ANNUAL TRAINING
ON THE REGULATION OF ENERGY UTILITIES

24th edition
1 October 2024 – 4 July 2025
Online class training

Course Director

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Honorary Course Director

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Background

Empowering the next generation of energy regulators.

During the Annual Training, you will gain extensive knowledge of the fundamental principles of the regulation of the power and gas sectors through theory and practice, learning from European leaders, former regulators, leading academics and industry specialists and practitioners.

After this nine-month online course, you will be equipped to take adequate positions on competition, the integration of markets and networks, quality of service, economic efficiency, and security of supply, with the ultimate goal of protecting the interests of consumers and the better integration of market participants and networks into a common European energy market.

Every other week, you will have the chance to discuss and learn from a different instructor via two interactive live classes, a Q&A session, and a master class led by a leading expert (around 35 live sessions in total). To ensure you have close and personalised interaction with the instructors, this online course will have a limit of 30 participants.

Learning Outcomes

After completing the course you'll be able to:

- Understand the principles of regulatory economics for the regulation of monopolies and competitive activities and the elements required for the proper functioning of competitive markets
- Interpret regulatory models and the restructuring process of the electricity and gas sectors – detailed view of the institutional structure for energy regulation and policy-making in Europe
- Compare different approaches to the regulation of transmission and distribution networks as natural monopolies
- Classify regulatory and technological challenges for the widespread inception of retail markets
- Analyze the common challenges that the electricity and gas sector will face towards the completion of the European internal energy market

- Apply the theoretical knowledge you will acquire through case study analysis
- Map and prioritize different regulatory issues

Target audience

The course is given in English and developed for:

- Undergraduate/Graduate/PhD Students
- Global audience
- Professionals engaged in the sector
- New stakeholders in the energy sector
- Government agencies
- Regulatory bodies
- Energy companies
- Energy companies such as Transmission System Operators and Distribution companies for electricity or gas, power generators or gas suppliers
- European Associations
- National Associations

Course Structure

The training is structured around three blocks: an initial one reviews the regulatory fundamentals; then Block II is the core of the course, in which the key issues are analyzed and participants are asked to contribute with their own analyses, and finally Block III gathers a series of live discussions on the hottest energy regulation topics.

Block 0: Basics on Energy Systems

1 October 2024 – 20 October 2024

Participants are offered selected readings describing how energy systems are operated and managed. How do energy (power and gas) systems manage to provide end-users with energy supply continuously with an adequate quality of service, at an affordable price and with an acceptable environmental impact.

Block I: Theory and Principles of Regulation

22 October 2024 – 21 November 2024

Three introductory modules (one-week long) to review the fundamentals of regulatory practice needed to delve into the subsequent study of the regulation of the different energy activities.
The modules consist of two interactive lectures at the start of the week. In the lecture, updated and selected support material is offered to the participants, so they can improve or consolidate their knowledge.

Block II: Regulation of Energy Supply Activities

26 November 2024 – 24 April 2025

A six-month online and fully interactive course, in which energy regulatory principles and case studies are studied together in-depth in a well-structured, flexible e-learning environment, featuring live lectures and discussions with the course instructors and participants.

Block III: Final Webinar Series: Current Regulatory Key Discussions

6 May 2025 – 15 May 2025 Online

3-4 July 2025 Residential event In Florence

Three live sessions, devoted to the discussion of case studies and the presentation of other topics of specific interest to the course participants, and a final one-day panel on energy and sustainability, which marks the end of the course with the awarding of diplomas to participants.
In July, we will host a special event created to offer to the alumni the opportunity to spend two days in Florence with a double objective:

- to attend a series of lectures offered by leading characters of the energy sector on the hottest current policy and regulatory challenges. The alumni have the chance not only to update their views on these issues but also participate in the discussions.
- to share the experience with their peers, not only during the sessions but also in the coffee breaks, lunches, and dinners, having the chance to meet in person other colleagues, coming from all around the world, and benefit from their experiences and lessons learnt in their countries.

