



IMES

MASTER IN BIOENERGY AND ENVIRONMENT



UNIVERSITÀ
DEGLI STUDI
FIRENZE





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DIEF

Dipartimento di
Ingegneria Industriale





The Master is Managed by the CREAR – Research Centre on Renewable Energies of the University of Florence

biofuels
wind
micrositing
development
CSP^{lab}
chain
PV
hydro
bioenergy
research
solar
geothterm
biochemicals
innovation
anemometries
Education
Training
biomass
renewables



The Organising Committee



Prof. Maurizio De Lucia
Director



Prof. Emiliano Fratini, PhD



Dr. Enrico Palchetti, PhD



Prof. David Chiaramonti, PhD



Eng. Leonardo Nibbi, M.Sc.

- The Director and the Organising Committee are due to the management of the IMES Master Course in all his aspects.
- A staff of renowned scientific experts in all the fields of interest of the biomass to energy chain supervises the IMES Master activities.

Quality of Teaching is our first concern.

A staff of University Professors and Researchers working together with Professionals from Industry and Research to give the Best quality in Education and Training.

People whose everyday work is to face the multiple challenges of Bioenergy, RES and Environmental issues.



Prof. Maurizio de Lucia – Director

- University Degree in Mechanical Engineering, magna cum laude, he received his PhD in Energy in 1989; his Present position is Full Professor of Energy Systems and Environment at the University of Florence.
- He is Expert & Reviewer for EU and ministries, chair and member of various National & International committees.
- He is Author of several publications in the field of Machinery and Energy Systems.
- His main areas of interest are energy systems, Renewable Energy, solar concentrators and energy efficiency.
- He coordinates groups with predominantly activities in Modelling, design, development and testing of Solar based Systems.



Prof. Emeritus Francesco Martelli – Former Director

- Full Professor since 1980 at the Department of Industrial Engineering, University of Florence, Founder of the CREAR Centre.
- Retired, he is presently Professor Emeritus.
- He is Chairman of the European Turbomachinery Committee, organiser and chairman of several International and EU Conference.
- He has more than 30 years experience in the field of Energy, CFD modelling and Environmental Impact Modelling of Energy Production Plants.
- Author of more than 130 publications on International Journals and Conferences, he was the first **Director of the IMES Master since the beginning until 2017.**



Prof. David Chiaramonti

- **David Chiaramonti** is Contract Professor of “Bioenergy” at the University of Florence and President of the RE-CORD research centre.
- Awarded Linneborn Prize in 2017, his main scientific interest is on the production and the use of biofuels, either liquid, gaseous or solid. His research works cover thermochemical biomass conversion processes as well as liquid biofuel production and use.
- He has published more than 120 scientific papers in these areas, chapters in books and studies, as well as articles in specialised magazines. He is also member of editorial boards of several scientific journals.
- **He has been one of the creators of the IMES Master**, member of the Organising Committee.



Dr. Enrico Palchetti, PhD

- **Dr. Enrico Palchetti**, full researcher at the Department of Plant, Soil and Environmental Science of the University of Florence, holds a PhD in Agro-biotechnologies for tropical production.
- He has 12 years of experience in R&D mainly in the area of Renewable Energy in agriculture and in the tropical agricultural productions.
- He collaborates with private companies involved in the biofuel production in tropical and subtropical countries with a special focus on *Jatropha curcas*.
- He is author of more than 60 Scientific Papers.
- He is Member of the IMES Master Organising Committee



Prof. Emiliano Fratini, PhD

- Dr. **Emiliano Fratini**, graduated in Chemistry, holds a PhD in Chemical Sciences at the University of Florence.
- He was Research Scholar at the Nuclear Engineering Department, MIT (USA) and he performed Research Activities in collaboration with several research Institutes, such as Laboratoire Léon Brillouin in Saclay, NIST Center for Neutron Research and Hahn-Meitner Institute in Berlin.
- Presently Assistant professor in Physical Chemistry, he is author of about 100 publications on peer review journals, and owns 3 national and international patents.
- He is Member of the IMES Master Organising Committee



