

Academic Year/course: 2022/23

66382 - Energy markets

Syllabus Information

Academic Year: 2022/23

Subject: 66382 - Energy markets

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 636 - Master's in Renewable Energies and Energy Efficiency

ECTS: 6.0

Year: 1

Semester: Second semester

Subject Type: Optional

Module:

1. General information

1.1. Aims of the course

1. Identify the different models of energy markets internationally applied and explain the functioning and problems of each one.
2. Optimize and negotiate the technical and economic conditions of electricity and gas supply contracts.
3. Develop computational and statistics skills for the mining and processing of data from international markets and the evaluation of indexed modalities of energy purchase.
4. Identify international strategies to promote investments in renewable energies and apply the Spanish legal framework for the optimal management of facilities.

These approaches and objectives are aligned with some of the **Sustainable Development Goals, SDG**, of the 2030 Agenda (<https://www.un.org/sustainabledevelopment/es/>) and certain specific goals, in such a way that the acquisition of learning outcomes of the subject provides training and competence to the student to contribute to some extent to their achievement:

Goal 7: Affordable and clean energy

- Target 7.1 By 2030, ensure universal access to affordable, reliable and modern energy services

1.2. Context and importance of this course in the degree

The ENERGY MARKETS course provides an essential complement to the technical content of other Master courses, training students in the economic management of energy supply and the legal knowledge of the more practical aspects of the development of renewable energies in the context of modern energy markets.

1.3. Recommendations to take this course

General knowledge of energy technologies and infrastructures.
Ability to conduct autonomous searches of technical and scientific information.
Sufficient knowledge of English for reading documentation.

2. Learning goals

2.1. Competences

Specific skills

CE01.- Ability to use and develop methodologies, methods, techniques, programs for specific use, norms and computing standards.

CE03.- Knowledge of the importance and implications of the use of energy in the development of society.

Basic and general skills

CB07.- That students know how to apply the knowledge acquired and their ability to solve problems in new environments within broader (or multidisciplinary) contexts related to their area of study.

CB08.- That students are able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.

CB09.- That students know how to communicate their conclusions and the knowledge and ultimate reasons that support them to specialized and non-specialized audiences in a clear and unambiguous way.

CB10.- That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

CG04.- Follow the technological evolution of renewable energies and have prospective knowledge of this evolution.

CG06.- Identify current legislation and regulations applicable to the renewable energy and energy efficiency sector

CG08.- Develop the ability to advise and guide on the best way to optimize energy resources in relation to renewable energies.

2.2. Learning goals

Identify the different models of energy markets internationally applied and explain the functioning and problems of each one.

Optimize and negotiate the technical and economic conditions of electricity and gas supply contracts.

Develop computational and statistics skills for the mining and processing of data from international markets and the evaluation of indexed modalities of energy purchase.

Identify international strategies to promote investments in renewable energies and apply the Spanish legal framework for the optimal management of facilities.

2.3. Importance of learning goals

- To prepare students for negotiating supply contracts in modern liberalized energy markets, a better understanding of the functioning of wholesale markets and optimal economic management of the sale of electricity produced in generation plants using renewable sources
- To initiate research in energy markets for those students who will continue in a doctoral training program

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The assessment of the subject will be carried out through the global evaluation system and will consist of two activities:

1. A set of practical exercises proposed by the teacher
2. A test of understanding basic concepts

However, all students will have the right to take a global evaluation test, which will be scheduled on the dates indicated by the centre in its exam calendar, both in the first and second calls.

Weighting of the assessment activities:

Activity 1: 50%

Activity 2: 50%

Assessment criteria:

The assessment criteria of activity nº 1 are:

- Fulfillment of the objectives proposed in each practical case

The assessment criteria of activity nº 2 are:

- Rating according to the number of correct answers obtained

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. It is based on an interactive methodology between the teacher and the students, supported by the reading of the materials provided by the teacher in each session and practical case studies.

4.2. Learning tasks

This is a 6 ECTS course organized as follows:

- A01 Lectures (30 hours). Presentation of theoretical contents by a faculty or by external experts to all students enrolled in the course. Although it is not a mandatory activity, regular attendance is highly recommended.
- A02 Problem and case solving (20 hours). Solve practical problems and exercises with all the students. Although it is not a mandatory activity, regular attendance is highly recommended.
- A03 Laboratory sessions (10 hours). Students will work actively in groups to solve practical exercises.
- A06 Guided assignments (20 hours). Students will complete assignments, problems and exercises related to concepts seen in laboratory sessions and lectures.
- A07 Autonomous work (50 hours). Students are expected to spend about 50 hours studying theory, solving problems and preparing lab sessions.
- A08 Assessment (5 hours).

The indicated hours are for guidance and will be adjusted depending on the academic calendar.

4.3. Syllabus

Regulation of the energy sector

- Regional markets. Internal energy market of the European Union.
- Economy of electricity sector. Wholesale markets and forward markets models. Emissions trading market.
- Technical grid operation and ancillary services markets.
- Regulation of electric transmission and distribution. Network access tariffs and other charges.

Electricity supply contracting

- Retail markets. Marketing of electricity. Components of the final price.
- Contract options for consumers.
- Negotiation of supply contracts. Types of offers and contracts. Examples.
- Direct energy market purchase.
- Electric bills optimization. Examples.
- Tools for monitoring of energy consumption and costs.
- Meters. Consumer access rights.

Introduction to market regulation

- Introduction to the structure of markets: private and social results.
- Imperfect competition markets. Origins and firm behavior
- Market regulation models and competition policy.

Regulation of distributed generation

- Models of regulation and remuneration of renewable energy.
- Specific regime for renewable energy and cogeneration in Spain.
- Impact of the sale of electricity from renewable sources in the Spanish wholesale market.
- Legal and economic regulation of electricity consumption in Spain. Examples. International experiences.

Oil and gas markets

- Regulation and operation of the Spanish gas sector.
- Regulation and operation of the Spanish oil sector. Biofuels.

Research topics in energy markets

4.4. Course planning and calendar

The course is taught in the second semester. At the beginning of the semester, the teacher will inform the planning of learning activities and key deadlines.