

# MASTER MEDEA 2020-21

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SCUOLA  
ENRICO  
MATTEI

Master in Energy  
and Environmental  
Management  
and Economics  
64<sup>th</sup> Academic Year



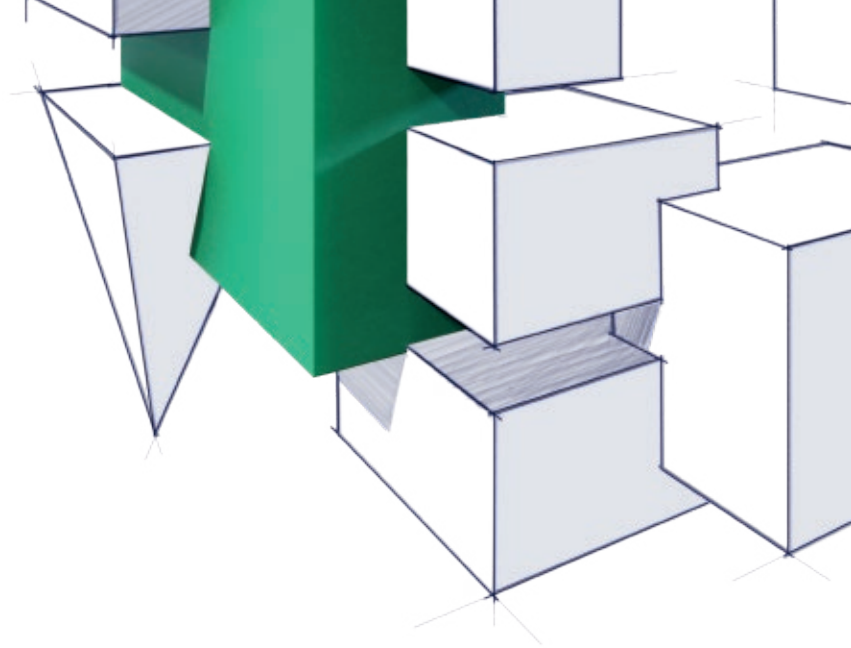


The MEDEA Master in Energy and Environmental Management and Economics is organized and directed by Scuola Enrico Mattei, an institution with over 60 years of tradition in advanced training and education of professionals for advanced specialties in the energy sector. Today, Scuola Enrico Mattei is an integral part of Eni Corporate University. Eni Corporate University is the company in charge of overseeing the whole knowledge cycle, ranging from design and delivery of training and development programs for employees to cover the professional life-cycle, up to knowledge management. All this is done in partnership with a number of academic and education institutes.

**Dean:** Enzo Di Giulio

**Academic staff:** Luciano Canova  
Stefania Migliavacca

**Organization staff:** Beatrice Bragato



The School was founded in 1957 by Eni's first Chairman Enrico Mattei. It was responsible for managing postgraduate education in technical and economic disciplines in Italy. The original name was School for Advanced Studies in Hydrocarbons, but in 1969, a few years after its founder's death, the name changed into Scuola Superiore Enrico Mattei. Today, the name is Scuola Enrico Mattei. Since its foundation, the School has trained about 3,000 graduates, 57% of which are colleagues coming from 111 countries outside Italy.

All along the years, Scuola Enrico Mattei has continually updated its curriculum, paying very strong attention to the international context and being oriented to energy economics. In 1991, the School upgraded its curriculum by introducing new topics such as environmental sustainability and by creating the Master of Energy and Environmental Economics, MEDEA.

In 1995-96 Academic Year, the topic of MEDEA changed and the level of specialization increase leading the Master to change its name into Master of Energy and Environmental Management and Economics.

In 2020-2021 Academic Year, MEDEA has been certified by Università degli Studi di Pavia, recognized for legal purposes by the Ministry of Education of Italy.

## Guidelines for admission

Italian candidates must:

- hold an Italian degree with a final grade of 105/110 (or 95/100) or above, obtained in economics or engineering, or an equivalent academic qualification from an international institution
- be younger than 28 years old on 31<sup>st</sup> December 2020
- have excellent English language skills

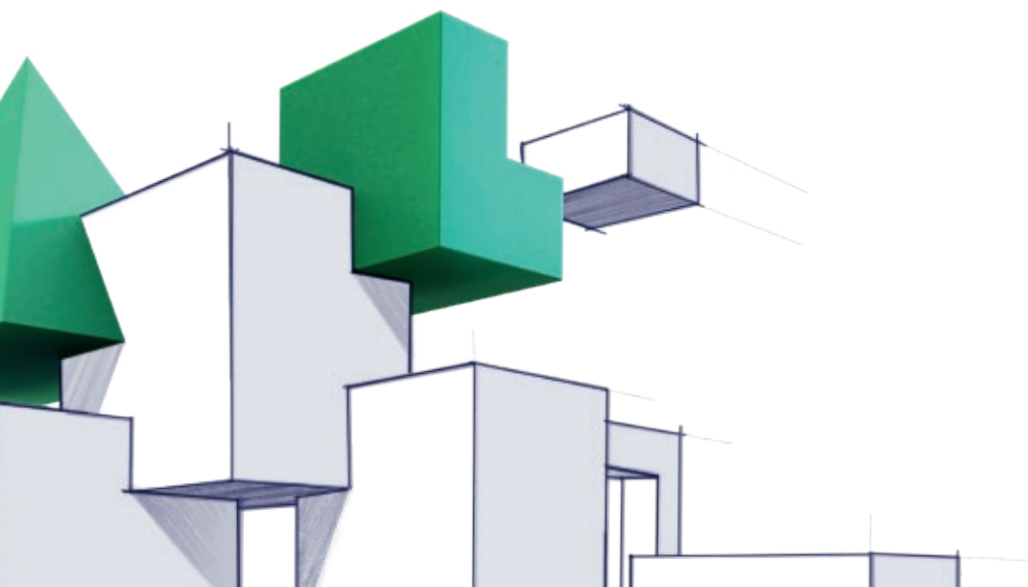
Applications are accepted from Italian candidates who are expected to graduate in July 2020.

