GoGreen

Augmented Reality Technology Green Curriculum

Using Augmented Reality Technology and Simulation-Based Training to Foster Innovation

Erasmus+

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Contents

Introduction

Climate Change

IPCC (Inter-governmental Panel on Climate Change) involves hundreds of experts from all countries in a joint effort to study and mitigate climate change. According to those experts, climate change is widespread, rapid, and intensifying. Scientists are observing changes in the Earth's climate in every region and across the whole climate system. Many of the changes observed in the climate are unprecedented in thousands, if not hundreds of thousands of years, and some of the changes already set in motion—such as continued sea level rise—are irreversible over hundreds to thousands of years. However, strong and sustained reductions in emissions of carbon dioxide (CO2) and other greenhouse gases would limit climate change. While benefits for air quality would come quickly, it could take 20-30 years to see global temperatures stabilize.

Many characteristics of climate change directly depend on the level of global warming, but what people experience is often very different to the global average. For example, warming over land is larger than the global average, and it is more than twice as high in the Arctic. Climate change is bringing multiple different changes in different regions – which will all increase with further warming. These include changes to wetness and dryness, to winds, snow and ice, coastal areas, and oceans. For example:

- Climate change is intensifying the water cycle. This brings more intense rainfall and associated flooding, as well as more intense drought in many regions.
- Coastal areas will see continued sea level rise throughout the 21st century, contributing to more frequent and severe coastal flooding in low-lying areas and coastal erosion. Extreme sea-level events that previously occurred once in 100 years could happen every year by the end of this century.
- For cities, some aspects of climate change may be amplified, including heat (since urban areas are usually warmer than their surroundings), flooding from heavy precipitation events and sea level rise in coastal cities.

The EU and many other countries are trying to act against climate change by reducing GHG emissions. This means redesigning the whole economy (e.g., renewable energy, electric cars, short supply chains). Besides economics and politics, formal education, adult and vocational education and training will be required to play their role in changing people's perceptions on many aspects, in the working

environment and everyday life. The project GoGreen, seeks to support the effort of educating professionals and the public on the topic of climate change and sustainable development.

Augmented Reality

Augmented reality is an emerging technology that allows the real, physical world to be enhanced/reinforced by virtual information. The potential user has real time control of the physical object/context on which audiovisual, virtual scenes - generated by a hardware - are imposed (Kato & Billinghurst, 1999; Lee, 2012). To avoid ambiguity, it is important to distinguish between Augmented and Virtual Reality (VR), since these two terms are often mixed up. Virtual Reality (VR) refers to the process of immersing yourself into a virtual environment that is a computer-generated simulation of an alternate world. Through the appropriate equipment (e.g., headsets and gloves), the user is "losing contact" from the real world and is immersed in an artificial environment. In contrast, in Augmented reality (AR) the information of the real world, perceived by the individuals through their senses, is enriched with digital data such as audiovisual, sensory elements.

Since AR doesn't try to recreate a completely virtual world, the requirements are simple: you need a smartphone or tablet to run augmented reality applications. For this reason, it is affordable and accessible technology that can become easily available to be used in many ways. The real world (such as surfaces, faces, hands) is captured through a smartphone camera and trackability features. Then, the AR app overlays virtual objects, so that users can see them on their smartphone screen, having the illusion that the digital object is actually there.

The augmentation of the real world is used to increase the degree of interactivity. Thus, AR is incorporated into various sectors: business, retail, advertising, entertainment, education, and training. Practitioners in the field of education and training can take advantage of the many benefits of AR (Hennel, Schmidt-Kraepelin, Van den Eynden, and Basten, 2015; Quintero, Baldiris, Rubira, Cerón, and Velez, 2019):

- Enhancement of users' interaction with technology and content
- Meaningful construction of knowledge through experience and trial and error
- Various ways of knowledge representation
- Increase and sustenance of motivation and overall satisfaction
- Improvement of concentration
- Opportunities for collaboration and reflection

There are three (3) main types of AR applications:

- **Marker-based AR:** using a smartphone camera, you are scanning visual markers, such as QR codes, and the animation is triggered. The digital, augmented scenes (e.g., video, text, animations) are displayed on the screen of your smartphone.
- **Markerless AR**: instead of requiring a marker, this type of application allows the user to decide where to place the virtual content. Specifically, the camera scans and recognizes the environment, gathering the information that is necessary for the AR software to make the digital content perfectly fit into the real world.
- **Projection-based AR**: by projecting light to physical surfaces and objects, 3D content is created and the user can actually interact with it. For this reason, you don't need a smartphone to display the content and everyone in the same environment can interact with it (e.g., see holograms).
- **Location-based**: is a GPS-based experience where digital content is connected to a specific location/place. You could send notification to visitors with your app.
- **Superimposition**: this type of AR application recognizes an object and provides an alternative view by "inserting" missing pieces or replacing the whole sight with an augmented one.

Curriculum and Training Modules

According to the most recent literature review, there is a lack of supporting material that sums up the available set of tools to use and create Mobile Augmented Reality Games for developing green skills and understanding about climate change.

This curriculum and training modules aim to equip the participating VET providers/trainers to advance their skills and key competences, increase their knowledge about climate change issues, and provide them with the necessary tools to address the challenges the private sector and entrepreneurs face.

The Curriculum includes a list of all the available digital tools for Mobile Augmented Reality Games and relevant software in lesson plans/scenarios related to the VET providers' work and analytical instructions on using the tools and their affordances limitations.

The Curriculum includes examples of methods of Augmented Reality as well as recommendations for these tools. Moreover, there is an effort to map the technological affordances of MARG to the corresponding educational objectives.

The curriculum includes guidelines with an explicit set of Learning Outcomes (LO), allocated time for each learning unit, and a tutor manual. Furthermore, a learning design framework was produced so that the VET providers can create lesson plans/scenarios, using Mobile Augmented Reality Games to promote green and digital competences to private entities and entrepreneurs.

The training course is divided into six sections, covering the following thematics:

- Section 1: Available Digital Tools for Mobile Augmented Reality Games
- Section 2: Training Module 1 - Business - High greenhouse gas (GHG) emissions which affect the climate
- Section 3: Training Module 2 - Risk for Penalty/fines
- Section 4: Training Module 3 - Identify opportunities for significant cost reductions
- Section 5: Training Module 4 - Increase marketing image – Corporate social responsibility
- Section 6: Learning Design Framework

Each Training Module includes the following subsections:

1. an “Outline of Module”: a subsection that provides an overview of the learning objectives, the content, activities, assessment, and equipment.
2. a detailed “Lesson Plan”: presents each subtopic/activity, the duration needed approximately, and the training material required. The material is further provided in the next subsection.

3. the “Material for activities and assessment”: provides the pre- and post-quizzes to assess the initial and acquired knowledge, respectively, as well as any further details that are important for the exercises presented in the lesson plan.

Section 1: Available Digital Tools for Mobile Augmented Reality Games

Table 1: Digital tools for Mobile Augmented Reality Games

a/a	Technology/ AR/ tool	links	How it can be used	Hardware/software needed	Cost
1	Ecological Footprint calculator	http://www.footprintcalculator.org/	The tool can be used to estimate the contribution of a person or a company to climate change. It can also be used to assess practices that could lead to GHG emissions reduction.	A pc with an internet connection	Free
2	Simplified emissions calculator for SMEs	https://www.epa.gov/climateleadership/simplified-ghg-emissions-calculator	The EPA Simplified GHG Emissions Calculator is designed as a simplified calculation tool to help small business and low emitter organizations estimate and inventory their annual greenhouse gas (GHG) emissions.	A pc with MS Office	Free
3	Augmented Reality software platform	http://taleblazer.org/	TaleBlazer is an augmented reality (AR) software that allows users to play and make their own location-based mobile games.	GPS-enabled Android and iOS smartphones	Free

4	Augmented Reality software platform	https://fielddaylab.org/make/aris/	ARISGAMES is an Augmented Reality (AR) software platform that allows users to play and make their own location-based mobile games and stories	GPS-enabled iOS (v. 8.0 or higher) iPhone, iPad or iPod	Free
5	Augmented Reality software platform		FreshAiR Platform is an augmented reality application that allows to navigate the pond environment and to observe virtual media and information overlaid on the physical pond.	Mobile wireless devices	Free
6	Augmented Reality software platform	https://en.actionbound.com/	Actionbound is a platform for creating educational Mobile Augmented Reality Games	Android, iOS	Free
7	Augmented Reality software platform	https://www.playvisit.com/	PlayVisit is a platform for creating educational Mobile Augmented Reality Games	Android, iOS	Free

Section 2: Training Module 1

Outline of the Module

Title: Business - High Greenhouse Gas (GHG) emissions which affect the climate			
Duration: 1 hour and 25 minutes			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: • recognize the factors that contribute to climate change • recognize the consequences of climate change • identify and compare how different economic sectors are related to greenhouse gas emissions • calculate a company's GHG emissions for SMEs	Introduction to climate change and sustainability issues; calculation of carbon footprint and GHG emissions for SMEs in the partnership countries	Participants will: 1. complete pre- and post-quizzes 2. calculate a company's GHG emissions (via SMEs Carbon Footprint calculator and/or basic calculations in excel) 3. identify hotspots for GHG emissions mitigation.	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. make a list of their company's activities that are associated with GHG emissions. Also, they will brainstorm possible sustainable options to replace their company's sources of GHG emissions

• identify sustainability options (e.g., climate change mitigation) • identify hotspots and propose GHG emissions mitigation			

Preparation/ Materials/Equipment:

- Training venue with IT equipment including laptop and projector
- A computer for the facilitator
- Internet connection
- Projector
- Flipchart and markers
- Sign-in sheet
- Electronic device (mobile or computer) for each participant (optional)
- A notebook and a pen for each participant

Lesson plan

Module 1: Business – High Greenhouse Gas (GHG) emissions accounting / reporting			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**Introduction to Module** - Shortly present the learning objectives, activities, and assessment	2’	Outline of the Module
2	**Pre-assessment: Quiz to assess initial knowledge** Students are asked to fill in a quiz prior to the introduction of the learning content, to assess their acquired knowledge. The quiz can be distributed on paper or via a digital tool. *[Individual assessment activity]*	10'	See the questions and answers of the pre-quiz here
3	**Introduction to the topic** - Present the following video about climate change: https://www.nationalgeographic.org/video/climate-101-cause-and-effect/ - Optionally you can watch the following video about global warming and climate change: 1. https://climate.nasa.gov/climate_resources/139/video-global-warming-from-1880-to-2020/	20'	YouTube videos

	2. https://youtu.be/8Rvl6z80baI After the introductory video, you can ask the following questions (they are indicative): • What is the Greenhouse effect? • What are the main causes for climate change? • What are the main consequences of climate change for: A. Oceans B. Weather C. Food D. Health • How do you feel about climate change? How does it affect us humans individually? • How can we humans help to combat climate change? • Why do you think companies should be more involved in the green economy? • How could companies be involved in combating climate change? • What are the benefits for them?		
4	**<u>Activity on GHG emissions accounting/reporting (Part 1/2)</u>** Ask participants to calculate their company's GHG emissions: Use the Carbon Trust tool to calculate the GHG emissions for your organization. The Carbon Footprint Calculator (CFC) has been designed to help SMEs measure their corporate emission footprint. The tool only	45' for both parts	- Carbon Trust tool (https://www.carbontrust.com/) - An introductory guide containing more details on the Carbon Footprint for companies could be obtained for free here: https://www.carbontrust.com/resources/

	includes selected emission sources, common to the majority of SMEs using an operational control approach. (see box here) After obtaining the results from the use of the tool, the following questions could be discussed: - Which is the CF for your organization? - What are Scope 1 and Scope 2 emissions? What do they mean? - What do you think about the tool? Could it be helpful for your organization? Can you suggest further capabilities that would be helpful for your company?		carbon-footprinting-guide (a ppt presentation could be prepared by the VET educator to provide more info to the trainees). - Access the CFC tool here: https://gbfcalc.azurewebsites.net/gbf/calc - Follow the STEPS for using the calculator that is provided in Annex 1. [Alternatively you can use the tool that is produced within OEB's Business4Climate project. This is the link to the calculator tool: http://business4climate.oeb.org.cy/]
5	**Activity on GHG emissions accounting/reporting (Part 2/2):** Ask participants to identify hotspots and compare their results (benchmarking): In the RESULTS PAGE (see Annex I) you can proceed by using the benchmark tool (to identify hotspots and further assess your company's emissions). After obtaining the results from the use of the tool, the following questions could be discussed: - What is the percentage of energy use for a) heating, b) cooling, c) lighting, d) office equipment? - Does your company perform according to your sector's standards?	-	Results Page – Annex 1

	- Are there options for energy use mitigation? Can you estimate the reductions in energy use?		
6	**Post-Assessment 1: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The final questionnaire consists of 11 multiple-choice questions about climate change and greenhouse emissions. *[Individual assessment activity]*	10’	See the questions and answers of the post-quiz here
7	**Post-Assessment 2: Hands on task** [1] Depending on the available time, ask participants to: - make a list of their company's activities that are associated with GHG emissions. - brainstorm possible sustainable options to replace their company’s sources of GHG emissions. *[Individual assessment activity].*	-	

[1] The assessment activities can either be conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home).

