

PLANET – PPlan for Agriculture reNewable Energy Training

D4.3 - Integrated training content for trainers and trainees on the platform

Document description:	The English training content for trainers and trainees will be integrated to the online platform.
Partner responsible:	UNITO
Due date:	Thursday, 28 February, 2019
Work package title:	Development of the learning platform
Task title:	Task 4.3: Development of the trainers and trainees section
Status (F: final; D: draft; RD: revised draft):	F

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1 Task description

Based on the training and educational materials produced by project partners in WP2 and WP3, UNITO will coordinate the uploading of the different English modules on the platform. It will include on-line materials (PDF, videos, homework, assessment and discussion forums).

The partners responsible of the content in WP2 and WP3 will help also to prepare and upload the material.

Based on the received material, UNITO will built the assessment, the monitoring system and the survey that will be used to follow the evaluation of the trainees and their satisfaction.

2 Hosting platform description

As described in the D4.1, the hosting platform chosen is Moodle, a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments.

Powering tens of thousands of learning environments globally, Moodle is trusted by institutions and organisations large and small, including Shell, London School of Economics, State University of New York, Microsoft and the Open University. Moodle's worldwide numbers of more than 90 million users across both academic and enterprise level usage makes it the world's most widely used learning platform.

Because it is open-source, Moodle can be customised in any way and tailored to individual needs. Its modular set up and interoperable design allows developers to create plugins and integrate external applications to achieve specific functionalities.

2.1 Licensing, data security and user privacy

Moodle is provided freely as Open Source software, under the GNU General Public License. Anyone can adapt, extend or modify Moodle for both commercial and non-commercial projects without any licensing fees and benefit from the cost-efficiencies, flexibility and other advantages of using Moodle. The PLANET Consortium therefore decided to use Moodle and adapt it to the training needs.

Regarding data security and user privacy, security controls are constantly being updated and implemented in Moodle development processes and software to protect against unauthorised access, data loss and misuse. UNITO, which is in charge for the creation of the platform, will update monthly the core of Moodle and its plugins to have

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always the latest updates on security. Finally, communication between the server and the client applications are encrypted using the HTTP-Secure protocol, which ensures data confidentiality during the connections.

2.2 User Access

Considering that there will be two sections in the PLANET platform, one for trainers and one for trainees, and the PLANET consortium will control the access to both sections:

Registration for trainers: the PLANET consortium wants to grant access to the trainers' section only those trainers who meet a set of pre-defined eligibility criteria, consequently the PLANET platform administrator (in the person of Alessandro Sopegno, UNITO) can grant access to a list of potential trainers and their email addresses. The administrator would then grant them access to trainers' section by creating a user account linked to their email addresses.

Registration for trainees: It will be used the same procedure described in the registration for trainers, but the registration process will be managed from the PLANET consortium training centres under the supervision of the PLANET platform administrator (in the person of Alessandro Sopegno, UNITO).

2.3 Sections available and navigation

With over 10 years of development guided by social constructionist pedagogy, Moodle delivers a powerful set of learner-centric tools and collaborative learning environments that empower both teaching and learning. This allowed the same platform to be used for both trainee and trainers training.

For this purpose, there are two separate sections available in the platform:

1. Trainees section, containing all the material for the learning modules for trainees: the on-line, in-class content and the guidelines for the work-based learning period.
2. Trainer section, containing all the material for the trainers' training toolkit that aims at giving to the trainers the tools and competences to use properly the training content created in WP2 and the necessary skills to manage the flipped classroom with online, in class activities and work-based periods.

Regarding the navigation, a simple interface, drag-and-drop features, and well-documented resources make this Moodle platform easy to learn and use. Furthermore, Moodle provides the most flexible tool-set to support both blended learning and 100% online courses. Moreover, for this reason the PLANET consortium through the complete range of built-in features of Moodle, including external collaborative tools such as forums, wikis, chats and blogs, made the e-learning portal using Moodle.

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Another important aspect to consider is that Moodle can be scaled to support the needs of both small classes and large organisations. Because of its flexibility and scalability, Moodle has been adapted for use across education, business, non-profit, government, and community contexts. In addition, it is perfect for the multi-lingual and multi-national training that will be developed for PLANET. Finally the platform is web-based and so can be accessed from anywhere in the world. With a default mobile-compatible interface and cross-browser compatibility, content on the Moodle platform is easily accessible and consistent across different web browsers and devices.

In respect of the specification of D4.1, simply perceivable icons are available and help users to visualize information what they stand for and what the user have to expect. In general, as it is possible to see in all the images of chapter 3 of this document, to simplify the user experience, we made large icons that once the user click lead to the material they want to see. This applies to videos, documents, presentations with notes and external links. Following the icons:

- preview of the video



- documents icon



- documents with notes



- external link icon



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2.4 Languages available

Moodle's multilingual capabilities ensure there are no linguistic limitations to learning online. The Moodle community has begun translating Moodle into more than 120 languages (and counting) so users can easily localise their Moodle site, along with plenty of resources, support and community discussions available in various languages.

Thanks to these features, it was possible to develop the multilingual aspect of the platform, which is available in the following 5 languages:

- English
- Italian
- Dutch
- French
- German

This will allow, after the optimisation that will be performed in Task 4.5 and the translation that will be performed in Task 2.4 (for the trainees modules) and Task 3.3 (for the trainers module) to show all the contents for the trainees and for the trainers in the 5 languages available.

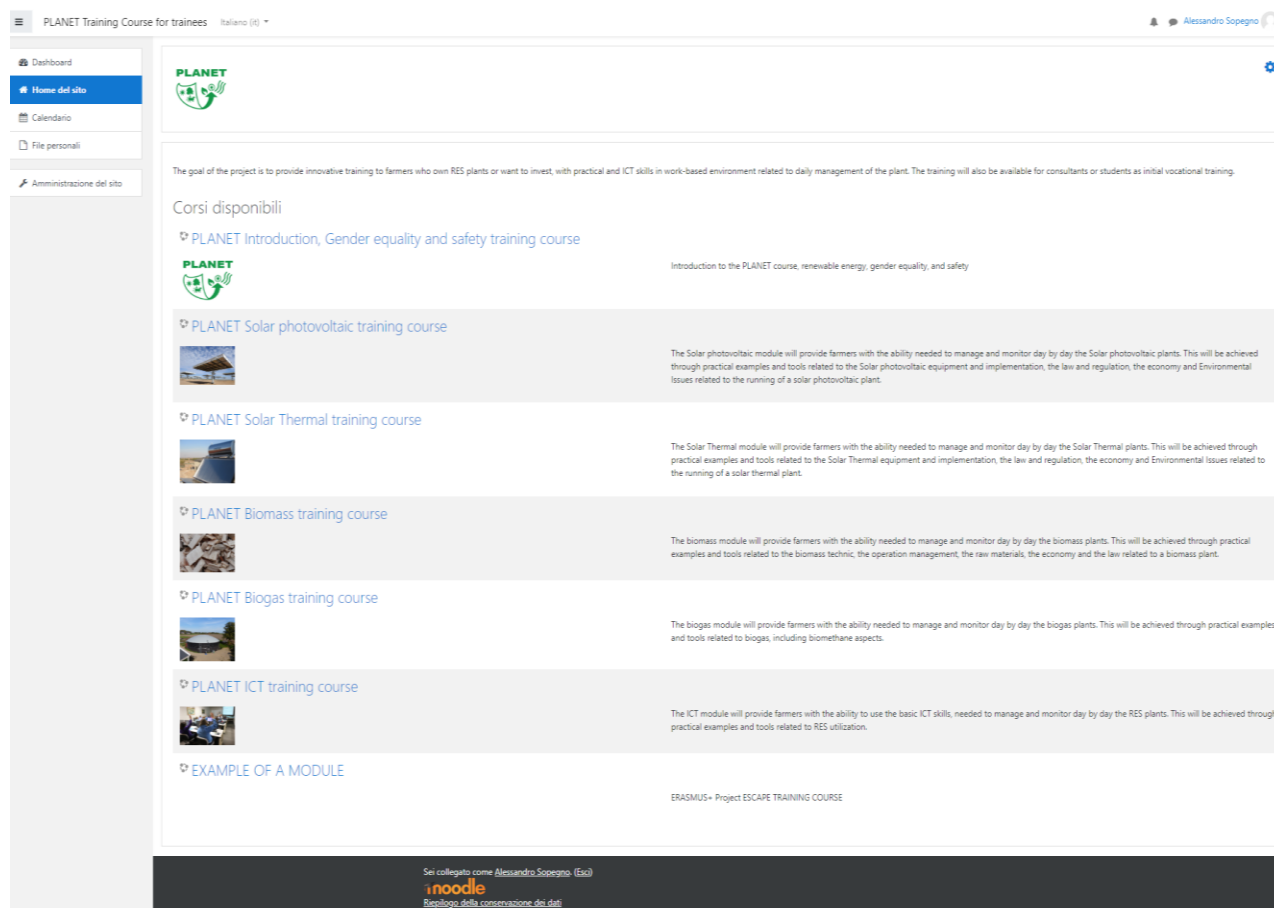
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3 Results

3.1 Online platform overview

In this chapter, you can see the result obtained after applying the specifications of D4.1 to create the e-learning platform of the PLANET course.

The following is the main page of the e-learning platform made for the PLANET project, in which it is possible to see the list of all available courses of the PLANET training course.



The screenshot shows the main page of the e-learning platform. The header includes the title "PLANET Training Course for trainees" and the language "Italiano (it)". The left sidebar contains navigation links: Dashboard, Home del sito, Calendario, File personali, and Amministrazione del sito. The main content area features the PLANET logo and a description of the project's goal: "The goal of the project is to provide innovative training to farmers who own RES plants or want to invest, with practical and ICT skills in work-based environment related to daily management of the plant. The training will also be available for consultants or students as initial vocational training." Below this, a section titled "Corsi disponibili" lists several courses:

- PLANET Introduction, Gender equality and safety training course**: Introduction to the PLANET course, renewable energy, gender equality, and safety.
- PLANET Solar photovoltaic training course**: The Solar photovoltaic module will provide farmers with the ability needed to manage and monitor day by day the Solar photovoltaic plants. This will be achieved through practical examples and tools related to the Solar photovoltaic equipment and implementation, the law and regulation, the economy and Environmental issues related to the running of a solar photovoltaic plant.
- PLANET Solar Thermal training course**: The Solar Thermal module will provide farmers with the ability needed to manage and monitor day by day the Solar Thermal plants. This will be achieved through practical examples and tools related to the Solar Thermal equipment and implementation, the law and regulation, the economy and Environmental issues related to the running of a solar thermal plant.
- PLANET Biomass training course**: The biomass module will provide farmers with the ability needed to manage and monitor day by day the biomass plants. This will be achieved through practical examples and tools related to the biomass technique, the operation management, the raw materials, the economy and the law related to a biomass plant.
- PLANET Biogas training course**: The biogas module will provide farmers with the ability needed to manage and monitor day by day the biogas plants. This will be achieved through practical examples and tools related to biogas, including biomethane aspects.
- PLANET ICT training course**: The ICT module will provide farmers with the ability to use the basic ICT skills, needed to manage and monitor day by day the RES plants. This will be achieved through practical examples and tools related to RES utilization.

At the bottom, there is a section titled "EXAMPLE OF A MODULE" with the text "ERASMUS+ Project ESCAPE TRAINING COURSE". The footer includes the text "Sei collegato come Alessandro Sapegno (Esc)" and the logo for "noodle" with the tagline "Ripulito dalla conservazione dei dati".

Figura 1

PLANET – Plan for Agriculture reNewable Energy Training

As you can see in figure 1, in the section dedicated to trainees there are 5 modules:

- PLANET Introduction, Gender equality and safety training course
- PLANET Solar photovoltaic training course
- PLANET Solar Thermal training course
- PLANET Biomass training course
- PLANET Biogas training course
- PLANET ICT training course

These modules are available also for the trainers sections. Through this screen, trainees or trainers can enter the individual modules to view the training contents.

3.2 English training content for trainers and trainees

The English content of the PLANET training course for both trainees and trainers is available at the following link:

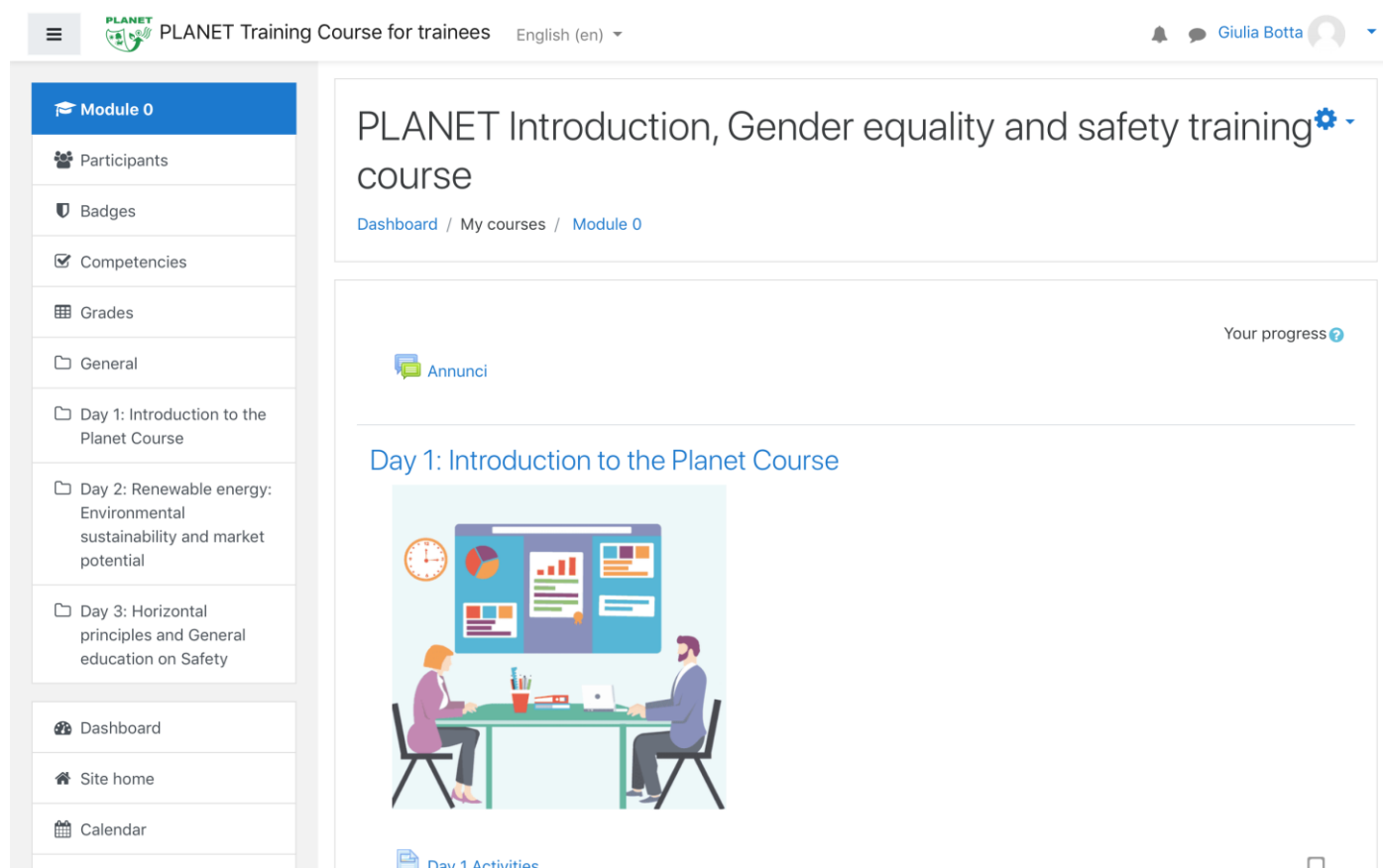
<https://www.erasmus-planet.eu/course/>

To view the contents without logging in, we have made the screenshots of all modules available in Annex 1. Annex 2 contains information on tests and methods for evaluating trainees' learning.

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ANNEX 1 : English training content for trainers and trainees, ALL MODULES



PLANET INTRODUCTION COURSE






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with "Module 0" (selected), "Participants", "Badges", "Competencies", "Grades", "General", "Day 1: Introduction to the Planet Course", "Day 2: Renewable energy: Environmental sustainability and market potential", "Day 3: Horizontal principles and General education on Safety", "Dashboard", "Site home", and "Calendar". The main content area displays the title "PLANET Introduction, Gender equality and safety training course" with a settings icon. Below the title is a breadcrumb trail: "Dashboard / My courses / Module 0". A section titled "Annunci" (Announcements) shows "Day 1: Introduction to the Planet Course" with a progress indicator. An illustration of two people at a desk with a large screen displaying charts is shown. At the bottom, there is a link for "Day 1 Activities".

Figura 1

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta



Module 0

Participants
Badges
Competencies
Grades
General
Day 1: Introduction to the Planet Course
Day 2: Renewable energy: Environmental sustainability and market potential
Day 3: Horizontal principles and General education on Safety

Dashboard
Site home
Calendar

Day 2: Renewable energy: Environmental sustainability and market potential




Day 2 Activities

Day 3: Horizontal principles and General education on Safety


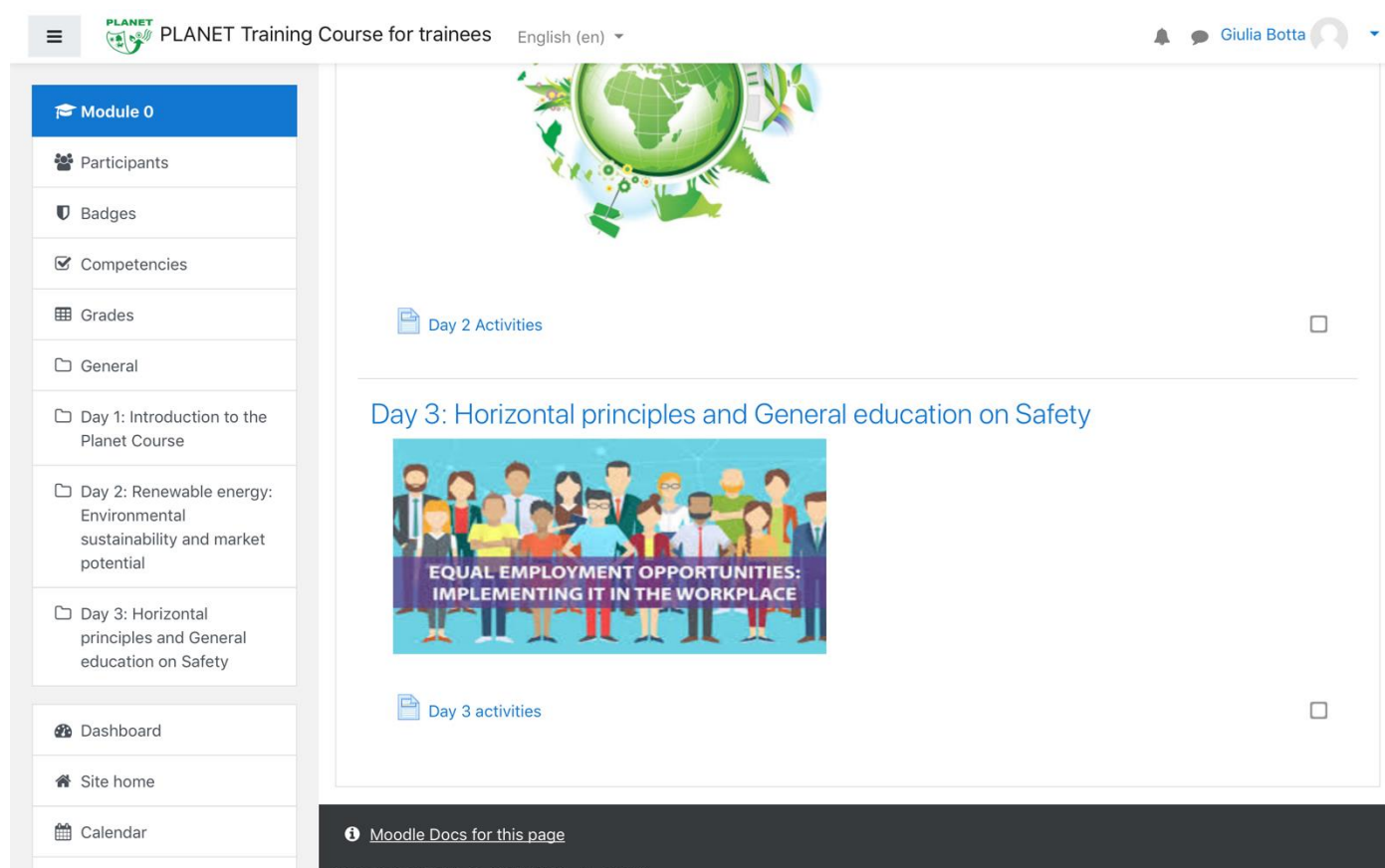


Figura 2

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the Moodle interface for the 'PLANET Training Course for trainees'. The top navigation bar includes the PLANET logo, the course title, the language 'English (en)', and a user profile for 'Giulia Botta'. The left sidebar contains a menu with 'Module 0' (Participants, Badges, Competencies, Grades, General) and 'Day 1: Introduction to the Planet Course'. The main content area displays 'Day 2 Activities' and 'Day 3: Horizontal principles and General education on Safety'. Below the Day 3 title is an image of a diverse group of people holding a banner that reads 'EQUAL EMPLOYMENT OPPORTUNITIES: IMPLEMENTING IT IN THE WORKPLACE'. The bottom of the page shows a 'Moodle Docs for this page' link and a login status message.

Figura 3

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DAYS STRUCTURE



ONE:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes a hamburger menu, the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a list of modules and activities, with "Day 1: Introduction to the Planet Course" selected. The main content area displays the title "PLANET Introduction, Gender equality and safety training course" and a breadcrumb trail: "Dashboard / My courses / Module 0 / Day 1: Introduction to the Planet Course / Day 1 Activities". Below this, the "Day 1 Activities" section is titled "INTRODUCTION Course - Day 1: Introduction to the Planet Course". It includes an "Aim of the module" (To give the trainees an overview of the course and guidance to the course.), "Learning outcomes" (By completing the activities and exercises in this module, you will achieve the following learning outcomes: 1. Know the educational tools, the training rooms, and the trainers. 2. Understand the structure of the course. 3. Be aware of personal competence (Core, technical and soft skills).), and "Activities" (Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.).

Figura 4

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PLANET Training Course for trainees
English (en)



Giulia Botta


Module 0
Participants
Badges
Competencies
Grades
General
Day 1: Introduction to the Planet Course
Day 2: Renewable energy: Environmental sustainability and market potential
Day 3: Horizontal principles and General education on Safety
Dashboard
Site home
Calendar

Objective 1: Know the educational tools, the training rooms, and the trainers



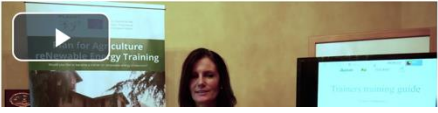
- Read or watch the following contents to know the educational tools, the training rooms, and the trainers:
 - Watch the following videos:
 - 
 - 
 - 

Figura 5

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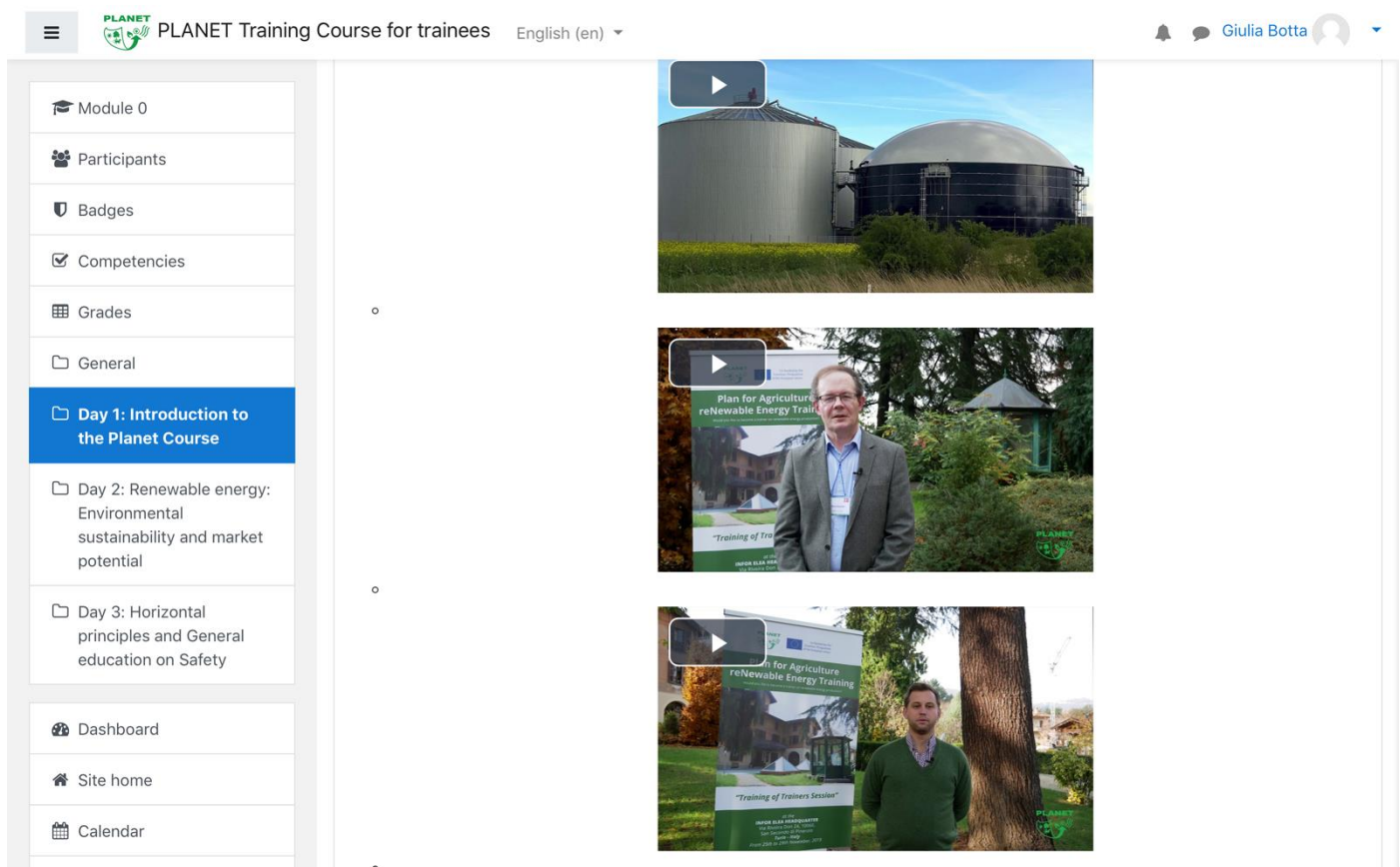
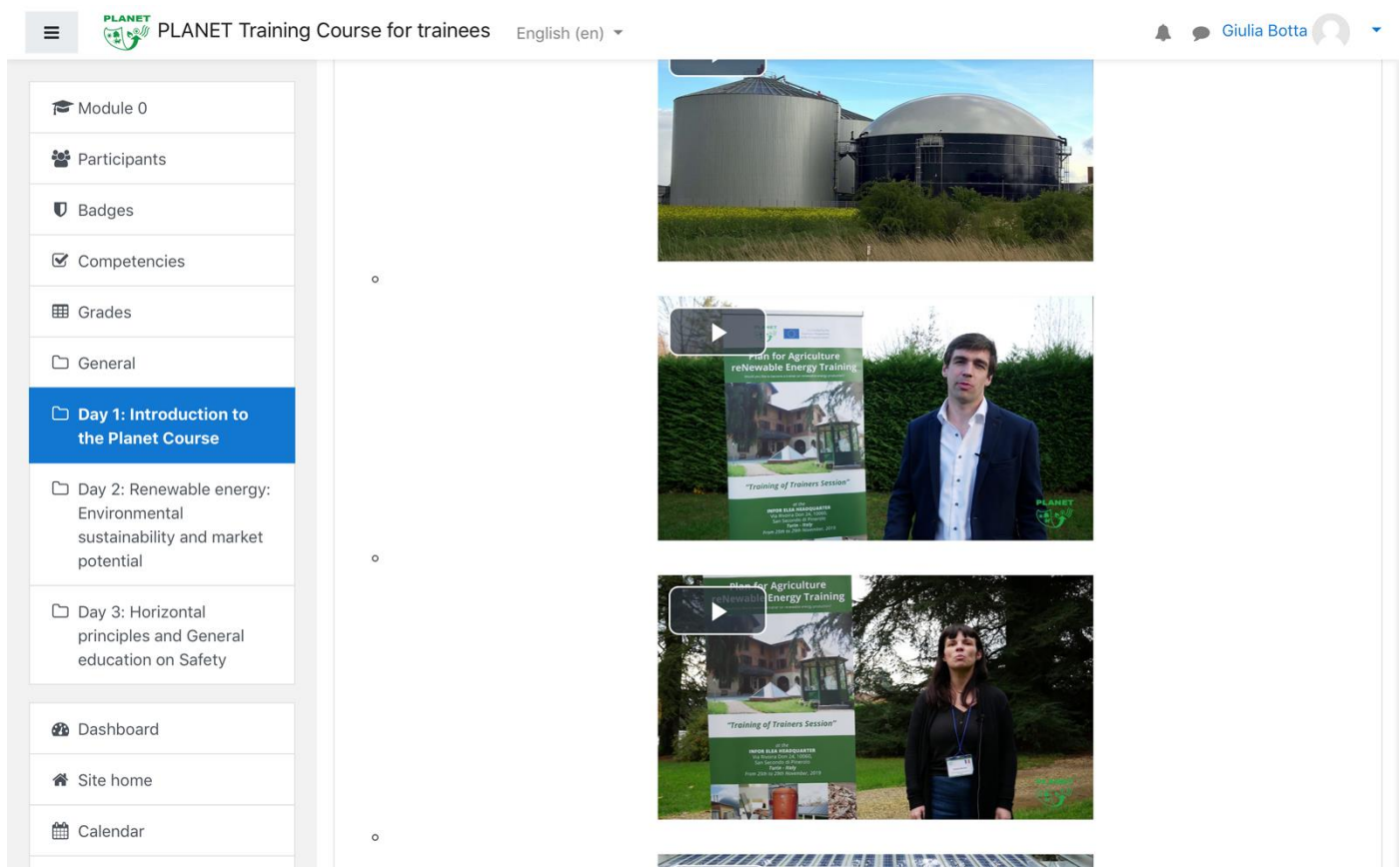


Figura 6



PLANET – Plan for Agriculture reNewable Energy Training






The screenshot displays the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with the following items: Module 0, Participants, Badges, Competencies, Grades, General, Day 1: Introduction to the Planet Course (highlighted), Day 2: Renewable energy: Environmental sustainability and market potential, Day 3: Horizontal principles and General education on Safety, Dashboard, Site home, and Calendar. The main content area shows three video thumbnails. The first thumbnail shows a large industrial silo. The second and third thumbnails show a man and a woman, respectively, standing in front of a banner that reads "Plan for Agriculture reNewable Energy Training" and "Training of Trainers Session".

Figura 7

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼



Module 0
Participants
Badges
Competencies
Grades
General

Day 1: Introduction to the Planet Course
Day 2: Renewable energy: Environmental sustainability and market potential
Day 3: Horizontal principles and General education on Safety

Dashboard
Site home
Calendar





Objective 2: Understand the structure of the course

- Read or watch the following contents to understand the structure of the course:
 - Read the "e-learning platform user guide" presentation

 - Read the "flipped classroom model" presentation


Objective 3: Be aware of personal competence (Core, technical and soft skills)

Figura 8

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)

Giulia Botta

Module 0

Participants

Badges

Competencies

Grades

General

Day 1: Introduction to the Planet Course

Day 2: Renewable energy: Environmental sustainability and market potential

Day 3: Horizontal principles and General education on Safety


Dashboard

Site home


Calendar

Additional material

- Watch the following videos to understand deeper the contents of this module:
 - For additional information on The Prisoner's Dilemma, watch the following video



- For additional information on The Importance of Empathy in the Workplace, watch the following video



- For additional information on How to Create Motivation at Work, watch the following video









Figura 9

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta




Module 0
Participants
Badges
Competencies
Grades
General

Day 1: Introduction to the Planet Course
Day 2: Renewable energy: Environmental sustainability and market potential
Day 3: Horizontal principles and General education on Safety

Dashboard
Site home
Calendar



Objective 2: Understand the structure of the course

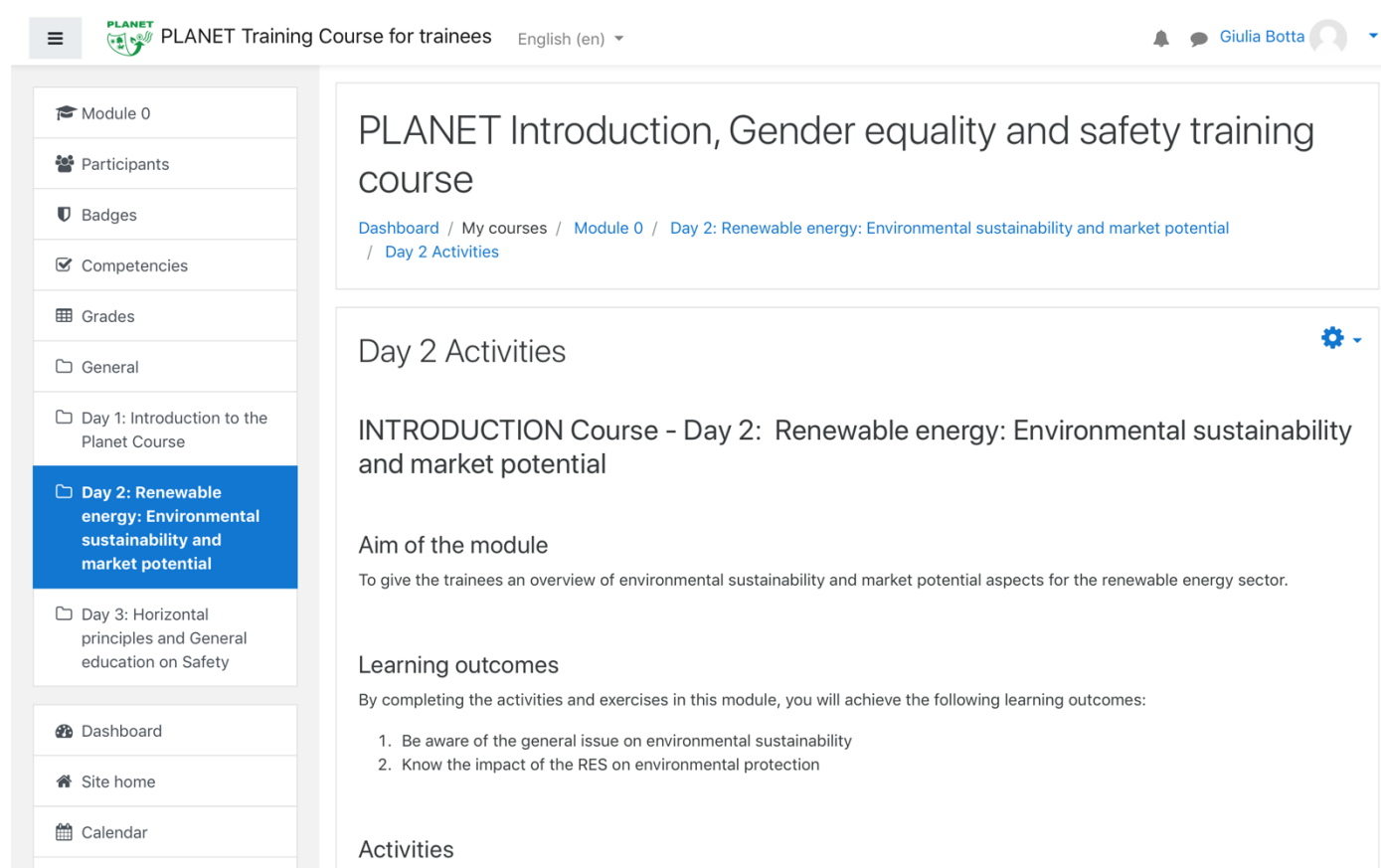
- Read or watch the following contents to understand the structure of the course:
 - Read the "e-learning platform user guide" presentation

 - Read the "flipped classroom model" presentation


Objective 3: Be aware of personal competence (Core, technical and soft skills)

Figura 10

PLANET – Plan for Agriculture reNewable Energy Training

TWO:



PLANET Training Course for trainees English (en) ▾

Giulia Botta ▾

Module 0

Participants

Badges

Competencies

Grades

General

Day 1: Introduction to the Planet Course

Day 2: Renewable energy: Environmental sustainability and market potential

Day 3: Horizontal principles and General education on Safety

Dashboard

Site home

Calendar

PLANET Introduction, Gender equality and safety training course

[Dashboard](#) / [My courses](#) / [Module 0](#) / [Day 2: Renewable energy: Environmental sustainability and market potential](#) / [Day 2 Activities](#)

Day 2 Activities

INTRODUCTION Course - Day 2: Renewable energy: Environmental sustainability and market potential

Aim of the module

To give the trainees an overview of environmental sustainability and market potential aspects for the renewable energy sector.

Learning outcomes



By completing the activities and exercises in this module, you will achieve the following learning outcomes:




1. Be aware of the general issue on environmental sustainability
2. Know the impact of the RES on environmental protection

Activities

Figura 11

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Module 0

Participants

Badges

Competencies

Grades

General

Day 1: Introduction to the Planet Course

Day 2: Renewable energy: Environmental sustainability and market potential

Day 3: Horizontal principles and General education on Safety

Dashboard


Site home

Calendar

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Be aware of the general issue on environmental sustainability

- Read or watch the following contents to have an overview of environmental sustainability:
 - Read the presentation Day2.1_Environmental sustainability


Objective 2: Know the impact of the RES on environmental protection


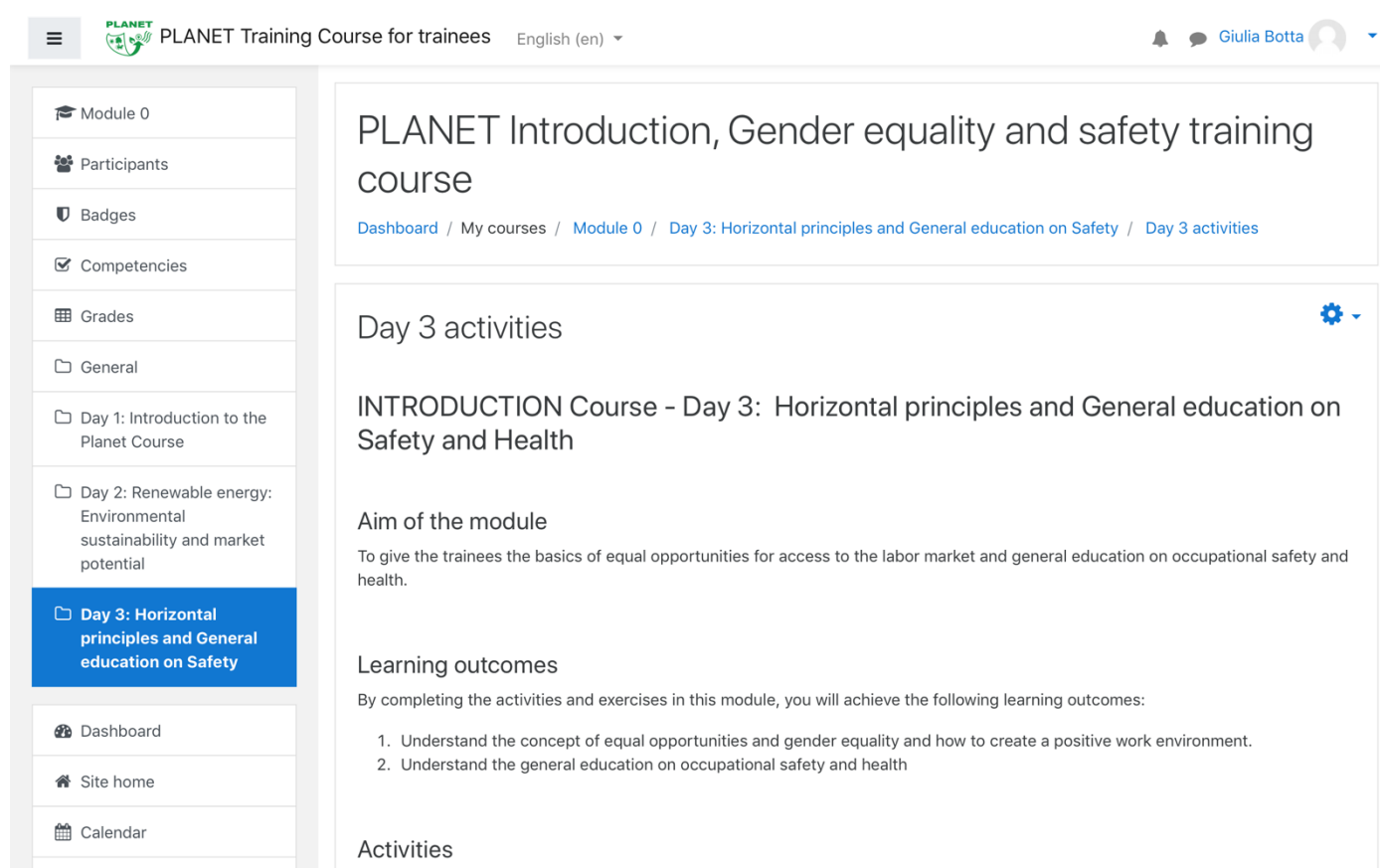
- Read the following contents to understand what RES are and what impact they can have on the environment:
 - Read the presentation Day2.2_Impact of RES


Figura 12

PLANET – Plan for Agriculture reNewable Energy Training

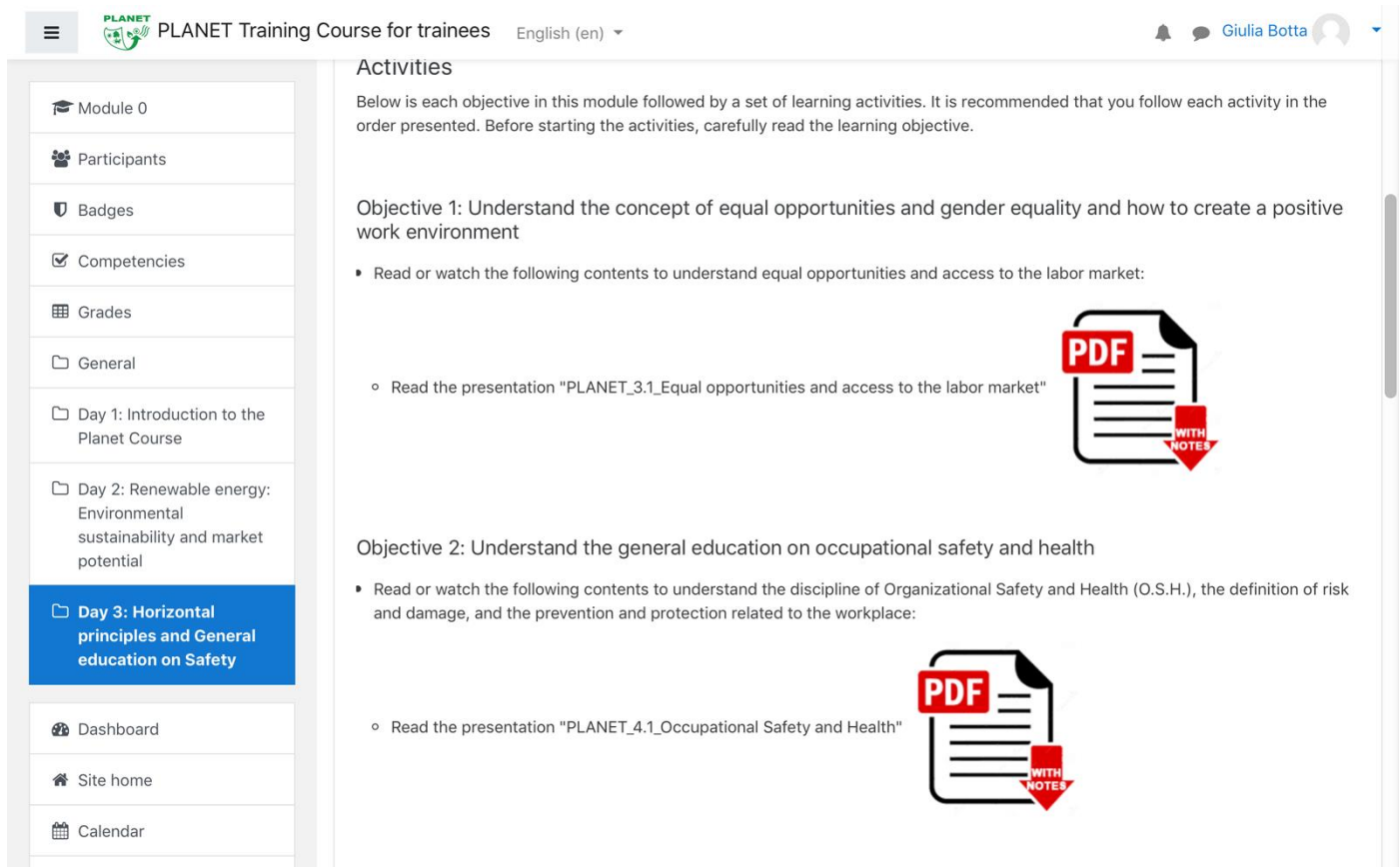
THREE:



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with the following items: Module 0, Participants, Badges, Competencies, Grades, General, Day 1: Introduction to the Planet Course, Day 2: Renewable energy: Environmental sustainability and market potential, and Day 3: Horizontal principles and General education on Safety (highlighted in blue). Below the sidebar, there are links for Dashboard, Site home, and Calendar. The main content area displays the title "PLANET Introduction, Gender equality and safety training course" and a breadcrumb trail: Dashboard / My courses / Module 0 / Day 3: Horizontal principles and General education on Safety / Day 3 activities. The "Day 3 activities" section is titled "INTRODUCTION Course - Day 3: Horizontal principles and General education on Safety and Health". It includes a section for "Aim of the module" with the text: "To give the trainees the basics of equal opportunities for access to the labor market and general education on occupational safety and health." and a section for "Learning outcomes" with the text: "By completing the activities and exercises in this module, you will achieve the following learning outcomes:" followed by a list of two outcomes: 1. Understand the concept of equal opportunities and gender equality and how to create a positive work environment. 2. Understand the general education on occupational safety and health. The "Activities" section is currently empty.