Non-Italian candidates must:

- hold a degree from a recognised university, obtained in Economics, Engineering, Mathematics, Physics, Chemistry, Geology, Statistics, Law, Political Sciences
- be younger than 32 years old on 31<sup>st</sup> December 2020
- have excellent knowledge of English

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

Candidates have to apply online both on the University of Pavia and Eni websites.





## Admission

The deadline for application is 4<sup>th</sup> May 2020 for foreign non-Italian citizens and 18<sup>th</sup> May 2020 for Italian citizens. Italian candidates will attend the final selection in San Donato Milanese (MI); non-Italian candidates will be assessed in the countries where they come from (if required).

The selection of Italian candidates is organized in three different phases. First, the examining committee will select a limited number of applicants after screening the CVs received. Secondly, the chosen candidates will undergo an attitude assessment and an English test. Candidates, who will pass the second phase of selection, will have a technical interview with the examining committee.

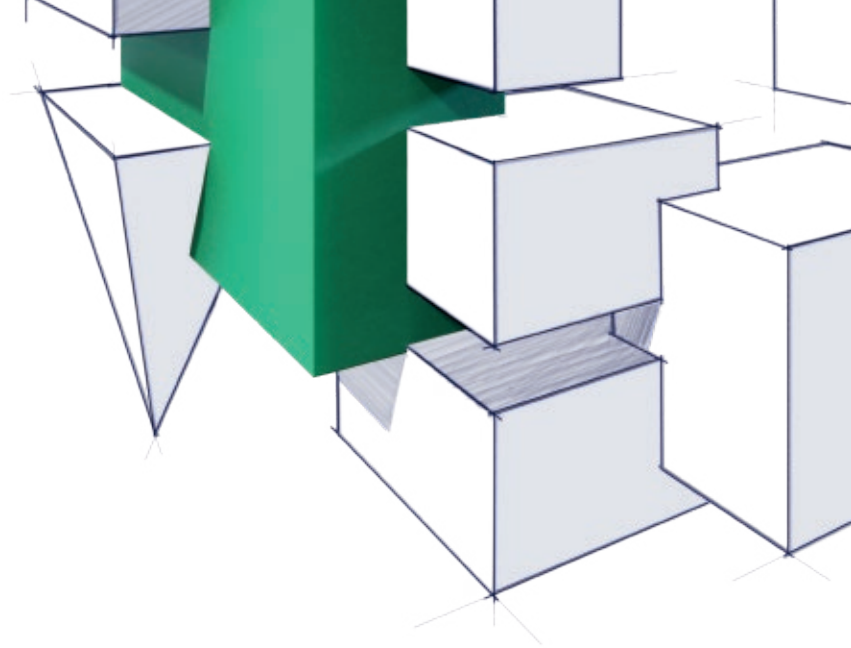
As far as non-Italian candidates, the selection committee will evaluate their academic records, degree certificates as well as professional experiences.





Scuola Enrico Mattei is focused on teaching and research only. Therefore, admission to the Master does not imply that their participants 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 without an employment contract with other companies or organizations, Eni S.p.A. and its operating companies may offer a job within 60 days after the conclusion of the Master program. Any possible position shall be compliant with Eni organizational structure and consistent with a post-graduate diploma. Students who will refuse the position with no adequate reasons will be required to pay the entire master enrolment fee (25,000 euros).

Master students who will accept the job offer, but quit before 24 months from the starting date of the contract, will have to refund the enrolment fee (25,000 euros).



## Grants

Students admitted to the Master are exempted from the payment of the enrolment fee (25,000 euros). Moreover, in order to help the spreading of the culture of energy where the energy industry plays an important role, a number of scholarships will be granted to deserving students coming from the following countries: Algeria, Angola, Congo, Cyprus, Egypt, Ghana, Indonesia, Italy, Kazakhstan, Libya, Mexico, Mozambique, Oman, Turkmenistan, United Arab Emirates, Vietnam. The exemption from enrolment fee is not the only benefit. Students will be given a financial contribution for accommodation and living expenses (1,000 euros for Italian students, 1,300 euros for non-Italian students, gross sums), access to Eni canteen and free training materials too. In granting the scholarships, a selection committee will evaluate academic records, degree certificates as well as professional experience.

