

FOR TOMORROW'S SOLUTIONS
WE NEED NEW MINDS,
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MASTER MEDEA ENI 2023-2024
**MASTER IN ENERGY AND ENVIRONMENTAL
MANAGEMENT AND ECONOMICS**

67th Academic Year



UNIVERSITÀ
DI PAVIA





MEDEA, A MASTER FOR THE ENERGY TRANSITION

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The MEDEA program (Master in Energy and Environmental Management and Economics) is offered by Scuola Enrico Mattei, a prestigious institution with a long-standing tradition in professional training and education for young graduated students who want to become experts in the energy sector. Scuola Enrico Mattei is a unit of Eni Corporate University, the company responsible for knowledge management in Eni, and employees' training program.





THE ROOTS



*Enrico Mattei School was founded in 1957
by Eni's first Chairman Enrico Mattei.
It is the first postgraduate training program
in technical and economic disciplines ever introduced in Italy.*

The original name was School for Advanced Studies in Hydrocarbons, but in 1969, a few years after the founder's death, the institute has been named after the great business hero. Enrico Mattei School has been training so far more than 3,000 students, 57% of which were foreign citizens coming from 111 countries. Scuola Enrico Mattei has continually been adapting its vision and purpose during its history, always being able to anticipate the trends of the energy sector and focusing on strong keywords: #inclusion, #diversity, #energytransition and #sustainability. In 1991, the School introduced the topics of environmental sustainability renaming the program Master of Energy and Environmental Economics, MEDEA. In 1995-96 Academic Year, a focus on professional specialization drove the change to Master of Energy and Environmental Management and Economics. In 2020-2021 Academic Year, Master MEDEA has been officially certified by Università degli Studi di Pavia, obtaining recognition for legal purposes by the Ministry of Education of Italy Enrico Mattei School represents a leading center for advanced studies in Italy and is perfectly envisioning with its history and tradition the new mission of ENI: "We are an energy company. We are working to build a future where everyone can access energy resources efficiently and sustainably".



TRUNK BASE



Guidelines for admission

*Every year Master MEDEA launches
a call for application searching for the best talents
in Italian universities and abroad.*

The following criteria are relevant for the recruitment process.
Italian candidates must:

- have an Italian university degree (laurea magistrale) with grades of 105/110 (or 95/100) or above, majoring in economics or engineering, or an equivalent academic certification from an international university
- be born on or after 1/1/1996
- be fluent in English
- Italian candidates projected to graduate before August 2022 can apply.

Non-Italian candidates must:

- have a university degree majoring in economics, engineering, mathematics, physics, chemistry, geology, statistics, law, political sciences
- be born on or after 1/1/1992
- be fluent in English

All the details about formal requirements are available on the **University of Pavia website**.

Candidates **MUST** apply online both on the **University of Pavia** and **Eni website**.



The deadline for application is 2nd May 2023 for foreign citizens and 9th May 2023 for Italian citizens. All the recruitment steps will take place from remote. Admission of Italian candidates requires the successful completion of 3 steps:

- 1 the recruitment committee will verify the possession of the pre-requisites among all the candidates
- 2 the recruitment committee will short list applicants after screening the resume of the candidates in possession of the pre-requisites
- 3 the assessment centre of HR department is used for the short-listed candidates together with an English test to select the final set of applicants eligible for the program

With regards to non-Italian candidates, the recruitment committee will assess their academic records, degree certificates as well as professional experiences.

Admission to the Master MEDEA program does not imply that students will be necessarily hired by Eni S.p.A. or by its operating companies. With regards to all the Italian students, or non-Italian students not employed by other companies or organizations, Eni S.p.A. and its operating companies may exercise an option to offer a job within 60 days after the completion of the Master program.

Any possible job position shall be compliant with Eni organizational structure and consistent with a post-graduate diploma.

Students who will refuse the job offer with no adequate reasons will be required to refund the full master enrolment fee (25,000 euros).



TRUNK STEM



Curriculum

The Master MEDEA program covers two different specializations:

- Global Energy (GE), 2nd level postgraduate program
- Managing Technical Assets (MTA), 1st level postgraduate

“Global Energy” focuses on energy transition challenges. Economics graduates as well as junior professionals working in energy companies are the key population target. The program provides all the notions and skills required to solve problems and innovate in a disruptively changing business environment.

Main topics are management, finance, climate change economics, energy economics and circular economy. The graduate of the 2nd level program is a 360° expert in sustainability and energy transition.

“Managing Technical Assets” focuses on more technical challenges faced by an integrated energy company. First level graduates in technical or scientific fields, and/or professionals already employed in companies operating in the energy sector are particularly suitable for this specialisation.