Figura 13

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The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with items: Module 0, Participants, Badges, Competencies, Grades, General, Day 1: Introduction to the Planet Course, Day 2: Renewable energy: Environmental sustainability and market potential, and Day 3: Horizontal principles and General education on Safety (highlighted in blue). Below the menu are links for Dashboard, Site home, and Calendar. The main content area is titled "Activities" and contains the following text:

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand the concept of equal opportunities and gender equality and how to create a positive work environment



- Read or watch the following contents to understand equal opportunities and access to the labor market:
 - Read the presentation "PLANET_3.1_Equal opportunities and access to the labor market" (indicated by a PDF icon with a red arrow and the text "WITH NOTES").




Objective 2: Understand the general education on occupational safety and health

- Read or watch the following contents to understand the discipline of Organizational Safety and Health (O.S.H.), the definition of risk and damage, and the prevention and protection related to the workplace:
 - Read the presentation "PLANET_4.1_Occupational Safety and Health" (indicated by a PDF icon with a red arrow and the text "WITH NOTES").

Figura 14

PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Module 0
Participants
Badges
Competencies
Grades
General
Day 1: Introduction to the Planet Course
Day 2: Renewable energy: Environmental sustainability and market potential
Day 3: Horizontal principles and General education on Safety
Dashboard
Site home
Calendar

Additional material

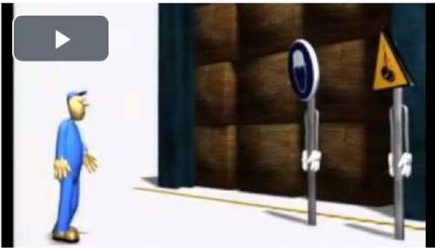




- Watch the following videos to understand deeper the contents of this module:
 - For additional information on health and safety signs and symbols found in the workplace, watch the following video

 - For additional information on the causes of stress at work, watch the following video

 - For additional information on the economic benefits of gender equality, watch the following video


Figura 15

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)

Giulia Botta

Module 0

Participants

Badges

Competencies

Grades

General

Day 1: Introduction to the Planet Course

Day 2: Renewable energy: Environmental sustainability and market potential

Day 3: Horizontal principles and General education on Safety

Dashboard

Site home

Calendar

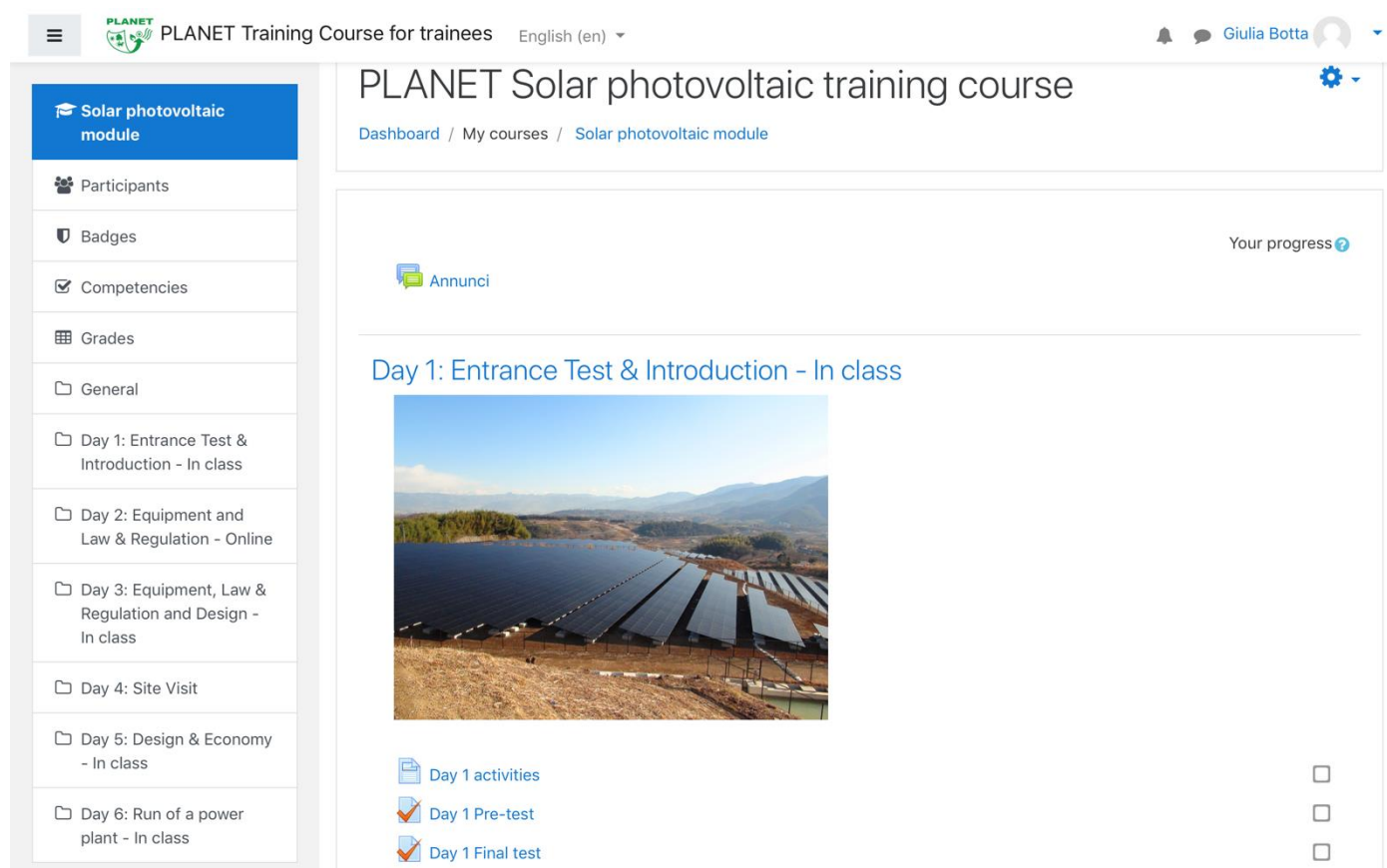
For additional information on exclusion, segregation, integration, and inclusion, watch the following video

For additional information on the meaning of affirmative action, watch the following video

Figura 16

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PLANET SOLAR PHOTOVOLTAIC TRAINING COURSE






The screenshot shows the user interface of the PLANET Solar photovoltaic training course. At the top, there is a navigation bar with the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". Below this is a sidebar menu with various options: "Solar photovoltaic module" (selected), "Participants", "Badges", "Competencies", "Grades", "General", and a list of course days. The main content area displays the title "PLANET Solar photovoltaic training course" and a breadcrumb trail "Dashboard / My courses / Solar photovoltaic module". It also shows a "Your progress" indicator and a section for "Annunci" (Announcements). The current announcement is "Day 1: Entrance Test & Introduction - In class", accompanied by a photograph of a large solar farm. Below the announcement, there is a list of activities: "Day 1 activities", "Day 1 Pre-test", and "Day 1 Final test", each with a checkbox for completion.

Figura 17

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PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

Solar photovoltaic module

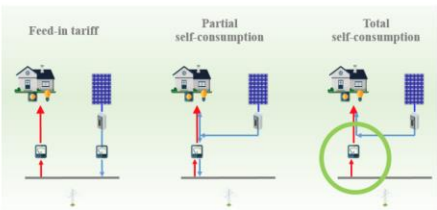
Participants
Badges
Competencies
Grades
General
Day 1: Entrance Test & Introduction - In class
Day 2: Equipment and Law & Regulation - Online
Day 3: Equipment, Law & Regulation and Design - In class
Day 4: Site Visit
Day 5: Design & Economy - In class
Day 6: Run of a power plant - In class

Day 2: Equipment and Law & Regulation - Online



Day 2 activities
Day 2 Pre-test
Day 2 Final test



Day 3: Equipment, Law & Regulation and Design - In class






Day 3 activities

Figura 18

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Solar photovoltaic module

Participants
Badges
Competencies
Grades
General
Day 1: Entrance Test & Introduction - In class
Day 2: Equipment and Law & Regulation - Online
Day 3: Equipment, Law & Regulation and Design - In class
Day 4: Site Visit
Day 5: Design & Economy - In class
Day 6: Run of a power plant - In class

Day 3: Equipment, Law & Regulation and Design - In class

Feed-in tariff

Partial self-consumption


Total self-consumption

Day 3 activities

Day 3 Pre-test

Day 3 Final test



Day 4: Site Visit






Day 4 Activities

Figura 19

PLANET – Plan for Agriculture reNewable Energy Training


PLANET Training Course for trainees
English (en)



Giulia Botta


Solar photovoltaic module

Participants
Badges
Competencies
Grades
General
Day 1: Entrance Test & Introduction - In class
Day 2: Equipment and Law & Regulation - Online
Day 3: Equipment, Law & Regulation and Design - In class
Day 4: Site Visit
Day 5: Design & Economy - In class
Day 6: Run of a power plant - In class

Day 5: Design & Economy - In class



Day 5 activities
Day 5 Pre-test
Day 5 Final test

Day 6: Run of a power plant - In class


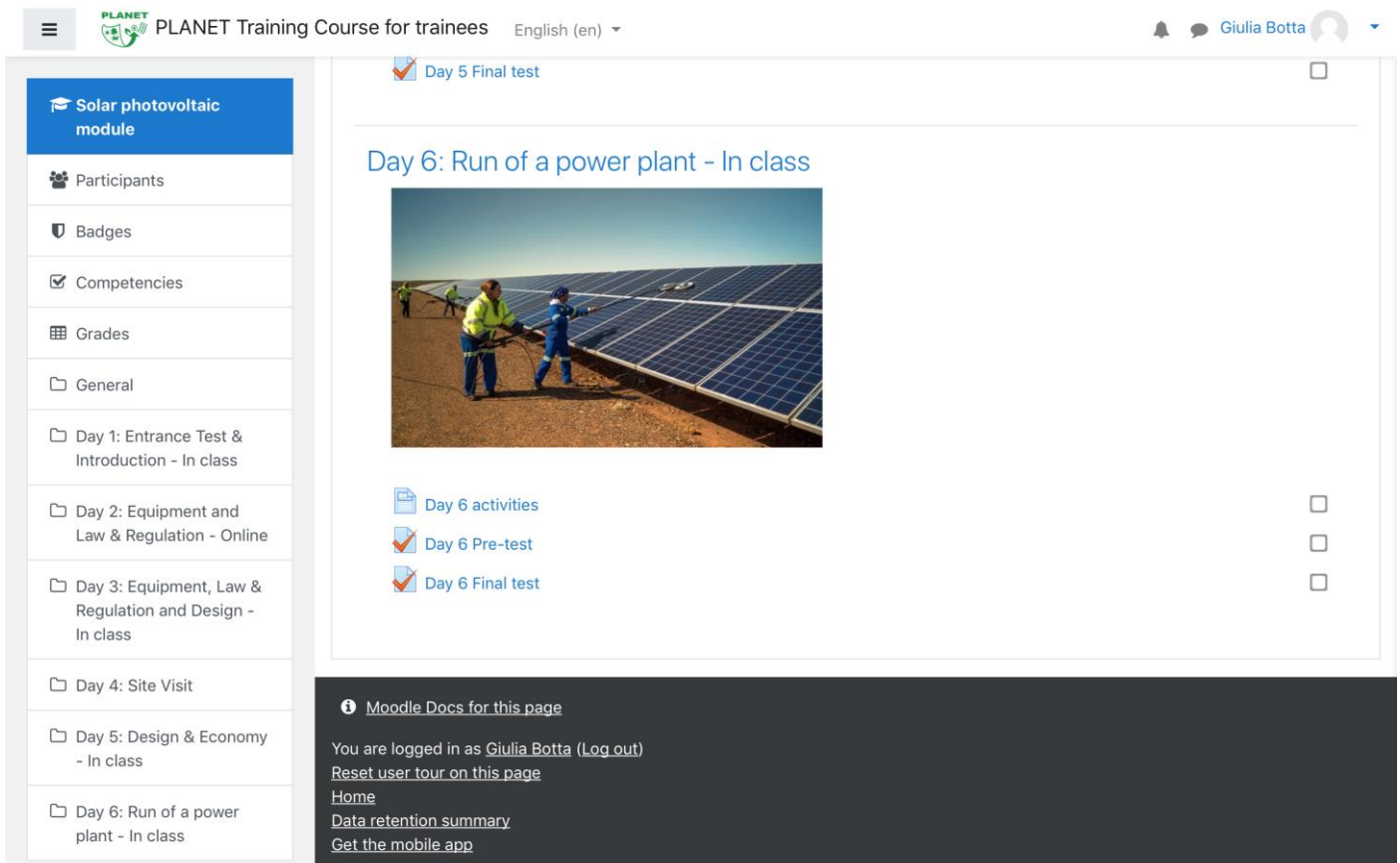


Figura 20

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees English (en)

Solar photovoltaic module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Day 5 Final test

Day 6: Run of a power plant - In class

Day 6 activities

Day 6 Pre-test

Day 6 Final test

Moodle Docs for this page

You are logged in as [Giulia Botta](#) ([Log out](#))

[Reset user tour on this page](#)

[Home](#)

[Data retention summary](#)

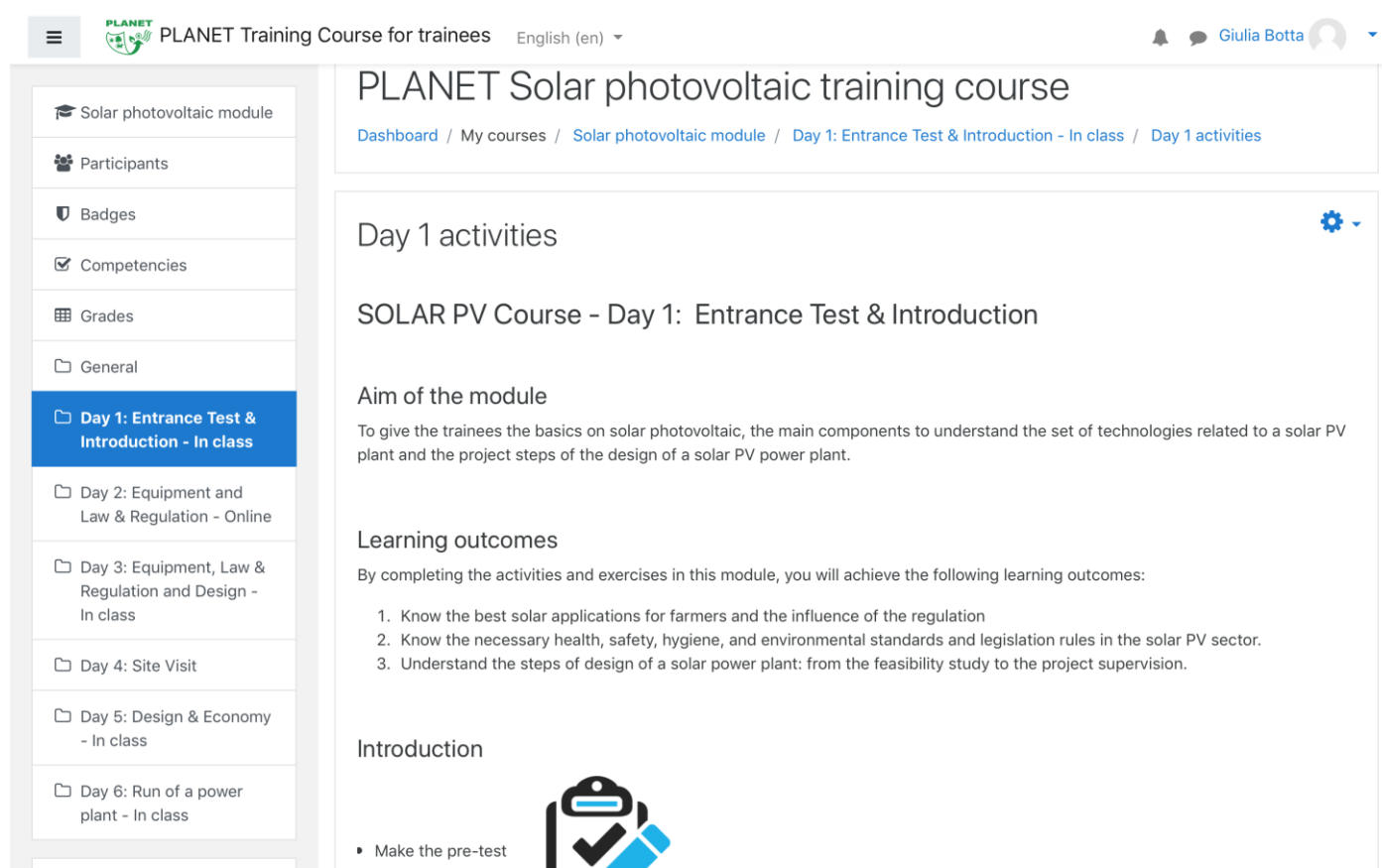
[Get the mobile app](#)

Figura 21

PLANET – Plan for Agriculture reNewable Energy Training

DAYS STRUCTURE



ONE:






The screenshot shows the PLANET Training Course interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile "Giulia Botta". The left sidebar lists the course structure, with "Day 1: Entrance Test & Introduction - In class" selected. The main content area displays the title "PLANET Solar photovoltaic training course" and the breadcrumb "Dashboard / My courses / Solar photovoltaic module / Day 1: Entrance Test & Introduction - In class / Day 1 activities". Below this, the section "Day 1 activities" is shown, followed by "SOLAR PV Course - Day 1: Entrance Test & Introduction". The "Aim of the module" section states: "To give the trainees the basics on solar photovoltaic, the main components to understand the set of technologies related to a solar PV plant and the project steps of the design of a solar PV power plant." The "Learning outcomes" section lists three outcomes: 1. Know the best solar applications for farmers and the influence of the regulation; 2. Know the necessary health, safety, hygiene, and environmental standards and legislation rules in the solar PV sector; 3. Understand the steps of design of a solar power plant: from the feasibility study to the project supervision. The "Introduction" section includes a bullet point "Make the pre-test" and an icon of a clipboard with a checkmark.

Figura 22

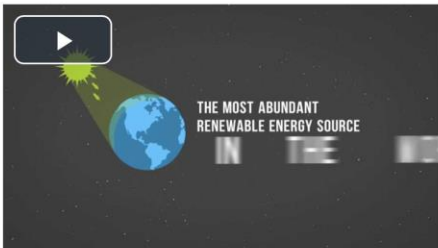
PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Watch the video on solar



- Watch the video on solar PV



Activities



Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.




Objective 1: Know the best solar applications for farmers and the influence of the regulation

- Read or watch the following contents to understand the best solar applications for farmers:

Figura 23

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class



Read or watch the following contents to understand the best solar applications for farmers:




- Read Presentation PLANET Solar PV Day 1.1.1, slides 1 to 8
- Watch the video on "From Sun To Electricity"
- Read Presentation PLANET Solar PV Day 1.1.2, slides 9 to 12

Objective 2: Understand the necessary health, safety, hygiene, and environmental standards and legislation rules in the solar PV sector

Figura 24


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta



- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Read Presentation PLANET Solar PV Day 1.2.2, slides 17 to 43




- Read or watch the following contents to understand the Health and safety precautions : security equipment impact on troubleshooting :

- Read Presentation PLANET Solar PV Day 1.2.3, slides 44 to 57



- Watch the video on PPE until minute 4:24



- Read Presentation PLANET Solar PV Day 1.2.4, slides 58 to 65









Figura 25

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Solar photovoltaic module

Participants

Badges

Competencies

Grades

General

Day 1: Entrance Test & Introduction - In class

Day 2: Equipment and Law & Regulation - Online

Day 3: Equipment, Law & Regulation and Design - In class


Day 4: Site Visit


Day 5: Design & Economy - In class

Day 6: Run of a power plant - In class

Objective 3: Understand the steps of design of a solar power plant: from the feasibility study to the project supervision

- Read or watch the following contents to understand the project step for a solar PV plant:
 - Presentation of the role of each actor involved on a solar power plant project (PLANET Solar PV Day 1.3.1 Project Steps, slides 1 to 15)


 - Presentation of the steps of design of a solar power plant : from the feasibility study to the project supervision (PLANET Solar PV Day 1.3.2 Project Steps, slides 16 to 37)



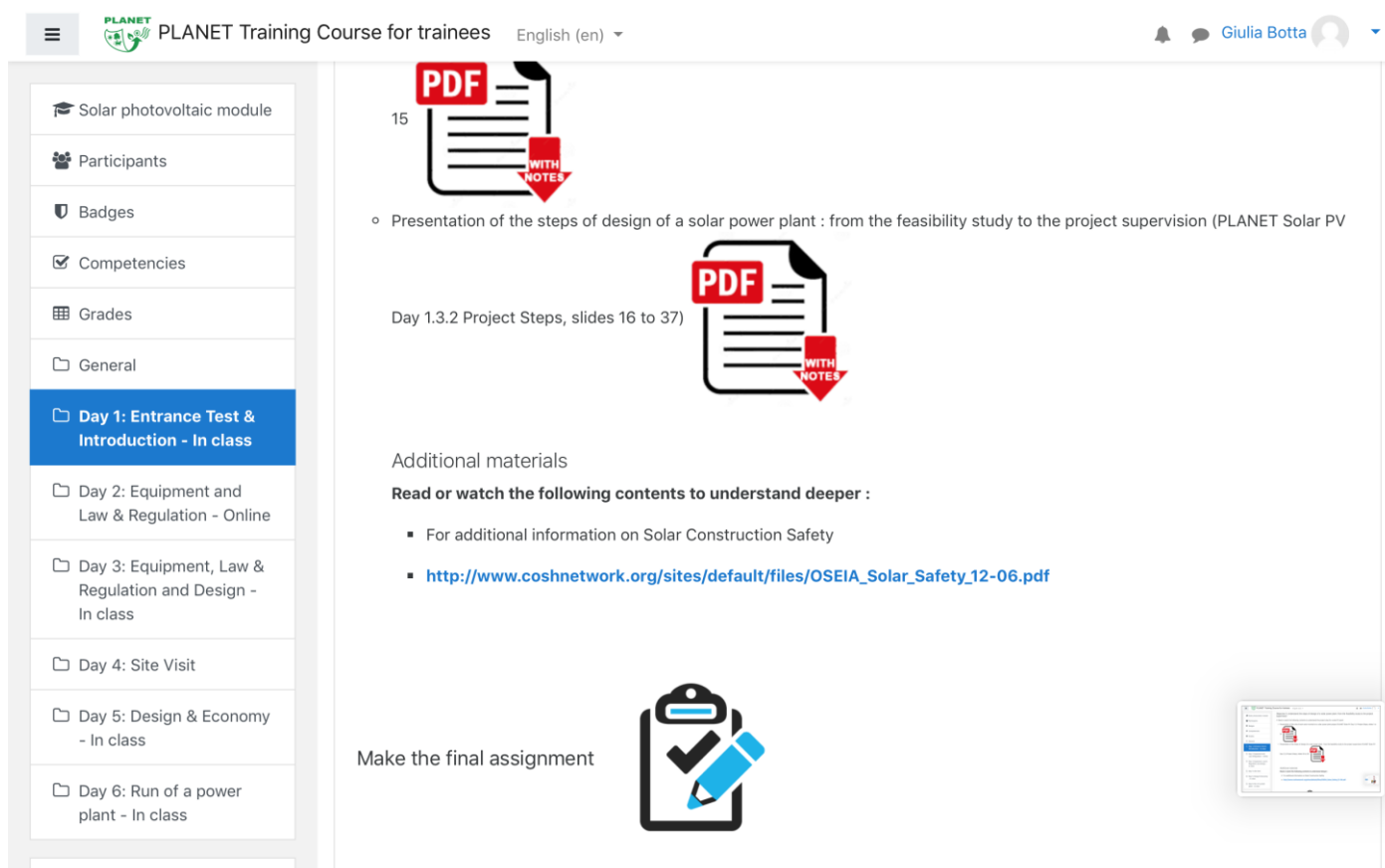
Additional materials

Read or watch the following contents to understand deeper :

- For additional information on Solar Construction Safety
- http://www.coshnetwork.org/sites/default/files/OSEIA_Solar_Safety_12-06.pdf

Figura 26

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the PLANET Training Course for trainees interface. The left sidebar contains a menu with the following items: Solar photovoltaic module, Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class (highlighted), Day 2: Equipment and Law & Regulation - Online, Day 3: Equipment, Law & Regulation and Design - In class, Day 4: Site Visit, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class.

The main content area displays a PDF icon with the number 15 and a red arrow pointing down with the text "WITH NOTES". Below this, there is a list of items:

- Presentation of the steps of design of a solar power plant : from the feasibility study to the project supervision (PLANET Solar PV)

Below the list, there is a PDF icon with the text "Day 1.3.2 Project Steps, slides 16 to 37)".

Additional materials

Read or watch the following contents to understand deeper :

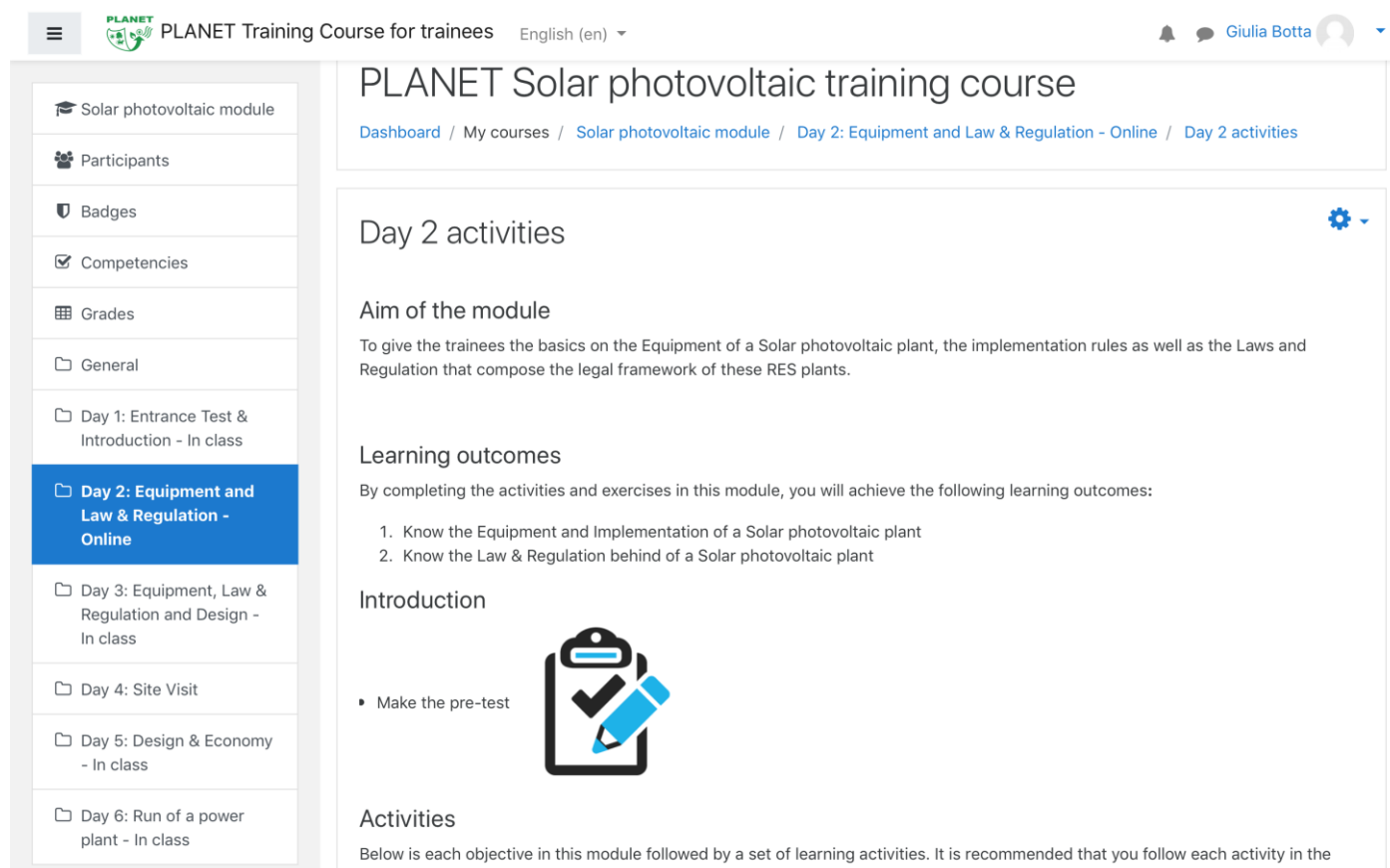
- For additional information on Solar Construction Safety
- http://www.coshnetwork.org/sites/default/files/OSEIA_Solar_Safety_12-06.pdf

At the bottom, there is a clipboard icon with a checkmark and a blue pencil, and the text "Make the final assignment".

Figura 27

PLANET – Plan for Agriculture reNewable Energy Training



TWO:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for Giulia Botta. The left sidebar contains a menu with items: Solar photovoltaic module, Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class, Day 2: Equipment and Law & Regulation - Online (highlighted), Day 3: Equipment, Law & Regulation and Design - In class, Day 4: Site Visit, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class. The main content area is titled "PLANET Solar photovoltaic training course" and shows the breadcrumb trail: Dashboard / My courses / Solar photovoltaic module / Day 2: Equipment and Law & Regulation - Online / Day 2 activities. The "Day 2 activities" section includes the "Aim of the module" (To give the trainees the basics on the Equipment of a Solar photovoltaic plant, the implementation rules as well as the Laws and Regulation that compose the legal framework of these RES plants), "Learning outcomes" (By completing the activities and exercises in this module, you will achieve the following learning outcomes: 1. Know the Equipment and Implementation of a Solar photovoltaic plant, 2. Know the Law & Regulation behind of a Solar photovoltaic plant), "Introduction" (Make the pre-test), and "Activities" (Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective).

Figura 28

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Objective 1: Know the Equipment and Implementation of a Solar photovoltaic plant










- Read the following documents to understand the Equipment:
 - Read Presentation PLANET Solar PV Day 2.1.1, slides 1 to 4

 - Watch the video on PV farm overview

- Read Presentation PLANET Solar PV Day 2.1.2, slides 5 to 9

- Watch the video on PV cell manufacturing


Figura 29


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta



- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Read Presentation PLANET Solar PV Day 2.1.3, slides 10 to 11
- Watch the video on PV module





- Read Presentation PLANET Solar PV Day 2.1.4, slides 12 to 15
- Watch the video on PV farm mounting











Figura 30


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼

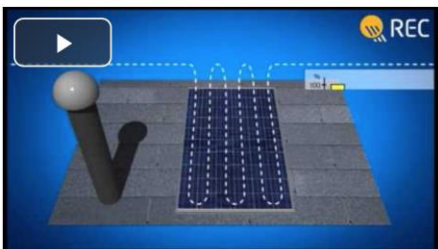


Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class


- Read Presentation PLANET Solar PV Day 2.1.5, slides 16 to 19



- Watch the video on Shading effects and diodes



- Read Presentation PLANET Solar PV Day 2.1.6, slides 20 to 22



- Watch the video on DC circuit









Figura 31


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Read Presentation PLANET Solar PV Day 2.1.7, slides 23 to 24


- Watch the video on Surge protection


- Read Presentation PLANET Solar PV Day 2.1.8, slides 25 to 32


- Watch the video on Inverter









Figura 32

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼





Giulia Botta





- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Read Presentation PLANET Solar PV Day 2.1.9, slides 33 to 36
 - Watch the video on Inverter AC Switchboard
- Read Presentation PLANET Solar PV Day 2.1.10, slides 37 to 40
 - Watch the video on Inside the Main Switchboard

Figura 33

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

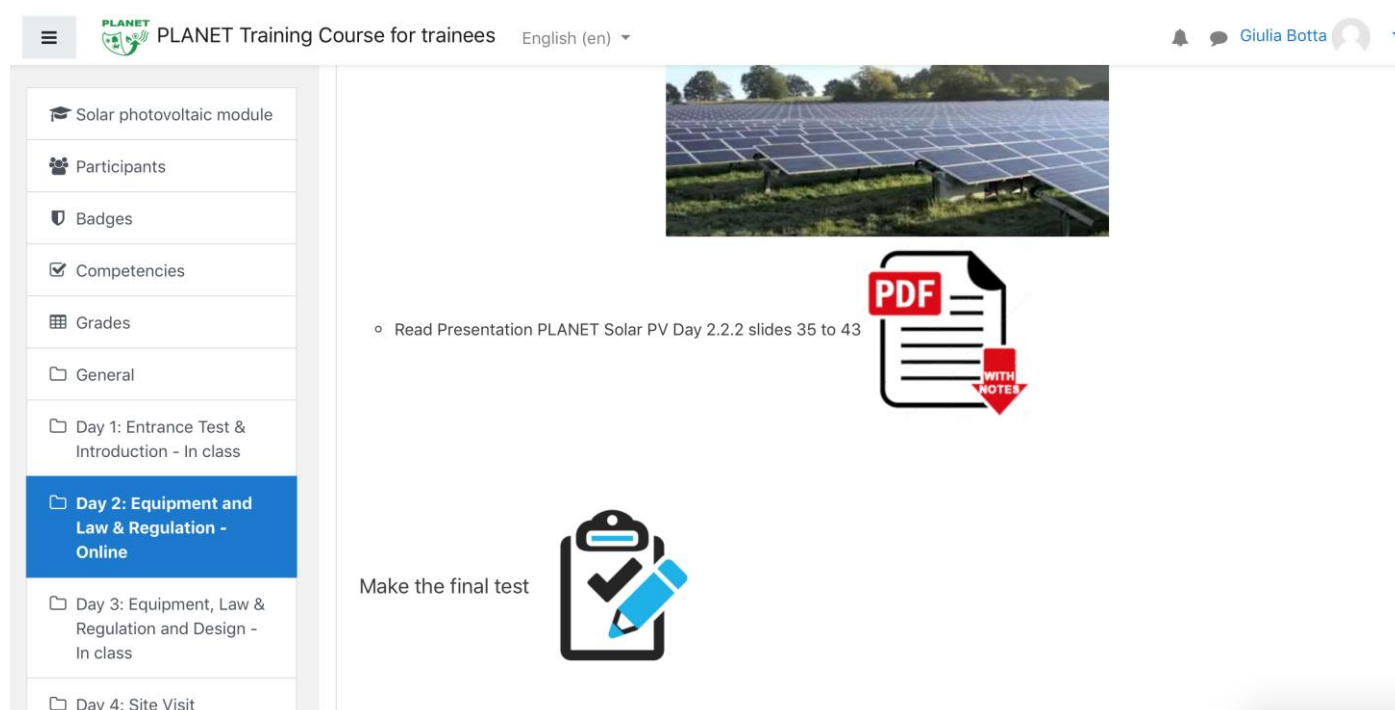
- Read Presentation PLANET Solar PV Day 2.1.11, slide 41

Objective 2: Know the Law & Regulation behind of a Solar photovoltaic plant

- Read or watch the following contents to understand the Law & Regulation behind of a Solar photovoltaic plant:
 - Read Presentation PLANET Solar PV Day 2.2.1, slides 1 to 34
 - Watch the video on PV module testing

Figura 34

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees English (en) ▾

- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online**
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit

Read Presentation PLANET Solar PV Day 2.2.2 slides 35 to 43

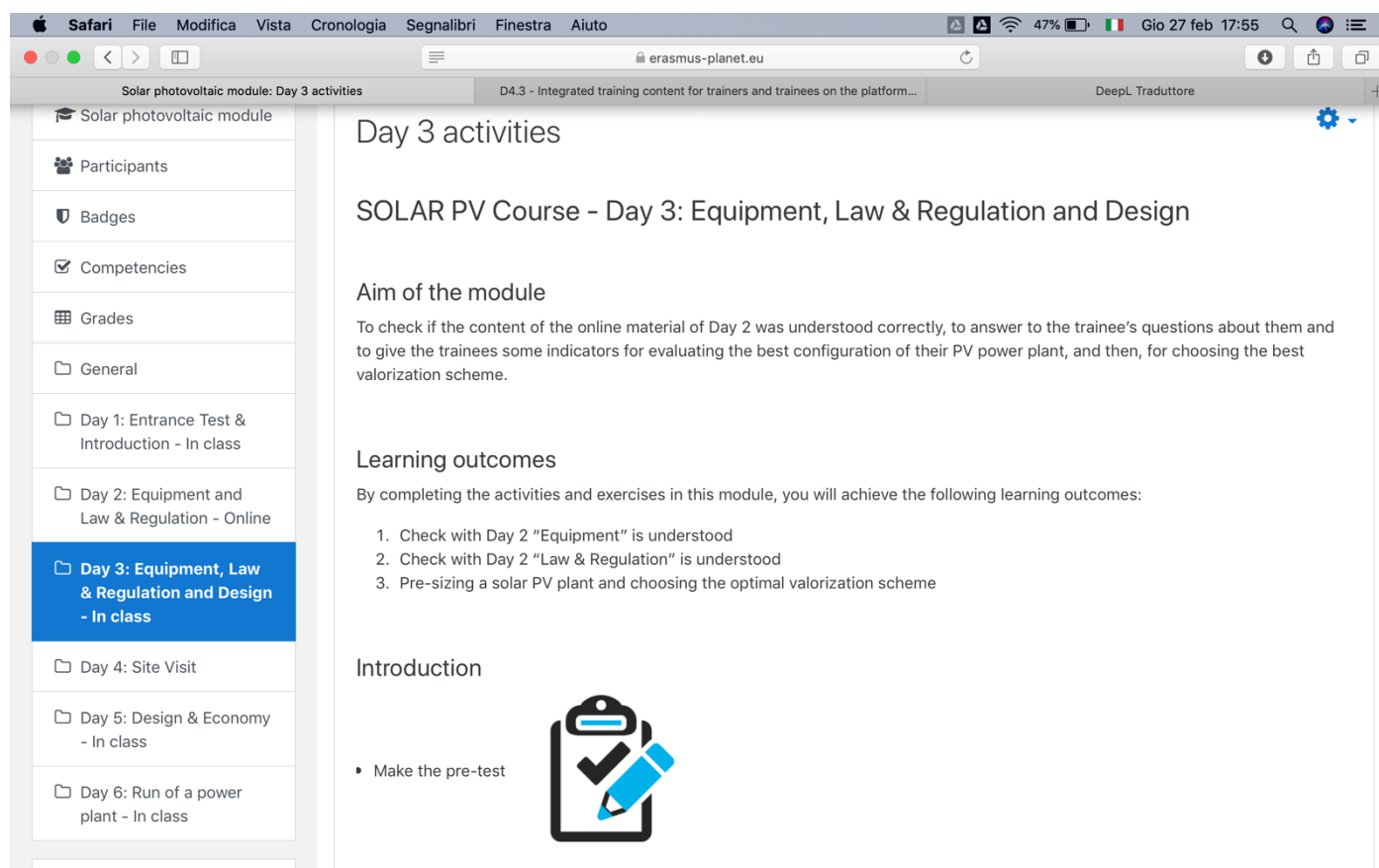
PDF WITH NOTES

Make the final test

Figura 35

PLANET – Plan for Agriculture reNewable Energy Training

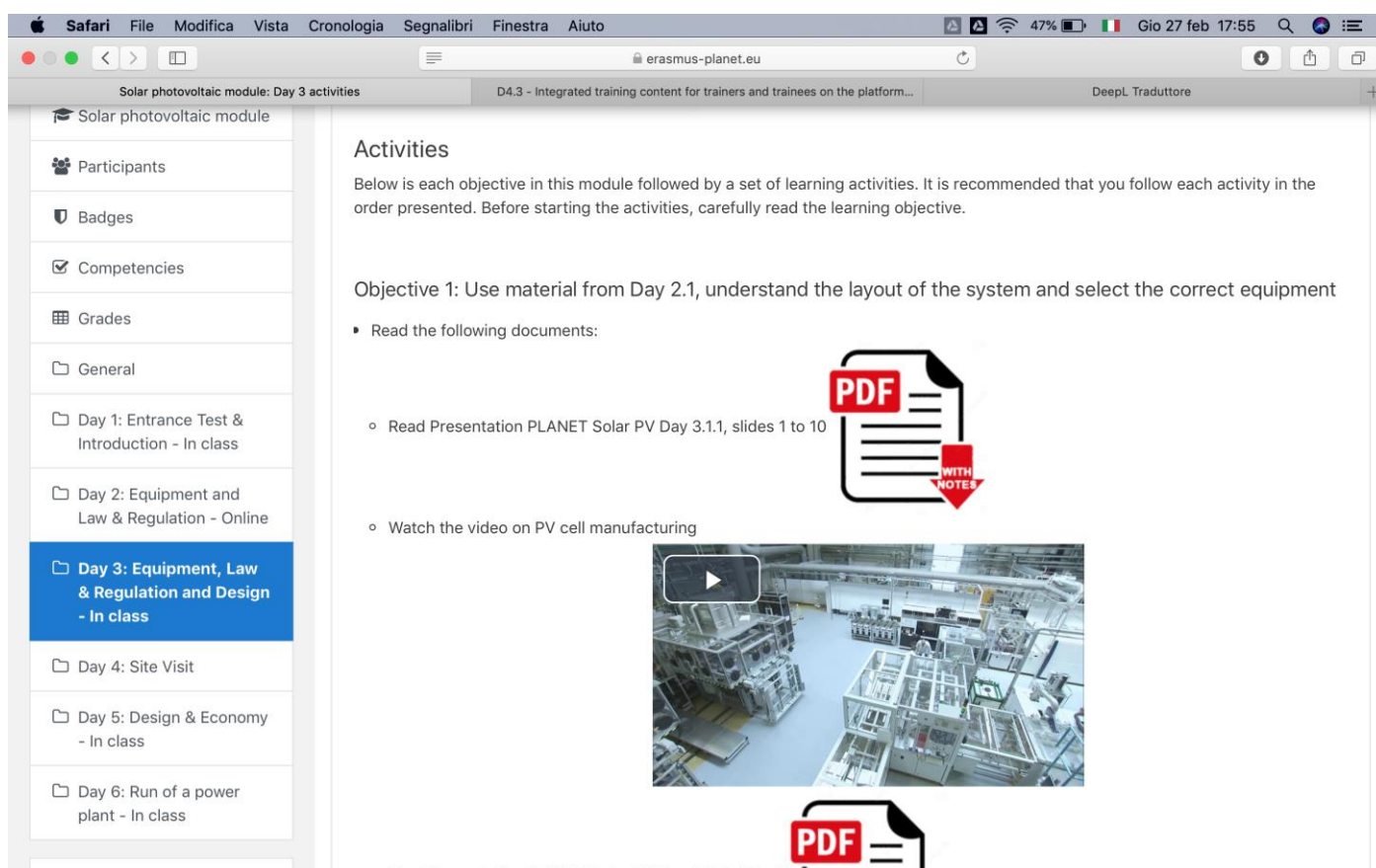
THREE:



The screenshot shows a web browser window displaying the PLANET platform. The left sidebar contains a navigation menu with the following items: Solar fotovoltaic module, Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class, Day 2: Equipment and Law & Regulation - Online, **Day 3: Equipment, Law & Regulation and Design - In class** (highlighted in blue), Day 4: Site Visit, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class. The main content area is titled 'Day 3 activities' and 'SOLAR PV Course - Day 3: Equipment, Law & Regulation and Design'. It includes a section 'Aim of the module' with a paragraph about checking understanding and evaluating PV power plant configurations. Below this is a 'Learning outcomes' section listing three points: 1. Check with Day 2 "Equipment" is understood, 2. Check with Day 2 "Law & Regulation" is understood, and 3. Pre-sizing a solar PV plant and choosing the optimal valorization scheme. An 'Introduction' section follows with a bullet point 'Make the pre-test' and an icon of a clipboard with a checkmark and a pencil.

Figura 36

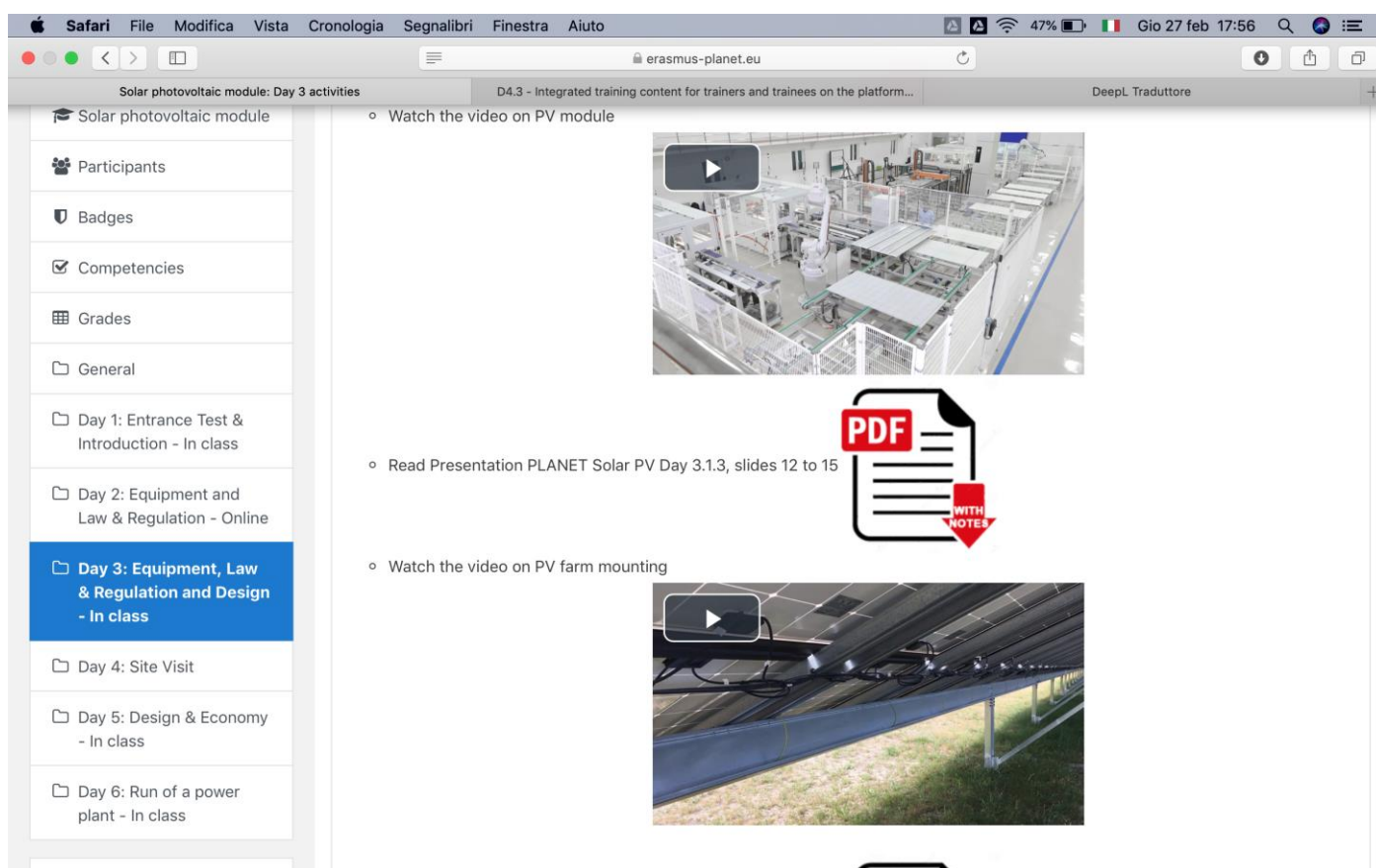
PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows a web browser window displaying the PLANET training platform. The browser is Safari, and the address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a menu with the following items: Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class, Day 2: Equipment and Law & Regulation - Online, Day 3: Equipment, Law & Regulation and Design - In class (highlighted), Day 4: Site Visit, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class. The main content area is titled 'Activities' and contains the following text: 'Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.' The first objective is 'Objective 1: Use material from Day 2.1, understand the layout of the system and select the correct equipment'. Below this, there is a list of activities: 'Read the following documents:' followed by 'Read Presentation PLANET Solar PV Day 3.1.1, slides 1 to 10' and 'Watch the video on PV cell manufacturing'. There are icons for PDF documents and a video player showing a factory interior.