A preferential qualification in the graduation is the possession of the citizenship of one of the countries benefiting from the scholarship (in particular, Italian citizenship for the Global Energy program and non-Italian citizenship for the Managing Technical Assets program). Academic or professional experiences in the oil and gas sector will be highly desirable and adequately valued. The master can be attended also by people who are autonomously chosen by Eni companies outside Italy. Eni will also provide foreign students with a health and accident insurance cover.

Students from Italy and the other European Union countries will be under the regulations of the National Health Service. All students - Italian and non-Italian - will have to pay the fees of their round-trips to Milan.

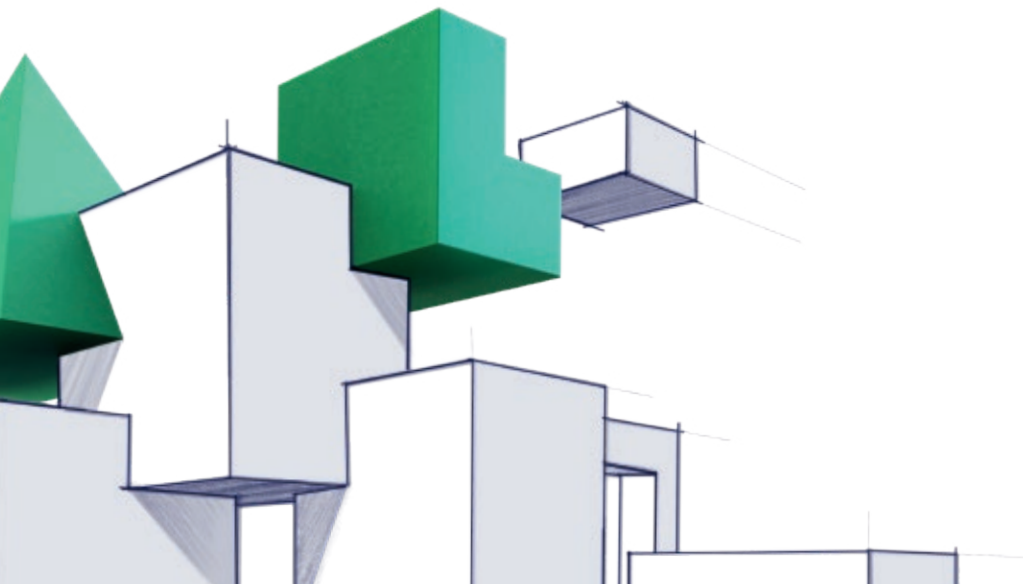
During the summer before the Master starts, in Milan, there will be an intensive Italian course for foreign students, which is mandatory. An Italian language course is offered also during the Academic Year: the attendance to this course is on voluntary basis.

## Teaching methodology

Scuola Enrico Mattei can rely on large resources of know-how and experience provided by all international activities of Eni, its operating companies and the University of Pavia.

The teaching methodology is based upon face-to-face lessons, case studies, software-assisted exercises, project works in collaboration with Eni companies.

The academic staff comprise an in-house team of teachers; lecturers and professors coming from the most prominent Italian and foreign universities; managers and experts from Eni and other environmental and energy companies.





During the course, students will have the chance to visit different Eni industrial plants: 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 organizations and scientific institutions, organizes seminars and conferences with top field experts. It also organizes open sessions to give students the opportunity to discuss economic issues regarding the world of energy. During these sessions, students can watch videos and listen to podcasts - specifically selected by the School Faculty - of interviews or lectures given by the most important experts in the world. Students will be then encouraged to use multimedia materials to prepare a presentation or a case study to share with the class, so they can practice and improve their team work and problem-solving skills.



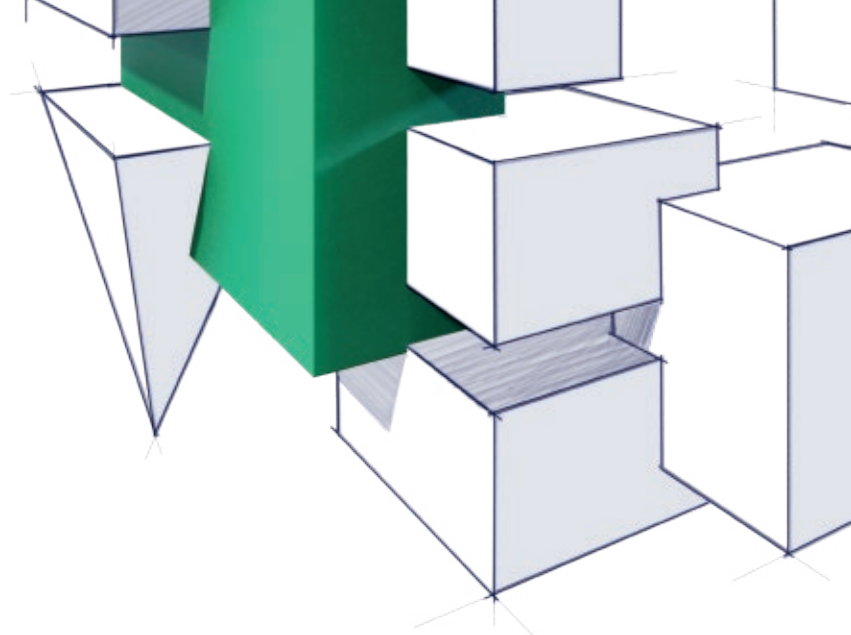


## Student requirements

The Academic Year lasts 10 months, from 16<sup>th</sup> September 2020 until 30<sup>th</sup> June 2021. Class attendance is required for the full Academic Year. Attendance is not compatible with any full-time or part-time job. Students not committed to their studies or not behaving in a proper way will be excluded from the program.