Material for activities and assessment

Pre-quiz

This questionnaire consists of 11 multiple-choice questions about climate change and greenhouse gas emissions. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. The greenhouse effect is caused by:

A. The gases from burning fossil fuels that increase, trap heat inside the earth's atmosphere and cause global temperatures to increase - **CORRECT**
B. The gases from burning fossil fuels that decrease, trap heat inside the earth's atmosphere and cause global temperatures to increase
C. The gases from burning fossil fuels that increase, trap heat inside the earth's atmosphere and cause global temperatures to decrease

Q2. One of the following is an example of greenhouse gas:

A. Argon
B. Carbon dioxide - **CORRECT**
C. Nitric oxide

Q3. One of the following is amongst the biggest causes of global warming:

A. Decomposing plants
B. Burning oil, gas, and coal - **CORRECT**
C. Pollution from wildfires

Q4. Which five-year period was the warmest on record?

A. 2016-2020 - **CORRECT**
B. 2011-2015
C. 2006-2010

Q5. Which of the following are consequences of climate change?

A. More extreme weather like droughts, heat waves and hurricanes
B. Global sea levels rising at an alarmingly fast rate
C. The ice sheets are declining, and glaciers are retreating globally

D. All the above – **CORRECT**

Q6. China is the biggest emitter of greenhouse gas CO2 in the world, having produced what percentage of total global emissions in 2019?

A. 30.4% - **CORRECT**
B. 8.5%
C. 17.8%

Q7. The transportation sector emits ……. percentage of the global greenhouse gas emissions:

A. 33%
B. 14% - **CORRECT**
C. 70%

Q8. Globally, one of the following economic sectors emits the largest percentage of greenhouse gas emissions:

A. Industry
B. Transportation
C. Electricity and heat production - **CORRECT**

Q9. What does sustainability mean?

A. To manage resources in a way that allows future generations to use them too - **CORRECT**
B. To increase the use of renewable energy
C. To develop alternative forms of energy

Q10. How can countries help to reduce the impact of climate change?

A. To phase out fossil fuels such as coal, oil, and gas
B. To increase the use of renewable energy
C. To protect forests
D. All the above - **CORRECT**

Q11. What was the goal of the 2015 Paris climate accord?

A. Limit global warming to well below 1 ^{o}C, preferably to 0.5 degrees Celsius, compared to pre-industrial levels.

B. Limit global warming to well below 2 ^{o}C, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. - **CORRECT**

C. Limit global warming to well below 4 ^{o}C, preferably to 2 degrees Celsius, compared to pre-industrial levels.

Activity on GHG emissions accounting/reporting (Part 1/2)

BOX I

To calculate the organisation's footprint, you will need the following information for your chosen reporting year:

Fuel consumption - Fuel consumed by the organisation in its sites and owned vehicles. This can be natural gas, diesel or LPG. You may find this information in bills, fuel card data or meters

Energy consumption - Electricity used in your sites. You may find this information through meter readings, utility bills, or automatic meter readings

Top-ups made to air conditioning units - Many refrigeration, fire protection and air conditioning equipment contain a type of F gas (Fluorinated greenhouse gas), which has a large carbon footprint. Please include the type and quantity of top-up that has been done during the reporting year. You can find this information in the service sheets provided by your air conditioning or refrigeration contractor

The reported data must cover the chosen 12 months of data. If you don't have data exactly for the whole year, you should estimate the consumption using the average energy or fuel consumed per month. Please note that there can be seasonal changes in energy demand due to production levels, need for heating/cooling and use and replacement of equipment.

Post-Quiz

This final questionnaire consists of 11 multiple-choice questions about climate change and greenhouse emissions. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. One of the greenhouse gases is characteristic to landfill sites:

A. Methane - **CORRECT**
B. Carbon dioxide
C. Nitrous oxide

Q2. Volcanic eruptions produce in high amounts one of the following greenhouse gas emissions:

A. Methane
B. Carbon dioxide - **CORRECT**
C. Nitrous oxide

Q3. How did global energy-related CO2 emissions change during 2020, compared with 2019?

A. - 3%
B. - 6% - **CORRECT**
C. - 9%

Q4. How much has the sea level rise since 1990 (global average)?

A. 21 cm
B. 6 cm - **CORRECT**
C. 14 cm

Q5. One example of mitigation strategy is:

A. Carbon capture - **CORRECT**
B. Sea defences
C. Water transfer schemes

Q6. One of the world's simplest molecules is a potential source of clean energy:

A. Hydrogen - **CORRECT**
B. Ammonia
C. Lithium

Q7. One of the following is a very strong GHG gas (high Carbon Footprint):

A. F gas
B. N_2O - **CORRECT**
C. CO_2

Q8. One of the following belongs to Scope 2 emissions from an organization:

A. Diesel used in cars
B. Electricity - **CORRECT**
C. Paper purchased

Q9. When using the CFC (Carbon Footprint Calculator) CO2eq emissions from “direct energy and processes” are included in:

A. Scope 1 - **CORRECT**
B. Scope 2
C. Scope 3

Q10. The term CO2eq includes:

A. All the greenhouse gases - **CORRECT**
B. CO_2, CH_4, N_2O
C. CO_2, CH_4, N_2O, F gas

Q11. Which of the following could mitigate GHG emissions from SMEs:

A. Changing to renewables - **CORRECT**
B. Using more electricity than diesel
C. All the above

Section 3: Training Module 2

Outline of the Module

Title: Risk for penalties and fines due to increased GHG emissions			
Duration: 4 hours			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: • recognize the human and companies' activities that may cause damages on the climate system due to the production of GHG emissions • calculate one's personal carbon footprint (CF) • explain the basic international, EU and national environmental policies and practices about the reduction of GHG emissions	Human and companies' activities that produce GHG emissions and mitigation measures, Introduction to the International and EU environmental policies, and the risks for penalties and fines due to increased GHG emissions, Introduction to the national environmental policies, and risk for penalties and fines due to increased GHG emissions	Participants will: 1. complete pre- and post-quizzes 2. recognize the human activities that produce GHG emissions and the mitigation measures through the use of the earth hero: climate change AR tool. They will describe the ways these activities are applied within a company/on a business level. 3. identify the penalties and fines due to increased GHG emissions *4.* identify the differences between the basic EU Effort	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. research the penalties and fines imposed in their country due to increased GHG emissions. They will draft a plan with specific green practices that they can follow in their company to mitigate GHG emissions, to avoid the national risks and penalties.

• recognize the legislation and risk for penalties and fines due to increased GHG emissions • plan how to avoid any risk for penalties and fines • apply green practices in the everyday operations of their companies to mitigate GHG emissions		sharing and EU Emissions Trading System (EU ETS)	
Preparation/ Materials/Equipment: • Training venue with IT equipment including laptop and projector • A computer for the facilitator • Internet connection • Projector • Flipchart and markers • Sign-in sheet • An electronic device (mobile or computer) for each participant (optional) • A notebook and a pen for each participant			

Lesson plan

Training Module 2: Risk for penalties and fines due to increased GHG emissions			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**<u>Introduction to the Module</u>** - Shortly present the learning objectives, activities, and assessment	2’	Outline of the Module
2	**<u>Pre-assessment: Quiz to assess initial knowledge</u>** Students are asked to fill in a quiz before the introduction of the learning content, to assess their acquired knowledge. The quiz can be distributed on paper or via a digital tool. *[Individual assessment activity]*	10'	See the questions and answers of the pre-quiz here
3	**<u>Warm up</u>** Sensitization about the human activities that produce GHG emissions and raising awareness about mitigation measures using the earth hero: climate change AR tool. Ask your trainees to download and sign in the "Earth Hero: Climate Change" app and calculate their emissions profile Then initiate a discussion, using the following indicative reflection questions: • How do you feel about your score?	35'	Links of AR app Earth Hero: Climate Change: https://apps.apple.com/gd/app/earth-hero-climate-change/id1458057746 https://play.google.com/store/apps/details?id=com.earthheroorg.earthhero&hl=en&gl=US

	• Is there deviance compared to your country and international scores? • To what extent do you implement in your company activities, or do you follow practices that produce GHG emissions? • Are you aware of any practices that you could follow in your company for decreasing GHG emissions? • Have you thought of adopting any of these practices? • Could you use in your company any of the actions proposed in the Earth Hero: Climate Change app to decrease the production of GHG emissions? • Are you aware of any policies or control mechanisms that your country or EU applies to companies for their compliance to the reduction of GHG emissions? • How can you be informed about these policies?		
4	**Introduction to International and EU environmental policies and the risks for penalties and fines due to increased GHG emissions.** Introduce to your trainees the basics of the international and EU policies.	40'	PPT FILE: TM2_International and EU Environmental Policies risk for penalties and fines due to increased GHG emissions
5	**Activity 1: Penalties and fines due to increased GHG emissions (Part 1/2)** The activity about penalties and fines imposed by EU due to increased GHG emissions consists of 2 parts: (a) article reading and (b) trainees' propositions for penalty/fines due to increased GHG emissions. Ask participants to read the article "St James's Hospital fined €200,000 for emissions rules breach".	25' for both parts	The article "St James's Hospital fined €200,000 for emissions rules breach": https://www.irishtimes.com/news/environment/st-james-s-hospital-fined-200-000-for-emissions-rules-breach-1.3891246

6	**Activity 1: Penalties and fines due to increased GHG emissions (Part 2/2)** Indicative questions to the trainees: • To which EU policy this case refers to? • What went wrong in the case of St James's Hospital? • Do you believe that generally, the imposition of fines and penalties helps the transition to a green economy, are they necessary? • Would you propose other measures? This is a peer-evaluation activity. It will be performed by trainees in groups and each group will then evaluate the responses of another group.	-	
7	**Activity 2: Identification of the differences between the basic EU policies** Study the EU policies Effort sharing and EU Emissions Trading System (EU ETS) in the following links and identify their differences based on the criteria presented in the Table found under the "Material for activities and assessment" part. This is a peer-evaluation activity. It will be performed by trainees in groups and each group will then evaluate the responses of another group. Support the participants while they are reading the regulations.	30'	https://ec.europa.eu/clima/policies/effort/regulation_en https://ec.europa.eu/clima/policies/ets_en Table can be found here

8	**Introduction to the national environmental policies & risk for penalties and fines due to increased GHG emissions** Questions to the trainees: Imagine that you are responsible for motivating companies in spur countries to decrease their GHG emissions. • Are you aware of any relevant cases in your country? • What policies have the government implemented, apart from the compliance to the EU legislation measures? • Are you aware of any penalties and fines?	25'	
9	**Post-assessment 1: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The final questionnaire consists of 7 multiple-choice questions about International, EU and National Environmental Policies: Risk for Penalties and Fines due to increased GHG emissions. *[Individual assessment activity]*	15'	See the questions and answers of the post-quiz here
10	**Post-assessment 2: Hands on task**[2] Depending on the available time, ask participants to: - research the penalties and fines imposed in their country due to increased GHG emissions. - draft a plan with specific green practices that they can follow in their company to mitigate GHG emissions, to avoid the national risks and penalties. *[Individual assessment activity].*	-	

[2] The assessment activities can either be conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home).

