



APPLIES TO ACADEMIC YEAR 2016/2017

GRA 6841 Energy in Green Transition: Markets, Policies and Business Innovation

Programme

Free electives/minors, Master of Science in Business

Responsible for the course

Atle Midttun

Department

Department of Law

Term

According to study plan

ECTS Credits

3

Language of instruction

English

Introduction

Following two decades of deregulation and a strong policy for de-carbonization, energy is undergoing rapid technological and economic change. The course highlights the sources of these changes, and what they mean for energy policy, markets and innovative business reconfiguration.

Learning outcome

The course presents the students with analytical tools and perspectives that can help understand and orchestrate technology development, market design and innovative business models towards affordable, low carbon, and sustainable energy systems. While addressing current energy challenges, the course introduces the students to a broad set of perspectives and analytical tools, including:

- Principles of deregulation and market design for energy industries;
- Principles of environmental policy and environmental economics;
- Innovation theory applied to green energy-transformation;
- The business model perspective and its use to clarify the options and challenges for green transition at the firm level.

Through invited industrial contributors, the course will supplement the theoretical perspectives with 'hands on' experience from practical cases.

Skills

Upon completion of the course, students should have acquired basic skills at:

- Analysing energy systems and developing policies for low carbon transition;
- Suggesting strategies and business models for sustainability-based innovation and value creation;
- Designing deployment strategies, and finding niche market trajectories for technology and business concept innovation.

Prerequisites

All courses in the Masters programme will assume that students have fulfilled the admission requirements for the programme. In addition, courses in second, third and/or fourth semester can have specific prerequisites and will assume that students have followed normal study progression. For double degree and exchange students, please note that equivalent courses are accepted.

Compulsory reading

Books:

Hunt, Sally. 2002. Making competition work in electricity. Wiley. New York. (selection 1-4)

Osterwalder Alexander, Pigneur, Yves. 2010. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. Wiley Hoboken, N.J

Book extract:

Christensen, Clayton M. 1997. The innovator's dilemma: when new technologies cause great firms to fail. Boston, Massachusetts, USA: Harvard Business School Press.. Introduction and Ch 1

Hanley, Nick; Shogren, Jason & White, Ben. 2013. Introduction to Environmental Economics. 2nd ed.. Oxford University Press, Oxford. Ch 1
 Weizsäcker, Ernst von. 2009. Factor Five. Earthscan, Sterling USA. pp. 1-19, 267-268, 279-299

Articles:

Midttun, Atle and Piccini Proadpran Boonprasurd. 2016. "Facing The Climate And Digital Challenge: European Energy Industry From Boom To Crisis And Transformation". BI – Center for Energy and Environment Working paper
 Schleicher-Tappeser, Ruggero. 2012. How renewables will change electricity markets in the next five years. Energy Policy. Vol 48 (Sep). pp. 64-75
 Wene, Clas-Otto. 2008. "Energy Technology Learning Through Deployment in Competitive Markets". The Engineering Economist. 53, pp. 340-364

Other:

IEA. 2015. World Energy Outlook – introduction and excerpts

Recommended reading

Books:

Chesbrough, Henry. 2006. Open Innovation, Researching a New Paradigm. Oxford University Press. Oxford. Ch 1

Articles:

Midttun, Atle & Toporowska, Elzbieta. 2014. "Sequencing Lead Markets for Photovoltaics" in Achim Brunnengraber & Maria Rosaria Di Nucci (eds) Im Hürdenlauf Zur Energiewende. Springer VS, Berlin
 Midttun, Atle. 2012. The greening of European electricity industry: A battle of modernities. Energy Policy. Vol 48 (Sep). pp. 22-35 (14 p)
 Perez, Carlota. 2010. "Technological revolutions and techno-economic paradigms". Cambridge Journal of Economics. Vol 34, Issue 1 (Jan). pp. 185-202

Other:

IPCC. 2013. Fifth Assessment Report: CLIMATE CHANGE 2013 The Physical Science Basis summary for Policymakers. http://www.ipcc.ch/report/ar5/#.UvP2_fldX_I (27pp)

Course outline

1. Energy and the Climate Challenge – Policy Challenges and the Need for Integrated Solutions
2. Energy from De-regulation Towards Green Transition, Perspectives and Tools
3. Innovation and Industrial Transformation: The Battle for Technological Hegemony
4. Business Models for the 21st century: Facing the Green and Digital Challenges
5. Green energy transition: Industrial cases
6. Green energy transition: Oslo's Green City Initiatives

Computer-based tools

Learning process and workload

A course of 3 ECTS credits corresponds to a workload of 80-90 hours.

The teaching will be based on lectures, cases, group-work as well as multimedia tools.

Examination

The course grade will be based on the following activities and weights:

- 30 % Class Participation and activities
- 70 % Written Assignment

Form of assessment	Weight	Group size
Class participation	30%	Individual
Assignment	70%	Group of max 3 students

Specific information regarding student assessment will be provided in class. This information may be relevant to requirements for term papers or other hand-ins, and/or where class participation can be one of several

components of the overall assessment. This is a course with continuous assessment (several exam components) and one final exam code. Each exam component is graded using points on a scale from 0-100. The final grade for the course is based on the aggregated mark of the course components. Each component is weighted as detailed in the course description. Students who fail to participate in one/some/all exam components will get a lower grade or may fail the course. You will find detailed information about the points system and the mapping scale in the student portal @bi. Candidates may be called in for an oral hearing as a verification/control of written assignments.

Examination code(s)

GRA 68411 continuous assessment accounts for 100 % of the final grade in the course GRA 6841.

Examination support materials

Not applicable

Permitted examination support materials for written examinations are detailed under examination information in the student portal @bi. The section on support materials and the use of calculators and dictionaries should be paid special attention to.

Re-sit examination

It is only possible to retake an examination when the course is next taught. The assessment in some courses is based on more than one exam code. Where this is the case, you may retake only the assessed components of one of these exam codes. All retaken examinations will incur an additional fee. Please note that you need to retake the latest version of the course with updated course literature and assessment. Please make sure that you have familiarised yourself with the latest course description.

Additional information

Honour code. Academic honesty and trust are important to all of us as individuals, and are values that are integral to BI's honour code system. Students are responsible for familiarising themselves with the honour code system, to which the faculty is deeply committed. Any violation of the honour code will be dealt with in accordance with BI's procedures for academic misconduct. Issues of academic integrity are taken seriously by everyone associated with the programmes at BI and are at the heart of the honour code. If you have any questions about your responsibilities under the honour code, please ask. The learning platform itslearning is used in the teaching of all courses at BI. All students are expected to make use of itslearning.