## Degree

Throughout the Academic Year students will undergo specific examinations. Those who will suitably complete the programme of study will be awarded by the Master's Degree of Energy and Environmental Management and Economics - MEDEA.



## Curriculum

The MEDEA program covers two different specializations:

- Global Energy (GE)
- Managing Technical Assets (MTA)

**“Global Energy”** focuses on energy companies contemporary challenges. Business economics or business graduates as well as people who are already working in energy and environment companies are the target of this specialization. The Master offers all the necessary skills to face problems and catch opportunities that company managers could possibly come across. Students will also focus on management and financial control (e.g. energy trading and risk management). They will learn how to arrange development plans for all the company’s business areas and also how cooperate all company departments and functions and liaise, with external experts and Public Administration representatives.

**“Managing Technical Assets”** centers on the management of technical issues that energy companies face. First level graduates in technical or scientific fields, and people already working in companies operating in energy and environment are the target of this specialisation. Its focus on technical and operational aspects is particularly useful for non-Italian students who have already worked in the energy industry and need to increase their economic skills, especially in technical and operational areas.

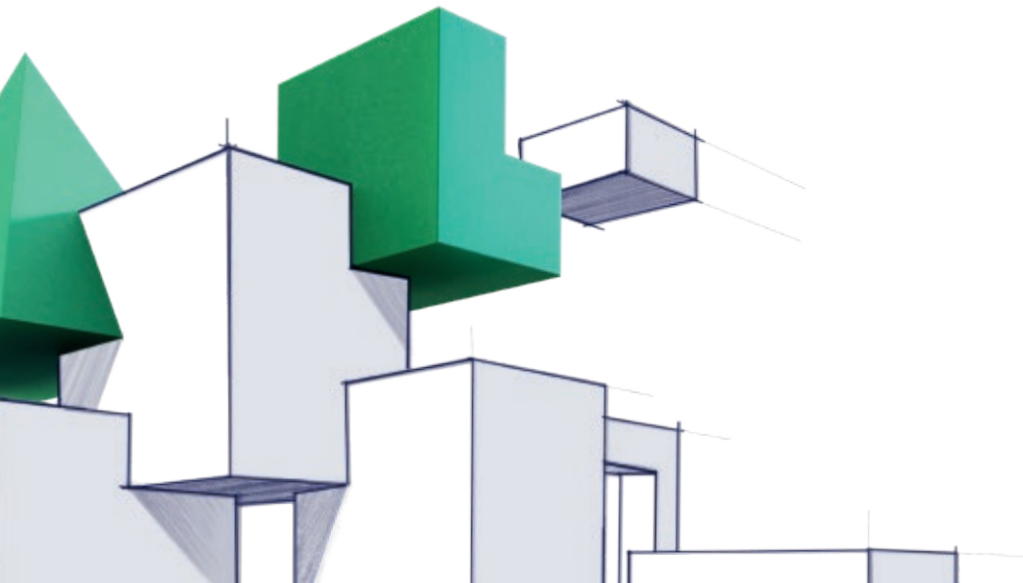
Students will attend GE or MTA depending on their Degree and their overall background. Generally, students with a Degree equivalent to the Italian first level will attend the MTA program. Students with a Degree equivalent to the Italian second level (Laurea Magistrale) will attend the GE program. If examinations requirements are fulfilled, both programs give rise to the award of Master in Energy and Environmental Management and Economics, MEDEA (1<sup>st</sup> Level for MTA, 2<sup>nd</sup> level for GE).

Most of the courses are attended by all the students in order to enrich the learning environment through internationality and multi-disciplinarity.

Classes extend over three terms. During the first term, Scuola Enrico Mattei provides introductory courses on fundamentals of economics, later exploring some quantitative tools. Students will also get acquainted with the energy industry value chain.

In the second term, students of both specialisations will work together on energy, environment, and finance.

In the third term, students of the two different specialisations will work separately on specific issues related to management and economics in the energy industry. This phase aims to give students a high level of knowledge on the specific matter of each specialisations of the Master. In the third phase, students will be engaged in project works they will develop in cooperation with Eni Companies.





## Collaboration with University of Pavia

The University of Pavia is one of the world's oldest academic institutions, with its foundations existing as early as the 9<sup>th</sup> century. Like the UK's Oxford and Cambridge, the University of Pavia is structured using a college system, dating back to the 16<sup>th</sup> 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 (UNIPV) 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.



