

AIRUSE

LIFE11 ENV/ES/584

**ANNEX 12: Courses  
on biomass  
combustion and  
sampling of emission  
from this source**

Action D4

Coordinated by:



**AIRUSE**



## Contenido

- 1 INTRODUCTION.....**
- 2 PROGRAM.....**
- 3 COURSE MATERIALS.....**



## 1 INTRODUCTION

On March 1–6<sup>th</sup>, 2013 partner UAVR ministered two complementary short courses on biomass combustion and sampling of emission from this source.

These short courses, of practical character, addressed the following aspects:

- modelling of biomass combustion processes
- mass and energy balances, combustion technologies
- domestic applications
- emission control technologies
- sampling probes
- calibration of gas analysers
- particulate matter samplers and other instruments
- isokinetic sampling
- sample conditioning
- calculation of emission factors



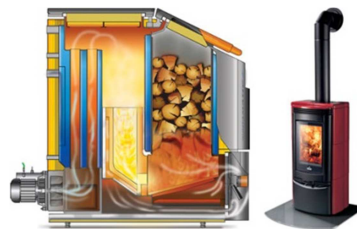


## 2 PROGRAM



# BIOMASS COMBUSTION

Short Course (1-3 March 2013)



## Course details

The course will provide a comprehensive overview of energy from biomass combustion and will give delegates a sound understanding of the fundamentals and practicalities of the following:

- Basics of solid biomass combustion
- Modelling of biomass combustion processes
- Mass and energy balances
- Combustion technologies
- Domestic applications
- Emission control technologies

The course will be delivered by a team of practitioners and academics, all experts in the field. Lectures will be supported by a full set of notes. The learning experience will be enhanced by a site visit to the University's biomass installation. The participant will have the opportunity to participate in the operation of this installation. Group work will be implemented. After data processing and interpretation a general discussion will be promoted.

## Who should attend?

This course will be of particular interest to:

- People who wish to further their knowledge of biomass energy, biomass stoves and biomass boilers
- Regional developers wanting to obtain a technical perspective on bioenergy
- Energy and environmental managers interested in utilising bioenergy
- Process heat system designers interested in biomass as a heat source
- Students who want to develop a project or thesis in the field

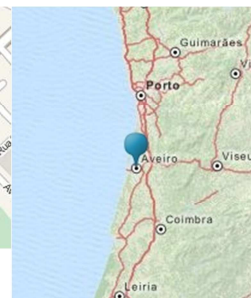
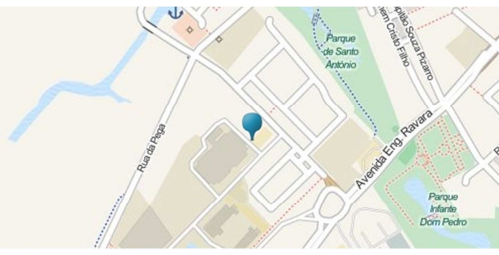
Limit: up to 15 participants

## Accreditation

This course has been developed in the frame of the LIFE 11 ENV/ES/00584 project (AIRUSE - Testing and Development of Air Quality Mitigation Measures in Southern Europe). The University of Aveiro actively participates in the LIFE+ programme funded project, being responsible for Action B.4. - Determination of the impact of biomass burning. The attendees will receive a participation certificate.

## Venue

The course venue will be the Department of Environment, University of Aveiro. The University campus is ten minutes by foot from Aveiro city centre.



### How to book?

Booking for this course should be made by sending an e-mail to [celia.alves@ua.pt](mailto:celia.alves@ua.pt). The following information should be included:

- Full name
- Institution
- Profession

There are no registration fees.