The focus on technical and operational aspects is particularly useful for non-Italian students who already are employed in the energy industry and need to upgrade their economic background.



Students enrol in GE (2nd level) or MTA (1st level) program based on their Degree and their background. The Academic Year lasts for 10 months, from 13th September 2023 to 30th June 2024.

Class attendance is mandatory. Enrolment in Master MEDEA is not compatible with any full-time or part-time job. Students not committed to their studies or not behaving in a proper way can be excluded from the program.

Classes are in English and extend over three terms. During the first term, Scuola Enrico Mattei faculty provides introductory courses on fundamentals of economics, exploring also quantitative tools and topics. Students get also acquainted with a course in the energy industry supply chain. In the second term, students of both specialisations major in energy, environmental and financial topics.

In the third term, students of the two different specialisations attend separate courses on specific topics related to management and economics in the energy sector.

In this last phase, students are also engaged in project works commissioned and tutored by Eni professional of different business units.

Upon successful completion of the exams, students are awarded a Degree certificate for the Master in Energy and Environmental Management and Economics, MEDEA (1st Level for MTA, 2nd level for GE).

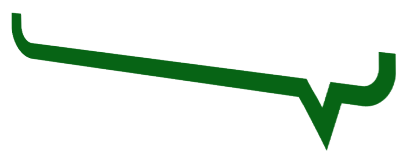


Global Energy		Managing Technical Assets	
I PHASE			
Financial Accounting			
Natural Resources and Renewable Energy			
Applied Econometrics		Quantitative Methods for Management	
Economics		Basic Economics	
System Dynamics Modelling for the Energy Transition		Data Analysis	
Workshops: History and Economics; LEGO Serious Play			
II PHASE			
Behavioral Economics and Green Nudges			
Energy Economics			
Energy Transition and Climate Change Economics			
Field Development Strategy and Carbon Management			
Corporate Finance and ESG Investments		Basic Corporate Finance and ESG Investments	
Workshops: Project Management; Coding			
III PHASE			
Geopolitics of Energy and Environment			
Renewables and Economics of Electricity			
Strategic Management			
Industry 4.0 and Logistics		Environmental Assessment	
Planning and Control		Safety and Environmental Protection	
Workshops: Sustainable Development; Energy Contracts and Trading; Circular Economy			





THE BRANCHES



Teaching methodologies

Scuola Enrico Mattei relies on extensive know-how and experience developed by the activities of Eni, its operating companies and the University of Pavia.

The master program combines frontal lessons, case studies, empirical projects, research assignments in collaboration with Eni companies, flipped classrooms, debates, collaborative teaching tools.

The academic staff includes an in-house team of teachers; lecturers and professors from the most prominent Italian and foreign universities; Eni managers and professionals and environmental or energy companies. Visits to Eni industrial plants are a relevant part of the activities: oil wells, petrochemical plants, refineries, offshore production platforms, methane re-gasification plants, research and specialized centres, etc.

Scuola Enrico Mattei, in collaboration with Italian and international universities and scientific institutions, organizes seminars and conferences with top field experts. A list of podcasts, online events and relevant articles selected by the School Faculty is constantly updated to keep students informed with relevant trends in the energy world.



Collaboration with Università di Pavia

University of Pavia is one of the world's oldest academic institutions, with its foundations existing as early as the 9th Century. Like the UK's Oxford and Cambridge, the University of Pavia is structured using a college system, dating back to the 16th century, with a striking historic campus.

The University of Pavia boasts an impressive number of famous alumni including Alessandro Volta, Ugo Foscolo, Giulio Natta and many others.

In 2019 according to the Academic Ranking of World Universities, the University of Pavia is in the top 10 Italian Universities. Ranked within the global top 581-590 in the QS World University Rankings 2020, UNIPV is particularly competitive - top 35 in the world - in the fields of Humanities. Research output of the faculty is rated as very high. Comprised of 20 colleges which all have their own particular histories, UNIPV is an open community where academic achievement, traditions, all have their place. Originally created around schools of law, humanities and medicine, the University of Pavia now offers 88 courses in: Engineering and Architecture, Mathematics, Physics, Natural sciences, Medicine and Pharmacology.





SOLAR RADIATION



Scholarships and benefits

Students enrolled to the Master program are exempted from the payment of the enrolment fee (25,000 euros).

Moreover, several scholarships will be granted to talented students coming from the following countries: Algeria, Cyprus, Congo, Ivory Coast, Egypt, Indonesia, Italy, Kazakhstan, Kenya, Libya, Mexico, Mozambique, Turkmenistan. The exemption from enrolment fee is not the only benefit. Students are provided with a scholarship (1.000 Euro gross for Italian students, 1.300 Euro gross for non-Italian students; net amount is very close to the gross), access to Eni canteen and teaching materials too.

