	
<p>4. Resources:</p> <ul style="list-style-type: none"> – Circular v Linear economy [video] – Circular Economy... it's the way forward [video] – The Circular Economy: A Simple Explanation Cillian Lohan [video] – EU Circular Economy Package [PPT] – EntreComp: The Entrepreneurship Competence Framework [document] – Self- assessment test to evaluate the trainees entrepreneurial spirit. [Worksheet] – http://www.greenentrepreneurship.com/ [website] – Worksheet to conduct the research about a good practice or case study of “Green Entrepreneurship”. – Worksheet for “Online Learning”: “How to start up a green business?”. – Flipcharts. 	

– PC's with internet connection.

5. Learning outcomes

Upon completion of this learning unit the learner will be able to:

Skills	Autonomy and Responsibility
Define the concepts of Circular Economy and Linear Economy.	Demonstrate autonomy in researching information and gathering knowledge actively.
Distinguish between the concepts of “Entrepreneurship” and “Green Entrepreneurship”.	Demonstrate ability to organize information and distinguish the relevant information.
Identify “Green Entrepreneurship” best practices and case studies.”	Demonstrate critical thinking and decision making competences.

6. Methodological approach

This sub-unit comprises a total of 4hours, of which 2 hours dedicated to classroom learning and 2 reserved for online learning.

Debate ideas:

To revise the concepts of “Linear Economy” and “Circular Economy”, the trainer can use one of the videos listed in the “Resources” section or research for other videos that are more suitable. The trainer will then lead a debate, between the trainees, to compare and contrast the “Linear Economy” to the “Circular Economy”. During the debate, the trainees must discuss the disadvantages and advantages of both economic models.

Explore conceptual maps:

When exploring the concept of entrepreneurship, the trainer can use the “EntreComp conceptual model”. This chart is illustrative of the different entrepreneurship competence areas. Use the map to illustrate the concept. It is important that the participant gains self-awareness of its own entrepreneurship competences. A self-assessment test can be done in the class so that the participants evaluate their own entrepreneurial spirit.

Research and team work:

To explore the concept of “Green Entrepreneurship” ask the participants to conduct a research online about a good practice or a case study. This activity can be executed in small groups. Each group must identify one case study and best practice and present it in front of the class. The participant must conduct the presentations and make a sum up of all the presentation with the objective to present the concept of “Green Entrepreneurship”.

Online learning:

The trainer gives the participants an exercise that will serve as an introduction to the next-sub-unit. The trainees can work in small groups and must reserve at least 2hours of online study and preparation. The resource for this exercise is the worksheet for “Online Learning”: “How to start up a green business?”

7. Evaluation

Self- assessment test: an exercise for the participants to evaluate their entrepreneurial spirit.

Sub-Unit 2	
1. How to create a Green Business Plan?	Total duration: 4hours
<p>2. Objectives of the sub-unit:</p> <p>In this sub-unit learners will:</p> <ul style="list-style-type: none"> • Learn about the concepts of “Green Business”, “Environmental Creation Value” and “Eco-Design”. • Relate the concepts of “Sustainable development” and “Green Business”. • Analyse the steps required to create a Green Business Plan, using as reference model the “Handbook for Green Entrepreneurs in Mediterranean”. • Learn how to use a business model canvas. • Learn how to develop a Green business plan. 	
<p>3. Content</p> <ul style="list-style-type: none"> • Green Business concept, considering three interdependent dimensions: environment, economy and society. • Sustainable development and sustainable business. • Environmental value creation concept. • Eco Design concept and principles. • Business model canvas vs Sustainable business model canvas. 	
<p>4. Resources:</p> <ul style="list-style-type: none"> – Worksheet for “Online Learning”: “How to start up a green business?” [introduced in sub-unit 1]. – Create your Green Business. The Handbook for Green Entrepreneurs in Mediterranean. [document]. – Circulab board, the canvas to design your circular business model. [document] – Business Model Canvas - How Does it Work? e.g. LEGO [video] – The Business Model Canvas - 9 Steps to Creating a Successful Business Model - Startup Tips [video] – Business Model Canvas Explained. [video] – CIR-ECO – Green Business Model Canvas [Worksheet]. – Flicharts. – PC’s with internet connection. 	
<p>5. Learning outcomes</p> <p>Upon completion of this learning unit the learner will be able to:</p>	