Figura 37

PLANET – Plan for Agriculture reNewable Energy Training



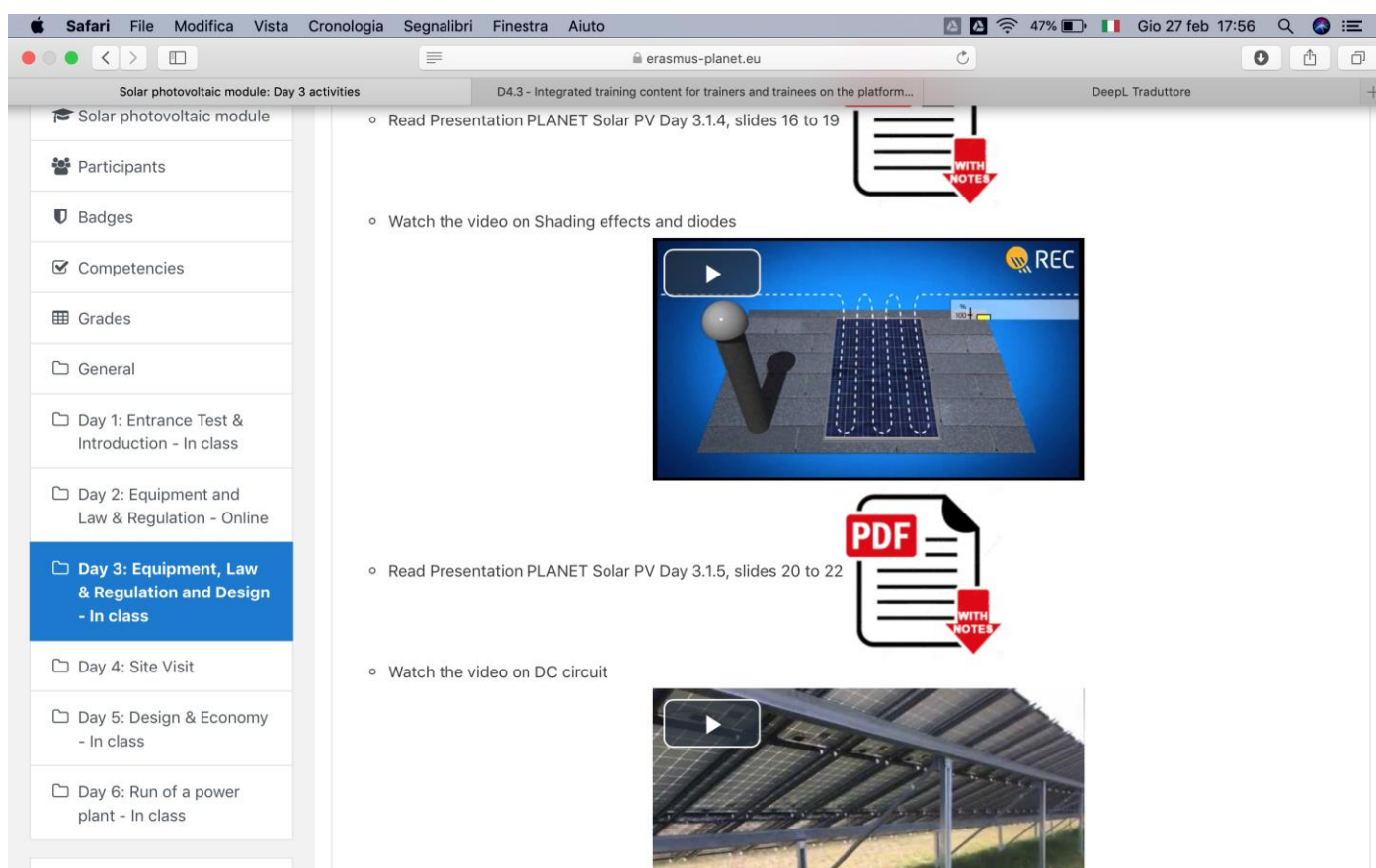
The screenshot shows a web browser window displaying the PLANET training platform. The browser's address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a menu with the following items: 'Solar photovoltaic module', 'Participants', 'Badges', 'Competencies', 'Grades', 'General', 'Day 1: Entrance Test & Introduction - In class', 'Day 2: Equipment and Law & Regulation - Online', 'Day 3: Equipment, Law & Regulation and Design - In class' (highlighted in blue), 'Day 4: Site Visit', 'Day 5: Design & Economy - In class', and 'Day 6: Run of a power plant - In class'. The main content area displays a list of activities for Day 3:

- Watch the video on PV module
- Read Presentation PLANET Solar PV Day 3.1.3, slides 12 to 15
- Watch the video on PV farm mounting

The first activity, 'Watch the video on PV module', is accompanied by a video player showing a factory interior. The second activity, 'Read Presentation PLANET Solar PV Day 3.1.3, slides 12 to 15', is accompanied by a PDF icon with a red arrow pointing down and the text 'WITH NOTES'. The third activity, 'Watch the video on PV farm mounting', is accompanied by a video player showing solar panels installed on a roof.

Figura 38

PLANET – Plan for Agriculture reNewable Energy Training

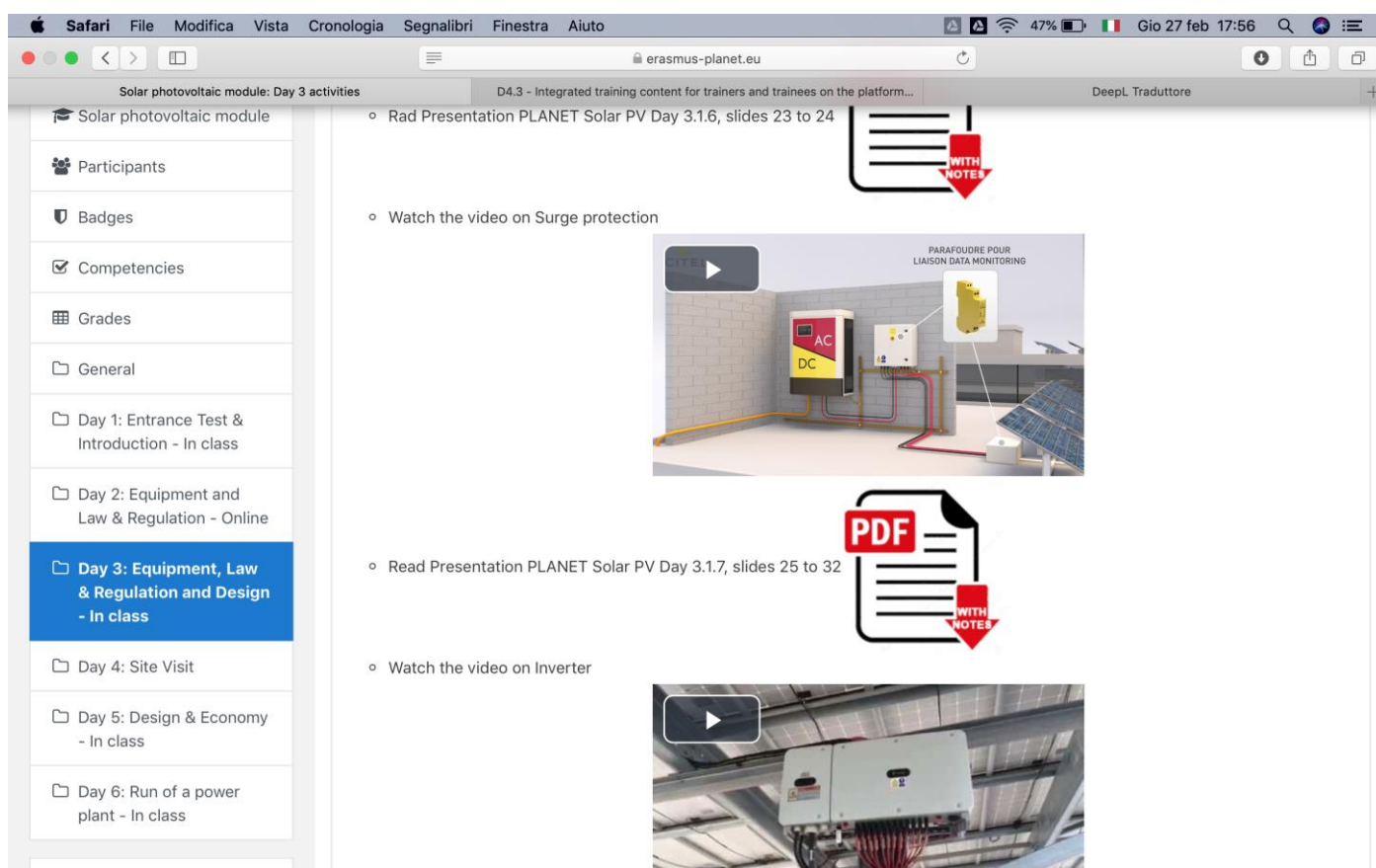


The screenshot shows a web browser window displaying the PLANET training platform. The browser is Safari, and the address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a list of activities, with 'Day 3: Equipment, Law & Regulation and Design - In class' highlighted. The main content area shows a list of activities for Day 3.1.4 and Day 3.1.5. Each activity includes a play button icon and a PDF icon with a 'WITH NOTES' label.

- Read Presentation PLANET Solar PV Day 3.1.4, slides 16 to 19
- Watch the video on Shading effects and diodes
- Read Presentation PLANET Solar PV Day 3.1.5, slides 20 to 22
- Watch the video on DC circuit

Figura 39

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows a web browser window displaying the PLANET training platform. The browser is Safari, and the address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a list of activities for Day 3, with 'Day 3: Equipment, Law & Regulation and Design - In class' highlighted. The main content area shows a list of activities for Day 3.1.6, slides 23 to 24. The activities include:

- Rad Presentation PLANET Solar PV Day 3.1.6, slides 23 to 24
- Watch the video on Surge protection

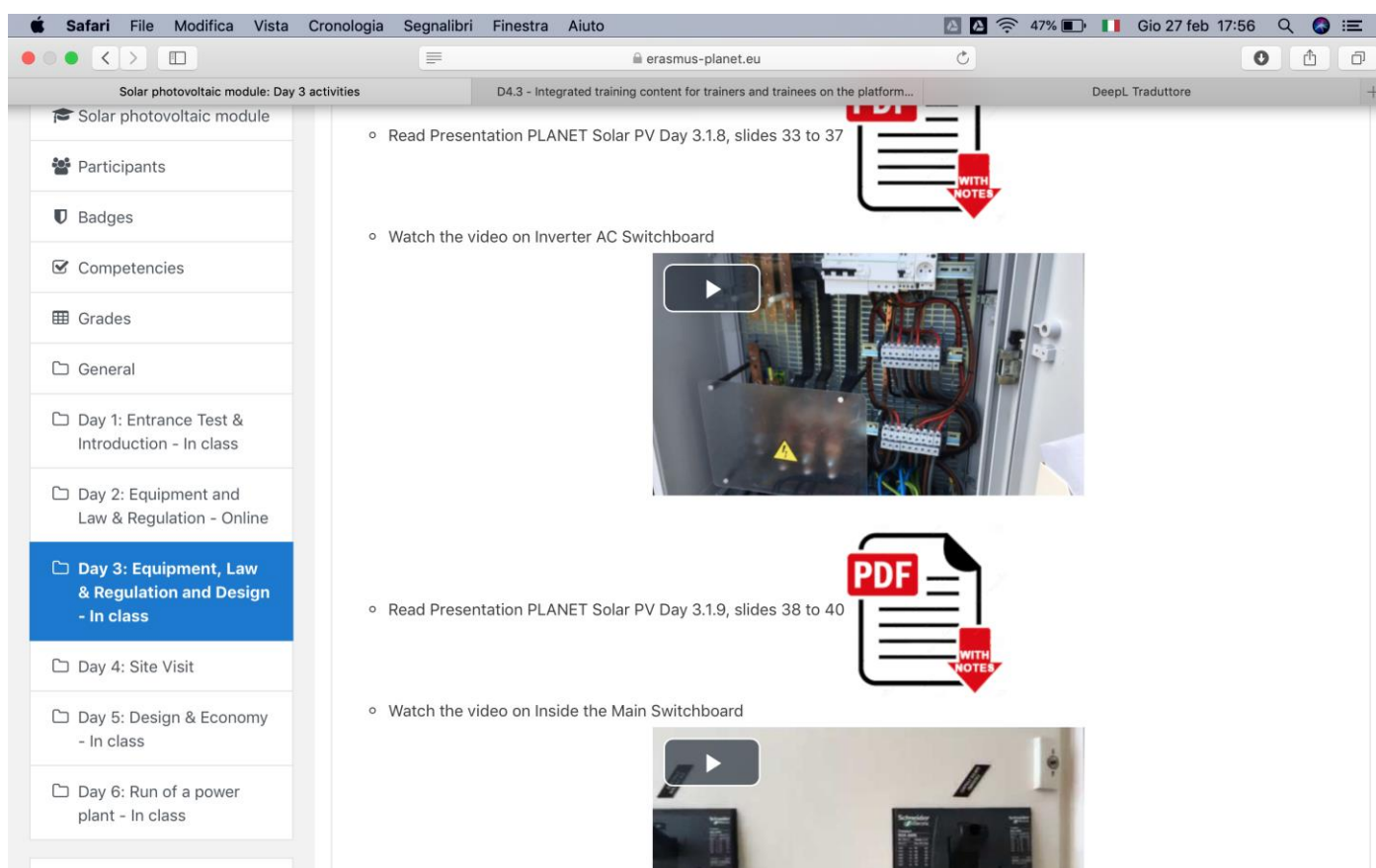
The video thumbnail shows a solar panel system with a surge protector and a data monitoring unit. The text 'PARAFoudre POUR LIAISON DATA MONITORING' is visible. Below the video, there is a PDF icon and a 'WITH NOTES' button. The activities continue with:

- Read Presentation PLANET Solar PV Day 3.1.7, slides 25 to 32
- Watch the video on Inverter

The video thumbnail shows a solar inverter mounted on a wall.

Figura 40

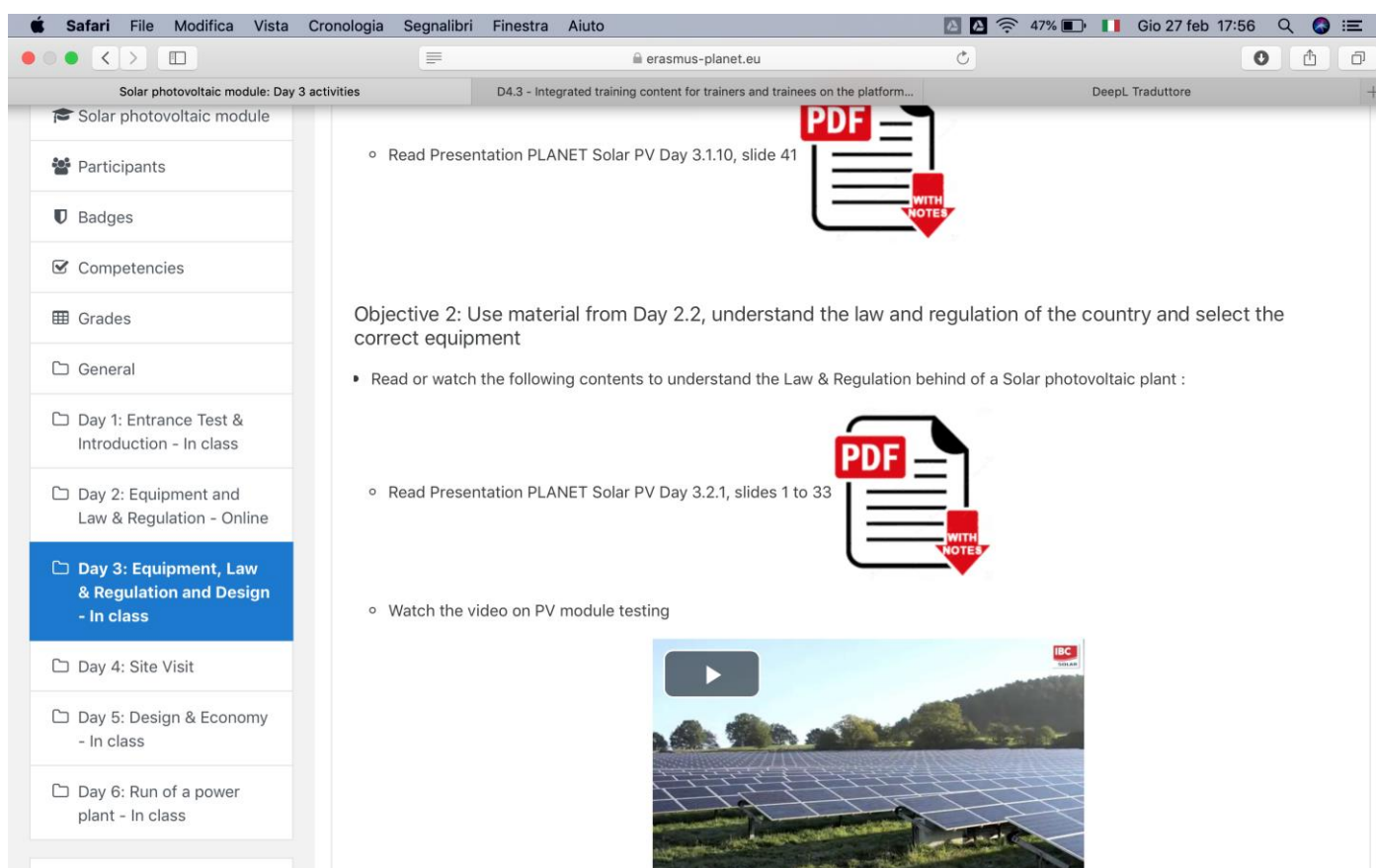
PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows a web browser window displaying the PLANET Solar photovoltaic module training interface. The browser is Safari, and the address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a list of activities, with 'Day 3: Equipment, Law & Regulation and Design - In class' highlighted in blue. The main content area displays a list of activities for Day 3, including reading presentations and watching videos. The first activity is 'Read Presentation PLANET Solar PV Day 3.1.8, slides 33 to 37', followed by 'Watch the video on Inverter AC Switchboard'. The video thumbnail shows a close-up of an inverter AC switchboard with various wires and components. The second activity is 'Read Presentation PLANET Solar PV Day 3.1.9, slides 38 to 40', followed by 'Watch the video on Inside the Main Switchboard'. The video thumbnail shows a close-up of a main switchboard with various wires and components. The interface also includes a 'DeepL Traduttore' button in the top right corner.

Figura 41

PLANET – Plan for Agriculture reNewable Energy Training



Safari File Modifica Vista Cronologia Segnalibri Finestra Aiuto 47% Gio 27 feb 17:56 erasmus-planet.eu

Solar photovoltaic module: Day 3 activities D4.3 - Integrated training content for trainers and trainees on the platform... DeepL Traduttore

Solar photovoltaic module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class**
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Read Presentation PLANET Solar PV Day 3.1.10, slide 41

Objective 2: Use material from Day 2.2, understand the law and regulation of the country and select the correct equipment

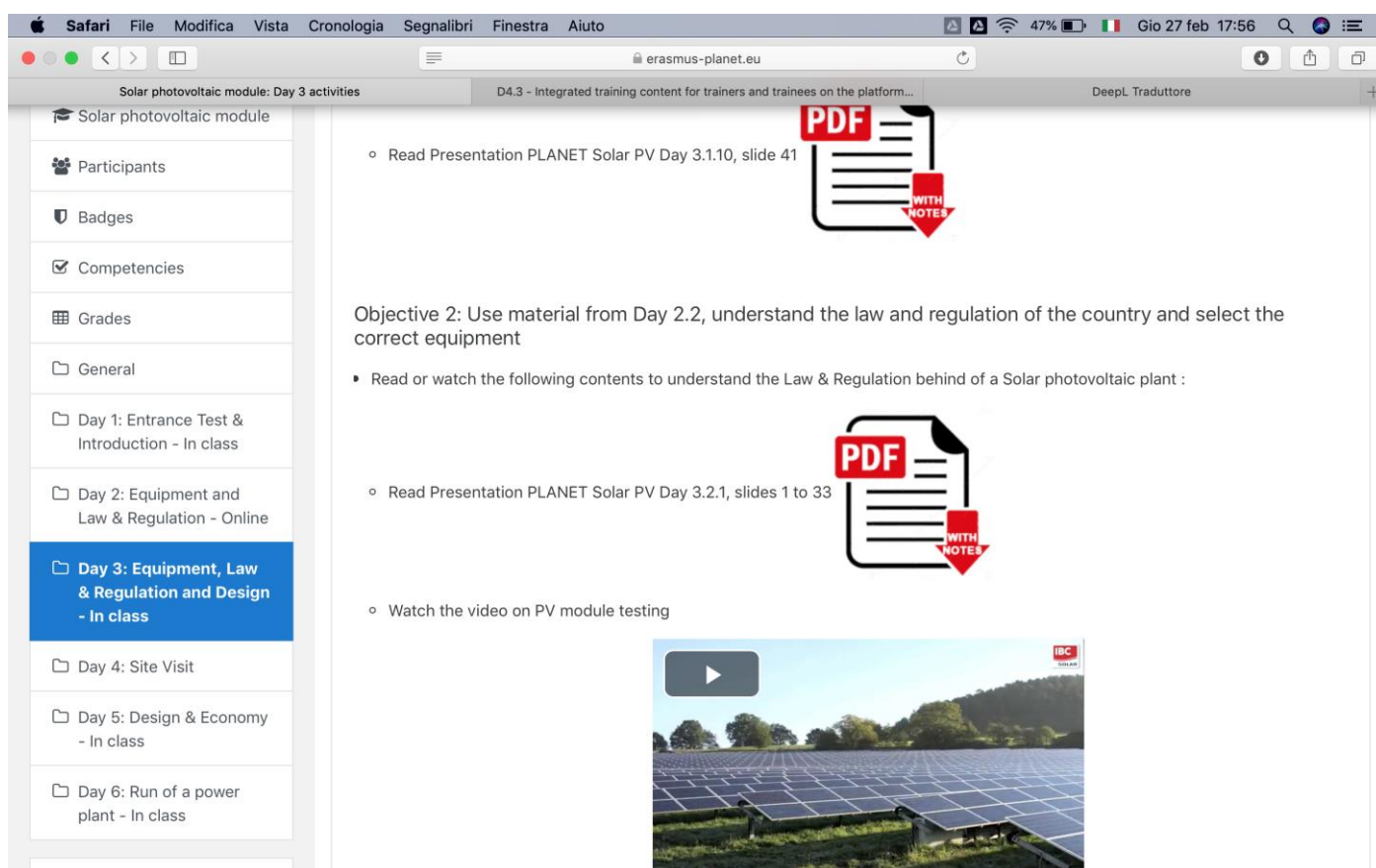
- Read or watch the following contents to understand the Law & Regulation behind of a Solar photovoltaic plant :

Read Presentation PLANET Solar PV Day 3.2.1, slides 1 to 33

Watch the video on PV module testing

Figura 42

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows a web browser window displaying the PLANET training platform. The browser is Safari, and the address bar shows 'erasmus-planet.eu'. The page title is 'Solar photovoltaic module: Day 3 activities'. The left sidebar contains a navigation menu with the following items: Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class, Day 2: Equipment and Law & Regulation - Online, **Day 3: Equipment, Law & Regulation and Design - In class**, Day 4: Site Visit, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class. The main content area is titled 'D4.3 - Integrated training content for trainers and trainees on the platform...'. It contains a list of activities for Day 3:



- Read Presentation PLANET Solar PV Day 3.1.10, slide 41
- Objective 2: Use material from Day 2.2, understand the law and regulation of the country and select the correct equipment
- Read or watch the following contents to understand the Law & Regulation behind of a Solar photovoltaic plant :
 - Read Presentation PLANET Solar PV Day 3.2.1, slides 1 to 33
 - Watch the video on PV module testing




There are two PDF icons with 'WITH NOTES' labels and a video player showing a solar panel array in a field.

Figura 43

PLANET – Plan for Agriculture reNewable Energy Training

FOUR:



PLANET Training Course for trainees
English (en)



Giulia Botta


Solar photovoltaic module

Participants

Badges

Competencies

Grades

General

Day 1: Entrance Test & Introduction - In class

Day 2: Equipment and Law & Regulation - Online

Day 3: Equipment, Law & Regulation and Design - In class

Day 4: Site Visit

Day 5: Design & Economy - In class

Day 6: Run of a power plant - In class

SOLAR PV Course - Day 4: Site Visit

Aim of the module

To enable the trainees to understand how to run a solar photovoltaic power plant

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Recognize the Equipment and Implementation
2. Check the sizing of the power plant
3. Identify the operating problems and solutions during the run of the power plant

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Recognize the Equipment and Implementation

- Read the following contents to recognize the equipment and implementation:
 - Print and read Presentation PLANET Solar PV Day 4.1
 - Fill in the questionnaire









Figura 44

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Solar photovoltaic module

Participants

Badges

Competencies

Grades

General

Day 1: Entrance Test & Introduction - In class

Day 2: Equipment and Law & Regulation - Online

Day 3: Equipment, Law & Regulation and Design - In class

Day 4: Site Visit



Day 5: Design & Economy - In class

Day 6: Run of a power plant - In class

- Fill in the questionnaire
- Discuss the assessment results with the other trainees and the trainer.

Objective 2: Check the sizing of the power plant



- Read the following contents to check the sizing of the power plant:
 - Print and read Presentation PLANET Solar PV Day 4.2

- Fill in the questionnaire
- Discuss the assessment results with the other trainees and the trainer.

Objective 3: Identify the operating problems and solutions during the run of the power plant

- Read or watch the following contents to identify the operating problems and solutions during the run of the power plant:
 - Print and read Presentation PLANET Solar PV Day 4.3

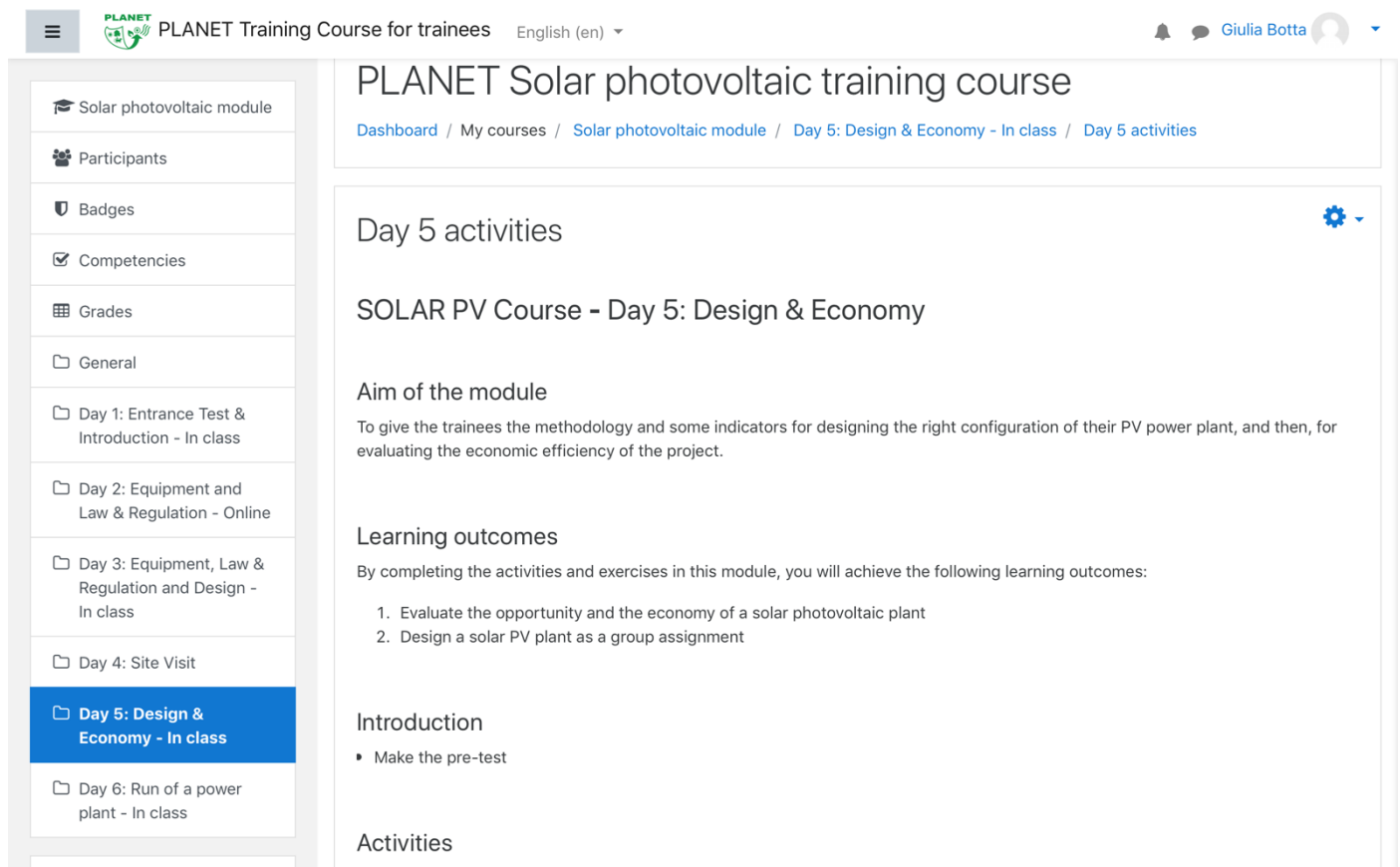
- Fill in the questionnaire
- Discuss the assessment results with the other trainees and the trainer.

Last modified: Thursday, 21 November 2019, 4:25 PM

Figura 45

PLANET – Plan for Agriculture reNewable Energy Training



FIVE:



The screenshot displays the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title 'PLANET Training Course for trainees', the language 'English (en)', and a user profile 'Giulia Botta'. The left sidebar lists various modules and activities, with 'Day 5: Design & Economy - In class' selected. The main content area shows the 'PLANET Solar photovoltaic training course' and 'Day 5 activities'. The 'SOLAR PV Course - Day 5: Design & Economy' section includes the 'Aim of the module' (to give trainees methodology and indicators for designing a PV power plant), 'Learning outcomes' (evaluating opportunity/economy and designing a PV plant), 'Introduction' (make the pre-test), and 'Activities'.



Figura 46

PLANET – Plan for Agriculture reNewable Energy Training





PLANET Training Course for trainees

English (en) ▼

Giulia Botta



Solar photovoltaic module

Participants

Badges

Competencies

Grades

General

Day 1: Entrance Test & Introduction - In class

Day 2: Equipment and Law & Regulation - Online

Day 3: Equipment, Law & Regulation and Design - In class

Day 4: Site Visit



Day 5: Design & Economy - In class

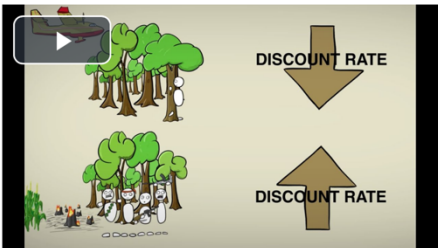
Day 6: Run of a power plant - In class

order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Evaluate the opportunity and the economy of a solar photovoltaic plant

- Read or watch the following documents to evaluate the opportunity and the economy of a solar photovoltaic plant:
 - Read Presentation PLANET Solar PV Day 5.1.1



 - Watch the video on Discounting


 - Read Presentation PLANET Solar PV Day 5.1.2










 - Watch the video on Net Present Value until minute 3:32

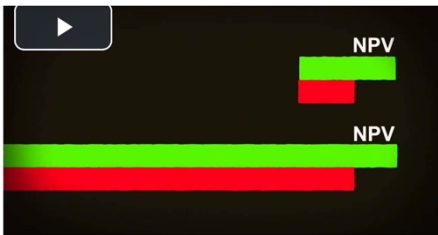
Figura 47

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class**
- Day 6: Run of a power plant - In class



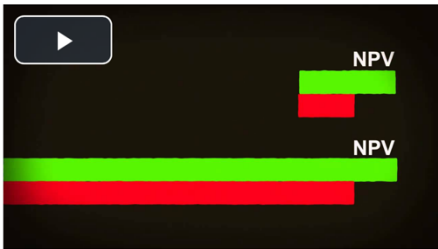
NPV

NPV

PDF

WITH NOTES

- Read Presentation PLANET Solar PV Day 5.1.3
- Watch the video on Internal Rate of Return



NPV



NPV




PDF

- Read Presentation PLANET Solar PV Day 5.1.4

Figura 48

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class**
- Day 6: Run of a power plant - In class

Objective 2: Design a solar PV plant as a group assignment












- Read the following documents to Design a solar PV plant as a group:
 - Read Presentation PLANET Solar PV Day 5.2.1

 - Start working on the assignment in groups

 - Show first hints to the trainees for the group assignment

 - Read Presentation PLANET Solar PV Day 5.2.2

 - Continue to work on the assignment in groups
 - Show the solution to the trainees

 - Read Presentation PLANET Solar PV Day 5.2.3


Figura 49

PLANET – Plan for Agriculture reNewable Energy Training

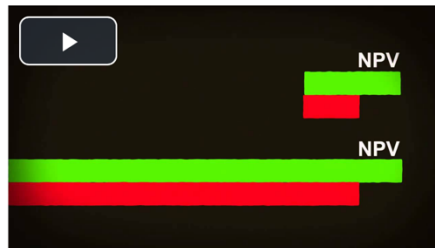


PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class**
- Day 6: Run of a power plant - In class

Additional materials

- Read the following documents to understand deeper:
 - Watch the video on Net Present Value until end

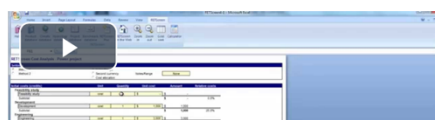


A video thumbnail showing two horizontal bars, one green and one red, with the label 'NPV' next to each. The green bar is longer than the red bar.

- Watch the video on Cost Ratio and Payback

	Project A	Project B
DISCOUNT RATE	16 %	
Benefit Cost Ratio	1.56	1.00
NPV	\$3586	\$0

- Watch RETScreen 4 Tutorial

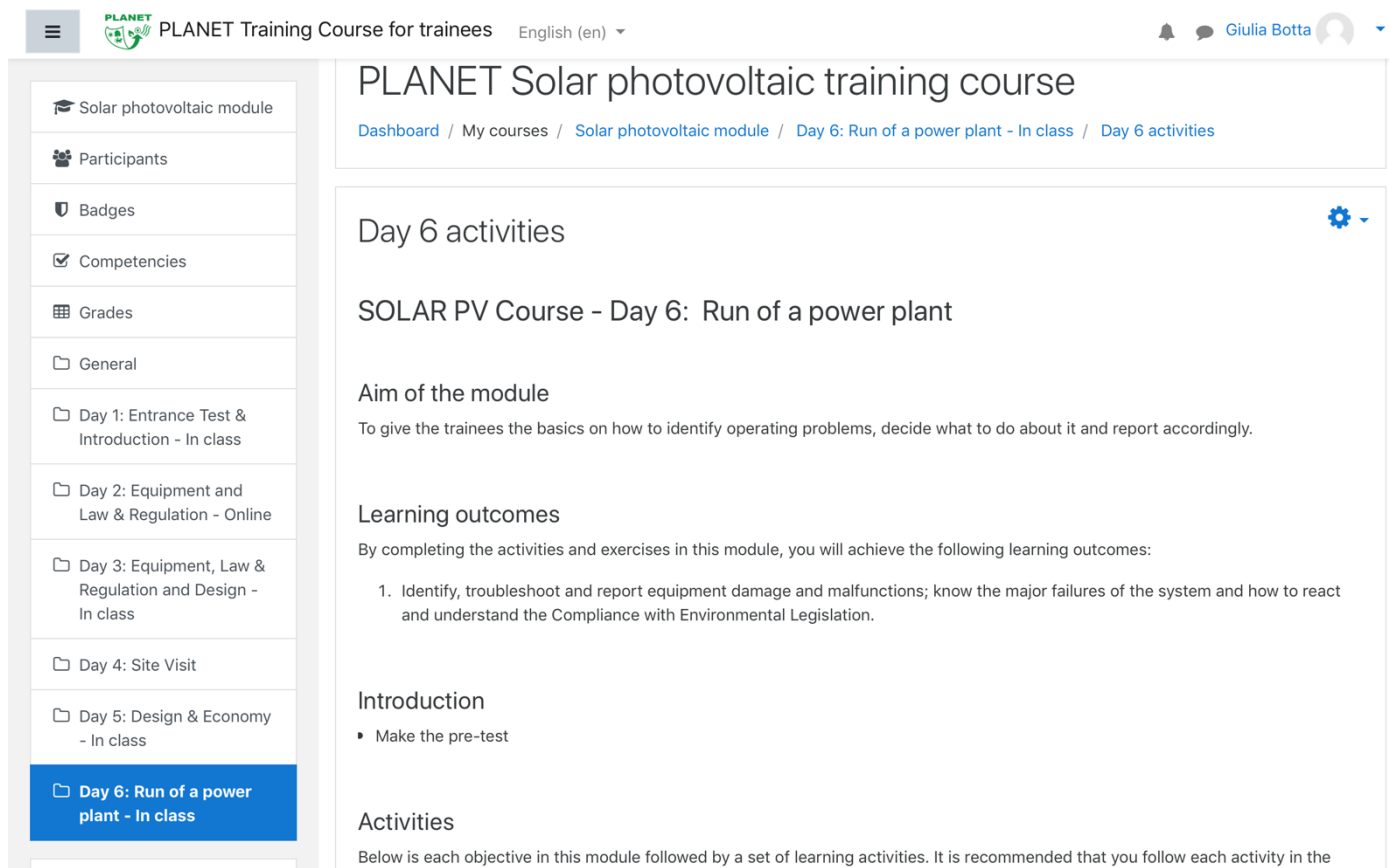


A video thumbnail showing the RETScreen 4 software interface with various data entry fields and a play button overlay.

Figura 50

PLANET – Plan for Agriculture reNewable Energy Training



Six:






The screenshot displays the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title 'PLANET Training Course for trainees', the language 'English (en)', and a user profile for 'Giulia Botta'. The left sidebar lists various modules and sections, with 'Day 6: Run of a power plant - In class' highlighted in blue. The main content area shows the 'PLANET Solar photovoltaic training course' title, a breadcrumb trail, and the 'Day 6 activities' section. The 'SOLAR PV Course - Day 6: Run of a power plant' section includes the 'Aim of the module' (to give trainees basics on identifying operating problems), 'Learning outcomes' (by completing activities, you will achieve the following learning outcomes: 1. Identify, troubleshoot and report equipment damage and malfunctions; know the major failures of the system and how to react and understand the Compliance with Environmental Legislation.), 'Introduction' (Make the pre-test), and 'Activities' (Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the...).

Figura 51

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class**

Objective 1: Identify, troubleshoot and report equipment damage and malfunctions; know the major failures of the system and how to react and understand the Compliance with Environmental Legislation









- Read the following contents to troubleshooting most recurrent operational problems:
 - Read Presentation PLANET Solar PV Day 6.1

- Read or watch the following contents to understand the major failures during the run of a PV power plant:
 - Read Presentation PLANET Solar PV Day 6.2

 - Watch the video on hail testing


Figura 52



PLANET – Plan for Agriculture reNewable Energy Training

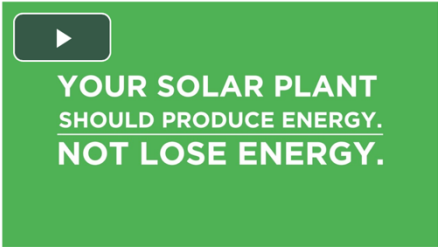


PLANET Training Course for trainees
English (en)





Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class**

- Read Presentation PLANET Solar PV Day 6.3



- Watch the video on PID


- Read Presentation PLANET Solar PV Day 6.4



- Read or watch the following contents to understand the Compliance with Environmental Legislation:
 - Read Presentation PLANET Solar PV Day 6.5









Figura 53




PLANET – Plan for Agriculture reNewable Energy Training

PLANET Training Course for trainees
English (en)



Giulia Botta


- Solar photovoltaic module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2: Equipment and Law & Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Day 4: Site Visit
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class**

- Read Presentation PLANET Solar PV Day 6.5

- Watch the video on recycling

- Read Presentation PLANET Solar PV Day 6.6


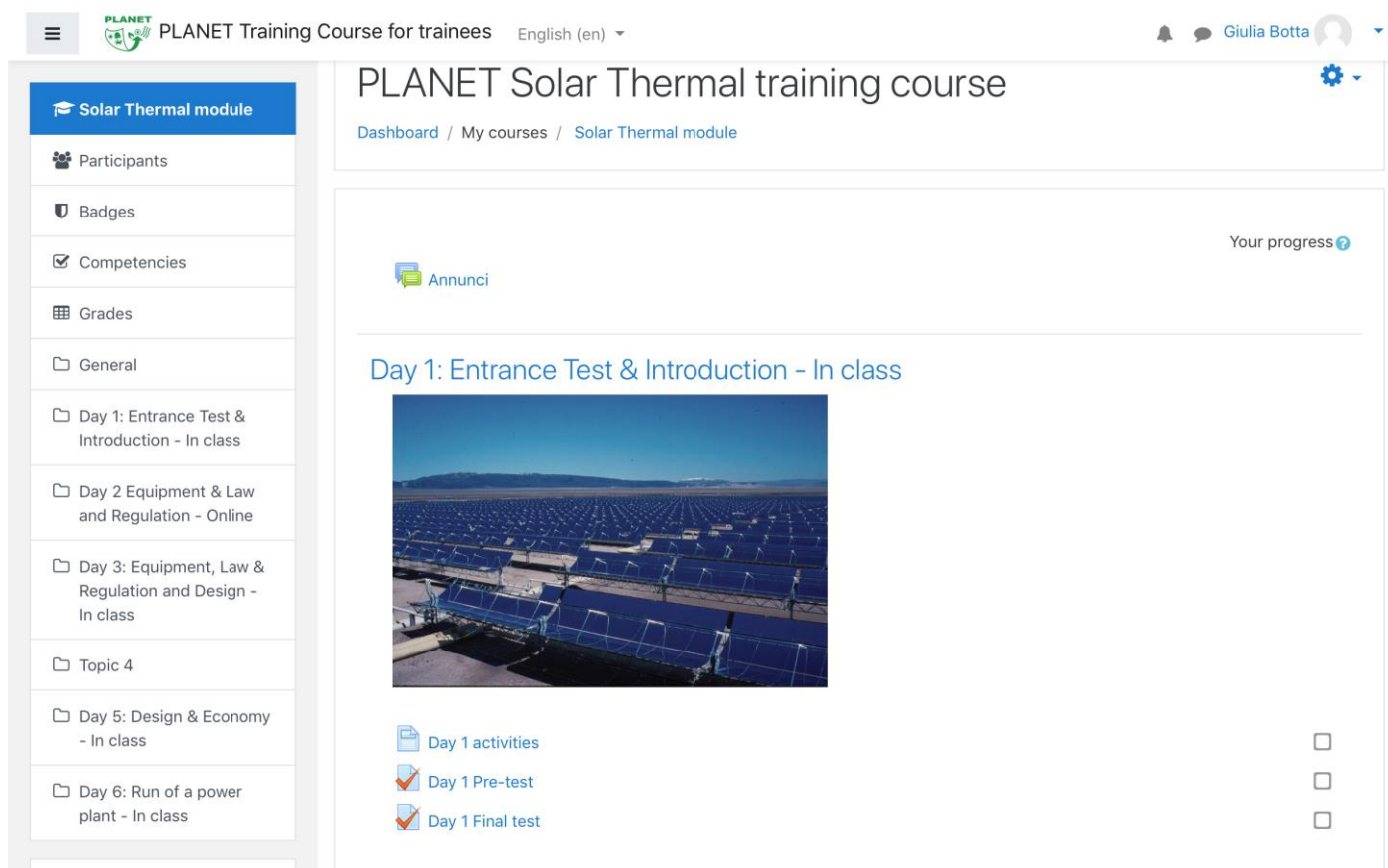
Make the final assignment (click here)

Last modified: Monday, 2 September 2019, 5:38 PM

Figura 54

PLANET – Plan for Agriculture reNewable Energy Training



1.4 PLANET Solar Thermal training course






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course name, the language (English (en)), and the user profile (Giulia Botta). The left sidebar lists the course structure under the 'Solar Thermal module' header, including Participants, Badges, Competencies, Grades, General, and a list of days from Day 1 to Day 6. The main content area displays the course title 'PLANET Solar Thermal training course' and a breadcrumb trail: Dashboard / My courses / Solar Thermal module. Below this, there is a section for 'Annunci' (Announcements) and a progress indicator 'Your progress'. The main content area is titled 'Day 1: Entrance Test & Introduction - In class' and features a large image of a solar thermal power plant. Below the image, there is a list of activities for Day 1: 'Day 1 activities', 'Day 1 Pre-test', and 'Day 1 Final test', each with a checkbox for completion.