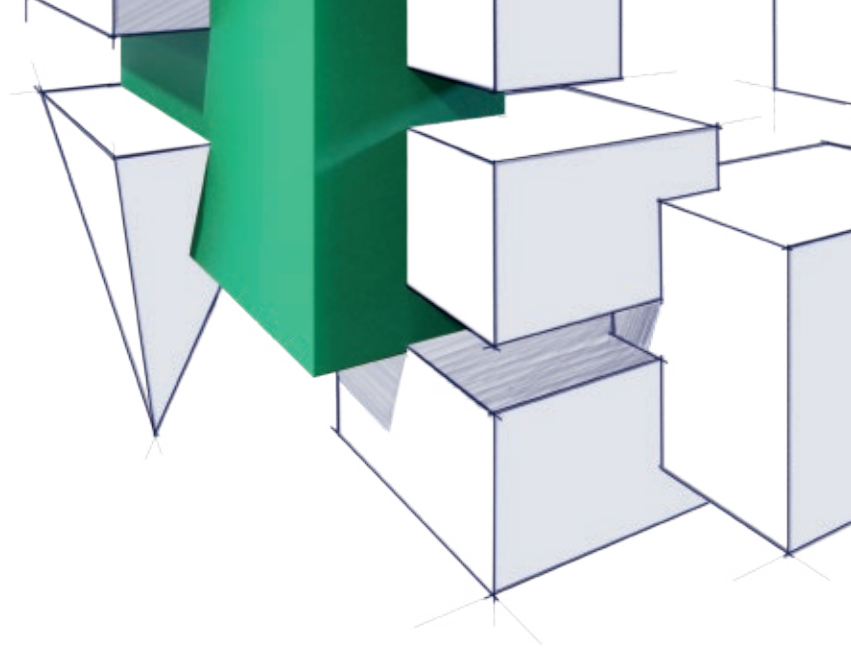




## International activities

Scuola Enrico Mattei is part of a major international energy company and it is committed to develop relationships and cooperation with academic and research institutions. Scuola Mattei also promotes an exchange program for professors and researchers of the Institut Français du Pétrole (IFP) of Paris.

MEDEA professors can also be engaged in seminars and joint research abroad, for institutions like International Association for Energy Economics, System Dynamics Society, Energy Modelling Forum, European Council for an Energy Efficient Economy, Human Development and Capability Association, International Association for Management of Technology, European Institute for Advanced Studies in Management and International Engineering Management Conference. Moreover, Scuola Mattei will promote new co-operations with international Universities through Eni Corporate University. Scuola Enrico Mattei pursues also networking activities by organizing international seminars and conferences on strategic research issues.

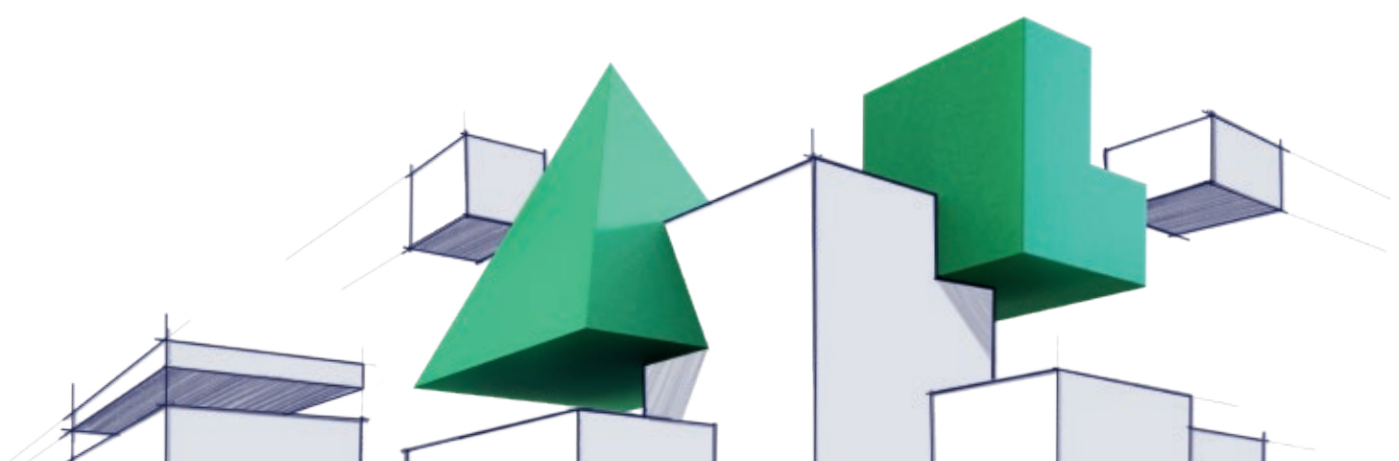


## International Alumni Association of Scuola Mattei (IAASM)

The School has always kept an active connection with its former students. In 1996, the "Scuola Mattei alumni club" was founded, in order to make the most of the professional experience of former students (3,000 graduates from 111 countries) and their relation with Scuola Enrico Mattei itself.

The International Alumni Association of Scuola Mattei (IAASM) was officially founded on 21<sup>st</sup> September 1997. IAASM is an independent and non-profit organization, pursuing scientific and cultural goals in the energy and environmental sectors and promoting Scuola Mattei's cultural heritage.

Today IAASM publishes books, manages information exchanges 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 specialists in the energy and environmental sector and, by extension, in the entire professional world.