Prof. Giovanni Liberatore

- Prof. **Giovanni Liberatore**, graduated in Economics, holds a PhD In Economics.
- He is Full Professor of Economics since 1992 and Adjunct Professor of Principles of Financial Accounting at the New York University (Abroad Program) since 1998. He also collaborates with the Luiss Business School since 1995.
- He is author of Papers and Monographies on Accounting, Control and Economic Assessment of Enterprises.
- He operates also as consultant for Societies and Public Bodies for Accounting and Project Finance.



Eng. Leonardo Nibbi M.Sc.

- Eng. **Leonardo Nibbi**, presently Fellow Researcher at the Department of Industrial Engineering, University of Florence.
- His experience in the renewable energy field since 1999 is mainly devoted to the logistic of the biomass to energy chain, with particular attention to the use of GIS tools for correct planning, sustainability of solid, gaseous and liquid biofuels, market and legislation for solid biofuel, microsinning and assessment of wind farms, Education and Training in the Renewable Energy Fields, with particular attention to Biomass to Energy and Wind Energy.
- **He tutors students and manages the IMES Master since 2005**, member of the organising Committee.



Dr.Silvia Maltagliati, PhD

- Dr.**Silvia Maltagliati**, formerly senior technician at the **Environmental Protection Agency of Tuscany (ARPAT)**, is presently Seconded National Expert at the Unit F2, Bioproducts and Processing of the **DG RTD (Science, Research and Innovation) in Brussels**
- She has her focus expertise in the field of Environmental Modelling.
- After her Master degree in Physics, she achieved a PhD in “Energy and innovative industrial technologies”.
- Previously Contract Professor of Biofluid-Dynamics and of Biomechanics at the University of Florence, **she has been one of the creators of the IMES Master.**



Dr. Giacomo Santini, PhD

- Dr. **Giacomo Santini**, graduated in Biological Sciences, holds a PhD in Animal Biology (Ethology).
- He is presently assistant professor for “Models & Methods in Conservation Biology” and for “Ethology and Animal Ecology”.
- His main scientific interests are about the behaviour and ecology of invertebrates, modelling in ecology and Community and Population Ecology.
- He is author of over 45 scientific papers on international ISI-indexed journals.



Dr. Silvia Bargigli, PhD

- Dr. **Silvia Bargigli**, Graduated in Environmental Chemistry, she holds a PhD in Life Cycle Assessment and is presently **EHS Manager at Siemens AG** by the Energy Management Division.
- Her current activity focusses on Product-related Environmental Protection topics, among which: Life Cycle Assessment, Environmental Product Declarations, and Chemicals legislations (REACH, RohS,...)
- She previously worked as EHS Specialist and Waste Manager for Boehringer Ingelheim GmbH, as Environmental Technician in the Environmental Department of the Province of Florence, as Fellow Researcher for ENEA, as well as Contract Professor on LCA at the University of Siena.



Eng. Marco Pacinotti M.Sc.

- Eng. **Marco Pacinotti**, MSc of Industrial engineering at the University of Florence and at University of Georgia (USA), is presently working in **ENI as project developer** responsible for acquisition and permitting of renewable projects.
- He previously worked for the CREAR, performing research in wind energy, concentrated solar power and cooling, where he developed two prototypes from design to commissioning.
- He also worked five years in ENEL as Project Developer and Project Engineer; during this period he developed around 600 MW of wind projects in Romania, plus several due diligences for wind projects in several countries and in Saudi Aramco as project developer.



Sabrina Bruschi, M.Sc.

- **Sabrina Bruschi** M.Sc. in Sociology, has a 15 years experience in the Certification of Management Systems for Enterprises.
- She started working as a consultant for Enterprises on Management Systems for Quality, Environment, Safety, Ethics.
- Since 2008 she works for **TÜV Sud**, with the role of **Sales Regional Manager** for the Centre-Sud Area of Italy.