Figura 55

PLANET – Plan for Agriculture reNewable Energy Training

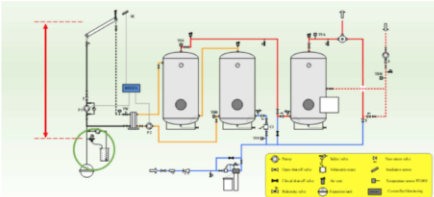


PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

Solar Thermal module

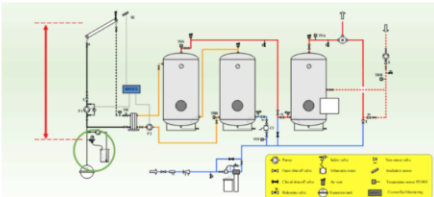
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Day 2 Equipment & Law and Regulation - Online



- Day 2 activities ☐
- Day 2 Pre-test ☐
- Day 2 Final test ☐



Day 3: Equipment, Law & Regulation and Design - In class






- Day 3 Activities ☐

Figura 56

PLANET – Plan for Agriculture reNewable Energy Training

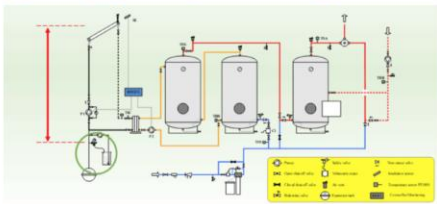


PLANET Training Course for trainees
English (en) ▼



Giulia Botta


Solar Thermal module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Day 3: Equipment, Law & Regulation and Design - In class



- Day 3 Activities ☐
- Day 3 Pre-test ☐
- Day 3 Final test ☐

Topic 4









Figura 57

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta


Solar Thermal module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Topic 4




Day 4 Activities

Day 5: Design & Economy - In class









Figura 58

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

Solar Thermal module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Day 5: Design & Economy - In class



- Day 5 Activities ☐
- Solar TH 5.2 Assignment files ☐
- Solar TH 5.2 Assignment Solution files ☐
- Day 5 Pre-test ☐
- Day 5 Final test ☐

Day 6: Run of a power plant - In class


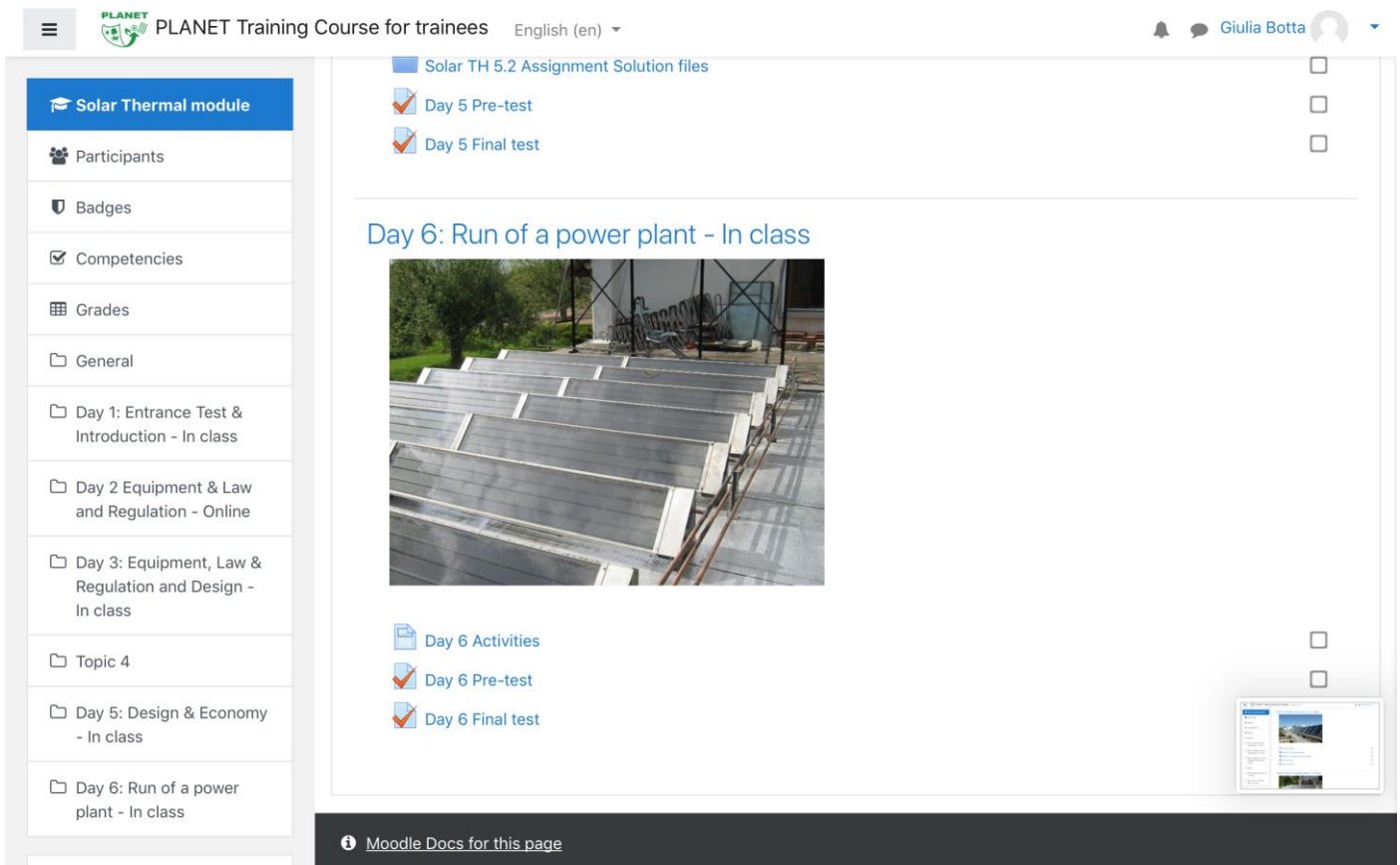


Figura 59

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees English (en) ▾

Giulia Botta

Solar Thermal module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

Solar TH 5.2 Assignment Solution files

Day 5 Pre-test

Day 5 Final test

Day 6: Run of a power plant - In class

Day 6 Activities

Day 6 Pre-test

Day 6 Final test

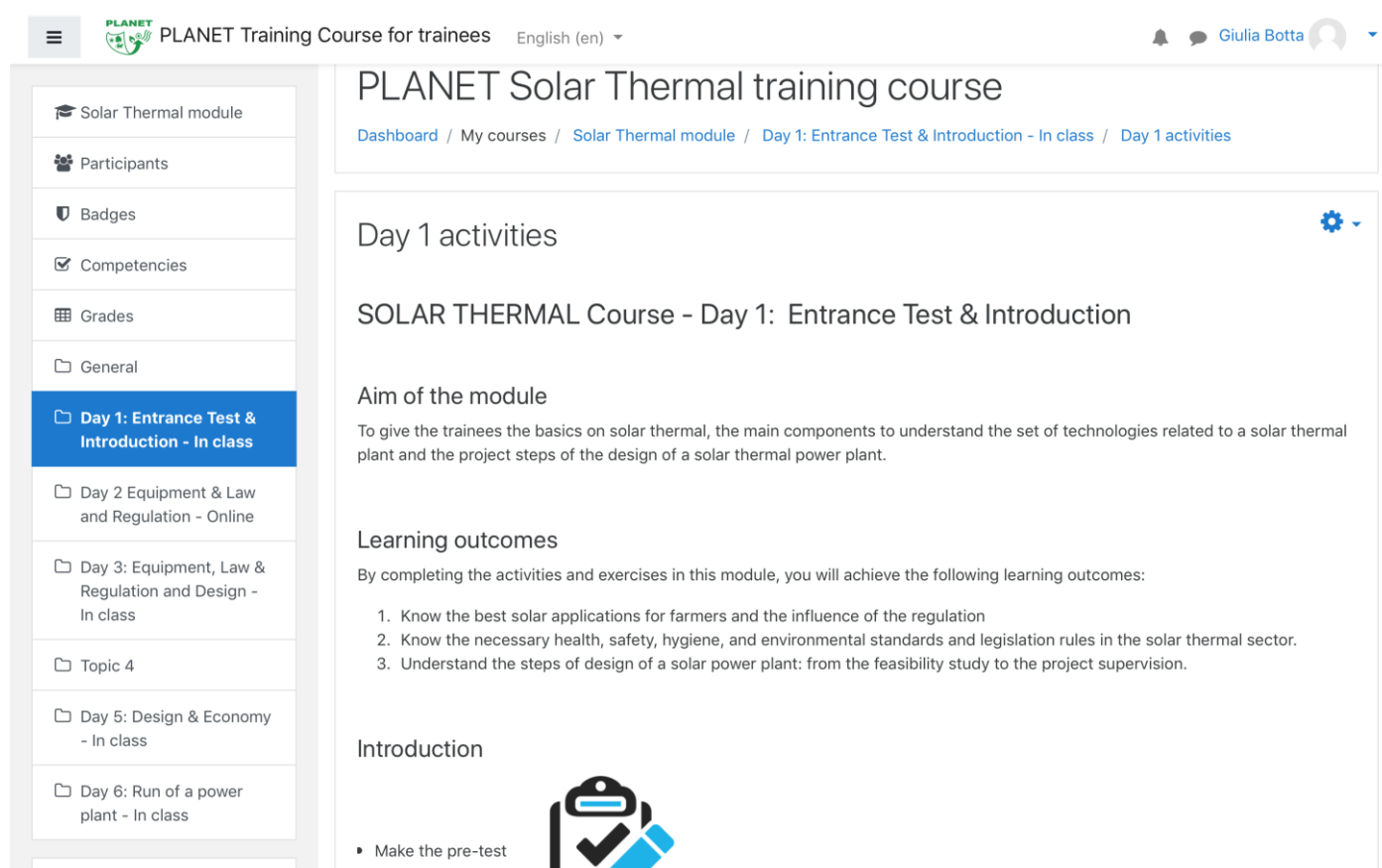
[Moodle Docs for this page](#)

Figura 60

PLANET – Plan for Agriculture reNewable Energy Training

DAYS ACTIVITIES:

ONE:








The screenshot shows the PLANET Training Course interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile "Giulia Botta". The left sidebar contains a menu with items: Solar Thermal module, Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class (highlighted), Day 2 Equipment & Law and Regulation - Online, Day 3: Equipment, Law & Regulation and Design - In class, Topic 4, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class.

The main content area is titled "PLANET Solar Thermal training course" and includes a breadcrumb trail: Dashboard / My courses / Solar Thermal module / Day 1: Entrance Test & Introduction - In class / Day 1 activities. The section "Day 1 activities" is displayed, featuring a gear icon for settings. Below this, the title "SOLAR THERMAL Course - Day 1: Entrance Test & Introduction" is shown. The "Aim of the module" section states: "To give the trainees the basics on solar thermal, the main components to understand the set of technologies related to a solar thermal plant and the project steps of the design of a solar thermal power plant." The "Learning outcomes" section lists three outcomes: 1. Know the best solar applications for farmers and the influence of the regulation; 2. Know the necessary health, safety, hygiene, and environmental standards and legislation rules in the solar thermal sector; 3. Understand the steps of design of a solar power plant: from the feasibility study to the project supervision. The "Introduction" section includes a bullet point: "Make the pre-test", accompanied by an icon of a clipboard with a checkmark.

Figura 61

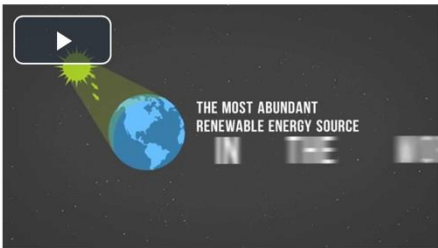
PLANET – Plan for Agriculture reNewable Energy Training

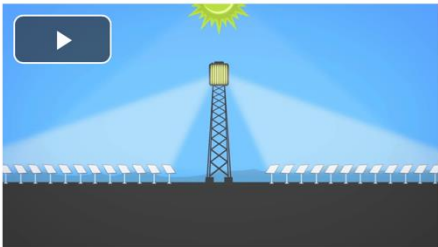


PLANET Training Course for trainees
English (en)



Giulia Botta


- Solar Thermal module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Watch the video on Solar


- Watch the video on Solar Thermal till minute 1:24


- Read Presentation PLANET Solar TH Day 1.0 Intro



Activities



Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Know the best solar applications for farmers and the influence of the regulation

Figura 62




PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta

- Solar Thermal module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class



Objective 1: Know the best solar applications for farmers and the influence of the regulation




- Read or watch the following contents to understand the best solar applications for farmers:
 - Read Presentation PLANET Solar TH Day 1.1.1, slides 1 to 8

 - Watch the video on "From Sun To Electricity"

 - Read Presentation PLANET Solar TH Day 1.1.2, slides 9 to 12


Objective 2: Understand the necessary health, safety, hygiene, and environmental standards and legislation rules in the solar thermal sector

Figura 63

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼



- Solar Thermal module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class



Objective 2: Understand the necessary health, safety, hygiene, and environmental standards and legislation rules in the solar thermal sector

- Read or watch the following contents to understand the different solar applications: individual plants, collective plants, heating, and cooling applications :
- Read Presentation PLANET Solar TH Day 1.2.1
 - Watch the video on Single family domestic hot water system till minute 2:32
- Read Presentation PLANET Solar TH Day 1.2.2
 - Watch the video on Solar District Heating

Figura 64


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta

- Solar Thermal module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Watch the video on Solar District Heating


- Read Presentation of Solar District Heating (SDH) European project <https://www.solar-district-heating.eu/en/benefits/>
- Read Presentation PLANET Solar TH Day 1.2.3


- Read or watch the following contents to understand the Health and safety precautions: security equipment impact on troubleshooting :


- Read Presentation PLANET Solar TH Day 1.2.4
- Watch the video on PPE until minute 4:24









Figura 65


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta



- Solar Thermal module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Entrance Test & Introduction - In class**
- Day 2 Equipment & Law and Regulation - Online
- Day 3: Equipment, Law & Regulation and Design - In class
- Topic 4
- Day 5: Design & Economy - In class
- Day 6: Run of a power plant - In class

- Read Presentation PLANET Solar TH Day 1.2.5




- Read or watch the following contents to understand the role of major components of a solar plant and the implementation rules :

- Read Presentation PLANET Solar TH Day 1.2.6



Objective 3: Understand the steps of design of a solar power plant: from the feasibility study to the project supervision

- Read the following documents to understand the project step for a solar thermal plant:
 - Presentation of the role of each actor involved on a solar power plant project "PLANET Solar TH Day 1.3.1 Project Steps"



- Presentation of the steps of design of a solar power plant: from the feasibility study to the project supervision "PLANET Solar TH Day 1.3.2 Project Steps"


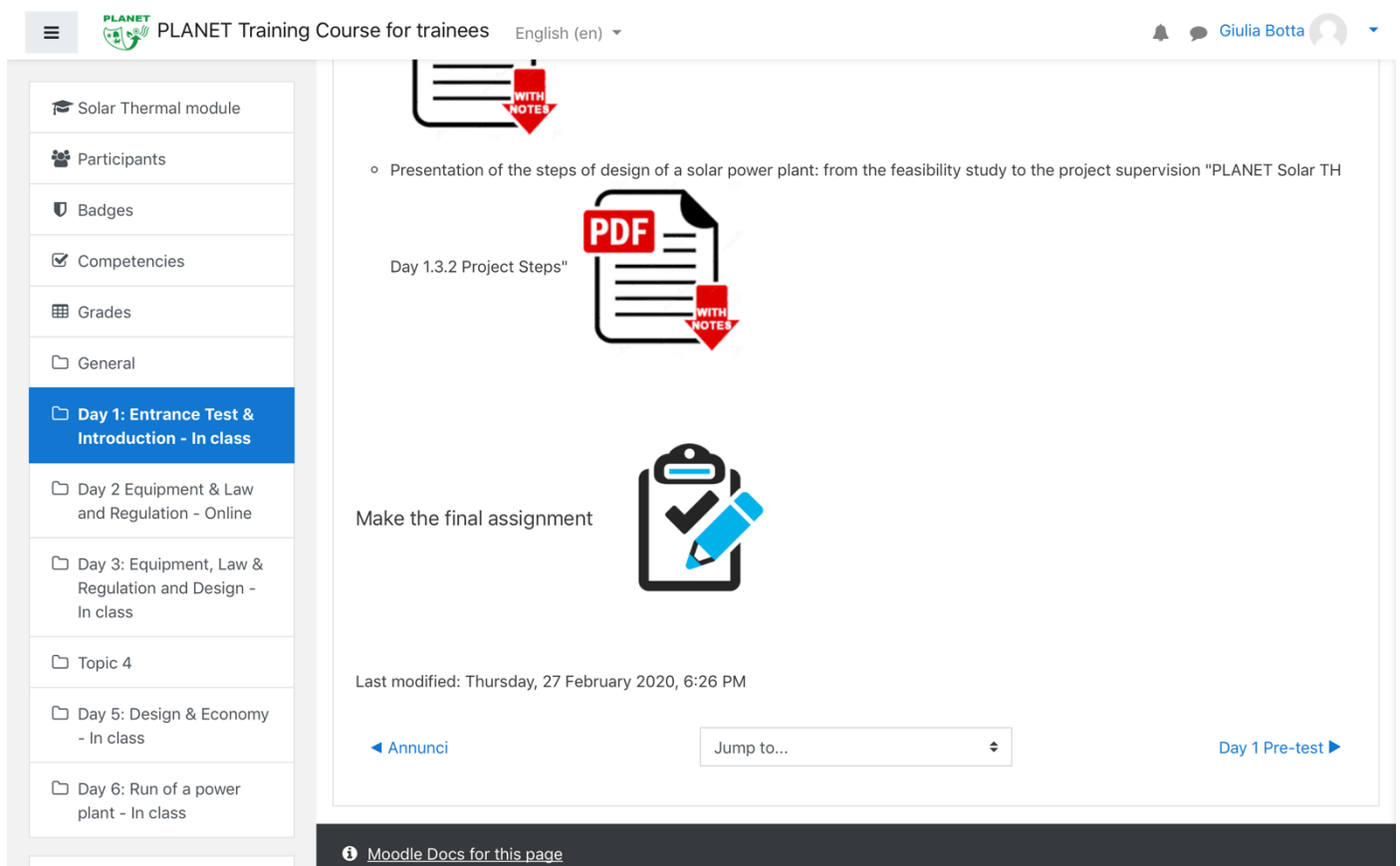


Figura 66

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the Moodle interface for the PLANET Training Course for trainees. The course is in English (en). The left sidebar contains a list of course sections: Solar Thermal module, Participants, Badges, Competencies, Grades, General, Day 1: Entrance Test & Introduction - In class (highlighted), Day 2 Equipment & Law and Regulation - Online, Day 3: Equipment, Law & Regulation and Design - In class, Topic 4, Day 5: Design & Economy - In class, and Day 6: Run of a power plant - In class.

The main content area displays the following information:



- A presentation of the steps of design of a solar power plant: from the feasibility study to the project supervision "PLANET Solar TH".
- A PDF icon labeled "Day 1.3.2 Project Steps" with a red arrow pointing down and the text "WITH NOTES".
- A clipboard icon labeled "Make the final assignment".
- Last modified: Thursday, 27 February 2020, 6:26 PM.
- Navigation links: < Annunci, Jump to..., and Day 1 Pre-test >.




At the bottom, there is a link to Moodle Docs for this page.

Figura 67

PLANET – Plan for Agriculture reNewable Energy Training

TWO:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET Solar Thermal training course

[Dashboard](#) /
[My courses](#) /
[Solar Thermal module](#) /
[Day 2 Equipment & Law and Regulation - Online](#) /
[Day 2 activities](#)

Day 2 activities

SOLAR THERMAL Course - Day 2: Equipment and Law & Regulation

Aim of the module

To give the trainees the basics on the Equipment of a Solar thermal plant, the implementation rules as well as the Laws and Regulation that compose the legal framework of these RES plants.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Know the Equipment and Implementation of a Solar thermal plant
2. Know the Law & Regulation behind of a Solar thermal plant

Introduction

- Make the pre-test









Figura 68

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Know the Equipment and Implementation of a Solar thermal plant




- Read or watch the following contents to understand the Equipment:
 - Read Presentation PLANET Solar TH Day 2.1.1, slides 1 to 7
 
 - Watch the video on GREENoneTEC company presentation
 
 - Read Presentation PLANET Solar TH Day 2.1.2, slides 8 to 19
 

Figura 69

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Watch the video on drainback systems


- Read Presentation PLANET Solar TH Day 2.1.3, slides 20 to 27





- Watch the video on Solar Collectors Overview









Figura 70

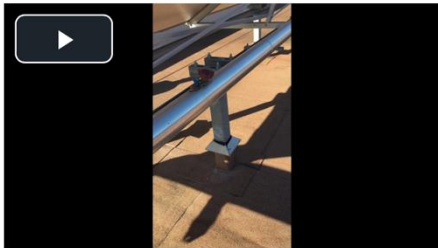
PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Read Presentation PLANET Solar TH Day 2.1.4, slides 28 to 30


- Watch the video Solar Collector Support


- Read Presentation PLANET Solar TH Day 2.1.5, slides 31 to 32


- Watch the video on Pump and Pressure Controller










Figura 71

PLANET – Plan for Agriculture reNewable Energy Training

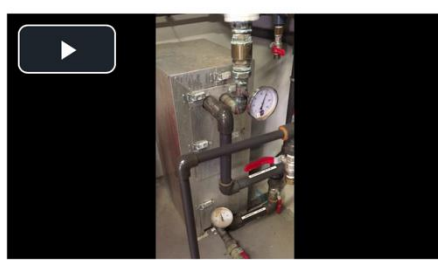


PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼


- Read Presentation PLANET Solar TH Day 2.1.6, slides 33 to 35



- Watch the video on Heat Exchanger



- Read Presentation PLANET Solar TH Day 2.1.7, slides 36 to 40



- Watch the video on Safety Valve

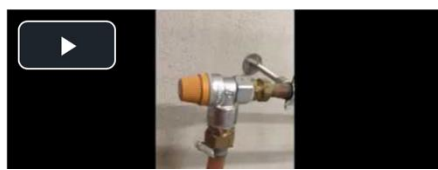







Figura 72


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta

- Read Presentation PLANET Solar TH Day 2.1.8, slides 41 to 45


- Watch the video on Expansion Tank


- Read Presentation PLANET Solar TH Day 2.1.9, slides 46 to 51


- Watch the video on Storage Tanks and Primary Solar Circuit










Figura 73

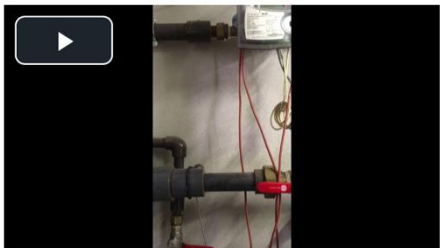
PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




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- Read Presentation PLANET Solar TH Day 2.1.10, slides 52 to 54
- Watch the video on Energy Meter





- Read Presentation PLANET Solar TH Day 2.1.11, slides 55 to 58
- Watch the video on Electric Switchboard













Figura 74

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta




- Read Presentation PLANET Solar TH Day 2.1.12, slides 59 to 63

Objective 2: Know the Law & Regulation behind of a Solar thermal plant

- Read or watch the following contents to understand the different solar applications: individual plants, collective plants, heating, and cooling applications :

- Read Presentation PLANET Solar TH Day 2.2.1, slides 1 to 14

- Watch video on Solar Keymark

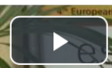
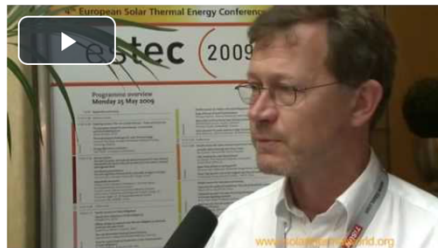









Figura 75


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

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- Read Presentation PLANET Solar TH Day 2.2.2, slides 15 to 20


- Watch the video on What is Legionella


- Read Presentation PLANET Solar TH Day 2.2.3, slides 21 to 22


- Watch the video on Dead legs until minute 11:27





Figura 76

PLANET – Plan for Agriculture reNewable Energy Training

 PLANET Training Course for trainees English (en) 

 Giulia Botta  



- Read Presentation PLANET Solar TH Day 2.2.4, slides 23 to 32





Make the final assignment






Figura 77

PLANET – Plan for Agriculture reNewable Energy Training

THREE:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET Solar Thermal training course

[Dashboard](#) /
[My courses](#) /
[Solar Thermal module](#) /
[Day 3: Equipment, Law & Regulation and Design - In class](#) /
[Day 3 Activities](#)

Day 3 Activities

SOLAR TH Course - Day 3: Equipment, Law & Regulation and Design

Aim of the module

To check if the content of the online material of Day 2 was understood correctly, to answer to the trainee's questions about them and to give the trainees some indicators for evaluating the best configuration of their Solar Thermal power plant, and then, for choosing the best valorisation scheme

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Check with Day 2 "Equipment" is understood
2. Check with Day 2 "Law & Regulation" is understood
3. Pre-sizing a solar thermal plant and choosing the optimal valorisation scheme

Introduction

- Make the pre-test









Figura 78

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼




Giulia Botta

▼

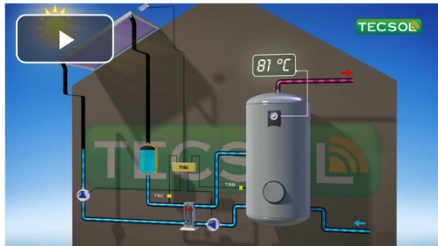
Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Use material from Day 2.1, understand the layout of the system and select the correct equipment

- Read the following contents to understand the layout of the system and select the correct equipment:
 - Read Presentation PLANET Solar TH Day 3.1.1 slides 1 to 18


 - Watch the video on Drainback Solar Thermal system


 - Read Presentation PLANET Solar TH Day 3.1.2 slides 19 to 21









Figura 79


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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Objective 2: Use material from Day 2.2, understand the law and regulation of the country and select the correct equipment


- Read the following contents to understand the law and regulation of the country:
 - Read Presentation PLANET Solar TH Day 3.2. slides 1 to 21



Objective 3: Pre-size a solar thermal plant and choosing the optimal valorisation scheme.

- Read the following contents to pre-size a solar thermal plant and choose the optimal valorisation scheme:
 - Read Presentation PLANET Solar TH Day 3.3 slides 1 to 17








Make the final assignment

Figura 80

PLANET – PLaN for Agriculture reNewable Energy Training

FOUR:



 PLANET Training Course for trainees
 English (en) ▾
🔔
💬
Giulia Botta


PLANET Solar Thermal training course

[Dashboard](#) / [My courses](#) / [Solar Thermal module](#) / [Topic 4](#) / [Day 4 Activities](#)

Day 4 Activities

SOLAR TH Course - Day 4: Site Visit

Aim of the module

To enable the trainees to understand how to run a solar thermal power plant

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Recognize the Equipment and Implementation
2. Check the sizing of the power plant
3. Identify the operating problems and solutions during the run of the power plant



Activities




Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Recognize the Equipment and Implementation


Figura 81

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



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Objective 1: Recognize the Equipment and Implementation

- Read the following contents to recognize the equipment and implementation:
 - Print and read Presentation PLANET Solar TH Day 4.1

 - Fill in the questionnaire
 - Discuss the assessment results with the other trainees and the trainer.

Objective 2: Check the sizing of the power plant

- Read the following contents to check the sizing of the power plant:
 - Print and read Presentation PLANET Solar TH Day 4.2

 - Fill in the questionnaire
 - Discuss the assessment results with the other trainees and the trainer.

Objective 3: Identify the operating problems and solutions during the run of the power plant







- Read the following contents to pre-size a solar thermal plant and choose the optimal valorisation scheme:



Figura 82

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



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Objective 2: Check the sizing of the power plant

- Read the following contents to check the sizing of the power plant:
 - Print and read Presentation PLANET Solar TH Day 4.2
 
 - Fill in the questionnaire
 - Discuss the assessment results with the other trainees and the trainer.

Objective 3: Identify the operating problems and solutions during the run of the power plant

- Read the following contents to pre-size a solar thermal plant and choose the optimal valorisation scheme:
 - Print and read Presentation PLANET Solar TH Day 4.3
 
 - Fill in the questionnaire
 - Discuss the assessment results with the other trainees and the trainer.

Last modified: Thursday, 21 November 2019, 4:18 PM

[◀ Day 3 Final test](#)

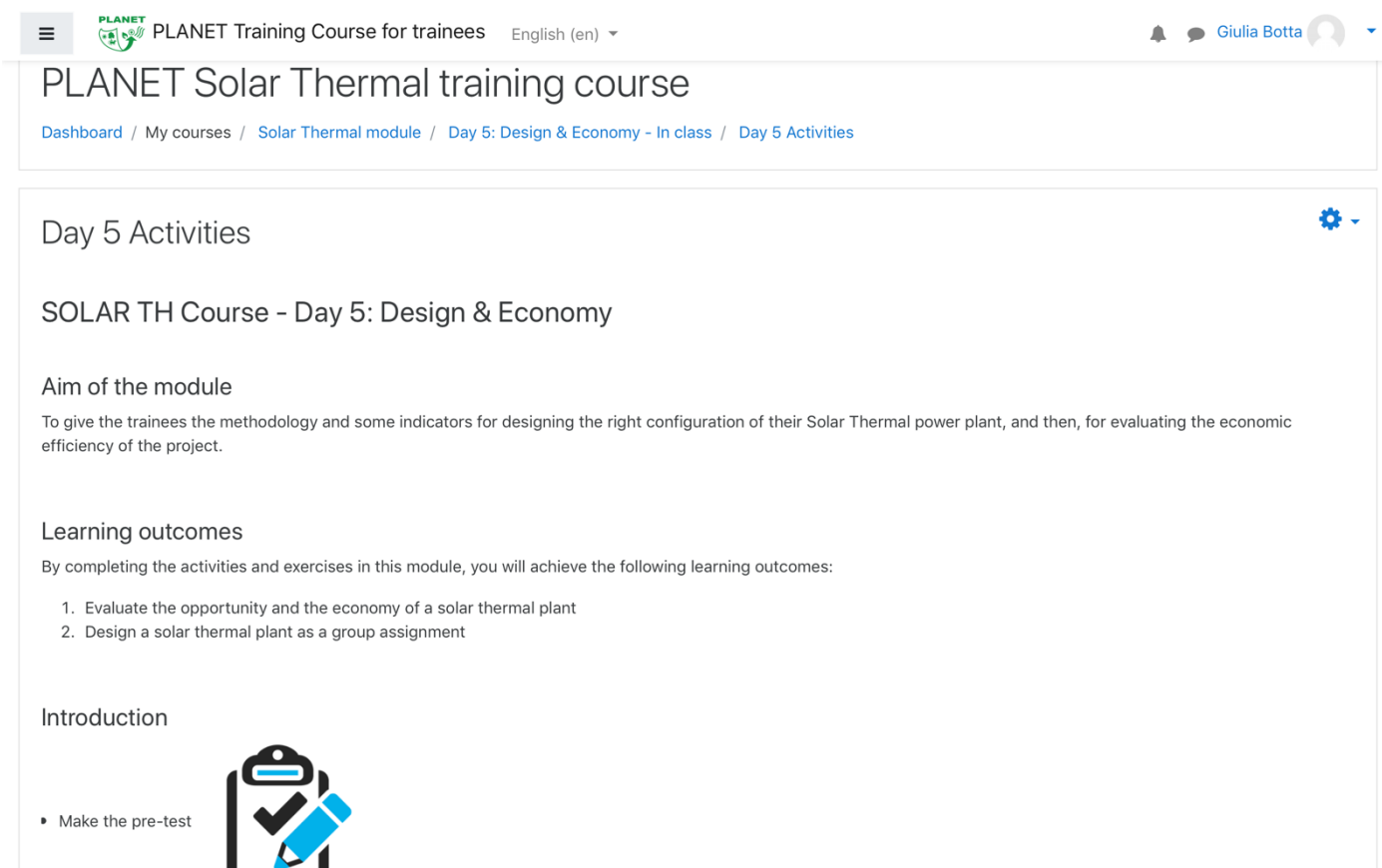
Jump to... ▼

[Day 5 Activities ▶](#)

Figura 83

PLANET – Plan for Agriculture reNewable Energy Training



FIVE:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes a hamburger menu, the PLANET logo, the course title 'PLANET Training Course for trainees', the language 'English (en)', and a user profile for 'Giulia Botta'. The main content area is titled 'PLANET Solar Thermal training course' and includes a breadcrumb trail: 'Dashboard / My courses / Solar Thermal module / Day 5: Design & Economy - In class / Day 5 Activities'. The 'Day 5 Activities' section is highlighted, showing the title 'SOLAR TH Course - Day 5: Design & Economy'. Below this, the 'Aim of the module' is stated: 'To give the trainees the methodology and some indicators for designing the right configuration of their Solar Thermal power plant, and then, for evaluating the economic efficiency of the project.' The 'Learning outcomes' section lists two outcomes: '1. Evaluate the opportunity and the economy of a solar thermal plant' and '2. Design a solar thermal plant as a group assignment'. The 'Introduction' section includes a bullet point: 'Make the pre-test' and an icon of a clipboard with a pencil.

Figura 84

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta

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Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Evaluate the opportunity and the economy of a solar thermal plant


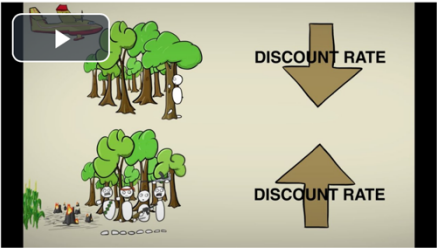





- Read the following contents to evaluate the opportunity and the economy of a solar photovoltaic plant:
 - Read Presentation PLANET Solar TH Day 5.1.1

 - Watch the video on Discounting

 - Read Presentation PLANET Solar TH Day 5.1.2



Figura 85


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Watch the video on Net Present Value until minute 3:32


- Read Presentation PLANET Solar TH Day 5.1.3


- Watch the video on Internal Rate of Return

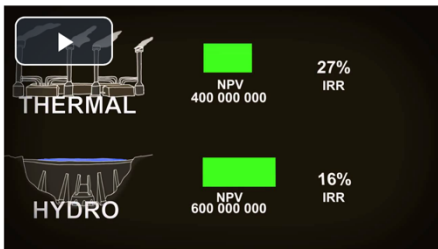








Figura 86


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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- Read Presentation PLANET Solar TH Day 5.1.4


- Watch the video on a real example of Solar Thermal plant until 1:57 <https://youtu.be/bOdim9L-sC8>
- Read Presentation PLANET Solar TH Day 5.1.5



Objective 2: Design a solar thermal plant as a group assignment

- Read or watch the following contents to Design a solar thermal plant as a group assignment:
 - Read Presentation PLANET Solar TH Day 5.2.1








 - Start working on the assignment in groups
 - Show first hints to the trainees for the group assignment



Figura 87



PLANET – Plan for Agriculture reNewable Energy Training





PLANET Training Course for trainees
English (en) ▼



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- Read Presentation PLANET Solar TH Day 5.2.2



- Show other hints to the trainees for the group assignment
- Read Presentation PLANET Solar TH Day 5.2.3



- Continue to work on the assignment in groups
- Show the solution to the trainees
- Read Presentation PLANET Solar TH Day 5.2.4

Additional materials

- Read or watch the following contents to understand deeper :
 - Watch the video on Net Present Value until end







NPV

Figura 88

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼




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- Watch the video on Cost Ratio and Payback

NPV
IRR
Payback
B:C

DISCOUNT RATE **16%**
Project A Project B
Benefit Cost Ratio Benefit Cost Ratio
1.56 **1.00**
NPV NPV
\$3586 **\$0**

- Read about LHV/HHV <https://dairy-cattle.extension.org/what-is-the-difference-between-the-higher-heating-value-hhv-and-lower-heating-value-lhv-of-a-biomass-fuel-and-why-is-the-difference-important/>
- Watch RETScreen 4 Tutorial:



- How to install the software

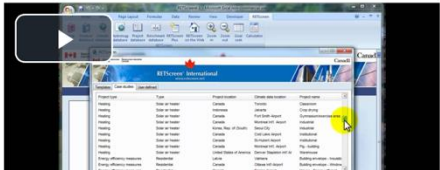







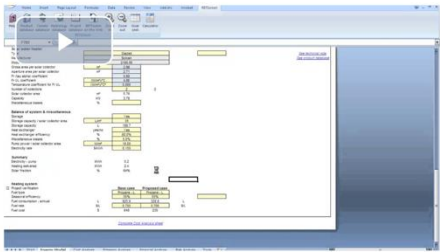
Figura 89

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- – How to start a project
- – Tutorial on Solar Thermal power plant

Make the final assignment









Figura 90

PLANET – PLaN for Agriculture reNewable Energy Training

Six:



PLANET Training Course for trainees
English (en) ▼



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PLANET Solar Thermal training course

[Dashboard](#) /
[My courses](#) /
[Solar Thermal module](#) /
[Day 6: Run of a power plant - In class](#) /
[Day 6 Activities](#)

Day 6 Activities

SOLAR TH Course - Day 6: Run of a power plant

Aim of the module

To give the trainees the basics on how to identify operating problems, decide what to do about it and report accordingly.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Identify, troubleshoot and report equipment damage and malfunctions; know the major failures of the system and how to react and understand the Compliance with Environmental Legislation.

Introduction

- Make the pre-test









Figura 91

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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▼

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Identify, troubleshoot and report equipment damage and malfunctions; know the major failures of the system and how to react and understand the Compliance with Environmental Legislation









- Read the following contents about most recurrent failures during the commissioning phase of a solar thermal power plant :
 - Read Presentation PLANET Solar TH Day 6.1
 
 - Read or watch the following contents to troubleshooting most recurrent operational problems:
 - Read Presentation PLANET Solar TH Day 6.2
 
 - Watch the video on drain back systems
 


Figura 92

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼




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- Read Presentation PLANET Solar TH Day 6.3




- Read or watch the following contents to understand the major failures during the run of a solar thermal plant:

- Read Presentation PLANET Solar PV Day 6.4



- Read the following contents to understand the operations and maintenance phase:

- Read Presentation PLANET Solar PV Day 6.5



- Read the following contents to understand Environmental Issues:

- Read Presentation PLANET Solar PV Day 6.6











Figura 93


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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- Read the following contents to understand the operations and maintenance phase:
 - Read Presentation PLANET Solar PV Day 6.5
 
- Read the following contents to understand Environmental Issues:
 - Read Presentation PLANET Solar PV Day 6.6
 

Make the final assignment





Last modified: Thursday, 27 February 2020, 7:00 PM




Figura 94

PLANET – Plan for Agriculture reNewable Energy Training

PLANET Biomass training course

PLANET Training Course for trainees
English (en)



Giulia Botta


Biomass module


Participants
Badges
Competencies
Grades
General
Day 1: Technic part 1 - In class
Day 2: Technic part 2 - In class
Day 3: Operation management - In class
Day 4: Raw material - In class
Day 5: Design & Economy - Online
Day 6: Law - Online
Day 7: Legal and safety issues - Online

PLANET Biomass training course

Dashboard / My courses / Biomass module

Annunci

Day 1: Technic part 1 - In class



Day 1 activities



Day1 pre-test

Day1 test

Your progress




Figura 96

PLANET – Plan for Agriculture reNewable Energy Training

PLANET Training Course for trainees

English (en) ▼



Giulia Botta


Biomass module

Participants

Badges

Competencies

Grades

General

Day 1: Technic part 1 - In class

Day 2: Technic part 2 - In class

Day 3: Operation management - In class

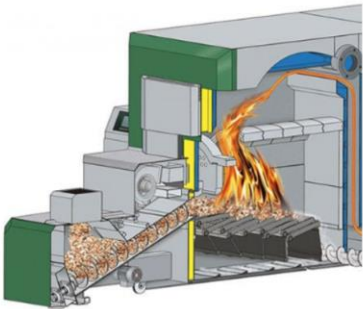
Day 4: Raw material - In class

Day 5: Design & Economy - Online

Day 6: Law - Online

Day 7: Legal and safety issues - Online

Day 2: Technic part 2 - In class



Day 2 activities

Day2 pre-test

Day2 test

Day 3: Operation management - In class





Figura 97


PLANET – PPlan for Agriculture reNewable Energy Training


Biomass module


- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Technic part 1 - In class
- Day 2: Technic part 2 - In class
- Day 3: Operation management - In class
- Day 4: Raw material - In class
- Day 5: Design & Economy - Online
- Day 6: Law - Online
- Day 7: Legal and safety issues - Online

Day 3: Operation management - In class




 Day 3 activities
☐

 Day3 pre-test
☐

 Day3 test
☐

Day 4: Raw material - In class




 Day 4 activities
☐

Figura 98

PLANET – PPlan for Agriculture reNewable Energy Training

PLANET Training Course for trainees


English (en) ▼

⌚ Giulia Botta

Biomass module

- 👤 Participants
- 🏆 Badges
- ✅ Competencies
- 📅 Grades
- 📁 General
- 📁 Day 1: Technic part 1 - In class
- 📁 Day 2: Technic part 2 - In class
- 📁 Day 3: Operation management - In class
- 📁 Day 4: Raw material - In class
- 📁 Day 5: Design & Economy - Online
- 📁 Day 6: Law - Online
- 📁 Day 7: Legal and safety issues - Online

Day 4: Raw material – In class



📄

Day 4 activities

☐

✔️

Day4 pre-test


☐

✔️

Day4 test

☐

Day 5: Design & Economy – Online





📄




Day 5 activities

☐

Figura 99

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta


Biomass module


Participants
Badges
Competencies
Grades
General
Day 1: Technic part 1 - In class
Day 2: Technic part 2 - In class
Day 3: Operation management - In class
Day 4: Raw material - In class
Day 5: Design & Economy - Online
Day 6: Law - Online
Day 7: Legal and safety issues - Online

Day 5: Design & Economy - Online



Day 5 activities
Day5 pre-test
Day5 test

Day 6: Law - Online

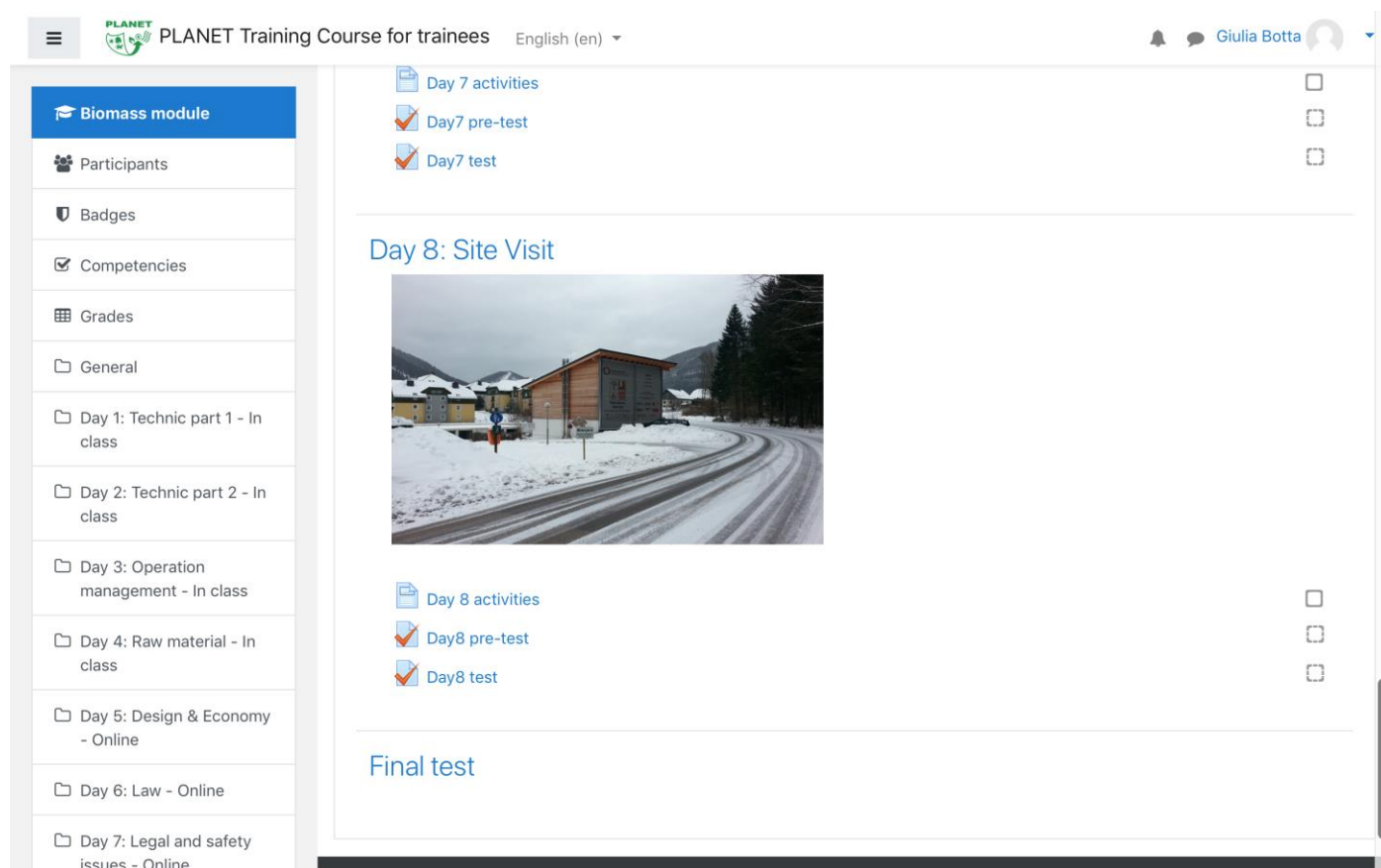


Day 6 activities
Day 6 pre-test

Figura 100

Figura 101

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes a hamburger menu, the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta".

The left sidebar contains a "Biomass module" section with a list of items: Participants, Badges, Competencies, Grades, General, Day 1: Technic part 1 - In class, Day 2: Technic part 2 - In class, Day 3: Operation management - In class, Day 4: Raw material - In class, Day 5: Design & Economy - Online, Day 6: Law - Online, and Day 7: Legal and safety issues - Online.



The main content area displays the "Day 7 activities" section, which includes a list of items: Day 7 activities, Day7 pre-test, and Day7 test. Below this is the "Day 8: Site Visit" section, which features a photograph of a snowy landscape with a wooden building and a road. The "Day 8 activities" section includes a list of items: Day 8 activities, Day8 pre-test, and Day8 test. At the bottom of the main content area is the "Final test" section.




Figura 102

PLANET – Plan for Agriculture reNewable Energy Training

DAYS ACTIVITIES

ONE:



PLANET Training Course for trainees
English (en)



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PLANET Biomass training course

[Dashboard](#) /
[My courses](#) /
[Biomass module](#) /
[Day 1: Technic part 1 - In class](#) /
[Day 1 activities](#)

Day 1 activities

BIOMASS Course - Day 1: Technic part 1

Aim of the module

To give the trainees the basics on biomass, the design of biomass district heating plant and the main components to understand the set of technologies related to the biomass plant.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand the set of biomass installations that are necessary and typical for biomass heating systems
2. Understand the conversion process whereby biological material becomes heat through combustion or biofuel through chemical, thermal, and biochemical methods. - The power transmission systems that use the force of flowing liquids to transmit power.
3. Understand the set of technologies that make a process, system, or apparatus operate automatically through the use of control systems.