Material for activities and assessment

Pre-Quiz

This questionnaire consists of 7 multiple-choice questions about the topic “International, EU and National Environmental Policies: Risk for Penalties and Fines due to increased GHG emissions”. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. Which of the following constitute international treaties that address environmental issues? **Choose ALL the correct answers**

A. Kyoto Protocol (1997) - **CORRECT**
B. Paris Agreement (2016) - **CORRECT**
C. United Nations Declaration (1942)
D. All the above

Q2. Governments can help tackle environmental issues by implementing policies such as

A. Penalties/fines for increased GHG emissions
B. Promotion of the effect of people’s and companies’ activities on the environment
C. All the above - **CORRECT**

Q3. Which of the following economic sectors do EU policies target for the decrease of GHG emissions?

A. Industry
B. Electricity and heat generation
C. Transportation
D. Agriculture
E. All the above - **CORRECT**

Q4. The EU Emissions Trading System refers to the trading system of allowances of GHG emissions.

A. True - **CORRECT**
B. False

Q5. Fines increased GHG emissions are imposed by the European Authorities to the companies that produce the emissions.

A. True

B. False - **CORRECT**

Q6. CO_2 emissions reduction policies from international aviation are covered by the EU legislation.

A. True

B. False - **CORRECT**

Q7. Which of the following are economic policy instruments for environmental protection? **Choose ALL the correct answers**

A. Taxation per unit of pollutants - **CORRECT**

B. The purchase of pollution rights - **CORRECT**

C. Standards

Activity 2

Criteria	**Effort sharing**	**EU Emissions Trading System**
Starting year		
Sectors covered		
Emission production limits		
Fines		
Targets until 2030		
Application process		

Post-Quiz

This final questionnaire consists of 7 multiple-choice questions about International, EU and National Environmental Policies: Risk for Penalties and Fines due to increased GHG emissions. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. “To keep the rise in global average temperature to well below 2 °C (3.6 °F) above pre-industrial levels, and to pursue efforts to limit the increase to 1.5 °C (2.7 °F)” is the aim of the….

A. Johannesburg Conference on Sustainable Development
B. Convention on Biological Diversity
C. Kyoto Protocol
D. Paris Agreement - **CORRECT**

Q2. EU Emissions Trading System (EU ETS) …

A. is a EU's policy to combat climate change
B. is a key tool for reducing greenhouse gas emissions cost-effectively
C. Both a and b- - **CORRECT**
D. None of the above

Q3. Based on the EU Emissions Trading System (EU ETS) …

A. Companies with emissions below the level can sell their excess allowances at a price determined by supply and demand at that time. - **CORRECT**
B. Companies with emissions below the level are not able to sell their excess allowances
C. Companies that cannot remain within emissions limit are not able to take any measures to reduce their emissions
D. Companies that cannot remain within emissions limit are not able to buy extra allowances

Q4. The EU Emissions Trading System (EU ETS) includes the following sectors

A. transport, buildings, agriculture and waste
B. electricity and heat generation, energy-intensive industry sectors, commercial aviation - **CORRECT**
C. All the above

Q5. The Effort-sharing Regulation covers sectors of the economy that fall outside the scope of the EU Emissions Trading System (EU ETS)

A. True – **CORRECT**

B. False

Q6. SMEs cumulatively are not able to impact environment

A. True

B. False - **CORRECT**

Q7. Some areas of EU environmental legislation relevant to SMEs refer to:

A. Air quality, emissions trading, and noise

B. Chemicals

C. Energy and Environmental management

D. All the above - **CORRECT**

Section 4: Training Module 3

Outline of the Module [Option 1]

Title: Identify opportunities for significant cost reductions			
Duration: 3 hours and 25 minutes			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: • recognize the different approaches for GHG reduction and its associated costs and savings • define the relation between cost and benefit of GHG reduction policies of a company • evaluate the implementation costs of applying certain GHG reduction measures to an organization/SME • identify different possible GHG reduction measures	GHG emission sources, evaluation, reduction measures and cost, Basic Economics and Finance, GHG Reduction and Organization Sustainability	Participants will: 1. complete pre- and post-quizzes 2. identify GHG emission reduction measures 3. calculate cost and benefit of GHG reduction policies 4. research different reduction measures and calculate the possible cost reduction for the company of the associated GHG reduction measures	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. complete a knowledge quiz about Economics and Finance before and after the course 3. list at least 3 GHG reduction measures that they are going to implement in their company, based on the reduction of cost that results from the application of these measures. They will refer to the cost reduced and

for a specific organization/scenario • estimate the total cost reduction after the implementation of certain GHG reduction measures • propose a GHG reduction mitigation measures policy to reduce costs			the relevant benefits for their company, to justify their responses.
Preparation/ Materials/Equipment: • Training venue with IT equipment including laptop and projector • A computer for the facilitator • Internet connection • Projector • Flipchart and markers • Sign-in sheet • An electronic device (mobile or computer) for each participant (optional) • A notebook and a pen for each participant			

Lesson plan [Option 1]

Module 3: Identify opportunities for significant cost reductions			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**Introduction to the Module** Shortly present the learning objectives, activities, and assessment	2’	Outline of the Module
2	**Pre-assessment: Quiz to assess initial knowledge on GHG emissions and reduction measures** Provide a short questionnaire to your trainees to assess their initial knowledge. The questionnaire consists of 9 multiple-choice questions about the topic “GHG emissions and reduction measures”. *[Individual assessment activity]* After the trainees finish the questionnaire, briefly discuss the results (anonymously) among them. Ask them possible questions like (to be adapted depending on the results):	10’	See the questions and answers of the pre-quiz A here

	• How do you feel about your score? • Why do you think … is/isn't a source of GHG emissions? • Why do you think … is/isn't a reduction measure? • Why do you think … is more important than …? * Optional activity: Create menti presentation (https://www.mentimeter.com) for a word cloud and ask the learners to fill in 5-10 (depending on the group size) different GHG emission sources they could reduce. Share the result screen and discuss the most important results.		
3	**Introduction to GHG emission sources, evaluation, reduction measures and cost** Introduce to your trainees the basics of GHG emissions and reduction measures.	25'	PPT FILE: TM3A_ Identify opportunities for significant cost reductions (Unit 1/Chapter 1.2) You will find: • Thematic introduction and video links • Presentation slides with information and reduction measures • Interesting carbon footprint links
4	**Activity: Practical case identifying GHG emission reduction measures** Introduce to your trainees the data and details of a real case of a small business (cafeteria). Let the trainees work individually on the case asking them to list on a paper all the possible reduction measures. *[Teacher or Peer assessment activity]*	20'	PPT FILE: TM3A_ Identify opportunities for significant cost reductions (continue to Unit 1/Chapter 1.3)

	After 10 minutes, discuss in group the solutions. Ask them possible questions like (to be adapted depending on the results): • Why do you think … is a reduction measure? • What measures would you think have more impact on GHG emissions? • What measures would you think are more costly to implement?		
5	**Post-assessment 1: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The questionnaire consists of 10 multiple-choice questions about the topic "GHG emissions and reduction measures". *[Individual assessment activity]*	10'	See the questions and answers of the post-quiz A here
6	**Pre-assessment 2: Quiz to assess initial knowledge on basic economics and finance** Assess preconceptions and initial knowledge about Economics and Finance: Provide this short questionnaire to you trainees to assess their initial knowledge. The questionnaire consists of 10 multiple-choice questions about the topic "Economics and Finance". *[Individual assessment activity].*	10'	See the questions and answers of the pre-quiz B here

7	**Introduction to Business Finance concepts and digital tools** Introduce to your trainees the basics of Economics and Finance. An Online page for the European Commission Financial capacity self-check Assessment tool is included in the presentation: https://ec.europa.eu/research/participants/lfv/lfvSimulation.do Here the trainer can comment on the resulting rations (solvency, profitability, G.O. Profit) or simply show the page for the trainees to be aware of the importance of economics and finance when asking for EU funds.	25’	PPT FILE: TM3A _ Identify opportunities for significant cost reductions (continue to Unit 2 – Chapter 2.2) EXCEL FILE: TM3A _ Worksheet 1 as an example of GHG reduction: What if every American household swapped out 3 incandescent light bulbs for LED light bulbs? - Here the trainer can play with the number of lights, power of each bulb, … and talk about the results.
8	**Activity: Practical case cost/benefit calculation** Introduce to your trainees the data and details of a real case of a series of calculations of different financial values. Let the trainees work individually on the case asking them to prepare the cell formulas for calculating the financial values. In case of doubt, the excel file used shows one possible solution with the formulas, description, and explanation. *[Teacher or Peer assessment activity]* Important observation for ALL activities using spreadsheets: If the students/trainees have access to a computer, ensure a spreadsheet software is installed (excel, opencalc, …). In the case there is no access to a computer, but there is access to mobile phone or tablet, then upload the Worksheet files in excel spreadsheet format to online spreadsheet format before the training, allowing the use of online/web tools like Google-Sheets or similar.	20’	PPT FILE: TM3A _ Identify opportunities for significant cost reductions (continue to Unit 2 – Chapter 2.3) EXCEL FILE: TM3A _ Worksheet 2

	After 15 minutes, discuss the results in groups		
9	**Post-assessment 2: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The questionnaire consists of 10 multiple-choice questions about the topic "Basic Economics and Finance". *[Individual assessment activity]*	10'	See the questions and answers of the post-quiz B here
10	**Introduction to GHG Reduction and Organization Sustainability** Opportunities for cost reduction and real case examples Introduce to your trainees the basics of cost reduction and real case.	20'	PPT FILE: TM3A _ Identify opportunities for significant cost reductions (continue to Unit 3 – Chapter 3) You will find: • Presentation slides with introductory information • Presentation slides with links to videos of real case examples
11	**Activity: Practical case with AR tool** This activity will be based on AR (Augmented Reality) tool Assemblr and it will consist in the trainees looking for the AR markers to see the information on different reduction measures, while taking notes, to finally introduce the data in an excel file to calculate the possible cost reduction for the company of the associated GHG reduction measures. Details on how to prepare for the activity can be found in the "Material for activities and assessment" part of this document below. Click here.	40'	EXCEL FILE: TM3A _Worksheet 3 Assemblr Edu app: https://play.google.com/store/apps/details?id=com.assemblr.education

12	**Module debrief and reflections** Group work, discussion, and reflection on the whole module. The trainer can ask questions like: • Are there any specific measures you will commit to adopt in your life personally? • And in your professional life? • What about the community/society? • What specific actions will you take? • What are the key takeaways from this session?	15’	
13	**Post-assessment 3: Hands-on task** [3] Depending on the available time, ask participants to: list at least 3 GHG reduction measures that they are going to implement in your company, based on the reduction of cost that results from the application of these measures. Point out that they need to refer to the cost reduced and the relevant benefits for their company, to justify their responses. *[Individual assessment activity].*	-	

[3] The assessment activities can either be conducted during the training or some of them can be assigned as homework (e.g., assign the quizzes for self-reflection at home).