For additional information, please contact the organising committee:

Célia Alves ([celia.alves@ua.pt](mailto:celia.alves@ua.pt))

Luís Tarelho ([ltarelho@ua.pt](mailto:ltarelho@ua.pt))

Tel.: (+351) 234 370 200

### Schedule

Day/Hour	Activities	Trainer
1 March 9-12 h 14-17 h	Lecture – room 218 Lecture – room 218	Prof. Luís Tarelho Dr. Célia Alves
2 March 9-17 h	Biomass burning experiments	Prof. Luís Tarelho Dr. Célia Alves Dr. Márcio Duarte
3 March 9-12 h 14-17 h	Data treatment Discusson	Prof. Luís Tarelho Dr. Célia Alves Dr. Márcio Duarte

# SAMPLING OF EMISSIONS FROM RESIDENTIAL WOOD COMBUSTION

Short Course (4-6 March 2013)



## Course details

The course is designed to provide direct individual instruction for hands-on training in stack sampling and operation of instruments to quantify emissions from residential wood combustion. The course will provide information and skills on:

- Unit standards and conversions
- Sampling probes and transfer lines
- Training on operation of equipments and techniques
- Calibration of gas analysers, particulate matter samplers and other instruments
- Isokinetic sampling
- Sample conditioning
- Training on data sheets
- Calculation of emission factors

The course will be delivered by a team of practitioners and academics, all experts in the field. One skilled and qualified specialist will be responsible for the operational control of the installation, and another two will escort the trainees on sampling and use of instruments. Although the course is eminently practical, an initial lesson on basic concepts will be given, in which the biomass burning installation of the University of Aveiro will be presented. The participant will have the opportunity to carry out practical work in this installation.

## Who should attend?

This course will be of particular interest to:

- People who wish to further their knowledge of biomass combustion emissions
- Regional developers wanting to obtain a technical perspective on biomass combustion emissions
- Environmental managers interested in proposing emission mitigation measures
- Technicians working in environmental monitoring companies
- Students who want to develop a project or thesis in the field
- Teachers who want to have a practical perspective of the subjects they teach in lectures

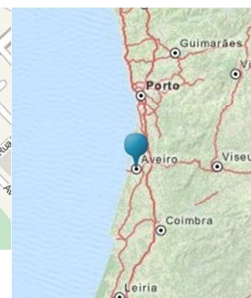
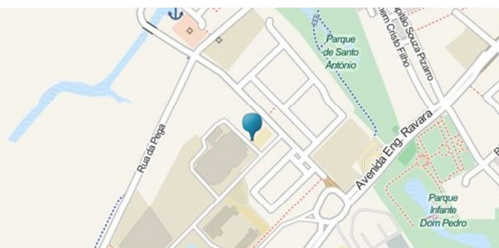
Course attendance is limited to a maximum of 10 people to ensure the maximum transfer of knowledge via maximisation of participant/teacher interaction and to provide for sufficient hands on instrument time.

## Accreditation

This course has been developed in the frame of the LIFE 11 ENV/ES/00584 project (AIRUSE - Testing and Development of Air Quality Mitigation Measures in Southern Europe). The University of Aveiro actively participates in the LIFE+ programme funded project, being responsible for Action B.4. - Determination of the impact of biomass burning. The attendees will receive a participation certificate.

## Venue

The course venue will be the Department of Environment, University of Aveiro. The University campus is ten minutes by foot from Aveiro city centre.



### How to book?

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For additional information, please contact the organising committee:

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Luís Tarelho ([ltarelho@ua.pt](mailto:ltarelho@ua.pt))

Tel.: (+351) 234 370 200

### Schedule

Day/Hour	Activities	Trainer
4 March 9-12 h	Lecture (Fundamentals) – room 223	Prof. Luís Tarelho
14-18 h	Weighing of filters, preparation of materials, calibration of equipments	Prof. Luís Tarelho, Dr. Célia Alves and Dr. Márcio Duarte
5 March 9-18 h	Biomass burning experiments	Prof. Luís Tarelho Dr. Célia Alves Dr. Márcio Duarte
6 March 9-12 h 14-16 h	Data treatment/Calculation of emission factors Discussion	Prof. Luís Tarelho Dr. Célia Alves Dr. Márcio Duarte

### **3 COURSE MATERIALS**