Introduction

- Read the presentation to biomass module on Typical places where you can find biogas (manure, waste, landfill, nature) (slides with notes)










Figura 103

PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Read the presentation to biomass module on Typical places where you can find biogas (manure, waste, landfill, nature) (slides with notes)
- Make the pre-test




Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand the set of biomass installations that are necessary and typical for biomass heating systems

- Read or watch the following contents to understand how a biomass heating plant is composed and the design of it:
 - Read the presentation "1.1.1_Design of biomass district heating plant" (pdf with notes)
 - Watch the video on District Heating











Figura 104

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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▼









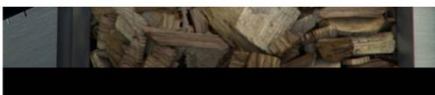
- Read or watch the following contents to understand the main components of a biomass district heating plant:
 - Read the presentation on "1.1.2_Main components of a biomass district heating plant" (pdf with notes)
 
 - Watch the video on Schematic assembly of biomass heating systems
 
 - Watch the following videos to understand the different biomass boilers:
 - Sidefeed with staged grate:
 

Figura 104


PLANET – Plan for Agriculture reNewable Energy Training



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English (en) ▼



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- Sidefeed with crawler grate:



High performance ignition
Shortest ignition time with lowest power consumption

- Read the presentation 1.1.3_Further components of a biomass district heating plant (pdf with notes)



Objective 2: Understand the conversion process whereby biological material becomes heat through combustion or biofuel through chemical, thermal, and biochemical methods. - The power transmission systems that use the force of flowing liquids to transmit power

- Read or watch the following contents to understand Heating:








Figura 105


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English (en)



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WITH NOTES

- Read the Modeling building energy performance ([external link](#))
- Read the Mechanisms of Heat Loss or Transfer ([external link](#))
- Watch the video on What is an Energy Performance Certificate




Energy Performance Asset Rating

Rating	Score Range
A	8-25
B	26-50
C	51-75
D	76-100
E	101-125
F	126-150
G	Over 150


Less Energy Efficient

- Read the Home Heating Systems ([external link](#))
- Read the presentation Biomass combustion processes (pdf with notes)



WITH NOTES

- Read or watch the following contents to understand hydraulics:








WITH NOTES


- Read the presentation 1.2.2_hydraulics (pdf with notes)

Figura 106

PLANET – Plan for Agriculture reNewable Energy Training

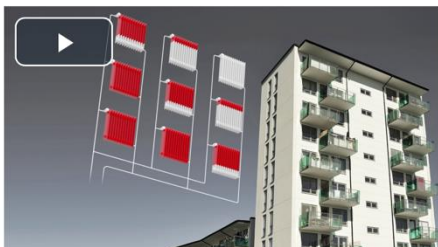


PLANET Training Course for trainees
English (en) ▼



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Additional material

- Watch the following videos to understand deeper the contents of this module:
 - For additional information to hydraulic balancing:


 - For additional information on District Heating & Cooling Networks watch:







 - For additional information on District Heating network watch:

Figura 107


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)

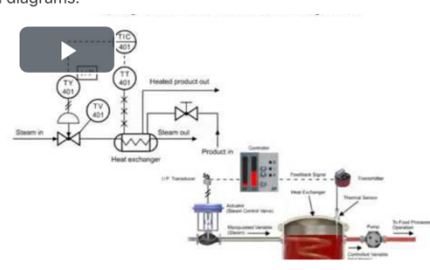


Giulia Botta

ACTUATORS

An actuator is the part of a final control device that causes a physical change in the final control device when signaled to do so.



- For additional information on piping and instrumentation diagrams:



- For additional information on types of valves:









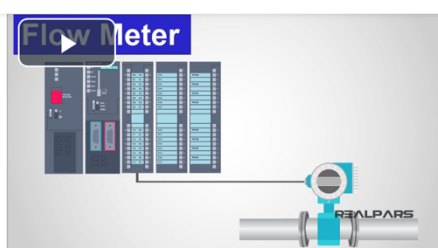
Figura 108

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)

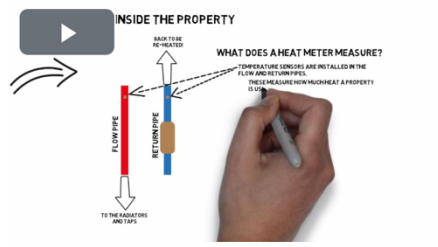


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Flow Meter



- For additional information on how a heat meter works:

INSIDE THE PROPERTY



- For additional information on how a heat exchanger works:

How Plate Heat Exchangers Work

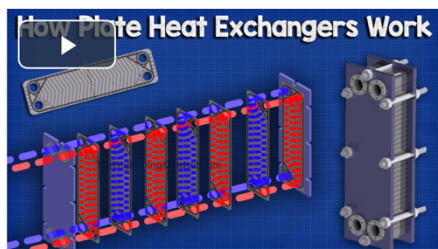








Figura 109



PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- For additional information on heat exchangers to learn about the function till minute 9:42

- For additional information on Hargassner Heating Technology - Wood chip boilers show a different rotation discharge

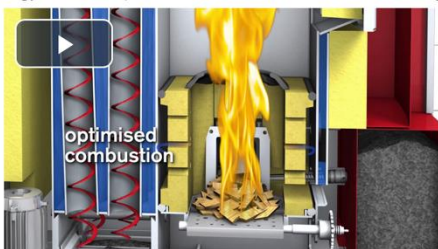







Figura 110

PLANET – Plan for Agriculture reNewable Energy Training

 PLANET Training Course for trainees English (en) ▾

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Last modified: Tuesday, 25 February 2020, 2:40 PM

[◀ Annunci](#)[Day1 pre-test ▶](#)

Figura 111

PLANET – PLaN for Agriculture reNewable Energy Training

TWO:



 PLANET Training Course for trainees
 English (en) ▾
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PLANET Biomass training course

[Dashboard](#) /
 [My courses](#) /
 [Biomass module](#) /
 [Day 2: Technic part 2 - In class](#) /
 [Day 2 activities](#)

Day 2 activities

BIOMASS Course - Day 1: Technic part 2

Aim of the module

To give the trainees the basics on biomass, the design of biomass district heating plant and the main components to understand the set of technologies related to the biomass plant.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Operate sealed vessels which contain fluids which are heated or vaporized, not always up to boiling, for heating or power generation, such as in utilities. Ensure safe procedures by monitoring the blower auxiliary equipment closely during operations, and identifying faults and risks.
2. Monitor the flow of the workpieces on the conveyor belt as they are processed by the machine to ensure optimal productivity.

Introduction

- Read the presentation to biomass module on Typical places where you can find biogas (manure, waste, landfill, nature) (slides with notes)










Figura 112

PLANET – PLaN for Agriculture reNewable Energy Training



 PLANET Training Course for trainees
 English (en) ▼
 

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Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Operate sealed vessels which contain fluids which are heated or vaporised, not always up to boiling, for heating or power generation, such as in utilities. Ensure safe procedures by monitoring the blower auxiliary equipment closely during operations, and identifying faults and risks.

- Read or watch the following contents to understand the Boiler technology:
 - Read the presentation Biomass 1.4.1_Technical Boiler ([PDF with notes](#))
 - Watch the video about underfeed combustion till minute 1:30










Figura 113

PLANET – Plan for Agriculture reNewable Energy Training

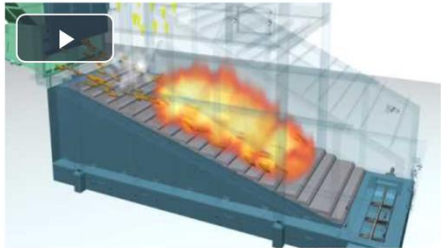


PLANET Training Course for trainees
English (en)



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Wood chip boilers

- Read the presentation Biomass 1.4.2_Technical Boiler ([PDF with notes](#))
- Watch the video about step grate system to see the function





- Read the presentation Biomass 1.4.3_Technical Boiler ([PDF with notes](#))
- Watch the video about tilting grate to learn about the function till minute 7:50






optimised

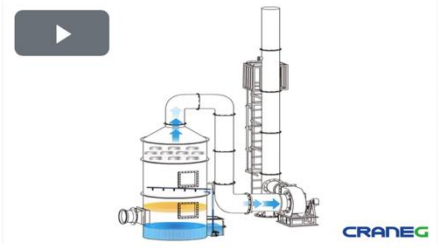
Figura 114

PLANET – Plan for Agriculture reNewable Energy Training

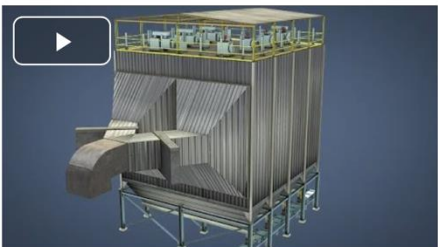


PLANET Training Course for trainees
English (en) ▼



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- Read the presentation Biomass 1.4.6_Technical Boiler ([PDF with notes](#))
- Watch the video on wet scrubber to learn about the function



- Read the presentation Biomass 1.4.7_Technical Boiler ([PDF with notes](#))
- Watch the video on electric precipitator to learn about the function



- Read the presentation Biomass 1.4.8_Technical Boiler ([PDF with notes](#))
- Watch the video on fabric filter to learn about the function









Figura 115

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PLANET Training Course for trainees
English (en) ▼



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Objective 2: Monitor the flow of the workpieces on the conveyor belt as they are processed by the machine to ensure optimal productivity


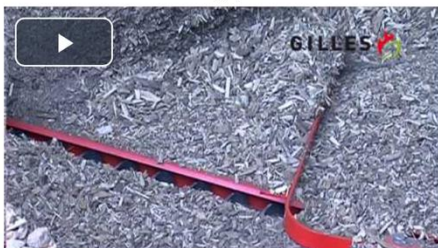






- Watch the following videos to understand the main systems of the auger/conveyor systems:
 - Screw conveyors (Windhager PuroWIN wood chip boiler - safety auger channel with SST)
 
 - Rotation discharge (Gilles rotation discharge, shows the function of a rotation discharge):
 
 - Walking floor (Walking floor biomass fuel storage, Winno Energy shows the function of a walking floor system that transports wood chips into a scratch chain conveyor)
 


Figura 116

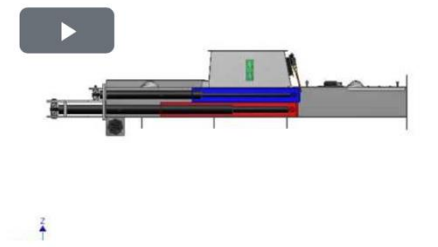
PLANET – PLaN for Agriculture reNewable Energy Training



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English (en)



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- Scratch chain conveyors (also called Redlers, Biomass silo/bunker with moving floors, connected to Redlers/Conveyors)


- Hydraulic push conveyors (Justsen Hydraulic Pusher, animation of a hydraulic push conveyors, a hydraulic piston transports/push the material)


- Suction conveyors (Windhager PuroWIN - wood chip boiler - suction system for wood chip, wood chips are transported by air stream)







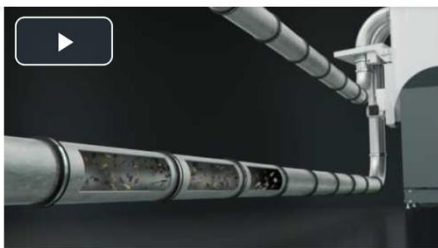


Figura 117


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English (en)



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- Conveyor belt (trailer with conveyor belt, video shows the difficulties of filling a wood chip storage, solved by a trailer that was combined by a conveyor belt)



- Toploader (Java Toploader - wood chips - heating system (pro), toploader installed at a biomass district heating system)









Figura 118


PLANET – Plan for Agriculture reNewable Energy Training



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English (en) ▼



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▼

Additional material

- Watch the following videos to understand deeper the contents of this module:
 - For additional information on wood chipper with a conveyor belt, reduces the power demand for the transport of wood chips from the chipper into a trailer and increases the wood chip quality by the reduction of fine fraction,


 - For additional information on Vecoplan Toploader - Vecoplan, see the function of toploader in an animation

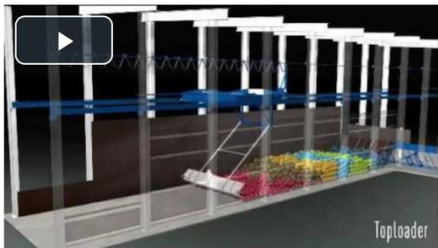






 - For additional information about particulate matter emission:
 - Read the presentation Biomass 1.4.5_Technical Boiler ([PDF with notes](#))
 - Watch the animation and read the text for further information on the website ([external link](#))
 - Watch the video for further information on cyclone filters

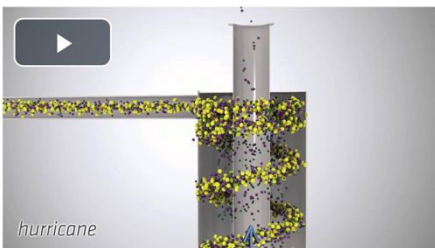
Figura 119

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English (en)



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- For additional information about particulate matter emission:
 - Read the presentation Biomass 1.4.5_Technical Boiler ([PDF with notes](#))
 - Watch the animation and read the text for further information on the website ([external link](#))
 - Watch the video for further information on cyclone filters



Make the final assignment






Last modified: Thursday, 16 January 2020, 11:29 AM

Figura 120

PLANET – PLaN for Agriculture reNewable Energy Training

THREE:



 PLANET Training Course for trainees
 English (en) ▾
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💬
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PLANET Biomass training course

[Dashboard](#) / [My courses](#) / [Biomass module](#) / [Day 3: Operation management - In class](#) / [Day 3 activities](#)

Day 3 activities
 ⚙️ ▾

BIOMASS Course - Day 3: Operation management

Aim of the module


To give the trainees the basics on biomass, the design of biomass district heating plant and the main components to understand the set of technologies related to the biomass plant.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand the preservation and restoration of products and systems and the methods and logistics of these practices.
2. Understand the procedures to inspect a product or system to ensure that it is according to specifications and requirements.
3. Use software tools to archive data by copying and backing them up, in order to ensure their integrity and to prevent data loss.
4. Selection of software that aids in estimating, managing and scheduling industrial processes such as design, workflow, and production improvement



Introduction





- Make the pre-test


Figura 121

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PLANET Training Course for trainees
English (en)



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- Make the pre-test




Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.


Objective 1: Understand the preservation and restoration of products and systems and the methods and logistics of these practices

- Read or watch the following contents to understand the maintenance of a biomass plant:

- Read the presentation “biomass 2.1.1_maintenance”



- Read the service manual of the biomass boiler to learn about the content of service manuals and the tasks to do



- Watch the video about the maintenance of a biomass boiler (in that case exemplary a wood pellet boiler), you will see some tasks that were described in the manual that you read before

Figura122

PLANET – Plan for Agriculture reNewable Energy Training



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English (en)



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- Watch the video about the maintenance of a biomass boiler (in that case exemplary a wood pellet boiler), you will see some tasks that were described in the manual that you read before



- Read the presentation "biomass 2.1.2_maintenance"








- Watch the video about How to test an RCD:




Figura123

PLANET – Plan for Agriculture reNewable Energy Training

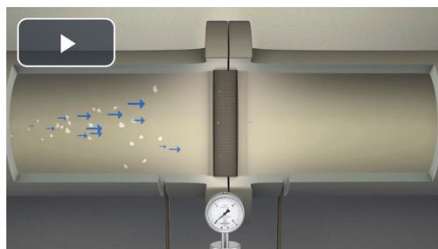


PLANET Training Course for trainees
English (en)



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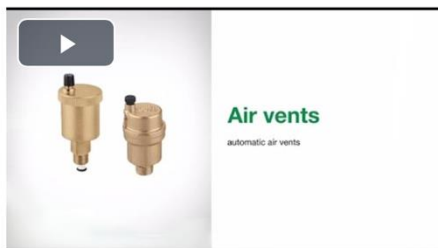
- Read the presentation "biomass 2.1.3_maintenance"



- Watch the video about differential pressure measurement at filters:



- Watch the video about air vents to learn about the function and installation position from 4:42 to 7:48:












Figura 124


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Read the presentation "biomass 2.1.4_maintenance"


Objective 2: Understand the procedures to inspect a product or system to ensure that it is according to specifications and requirements

- Read or watch the following documents to understand monitoring, quality management, benchmark, plant optimisation:
 - Read the presentation biomass 2.2_monitoring, quality management, benchmark, plant optimisation


Objective 3: Use software tools to archive data by copying and backing them up, in order to ensure their integrity and to prevent data loss









- Watch the following videos to understand data backup:
 - Read the presentation Biomass 2.6_data backup

 - Watch the following videos to understand the function and use of backup batteries:

Figura 125

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UPS Basics

How a UPS Works

- Watch the following videos to understand the data backup basics:



- Watch the following videos to understand the data backup basics:









Figura 126

PLANET – Plan for Agriculture reNewable Energy Training

 PLANET Training Course for trainees English (en) ▾

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




- Watch the following videos to understand the data backup basics:
A man with glasses and a beard, wearing a light blue shirt over a dark red t-shirt, is speaking. A white mug is on the table in front of him. The background has green and yellow vertical lines.
- Watch the following videos to understand the data backup systems:
A man with glasses and a beard, wearing a light blue shirt over a dark red t-shirt, is speaking. The background has green and yellow vertical lines.
- Watch the following videos to understand the types of data backup:
A man with glasses and a beard, wearing a light blue shirt over a dark red t-shirt, is speaking. The background has green and yellow vertical lines.


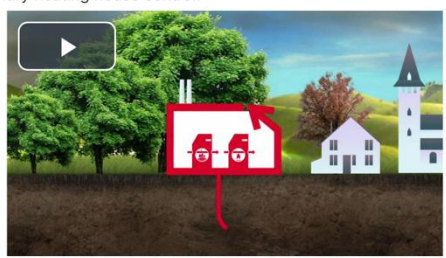

Figura 127

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Objective 4: Know a selection of software that aids in estimating, managing and scheduling industrial processes such as design, workflow, and production improvement

- Watch the following videos to understand supporting computer programs:
 - Read the presentation Biomass 2.7.1_supporting computer programs:

 - Watch the following videos to understand the superordinary heating house control:

 - Read the presentation Biomass 2.7_supporting computer programs










Figura 128

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English (en)



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- Read the presentation Biomass 2.7_supporting computer programs

- For further information on Heidi Software have a look at (use automatic translation of your browser):

- Read the presentation Biomass 2.7_supporting computer programs

- For information about calculator from energy amount of wood chips and calculator of wood chip amount for energy demand have a look at (use automatic translation of your browser):

- For information about efficiency comparison calculator have a look at (use automatic translation of your browser):



Figura 129

PLANET – Plan for Agriculture reNewable Energy Training



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English (en)

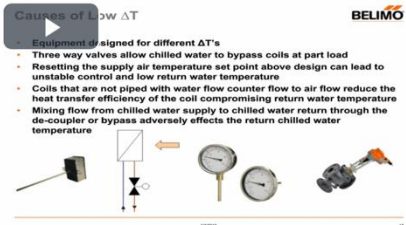


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You find a calculation of fuelwood parameters here on the learning platform, please see also the manual for the calculation:



Additional material

- Watch the following videos to understand deeper the contents of this module:
 - For additional information to operation optimization watch:



Make the final assignment









Figura 130

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FOUR:



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English (en)



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PLANET Biomass training course

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[Day 4: Raw material - In class](#) /
[Day 4 activities](#)

Day 4 activities

BIOMASS Course - Day 4: Raw Material

Aim of the module

To give the trainees the basics of the raw material that is used in biomass plants, its origin, its production process, and its logistical characteristics.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand the origins of wooden biomass products for energetic use.
2. Understand the process used for reducing the wood into wood chips.
3. Understand logistic systems used to manage the reception and the transportation of the raw material.
4. Understand the quality and quantity measurement systems.
5. Understand the different possibilities in the residue management field.

Introduction

- Watch the Video on CO2 NEUTRALITY









Figura 131

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English (en)



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- Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand the origins of wooden biomass products for the energetic use

- Read or watch the following contents to understand where the Raw Material is coming from:
 - Watch the video on Raw Material Sources












Figura 132

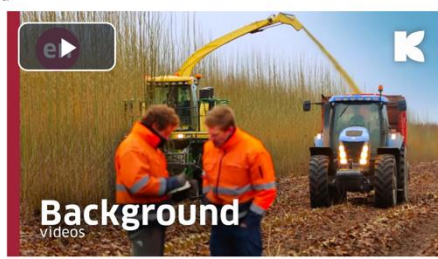
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- Read the presentation “PLANET_3.1 Raw Material sources”


- Read or watch the following contents to understand the main components of short rotation silviculture:
 - Watch the video on Short-rotation forestry and woodland



Objective 2: Understand the process used for reducing the wood into wood chips

- Read or watch the following contents to understand Wood Chip Production:
 - Read the documents on woodchips




Figura 133

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- Read the presentation PLANET_3.2 Wood chips production




- Watch the following videos to understand the main wood chipping systems:
 - Disk Chipper:





 - Drum Chipper:


 - Screw Chipper:


Figura 134

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English (en) ▼




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◻▶




◦ Conveyor Belt:

◻▶



◦ Air Blower:

◻▶



Hackschnitzelherstellung mit der Hackmaschine Eschböck Biber 84
Production of Wood Chips with the Eschböck Chipper Biber 84









Figura 135

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PLANET Training Course for trainees
English (en)



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Objective 3: Understand logistic systems used to manage the reception and the transportation of the raw material










- Read the following documents to understand the logistics of the raw material treatment for heating plants:
 - Read the presentation "PLANET_3.3 Logistics"

 - Read the following document "IRL_Biomass_manual.pdf" from page 43 to page 52

- Watch the following videos to understand the logistic systems:
 - Harvesting-Chipping in forest/on forest road-Transportation-Storage-Drying-Delivery

 - Harvesting-Transportation-Chipping-Storage-Drying-Delivery-Energy use:


Figura 136

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PLANET Training Course for trainees
English (en)



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Objective 4: Understand the quality and quantity measurement systems



- Read the following documents to understand the quality and quantity measurement methods:
 - Read the presentation "Read the presentation "PLANET_3.4 Fuel quality and quantity measurement"
 - Read the following document "IRL_Biomass_manual.pdf" from page 33 to page 42




Objective 5: Understand the different possibilities in the residue management field



- Watch the following documents to understand the use of ash from biomass heating plants:
 -
 - Read the presentation "PLANET_3.5: residue management"

Figura 137

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- Read the following document "Options for increased use of ash from biomass combustion and co-firing"

- Read the following document "Paper-Obernberger-ash-utilisation-2009"


Additional material

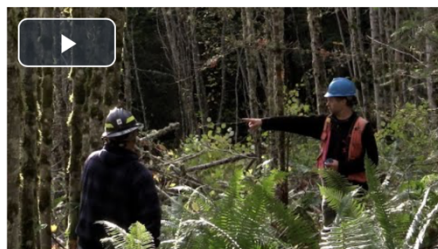







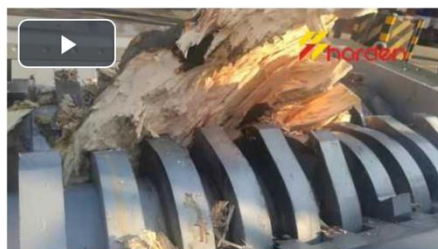
- Watch the following videos to understand deeper the contents of this module:
 - For additional information to understand thinning in forests

 - For additional information on Shredder:


Figura 138

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- For additional information on quality and quantity measurement systems:
 - Read the following manual "Manual_Energieholzkenndaten_16_englisch.pdf"

 - Apply the new knowledge of the manual "B4B_Solid_Biomass_Fuel_Parameter_Tool_v1.7_final.xlsm"

- Read the following documents to understand the possibilities for the use of ash:
 - FACTSHEET_Forststraßenbau



Figura 139


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- FACTSHEET_Land-Forstwirtschaft


- FACTSHEET_StraßenbauBodenstabilisierung


- FACTSHEET_Zwischenlagerung



Make the final assignment






Figura 140

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FIVE:



 PLANET Training Course for trainees
 English (en) ▾
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PLANET Biomass training course

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Day 5 activities
 ⚙️ ▾

BIOMASS Course - Day 5: Economy

Aim of the module

To give the trainees the basics of the financial and administrative processes of biomass heating systems.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand the field of finance that concerns the practical process analysis and tools for designating financial resources in the biomass field.
2. Understand, retrieve and analyze different kinds of information with regards to the management of a biomass heating plant in order to draw conclusions on projects, strategies, and developments.
3. Understand and synchronize the efforts, plans, strategies, and actions carried out in departments of biomass plants towards the growth of business and its turnover.

Introduction

- Watch the Video on "Market"










Figura 141

PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Make the [pre-test](#)



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand the field of finance that concerns the practical process analysis and tools for designating financial resources in the biomass field



- Read or watch the following contents to understand the practical process analysis and tools for designating financial resources in the biomass field:
 - Read the presentation "PLANET_4.1 Financing – business plan, subsidies, investment, insurance"





Objective 2: Understand, retrieve and analyze different kinds of information with regards to the management of a biomass heating plant in order to draw conclusions on projects, strategies, and developments

- Read or watch the following contents to understand Business administration of a biomass heating plant:


Figura 142

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PLANET Training Course for trainees
English (en)




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- Read the presentation "PLANET_4.2 Business administration"



Objective 3: Understand and synchronize the efforts, plans, strategies, and actions carried out in departments of biomass plants towards the growth of business and its turnover

- Read the following documents to understand the logistics of the raw material treatment for heating plants:
 - Read the presentation "PLANET_4.3 Business development"



Additional material

- Watch the following videos to understand deeper the contents of this module:
 - Read the presentation "PLANET_Funding system biomass district heating"













Figura 143

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English (en)



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- Read the presentation "PLANET_Business development example"

- Read the presentation "PLANET_Insurance"

- Read the presentation "PLANET_Bioenergy Market Austria"









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Figura 144

PLANET – Plan for Agriculture reNewable Energy Training

Six:



PLANET Training Course for trainees
English (en) ▼



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PLANET Biomass training course

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[Biomass module](#) /
[Day 6: Law - Online](#) /
[Day 6 activities](#)

Day 6 activities

BIOMASS Course - Day 6: Law

Aim of the module

To give the trainees the basic legal principles related to the biomass plant.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Know the basic contract law, such as financing, lease, easement, raw material supply, community, heat supply contracts, etc.

Introduction

- Make the pre-test









Figura 145

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: To know the basic contract law, such as financing, lease, easement, raw material supply, community, heat supply contracts, etc.









- Read or watch the following contents to understand the maintenance of a biomass plant:
 - Read the presentation "biomass 5.1.1_Contract Law"

 - For the detailed content of the heat supply contract open the Model heat supply contract file

 - Read the presentation "biomass 5.1.2_Contract Law"




Figura 146



PLANET – Plan for Agriculture reNewable Energy Training





PLANET Training Course for trainees
English (en)

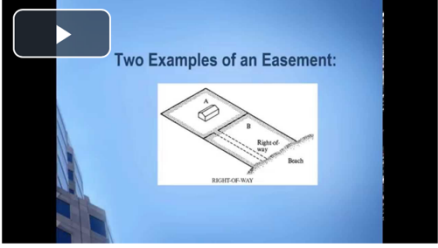


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- Read the presentation "biomass 5.1.3_Contract Law"



- have a look at the detailed corresponding content in the model biomass supply contract



- Read the presentation "biomass 5.1.4_Contract Law"



- Watch the video about easement to learn about it 0:29 to 3:52:











Figura 147

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- have a look at the detailed corresponding content in the model easement contract
- Read the presentation "biomass 5.1.6_Contract Law"
- have a look at the detailed corresponding content in the model rental contract
- Read the presentation "biomass 5.1.7_Contract Law"

















Figura 148

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PLANET Training Course for trainees
English (en)



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- Read the presentation "biomass 5.1.7_Contract Law"



Make the final assignment

Last modified: Thursday, 16 January 2020, 11:35 AM

[◀ Day5 test](#)




Figura 149

PLANET – Plan for Agriculture reNewable Energy Training

SEVEN:



PLANET Training Course for trainees
English (en) ▼



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PLANET Biomass training course

[Dashboard](#) /
[My courses](#) /
[Biomass module](#) /
[Day 7: Legal and safety issues - Online](#) /
[Day 7 activities](#)

Day 7 activities

BIOMASS Course - Day 7: Legal and safety issues

Aim of the module

To give the trainees the ability to read and interpret legal documents, knowledge of the Tax legislation and be aware of safety issues.

Learning outcomes



By completing the activities and exercises in this module, you will achieve the following learning outcomes:




1. Be able to interpret legal documents related to the Legal entity and liability issues
2. Be able to issue construction and plant permission
3. Maintain liaison and exchange of information with regional or local authorities
4. Understand necessary health, safety, hygiene, and environmental standards and legislation rules in the sector of a particular activity.
5. Understand the regulations concerning fire and explosion prevention, and the equipment, systems, and methods used in it.
6. Identify operating problems, decide what to do about it and report accordingly

Introduction

Figura 150


PLANET – PPlan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Introduction

- Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: To be able to interpret legal documents related to the Legal entity and liability issues

- Read or watch the following contents to understand Legal entity and liability issues:
 - Read the presentation "biomass 5.2_Legal entity"










Figura 151

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Objective 2: To be able to issue construction and plant permission

- Read or watch the following contents to understand health and safety precautions:
 - Read the presentation "biomass 5.3_Construction and plant permission"


Objective 3: To maintain liaison and exchange of information with regional or local authorities








- Read or watch the following contents to understand the exchange of information with regional or local authorities:
 - Read the presentation "Biomass 5.7 local authorities"

 - Have a look at the "biomass boiler control book"


Figura 152

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Objective 4: Understand necessary health, safety, hygiene, and environmental standards and legislation rules in the sector of a particular activity


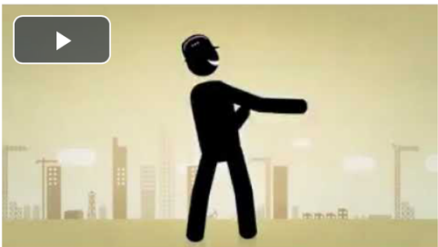






- Read the following documents to understand health and safety precautions:
 - Read the presentation Biomass 2.3.1_health and safety precautions

 - watch the video about On The Importance Of Health And Safety In The Workplace:

 - watch the video about safety starts with you:



Figura 153


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



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- Read the presentation Biomass 2.3.2_health and safety precautions


- watch the video about personal safety equipment:


- Read the presentation Biomass 2.3.3_health and safety precautions



Objective 5: Understand the regulations concerning fire and explosion prevention, and the equipment, systems, and methods used in it

- Read or watch the following contents to understand fire prevention:









Figura 154

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Objective 6: Identify operating problems, decide what to do about it and report accordingly











- Watch the following videos to understand troubleshooting:
 - Read the presentation Biomass 2.5.1_troubleshooting

 - Watch the following videos to understand instructions in case of fire:

 - Read the presentation Biomass 2.5.2_troubleshooting

 - Watch the following video to understand the use of a repair clamp:




Figura 155

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PLANET Training Course for trainees
English (en)



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- Read the presentation Biomass 2.5.3_troubleshooting

- Watch the following video to understand the ash box disposal on a biomass boiler:










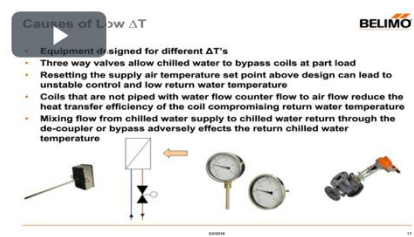
Figura 156

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Watch the following video to understand the ash box disposal on a biomass boiler:



Additional material

- Watch the following videos to understand deeper the contents of this module:
 - For additional information on Health and safety precautions watch the following videos:




Figura 157




PLANET – Plan for Agriculture reNewable Energy Training



Figura 158


PLANET – PLaN for Agriculture reNewable Energy Training

EIGHT:



 PLANET Training Course for trainees
 English (en) ▾
🔔
💬
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PLANET Biomass training course

[Dashboard](#) / [My courses](#) / [Biomass module](#) / [Day 8: Site Visit](#) / [Day 8 activities](#)

Day 8 activities
 

Biomass - Day 8: Site Visit

Aim of the module

 To enable the trainees to understand how to run a biomass heating plant

Learning outcomes

 By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Recognize the Equipment and Implementation, get an overview of the sizing of a biomass plant and identify operating problems and solutions during the run of a biomass plant



Activities




 Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Recognize the Equipment and Implementation, get an overview of the sizing of a biomass plant and identify operating problems and solutions during the run of a biomass plant

Figura 159


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Recognize the Equipment and Implementation, get an overview of the sizing of a biomass plant and identify operating problems and solutions during the run of a biomass plant


- Read or watch the following contents to recognize the equipment and implementation:
 - 
 - Print and read the Presentation PLANET_Biomass_6.1.pptx
 - Fill in the questionnaire
 - Discuss the assessment results with the other trainees, the trainer and the owner of the plant

Last modified: Thursday, 16 January 2020, 12:29 PM

[◀ Day7 test](#)

Jump to...

[Day8 pre-test ▶](#)

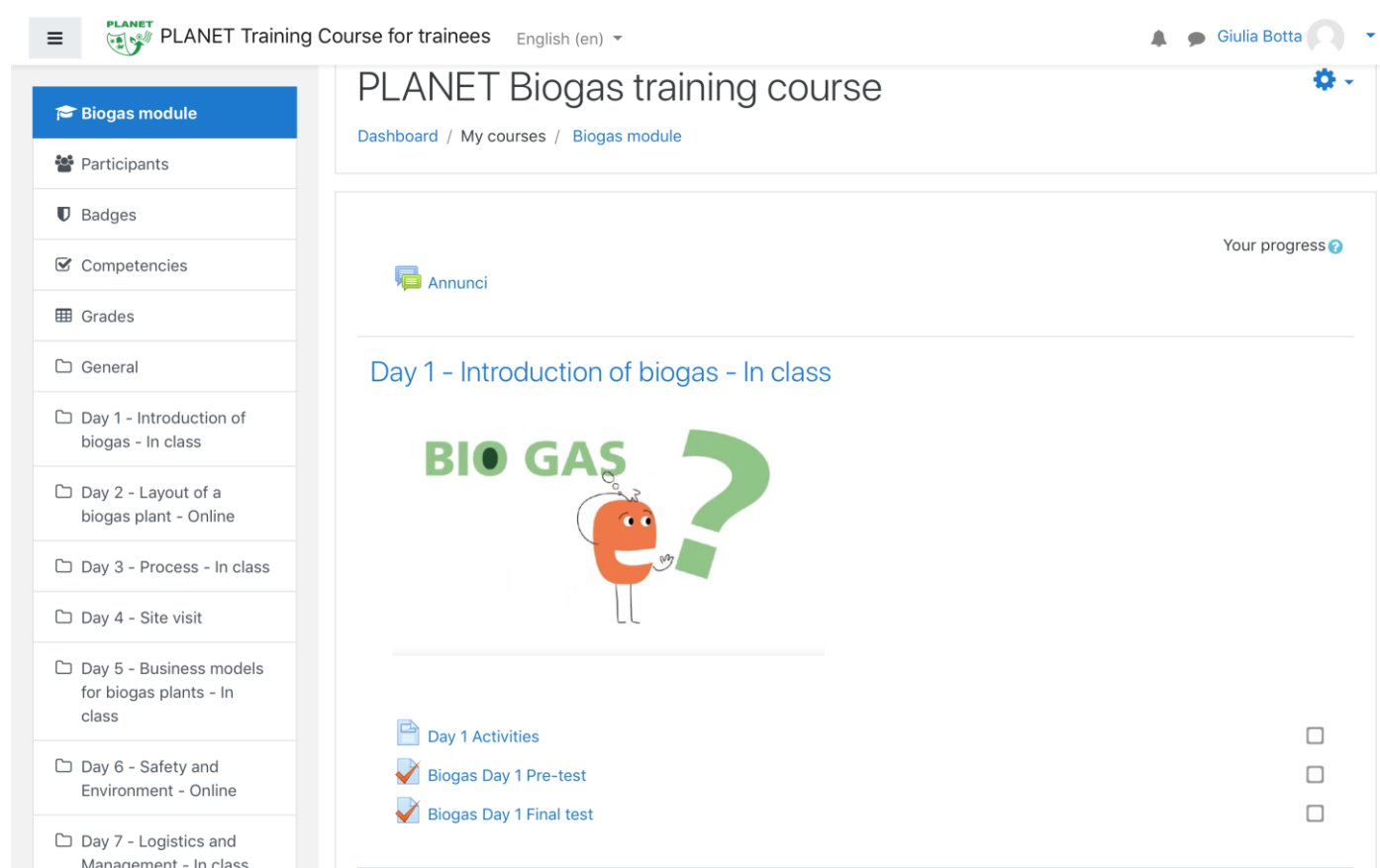

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Figura 160

PLANET – Plan for Agriculture reNewable Energy Training



1.1 PLANET Biogas training course







The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar lists the course modules, with "Biogas module" selected. The main content area displays the "PLANET Biogas training course" title and a breadcrumb trail: "Dashboard / My courses / Biogas module". Below this, there is a section for "Annunci" (Announcements) and a "Your progress" indicator. The main content area shows the "Day 1 - Introduction of biogas - In class" section, which includes a large graphic with the text "BIO GAS" and a cartoon character holding a question mark. Below the graphic, there is a list of activities: "Day 1 Activities", "Biogas Day 1 Pre-test", and "Biogas Day 1 Final test", each with a checkbox for completion.


Figura 158


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta




Biogas module



Participants



Badges



Competencies



Grades



General



Day 1 - Introduction of biogas - In class



Day 2 - Layout of a biogas plant - Online


Day 3 - Process - In class

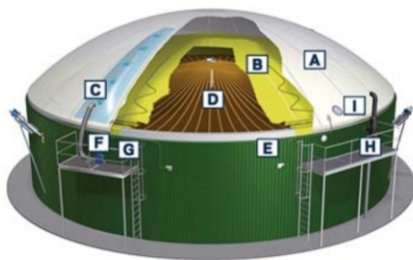

Day 4 - Site visit


Day 5 - Business models for biogas plants - In class



Day 6 - Safety and Environment - Online



Day 7 - Logistics and Management - In class


Day 2 - Layout of a biogas plant - Online



A Outer membrane **B** Inner membrane **C** Air Flow System **D** Brace system
E Anchor ring **F** Air regulation valve **G** Support air blower **H** Safety valve
I Inspection window


Day 2 Activities
☐


Biogas Day 2 Pre-test
☐


Biogas Day 2 Final test
☐

Day 3 - Process - In class

Thermophil (50 - 60 °C)
→ high gas yield after short retention time
→ sensitive biocenosis → caution with rapid degradable substrates, (hydrolysis develops too fast)

Mesophil (32 - 45 °C)
→ stable biocenosis → satisfying gas yield with acceptable retention time
→ common, particularly in wet fermentation processes

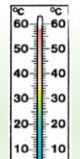


Figura 159

PLANET – PPlan for Agriculture reNewable Energy Training

PLANET Training Course for trainees

English (en)

Giulia Botta

Biogas module

Participants

Badges

Competencies

Grades

General

Day 1 - Introduction of biogas - In class

Day 2 - Layout of a biogas plant - Online

Day 3 - Process - In class

Day 4 - Site visit

Day 5 - Business models for biogas plants - In class

Day 6 - Safety and Environment - Online

Day 7 - Logistics and Management - In class

Day 3 - Process - In class

Thermophil (50 - 60 °C)
→ high gas yield after short retention time
→ sensitive biocoenosis → caution with rapid degradable substrates, (hydrolysis develops too fast)

Mesophil (32 - 45 °C)
→ stable biocoenosis → satisfying gas yield with acceptable retention time
→ common, particularly in wet fermentation processes

Psychrophil (< 25 °C)
→ low growth rate → long retention times
→ inefficient for biogas production → no longer in use

Day 3 Activities



Biogas Day 3 Pre-test




Biogas Day 3 Final test


Day 4 - Site visit


Figura 160


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta




Biogas module



Participants



Badges



Competencies



Grades



General



Day 1 - Introduction of biogas - In class



Day 2 - Layout of a biogas plant - Online



Day 3 - Process - In class



Day 4 - Site visit



Day 5 - Business models for biogas plants - In class


Day 6 - Safety and Environment - Online


Day 7 - Logistics and Management - In class

Day 4 - Site visit



Day 4 Activities
☐


Assignment Biogas Module 4
☐







Day 5 - Business models for biogas plants - In class


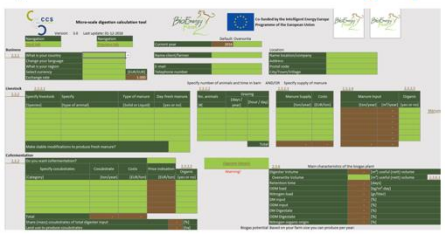
Figura 161


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




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Day 5 - Business models for biogas plants - In class

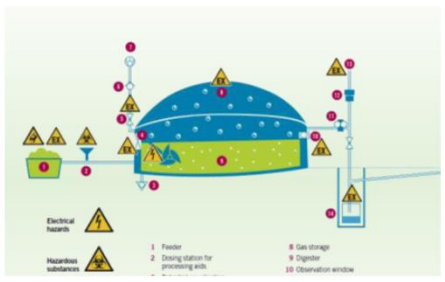


 Day 5 Activities
☐

 Biogas Day 5 Pre-test
☐

 Biogas Day 5 Final test
☐

Day 6 - Safety and Environment - Online



Electrical hazards

Hazardous substances

1 Feeder

2 Drawing station for ponding ash



3 Gas storage




4 Digester

5 Observation window

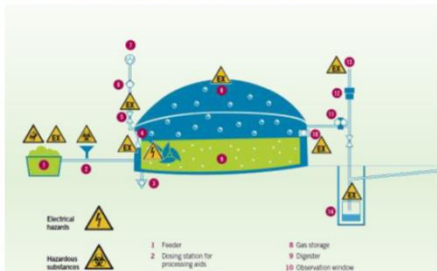
Figura 162


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PLANET Training Course for trainees
English (en)




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Day 6 - Safety and Environment - Online



 Day 6 Activities
☐

 Biogas Day 6 Pre-test
☐

 Biogas Day 6 Final test
☐

Day 7 - Logistics and Management - In class

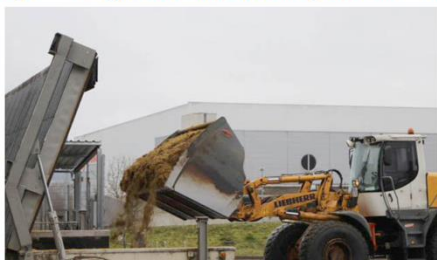







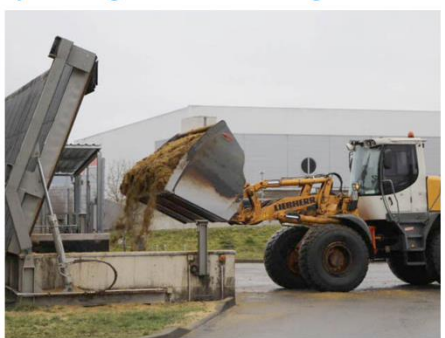
Figura 163


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




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Day 7 - Logistics and Management - In class



 Day 7 Activities
☐

 Biogas Day 7 Pre-test
☐

 Biogas Day 7 Final test
☐

Day 8 - Operation of biogas plant - In class










Figura 164


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




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Day 8 - Operation of biogas plant - In class



 Day 8 Activities
☐

 Biogas Day 8 Pre-test
☐

 Biogas Day 8 Final test
☐

Day 9 - Maintenance - In class











Figura 165


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




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Biogas module



Participants



Badges



Competencies



Grades



General



Day 1 - Introduction of biogas - In class



Day 2 - Layout of a biogas plant - Online



Day 3 - Process - In class



Day 4 - Site visit



Day 5 - Business models for biogas plants - In class



Day 6 - Safety and Environment - Online


Day 7 - Logistics and Management - In class

Day 9 - Maintenance - In class




Day 9 Activities
☐


Biogas Day 9 Pre-test
☐


Biogas Day 9 Final test
☐

Day 10 - Site visit

Day 11 - Recap, test and presentation


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Figura 166

PLANET – Plan for Agriculture reNewable Energy Training

ACTIVITIES:

ONE:



PLANET Training Course for trainees
English (en)



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PLANET Biogas training course

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[My courses](#) /
[Biogas module](#) /
[Day 1 - Introduction of biogas - In class](#) /
[Day 1 Activities](#)

Day 1 Activities

BIOGAS Course - Day 1: Introduction of biogas

Aim of the module

The aim of this module is to get a basic knowledge of biogas formation and understand the basic characteristics of biogas as a gaseous fuel. Also, the aim is to familiarize the student with the possibilities and advantages of biogas production and digestate and know the 6. Know milestones in the history of biogas and the current situation of biogas in your country.

Learning outcomes

By the end of this day, the trainee has been introduced with the basic biology of digestion and with basic characteristics of biogas. The trainee is familiar with the advantages of biogas production, with the value of digestate, with the potential for biogas and knows the key milestones in the history of biogas production.



By completing the activities and exercises in this module, you will achieve the following learning outcomes:




1. Understand the purpose of the module
2. Understand the basic biology of the anaerobic digestion process
3. Understand the basic characteristics of biogas
4. Understand what the possibilities and advantages of biogas are
5. Understand what digestate is and what the value of digestate is compared to undigested manure.
6. Know milestones in the history of biogas and the current situation of biogas in your country

Introduction

Figura 167

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼







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Introduction

Objective 1: Understand the purpose of the module

The purpose of the module is to give the trainees the basics on biogas from anaerobic digestion, the design, operation and maintenance of a small scale biogas installation and technologies related to the biogas installation.

- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.1 General introduction
- Watch following introductory video to biogas module
- Make the pre-test

BIOGAS









Figura 168

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PLANET Training Course for trainees
English (en)



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Activities


Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 2: Understand the basic biology of the anaerobic digestion process

What is anaerobic digestion?

This lecture gives an introduction to the anaerobic digestion process. It will provide insight into the different phases of digestion, the biology, and the chemical features of anaerobic digestion:

- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.2



Objective 3: Understand the basic characteristics of biogas

What is biogas?

This lecture gives insight into the basic characteristics of biogas. You will learn the biogas composition (CH₄, CO₂, etc) and how to compare it to other energy sources. We will also discuss the typical places where you can find biogas.

The feedstock is important to a biogas plant. It determines the for biogas yield. We will compare the energy value and the gas production for different kind of substrates.

The applications of biogas can vary from the production of electricity, heat or biomethane, as a substitute for natural gas. We will provide insight into the basics of these techniques and discuss the pros and cons.









Figura 169

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English (en)



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- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.3
 
- Objective 4: Understand what the possibilities and advantages of biogas are
 Why biogas?
 This lecture focusses on the advantages and possibilities of biogas. Why would add a biogas plant to a farm? We talk about the potential sustainable energy (electricity, biomethane, heat), the opportunities and potential of biogas. Other advantages of biogas, like improved fertilizer value and avoided methane emissions from different manure management, are discussed.
 
- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.4
 
- Link to interactive CH4 source emission visualization
 
- Objective 5: Understand what digestate is and what the value of digestate is compared to undigested manure.
 What is digestate?
 This lecture gives insight into the value of digestate and how it compares to normal manure. The nutrient content (nitrogen, phosphate, odour, pathogens, weeds, etc.), application of digestate, and organic matter.
 