A technical committee will award scholarships by assessing academic records, degree certificates as well as professional experience of the candidates. Italian citizenship is a preferential qualification for the Global Energy program and non-Italian citizenship for the Managing Technical Assets program. Academic or professional experiences in energy sector will be given adequate consideration. The master program can be attended also by candidates independently selected by Eni companies outside Italy. Eni will also provide foreign students with a health and accident insurance contract. Students from Italy and the other European Union countries have access to National Health Service. All students – Italian and non-Italian – are supposed to cover their travel expenses to and from Milan. Before the Master program begins, during summer, foreign students will attend an Italian language course.



LEAVES OF THE TREE



International Alumni Association of Scuola Mattei (IAASM)

*The School has always promoted the creation
of a strong international network with former students.*

In 1996, the “Scuola Mattei alumni club” was founded, in order to make the most of the professional experience of former students and their connection with Scuola Enrico Mattei.

More than 3,000 graduates from 111 countries attended the School until nowadays. Many of them hold senior positions (CEOs, CFOs, Managing Directors, Directors, Entrepreneurs, Ambassadors, Professors, etc.) within the international energy business, energy and environmental institutions, Universities, etc.

The International Alumni Association of Scuola Mattei (IAASM) was officially founded in 1997. IAASM is an independent and non-profit organisation, pursuing scientific and intellectual goals, promoting Scuola Mattei’s cultural heritage in time.

Today IAASM promotes network bonding and organizes seminars, conferences and informal meetings. The main objectives of IAASM are knowledge sharing, professional networking, cooperation, and dialogue among different cultures. More generally, IAASM aims to consolidate an international network among experts in the energy and environmental sector.

Applied Econometrics

- Descriptive and inferential statistics
- Linear regression model
- Hypotheses testing
- Generalised least squares
- Multivariate regressions
- Non linear model: logit and probit
- Applied sessions

Behavioural Economics and Green Nudges

- Introduction to irrationality
- Psychology of money
- Dishonesty and cheating: public goods and social cooperation
- Work and motivation: the role of incentives
- Self-control and climate
- Managing emotions with catastrophes
- Green Nudges

Circular Economy

- The concept of circular economy
- The R framework
- From end of waste to better waste
- New frontiers of technologies
- Drivers and benefits of circular economy
- The legal context of circular economy: Italy, EU, international situation
- Scenarios for a low carbon economy

Corporate Finance and ESG Investments *(Advanced and Basic Course)*

- Financial analysis and forecasting models
- Investment analysis methods
- Principles of financial management: value theory, portfolio theory, CAPM and APT
- Financial structure decisions and corporate value
- Value creation and EVA-theory models
- Derivatives and their markets
- ESG Investments: criteria and trends. The relevance of SFDR

Data Analysis

- Define a standard and structured approach to Microsoft Excel databases
- Develop technical skills to perform simple and complex analysis

Economics *(Advanced and Basic Course)*

- Capitalism and democracy: affluence, inequality, and the environment
- Social interactions and economic outcomes
- Work, wellbeing and scarcity
- Institutions, power and inequality
- The firm: employess, managers and owners
- Firms and markets for goods and services
- The labour market and the product market: unemployment and inequality
- Credit markets: borrowers, lenders and the rate of interest
- Banks, money, houses and financial assets
- Government and markets in a democratic society

Energy Contracts and Trading

- Oil and gas markets
- Oil trading and other related products
- The oil price in the context of the energy transition
- Negotiation phases
- Elements of an energy contract
- Types of energy contracts
- Case studies

Energy Economics

- History and structure of the energy industry
- Fundamentals of the energy system: energy demand and supply
- Fundamentals of the oil and gas market. Covid's impact.
- The oil price and its relationships with economics, geopolitics, technology.
- The shale revolution
- Energy statistics and indicators
- Introduction to market regulation
- Public utilities sector
- Case studies on the energy transition

Energy transition and climate change economics

- The theory of externalities and public goods
- Looking for the efficient level of pollution
- Property rights and bargaining
- Environmental policy tools: standards, taxes, tradable permits
- Sustainable development, SDGs and global pollution problems

- Climate change: causes, dynamics, impact
- Times and features of the energy transitions.
- The challenge of net zero emissions: scenarios, times, policies and costs
- Unfccc, COPs, and the international negotiations on climate change: Rio, Kyoto, Paris, Glasgow
- Emissions trading markets
- Case studies on the energy transition.