Material for activities and assessment [Option 1]

Pre-Quiz A

This questionnaire consists of 9 multiple-choice questions about the topic "GHG emissions and reduction measures". Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. Which activities are the largest contributors of greenhouse gases? (**Choose ALL the correct answers)**

A. Deforestation
B. Electricity generation - **CORRECT**
C. Industry
D. Transportation – **CORRECT**
E. Agriculture

Q2. How much has CO2 in the atmosphere increased since the Industrial Revolution? In the 10,000 years before the Industrial Revolution in 1751, carbon dioxide levels rose less than 1 per cent. Since then, they've risen by:

A. 11 %
B. 49 % - CORRECT
C. 62 %

Q3. How has the global average temperature changed since the Industrial Revolution?

A. Cooler by 0.1 degrees C
B. The temperature has gone up and down but remains the same
C. Warmer by 0.1 degrees C
D. Warmer by more than 1 degree C - **CORRECT**
E. Warmer by almost 2 degrees C

Q4. If the global temperature rises by over 1.5°C what percentage of species will be at risk of extinction?

A. 100% – all species will be at risk
B. 15-20% – at least one in six species- **CORRECT**

C. 0% – no species will be at risk

D. 10-15% – one in ten species will be at risk

Q5. According to the Sustainable Development Goal 13, the biggest threat towards development is:

A. Climate change – **CORRECT**

B. Pollution

C. Melting Polar Ice-Caps

D. Population Growth

Q6. The 2030 climate and energy framework has the ambition to have at least a renewable energy share of:

A. 15%

B. 32% - **CORRECT**

C. 50%

Q7. Which of the following are GHG emission reduction measures? (**Choose ALL the correct answers**)

A. Avoid email attachments - **CORRECT**

B. Having no milk in the coffee/tea - **CORRECT**

C. Eating beef instead of pork

D. All the above

Q8. Upgrade light bulbs have a higher impact than always washing with cold water.

A. True

B. False - **CORRECT**

C. They have the same impact

Q9. Which of the following GHG emission reduction measures have a higher impact?

A. Replace a gasoline car with and hybrid car

B. Eat a plant-based diet - **CORRECT**

C. Recycling

Q10. Which country has emitted the most CO2 over time being the most responsible for the greenhouse gases that are currently residing in the atmosphere?

A. China

B. USA - **CORRECT**

C. Russia

D. European Union

E. Saudi Arabia

Post-Quiz A

This final questionnaire consists of 10 multiple-choice questions about the topic “GHG emissions and reduction measures”. Instructions: Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. What is the greenhouse effect?

A. The greenhouse effect is the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature above what it would be without this atmosphere- **CORRECT**
B. The greenhouse effect is the process by which radiation from a planet's atmosphere warms the planet's surface to a temperature below what it would be without this atmosphere.
C. The greenhouse effect is the process by which convective heat from a planet's atmosphere warms the planet's surface to a temperature above what it would be without this atmosphere.

Q2. What is a GHG (Greenhouse Gas)?

A. A greenhouse GHG is a gas that absorbs and emits radiant energy within the thermal ultraviolet range, causing the greenhouse effect.
B. A greenhouse gas GHG is a gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect. - **CORRECT**
C. A greenhouse gas GHG is a gas that absorbs and emits convective energy within the thermal infrared range, causing the greenhouse effect.

Q3. Which is the percentage contribution to the greenhouse effect of carbon dioxide among the other greenhouse gases?

A. 6-12%
B. 9-26% - **CORRECT**
C. 32-39%
D. 55-60%

Q4. Without greenhouse gases, the average temperature of the Earth's surface would be about

A. -23.5°C
B. -18°C - **CORRECT**
C. 2°C
D. 7.5°C

Q5. Why is climate change caused by excess greenhouse gases and a big carbon footprint so important? **(Choose ALL the correct answers)**

A. Because it causes heat waves that can damage crops and livestock. - **CORRECT**
B. Because it decreases sea level and might cause loss of marine habitats
C. Because the associated increased air pollution is linked to health problems. - **CORRECT**
D. All the above

Q6. Carbon footprint is the total greenhouse gas (GHG) emissions caused by an individual, event, organization, service, place or product, expressed as carbon dioxide equivalent, and

A. It includes only carbon dioxide
B. It includes also other gases like oxygen (O2) and helium (He)
C. It includes also other gases like nitrous oxide (N2O) and Hydrofluorocarbons (HFCs) - **CORRECT**
D. None of the above

Q7. Which of the following affirmations is correct for a typical 40g portion of edible protein?

A. Farmed salmon has a higher carbon footprint than Pork
B. Chicken has a higher carbon footprint than Beef
C. Pork has less carbon footprint than Chicken and higher than Farmed Salmon
D. None of the above - **CORRECT**

Q8. A standard LED light bulb last approximately

A. The same as an incandescent lamp
B. 10-15 times more than an incandescent lamp - **CORRECT**
C. 50-100 times more than an incandescent lamp

D. None of the above

Q9. Which of the following affirmations are true? **(Choose ALL the correct answers)**

A. A spam email has usually the same carbon footprint as a proper email
B. An email with a long attachment has usually a higher carbon footprint than a black tea or coffee, boiling only the water you need - **CORRECT**
C. A large cappuccino has a lower carbon footprint than a white tea or coffee, boiling double the water you need
D. A large café latte has usually higher carbon footprint than a large cappuccino - **CORRECT**

Q10. Which of the following actions would reduce GHG emissions? **(Choose ALL the correct answers)**

A. Turn off lights when not used - **CORRECT**
B. Increase winter household thermostat temperature
C. Increase summer household thermostat - **CORRECT**
D. Install low flow showerheads - **CORRECT**
E. Practice eco-driving - **CORRECT**

Pre-Quiz B

The questionnaire consists of 10 multiple-choice questions about the topic "Economics and Finance". Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. The resources used in the production of goods and services are limited, so society should:

A. Make choices about how to use resources.
B. Try to obtain additional resources.
C. Reduce their use of resources. - **CORRECT**
D. All the above

Q2. The concept of present value relates to the idea that

A. The money you have now is worth less today than an identical amount you would receive in the future
B. The money you have now is worth the same today as an identical amount you would receive in the future
C. The money you have now is worth more today than an identical amount you would receive in the future - **CORRECT**
D. None of the above

Q3. What is the law of demand? **(Choose ALL the correct answers)**

A. As price increases, consumers will purchase less of the specific goods. – **CORRECT**
B. As price increases, consumers will purchase more of the specific goods.
C. As price decreases, consumers will purchase more of the specific goods. – **CORRECT**
D. As price decreases, consumers will purchase less of the specific goods.

Q4. Suppose you have 100€ in a savings account earning 3% interest a year. After 3 years, how much would you have?

A. More than 103€ – **CORRECT**
B. Exactly 103€
C. Less than 103€

Q5. Suppose you have 1000€ in a savings account earning 1% interest a year and inflation is 2% a year. After 1 year, how much would you have?

A. More than now
B. Exactly the same
C. Less than now – **CORRECT**
D. None of the above

Q6. What affects the amount of interest that you would pay on a loan?

A. Your credit rating
B. How much you borrow
C. How long do you take to repay the loan
D. All the above – **CORRECT**

Q7. Suppose that by 20 years your income has doubled and prices have doubled too. How much will you be able to buy with your future income?

A. More than today
B. Less than today
C. The same as today – **CORRECT**

Q8. When deciding which of the two items to purchase, one should always:

A. Choose the item that costs less.
B. Choose the item with the greatest benefits.
C. Choose an item after comparing the costs and benefits of both items– **CORRECT**
D. None of the above

Q9. Suppose you put money in the bank for two years and the bank agrees to add 15 per cent per year to your account. How much money will the bank add to your account in the second year?

A. More than the first year – **CORRECT**
B. The same as the first year
C. Less than the first year

Q10. If the price of rice doubled and the price of pasta stayed the same, people would most likely buy:

A. More rice and less pasta.

B. Less rice and more pasta. – **CORRECT**

C. The same amount of rice and pasta

Post-Quiz B

This final questionnaire consists of 10 multiple-choice questions about the topic "Basic Economics and Finance". Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated

Q1. Which of the following affirmations are true? **(Choose ALL the correct answers)**

A. Net profit is the gross profit minus all other expenses – **CORRECT**
B. Net profit is the same as the cash flow
C. Net profit is the revenue minus the direct costs
D. Net profit is the revenue minus the costs of goods sold and all other expenses – **CORRECT**

Q2. The bank debt is

A. An ASSET
B. A LIABILITY – **CORRECT**
C. A COST
D. None of the above

Q3. With no other variable changed, if we decrease the energy consumption of a company: **(Choose ALL the correct answers)**

A. The Net operating profit will be higher – **CORRECT**
B. The Net operating profit will be lower
C. The turnover will increase
D. The taxes on profit will increase – **CORRECT**

Q4. Which of the following are usually considered fixed costs? **(Choose ALL the correct answers)**

A. Internet costs – **CORRECT**
B. Taxes
C. Logistics
D. Office rental – **CORRECT**

Q5. If you invest 100€ in something and after 2 years you get 130€ back, the simple ROI (Return of investment) for a 2-year period would be?

A. 15%
B. 30% – **CORRECT**

C. 130%

D. None of the above

Q6. Considering a general bank interest rate of 10%, the present value of 1.000€ you would receive in one year from now is:

A. 1.000€, it does not depend on the interest

B. 909€

C. 1.100€ – **CORRECT**

D. None of the above

Q7. If we deposit 200€ in a bank at a 10€ annual interest rate, and inflation is 5%. How much money will we get back after one year?

A. 200€

B. 210€ – **CORRECT**

C. 205€

D. 195€

Q8. If we take a loan of 100€ to invest in changing the incandescent lights in our building, and we save 20€ per year (considering interest=inflation=0) that we use for paying back the loan, when will we have paid back the loan and begin having profit on the investment?

A. After 4 years

B. After 7 years

C. After 5 years – **CORRECT**

D. After 1 year

Q9. You need to buy a new transport vehicle for your company. An electric van costs 35.000€ and every year you will spend 2.000€ in electricity, and a diesel van costs 30.000€ and will draw 3.000€ fuel per year. If we consider the vehicle will last for 10 years, which should you buy?

A. The electric van – **CORRECT**

B. The diesel van

Q10. You have very old and thin glass in your office. Changing the windows for new low thermal coefficient, high quality, hermetic seal models would cost 2.000€ but you would save 100€ per year in heating and cooling energy costs. If we consider a life of 20 years for the building, what should you do? **(Choose ALL the correct answers)**

A. Do not change the windows because you will waste money
B. Change the windows because even if there is no direct financial profit, at the end of life the value of the building will be higher than with actual windows – **CORRECT**
C. Change the windows because even if ROI is zero you also contribute to reducing your carbon footprint / GHG emissions
D. Remember to bring the old windows for recycling – **CORRECT**

Activity: Practical case with AR tool

This activity will be based on AR (Augmented Reality) tool Assembly and it will consist of the trainees looking for the AR markers to see the information on different reduction measures, while taking notes, to finally introduce the data in an excel file to calculate the possible cost reduction for the company of the associated GHG reduction measures.

Preparation of the activity:

- Select the appropriate or desired markers depending on the working scenario (computers, light bulbs, vehicles, …) available in the Excel File: TM3_Worskheet 3
- Print the selected markers and cut out the excess paper.
- Stick (blue-tack or similar) or fix (tape) each marker to the item.

Ask your trainees to download and sign in to the “Assemblr Edu” app from the following link: https://play.google.com/store/apps/details?id=com.assemblr.education

Ask the trainees to scan all the markers they can find in the classroom with the installed app:


Exclusive Content
Assemblr EDU
VIEW
ASSEMBLR | EDU
More
WHAT'S NEW
FEATURED CREATIONS
HOME
EXPLORE
SCAN
AR BOOK
PROFILE

Once the AR element of the reduction measure appears on the app, tap on the information dot (blue) to see its associated data (name, cost, energy, daily use), and write it down on paper (or take a screenshot).