Figura 170

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English (en)



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- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.5



WITH NOTES

Objective 6: Know milestones in the history of biogas and the current situation of biogas in your country

History of biogas

This lecture gives insight into the history of biogas and the current situation country.

- Watch the following video on what is biogas? how did it produce?





- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.6






WITH NOTES

Figura 171


PLANET – Plan for Agriculture reNewable Energy Training



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English (en) ▼




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This lecture gives insight into the history of biogas and the current situation country.

- Watch the following video on what is biogas? how did it produce?



- The following presentation will be given in class and is available online after the lecture: Planet Biogas Day 1.6



Make the final assignment







Figura 172

PLANET – Plan for Agriculture reNewable Energy Training

Two:



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 English (en) ▾
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💬
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PLANET Biogas training course

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Day 2 Activities
 ⚙️ ▾

BIOGAS Course - Day 2: Layout of a biogas plant

Aim of the module

The aim of this module is to expand knowledge of biogas formation and of general aspects of the use of gaseous fuels. Also, the aim is to familiarize the student with various diagrams used in the design and operation of biogas installations.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. The different types of digesters on farm-scale and the construction of a CSTR digester
2. The different components of a biogas installation
3. The various gas treatments and monitoring of the gas composition
4. The characteristics of the different biogas utilization techniques

Introduction

- Make the pre-test









Figura 173


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




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Objective 1: understand the different types of digesters on a farm scale

- Read or watch the following sources to understand the various types of digesters and the general construction of a CSTR digester:
 - Watch the video on How a digester works



- Watch the video about Digester roofs



- Watch the video about Tank construction










Figura 174


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English (en)



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- Read and study the presentation with notes "PLANET Biogas Day 2 Digesters and components pt 1-Digester types"
- Watch the Virtual tour through the digester
- Watch the video on the plug flow digester










Objective 2 Understand the different components of a biogas installation


- Read or watch the following sources to understand the role of the various components:

Figura 175

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PLANET Training Course for trainees
English (en)



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- PLANET Biogas Day 2 Digesters and components pt 2-Digester equipment

- Watch the videos and follow the links mentioned in the presentation

Objective 3 Understand the various gas treatments and monitoring of the gas composition









- Read or watch the following sources to understand the various treatments to remove H₂S and water from the gas:
 - Read the presentation PLANET Biogas Day 2 Digesters and components pt 3-gas treatment and monitoring

 - Watch the videos about mixing and heating



Figura 176




PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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Read the presentation PLANET Biogas Day 2 Digestate treatment


Objective 4 Understand the characteristics of the different biogas utilization techniques

- Read or watch the following sources to understand the characteristics of the different biogas utilization techniques:
 - PLANET Biogas Day 2 Biogas Utilization

 - Watch a video about membrane biogas upgrading



Additional materials









Figura 177



PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




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Additional materials

- Read the report about the cleaning and upgrading of biogas by IEA
- Read the website "from Idea to implementation" of BioEnergy Farm 2

Make the final assignment






Last modified: Friday, 28 February 2020, 9:48 AM

Figura 178


PLANET – PLaN for Agriculture reNewable Energy Training

THREE:



 PLANET Training Course for trainees
 English (en) ▾
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PLANET Biogas training course

[Dashboard](#) / [My courses](#) / [Biogas module](#) / [Day 3 - Process - In class](#) / [Day 3 Activities](#)

Day 3 Activities 

BIOGAS Course - Day 3: Process

Aim of the module

The aim of this module is to expand knowledge of biogas formation and of general aspects of the use of gaseous fuels. Also, the aim is to familiarize the student with various diagrams used in the design and operation of biogas installations.

Learning outcomes

By the end of this module, the trainee is familiar with the biology of digestion, with general energy balance calculations, with the most relevant control variables. The trainee has been introduced to PFDs and P&IDs.

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand the basics of the biology of biogas generation
2. Understand the influence of process parameters on the process
3. Understand the influence of substrates on biogas formation
4. Understand the laws of conservation of energy

 Introduction









Figura 179

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand the basics of the biology of biogas generation

Read or watch the following sources to understand the various stages of biogas generation:

- Presentation on 3.1 Biology of Digestion
- Video about the anaerobic digestion process


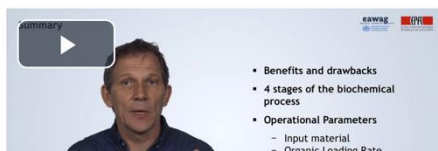








Figura 180


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta



Objective 2: Understand the influence of process parameters on the process

Read or watch the following sources to understand the influence of process parameters on the process:

- Presentation on 3.2 Process conditions


Objective 3: Understand the influence of substrates on biogas formation

Read or watch the following sources to understand the influence of substrates on biogas formation:

- Solve the exercise problems presented in Presentation 3.2 Process conditions
- Presentation 3.3 Energy and Process




Objective 4: Understand the laws of conservation of energy




Read or watch the following sources to understand the various stages of biogas generation:

- Video about Energy Units

Figura 181

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta



Objective 4: Understand the laws of conservation of energy

Read or watch the following sources to understand the various stages of biogas generation:

- Video about Energy Units



ENERGY UNITS



Make the final assignment









Figura 182

PLANET – Plan for Agriculture reNewable Energy Training

FOUR:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET Biogas training course

[Dashboard](#) /
[My courses](#) /
[Biogas module](#) /
[Day 4 - Site visit](#) /
[Day 4 Activities](#)

Day 4 Activities

BIOGAS Course - Day 4: Site visit

Aim of the module


The aim of this module is to learn to apply the knowledge biogas plant layout and of biogas formation from the previous models.

Learning outcomes

By the end of this module, the trainee is able to recognize the type of digester and components, the type of substrate feeding the digester, and calculate the biogas yield and process conditions of the visited biogas plant, according to theoretical values.

Introduction

- Make the pre-test








Activities

Today you will visit a biogas plant. During the visit, you will observe what the lay-out of the plant is, what technologies are used, what type of substrate is used. After the visit,

Figura 183

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Activities

Today you will visit a biogas plant. During the visit, you will observe what the lay-out of the plant is, what technologies are used, what type of substrate is used. After the visit, you will make an assignment, calculating the potential biogas yield and process conditions of the visited installation.









- Link to Site visit observation form
 
- Link to Literature with theoretical values about substrates
 
- Make the final assignment
 

Figura 184

PLANET – Plan for Agriculture reNewable Energy Training

FIVE:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET Biogas training course

[Dashboard](#) /
[My courses](#) /
[Biogas module](#) /
[Day 5 – Business models for biogas plants - In class](#) /
[Day 5 Activities](#)

Day 5 Activities

BIOGAS Course - Day 5: Business models for biogas plants

Aim of the module

The aim of this module is to learn how to make business models for biogas a plant.

Learning outcomes

By the end of this module, the trainee is able to:

- Know how to size the components of a biogas plant
- Understand the Operational costs of a biogas plant
- Understand the Income & Subsidies of a biogas plant
- Be able to compile a business model of a biogas plant

Introduction

- Make the pre-test









Figura 185

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta



Activities

Below is a list of the objectives in this module together with some learning activities. It is recommended that you carefully read the objective first and that you follow the activities in the presented order.

Objective 1: Know how to size the components of a biogas plant

Read or watch the following sources to understand how to size several digester components:

- Study the lecture 5.1 on sizing digester components



Objective 2: Understand the Operational costs of a biogas plant

Read or watch the following sources to be familiar in the use of a business model tool and understand the operational costs of a biogas plant:

- Watch the video on the payback period

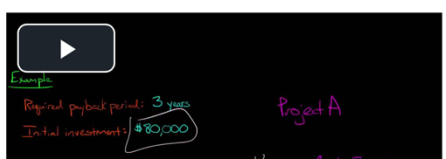
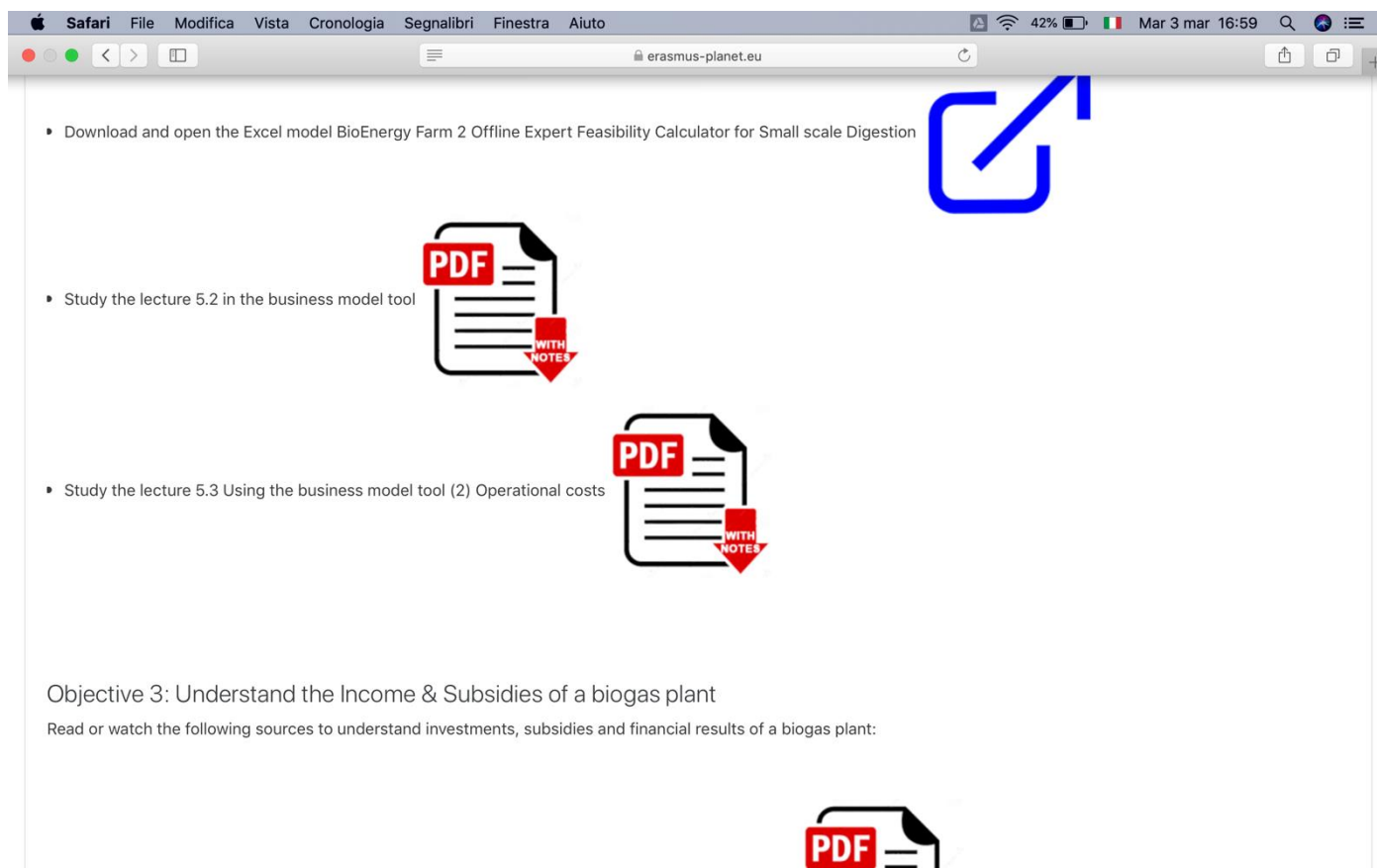


Figura 186

PLANET – Plan for Agriculture reNewable Energy Training



Download and open the Excel model BioEnergy Farm 2 Offline Expert Feasibility Calculator for Small scale Digestion

Study the lecture 5.2 in the business model tool

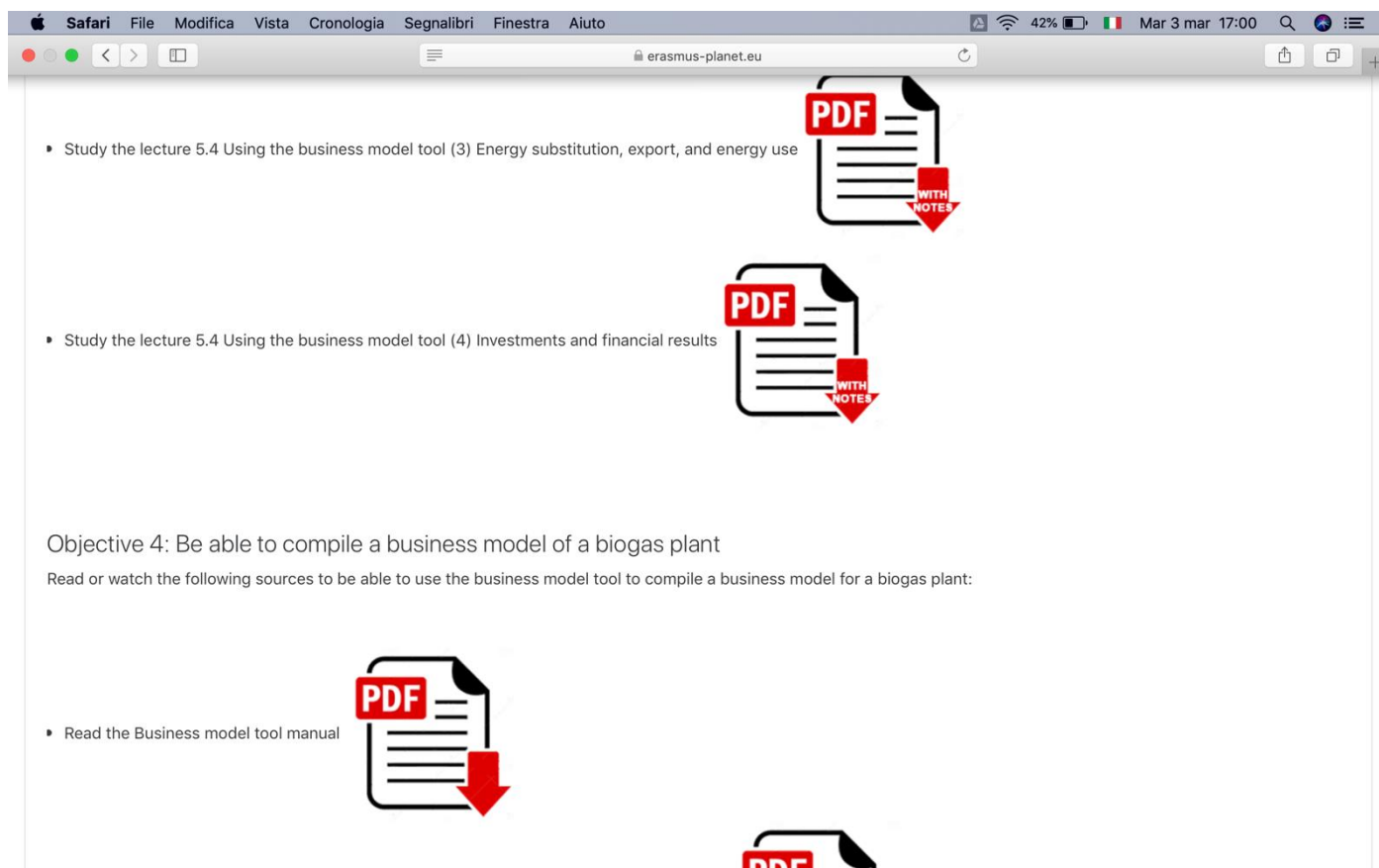
Study the lecture 5.3 Using the business model tool (2) Operational costs

Objective 3: Understand the Income & Subsidies of a biogas plant

Read or watch the following sources to understand investments, subsidies and financial results of a biogas plant:

Figura 187

PLANET – Plan for Agriculture reNewable Energy Training



Study the lecture 5.4 Using the business model tool (3) Energy substitution, export, and energy use

Study the lecture 5.4 Using the business model tool (4) Investments and financial results

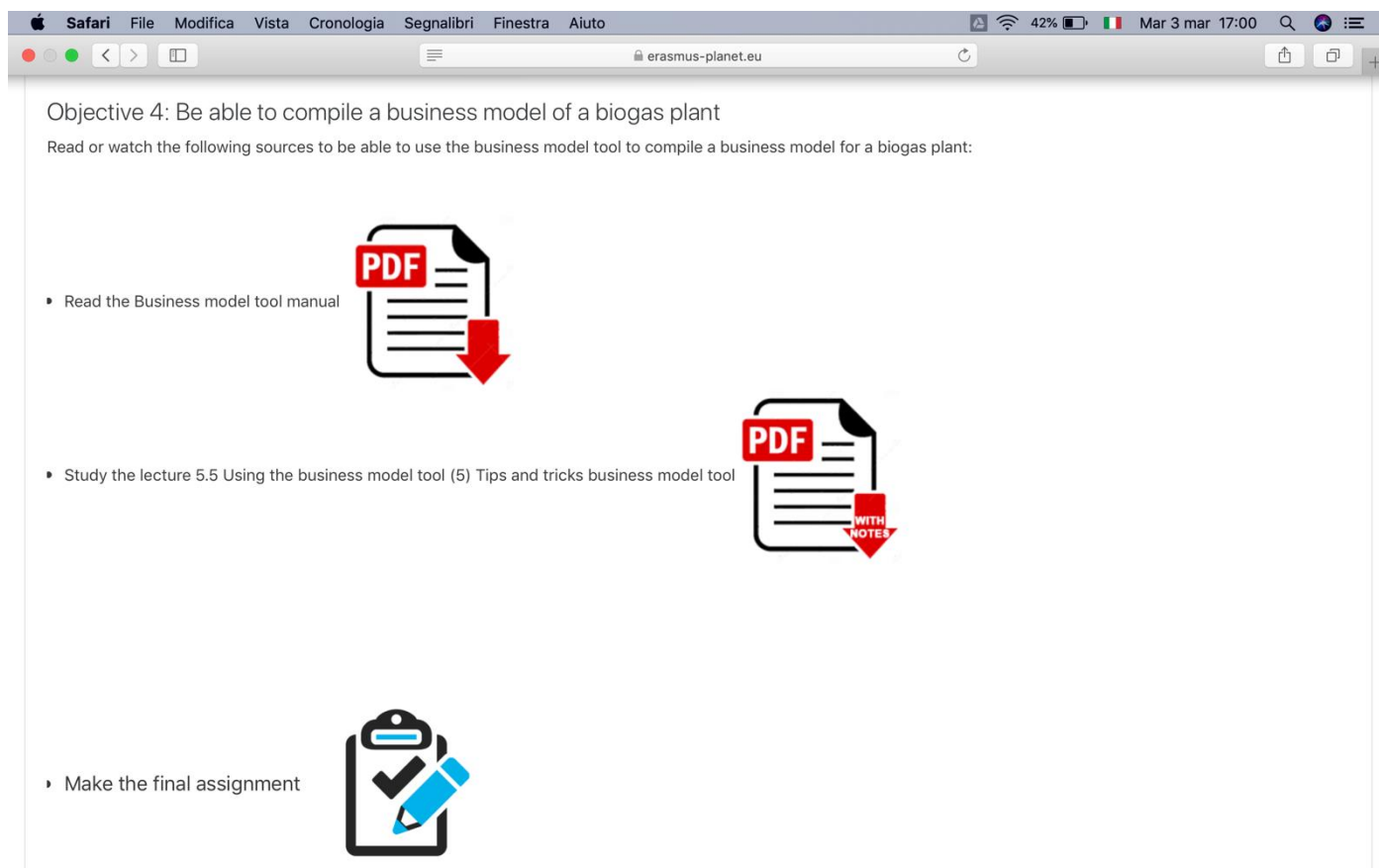
Objective 4: Be able to compile a business model of a biogas plant

Read or watch the following sources to be able to use the business model tool to compile a business model for a biogas plant:

Read the Business model tool manual

Figura 188

PLANET – Plan for Agriculture reNewable Energy Training



Objective 4: Be able to compile a business model of a biogas plant



Read or watch the following sources to be able to use the business model tool to compile a business model for a biogas plant:




- Read the Business model tool manual
- Study the lecture 5.5 Using the business model tool (5) Tips and tricks business model tool
- Make the final assignment

Figura 189

PLANET – Plan for Agriculture reNewable Energy Training

Six:



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


PLANET Biogas training course

[Dashboard](#) /
[My courses](#) /
[Biogas module](#) /
[Day 6 - Safety and Environment - Online](#) /
[Day 6 Activities](#)

Day 6 Activities

BIOGAS Course - Day 6: Safety and Environment

Aim of the module

The aim of this module is to expand knowledge of biogas safety and the environmental impact of biogas production. Also, the aim is to be able to recognize dangerous situations on a biogas plant.

Learning outcomes

By the end of this module, the trainee is able to:

- Be able to recognize the hazards in a biogas plant
- Know the environmental impact of biogas production

Introduction

- Make the pre-test








Figura 190

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Activities

Below is a list of the objectives in this module together with some learning activities. It is recommended that you carefully read the objective first and that you follow the activities in the presented order.


Objective 1: Be able to recognize the hazards in a biogas plant

Read or watch the following sources to understand how to recognize the hazards in a biogas plant:

- Watch the video about ATEX zones



- Study the material 6.1.1 Safety Classification of risks



- Watch the video about manure safety









Figura 191

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Study the material 6.1.2 Safety Toxicity
 
- Study the material 6.1.3 Safety Explosion and fire
 
- Watch the video Keeping Safe around biogas plants
 
- Study the material Day 6.1.4 Safety Prevention of accidents
 
- Watch the video about safety considerations on an AD plant
 

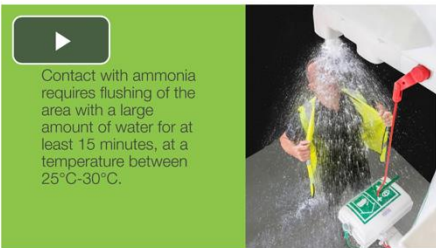
Figura 192

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


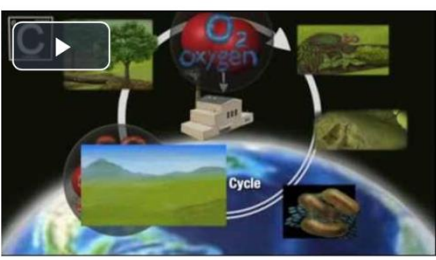
- Watch the video about safety considerations on an AD plant



Objective 2: Know the environmental impact of biogas production

Read or watch the following sources to understand the environmental impact of biogas production:

- Watch the video about the Carbon Cycle



- Watch the video about Global warming potential










Figura 193

PLANET – Plan for Agriculture reNewable Energy Training

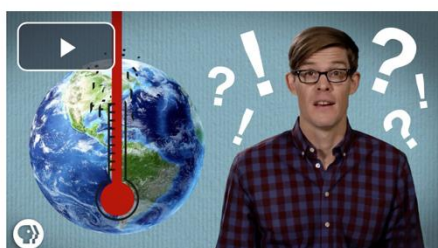


PLANET Training Course for trainees
English (en)



Giulia Botta





1 CH₄ = 25 CO₂e

- Watch the video about Climate Science



- Study the material 6.2.1 Environmental emissions and emission reduction



- Watch the video about Turning poop into power, not pollution







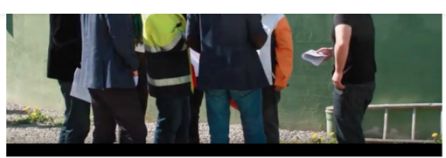


Figura 194


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




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- Study the material 6.2.2 Environment and neighbors



- Additional information on smells from a biogas plant

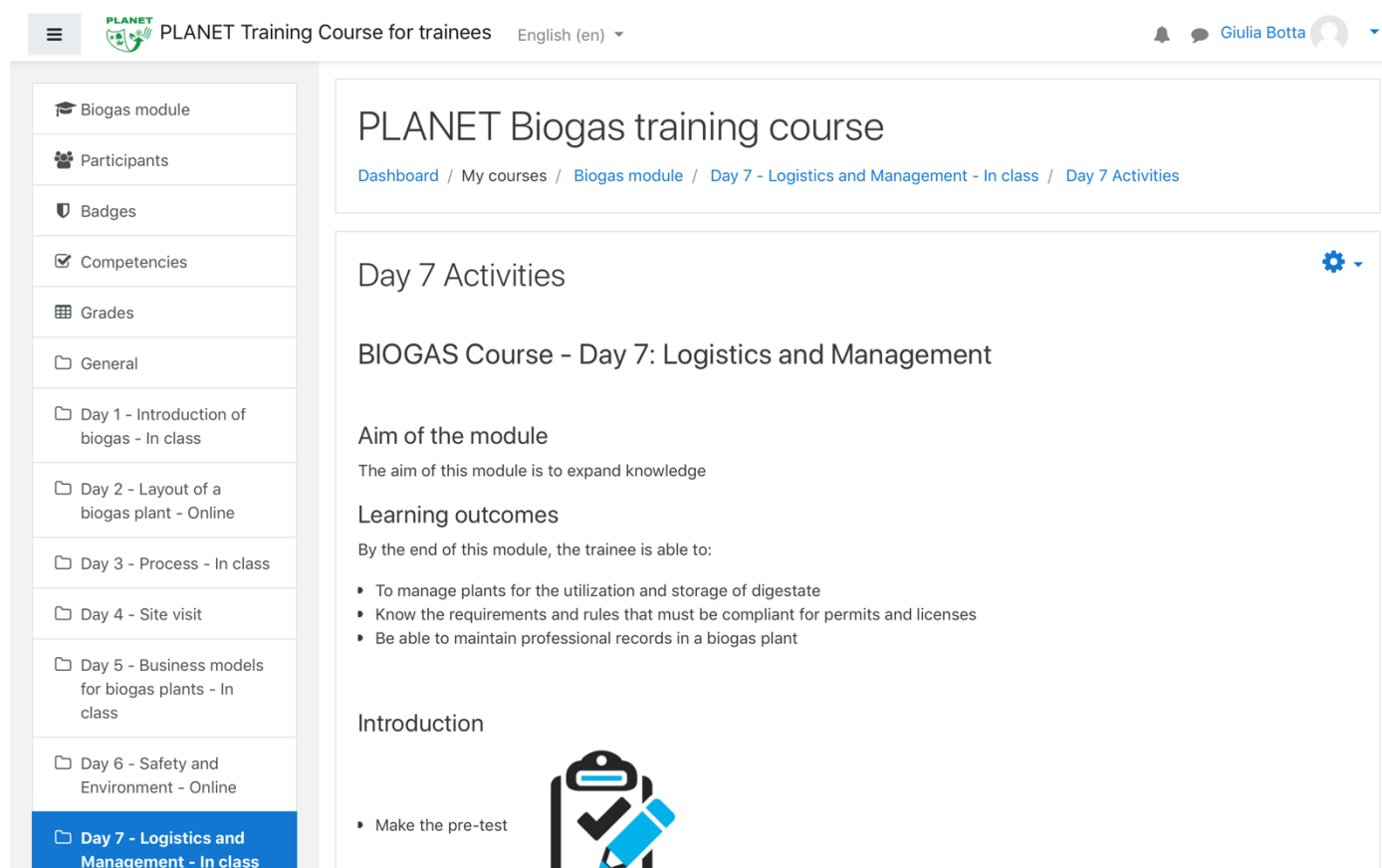


- Make the final assignment

Figura 195

PLANET – Plan for Agriculture reNewable Energy Training



SEVEN:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile "Giulia Botta". The left sidebar contains a menu with items: Biogas module, Participants, Badges, Competencies, Grades, General, Day 1 - Introduction of biogas - In class, Day 2 - Layout of a biogas plant - Online, Day 3 - Process - In class, Day 4 - Site visit, Day 5 - Business models for biogas plants - In class, Day 6 - Safety and Environment - Online, and Day 7 - Logistics and Management - In class (highlighted in blue). The main content area displays the "PLANET Biogas training course" title, a breadcrumb trail "Dashboard / My courses / Biogas module / Day 7 - Logistics and Management - In class / Day 7 Activities", and the "Day 7 Activities" section. The "Day 7 Activities" section includes the title "BIOGAS Course - Day 7: Logistics and Management", the "Aim of the module" (The aim of this module is to expand knowledge), the "Learning outcomes" (By the end of this module, the trainee is able to: To manage plants for the utilization and storage of digestate, Know the requirements and rules that must be compliant for permits and licenses, Be able to maintain professional records in a biogas plant), and the "Introduction" section (Make the pre-test). A clipboard icon is also visible next to the pre-test item.

Figura 196

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Biogas module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1 - Introduction of biogas - In class
- Day 2 - Layout of a biogas plant - Online
- Day 3 - Process - In class
- Day 4 - Site visit
- Day 5 - Business models for biogas plants - In class
- Day 6 - Safety and Environment - Online
- Day 7 - Logistics and Management - In class**

Activities

Below is a list of the objectives in this module together with some learning activities. It is recommended that you carefully read the objective first and that you follow the activities in the presented order.

Objective 1: Understand the basic logistic of a biogas plant and how to manage plants for the utilization and storage of digestate

Read or watch the following sources to understand:

- Study the material



Objective 2: Know the requirements and rules that must be compliant for permits and licenses

Read or watch the following sources to understand:




- Study the material

Figura 197

PLANET – Plan for Agriculture reNewable Energy Training


PLANET Training Course for trainees
English (en)



Giulia Botta


- Biogas module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1 - Introduction of biogas - In class
- Day 2 - Layout of a biogas plant - Online
- Day 3 - Process - In class
- Day 4 - Site visit
- Day 5 - Business models for biogas plants - In class
- Day 6 - Safety and Environment - Online
- Day 7 - Logistics and Management - In class**

Read or watch the following sources to understand:

- Study the material



Objective 3: Be able to maintain professional records in a biogas plant

Read or watch the following sources to understand:

- Make the final assignment






Figura 198

PLANET – PLaN for Agriculture reNewable Energy Training

EIGHT:



 PLANET Training Course for trainees
 English (en) ▾
🔔 💬 Giulia Botta 👤 ▾

PLANET Biogas training course

[Dashboard](#) / [My courses](#) / [Biogas module](#) / [Day 8 - Operation of biogas plant - In class](#) / [Day 8 Activities](#)

Day 8 Activities
 ⚙️ ▾

BIOGAS Course - Day 8: Operation of a biogas plant

Aim of the module

The aim of this module is to make the trainee familiar with the operation of a biogas plant such as:

- daily operation
- daily checks of process indicators
- troubleshooting the process
- optimizing digester biology

Learning outcomes

By the end of this module, the trainee is able to:

- Know how to operate a biogas plant
- Understand how to collect and preserve samples for analysis
- Be able to resolve equipment malfunctions


Introduction
 

Figura 199

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Make the pre-test




Activities

Below is a list of the objectives in this module together with some learning activities. It is recommended that you carefully read the objective first and that you follow the activities in the presented order.

Objective 1: Know how to operate a biogas plant

Read or watch the following sources to understand how to operate a biogas plant:

- Watch the video on agricultural biogas plant with daily tasks







- Watch the video on Operation of biogas upgrading by a farmer




Figura 200

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Follow the lesson 8.1 Operation of biogas plants




Objective 2: Understand how to collect and preserve samples for analysis

Read or watch the following sources to understand the monitoring and analyzing aspects of a biogas plant:

- Watch the video on biogas Permanent Monitoring of Biogas plants





- Follow the lesson on 8.2 Monitoring and analyzing






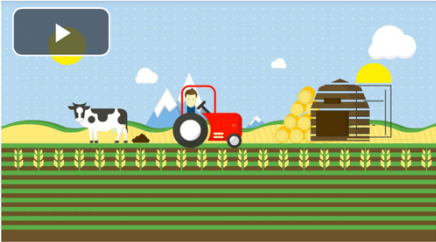
- Watch the video on Biomethane

Figura 201

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta




Objective 3: Be able to resolve equipment malfunctions

Read or watch the following sources to understand the environmental impact of biogas production:

- Follow the lesson 8.3 Staff and training. More information on this topic will be provided during part 9, maintenance.
- Watch the video on Gritting & Foaming



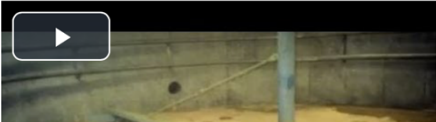








Figura 202


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Watch the video on Mixing crust


- Follow the lesson 8.4 Startup shutdown


- Make the final assignment









Figura 203

PLANET – Plan for Agriculture reNewable Energy Training

NINE:



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


PLANET Biogas training course

[Dashboard](#) /
[My courses](#) /
[Biogas module](#) /
[Day 9 - Maintenance - In class](#) /
[Day 9 Activities](#)

Day 9 Activities

BIOGAS Course - Day 9: Maintenance

Aim of the module

By the end of this module, the trainee will be familiar with the maintenance of a biogas plant. He will know why maintenance is important, will be aware of the administrative demands of proper maintenance, will know which components are the most sensitive to proper maintenance, will be aware of the risks of maintenance neglect, will be aware of the necessity of maintenance contracts.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Know how to maintain a biogas plant
2. Ensure rotation equipment maintenance
3. Monitor heaters and CHPs
4. Ensure static equipment maintenance
5. Maintain records of maintenance interventions

Introduction









Figura 204

PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta

- Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Know how to maintain a biogas plant

Read or watch the following sources to understand why maintenance is important:

-
- Read chapter 5 of Guide to Biogas, From production to use (FNR 2012)
- Attend lesson 9.1 with general maintenance considerations and how to maintain records of maintenance interventions












Figura 205

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- 
Study BioEnergyFarm Maintenance
- 
Watch the video on types of maintenance

Objective 2: Ensure rotation equipment maintenance

Read or watch the following sources to understand the maintenance of rotating equipment:







- 
Attend lesson 9.3 on the maintenance of rotating equipment

Figura 206

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta


Objective 3: Monitor heaters and CHPs

Read or watch the following sources to understand how to monitor CHPs:

- Watch the video on the maintenance of a CHP



Objective 4: Ensure static equipment maintenance

Read or watch the following sources to understand the maintenance of static equipment:

- Attend lesson 9.2 on maintenance aspects of static digester equipment









Figura 207


PLANET – PLaN for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Read or watch the following sources to understand the maintenance of static equipment:


- Attend lesson 9.2 on maintenance aspects of static digester equipment



Objective 5: Maintain records of maintenance interventions

Read or watch the following sources to understand the maintenance interventions:

- Attend lesson 9.4 on maintenance demands of gas treatment, boilers, CHP and biogas upgrade



Make the final assignment




Figura 208

PLANET – Plan for Agriculture reNewable Energy Training

PLANET ICT training course



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title, the language (English (en)), and the user profile (Giulia Botta). The left sidebar lists the course modules, with 'ICT module' selected. The main content area displays the 'PLANET ICT training course' title, a breadcrumb trail (Dashboard / My courses / ICT module), and a 'Your progress' section. Below this, there is an 'Announcements' section with a link to 'Day 1: Basics on ICT - Online'. A large image of hands typing on a keyboard is shown. At the bottom, a list of course items is displayed with checkboxes for completion:

- Basics on ICT ☐
- ICT Day 1 pre-test ☐
- ICT Day 1 test ☐

Figura 209


PLANET – Plan for Agriculture reNewable Energy Training

PLANET Training Course for trainees English (en) Giulia Botta

ICT module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

Day 2: Safety Surfing and Communication - Online



- Safety Surfing and Communication ☐
- ICT Day 2 pre-test ☐
- ICT Day 2 test ☐

Day 3: MS Office applications - Online









Figura 210

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


ICT module

Participants

Badges

Competencies

Grades

General

Day 1: Basics on ICT - Online

Day 2: Safety Surfing and Communication - Online

Day 3: MS Office applications - Online

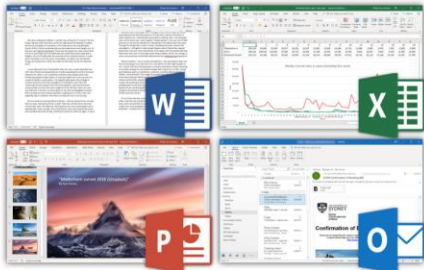
Day 4: General in-class activity - In class

Day 5: Word practice and tasks - In class

Day 6: Excel practice and tasks - In class

Day 7: Excel practice and

Day 3: MS Office applications - Online



MS Office applications
☐

ICT Day 3 pre-test
☒

ICT Day 3 test
☒

Day 4: General in-class activity - In class









Figura 211

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

ICT module

- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

Day 4: General in-class activity - In class



- Day 4 activities ☐
- ICT Day 4 pre-test ☐
- ICT Day 4 test ☐

Day 5: Word practice and tasks - In class









Figura 212

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta

▼

ICT module


- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

Day 5: Word practice and tasks - In class



 Day 5 activities

Day 6: Excel practice and tasks - In class









 Day 6 activities

Figura 213

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


ICT module

Participants

Badges

Competencies

Grades

General

Day 1: Basics on ICT - Online

Day 2: Safety Surfing and Communication - Online

Day 3: MS Office applications - Online


Day 4: General in-class activity - In class


Day 5: Word practice and tasks - In class

Day 6: Excel practice and tasks - In class


Day 7: Excel practice and


Day 7: Excel practice and tasks - In class




 Day 7 activities

Day 8: Creating reports for investors and stakeholders - In class





 Day 8 activities




 ICT Day8 in-class assignment

Day 9: Informatic RES plant management tools - In class

Figura 214

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


ICT module

Participants

Badges

Competencies

Grades

General

Day 1: Basics on ICT - Online

Day 2: Safety Surfing and Communication - Online

Day 3: MS Office applications - Online

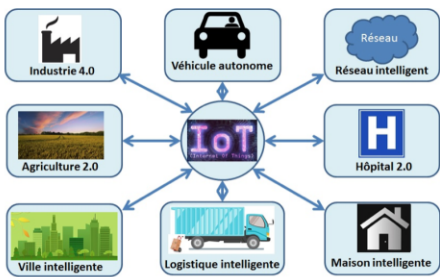
Day 4: General in-class activity - In class

Day 5: Word practice and tasks - In class

Day 6: Excel practice and tasks - In class

Day 7: Excel practice and

Day 9: Informatic RES plant management tools - In class



Day 9 activities

Final test

ICT Final test

Moodle Docs for this page

You are logged in as Giulia Botta (Log out)

Reset user tour on this page

Home

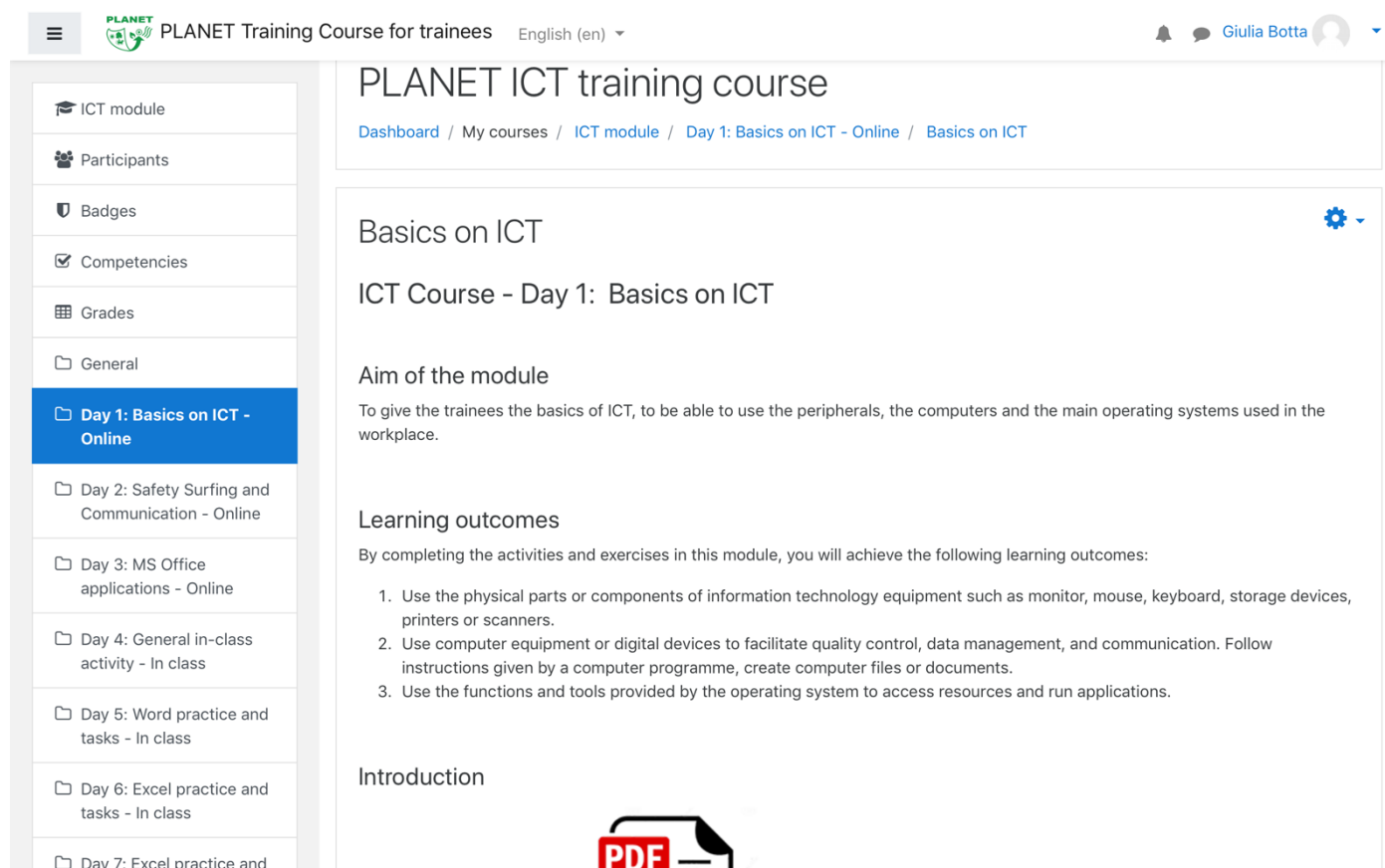
Data retention summary

Figura 215

PLANET – Plan for Agriculture reNewable Energy Training

ACTIVITIES:



ONE:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with items: ICT module, Participants, Badges, Competencies, Grades, General, and a highlighted "Day 1: Basics on ICT - Online". The main content area is titled "PLANET ICT training course" and shows the breadcrumb "Dashboard / My courses / ICT module / Day 1: Basics on ICT - Online / Basics on ICT". The section "Basics on ICT" is displayed, with a sub-section "ICT Course - Day 1: Basics on ICT". The "Aim of the module" is to give trainees the basics of ICT, to be able to use the peripherals, the computers and the main operating systems used in the workplace. The "Learning outcomes" section lists three outcomes: 1. Use the physical parts or components of information technology equipment such as monitor, mouse, keyboard, storage devices, printers or scanners. 2. Use computer equipment or digital devices to facilitate quality control, data management, and communication. Follow instructions given by a computer programme, create computer files or documents. 3. Use the functions and tools provided by the operating system to access resources and run applications. The "Introduction" section is partially visible, showing a PDF icon.

Figura 216


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta


- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online**
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

- Watch the introduction video



- Make the pre-test



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Use ICT peripherals

- Watch the video on "Computer classification" to Understand and distinguish between mainframe computer, network computer, personal computer, laptop, personal digital assistant (PDA) in terms of capacity, speed, cost, and typical users.








Figura 217

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta

ICT module
Participants
Badges
Competencies
Grades
General
Day 1: Basics on ICT - Online
Day 2: Safety Surfing and Communication - Online
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Day 7: Excel practice and

- Watch the video on "Computer components" to:
 - Know the main part of a computer such as a central processing unit (CPU), hard disk, common input, and output devices, types of memory. Understand the term peripheral device.
 - Know some of the factors that impact on a computer's performance such as CPU speed, RAM size, and the number of applications running.
 - Identify some of the main devices for inputting data into a computer such as a mouse, keyboard, trackball, scanner, touchpad, lightpen, joystick, digital camera, and microphone.
 - Identify common output devices for displaying the results of the processing carried out by a computer, such as monitors, screens, printers, plotters, and speakers. Know where these devices are used.

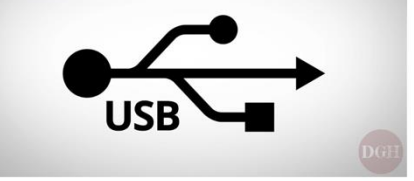
The Central Processing Unit (CPU)

- The box that sits on your desk or the floor
- May be integrated into the monitor
- "The brains" of the system



- Watch the video on "Computer ports and connectors" to Know the main computer ports and connectors.



PORTS AND CONNECTORS





- Watch the video on "Touchscreen" to Understand some devices are both input/output devices such as touchscreens.