Course Activities

- **Live sessions**
  Please note that live sessions won't be recorded to guarantee the maximum interaction and participation.
  - *Live classes*: 1h 15' (+15' voluntary additional Q&A)
    Participants can raise hands and make questions during the lecture and instructors also address participants via quizzes to motivate participation.
  - *Master Classes:* 45' (+15' Q&A)
    One leading expert discusses a hot regulatory matter related to the topics reviewed in the previous modules.
  - *Live Office Hours:* Voluntary live and interactive session (30')
    Forum discussion and Q&As with the module's instructor.
  - *Panel Debates*
- **Course Readings**
  Time to review the lectures and the suggested reading materials.
- **Video Lectures**
  Time to review the lectures and the suggested reading materials.
- **Forum discussions**
  Interactive forum in which participants can exchange questions for clarification or topics for discussion.
- **Quizzes**
  Test your understanding: 5 to 10 multi-choice questions.
  Self-assessment quiz to give participants an overview of the content and information about their knowledge level.
- **Case Study Assignments**
  Participants are presented a real-life and recent case study related to the topics reviewed in the previous weeks.
  They are asked to analyze it and submit their personal discussion on the issue.
  Submissions are graded and reviewed by the case study instructor in a live session.

Course Instructors

- **Carlos Batlle** | MIT Energy Initiative, Florence School of Regulation
- **Pablo Rodilla** | Comillas Pontifical University
- **Alberto Pototschnig** | Florence School of Regulation
- **Elena Fumagalli** | Copernicus Institute of Sustainable Development, Utrecht University
- **Aad Correlje** | Delft University of Technology

- **Marzia Sesini** | Florence School of Regulation
- **Andris Pielbags** | Florence School of Regulation
- **Ellen Beckstedde** | Florence School of Regulation
- **Sabine Lobbe** | Reutlingen University
- **Kaisa Huhta** | UEF Law School
- **François Beaude** | ACER
- **Ignacio J. Pérez-Arriaga** | Florence School of Regulation, RSCAS, EUI; Comillas University; Massachusetts Institute of Technology, MIT
- **Peter Heller** | University; Massachusetts Institute of Technology, MIT
- **Jos Delbeke** | School of Transnational Governance, EUI
- **Christopher Jones** | Florence School of Regulation, RSCAS, EUI; Baker & McKenzie

Assessment criteria

- Attendance
- Active participation in class
- Course assignments (case study assignments)
- Quizzes
- Forum Discussions
- Instructors' evaluation

Course Levels and workload

There are three types of certificates that can be earned at the end of the course. The participants who do exceptionally well will receive a letter of recommendation from the Course Director in addition to the certificate. The letter will be sent to the supervisor of these participants or equivalent position, as indicated by the participant.

Certificate of Attendance (Investigator level)

If you have actively taken part in the course, attended 12 live classes and received at least:

- 8 Investigator badges

Certificate of Completion (Advocate level)

If you have actively taken part in the course, attended 15 live classes and received at least:

- 8 Investigator badges
- 5 Advocate badges
- Submitted 4 case studies in which the graded average is Adequate (65%) or Minimally Acceptable (55%).

Certificate of Excellence (Master level)

If you have actively taken part in the course, attended 18 live classes and received at least:

- 8 Investigator badges
- 8 Advocate badges
- Submitted 4 case studies in which the graded average is Excellent (95%) or Good (85%)

Workload

We estimate a workload of 8 to 12 hours per week

Admission requirements

No formal background on energy regulation is required. An educational background in engineering, economics, or law is strongly recommended.

To ensure a close interaction with the instructors and a personalised learning experience, this online course will have a limited number of participants.

Syllabus

Block 0: Basics on Energy Systems

I.1. Regulatory models for energy systems - *Carlos Batlle*

Tuesday 1 October 2024 *2:30 – 4 PM CEST*	Live Class	**Welcome live class**
Thursday, 15 October 2024 *2:30 – 4 PM CEST*	Live Class	**Presentation Session**

Block I: Theory and Principles of Regulation

I.1. Regulatory models for energy systems - *Carlos Batlle*

Tuesday 22 October 2024 *2:30 – 4 PM CEST*	Live Class	**Energy services pricing: from regulated costs to price competition** Cost-of-service regulation. Incentive regulation. Competitive bidding. Market competition
Thursday 24 October 2024 *2:30 – 4 PM CEST*	Live Class	**Energy systems' governance: activities, structure, stakeholders' roles** Unbundling. System and market operation
Friday 25 October 2024– Sunday 27 October 2024	Review Period	Activities on the course platform

I.2. Fundamentals of energy systems economics - *Pablo Rodilla*

Tuesday 5 November 2024 *2:30 – 4 PM CET*	Live Class	**Centralized versus market-based planning** Costs' characterization: investment, average and marginal costs Cost minimization versus profit maximization
Thursday 7 November 2024 *2:30 – 4 PM CET*	Live Class	**Basics on energy contracts** Physical versus financial contracts.
Friday 8 November 2024– Sunday 10 November 2024	Review Period	Activities on the course platform

