

ME 2087 Energy Business, Course PM 2025

Learning outcomes

On completion of the course, the student by combining knowledge in the subareas energy engineering, business administration, economics, business models and decision models should be able to:

1. Carry out basic analyses of how a business is influenced by external factors in energy markets such as policies and other actors' actions.
2. Analyse and evaluate businesses and business opportunities in different parts of the value chain in energy systems.
3. Analyse how the climate issue and other sustainability issues can transform energy systems.
4. Analyse how the action of different actors in the energy field influence the future design of energy systems.

Course main content

The course deals with:

- Analyses of the technical structure and institutional preconditions of different energy systems
- Different forms of entrepreneurship and companies based on different core and support processes in the energy systems, regarding both extent (local, regional, national, international) and time (epochs)
- The businesses, which can be developed in different parts of the energy value chain with different energy technologies, energy types, energy services, customer categories, geographical markets, financial instruments, etc.
- Analyses of the function of the energy markets
- Analyses of strategies both at company policy level, with regard to the transformation of the energy systems and the energy markets
- The effect of the climate changes on the transformation of the energy systems
- Business plans for an existing or recently started energy business, combining technical as well as the environmental and economical aspects.

Schedule

2025-03-19 10-12 U61 FL Course Introduction
2025-03-20 10-12 E33 FL Strategy and decision making
2025-03-21 13-15 U61 FL Organization of energy markets
2025-03-27 13-15 U61 FL Markets, policy and economic welfare
X 2025-04-08 13-15 E36 Matti Kaulio Business models
2025-04-09 13-15 E36 FL Business models
X 2025-04-10 10-12 E36 FL Scenario instruction
2025-04-10 13-15 E36 Stefan tongur Business models (online recording)
X 2025-04-11 10-12 FL Site visit
X 2025-04-11 13-15 Q17 Site visit
X 2025-04-16 10-12 E33 Emma Wiesner
2025-04-17 13-15 E33 Scenario Q&A
2025-04-28 10-12 E51 FL Investments
X 2025-05-05 10-12 E36 Cali Nuur Economics
X 2025-05-06 10-12 E36 Scenario Seminar
2025-05-07 13-15 E36 Technoeconomics
2025-05-09 13-15 Q36 FL Technoeconomics
2025-05-14 10-12 E36 FL Back up
2025-05-16 10-12 E33 FL Q31 FL Course Closure and Q&A

X 2025-04-28 Scenario hand in

X 2025-06-03 24:00 Individual exam hand in

X = mandatory

Readings

Red most important, black less important

Strategy and decision making

- Coase R. The Nature of the Firm. *Economica*, 1937, 16, 386-405
- Simon H.A. Theories of Decision-Making in Economics and Behavioral Science. *The American Economic Review*, 1959, 49, 253-283.
- Peter Swartz - Art of the long view
<https://www.youtube.com/watch?v=Q4WZ-8-BcbU>
- Lempert R.J, Collins M.T. Managing the Risk of Uncertain Threshold Responses: Comparison of Robust, Optimum, and Precautionary Approaches. *Risk Analysis*, 2007, 27, 1009-1026
- Midttun A, Handeland J, Henriksen J.T, Micola A.R, Omland T. Chapter II – Nordic Business Strategies. *European Energy Industry Business Strategies*, 2001, 23-73.

Business models

- Tongur S, Engwall M. The business model dilemma of technology shifts. *Technovation*, 2014, 34, 525-535.
- Boons F, Montalvo C, Quist J, Wagner M. Sustainable innovation, business models and economic performance: an overview. *Journal of Cleaner Production*, 2013, 45, 1-8.
- Karakaya E, Nuur C, Hidalgo A. Business model challenge: Lessons from a local solar company.

Energy systems

- Cullen JM, Allwood JM, The efficient use of energy, Tracing the global flow of energy from fuel to service. *Energy Policy*, 2010, 38, 75-81.
- IPCC AR6 Synthesis Report, summary for policy makers. Published 2023-03-20.
- https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/the-energy-transformation-scenarios/_jcr_content/root/main/section_524990089/simple/promo_copy/links/item0.stream/1652119830834/fba2959d9759c5ae806a03acfb187f1c33409a91/energy-transformation-scenarios.pdf

Policy

- Hepburn C. Regulation by prices quantities or both: a review of instrument choice. *Oxford Review of Economic Policy*, 2006, 22, 226-247.
- Baker and Barron, 2013. Technological Change and the Marginal Cost of Abatement. *Encyclopedia of Energy, Natural Resource, and Environmental Economics*, 2013, 1, 117-122.
- Krahé M, Heidug W, Ward J, Smale R. From demonstration to deployment: An economic analysis of support policies for carbon capture and storage. *Energy Policy*, 2013, 60, 753-763.
- Levihn, 2025. "Integrating permanent removals into the EU ETS". TRITA-ITM-RP 2025:4
- Coase R, 1960. "The problem of social cost". *The Journal of Law and economics*.

Scenario exercise / group work / seminars

- Students will during the mandatory scenario lecture be divided into groups of 2-3.
- Each group will develop two scenarios. For inspiration of how to formulate a scenario, use the Shell scenario report that is part of the course literature.
- The scenarios should focus on developments in Europe.
- During the seminar each group will present their two scenarios.
- After the seminar, the scenarios should be finalized taking eventual comments from the seminar into account.
- Keep it at 4-8 pages of written text.

Written Examination

Individual home exam, whereby students should develop their own strategic analysis of the business potential of an own idea using any two scenarios from the seminars. The home exam can be worked on throughout the course and it is suggested that students do so. This also allows to actively use the lectures as input to the home exam.

It is further emphasized that students look at grading info bellow as it provides insights to what is expected for different grades. The analysis should be maximum 10 pages long. Calculations could be provided in an appendix in addition to the ten pages if so desired.

The analysis should try to cover all aspects of the course to get a top grade.

Course grading

Learning outcomes are examined in the compulsory parts of the exam and seminar. To pass the course (grade E), the student needs to show that the course's learning objectives are met at the basic level within a certain part of the course's sub-areas. For higher grades, the student needs to show either greater breadth at the basic level and / or greater depth in their knowledge and skills in combining the different parts of the course.

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| E | Define basic concepts within the course sub-areas, and show the ability to apply these to simpler problems. |
| D | In addition, demonstrate the ability to apply the course's sub-areas to different problems. |
| C | In addition, apply the course content to basic problems that combines several parts of the course. |
| B | In addition, apply all parts of the course to several advanced problems or solve advanced problems that combine several parts of the course. |
| A | In addition, apply all parts of the course to several advanced problems and solve advanced problems that combines several parts of the course. |

Seminar: Pass on this part of the course is attendance on all mandatory lectures and an approved scenario hand in. Contribution to groups work is mandatory. (P/F)

Written home exam (F-A)

Final grade according to written exam results if P on seminar part of course.