Figura 218

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta

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- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

Objective 2: Use a computer

- Watch the video on "Data management using files and folders" to:
 - Use an icon to open a file, folder, application.
 - Collapse, expand, restore, resize, move, close a window
 - Switch between open windows.
 - Understand how an operating system organizes drives, folders, files in a hierarchical structure
 - Open a window to display the folder name, size, location on a drive.
 - Expand, collapse views of drives, folders
 - Navigate to a folder, file on a drive
 - Create a folder and a further subfolder
 - Identify common file types: word processing files, spreadsheet files, database files, presentation files, portable document format files, image files, audio files, video files, compressed files, temporary files, executable files.
 - Open a text editing application. Enter text into a file, name and save the file to a location on a drive.
 - Sort files in ascending, descending order by name, size, type, date modified.
 - Recognize good practice in a folder, file naming: use meaningful names for folders and files to help with recall and organization.
 - Rename files, folders
 - Select a file, folder individually or as a group of adjacent, non-adjacent files, folders.
 - Copy files, folders between folders and between drives.
 - Move files, folders between folders and between drives.
 - Delete files, folders to the recycle bin/wastebasket/trash
 - Restore files, folders from the recycle bin/wastebasket/trash.
 - Empty the recycle bin/wastebasket/trash
 - Use the Find tool to locate a file, folder.
 - Search for files by all or part of a file name, by content.
 - Search for files by date modified, by date created, by size.
 - Search for files by using wildcards: file type, the first letter of the file name.
 - View list of recently used files
 - Understand what file compression means.
 - Compress files in a folder on a drive
 - Extract compressed files from a location on a drive


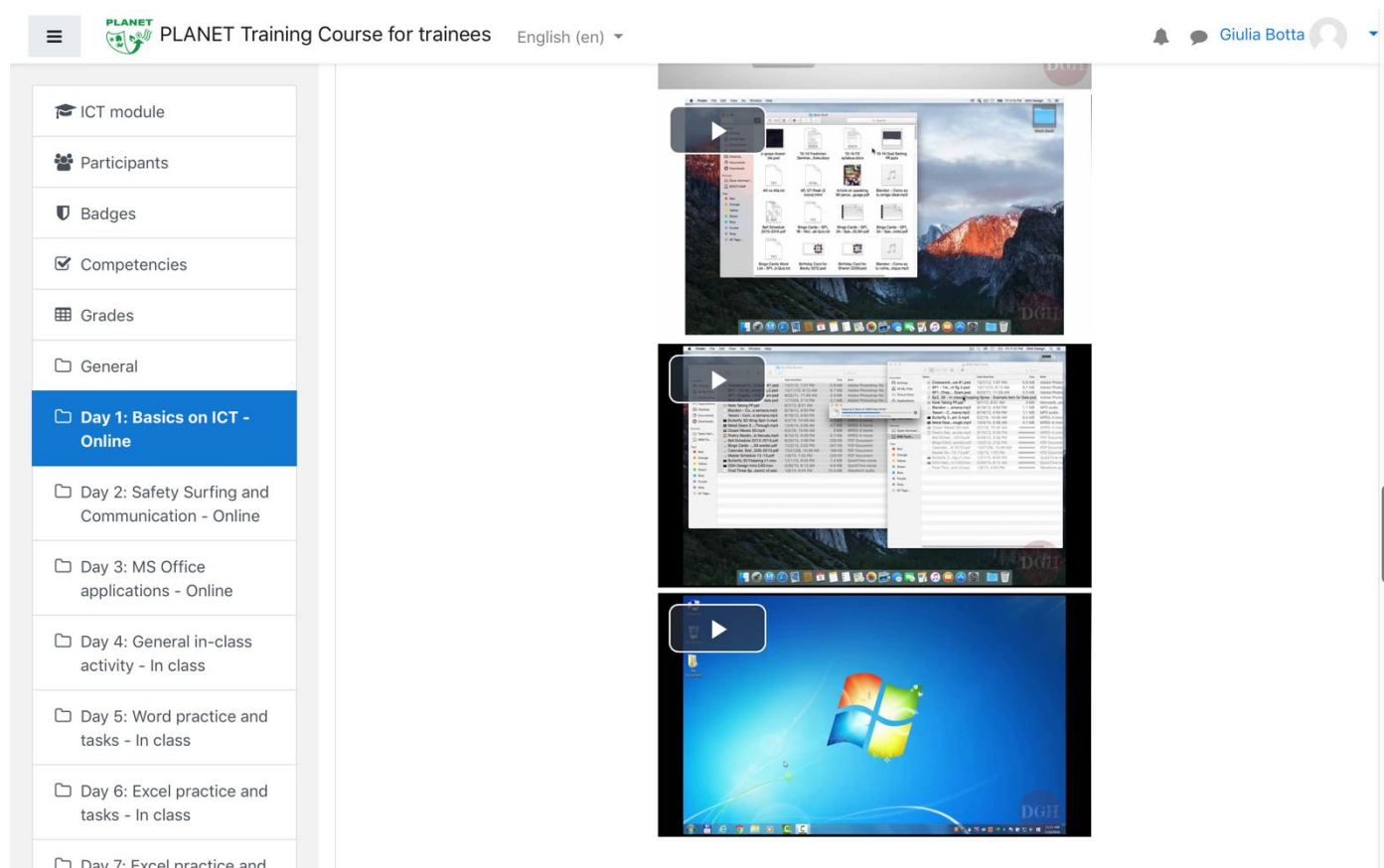

Files
Folders

Figura 219

PLANET – Plan for Agriculture reNewable Energy Training





PLANET Training Course for trainees English (en) ▼



Giulia Botta

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- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

Figura 220

PLANET – Plan for Agriculture reNewable Energy Training

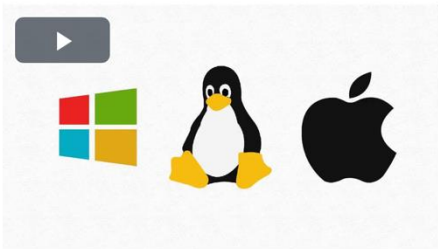


PLANET Training Course for trainees
English (en)



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- Day 7: Excel practice and

Objective 3: Use digital operating system

- Watch the video on "Understanding operating system" to Distinguish between operating systems software and applications software.



- Watch the video on "Introduction to Windows 10" to:
 - Know the main functions of the Windows 10 operating system.
 - Start menu functions
 - Open an application
 - Settings on the Control Panel
 - Log in, Shut down, restart, sleeping
 - Change account settings
 - Cortana
 - Taskbar
 - File Explorer and Quick access.

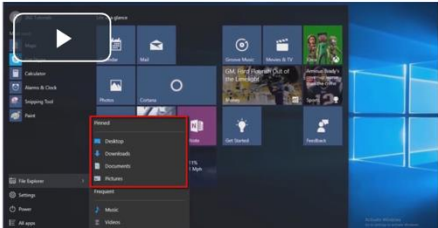









Figura 221


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 ICT module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1: Basics on ICT - Online


 Day 2: Safety Surfing and Communication - Online

 Day 3: MS Office applications - Online


 Day 4: General in-class activity - In class

 Day 5: Word practice and tasks - In class

 Day 6: Excel practice and tasks - In class

 Day 7: Excel practice and tasks - In class



- Watch the video on "Introduction to Mac" to:
 - Finder and its setup
 - Recent
 - AirDrop
 - System preferences
 - Desktop and screen saver settings
 - Search a file and Spotlight
 - Built-in Retina display
 - Trackpad
 - Maximize, minimize and close a window
 - Open and run more windows simultaneously
 - Create a folder
 - Add a printer
 - iCloud
 - How to activate Siri app
 - Selecting multiple items
 - Organize files by stack
 - Remove and restore an app
 - Malware protection
 - Setting a continuity camera.







- Watch the video on "Software installation" to know how to install and set up a printer.


Figura 222


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 ICT module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1: Basics on ICT - Online


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 Day 6: Excel practice and tasks - In class


 Day 7: Excel practice and tasks - In class



Watch the video on "Software installation" to know how to install and set up a printer.



Read the documents on "TCP/IP" to Understand and Setting the main features of internet protocol (click here)





Make the final assignment




Last modified: Wednesday, 15 January 2020, 12:24 PM


Figura 223


PLANET – Plan for Agriculture reNewable Energy Training


TWO:




PLANET Training Course for trainees
English (en)




Giulia Botta



 ICT module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1: Basics on ICT - Online

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 Day 6: Excel practice and tasks - In class

PLANET ICT training course

[Dashboard](#) / [My courses](#) / [ICT module](#) / [Day 2: Safety Surfing and Communication - Online](#) / [Safety Surfing and Communication](#)

Safety Surfing and Communication

ICT Course - Day 2: Safety Surfing and Communication

Aim of the module

To give the trainees the basics of internet research, the use of online communication tools, the general principles on the Internet of Things, knowledge on ICT safety and the ways to store the digital data.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:



1. Execute an efficient search on the internet in order to gather relevant information and share it with others.
2. Use digital tools that enable various forms of communication over the Internet, such as e-mail, instant messaging, Voice over Internet Protocol, social networks, while following netiquette rules and protecting one's reputation and digital identity.
3. The general principles, categories, requirements, limitations, and vulnerabilities of smart connected devices, most of them with intended internet connectivity.
4. Personal protection, antivirus, data protection, digital identity protection, security measures, safe and sustainable use.
5. Use software tools to archive data by copying and backing them up, in order to ensure their integrity and to prevent data loss.



Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the

Figura 224

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta

- ICT module
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Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Introduction:

- Make the pre-test

Objective 1: Carry out internet research

- Read the document on how to carry internet research
- Watch the video on "15 Ways to Search Google 96% of People Don't Know About" to understand deeper how to make web research













Figura 225

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



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Objective 2: Use online communication tools

- Watch the video on "Mail management" to understand how to:
 - Open (and close) an e-mail application
 - Open a mail inbox for a specified user
 - Open one, several mail messages.
 - Close a mail message.
 - Display, hide built-in toolbars.
 - Flag a mail message. Remove a flag mark from a mail message.
 - Mark a message as unread, read.
 - Open and save a file attachment to a location on a drive.
 - Use the reply, reply to all function.
 - Reply with, without original message insertion.
 - Create a new message.
 - Insert a mail address in the 'To' field.
 - Copy (Cc), blind copy (Bcc) a message to another address/addresses.
 - Insert a title in the 'Subject' field.
 - Use a spell-checking tool if available and make changes such as: correcting spelling errors, deleting repeated words.
 - Attach a file to a message.
 - Send a message with high, low priority.
 - Send a message using a distribution list.
 - Forward a message.
 - Recognize some techniques to manage e-mail effectively such as creating and naming folders, moving messages to appropriate folders, deleting an unrequired e-mail, using address lists.
 - Create a new address list/distribution list.
 - Add a mail address to an address list.
 - Delete a mail address from an address list.
 - Search for a message by the sender, subject, mail content.
 - Create a new folder for mail.
 - Move messages to a new folder for mail.
 - Sort messages by name, by date.
 - Delete a message.
 - Empty the mail bin/deleted items folder.

Figura 226


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta

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- Empty the mail bin/deleted items folder.
- Make and organize an Agenda
- Organize Contacts
- Setting the Calendar application
- Manage appointments and meetings.



- Read the documents on "Netiquette" to understand the Rules to write a formal email



- Watch the video on "Skype tutorial" to Understand Skype settings and use









Figura 227

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta


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Objective 3: Internet of things

- Watch the video on "General principles on IoT" to:
 - Have an introduction to the Internet of Things
 - Understand the Smart and Active Grid
 - Understand the Internet of things vulnerability.



Objective 4: ICT Safety



- Watch the video on "Internet Malware classification" to understand the definition of main malware threats such as Viruses, Trojans, Ransomware, Spyware, and Worms.





- Watch the video on "Cybersecurity attack" to understand how to manage a Phishing threat.


Figura 228

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



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- Day 6: Excel practice and tasks - In class



Microsoft shares tips on how to secure your identity against cybersecurity threats

Microsoft

- Watch the video on the "Windows 10 Security System" to understand how to Set the Windows Firewall and Defender.




WINDOWS 10 TRAINING

MANAGING WINDOWS 10 SECURITY

Simon Sez IT



- Watch the video on "Antivirus software" to know how to:
 - Downloading and installing a free antivirus
 - Setting and run an antivirus scan session.





Windows Defender Antivirus Free Edition

Figura 229

PLANET – Plan for Agriculture reNewable Energy Training

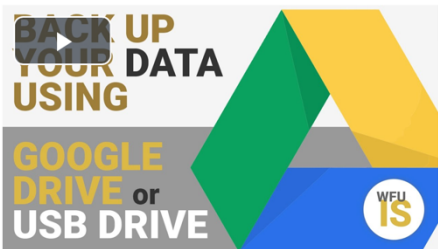


PLANET Training Course for trainees
English (en)



Giulia Botta


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- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class


Objective 5: Store digital data and systems

- Watch the video on "Data backup" to Understand the purpose of regularly backing up data to a removable storage device for off-site storage.



- Watch the video on "The Cloud" to Understand how the cloud systems work (Google Drive, DropBox, Evernote).



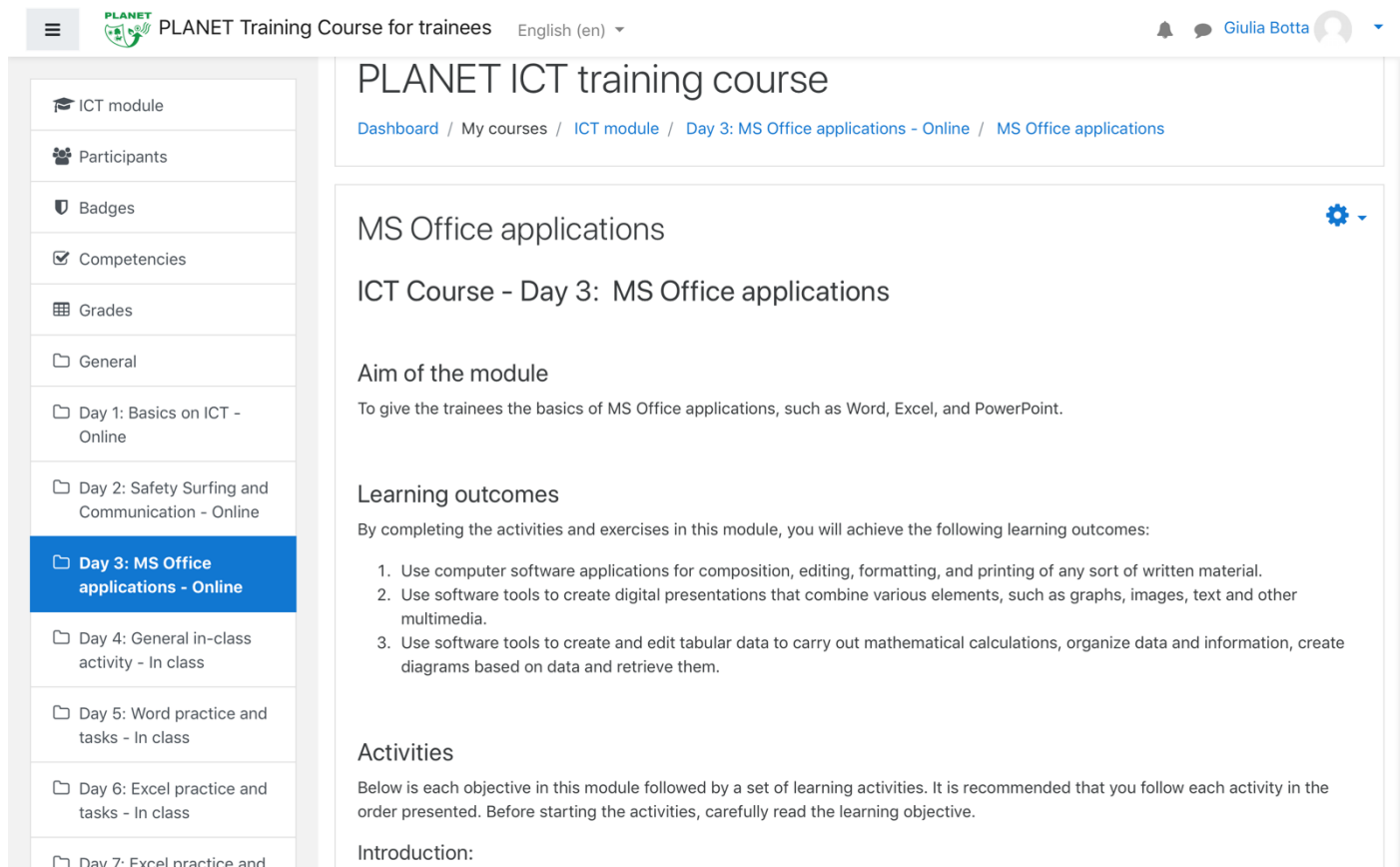


Make the final assignment

Figura 230

PLANET – Plan for Agriculture reNewable Energy Training

THREE:



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class. The main content area is titled "PLANET ICT training course" and shows the breadcrumb "Dashboard / My courses / ICT module / Day 3: MS Office applications - Online / MS Office applications". The module title is "MS Office applications" with a settings icon. Below it is the section "ICT Course - Day 3: MS Office applications". The "Aim of the module" is "To give the trainees the basics of MS Office applications, such as Word, Excel, and PowerPoint." The "Learning outcomes" section states: "By completing the activities and exercises in this module, you will achieve the following learning outcomes:" followed by a list of three outcomes. The "Activities" section states: "Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective." The "Introduction:" section is partially visible.

PLANET Training Course for trainees English (en) Giulia Botta

PLANET ICT training course

Dashboard / My courses / ICT module / Day 3: MS Office applications - Online / MS Office applications

MS Office applications

ICT Course - Day 3: MS Office applications

Aim of the module

To give the trainees the basics of MS Office applications, such as Word, Excel, and PowerPoint.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Use computer software applications for composition, editing, formatting, and printing of any sort of written material.
2. Use software tools to create digital presentations that combine various elements, such as graphs, images, text and other multimedia.
3. Use software tools to create and edit tabular data to carry out mathematical calculations, organize data and information, create diagrams based on data and retrieve them.



Activities




Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Introduction:

Figura 231


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta



- ICT module
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- Make the pre-test




Objective 1: use word processing software

- Watch the following video on "Basics On Creating A Document"





- Watch the following video on "Move, Insert, Copy And Paste Data"



- Watch the following video on "Undo, Redo And Repeat"



Figura 232

PLANET – Plan for Agriculture reNewable Energy Training






PLANET Training Course for trainees


English (en) ▼






Giulia Botta





 ICT module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1: Basics on ICT - Online


 Day 2: Safety Surfing and Communication - Online



 **Day 3: MS Office applications - Online**

 Day 4: General in-class activity - In class

 Day 5: Word practice and tasks - In class

 Day 6: Excel practice and tasks - In class

 Day 7: Excel practice and






Word 2016

Certified Trainer!

Kirt Kershaw

• Watch the following video on "Formatting Text"






Word 2016

Certified Trainer!

Kirt Kershaw

• Watch the following video on "How To Create A Table"

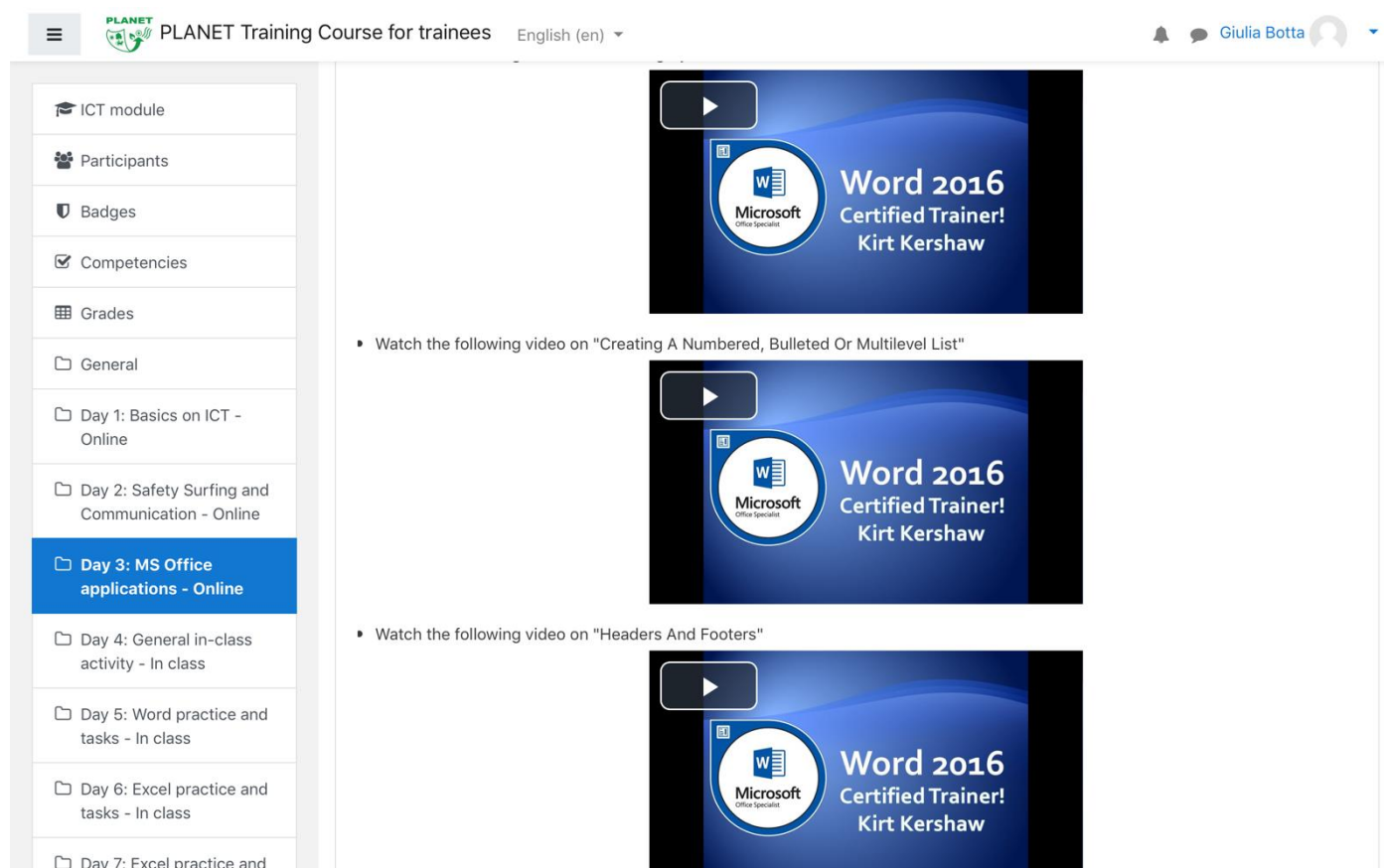
Word 2016

Certified Trainer!

Kirt Kershaw

Figura 233



PLANET – Plan for Agriculture reNewable Energy Training





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Figura 234

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta

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- Day 7: Excel practice and



Objective 2: use presentation software

- Watch the following video on "PowerPoint Introduction"



- Watch the following video on "Free PowerPoint Templates"


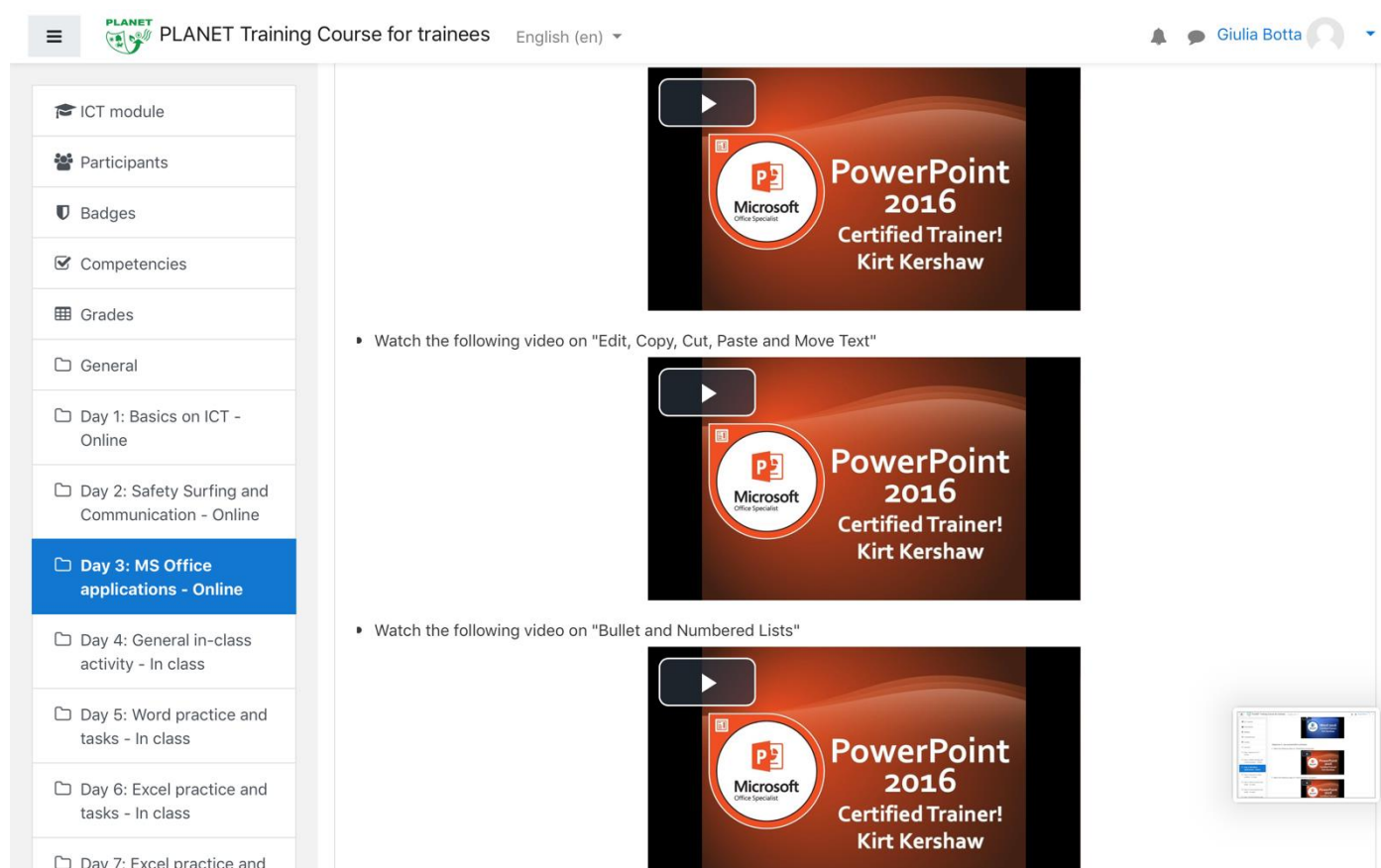


Figura 235

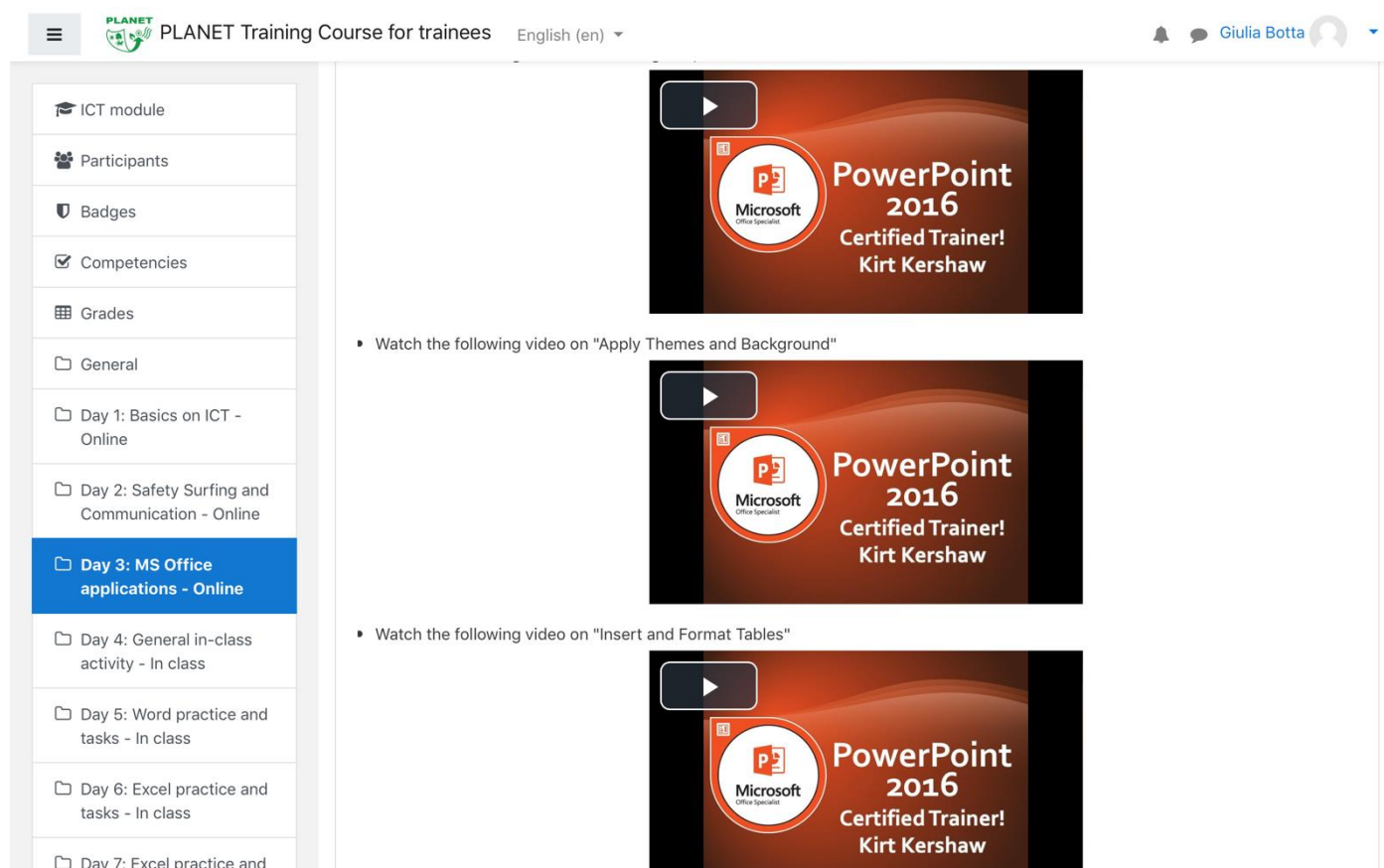
PLANET – Plan for Agriculture reNewable Energy Training



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Figura 236

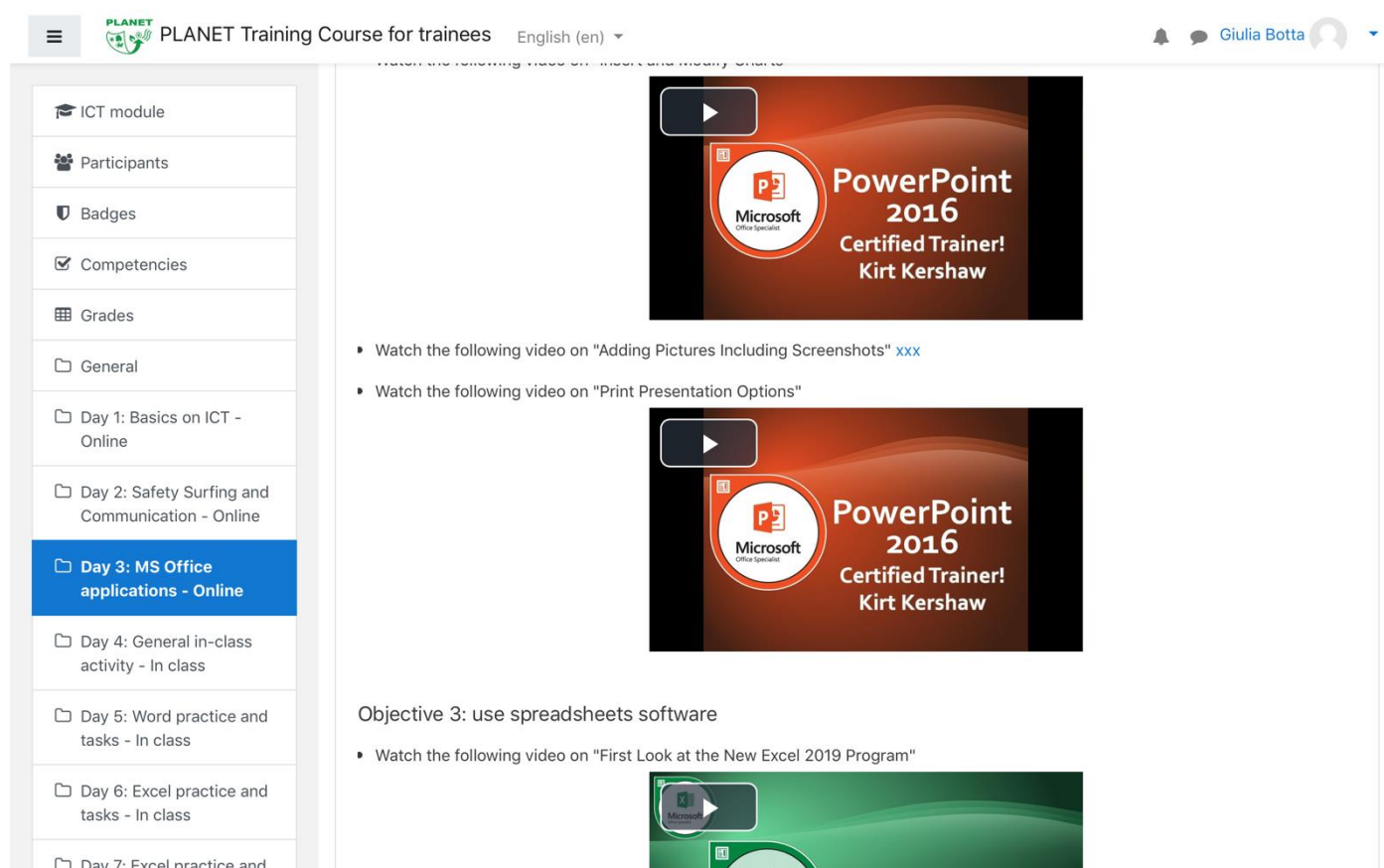
PLANET – Plan for Agriculture reNewable Energy Training



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Figura 237

PLANET – Plan for Agriculture reNewable Energy Training





The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile "Giulia Botta". The left sidebar contains a menu with the following items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted in blue), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class.




The main content area displays a list of training modules. The first module is "PowerPoint 2016 Certified Trainer! Kirt Kershaw", which includes two video links: "Watch the following video on 'Adding Pictures Including Screenshots'" and "Watch the following video on 'Print Presentation Options'". The second module is "PowerPoint 2016 Certified Trainer! Kirt Kershaw", which includes a video link: "Watch the following video on 'First Look at the New Excel 2019 Program'".


Below the video links, the text "Objective 3: use spreadsheets software" is displayed. The bottom of the screenshot shows a partial view of a video player with a green background and a Microsoft logo.


Figura 238


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 ICT module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1: Basics on ICT - Online


 Day 2: Safety Surfing and Communication - Online



 **Day 3: MS Office applications - Online**

 Day 4: General in-class activity - In class

 Day 5: Word practice and tasks - In class

 Day 6: Excel practice and tasks - In class



 Day 7: Excel practice and

Excel 2019

Microsoft
Excel Specialist & Expert!
Kirt Kershaw



- Watch the following video on "Save & Save As for Backups and Copies of Workbooks"

Excel 2019

Microsoft
Excel Specialist & Expert!
Kirt Kershaw

- Watch the following video on "How to Enter Basic Formulas"









Excel 2019

Microsoft
Excel Specialist & Expert!
Kirt Kershaw


Figura 239

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta


- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and




Excel 2019
Microsoft
Excel Specialist & Expert!
Kirt Kershaw

- Watch the following video on "MAX and MIN Functions"



Excel 2019
Microsoft
Excel Specialist & Expert!
Kirt Kershaw

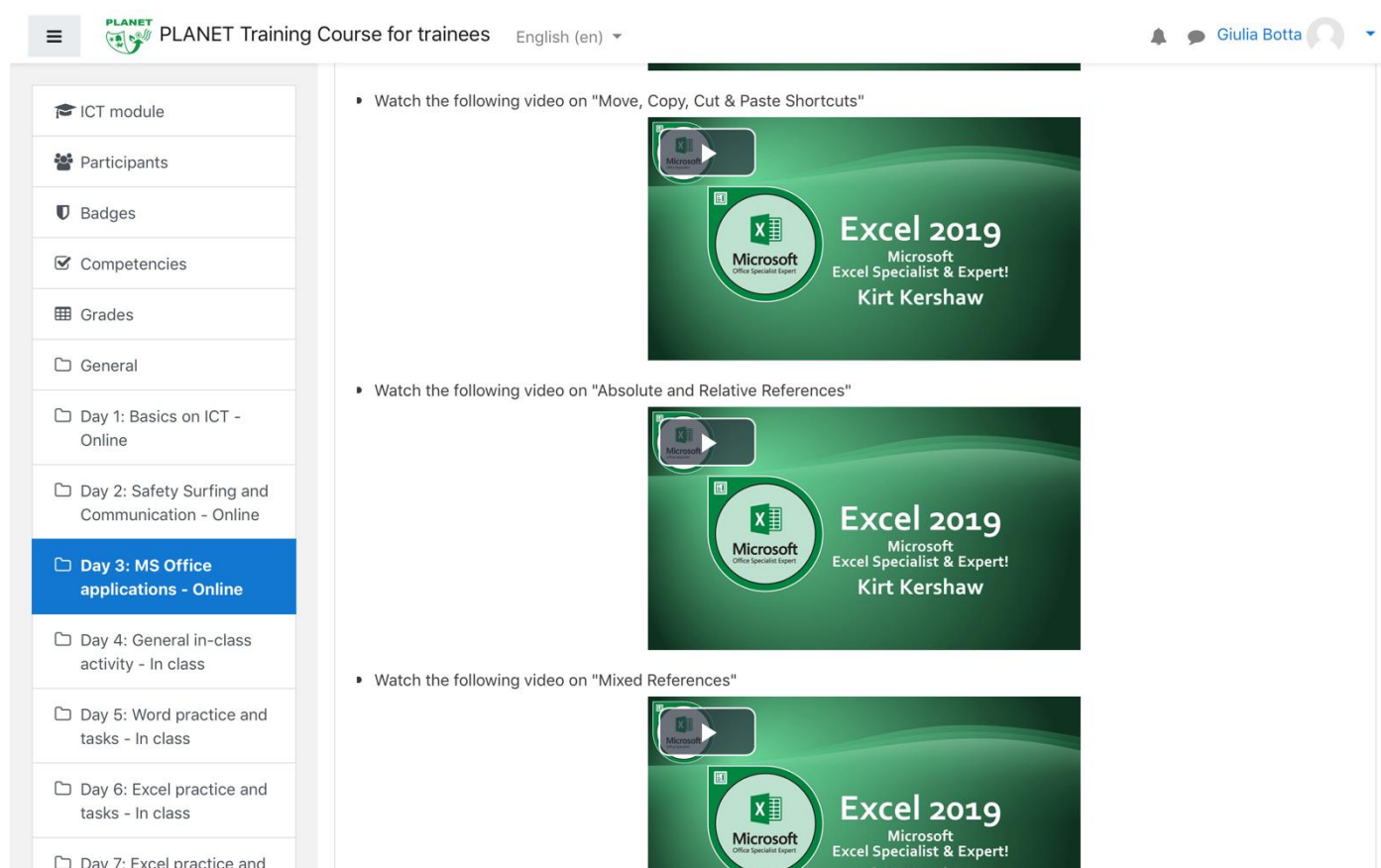
- Watch the following video on "COUNT and COUNTA Functions"



Excel 2019
Microsoft
Excel Specialist & Expert!
Kirt Kershaw

Figura 240

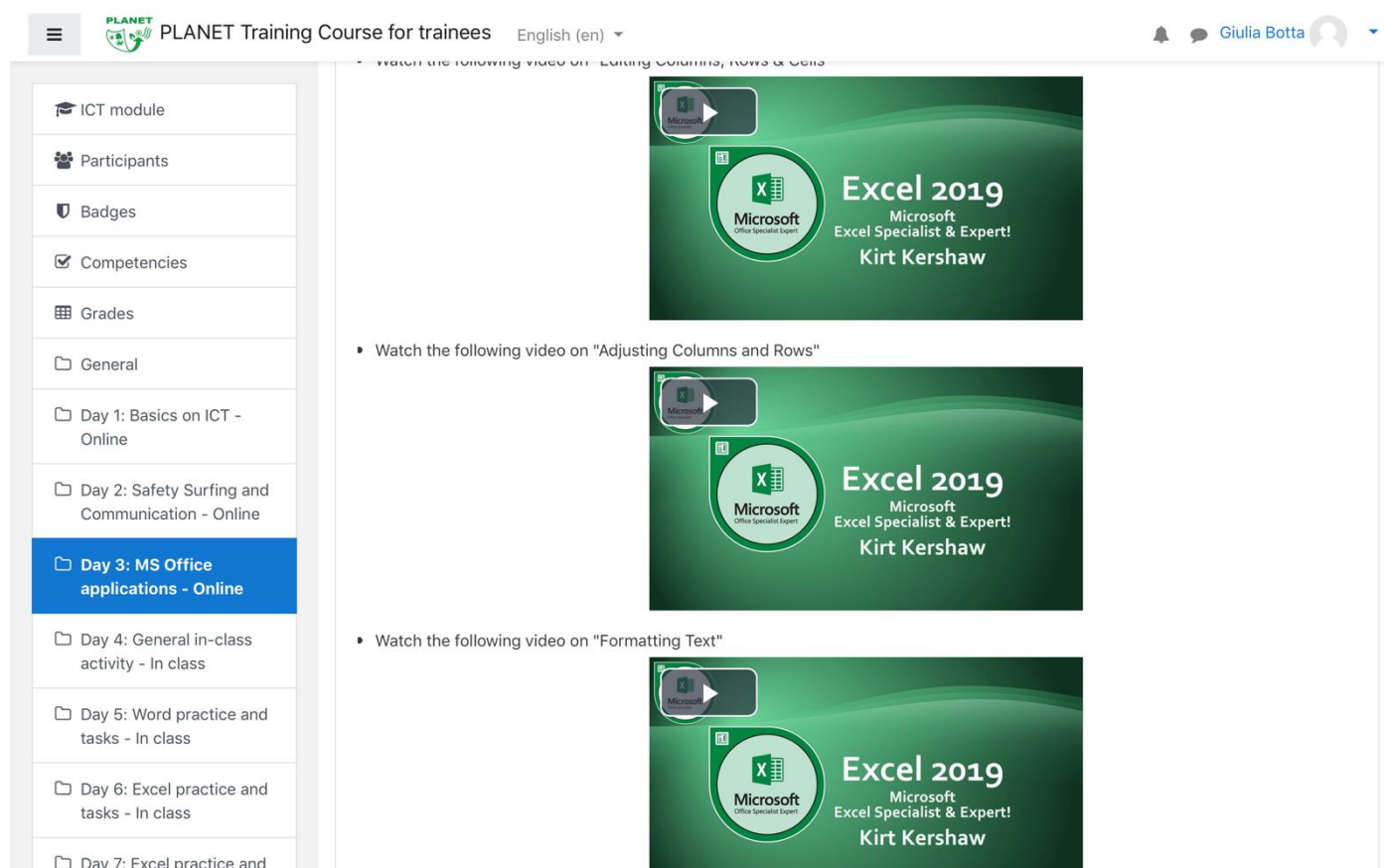
PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for Giulia Botta. The left sidebar contains a menu with the following items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted in blue), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class. The main content area displays three video thumbnails for Excel 2019 training, each featuring the Microsoft logo and the text "Excel 2019 Microsoft Excel Specialist & Expert! Kirt Kershaw". The videos are titled "Watch the following video on 'Move, Copy, Cut & Paste Shortcuts'", "Watch the following video on 'Absolute and Relative References'", and "Watch the following video on 'Mixed References'".

Figura 241



PLANET – Plan for Agriculture reNewable Energy Training





The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile "Giulia Botta". The left sidebar contains a menu with the following items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted in blue), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class. The main content area displays three video thumbnails for "Excel 2019" by Kirt Kershaw, each with a "Watch the following video on" instruction. The first video is titled "Adjusting Columns, Rows & Cells", the second is "Formatting Text", and the third is "Formatting Text". Each video thumbnail features the Microsoft Excel logo and the text "Microsoft Excel Specialist & Expert! Kirt Kershaw".

Figura 242


PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)




Giulia Botta

- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

- watch the following video on "Basic Number Formats"



- Watch the following video on "Formatting Shortcuts"



- Watch the following video on "Align, Position, Merge and Wrap Cell Data"









Figura 243


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta


- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

- Watch the following video on "Print Preview"


- Watch the following video on "Insert, Delete, Move, Copy, Rename and Color Worksheets"


- Watch the following video on "Learn the Basics for a Quick Start"










Figura 244

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼




Giulia Botta

▼

- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and



Excel's IF function simplified

- Watch the following video on "Sorting Data"



Additional materials

- For deeper understand word processing software:
 - Watch the video on "Find, Search And Navigation Panel"


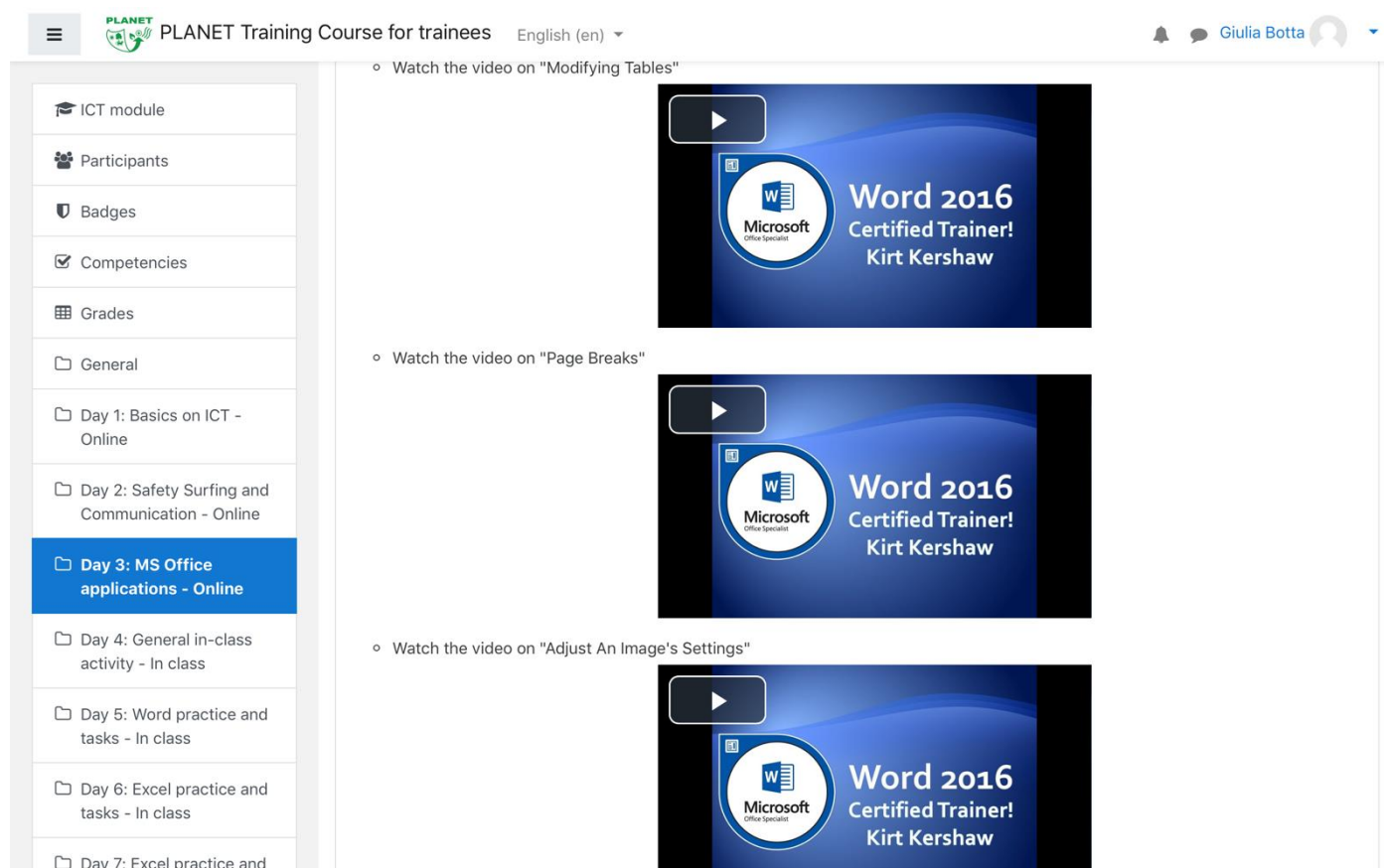


Figura 245



PLANET – Plan for Agriculture reNewable Energy Training






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with the following items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class. The main content area displays three video thumbnails, each with a play button and the text "Word 2016 Certified Trainer! Kirt Kershaw". The videos are titled "Watch the video on 'Modifying Tables'", "Watch the video on 'Page Breaks'", and "Watch the video on 'Adjust An Image's Settings'".