Example screenshot

Once found and scanned all the reduction measures, ask the trainees to build a new tab/sheet in the excel file made in activity 2, to sum up the values and calculate the cost reduction of implementing the selected GHG reduction measures.

In case of doubt, or problems with the spreadsheet built by the students, use the excel tool TM3_Worksheet 3 (the student has to fill in the cells corresponding to “Data input from Assemblr”

Electricity cost [€/kWh]	0,28
Electricity generation GHG emission [kgCO2e/kWh]	0,2
DATA INPUT FROM ASSEMBLR	**FILL**
Actual item/mesure NAME	Example1
Actual item/mesure acquisition cost [€]	10
Actual item/measure energy [W]	2
New item/mesure NAME	Example2
New item/mesure acquisition cost [€]	15
New item/measure energy [W]	1
Item/measure daiy usage [hours]	3
SOLUTION	
ACTUAL ITEM	
Aquisition cost [€]	10,0
Yearly Operation cost [€]	0,6
Total yearly cost [€]	10,6
Total yearly GHG emission [kgCO2e]	0,4
NEW ITEM	
Aquisition cost [€]	15,0
Yearly Operation cost [€]	0,3
Total yearly cost [€]	15,3
Total yearly GHG emission [kgCO2e]	0,2
RESULTS	
COST REDUCTION [€]	**-4,7**
GHG REDUCTION [kgCO2e]	**0,2**

Spreadsheet example

Outline of the Module [Option 2]

Title: Identifying opportunities for significant cost reductions.			
Duration: approx. 4 hours			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: • differentiate between the different costs that a company must pay • identify opportunities that are available to an organisation for cost reduction • compare how an organisation's corporate strategy can be linked to cost reductions • compare and contrast the different strategies that can be employed by a business depending on their product or service offering	costs that are faced by an organisation and how costs are linked to corporate strategy	Participants will: 1. complete pre- and post-quizzes 2. brainstorm on fixed and variable costs faced by businesses 3. discuss how the costs identified can impact upon a company's ability to maintain cost reductions 4. identify cost saving strategies for organisations in their area 5. identify opportunities for cost reductions within their businesses	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. list at least 3 GHG reduction measures that they are going to implement in their company, based on the reduction of cost that results from the application of these measures. They will refer to the cost reduced and the relevant benefits for their company, to justify their responses.

Preparation/ Materials/Equipment:

- Training venue with IT equipment including laptop and projector
- A computer for the facilitator
- Internet connection
- Projector
- Flipchart and markers
- Sign-in sheet
- Electronic device (mobile or computer) for each participant (optional)
- A notebook and a pen for each participant

Lesson plan [Option 2]

Module 3: Identifying opportunities for significant cost reductions			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**Introduction to the Module** - Shortly present the learning objectives, activities, and assessment	2’	Outline of the Module
2	**Pre-assessment: Quiz to assess initial knowledge** Students are asked to fill in a quiz before the introduction of the learning content, to assess their acquired knowledge. The quiz can be distributed on paper or via a digital tool. As stated on slide 3 of the accompanying PowerPoint presentation, this questionnaire consists of 5 multiple-choice questions. Participants should be encouraged to reflect on each question. *[Individual assessment activity]* Upon successful completion of the quiz, participants will openly discuss how these questions impact an organisation's ability to successfully make money whilst simultaneously reducing costs.	10’	See the questions and answers of the pre-quiz here
3	**Introduction to the topic: recognise and identify what costs an organisation faces**	20’	PPT FILE: TM3B _ Identifying opportunities for significant cost reductions

	Participants will be presented with examples of fixed and variable costs as seen on slide 4 of the PowerPoint Presentation. Participants will break up into teams of 3-4 and will brainstorm 10 additional fixed and variable costs faced by businesses, in any industry. Participants will present their findings to the group and the answers will be written on a whiteboard or flipchart provided.		
4	**Introduction to the topic: how costs are linked to corporate strategy** Participants will discuss the key learning material on slide 5. Learners will be asked to research well-known corporations in their areas to identify their corporate strategy. Based on the lists of fixed and variable costs identified during the previous exercise, participants will discuss how these costs impact a company's ability to maintain cost reductions. Ask them to identify at least one initiative in each topic and discuss it with their colleagues.	20'	PPT FILE: TM3B _ Identifying opportunities for significant cost reductions
5	**Introduction to the topic: what opportunities are available to an organisation to significantly reduce their costs?** Slides 6-11 of the accompanying PowerPoint presentation discuss a wide range of opportunities that organisations can use to support their endeavours to reduce costs. The following questions can be used to support further knowledge acquisition:	60'	PPT FILE: TM3B _ Identifying opportunities for significant cost reductions

	• 5 strategies have been presented to support organisations to reduce their costs. How might organisations in different industries, such as retail and hospitality, construction and healthcare use these strategies differently? • How can Lean Manufacturing support organisations reduce their costs? • What benefits can standardization provide to large scale organisations?		
6	**Activity on identifying cost-saving practices [Part 1/2]** Participants will examine two frequently used applications that can be used by organisations to support them in their cost reduction efforts. a) Zero Waste Application: Using the Zero Waste App and working in 3-4, participants will research and identify cost-saving strategies for organisations in their area. Slide 13 of the accompanying presentation offers industry-specific suggestions. Participants will present their findings to the group.	50’	PPT FILE: TM3B _ Identifying opportunities for significant cost reductions Zero Waste App
7	**Activity on identifying cost-saving practices [Part 1/2]** b) Dropcountr: Using the Dropcountr application or website, participants should firstly identify how much water is used in the creation of commonly found products or services used in their corporations. Participants should	50	Dropcountr website

	research water charges in their home country and calculate the cost of using these products and/or services. Participants should identify these costs and discuss ways in which they can reduce their costs within their organisations		
8	**Post-assessment 1: Quiz for self-reflection** As stated on slide 15 of the accompanying PowerPoint presentation, this questionnaire consists of 5 multiple-choice questions. Participants should be encouraged to reflect on each question. *[Individual assessment activity]* Upon successful completion of the quiz, learners will openly discuss how these questions impact an organisation's ability to successfully make money whilst simultaneously reducing costs.	10’	See the questions and answers of the post-quiz here
9	**Post-assessment 3: Hands-on task** [4] Depending on the available time, ask participants to: list at least 3 GHG reduction measures that they are going to implement in your company, based on the reduction of cost that results from the application of these measures. Point out that they need to refer to the cost reduced and the relevant benefits for their company, to justify their responses. *[Individual assessment activity]*. The assessment activities can be both conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home).		

[4] The assessment activities can either be conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home).

Material for activities and assessment [Option 2]

Pre-Quiz

This questionnaire consists of 5 multiple-choice questions about the topic "opportunities for significant cost reductions". Please circle ONLY ONE as the right answer to each question.

Q1. Fixed costs are:

A. Costs that do not change as the level of production increases or decreases. - **CORRECT**
B. Costs that change as the level of production increases or decreases.

Q2. Variable Costs are:

A. Costs that do not change as the level of production increases or decreases.
B. Costs that change as the level of production increases or decreases. - **CORRECT**

Q3. What is cash flow?

A. Money that an organisation has available to spend at the end of the trading period.
B. A measurement of the amount of cash that a company spends and receives during a trading period. - **CORRECT**

Q4. What is Lean Manufacturing?

A. Supports the minimization of labour and material wastage whilst simultaneously maintaining and /or increasing production levels. - **CORRECT**
B. An iterative approach to managing manufacturing plants.

Q5. Economies of Scale:

A. The capacity of a business to scale its business and all their debts.
B. Cost reductions are achieved as production is scaled up. - **CORRECT**

Post-Quiz

This final questionnaire consists of 5 multiple-choice questions about the topic “Basic Economics and Finance”. Please circle ONLY ONE as the right answer to each question.

Q1. True or False: Cost Reduction by Design can help to mitigate ecological damage.

A. True - **CORRECT**
B. False

Q2. Just-in-Time manufacturing supports ____ lead times:

A. Short- **CORRECT**
B. Long

Q3. How many pillars are there in the Lean House?

A. 5
B. 6 - **CORRECT**

Q4. What are the benefits of standardisation in ensuring cost reduction on a global scale?

A. Standardisation enables organisations to buy in bulk and reduce the unit price of a product. - **CORRECT**
B. Standardisation reduces the overall quality of a good or service.

Q5. Which is a common example of a liquidity challenge faced by an organisation.

A. Not being able to quickly transfer tangible assets into cash. - **CORRECT**
B. Not being able to buy stock.

Section 5: Training Module 4

Outline of the Module [Option 1]

Title: Increase marketing image – corporate social responsibility			
Duration: 3 hours			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: - explain what CSR is - identify the main aspects of External and Internal CSR - outline the CSR Manager Roles and Responsibilities - choose which of the SDGs are relevant for CSR - calculate a company's CSR Performance - calculate Company's GHG emissions - identify concrete initiatives to improve the CSR of a business company - explain the main aspects of green CSR	Definition of CSR, differences between External and Internal CSR, strategies for improving a company's CSR.	Participants will: 1. complete pre- and post-quizzes 1. calculate a company's CSR performance (using an application) 2. distinguish between Internal and External CSR 3. propose and justify a choice of Sustainable Development Goals (SDGs) of the UN Agenda 2030 as a good Environmental CSR Strategy	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. make a plan of the steps they will follow to improve the CSR of their company in line with the Sustainable Development Goals of the UN Agenda. They have to justify the steps they propose.

Preparation/ Materials/Equipment:

- Training venue with IT equipment including laptop and projector
- A computer for the facilitator
- Internet connection
- Projector
- Flipchart and markers
- Sign-in sheet
- An electronic device (mobile or computer) for each participant (optional)
- A notebook and a pen for each participant

Lesson plan [Option 1]

Module 4: Increase marketing image – corporate social responsibility			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**Introduction to the Module** - Shortly present the learning objectives, activities, and assessment - Place your students in pairs (group of 2 people at maximum). At the end of each type of exercise, the students should complete the peer review evaluation activities to check the work done by his/her classmate.	2’	Outline of the Module
2	**Pre-assessment: Quiz to assess initial knowledge** Ask the participants to fill in a quiz before the introduction of the learning content, to assess their acquired knowledge. The quiz can be distributed on paper or via a digital tool. *[Individual assessment activity]*	30’	See the questions and answers of the pre-quiz here
3	**Introduction to the topic** Watch the two videos about the importance of the issue of climate change.	45’	Climate change: Link (NASA): https://youtu.be/FsX4qHgDlZM Link (SDGs) : https://sdgs.un.org/goals

	Watch the video about corporate social responsibility. Questions that can be asked after the video: a) What are the stakeholders that a Socially Responsible Enterprise must involve? List them below: .... b) What are the principles behind corporate social responsibility? Please, identify at least 2 principles. c) What is the main goal a company must pursue according to CSR? --- Watch the video about Greenwashing. Questions that can be asked after the video: a) What is Greenwashing? b) What are the rules to follow to contrast Greenwashing? Please list them below. --- Watch the video about the ISO14001:2015:		Corporate social responsibility: Link 1: https://www.youtube.com/watch?v=va-y3qU4RDc (Italian) Link 2: https://www.youtube.com/watch?v=1bpf_sHebLI (English) --- Greenwashing: Link: https://www.youtube.com/watch?v=5AUasE1h1k (English) --- ISO14001:2015: Link: https://www.youtube.com/watch?v=RQrkz9didN0 --- EU Ecolabel: Link: https://www.youtube.com/watch?v=-u1dDLhTmW8

	Questions that can be asked after the video: What are the benefits of the adoption of the ISO140001:2015 Management System? --- Watch the video about the EU Ecolabel: Questions that can be asked after the video: What are the rigorous criteria that a company must respect for getting the EU Ecolabel?		English with Italian subs)
4	**Activity on increasing the marketing image – corporate social responsibility (Part 1/4)** Ask participants to calculate their company's CSR Performance: They will use the CSR Rating Performance tool to calculate the CSR Performance for their organization. Ask them to answer the questions they find in the app. In the end, they will get a Total Score for their Organization. (Teacher: Score min 20 = the company takes care of the CSR; Score max 50 your company is not socially responsible at all) Ask the following question: "Based on your performance in CSR, what initiatives would you take to improve your company's performance concerning: • waste management • GHG emissions	75 (distributed across all parts)	Access the tool here (only for Android): https://play.google.com/store/apps/details?id=com.cloudpensystems.csrratings&hl=en&gl=US

	• Energy Efficiency Please, identify at least one initiative in each topic and discuss it with your colleagues.”		
5	**Activity on increasing the marketing image – corporate social responsibility (Part 2/4)** Case Study: Barilla. -What environmental values does the commercial highlight? Show and Discuss the Sustainable Report 2020 of Barilla together with your trainees.	-	Watch the video here: https://www.youtube.com/watch?v=T67ZT6PdJ7U and answer the following questions
6	**Activity on increasing the marketing image – corporate social responsibility (Part 3/4)** Fill in the table found here.	-	
7	**Activity on increasing the marketing image – corporate social responsibility (Part 4/4)** Which of the Sustainable Development Goals (SDGs) of UN Agenda 2030 a company could address when planning a good Environmental CSR Strategy? Choose 3 options at maximum and explain your choice.	-	Present the Sustainable Development Goals (SDGs) of UN Agenda 2030 here.