# MEDEA

## Master in Energy and Environmental Management and Economics

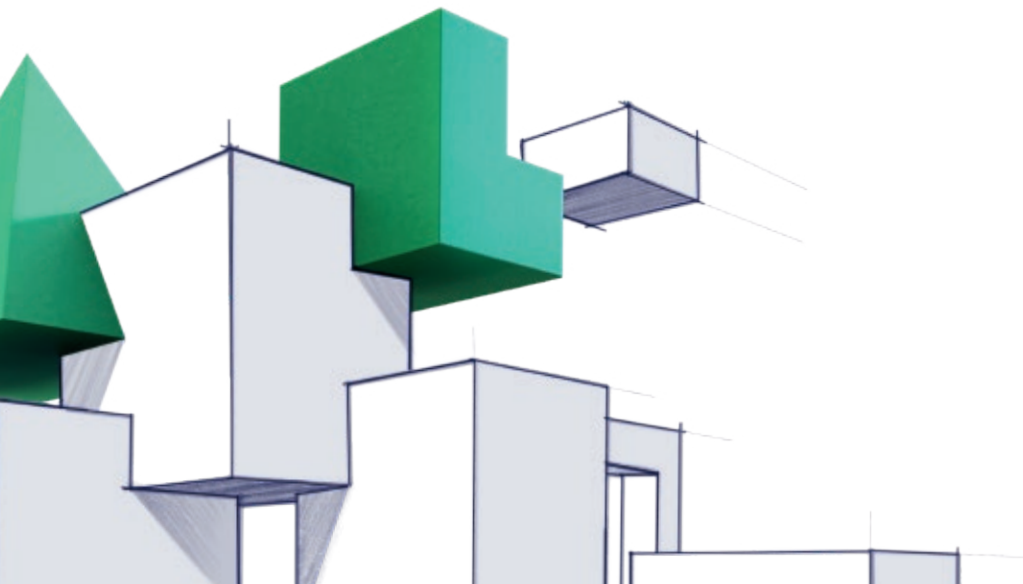
	GLOBAL ENERGY	MANAGING TECHNICAL ASSETS
I phase	Financial Accounting	
	Hydrocarbons' Cycle	
	Applied Econometrics	Quantitative Methods For Management
	Economics	Basic Economics
	System Dynamics Modelling	Data Analysis
	Workshops: History and Economics LEGO Serious Play Science Communication	
II phase	Behavioural Economics	
	Energy Economics	
	Environmental Economics and Policy	
	Field Development Strategy	
	Corporate Finance	Basic Corporate Finance
	Workshops: Project Management Coding	
III phase	Geopolitics of Energy	
	Power Sector Economics	
	Strategic Management	
	Industry 4.0 and Logistics Planning and Control	Environmental Impact Assessment Safety and Environmental Protection
	Workshops: Sustainability: Eni's Approach Oil and Gas Contracts and Trading Circular Economy	

Due to organizational reasons the program might change.

# SYLLABUS

in alphabetical order

Applied Econometrics	Behavioural Economics	Corporate Finance and Basic Corporate Finance (topics are the same, with different degree of deepening)	Data Analysis
<ul style="list-style-type: none"><li>□ Basic statistics</li><li>□ Classical linear regression model</li><li>□ Hypotheses testing</li><li>□ Generalised least squares</li><li>□ Systems of equations</li><li>□ Applied sessions</li></ul>	<ul style="list-style-type: none"><li>□ Introduction to irrationality</li><li>□ Psychology of money</li><li>□ Dishonesty and cheating: illegal behaviour</li><li>□ Work and motivation</li><li>□ Self-control</li><li>□ Emotions</li></ul>	<ul style="list-style-type: none"><li>□ Financial analysis and forecasting models</li><li>□ Investment analysis methods</li><li>□ Principles of financial management: value theory, portfolio theory, CAPM and APT</li><li>□ Financial structure decisions and corporate value</li><li>□ Value creation and EVA-theory models</li><li>□ Derivatives and their markets</li></ul>	<ul style="list-style-type: none"><li>□ Define a standard and structured approach to Microsoft Excel databases</li><li>□ Develop technical skills to perform simple and complex analysis</li></ul>





## Economics and Basic Economics

(topics are the same, with different degree of deepening)