I.3. Cost allocation methodologies - *Carlos Batlle*

Tuesday 12 November 2024 *2:30 – 4 PM CET*	Live Class	**Practical case example of cost allocation** Discussion of a real life (non-energy related) case example of cost allocation
Thursday 14 November 2024 *2:30 – 4 PM CET*	Live Class	**Cost allocation theory** Efficiency and equity. Long-run marginal costs. Residual costs…
Friday 15 November 2024– Sunday 17 November 2024	Review Period	Activities on the course platform

I.4. Live office hour - *Carlos Batlle*

Thursday 21 November 2024 *2:30 – 4 PM CET*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

Block II: Regulation of energy supply activities

II.1. Wholesale electricity generation

II.1.1. Pricing electricity generation - *Carlos Batlle*

Tuesday 26 November 2024 *2:30 – 4 PM CET*	Live Class	**Investment and operation planning** From central planning and operation to wholesale markets
Thursday 28 November 2024 *2:30 – 4 PM CET*	Live Class	**Energy markets design elements** Market-based economic scheduling: Market design elements
Friday 29 Noveber 2024– Sunday 1 December 2024	Review Period	Activities on the course platform

II.1.2. Complements to energy markets: ancillary services and capacity mechanisms - *Carlos Batlle*

Tuesday 3 December 2024 *2:30 – 4 PM CET*	Live Class	**Flexibility markets** Intraday, reserves and regulation markets.
Thursday 5 December 2024 *2:30 – 4 PM CET*	Live Class	**Capacity and RES-support mechanisms** Design elements of capacity and RES promotion mechanisms
Friday 6 December 2024– Sunday 8 December 2024	Review Period	Activities on the course platform

II.1.3. Case study on wholesale electricity generation - *Carlos Batlle*

Beginning of the module	Case Study Assignment	**Case study formulation** Instructors' description of the problem to be analyzed.
Tuesday 31 December 2024	Case Study Assignment	**Submission deadline**

II.1.4. Leading expert master class - *Alberto Pototschnig*

Tuesday 10 December 2024 *2:30 – 4 PM CET*	Master Class	**Current regulatory challenges of wholesale electricity markets**

II.1.5. Live office hour - *Carlos Batlle*

Thursday 12 December 2024 *2:30 – 4 PM CET*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

II.2. Electricity networks

II.2.1. Interplay between transmission and generation - *Carlos Batlle*

Tuesday 7 January 2025 *2:30 – 4 PM CET*	Live Class	**Locational pricing** Fundamentals of nodal (and zonal) pricing
Thursday 9 January 2025 *2:30 – 4 PM CET*	Live Class	**Regulatory treatment of transmission investment planning** Golden rules, net-social welfare maximization
Friday 10 January 2024 – Sunday 12 January 2025	Review Period	Activities on the course platform

II.2.2. Regulated revenues and cost allocation - *Carlos Batlle*

Tuesday 14 January 2025 *2:30 – 4 PM CET*	Live Class	**Remuneration mechanisms for distribution** Cost-of-service, RPI-X, TOTEX…
Thursday 16 January 2025 *2:30 – 4 PM CET*	Live Class	**Network costs allocation** Transmission and distribution tariffs
Friday 17 January 2025– Sunday 19 January 2025	Review Period	Activities on the course platform

II.2.3. Case study on network regulation - *Carlos Batlle*

Beginning of the module	Case Study Assignment	**Case study formulation** Instructors' description of the problem to be analyzed.
Friday 31 January 2025	Case Study Assignment	**Submission deadline**

II.2.4. Leading expert master class - *Elena Fumagalli*

Tuesday 21 January 2025 *2:30 – 4 PM CET*	Master Class	**Quality of Service**

II.2.5. Live office hour - *Carlos Batlle*

Thursday 23 January 2025 *2:30 – 4 PM CET*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

II.3. Gas markets and networks

II.3.1. Gas markets - *Aad Correlje*

Tuesday 4 February 2025 *2:30 – 4 PM CET*	Live Class	**A tale of three natural gas markets** Evolution of economic, commercial and political coordination of gas markets
Thursday 6 February 2025 *2:30 – 4 PM CET*	Live Class	**Regulating the Natural Gas Industry** Challenges to regulating the national gas industry in a global gas market
Friday 7 February 2025– Sunday 9 February 2025	Review Period	Activities on the course platform