Figura 246

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta


- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and



- For deeper understand presentation software
 - Watch the video on "Format Text and Text Boxes"



- Watch the video on "Add, Delete and Modify Slide Layouts"










Figura 247

PLANET – Plan for Agriculture reNewable Energy Training





PLANET Training Course for trainees
English (en)



Giulia Botta

- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

- Watch the video on "Format Objects, Brightness, Transparency and 3D Rotation"

- For deeper understand spreadsheets software
 - Watch the video on "Text to Columns"



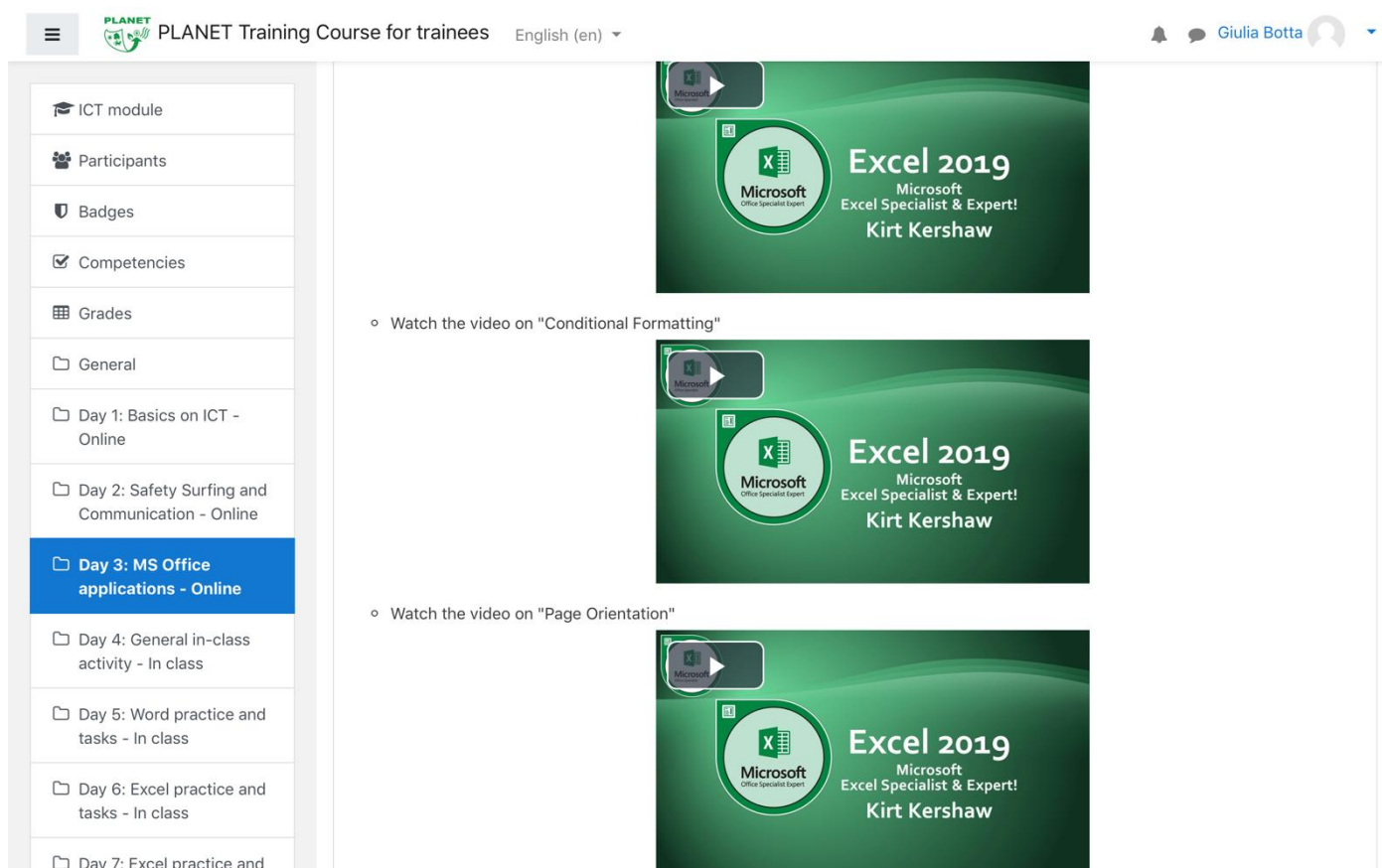



Figura 248

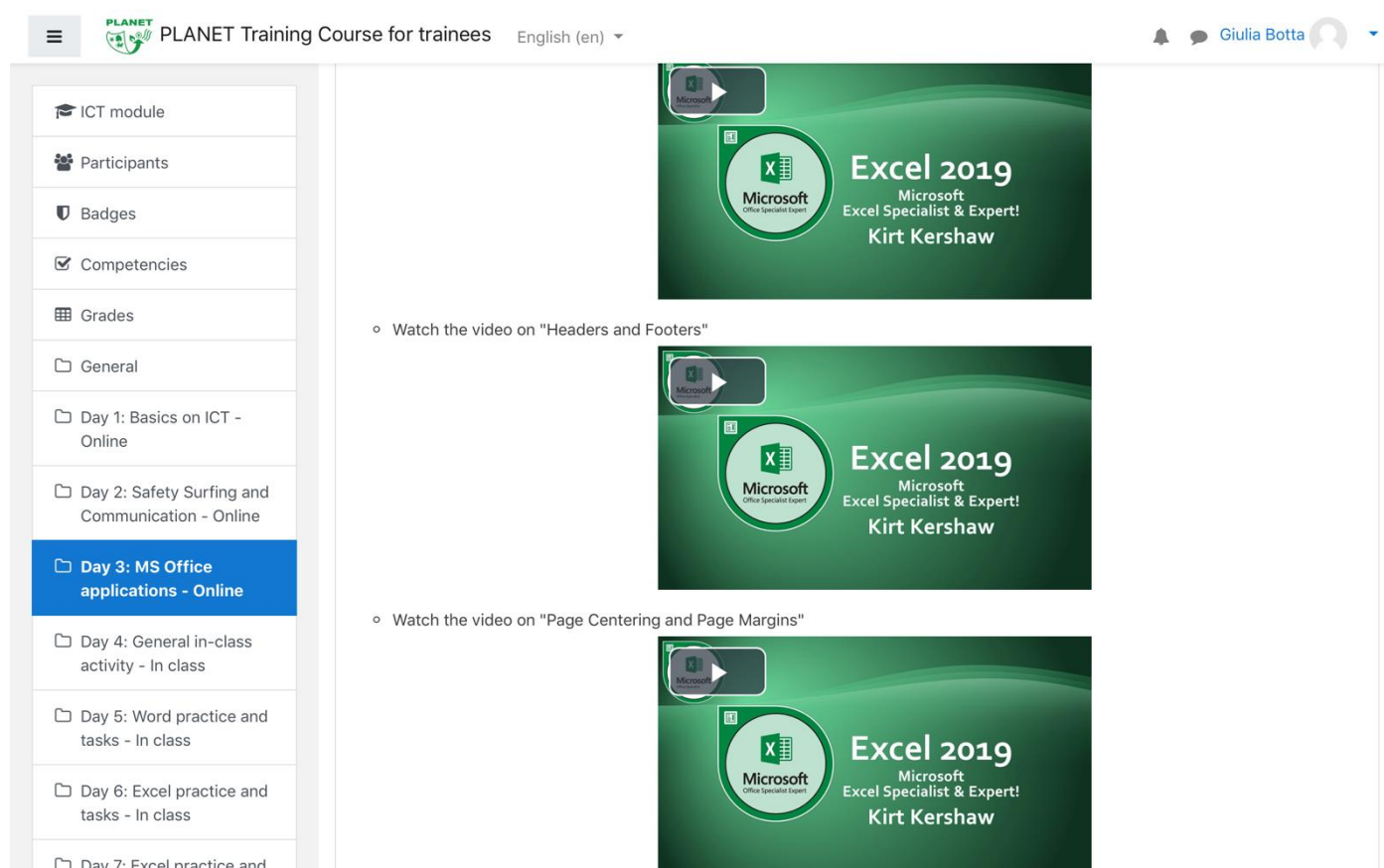
PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta". The left sidebar contains a menu with the following items: ICT module, Participants, Badges, Competencies, Grades, General, Day 1: Basics on ICT - Online, Day 2: Safety Surfing and Communication - Online, Day 3: MS Office applications - Online (highlighted in blue), Day 4: General in-class activity - In class, Day 5: Word practice and tasks - In class, Day 6: Excel practice and tasks - In class, and Day 7: Excel practice and tasks - In class. The main content area displays three video thumbnails for "Excel 2019 Microsoft Excel Specialist & Expert! Kirt Kershaw". The first video is titled "Watch the video on 'Conditional Formatting'", the second "Watch the video on 'Page Orientation'", and the third "Watch the video on 'Page Orientation'".

Figura 249

PLANET – Plan for Agriculture reNewable Energy Training



The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and a user profile for "Giulia Botta".

The left sidebar contains a list of course modules and activities:



- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online** (highlighted)
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and



The main content area displays three video thumbnails for "Excel 2019" by Kirt Kershaw, Microsoft Excel Specialist & Expert. The videos are titled:

- Watch the video on "Headers and Footers"
- Watch the video on "Page Centering and Page Margins"
- Watch the video on "Page Centering and Page Margins"

Figura 250


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)



Giulia Botta

- ICT module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1: Basics on ICT - Online
- Day 2: Safety Surfing and Communication - Online
- Day 3: MS Office applications - Online**
- Day 4: General in-class activity - In class
- Day 5: Word practice and tasks - In class
- Day 6: Excel practice and tasks - In class
- Day 7: Excel practice and

- Watch the video on "Page Breaks"


- Watch the video on "Set Print Range and Scaling"



Make the final assignment









Figura 251

PLANET – PLaN for Agriculture reNewable Energy Training

FOUR:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET ICT training course

[Dashboard](#) /
[My courses](#) /
[ICT module](#) /
[Day 4: General in-class activity - In class](#) /
[Day 4 activities](#)

Day 4 activities

ICT Course - Day 4: General in-class activity

Aim of the module

To give the trainees an efficient strategy to manage documents and data and address the issues arising from the online content.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Understand and apply the most efficient strategy to manage documents and data.
2. Be able to share and synchronize directories to prevent data loss.

Introduction

- Make the pre-test









Figura 252

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼


- In-class activity based on issues arising from the study of online material

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Understand and apply the most efficient strategy to manage documents and data

- Read or watch the following documents to understand how to manage files on a personal computer:
 - Read the 4.1_manage documents and data


 - Watch the following video on "Strategy of file naming"











Figura 253

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


Objective 2: Be able to share and synchronize directories to prevent data loss

- Read or watch the following documents to understand how to prevent data loss and How to share and synchronize directories:
 - Read the document on Share and synchronize directories
 
 - Read the document on Strategy to prevent data loss
 

Additional materials

- For deeper understand share and synchronize directories to prevent data loss:
 - Watch the video <https://www.bing.com/videos/search?q=how+to+use+google+drive&view=detail&mid=487252DA0194CBA7CD4C487252DA0194CBA7CD4C&rvsmid=A5336093A0E5B567D48EA5336093A0E5B567D48E&FORM=VIRE>
 - Watch the video <https://www.bing.com/videos/search?q=how+to+use+google+drive&view=detail&mid=A5336093A0E5B567D48EA5336093A0E5B567D48E&FORM=VIRE>
 - Watch the video




Figura 254

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)

[q=how+to+use+google+drive&view=detail&mid=467292DA0194CBA7CD4C467292DA0194CBA7CD4C4&vsiid=A5336093A0E5B567D48EA5336093A0E5B567D48E&FORM=VIRE](#)

- Watch the video
- Watch the video



- Watch the video





Make the final assignment






Figura 255

PLANET – PLaN for Agriculture reNewable Energy Training

FIVE:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET ICT training course

[Dashboard](#) /
[My courses](#) /
[ICT module](#) /
[Day 5: Word practice and tasks - In class](#) /
[Day 5 activities](#)

Day 5 activities

ICT Course - Day 5: Word practice and tasks

Aim of the module

To give the trainees an overview of how to make a technical report using Microsoft Word.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Create a technical report using Microsoft Word

Introduction

- Make the pre-test









Figura 256

PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Create a technical report using Microsoft Word

- Read the following documents to understand how to avoid the usual mistake on making a technical report using Microsoft Word:
 - Read the 5.1_Guide on text writing with Word (EN)
 

Additional materials


- For deeper understand how to avoid common grammar mistakes in English:
 - Watch the video on Common Grammar Mistakes in English
 

Figura 257

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta




Additional materials

- For deeper understand how to avoid common grammar mistakes in English:
 - Watch the video on Common Grammar Mistakes in English



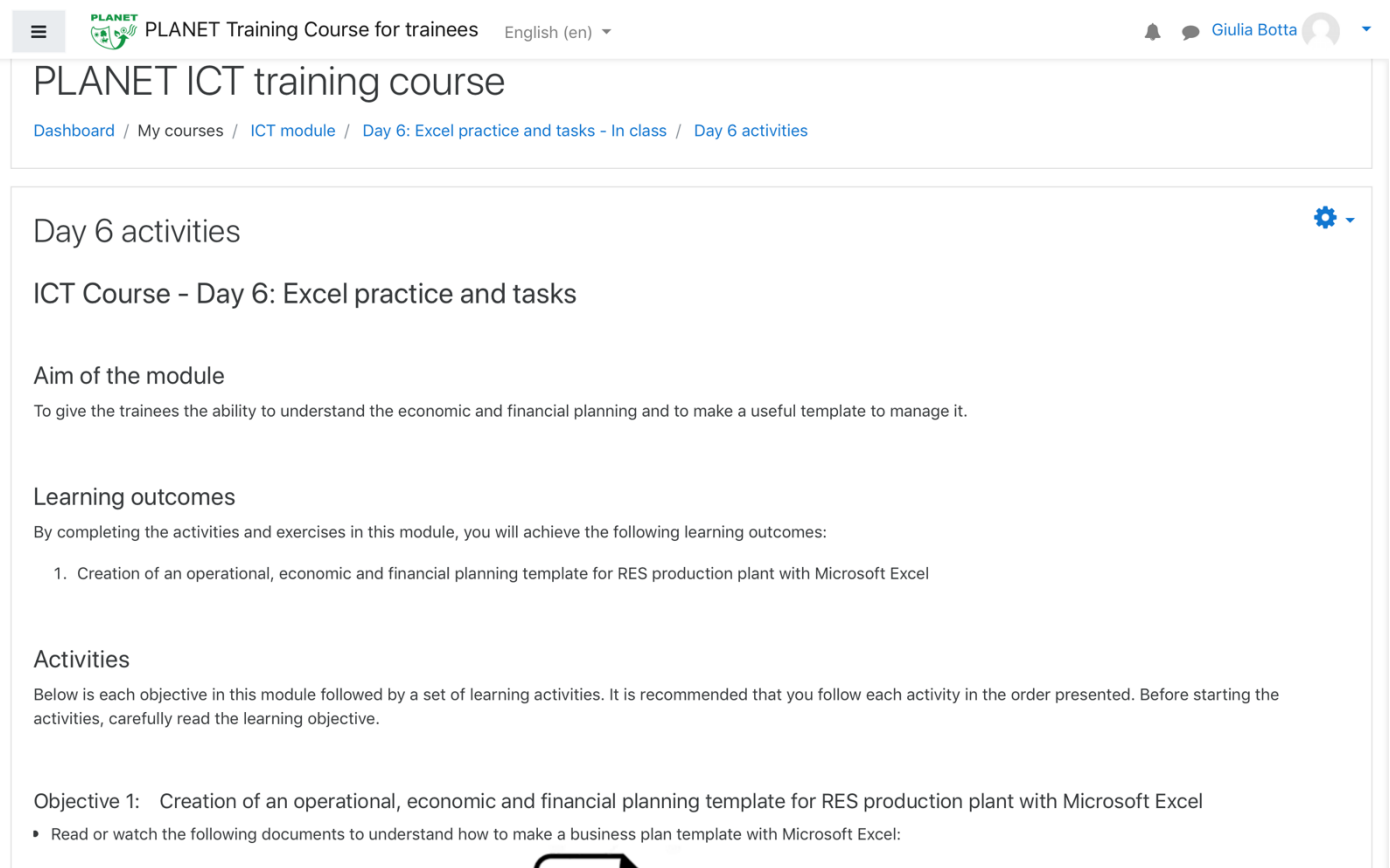
Make the final assignment



Figura 258

PLANET – Plan for Agriculture reNewable Energy Training



SIX:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes a hamburger menu, the PLANET logo, the course title 'PLANET Training Course for trainees', the language 'English (en)', a notification bell, a chat icon, and the user profile 'Giulia Botta'. The main content area is titled 'PLANET ICT training course' and includes a breadcrumb trail: 'Dashboard / My courses / ICT module / Day 6: Excel practice and tasks - In class / Day 6 activities'. The 'Day 6 activities' section is expanded, showing the 'ICT Course - Day 6: Excel practice and tasks' module. The module's aim is to give trainees the ability to understand economic and financial planning and to make a useful template to manage it. The learning outcomes section states that by completing the activities, trainees will achieve the following learning outcomes: 1. Creation of an operational, economic and financial planning template for RES production plant with Microsoft Excel. The activities section states that below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective. The objective 1 is: Creation of an operational, economic and financial planning template for RES production plant with Microsoft Excel. The activities listed are: Read or watch the following documents to understand how to make a business plan template with Microsoft Excel.

Figura 259

PLANET – PLaN for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Creation of an operational, economic and financial planning template for RES production plant with Microsoft Excel

- Read or watch the following documents to understand how to make a business plan template with Microsoft Excel:
 - Read the "6.1_Business Plan general introduction" document



Additional materials

- For deeper understand share and synchronize directories to prevent data loss:

Make the final assignment


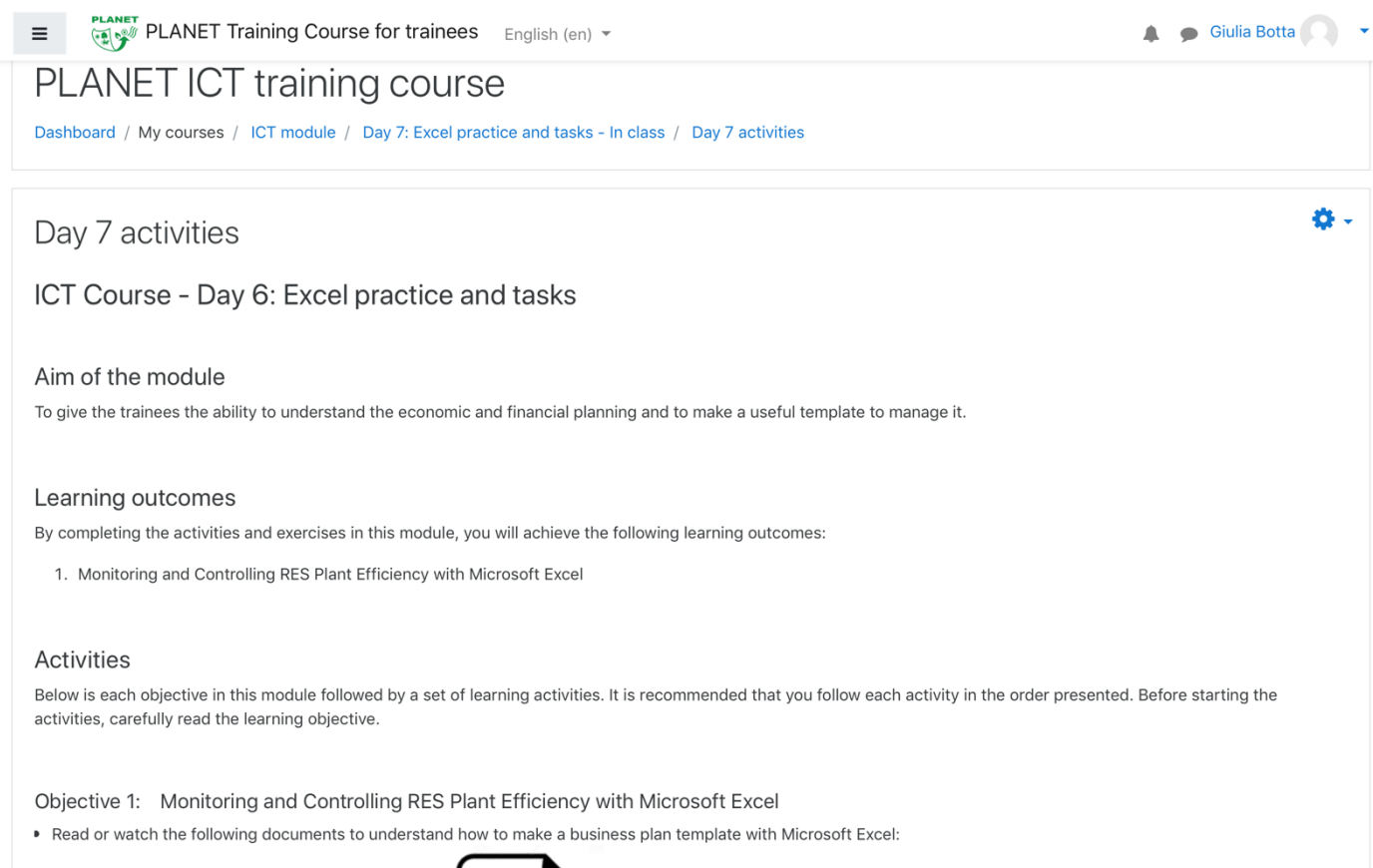


Figura 260

PLANET – PLaN for Agriculture reNewable Energy Training



SEVEN:






The screenshot shows the PLANET Training Course for trainees interface. The top navigation bar includes a hamburger menu, the PLANET logo, the course title 'PLANET Training Course for trainees', the language 'English (en)', a notification bell, a chat icon, and the user profile 'Giulia Botta'. The main content area is titled 'PLANET ICT training course' and includes a breadcrumb trail: 'Dashboard / My courses / ICT module / Day 7: Excel practice and tasks - In class / Day 7 activities'. The 'Day 7 activities' section is active, showing the 'ICT Course - Day 6: Excel practice and tasks'. Below this, the 'Aim of the module' is to give trainees the ability to understand economic and financial planning and make a useful template. The 'Learning outcomes' section states that by completing activities, trainees will achieve the following: 1. Monitoring and Controlling RES Plant Efficiency with Microsoft Excel. The 'Activities' section explains that each objective is followed by a set of learning activities and recommends following them in order. The 'Objective 1: Monitoring and Controlling RES Plant Efficiency with Microsoft Excel' is listed, with a sub-point: 'Read or watch the following documents to understand how to make a business plan template with Microsoft Excel:'. A small icon of a laptop is visible at the bottom of the objective list.


Figura 261

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Read the "7.1_Business Plan with Excel" document
- Download and practice with "7.1_Excel_practice"



Additional materials

- For deeper understand share and synchronize directories to prevent data loss:

Make the final assignment









Figura 262

PLANET – Plan for Agriculture reNewable Energy Training

EIGHT:



PLANET Training Course for trainees
English (en) ▼



Giulia Botta

▼

PLANET ICT training course

[Dashboard](#) /
[My courses](#) /
[ICT module](#) /
[Day 8: Creating reports for investors and stakeholders - In class](#) /
[Day 8 activities](#)

Day 8 activities

ICT Course - Day 8: Creating reports for investors and stakeholders

Aim of the module

To give the trainees the ability to prepare a report on RES production and show it to the investors and stakeholders.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Create data outputs with Power point
2. Be able to prepare a report on RES production

Activities



Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.




Objective 1: Create data outputs with Power point

- Read or watch the following documents to understand how to make a business plan template with Microsoft Excel:

Figura 263

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼




Giulia Botta

▼

2. Be able to prepare a report on RES production

Activities

Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Create data outputs with Power point

- Read or watch the following documents to understand how to make a business plan template with Microsoft Excel:
 - Read the "8.1_Tips for Power Point presentation (EN)"
 

Objective 2: Be able to prepare a report on RES production







- Read or watch the following documents to understand how to make a business plan template with Microsoft Excel:
 - Make a power Point presentation example for the investors and the stakeholders
 

Figura 264

PLANET – PLaN for Agriculture reNewable Energy Training

NINE:



PLANET Training Course for trainees
English (en)



Giulia Botta


PLANET ICT training course

[Dashboard](#) /
[My courses](#) /
[ICT module](#) /
[Day 9: Informatic RES plant management tools - In class](#) /
[Day 9 activities](#)

Day 9 activities

ICT Course - Day 9: Informatic RES plant management tools

Aim of the module

To give the trainees the basics on the Internet of Things on RES production and an example of a tool for RES plant management.

Learning outcomes

By completing the activities and exercises in this module, you will achieve the following learning outcomes:

1. Know specific software for RES plant management
2. Understand the implications of the Internet of Things on RES production



Activities




Below is each objective in this module followed by a set of learning activities. It is recommended that you follow each activity in the order presented. Before starting the activities, carefully read the learning objective.

Objective 1: Know specific software for RES plant management


Figura 265

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Objective 1: Know specific software for RES plant management

- Read or watch the following documents to have a look at an example of a tool for RES plant management:
 - Read the "9.1 CMA tool"


Objective 2: Understand the implications of the Internet of Things on RES production








- Read or watch the following documents to understand the basics of IoT for RES production:
 - Read the "9.2.1_Internet of Things basics"

 - read the "9.2.2_IoT for RES production"




Figura 266

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


Objective 2: Understand the implications of the Internet of Things on RES production

- Read or watch the following documents to understand the basics of IoT for RES production:
 - Read the "9.2.1_Internet of Things basics"

 - read the "9.2.2_IoT for RES production"


Make the day9 final test




Figura 267



Co-funded by the
Erasmus+ Programme
of the European Union

PLANET – Plan for Agriculture reNewable Energy Training

ANNEX 2: EVALUATION OF TRAINEES' LEARNING

LEARNING EVALUATION:

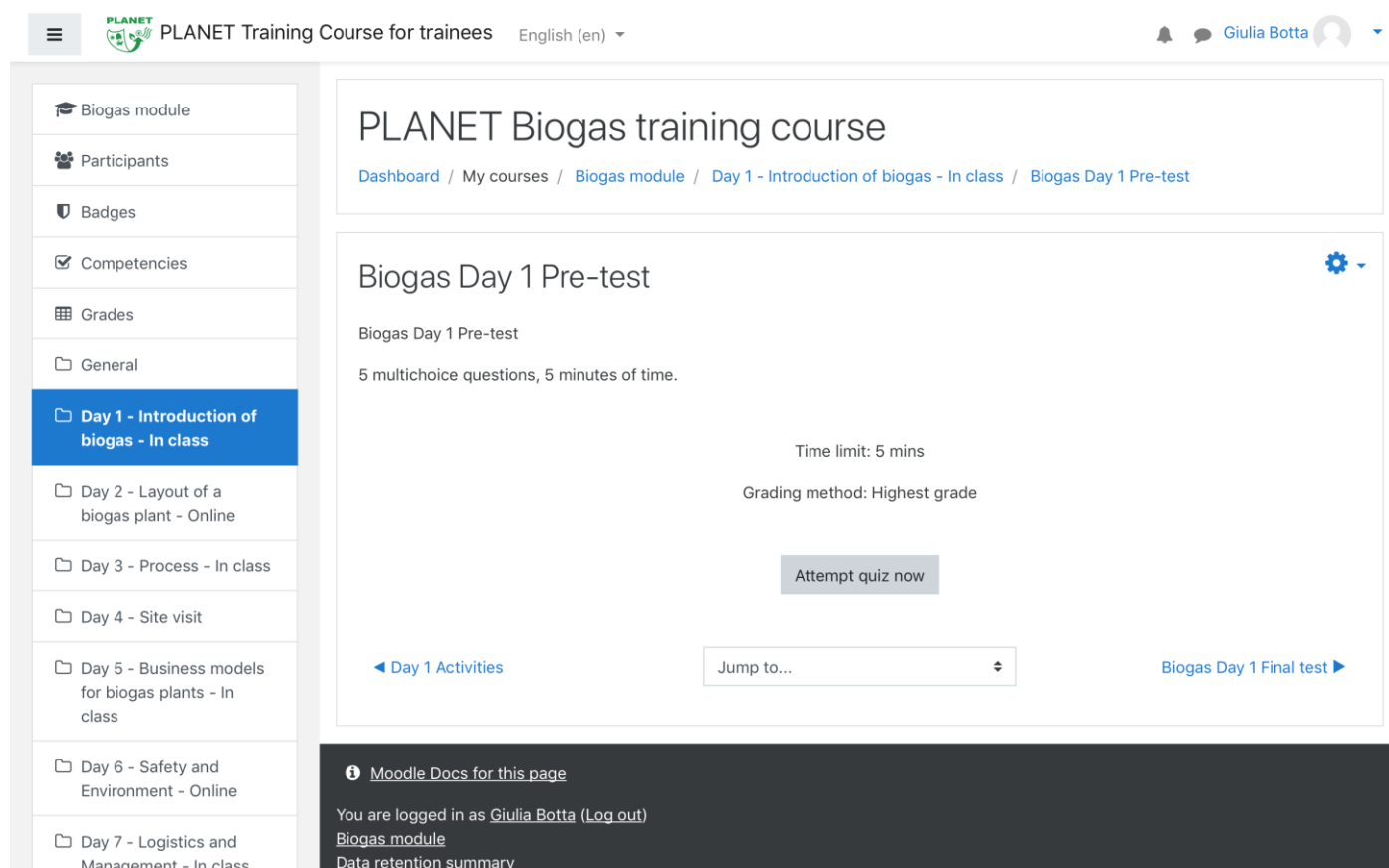
In order to evaluate the learning outcomes of the trainees, tests have been created on the platform for each training day of each module. In particular, it is planned to take a preliminary test of 5 questions before the trainee starts to follow the course, and a final test (of 10 questions) at the end of the course. The latter gives the evaluation of each student and allows the teacher to understand (by comparing the results of the pre-test and final test) how much the course and the teaching method chosen have been able to increase the student's training (the pre-test and final test questions are "taken" from the same drawer but proposed randomly to the student).

EVALUATION OF TRAINEES' SATISFACTION:

At the end of each course, students are offered a questionnaire to assess their satisfaction. This will be delivered on paper by the teacher at the end of the last lesson and collected. This choice is dictated by the fact that this method ensures that all students fill in the questionnaire and are not influenced by the final test grade.

PLANET – Plan for Agriculture reNewable Energy Training

EXAMPLE OF A PRE-TEST:



The screenshot displays the PLANET Training Course for trainees interface. The top navigation bar includes the PLANET logo, the course title "PLANET Training Course for trainees", the language "English (en)", and the user profile "Giulia Botta".

The left sidebar lists the course structure:

- Biogas module
- Participants
- Badges
- Competencies
- Grades
- General
- Day 1 - Introduction of biogas - In class** (selected)
- Day 2 - Layout of a biogas plant - Online
- Day 3 - Process - In class
- Day 4 - Site visit
- Day 5 - Business models for biogas plants - In class
- Day 6 - Safety and Environment - Online
- Day 7 - Logistics and Management - In class

The main content area is titled "PLANET Biogas training course" and shows the breadcrumb path: [Dashboard](#) / [My courses](#) / [Biogas module](#) / [Day 1 - Introduction of biogas - In class](#) / [Biogas Day 1 Pre-test](#).

The "Biogas Day 1 Pre-test" section displays the following information:

- Biogas Day 1 Pre-test**
- 5 multichoice questions, 5 minutes of time.
- Time limit: 5 mins
- Grading method: Highest grade
- [Attempt quiz now](#)



Navigation links include [◀ Day 1 Activities](#), a [Jump to...](#) dropdown menu, and [Biogas Day 1 Final test ▶](#).




The footer section contains:


- [Moodle Docs for this page](#)
- You are logged in as [Giulia Botta](#) ([Log out](#))
- [Biogas module](#)
- [Data retention summary](#)


Figura 268


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 Biogas module


 Participants


 Badges


 Competencies


 Grades


 General


 Day 1 - Introduction of biogas - In class


 Day 2 - Layout of a biogas plant - Online

 Day 3 - Process - In class

 Day 4 - Site visit

 Day 5 - Business models for biogas plants - In class

 Day 6 - Safety and Environment - Online

 Day 7 - Logistics and Management - In class

PLANET Biogas training course

[Dashboard](#) /
[My courses](#) /
[Biogas module](#) /
[Day 1 - Introduction of biogas - In class](#) /
[Biogas Day 1 Pre-test](#) /
[Preview](#)

Question 1

Not yet answered

Marked out of 2.00

Flag question

Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of dissolved polymers like sugar, amino and fatty acids with formation of H₂.

Select one or more:

☐ a. Acetogenesis

☐ b. Hydrolysis

☐ c. Acidogenesis

☐ d. Methanogenesis

Question 2

Not yet answered

Marked out of 2.00

Flag question

Edit question

What lead to a decline in biogas production form 1950-1970?

Select one or more:

☐ a. The oil crisis

☐ b. Increase in animal husbandry

☐ c. Cheap fuels and natural gas

☐ d. The energy deficit

Quiz navigation

1

2

3

4

5

[Finish attempt ...](#)

Time left **0:04:55**



Start a new preview




Figura 269

Project Erasmus + PLANET

Agreement Number 2017-3177/001-001

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en) ▼



Giulia Botta


- Biogas module
- Participants
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- Day 1 - Introduction of biogas - In class**
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- Day 5 - Business models for biogas plants - In class
- Day 6 - Safety and Environment - Online
- Day 7 - Logistics and Management - In class

Question 3

Not yet answered

Marked out of 2.00

Flag question

Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of the products from the previous stages with formation of methane, CO₂ and water.

Select one or more:

- ☐ a. Methagogenesis
- ☐ b. Acidogenesis
- ☐ c. Acetogenesis
- ☐ d. Hydrolysis

Question 4

Not yet answered

Marked out of 2.00

Flag question

Edit question

What do you call the residue from biogas production

Select one or more:

- ☐ a. Co-substrate
- ☐ b. Digestate
- ☐ c. Silage
- ☐ d. Slurry

Question 5

Not yet answered

Marked out of 2.00

Flag question



The global warming potatial of methane is 28. The definition of Global warming potential is:




Select one or more:


- ☐ a. none of the above
- ☐ b. a measure of how much carbon dioxide gas is


Figura 270


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta  ▼


 Biogas module


 Participants


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 General


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Not yet answered
Marked out of 2.00
Flag question
Edit question

Question 5
Not yet answered
Marked out of 2.00
Flag question
Edit question

Select one or more:

- ☐ a. Co-substrate
- ☐ b. Digestate
- ☐ c. Silage
- ☐ d. Slurry

The global warming potatol of methane is 28. The definition of Global warming potential is:

Select one or more:

- ☐ a. none of the above
- ☐ b. a measure of how much carbon dioxide gas is trapped in the atmosphere
- ☐ c. a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to a normal car
- ☐ d. a measure of how much heat a greenhouse gas traps in the atmosphere up to a specific time horizon, relative to carbon dioxide

Finish attempt ...



◀ Day 1 Activities




Jump to...
▼


Biogas Day 1 Final test ▶


Figura 271


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 Biogas module


 Participants


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Biogas Day 1 Pre-test

Summary of attempt

Question	Status
1	Answer saved
2	Answer saved
3	Answer saved
4	Answer saved
5	Answer saved

Return to attempt

Time left 0:04:00

This attempt must be submitted by Wednesday, 4 March 2020, 3:39 PM.

Submit all and finish

[◀ Day 1 Activities](#)

Jump to...

[Biogas Day 1 Final test ▶](#)

Quiz navigation

1

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4



5




[Finish attempt ...](#)

Start a new preview

Figura 272

PLANET – Plan for Agriculture reNewable Energy Training



PLANET Training Course for trainees
English (en)



Giulia Botta


- Biogas module
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PLANET Biogas training course

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Started on	Wednesday, 4 March 2020, 3:34 PM
State	Finished
Completed on	Wednesday, 4 March 2020, 3:35 PM
Time taken	1 min 6 secs
Grade	3.80 out of 10.00 (38%)

Question 1

Incorrect

Mark 0.00 out of 2.00

Flag question

Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of dissolved polymers like sugar, amino and fatty acids with formation of H₂.

Select one or more:

- ☐ a. Acetogenesis
- ☒ b. Hydrolysis ✖
- ☐ c. Acidogenesis
- ☐ d. Methanogenesis

The correct answer is: Acidogenesis

Quiz navigation

1

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3

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5

Finish review

Start a new preview

Question 2

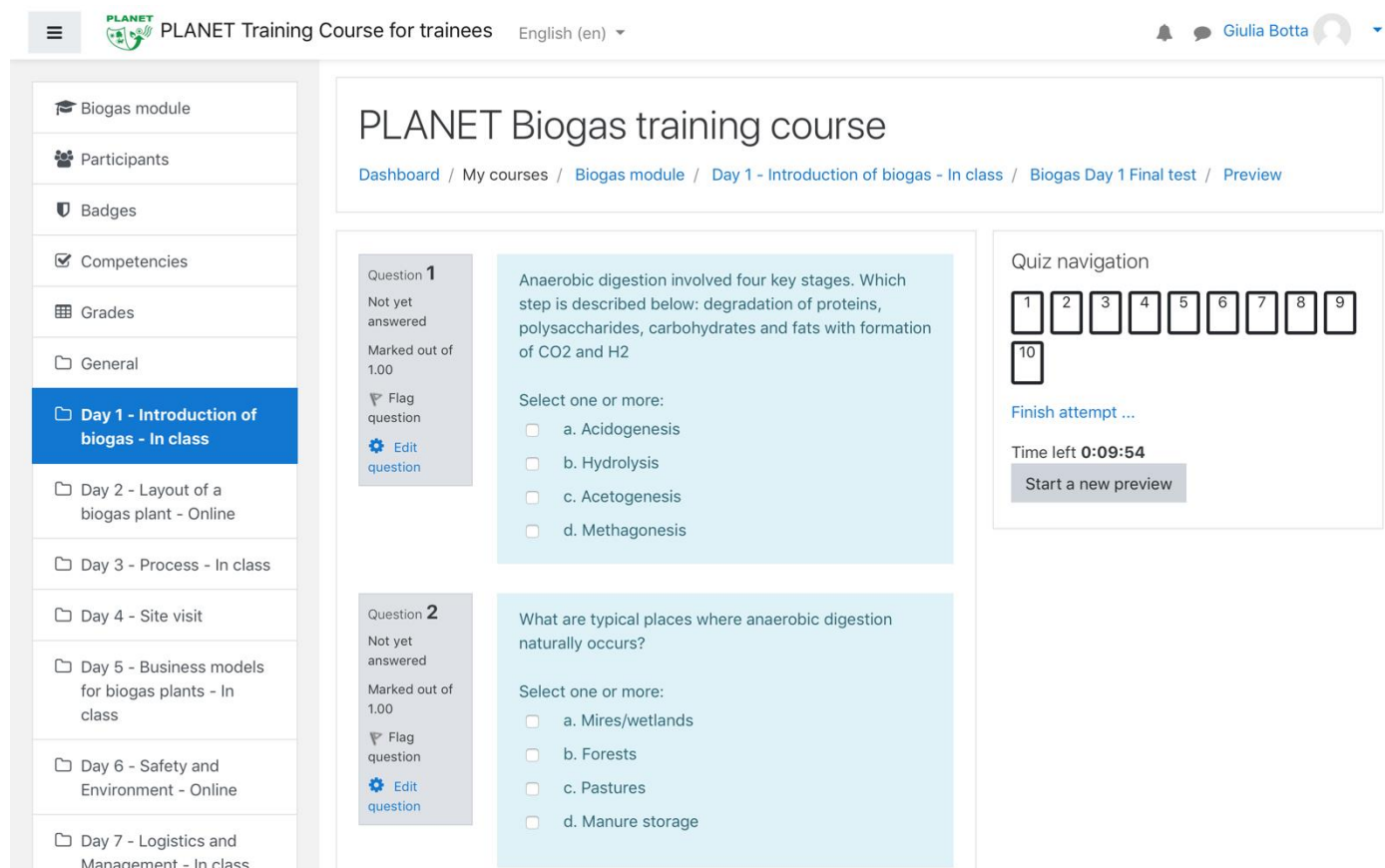
Incorrect

What lead to a decline in biogas production form 1950-1970?

Figura 273

PLANET – Plan for Agriculture reNewable Energy Training

EXAMPLE OF A FINAL TEST:



The screenshot displays the PLANET Training Course for trainees interface. The left sidebar shows the course structure with 'Day 1 - Introduction of biogas - In class' selected. The main content area shows 'Question 1' about the stages of anaerobic digestion. The question text is: 'Anaerobic digestion involved four key stages. Which step is described below: degradation of proteins, polysaccharides, carbohydrates and fats with formation of CO2 and H2'. The options are: a. Acidogenesis, b. Hydrolysis, c. Acetogenesis, and d. Methanogenesis. The right sidebar shows 'Quiz navigation' with buttons for questions 1 through 10, and a 'Finish attempt ...' button. The time left is 0:09:54.

PLANET Biogas training course

Dashboard / My courses / Biogas module / Day 1 - Introduction of biogas - In class / Biogas Day 1 Final test / Preview

Question 1
Not yet answered
Marked out of 1.00
Flag question
Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of proteins, polysaccharides, carbohydrates and fats with formation of CO₂ and H₂

Select one or more:

- ☐ a. Acidogenesis
- ☐ b. Hydrolysis
- ☐ c. Acetogenesis
- ☐ d. Methanogenesis

Question 2
Not yet answered
Marked out of 1.00
Flag question
Edit question

What are typical places where anaerobic digestion naturally occurs?

Select one or more:

- ☐ a. Mires/wetlands
- ☐ b. Forests
- ☐ c. Pastures
- ☐ d. Manure storage

Quiz navigation

1 2 3 4 5 6 7 8 9 10



Finish attempt ...




Time left 0:09:54


Start a new preview


Figura 274


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta  ▼


 Biogas module


 Participants


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Question 3
Not yet answered
Marked out of 1.00
 Flag question
 Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of short-chain fatty acids, acetic acid, CO₂ and hydrogen with formation of CO₂



Select one or more:

☐ a. Hydrolysis

☐ b. Acetogenesis

☐ c. Methanogenesis

☐ d. Acidogenesis

Question 4
Not yet answered
Marked out of 1.00
 Flag question
 Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of the products from the previous stages with formation of methane, CO₂ and water.

Select one or more:

☐ a. Acetogenesis

☐ b. Methanogenesis

☐ c. Acidogenesis

☐ d. Hydrolysis

Question 5
Not yet answered
Marked out of 1.00



What do you call the residue from biogas production




Select one or more:


☐ a. Digestate


Figura 275


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta

▼


 Biogas module


 Participants


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Question 3

Not yet answered

Marked out of 1.00

 Flag question

 Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of short-chain fatty acids, acetic acid, CO₂ and hydrogen with formation of CO₂


Select one or more:


- ☐ a. Hydrolysis
- ☐ b. Acetogenesis
- ☐ c. Methanogenesis
- ☐ d. Acidogenesis

Question 4

Not yet answered

Marked out of 1.00

 Flag question

 Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of the products from the previous stages with formation of methane, CO₂ and water.

Select one or more:

- ☐ a. Acetogenesis
- ☐ b. Methanogenesis
- ☐ c. Acidogenesis
- ☐ d. Hydrolysis

Question 5

Not yet answered

Marked out of 1.00



What do you call the residue from biogas production




Select one or more:


- ☐ a. Digestate


Figura 276


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta



 Biogas module


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Question 6
Not yet answered
Marked out of 1.00
Flag question
Edit question

Biogas has a different energy density than other fuels. 1 m³ of biogas can be compared to:

Select one or more:

- ☐ a. 0,67 m³ of natural gas
- ☐ b. 2 liters of diesel
- ☐ c. 1,5 liter of benzine
- ☐ d. 0,5 liter of jet fuel

Question 7
Not yet answered
Marked out of 1.00
Flag question
Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of dissolved polymers like sugar, amino and fatty acids with formation of H₂.

Select one or more:

- ☐ a. Hydrolysis
- ☐ b. Acidogenesis
- ☐ c. Methanogenesis
- ☐ d. Acetogenesis

Question 8
Not yet answered
Marked out of 1.00
Flag question



Anaerobic digestion involved four key stages. What is true:




Select one or more:


- ☐ a. Hydrolysis (1) is the fastest, methanogenesis (4) the slowest


Figura 277


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en) ▼




Giulia Botta  ▼


 Biogas module


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Question **9**

Not yet answered

Marked out of 1.00

 Flag question


 Edit question


☐ d. Acetogenesis is also called acidification

Question **10**

Not yet answered

Marked out of 1.00

 Flag question

 Edit question

How many times must you fly from Paris to Amsterdam to emit 1 ton of CO₂

Select one or more:

☐ a. 150

☐ b. 25

☐ c. 1

☐ d. 7

What does anaerobic mean

Select one or more:

☐ a. occurring in the presence of oxygen


☐ b. occurring in the absence of free oxygen

☐ c. occurring naturally without human interference

☐ d. occurring only from a biological proces

◀ Biogas Day 1 Pre-test

Jump to...



Finish attempt ...



Day 2 Activities ▶




Figura 278


Project Erasmus + PLANET


Agreement Number 2017-3177/001-001


PLANET – Plan for Agriculture reNewable Energy Training




PLANET Training Course for trainees
English (en)




Giulia Botta



 Biogas module


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PLANET Biogas training course

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Started on	Wednesday, 4 March 2020, 3:36 PM
State	Finished
Completed on	Wednesday, 4 March 2020, 3:37 PM
Time taken	1 min 43 secs
Grade	3.80 out of 10.00 (38%)

Question 1

Correct

Mark 1.00 out of 1.00

Flag question

Edit question

Anaerobic digestion involved four key stages. Which step is described below: degradation of proteins, polysaccharides, carbohydrates and fats with formation of CO₂ and H₂

Select one or more:

- ☐ a. Acidogenesis
- ☒ b. Hydrolysis ✓
- ☐ c. Acetogenesis
- ☐ d. Methagogenesis

The correct answer is: Hydrolysis

Question 2

Incorrect

What are typical places where anaerobic digestion naturally occurs?

Quiz navigation

1

2

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6

7

8

9

10

[Finish review](#)

[Start a new preview](#)

Figura 279



Co-funded by the
Erasmus+ Programme
of the European Union

PLANET – PLaN for Agriculture reNewable Energy Training

FINAL COMMENTS ON LEARNING EVALUATION:

As the example images, in this case of Biogas Day1, for the pre-test there are 5 questions to answer in 5 min time, which are worth 2 points each, for the final test there are instead 10 questions from 1 point to answer in 10 min time. On the left there is the passage of time, and at the end of the attempt, whether it is a pre-test or a final test, the correction and the final score are presented.

Although this is only one example, everything is the same in every single "Day" of each module. Only the questions change, there are "drawers" of at least 15 questions for each "Day" of each module from which the system randomly draws at each attempt of all the simulations.