# Minor in Energy Economics and Policy

## Description

### The Minor concept

A minor gives you the opportunity of having a second specialisation in your degree. It is a bundle of three electives that can also be chosen separately, but if chosen together they constitute a minor.

### Purpose

Introduction: The European Green Deal has established the objective of making Europe the first climate-neutral continent by 2050. At the same time, Denmark has decided to be at the frontline and set an ambitious target of 70% reduction in greenhouse gas emissions by 2030, before climate neutrality is achieved by 2050. Reaching these objectives imply massive transformations in the energy industry from technical, economic, regulatory, social, and political viewpoints. This minor gives you the opportunity to have a second specialisation in your degree. It is designed to prepare you to understand the main energy and related environmental challenges for the economy and business. This minor is a bundle of three electives that can be chosen separately, but if chosen together, reward a minor.

Background: The transition from a fossil fuel-based economy with an unsustainable use of natural resources towards a production system based on renewables, recycling, and reuse of materials is one of the defining challenges of our age. In no other area is this more important than in the energy sector. Energy is essential to the functioning of the modern economy, but we must switch from the current use of oil, coal, and natural gas towards renewable energy sources such as wind, solar, hydropower, marine or geothermal energy. This massive undertaking requires investments in new infrastructure in every aspect of energy in modern life, from heating and powering our homes, transportation of goods and people, industrial production, heating and powering of commercial buildings, and agriculture and forestry. Bloomberg NEF estimates that 78 to 130 trillion USD will be required between now and 2050 in global clean energy investments. At the same time, the energy system is highly complex and characterised by physical and technical relationships that need to be taken into account in an economic analysis. Globally, there is a strong and growing need for graduates who can master the analytical skills and business perspectives needed for success in this evolving landscape.

Purpose: This minor should provide you with the tools, concepts and theories needed to analyse the functioning of the energy sector from an economic, system modelling, and business perspective to inform regulatory policy as well as individual business strategies and investments. We have assembled three courses that together form a comprehensive set of perspectives and methods, with

certain emphasis on quantitative analysis and a thorough understanding of the complex structure of the energy industry. This minor supports the students to acquire skills and capabilities in line with the Nordic Nine principles. In particular, the minor facilitates the students to develop analytical thinking with data and curiosity about ambiguity, produce prosperity and protect the prosperity of next generations, and understand ethical dilemmas and have the leadership values to overcome them.

## Organisation

This minor is organised and supported by the Copenhagen School of Energy Infrastructure (CSEI) at CBS and is embedded in its overall strategy of research and education. The centre conducts research in tomorrow's energy infrastructure from an economic policy point-of-view to ensure a successful transition towards a new sustainable European energy infrastructure based on volatile and renewable energy sources. The strong involvement of CSEI in the current European energy debate endorses that the students will get a good foundation for their professional development in the sector.

## Structure

The below table lists the structure and the ECTS credits of the individual courses. The course descriptions are available in the online course catalogue. Direct links are inserted in the below table.

| Course | ECTS |
|---|---|
| Energy Economics, Markets, and Policy | 7.5 |
| Energy System Economics and Modelling | 7.5 |
| The Energy Industry in Transition: Markets, Innovation and Strategies | 7.5 |

## Content

The minor builds upon the competences acquired by the students during their first year. Completing the minor will qualify you uniquely for specialist and management positions in the energy industry, broadly conceived as energy producers, technology providers, regulators, and adjacent supplier networks. The minor is strongly based on theories and methods from microeconomics, business strategy and innovation, operations research, and system dynamics.

Each course counts for 7.5 ECTS. In order to obtain the minor, you must choose the three of them. The courses are as follows:

***Energy Economics, Markets, and Policy*.** Based upon microeconomic theory, the course introduces you to theories and models of energy markets, regulation, and competition policy, with an emphasis on how these markets and their regulation are affected by globalisation and the need for fair and environmentally sustainable energy development.

***The Energy Industry in Transition: Markets, Innovation, and Strategies*.** Gives you a deep insight into the energy industry from a business perspective, with an emphasis on innovation and business strategy and a focus on frameworks to analyse 'systemic innovation', where the value of a product, process, or technology is fundamentally dependent upon its interaction with other parts of the energy system. It builds on theories from business strategy, innovation, microeconomics, the economics and politics of regulation, and consumer behaviour, as they apply to concrete issues in

the energy industry. To give you first-hand knowledge of the energy industry, we will also aim to invite guest lectures from the industry.

***Energy System Economics and Modelling.*** Introduces methods for modelling the energy system that are used by firms and policy makers for forecasting and for policy and scenario analysis. These methods are essentially optimisation models, but also some additional models are briefly featured during the course. The course introduces you to the details and challenges of energy system analysis, system dynamics, and efficiency and productivity analysis, all methods that are part of the ongoing policy debate surrounding alternative energy technologies and future development paths. Through hands-on experience with such models, you will get a thorough understanding of how they work, and we will also explore how such models are used in the policy-making process.

## Examinations

The minor consists of the examinations listed below. The learning objectives and the regulations of the individual examinations are prescribed in the online course catalogue. Direct links to the individual examinations are inserted in the table below.

| Exam name | Exam form | Gradingscale | Internal/external exam | ECTS |
|---|---|---|---|---|
| Energy Economics, Markets, and Policy | Written sit-in exam on CBS' computers | 7-point grading scale | Internal exam | 7.5 |
| Energy System Economics and Modelling | Oral exam based on written product | 7-point grading scale | Internal exam | 7.5 |
| The Energy Industry in Transition: Markets, Innovation, and Strategies | Oral exam based on written product | 7-point grading scale | Internal exam | 7.5 |

## Prerequisites for registering for the exam – compulsory activities

There are no compulsory assignments or requirements about active class participation.

## Further information

## Minor coordinator

Manuel Llorca – Department of Economics (ECON)

## Study Board

The Minor in Circular Economy is offered by the Study Board for the Master of Science Programme in Economics and Business Administration.

## How to sign up

If you want to sign up for the Minor in Energy Economics and Policy, you have to select the Minor in Energy Economics and Policy (CCMVM1960U) when you sign up for your electives. You will then subsequently be signed up for all three courses.