Skills	Autonomy and Responsibility
<p>Explain the concepts of “Green Business”, “Environmental Creation Value” and “Eco-Design”.</p> <p>Relate Sustainable development and sustainable business.</p> <p>Distinguish between “Business model canvas” and “Sustainable business model canvas”.</p> <p>Develop a Green Business Plan.</p>	<p>Demonstrate autonomy in researching information and gathering knowledge actively.</p> <p>Demonstrate ability to organize information and distinguish the relevant information.</p> <p>Demonstrate critical thinking and decision making competences.</p>

6. Methodological approach

This sub-unit compromise a total of 4 hours, of which 2 hours is dedicated to classroom learning and 2 hours for online learning.

Revise concepts

Each group must present the results of the “Online learning” assignment. The trainer must allow at least 10 minutes to each group to present the results of the work the participants have prepared in advance. Do not spend more than 30 minutes on this activity. The presentation activity must be concluded with a debriefing. The trainer must conduct the debriefing.

Analyse and explore new tools

It is suggested that the trainer uses the manual “Create your Green Business” as a reference. “The Handbook for Green Entrepreneurs in Mediterranean”, focusing on the “Green business canvas” methodology is also proposed. Trainers must present the manual and synthesize the main information required for the participants to then develop a green business plan using the Green Business Canvas Model. In the “Resources” section the trainer can also find some proposals for videos and other tools to explore the “Business Model Canvas”. This is the core part of this sub-unit, we suggest that the trainer uses conceptual maps, charts and videos to present the contents related to the development of a green business plan.

Research, development and team work

The trainer challenges the participants to create a business model, using the Green Business Model Canvas, in the household appliances sector. The proposed exercise is explained in the “CIR-ECO – Green Business Model Canvas” worksheet. The trainer must explain the exercise to the participants and allow for some time in the classroom to arrange the groups and distribute the assignments.

Online learning

The trainees must be encouraged to complete the exercise in an online environment. The

trainer must prepare a collaborative platform in advance where the groups of participants can exchange information and collaborate in tasks. It is recommended that the participants spend at least 2 hours on the online learning part. The results of the assignment will be presented in sub-unit 3.

7. Evaluation

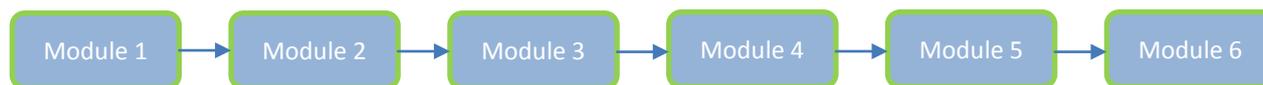
N/A for this sub-unit.



Sub-Unit 3									
1. Presenting our Green Business Proposal	Total duration: 3hours								
<p>2. Objectives of the sub-unit:</p> <p>In this sub-unit learners will:</p> <ul style="list-style-type: none"> • Finalise the development of the green business in the household appliances sector. • Present their green business proposal. • Have their work evaluated. 									
<p>3. Content</p> <ul style="list-style-type: none"> • Green Business concept, considering three interdependent dimensions: environment, economy and society. • Sustainable development and sustainable business. • Environmental value creation concept. • Eco Design concept and principles. • Business model canvas vs. Sustainable business model canvas. 									
<p>4. Resources:</p> <ul style="list-style-type: none"> – CIR-ECO – Green Business Model Canvas. [Worksheet]. – Peer evaluation form for group work. [Worksheet]. – Trainer evaluation form for group work. [Worksheet]. – Flipcharts. – PC's with internet connection. 									
<p>5. Learning outcomes</p> <p>Upon completion of this learning unit the learner will be able to:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: left;">Skills</th> <th style="width: 50%; text-align: left;">Autonomy and Responsibility</th> </tr> </thead> <tbody> <tr> <td>Recognise and value ideas for developing a Green Business.</td> <td>Demonstrate capacities of management in the implementation of business projects.</td> </tr> <tr> <td>Create a business idea using the Green Business Canvas Model.</td> <td>? the relations between the different actors of a business project.</td> </tr> <tr> <td>Choose appropriate, effective ways to communicate with other and/or to</td> <td>Demonstrate self-confidence and sense of</td> </tr> </tbody> </table>		Skills	Autonomy and Responsibility	Recognise and value ideas for developing a Green Business.	Demonstrate capacities of management in the implementation of business projects.	Create a business idea using the Green Business Canvas Model.	? the relations between the different actors of a business project.	Choose appropriate, effective ways to communicate with other and/or to	Demonstrate self-confidence and sense of
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Create a business idea using the Green Business Canvas Model.	? the relations between the different actors of a business project.								
Choose appropriate, effective ways to communicate with other and/or to	Demonstrate self-confidence and sense of								