8	**Post-assessment 1: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The final questionnaire consists of 12 multiple-choice questions about Corporate Social Responsibility. *[Individual assessment activity]*	30’	See the questions and answers of the post-quiz here
9	**Post-assessment 2: Hands-on task** [5] Depending on the available time, ask participants to: make a plan of the steps they will follow to improve the CSR of their company in line with the Sustainable Development Goals of the UN Agenda. They have to justify the steps they propose. *[Individual assessment activity].*	-	

[5] The assessment activities can either be conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home).

Material for activities and assessment [Option 1]

Pre-Quiz

This questionnaire consists of 11 multiple-choice questions about “Corporate Social Responsibility”. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. CSR is defined as:

A. It is the voluntary integration of the social and ecological concerns of companies into their business operations and their relationships with stakeholders. - **CORRECT**
B. It is the responsibility of the company concerning the issue of safety in the workplace.
C. It is a business operation of a company

Q2. CSR serves to:

A. Improve a company's profits.
B. Improve the image and reputation of a company - **CORRECT**
C. Improve business management

Q3. Corporate Social Responsibility means:

A. Effective management of resources
B. Reducing environmental impact
C. Improving the working conditions of employees.
D. All Answers - **CORRECT**

Q4. According to internal CSR, a company will need to improve relationships with:

A. Workers - **CORRECT**
B. Business partners
C. Stakeholders (associations and local authorities)

Q5. One of the following is part of external CSR:

A. The length of employees' contracts
B. The working conditions of employees
C. Noise and Air Pollution - **CORRECT**

Q6. The benefits of CSR for a company are:

A. Customer loyalty
B. Increased Sales
C. Increased company productivity
D. All the above are correct - **CORRECT**

Q7. What are the duties of the CSR Manager?

A. The CSR Manager serves as the intermediary between foreign buyers and domestic sellers.
B. THE CSR Manager is responsible for greeting visitors and delivering exceptional customer service assistance.
C. The CSR makes sure that Company's practices, processes, products and procedures are ethical, sustainable and environmentally in compliance with national and international rules and practices. - **CORRECT**

Q8. What is the Social and Environmental Responsibility Report?

A. A European regulation
B. The report on the social and environmental responsibility actions carried out during the year - **CORRECT**
C. The balance sheet of the partners of a company

Q9. What is the EU Ecolabel?

A. An agreement between a Company and the Stakeholders to take sustainable actions.
B. A label of fashion luxury products
C. A label of environmental excellence that is awarded to products and services meeting high environmental standards. - **CORRECT**

Q10. What does the expression ISO 14001:2015 mean?

A. A smartphone model built according to the principles of environmental and social sustainability.
B. The international standard law that a company must comply with to operate sustainably. - **CORRECT**
C. It has no meaning.

Q11. What is the UN Global Compact?

A. An international initiative to align CSR strategies and principles of the companies worldwide.

   - **CORRECT**

B. International law for private companies

C. A commercial treaty

Activity on increasing the marketing image – corporate social responsibility (Part 3/4)

CSR Types: Provide the following table empty, without any answers, to your students. Ask them to fill in the two columns with the keywords they find below the table.

Instructions: Enter the keywords into the two columns.

Internal CSR	External CSR
Answers: Efficient Management of Human Resources; Occupational Health and Safety	Answers: Donations to Charities; Local Communities - Limiting Noise Pollution - Limiting Air Pollution; Business Partnerships – Suppliers - Responsible Supply Chain Management

Keywords:

Efficient Management of Human Resources - Occupational Health and Safety - Business Partnerships - Suppliers - Local Communities - Limiting Noise Pollution - Limiting Air Pollution - Responsible Supply Chain Management - Donations to Charities

Activity on increasing the marketing image – corporate social responsibility (Part 4/4)

Which of the following Sustainable Development Goals (SDGs) of UN Agenda 2030 a company could address when planning a good Environmental CSR Strategy? Choose 3 options at maximum and explain your choice.

- SDG 1: End poverty in all its forms everywhere
- SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- SDG 3: Ensure healthy lives and promote well-being for all at all ages
- SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- SDG 5: Achieve gender equality and empower all women and girls
- SDG 6: Ensure availability and sustainable management of water and sanitation for all
- SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all
- SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- SDG 10: Reduce inequality within and among countries
- SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable
- SDG 12: Ensure sustainable consumption and production patterns
- SDG 13: Take urgent action to combat climate change and its impacts
- SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- SDG 15: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

Post-quiz

This final questionnaire consists of 11 multiple-choice questions about “Corporate Social Responsibility”. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. CSR is defined as:

D. It is the voluntary integration of the social and ecological concerns of companies into their business operations and their relationships with stakeholders. - **CORRECT**
E. It is the responsibility of the company for the issue of safety in the workplace.
F. It is a business operation of a company

Q2. CSR serves to:

D. Improve a company's profits.
E. Improve the image and reputation of a company - **CORRECT**
F. Improve business management

Q3. Corporate Social Responsibility means:

E. Effective management of resources
F. Reducing environmental impact
G. Improving the working conditions of employees.
H. All Answers - **CORRECT**

Q4. According to internal CSR, a company will need to improve relationships with:

D. Workers - **CORRECT**
E. Business partners
F. Stakeholders (associations and local authorities)

Q5. One of the following is part of external CSR:

D. The length of employees' contracts
E. The working conditions of employees
F. Noise and Air Pollution - **CORRECT**

Q6. The benefits of CSR for a company are:

E. Customer loyalty
F. Increased Sales
G. Increased company productivity
H. All the above are correct - **CORRECT**

Q7. What are the duties of the CSR Manager?

D. The CSR Manager serves as intermediary between foreign buyers and domestic sellers.
E. THE CSR Manager is responsible for greeting visitors and delivering exceptional customer service assistance.
F. The CSR makes sure that Company's practices, processes, products, and procedures are ethical, sustainable, and environmentally in compliance with national and international rules and practices. - **CORRECT**

Q8. What is the Social and Environmental Responsibility Report?

D. A European regulation
E. The report on the social and environmental responsibility actions carried out during the year - **CORRECT**
F. The balance sheet of the partners of a company

Q9. What is the EU Ecolabel?

D. An agreement between a Company and the Stakeholders to take sustainable actions.
E. A label of fashion luxury products
F. A label of environmental excellence that is awarded to products and services meeting high environmental standards. - **CORRECT**

Q10. What does the expression ISO 14001:2015 mean?

D. A smartphone model built according to the principles of environmental and social sustainability.
E. The international standard law that a company must comply with in order to operate in a sustainable way. - **CORRECT**
F. It has no meaning.

Q11. What is the UN Global Compact?

D. An international initiative to align CSR strategies and principles of the companies worldwide.
   - **CORRECT**
E. An international law for private companies
F. A commercial treaty

Outline of the Module [Option 2]

Title: Corporate social responsibility			
Duration: 1 hour and 40 minutes			
Learning outcomes	**Learning Content**	**Activities**	**Assessment**
Learners should be able to: - define the principles of Corporate Social Responsibility and Sustainability - identify the corporate/business activities that create awareness and help their communities create a culture of sustainability - recognize the best practices from some of the most active companies in the area of Corporate Social Responsibility and Sustainability and how Greenwashing	Definition of CSR, differences between External and Internal CSR, strategies for improving a company's CSR.	Participants will: 1. complete pre- and post-quizzes 2. assess, in groups, the benefits to companies from practicing specific CSR and sustainability practices	Participants, individually, will: 1. complete a knowledge quiz before and after the course 2. make a plan of the steps they will follow to improve the CSR of their company based on the best greenwashing practices of other companies. They have to justify the steps they propose.

contradicts some companies' CSR claims - differentiate between CSR and Greenwashing practices - identify and implement best company practices in the area of CSR - assess the benefit on a company's reputation from corporate social responsibility practices			

Preparation/ Materials/Equipment:

- Training venue with IT equipment including laptop and projector
- A computer for the facilitator
- Internet connection
- Projector
- Flipchart and markers
- Sign-in sheet
- An electronic device (mobile or computer) for each participant (optional)
- A notebook and a pen for each participant

Lesson plan [Option 2]

Module 4: Corporate social responsibility			
No	**Topics and Sub-topics/Learning activities**	**Duration**	**Material and Activity sheets**
1	**Introduction to the Module** - Shortly present the learning objectives, activities, and assessment	2’	Outline of the Module
2	**Pre-assessment: Quiz to assess initial knowledge** Students are asked to fill in a quiz before the introduction of the learning content, to assess their acquired knowledge. The quiz can be distributed on paper or via a digital tool. *[Individual assessment activity]*	15’	See the questions and answers of the pre-quiz here
3	**Introduction to the topic of CSR** Ask the participants to brainstorm what “Corporate Social Responsibility” means and give examples of policies or practices which demonstrate a CSR consciousness from the part of an organisation. A list of all these examples will be drafted. A video will be shown. This references the 17 Sustainable Development Goals (SDGs) which represent an urgent call for action by all developed and developing countries, for peace and prosperity for the people and our planet, now and into the future.	50’	Link of video 1: https://sdgs.un.org/goals Link of video 2: https://www.youtube.com/watch?app=desktop&v=1bpf_sHebLI

	Working in teams of two or three, the participants will go through the list of CSR examples created earlier and will assess the benefits to companies from practising these specific CSR and sustainability practices. The next video will be played, which shows how a company practices CSR in its field and is a proud global citizen.		
4	**<u>Introduction to Greenwashing</u>** The facilitator will introduce the participants to “greenwashing”. A video will be shown, and participants will be asked to share any examples of companies that are practicing “greenwashing”.	30’	Link of the video: https://www.youtube.com/watch?app=desktop&v=5AUDasE1h1k [Optional Video: https://www.youtube.com/watch?v=wTidplpkqZE]
5	**<u>Activity on determining the carbon outputs</u>** Participants will use the platforms Eevie and Oro Eco to determine their carbon outputs. These resources can be accessed through: https://www.eevie.io/ & https://www.oroeco.com. Once carbon outputs have been determined, participants should examine if the behaviours of the company are in line with their strategy. For example, are companies in fact greenwashing their behaviour or trading ethically. Learners will discuss their findings with the group.	30’	https://www.eevie.io https://www.oroeco.com

6	**Post-assessment 1: Quiz for self-reflection** Provide a short questionnaire to your trainees to assess their knowledge. The final questionnaire consists of 7 multiple-choice questions about Corporate Social Responsibility. *[Individual assessment activity]*	15’	See the questions and answers of the post-quiz here
7	**Post-assessment 2: Hands-on task**[6] Depending on the available time, ask participants to: make a plan of the steps they will follow to improve the CSR of their company based on the best greenwashing practices of other companies. They have to justify the steps they propose. *[Individual assessment activity].*	-	

[6] The assessment activities can either be conducted during the training or one of them can be assigned as homework (e.g., assign the quiz for self-reflection at home)

Material for activities and assessment [Option 2]

Pre-Quiz

This questionnaire consists of 7 multiple-choice questions about climate change and greenhouse gas emissions. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. Companies should take the expectations of the broader community into account when making decisions:

A. True - **CORRECT**
B. False

Q2. A company's stakeholders include:

A. Employees
B. Customers
C. The Government
D. All the above - **CORRECT**

Q3. What is the most important responsibility of business, when implementing cost strategy?