- 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

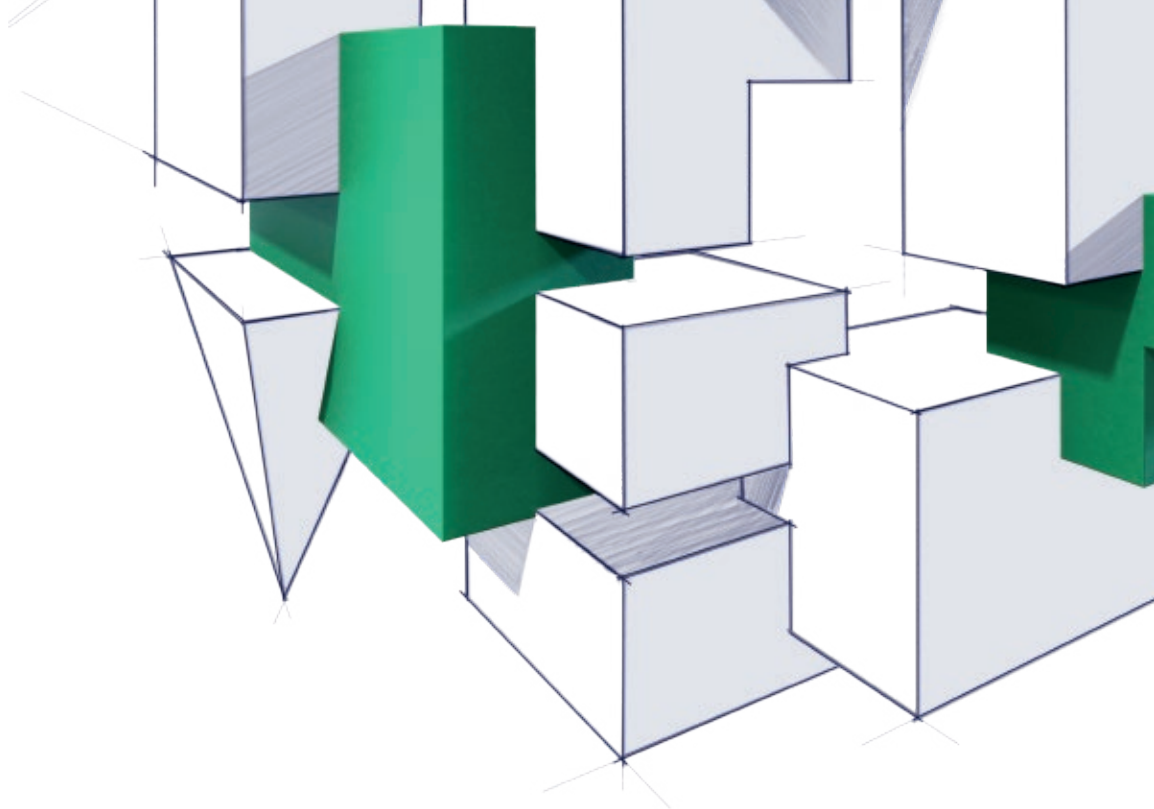




## SYLLABUS

in alphabetical order

Energy Economics	Environmental Economics and Policy	Environmental Impact Assessment	Geopolitics of Energy
<ul style="list-style-type: none"> <li>□ Fundamentals of the energy system: energy demand and supply</li> <li>□ The evolution of the energy industry</li> <li>□ Fundamentals of the oil market</li> <li>□ The shale revolution</li> <li>□ Energy statistics and indicators</li> <li>□ Introduction to market regulation</li> <li>□ Public utilities sector</li> </ul>	<ul style="list-style-type: none"> <li>□ The theory of externalities and public goods</li> <li>□ The design of environmental policy: standards, taxes, tradable permits</li> <li>□ Sustainable development and global pollution problems</li> <li>□ Global warming and post Kyoto context</li> <li>□ Environmental accounting</li> </ul>	<ul style="list-style-type: none"> <li>□ Cost-benefit analysis versus SEA</li> <li>□ SEA problems and methods</li> <li>□ Impacts analysis and forecasting</li> <li>□ Evaluation and choice among different projects</li> </ul>	<ul style="list-style-type: none"> <li>□ The Suez crises (1956)</li> <li>□ The Yom Kippur War and the Iranian crisis</li> <li>□ The first Gulf War (1991)</li> <li>□ Central Asia scenarios</li> <li>□ International relations and geopolitics of energy after 9/11</li> <li>□ Iraq after Saddam Hussein</li> </ul>