Environmental Assessment

- Cost-benefit analysis versus Strategic Environmental Assessment (SEA)
- SEA problems and methods
- Economic, environmental and social indicators
- Methodologies for the impact analysis
- Evaluation and choice among different projects
- Expected impacts and discussion of alternatives
- Case studies



Geopolitics of Energy and Environment

- The Suez crises (1956)
- The Yom Kippur War and the Iranian crisis
- The first Gulf War (1991)
- Central Asia scenarios
- International relations and geopolitics of energy after 9/11
- Iraq after Saddam Hussein
- The current geopolitical scenario
- Geopolitics, environment and climate change

Field Development Strategy and Carbon Management

- Type of petroleum contracts
- Strategies and tactics of the partners and hosting Country
- Proven reserves vs. probable and possible upsides
- Reservoir type and level of uncertainties
- Enhanced Oil Recovery (EOR) and Improved Oil Recovery (IOR)
- Possibilities of farm out
- The challenge of carbon management and the impact on the energy industry: overview and case studies

Financial Accounting

- Accounting systems
- Book-keeping
- Balance sheet
- Financial statement analysis: discriminant analysis, ratios and flows
- Pro-forma statements and expected cash flow

Natural Resources and Renewable Energy

- Hydrocarbons origin and accumulation
- Exploration, drilling, completion and production
- Treatments and transportation of oil and gas
- Petrochemical processes and products
- The refining industry
- Renewable energy: solar, wind, hydro, biomass, tides, geothermal energy. Technology and economics.
- The challenge of hydrogen.
- The challenge of producing decarbonizing products.
- Decarboning through forests.
- Towards a new kind of mobility: biofuels.
- New frontier of energy: nuclear fusion

Industry 4.0 and Logistics

- The innovation process
- Strategic decisions in managing innovation
- Technological planning process
- Introduction to logistics in the energy industry
- IoT and Blockchain

Planning and Control

- Planning and control: basic methodologies
- Planning and control in the energy sector
- Economic and capital budgeting
- Budgetary control and variance analysis
- Corporate planning and the reporting system

Quantitative Methods for Management

- Basic data handling: types of data, descriptive statistics, index numbers
- Correlation vs. causation
- An introduction to simple regression analysis
- Statistical aspects of regression: standard error, coefficients' standard errors, hypothesis testing
- Multiple regression
- Multivariate statistical analysis: descriptive statistics, principal components

Renewables and economics of electricity

- Electrical power system structure
- How electricity is generated, transmitted and distributed.
- Electricity by coal
- Natural gas and the energy transition
- Nuclear power
- Renewable energy sources: solar, wind, hydro, biomass, etc: technology and economics
- Functioning and features of the electricity market
- Comparison among technologies and costs
- Electrification in the context of the energy transition.
- Emissions market and carbon credits.
- The challenge of CCUS.
- Carbon management and carbon credits.

Safety and Environmental Protection

- Introduction to environmental accounting
- The environmental report as a tool of analysis and communication
- Evaluating the environment: tools and methodologies
- The eco-management system according to the EMAS regulations
- Certification systems and ISO14000 as an international standard

Strategic Management

- The nature of business strategy
- Industry analysis: the structural determinants of competition and profitability
- Competitive advantage and analysis of cost advantage
- Technology management and diversification
- Issues in international expansion
- Corporate planning and restructuring in the oil industry
- The energy industry facing the energy transition. Overview and case studies.

Sustainable Development

- Sustainability: overview and evolution
- Sustainable Development Goals
- Sustainable Development at Corporate level
- Human rights, inclusion and diversity
- Case studies

System Dynamic Modelling for the Energy Transition

- Stock, flows, converters and connectors
- Positive and negative feedbacks
- Modelling principles
- Introduction to archetypes
- Applied sessions: simplified and complex models building
- Mobility, electricity, wastes, energy markets: modelling the energy transition

Faculty

Maria Virginia Aliberti > *Eni*
Pierluigi Ameno > *Eni*
Francesca Arcovito > *Eni*
Costantino Alberici > *Eni Corporate University*
Alfonso Amendola > *Eni NEXT*
Giovanni Azzone > *Politecnico di Milano*
Francesco Baldino > *Eni*
Giorgio Baiocco > *Eni*
Andrea Bellati > *Fondazione Eni Enrico Mattei*
Stefano Bellisario > *Eni*
Giuseppe Bellussi > *Eni*
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Marco Bertino > *Eni*
Raffaella Bordogna > *Eni*
Stella Brandolese > *Eni*
Vittoria Camodeca > *Eni*
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Giovanni Caron > *GEMA Business School*
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