A. Increase selling price
B. Increase Profits - **CORRECT**
C. Care for the Environment
D. Take care of employees

Q4. Select the term that best matches this statement: A business is responsible to ensure that it produces goods/services that can be sold at a profit from which employees and shareholders will benefit.

A. Discretionary responsibility
B. Ethical responsibility
C. Economic responsibility - **CORRECT**
D. None of the above

Q5. What does sustainability mean?

A. To manage resources in a way that allows future generations to use them too - **CORRECT**
B. To increase the use of renewable energy

C. To develop alternative forms of energy

Q6. How can countries help to reduce the impact of climate change?

A. By phasing out fossil fuels such as coal, oil and gas
B. By increasing the use of renewable energy
C. By protecting forests
D. All the above - **CORRECT**

Q7. Sustainable business practice means:

A. Assessing how the present business practice affects the future. - **CORRECT**
B. Involving employees in decision making.
C. Considering the benefits of stakeholder over shareholder practices.

Post-quiz

This final questionnaire consists of 7 multiple-choice questions about climate change and greenhouse emissions. Please circle ONLY ONE as the right answer to each question, UNLESS otherwise stated.

Q1. Which of the following is considered to be the first step in the recipe for designing a successful CSR programme:

A. Management should create a CSR policy for the business
B. Employees in the business must brainstorm to come up with initiatives for CSR
C. An inventory of skills and resources needed to implement the programme should be drawn up
D. Management must communicate the need for CSR across the business - **CORRECT**

Q2. The three areas of social responsibility of a business are:

A. Political, Economic, Environmental
B. Environmental, Social, Technological
C. Economic, Social, Environmental - **CORRECT**
D. Economic, Environmental, Ethical

Q3. When will resources be directed towards the successful implementation of a CSR programme?

A. Only when CSR becomes part of the core and the identity of the business and brand - **CORRECT**
B. It depends on the nature of the business and the needs and concerns of the community it operates in
C. When management communicates the need for CSR across the business
D. When management communicates the CSR policy throughout the business

Q4. Which one of the following is not a reason for embracing CSR?

A. Innovation
B. Long Term Thinking
C. Consumer Engagement
D. Employee Exploitation - **CORRECT**

Q5. CSR is defined as:

A. The voluntary integration of the social and ecological concerns of companies into their business operations and their relationships with stakeholders - **CORRECT**
B. The responsibility of the company to the issue of safety in the workplace.
C. A business operation of a company

Q6. Corporate Social Responsibility means:

A. Effectively managing the resources
B. Reducing environmental impact
C. Improving the working conditions of employees
D. All the above - **CORRECT**

Q7. CSR serves to:

A. Improve a company's profits.
B. Improve the image and reputation of a company - **CORRECT**
C. Improve business management

Section 6: Learning design framework

Below, you can find a concrete learning design framework that will guide you when preparing lessons that incorporate augmented reality and climate change topics. Examine the information presented under the 3 key steps (Analysis, Design, and Evaluation) and explore the extra resources linked.

Analysis

- **Institutional level**: Analyse your organisation's resources to identify what is available and what is needed to support the design, development, and delivery of lessons supported by mobile augmented reality. Define whether your staff is skilled enough to design and deliver relevant lessons. In case extra resources are needed, draft a strategic plan on how to contact key stakeholders.

What are the AR resources available/missing? Can we acquire new resources?

- **Individual-level**: Analyse your target audience (i.e., the students) to identify their prior knowledge, skills, interests, needs, and future goals. This way, the lesson will match their distinct characteristics.

What's the profile of each learner? [background, special needs, etc.]

What are the AR-related challenges learners might face?

Erasmus+

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Design

- **Overall aim:** Define the overall purpose of your lesson. This refers to the general topic to be covered according to the curriculum or national standards that you follow.

What are we aiming to achieve with this lesson?

- **Learning outcomes:** Define the objectives of the lesson. Make sure that the outcomes include what learners should be able to do, after the completion of the specific lesson. The outcomes should be SMART. When writing your learning outcomes, you can consult Bloom's revised taxonomy. Ensure that higher-order thinking skills are targeted, too. Use simple language and communicate the objectives to your learners.

What should learners be able to do upon completion of this lesson?

- **Learning theories:** Knowing which learning theories exist, their advantages and disadvantages, allows you to accommodate the teaching experience to fit the way learners learn best. The learning theories are evident across the whole spectrum of teaching, including assessment. Brainstorm which theories will underline teaching. Check this article out; it summarises the key learning theories.

- **Learning content:** Select which content will cover your learning outcomes. Gather adequate, relevant, and up to date information and material. Ensure that the language is simple and matches learners' age and educational background. Keep an eye on any sensitive elements related to gender or cultural issues. Aim for authentic material, incorporating practical cases and examples as well as a variety of formats (e.g., text-based, audiovisual, etc.). If the content is large, break it down into digestible units/sections to reduce cognitive overload.; their sequence should be logical and coherent.

Teaching resources-content for climate change:

1. Sustainability and Environmental Education (SEEd)
2. National Oceanic and Atmospheric Administration (NOAA)
3. The Climate Change Collection

Erasmus+
The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

4. NASA Earth Observatory Global Maps
5. Climate change and sustainability resources (Royal Society of Chemistry)
6. Mediterranean Experts on Climate and environmental Change (MedECC) https://www.medecc.org/

- **Learning activities and teaching approaches/methodologies:** These two complement each other. The activities you prepare (what students will be doing throughout the lesson) should support the learning outcomes that you have defined in the beginning, to facilitate learners' understanding and develop the desired skills. The activities will be based on a teaching approach/methodology. In our case, augmented reality will be the backbone that supports our teaching process. The activities should promote students' engagement and active application of newly acquired knowledge. Immediate and constructive feedback should be given. You can find here 50 modern teaching approaches to expand your teaching repertoire and complement augmented reality.

Which activities should help us achieve the desired learning outcomes? In which ways can AR-based activities facilitate learning?

- **Assessment:** There are various assessment types that you can implement: diagnostic is conducted at the beginning of a lesson/unit, to review students' prior knowledge and skills; formative is conducted during the lesson/units to assess students' understanding; summative is conducted at the end of the lesson/units. Make sure that summative assessment is aligned with the learning outcomes stated and the activities implemented to measure the extent to which the objectives have been met. Feedback can be provided either by the teacher or the other students; it should be sufficient and prompt reflection and further development. Aim for alternative types of assessment, too (i.e., portfolios, blog posts, etc.)

How can I measure what learners already know? How can I measure what they have learned? i.e., if the outcomes have been achieved. Which alternative types of assessment can be supported by AR?

- **Resources, technology, and support**: Incorporate resources and technology that will help you achieve the specific purposes you have set. Since new AR and tech tools are constantly being

Erasmus+
The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

produced, you can use a rubric (see this example), with specific criteria that will guide you when selecting the AR tool/app that will fit your needs.

Which tools (e.g., mobile augmented reality tools) will help learners interact with the content/conduct the learning activities/assessment?

Evaluation

- Evaluation is a constant procedure to ensure the quality of your learning programmes. You can gather feedback from your students (e.g., through group or individual discussions, surveys), colleagues (e.g., through discussions, observations) or external evaluators. Also, examine the results of formative and summative assessment to investigate patterns in students' responses. To improve the learning experience, you can also follow a reflective practice.

Key elements to consider

- **Interaction:** AR tools enhance learners' interaction with the material/content and the technology itself. Make sure that interaction among learners is also present, either by working in groups or exchanging ideas prior, during, and after interacting with the tool.
- **Infrastructure**: Check the requirements of the app/ AR tools to be used. Do they require registration? What data protection measures are in place? Is a wireless Internet connection needed?
- **Authenticity**: Aim at preparing lessons that allow students to immerse themselves in the AR-driven environment through authentic tasks. Use AR purposefully.

Erasmus+

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Annexes

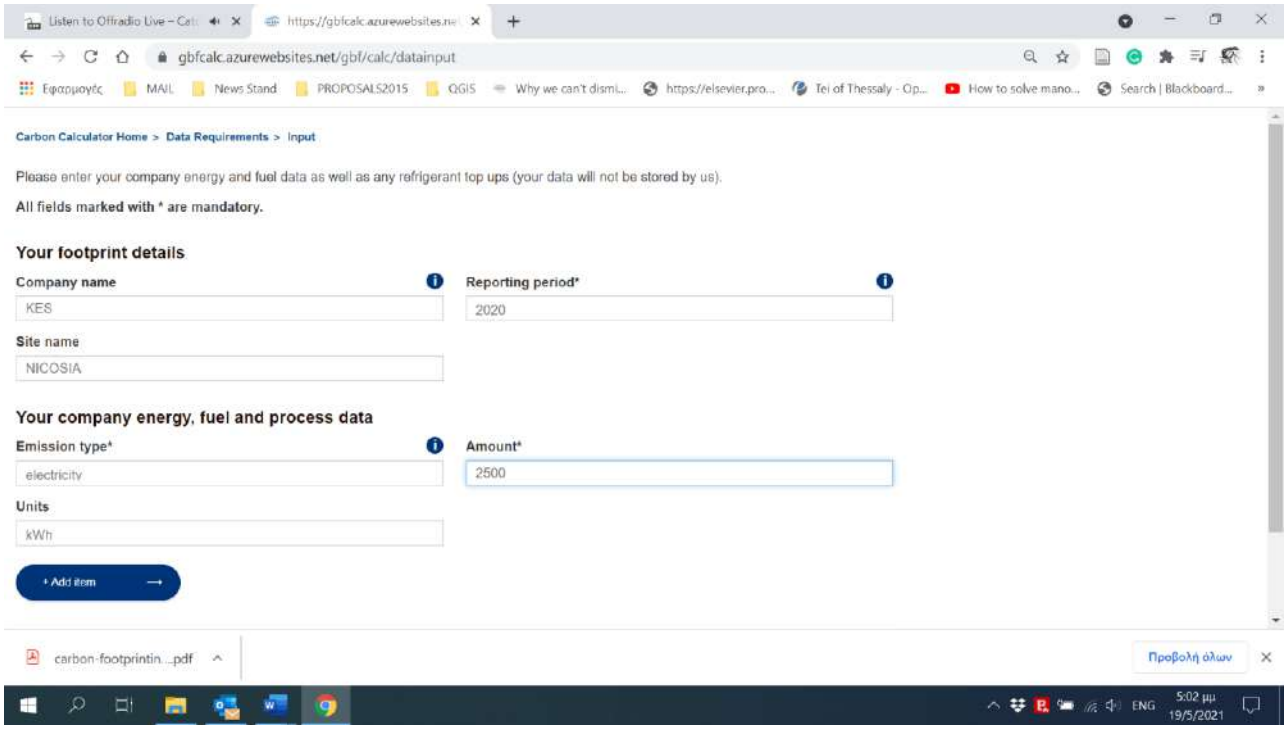
Annex 1

1. Example for the use of the GHG emissions calculator (for SMEs).

1) Access the tool https://gbfcalc.azurewebsites.net/gbf/calc
2) Press START then ENTER MY DATA
3) Select “electricity” from the menu “Emission Type” and then add the data for electricity consumption (screenshot #1) and then press ADD ITEM.
4) Repeat step 3 and select “diesel” to add the amount of fuel consumed in the company’s car fleet. Add the data for diesel consumption (sceenshot #2) and press ADD ITEM.
5) At the bottom of the page, press “CALCULATE MY FOOTPRINT”.
6) The results appear (screenshot #3)