audiences in diverse situations.	initiative. Demonstrate ethical and sustainable thinking. Demonstrate critical thinking and decision making competences.
<p>6. Methodological approach</p> <p>This sub-unit compromise a total of 3 hours. The trainer must reserve:</p> <ul style="list-style-type: none"> - Time for the trainers to finalise any aspect of the assignment given in the previous sub-unit. - Time for the groups presentations. - Time to evaluate the work conducted by the participants. <p>Finalise the assignment</p> <p>At the beginning of the class, the trainer must give some time so that the participants can complete any unfinished aspect of the assignment.</p> <p>Group work presentation</p> <p>The trainer must ? the trainers in the instruction given in the CIR-ECO – Green Business Model Canvas [Worksheet]. All groups must respect the time set for presentation. At the end of the group presentations, the trainer must conclude with a debriefing, revising all the content that was approached in this unit.</p>	
<p>7. Evaluation</p> <p>The evaluation can be created in two models:</p> <ol style="list-style-type: none"> 1. Peer Evaluation (see worksheet). 2. Trainer Evaluation (see worksheet). 	

3.3 ORGANISATION OF THE MODULES



Module 1 is taught before all other Modules. It provides basic knowledge of environmental protection, waste management and Circular Economy.

Module 2 will be taught after Module 1. It is closely related with module 3 and 4 so it will be necessary to complete this module before starting the subsequent ones.

3.4 GROUP SIZE

At the beginning of the training, the number of course participants should be limited to 12.

3.5 DIDACTIC TOOLS

Computer and internet connection for access to the training modules

The training room should have enough space for implementing the training module successfully.

The classroom is equipped in such a way that there are always different types of household appliances available so that the theory can immediately be put into practice.

In the workshop there is water supply, drainage, electricity and network connection

3.6 TIMETABLE

Modules	Number of hours	Evaluation
Circular Economy Thinking	4	1
Equipment and materials design and characteristics	19	1
Basic electricity	40	1
Clean, repair and refurbish of reusable/re-employable household appliances	92 (+ 32)	4
Sorting and dismantling properties / sub-elements	20	1
Circular Economy for Green Entrepreneurship	9	3
TOTAL	184 (+32)	11

4 TRAINER'S PROFILE

General

The trainer must have a minimum degree of electrical engineer or have obtained similar competences due to experience as an installer.

More important than the education, level or specific degree of the trainers is the acquired practical knowledge with regard to the repair of household appliances (unit 3 and 4).

The following criteria are important here:

- 5 years working as an independent repairer
- 5 years working in the repair service
- 5 years working in service after selling ? electrical household appliances
- 5 years working in the design department of a company that produces electrical household appliances

Special criteria

- Being able to work
- have good technical skills
- pedagogical qualities
- awareness of circular economy
- awareness of specific regulations



5 PRACTICAL ORGANISATION

1. The graduated participants receive the certificate basic knowledge “circular economy specialist in repair and refurbishment of household appliances”

Requirements to fulfil the conditions for obtaining this certificate:

- He or she has passed all the assessments.

2. The classrooms/workshops must provide rooms with adapted infrastructure and this in relation to the size and nature of the group of students.

See enumeration 3.5 didactic tools

3. Supplies to be purchased by the trainee (training institute can provide this for the students)

A toolbox must be provided for each participant (and should be purchased and brought by each participant) including the necessary small tools (screwdriver, pliers, universal meter, ...).



Evaluation:

See section 7 of each sub-unit in the curriculum.