Eng. Caterina Susini, M.Sc.

- Eng. **Caterina Susini**, is an Environmental Engineer whose main expertise is in the field of Waste Management and Waste Water Treatment, with a special focus on Anaerobic Digestion of the organic fraction of Municipal Solid Wastes.
- Since 2005, she is the **responsible of the MSW treatment plant of SEA Risorse**, the Municipal Waste management, Disposal and Collection enterprise of the Viareggio Area (Tuscany, Italy).
- She teaches “Anaerobic Digestion” for IMES.



Dr. Antonio Borzì, PhD

- Dr. **Antonio Borzì** has a law degree from the University of Florence, with a thesis on constitutional law, holds a Ph. D. in constitutional law.
- He was a research associate in constitutional law and is an attorney at law. He was a member of the research group for the Observatory of Environmental Protection Legislation (O.Le.A.) of Ceradi – Luiss Guido Carli, coordinated by Professor Stefano Grassi. He was an official of the Regional Environmental Protection Agency for the Region of Calabria, and worked at the Ministry of the Environment.
- Presently, he is an **official at the AEEG, the Italian Regulatory Authority for Electricity Gas and Water.**



Eng. Lucia Recchia, PhD

- M.Sc. in Environmental Engineering in 2002 and Ph.D. in Agricultural and Forestry Engineering in 2006 at the University of Florence, Italy.
- She is currently research fellow at the University of Florence. **She is accredited ISCC auditor.**
- Her research activity focuses on the evaluation of energy consumption of industrial and agro-industrial processes, the assessment of the impacts of phytosanitary products, the noise and vibration modelling for agricultural operations, the development and implementation of multicriteria analysis, LCA methodology, Carbon Footprint approach and the application of GIS tools.



Dr. Paolo Sospiro, PhD

- Dr. **Paolo Sospiro**, PhD in Development Economic, graduated in Political Economy with a thesis on Poverty and Famine in Ethiopia.
- Erasmus Visiting Student at the ISCTE in Lisbon (Portugal), where he followed the African Mestrado, he specialised on International Aid at University of Ancona and then worked in different countries as Economist on International Aid projects.
- He is Contract Professor on Development Economics at **University of Macerata** since 2006.
- His main research interests are: Development, Education, Poverty and Inequality, Energy, Transport, Waste Management and Water Supply and consumers behavior.



Eng. Alessandro Cappelletti, PhD

- Eng. **Alessandro Cappelletti**, PhD, is presently Fellow Researcher at the Department of Industrial Engineering, University of Florence.
- His main field of interest is the use of alternative fuels in gas turbine.
- He worked in many Italian and International projects on the design, numerical simulation and testing of new combustion system fueled with Hydrogen, Vegetal-oil and Pyrolysis oil.
- He collaborated with the main Italian energy companies such as ENEL, GE –Nuovo Pignone and Turbec (now Ansaldo Energia).
- He's also working on the development of innovative PV concentrated solar system, for the Combined Heat and Power production.



Maurizio Cocchi, M.Sc.

- M.Sc. Agronomist and graduated at the IMES Master in Bioenergy and Environment, since 2007 Maurizio Cocchi is working in the field of bioenergy as consultant and project manager in national and international projects, carrying out feasibility studies, biomass resources assessments, market and policy assessments, training, capacity building and dissemination activities.
- Since 2012 he is also **editor of BE-Sustainable**, a quarterly magazine of bioenergy and the bioeconomy published by ETA-Florence.
- He has been Member of the IEA Bioenergy Task 40 “Sustainable International Bioenergy Trade: Securing Supply and Demand”



Forest Biomass Production

- Fundamentals of Forestry
- Short Rotation Forestry (SRF) and forest residues

Agricultural Energy crops and residues

- Energy Crops, Agricultural Residues and their Valorisation
- Crops for Biofuels Production

Cultivation and harvesting techniques

- Evaluation of suitable and available areas
- Estimating the environmentally compatible bioenergy potential from agriculture
- Sustainability Criteria for Biofuels
- Cultivation and harvesting techniques