### Field Development Strategy

- 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

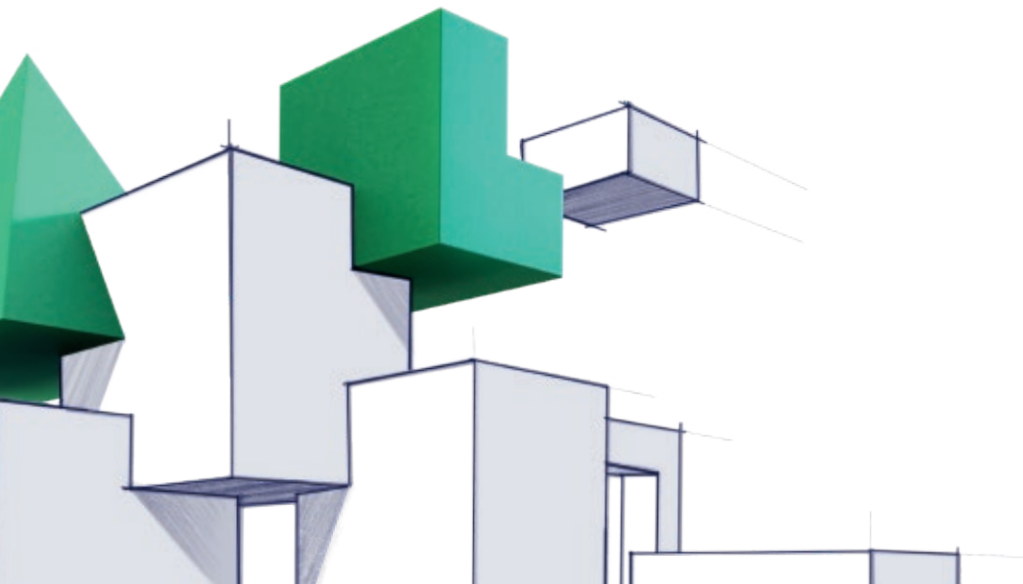
### Financial Accounting

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

# SYLLABUS

in alphabetical order

Hydrocarbons' Cycle	Industry 4.0 and Logistics	Planning and Control	Power Sector Economics
<ul style="list-style-type: none"><li>□ Hydrocarbons origin and accumulation</li><li>□ Hydrocarbons exploration techniques</li><li>□ Drilling, completion and production</li><li>□ Treatments and transportation of oil and gas</li><li>□ Petrochemical processes and products</li><li>□ The refining industry</li></ul>	<ul style="list-style-type: none"><li>□ The innovation process</li><li>□ Strategic decisions in managing innovation</li><li>□ Technological planning process</li><li>□ Introduction to logistics in the oil&amp;gas industry</li><li>□ IoT and Blockchain</li></ul>	<ul style="list-style-type: none"><li>□ Planning and control: basic methodologies</li><li>□ Planning and control in the energy sector</li><li>□ Economic and capital budgeting</li><li>□ Budgetary control and variance analysis</li><li>□ Corporate planning and the reporting system</li></ul>	<ul style="list-style-type: none"><li>□ Electrical power system structure</li><li>□ The coal cycle</li><li>□ Nuclear power</li><li>□ Renewable energy sources</li></ul>



### 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

### 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

### System Dynamics Modelling

- Stock, flows, converters and connectors
- Positive and negative feedbacks
- Modelling principles
- Introduction to archetypes
- Applied sessions: simplified and complex models building







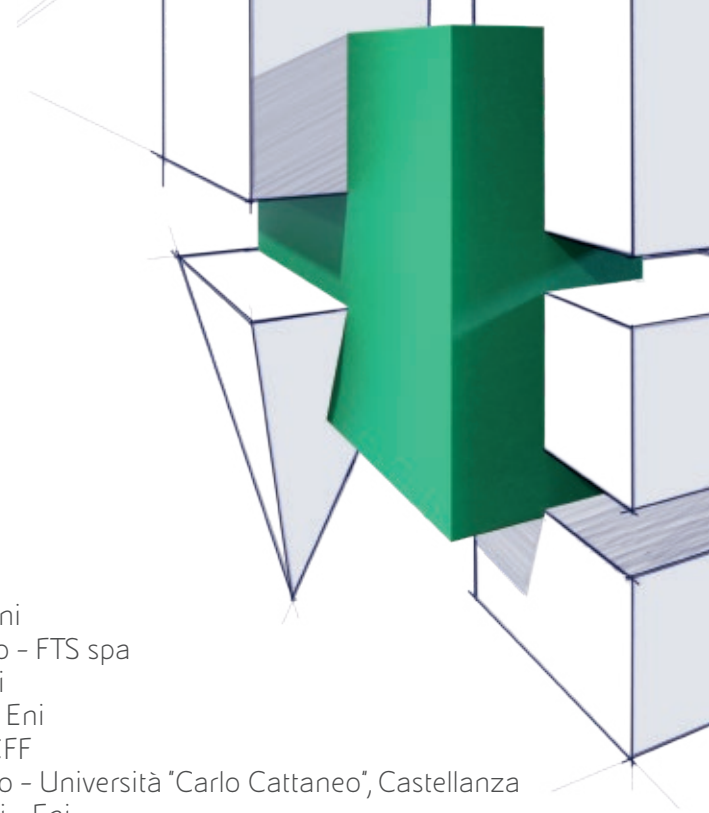
## Faculty

Francesca Arcovito - Eni  
Costantino Alberici - Eni Corporate University  
Alfonso Amedola - Eni  
Donato Azzarone - Eni  
Giovanni Azzone - Politecnico di Milano  
Francesco Baldino - Eni  
Andrea Bellati - Fondazione Eni Enrico Mattei  
Stefano Bellisario - Eni  
Giuseppe Bellussi - Eni  
Luca Bertelli - Eni  
Milo Bianchi - Toulouse School of Economics  
Marco Bollini - Eni  
Raffaella Bordogna - Eni  
Stella Brandolese - Eni  
Cosimo Campidoglio - Gestore del Mercato Elettrico  
Luciano Canova - Scuola Enrico Mattei  
Salvatore Carollo - Esperto Energia  
Giovanni Caron - GEMA Business School  
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Carlo Comaschi - Eni  
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Stefano Fabris - Versalis  
Gaetano Formato - Eni  
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Francesco Gattei - Eni  
Robert Grant - Georgetown University e Università "Luigi Bocconi"  
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Frederic Lantz - Institut Français du Pétrole  
Paddy Lewis - Arcus Partnership  
Antonino Lo Sardo - Nagima  
Giuseppe Maddinelli - Eni  
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Sergio Mariotti - Politecnico di Milano  
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Danilo Monti - Eni  
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Giuliano Noci - Politecnico di Milano

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TOGETHER WE HAVE GREATER ENERGY

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