II.3.2. Gas networks – *Marzia Sesini*

Tuesday 11 February 2025 *2:30 – 4 PM CET*	Live Class	**Regulatory models and tariffs** The gas industry, transmission, LNG and storage tariffs
Thursday 13 February 2025 *2:30 – 4 PM CET*	Live Class	**Transmission access and distribution** Capacity allocation, tariffs, …
Friday 14 February 2025– Sunday 16 February 2025	Review Period	Activities on the course platform

II.3.3. Case study on gas regulation - *Aad Correlje*

Beginning of the module	Case Study Assignment	**Case study formulation** Instructors' description of the problem to be analyzed.
Friday 28 February 2025	Case Study Assignment	**Submission deadline**

II.3.4. Leading expert master class - *Andris Pielbags*

Tuesday 18 February 2025 *2:30 – 4 PM CET*	Master Class	**The Role of Renewable Hydrogen**

II.3.5. Live office hour - *Aad Correlje*

Thursday 20 February 2025 *2:30 – 4 PM CET*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

II.4. End-user energy pricing

II.4.1. End-user tariffs - *Ellen Beckstedde*

Tuesday 4 March 2025 *2:30 – 4 PM CET*	Live Class	**Principles and basic tariff structures** Efficiency & equity. Additivity, components.
Thursday 6 March 2025 *2:30 – 4 PM CET*	Live Class	**Time and locational granularity** Dynamic, TOU, fixed, …
Friday 7 March 2025– Sunday 9 March 2025	Review Period	Activities on the course platform

II.4.2. Retail markets - *Carlos Batlle*

Tuesday 11 March 2025 *2:30 – 4 PM CET*	Live Class	**Business models** Retail activities, stakeholders roles
Thursday 13 March 2025 *2:30 – 4 PM CET*	Live Class	**Consumer protection** Data management, switching, vulnerable customers
Friday 14 March 2025– Sunday 16 March 2025	Review Period	Activities on the course platform

II.4.3. Case study on end-user pricing – *Ellen Beckstedde*

Beginning of the module	Case Study Assignment	**Case study formulation** Instructors' description of the problem to be analyzed.
Monday 31 March 2025	Case Study Assignment	**Submission deadline**

II.4.4. Leading expert master class – *Sabine Lobbe*

Tuesday 18 March 2025 *2:30 – 4 PM CET*	Master Class	**Citizen Energy Communities**

II.4.5. Live office hour - *Carlos Batlle*

Thursday 20 March 2025 *2:30 – 4 PM CET*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

II.5. Legal Aspects of Applied Energy Regulation

II.5.1. Case study on regulatory authorities – *Kaisa Huhta*

Tuesday 8 April 2025 *2:30 – 4 PM CEST*	Live Class	**Legal Aspects of Applied Energy Regulation**
Friday 12 April 2025– Sunday 14 April 2025	Review Period	Activities on the course platform

II.5.2. Case study on regulatory authorities - *Kaisa Huhta*

Beginning of the module	Case Study Assignment	**Case study formulation** Instructors' description of the problem to be analyzed.
Wednesday 30 April 2025	Case Study Assignment	**Submission deadline**

II.5.3. Live office hour - *Kaisa Huhta*

Tuesday 15 April 2025 *2:30 – 4 PM CEST*	Live Office Hour	**Voluntary live Q&A session with the module's instructor**

Block III: Final webinar series: current regulatory key discussions

[Disclaimer: As an illustration, the program for Block III of the 2022-23 follows. The 2023-2024 version will be updated to the current discussions alive in June 2024]

III.1. Case study 1 - *Ignacio J. Pérez-Arriaga* (TBC) Tuesday 6 May 2025 *2:30 – 4 PM CEST*	Master Class	**Distribution challenges in the developing world**
III.2. Case study 2 – *François Beaude* (TBC) Thursday 8 May 2025 *2:30 – 4 PM CEST*	Master Class	**Cross-border issues in EU wholesale markets**
III.3. Case study 3 – *Peter Heller* (TBC) Tuesday 13 May 2025 *2:30 – 4 PM CEST*	Master Class	**Vulnerable customers: the US and EU approaches to face the energy poverty challenge in the move towards decarbonization**
III.4. Panel discussion - *Christopher Jones, Jos Delbeke, Andris Pielbags* (TBC) Thursday 15 May 2025 *2:30 – 4 PM CEST*	Panel Debate	**Sustainability of our energy model and future perspectives**

3-4 July Special event in Florence