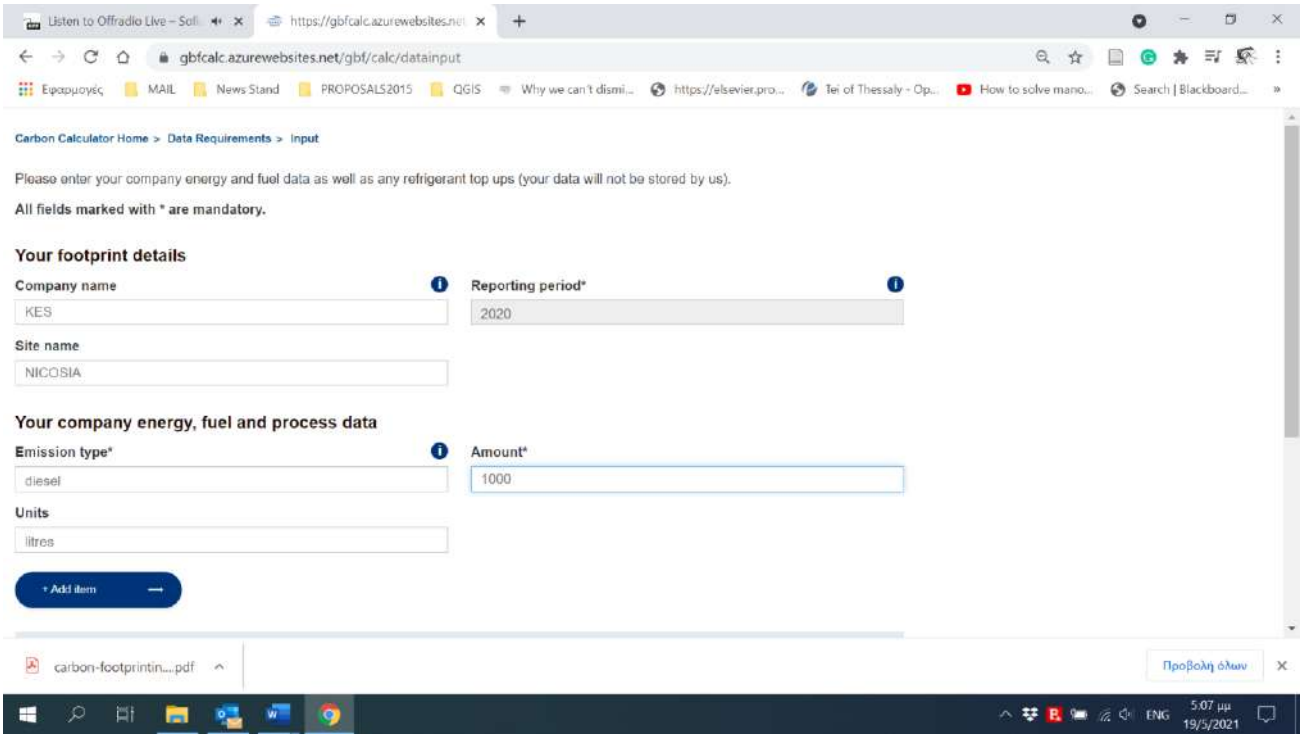
[Project number: 2020-1-CY01-KA202-065983]

Screenshot #1



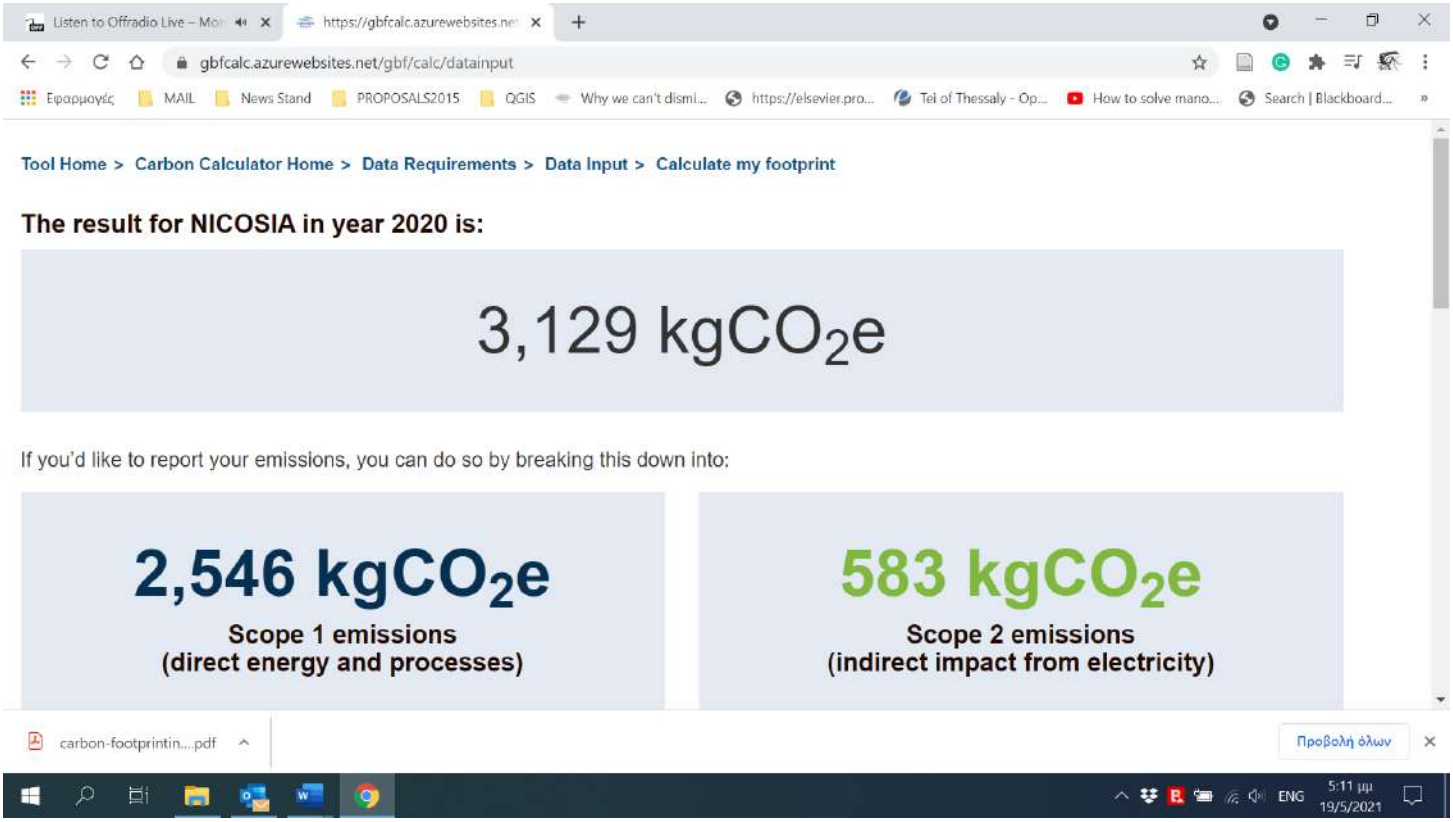
The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Screenshot #2



The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Screenshot #3

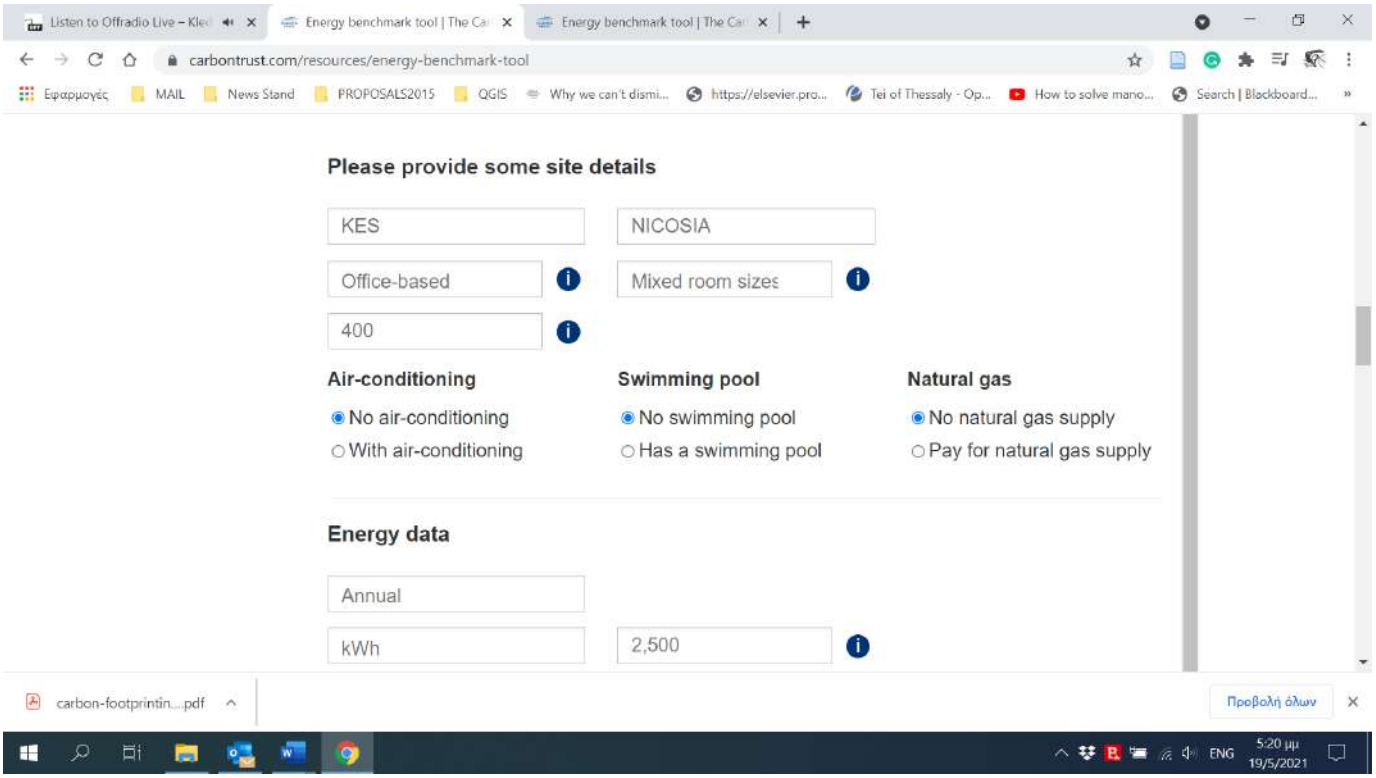


1. BENCHMARK tool

1) In the results page (screenshot #3) go down and press “ASSESS ENERGY USE”
2) Following the same philosophy, provide the data required (see screenshot #4)
3) Press “UPDATE RESULTS” (see screenshot #5)

The European Commission’s support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Screenshot #4



The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]

Screenshot #5

The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.
[Project number: 2020-1-CY01-KA202-065983]