Dr. Barbara Mariotti, PhD
University of Florence



Dr. Enrico Palchetti, PhD
University of Florence



Eng. Lucia Recchia, PhD
University of Florence

Introduction to Energy Conversion Principles

- Basics and Thermodynamic Principles
- Fundamentals of Energy Engineering
- Thermodynamic Cycles

Power plant technologies

- Introduction to Turbomachinery
- Turbines, Steam Plants, Internal and External Combustion Engines
- Organic Rankine Cycles
- CHP and Cogeneration
- System Analysis
- Small and Medium Size Heating Plants, District Heating
- Interfacing Production and Conversion



Prof. Francesco Martelli
University of Florence



Eng. Leonardo Nibbi, M.Sc.
University of Florence



Eng. Alessandro Cappelletti,
PhD
University of Florence

Renewable Energy Technologies

- Wind, Solar H&C, Photovoltaics, CSP, Mini Hydro, Geothermal, Carbon Storage

Biomass Energy Conversion Technologies

- Biomass Pre-treatment, Drying
- Thermochemical Conversion, Biomass Combustion, Gasification, Pyrolysis, Torrefaction
- Anaerobic Digestion, Microalgae

Chemical and Physical Characteristic of Biofuels

- Chemistry of Biofuels
- 1st and 2nd Generation Biofuels
- Green Chemistry and by-products



Prof. David Chiaramonti
University of Florence



Dr. Emiliano Fratini, PhD
University of Florence



Eng. Caterina Susini, M.Sc.
SEA Risorse S.p.A.



Eng. Marco Pacinotti, M.Sc.
ENI

General ecology

- Ecology of Organisms, Populations, Communities and Ecosystems
- Environmental Monitoring, Applied Ecology, Natural Resources Preservation

Environment and Air Pollution

- Air quality and Air pollutants, Boundary Layer Physics
- Air Pollution Emissions: Monitoring and Dispersion Modelling

Environmental Impact Assessment of Bioenergy System

- Fundamentals of Life Cycle Assessment
- Waste Management, GHS, CLP, REACH, MSDS



Dr. Giacomo Santini, PhD
University of Florence



Dr. Silvia Maltagliati, PhD
European Commission – DG RTD



Dr. Silvia Bargigli, PhD
Siemens AG

Energy Market & EMS

- System Management, EMAS, ISO 140001, ISO 50001
- Biomass Market, Energy Market

Principles of economic and financial analysis of projects

- Fundamentals of Economy
- Economic aspects of energy
- How to submit a Proposal

Environmental legislation

- Fundamentals of law
- National and International Environmental Legislation
- Waste Management, Land remediation



Prof. Giovanni Liberatore
University of Florence



Sabrina Bruschi, M.Sc.
TÜV Süd - Italia



Dr. Antonio Borzì, PhD
Authority of Electricity and Gas



Dr. Paolo Sospiro, PhD
University of Macerata



Maurizio Cocchi, M.Sc.
ETA Renewable Energies



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Extra Curricular
Seminars

In order to widen the Master contents, several renowned Researchers and Experts are regularly invited to hold Seminars on specific topics.

These Seminars are held both as front lessons or as video conference.

As a matter of example, in the latest editions, lecturers were invited from Deutsches Biomasseforschungszentrum (DBFZ), Arizona State University, Viessmann Academy, Italian National Research Centre IVALLSA and Efeso Consulting.



Dr. - Ing. Franziska Müller-Langer
*DBFZ Deutsches
Biomasseforschungszentrum*



Dr. - Ing. Marco Klemm
*DBFZ Deutsches
Biomasseforschungszentrum*



Dr. Raffaele Spinelli, PhD
CNR Ivalsa



Prof. Larry Olson,
Arizona State University



Mauro Braga
Viessmann Academy



Filippo Garini, M.Sc.
Efeso Consulting

IMES Master CONTACTS



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