

21E16100 Energy Business and Innovation (6cr)

SYLLABUS

23.4.2019

Instructors' contact information	Course information
<p>Name: Jouni K Juntunen E-mail: jouni.juntunen@aalto.fi Office: R208 (Otaniemi, Väre building) Office Hours: by appointment</p> <p>Name: Paula Kivimaa E-mail: paula.kivimaa@ymparisto.fi Office: Office Hours: by appointment</p>	<p>Status of the course: M.Sc. degree, an elective course at Aalto University.</p> <p>Academic Year, Period: period V, 2019 Location: Töölö (Teaching venue information available at weboodi or my courses) Language of Instruction: English Course Website: https://mycourses.aalto.fi/course/view.php?id=19843</p>

1. OVERVIEW

The objective of the course is to develop students' abilities to understand distributed energy production and consumption from social sciences perspective. The course develops students' knowledge on sustainability transitions and familiarizes students with contemporary concepts driving energy transition e.g. prosumerism. Furthermore, it addresses renewable and energy efficient business models, different types of innovation systems, innovation dynamics and diffusion.

2. PREREQUISITES

This course is part of the advanced studies (master level).

3. LEARNING OUTCOMES

- Understanding the concepts of transition management, multi-level perspective, strategic niche management, technological innovation systems, and energy business models
- Identifying sustainability challenges
- Recognizing how energy industry can collaborate for innovating to more sustainable and more inclusive businesses, and how such activities are influenced by energy policy
- The course familiarizes students with relations, processes and dynamics of 'co-provision' / prosumerism.
- During the course students will also develop their writing, group working as well as presentation skills.

4. ASSESSMENT AND GRADING

Final exam: 70%

Group work final report and presentation: 30% (group assessment)

Home exercises: Pass/fail compulsory

Grading is according to the scale from 0-5.

5. ASSIGNMENTS, GROUP WORKS AND EXAMS

Personal assignment 1 is due: 1.5.2019

Personal assignment 2 is due: 13.5.2019

Personal assignment 3 is due : 20.5.2019

Group work draft report for commenting is due: 20.5.2019

Group work comments for other group to be given: 23.5.2019

Group work presentation is held: 28.5.2019

Group work final report and peer evaluation is due: 4.6.2019

1st exam: 31.5.2019, 09.00-13.00, in R001/U4 (U142). The course registration automatically includes registration for the course examination.

2nd exam 04.09.19 09:00-13:00. In R038U006 Weboodi registration required.

3rd exam 04.11.19 16:00-20:00. In R101B-163 Weboodi registration required.

6. READINGS

Selection of academic articles. Required pre-readings for each lecture (2-3 articles per lecture) unless otherwise stated. The readings will be discussed during lectures, and discussion content will be included in exam questions.

7. PRELIMINARY SCHEDULE

Date	Topic	Readings / material	Assignment Due Date
Tuesday 16.04 13:15- 16:00 R038/U0 06	Introduction Course practicalities & Group work introductions & Key concepts	Session 1 During the first lecture, an overview of the course learning outcomes, schedule, content, visiting lecturers, assignments and group works will be given. The feedback summary from the previous year has been used to improve the course content and student will get a plan how main issue from last year have been improved. There will be a mandatory group work during the course. This group work represents 30% weight in total grading. Group work topics are provided by companies. The companies are Nordic Development Fund, Optiwatti, Joukon Voima and Lumituuli. Topic overviews are presented during the first session and everyone should give a vote for 1 st and 2 nd priority topic via Mycourses by 17.4. Students who do not give this indication are not assigned automatically to groups (i.e. course registration is not enough) and are taken as personal course cancellations.	Vote your priority topic via Mycourses by 17.4. midnight.

		<p>13.15 - 14.00 Course introduction and practicalities 14.00 - 14.15 Break 14.15 - 15.15 Group work introductions 15.15 - 15.45 Key concepts</p>	
<p>Tuesday 23.04 13.15- 14:45 R038/U0 06</p>	<p>Current Energy market review</p>	<p>Session 2 Current Energy market review Guest Lecturer: Aleksi Lumijärvi</p>	
<p>Tuesday 23.04 14.45- 16:15 R038/U0 06</p>	<p>Group work kickoff Groups 1-3</p>	<p>Meeting with groups Nordic Development Fund (NDF) and Joukon Voima (JV) groups Groups 1-2 NDF Africa&Asia: 14.45-15.30 (confirmed) Group 3 JV: 15.30-16.15 (confirmed)</p> <p>In this meeting, groups 1 and 2 meet a representative from NDF and groups 3 and 4 meet JV. Organizations describe the challenge and groups have time to make questions to clarify the problem setting. After the meeting groups work independently and create their own solution that will be documented in the final report (max 10 pages). Final presentation of the solution will be given on 28th of May.</p>	
<p>Thursday 25.04 13:15- 14:45 R038/U0 06</p>	<p>Infrastructures of consumption</p>	<p>Session 3: Lecture Infrastructures of consumption Readings: van Vliet, B., H. Chappells, and E. Shove. 2005. <i>Infrastructures of Consumption: Environmental Innovation in the Utility Industries</i>. London: Earthscan. Chapter 2. Linking Utilities and Users 13-26 Seyfang, Gill. 2009. "Introduction: A Consuming Issue." In <i>The New Economics of Sustainable Consumption: Seed of Change</i>, 1–26. Houndmills, UK: Palgrave Macmillan. Optional reading: Hughes, T.P. The evolution of large technological systems. In <i>The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology</i>; Bijker, W.E., Hughes, T.P., Pinch, T., Douglas, D.G., Eds.; MIT Press: Cambridge, MA, USA, 1987; pp. 51–82.</p>	<p>All readings (1&2) are due for the lecture Assignment 1 deadline is 1.5.</p>
<p>Thursday 25.04 14:45 – 16:15 R038/U0 06</p>	<p>Group work kickoff Groups 4-7</p>	<p>Meetings with groups Lumituuli (LT): Groups 4: 14:45-15:30 (confirmed) Optiwatti (OW1&2): Groups 5-6: 15.30-16:15 (confirmed)</p>	
<p>Thursday 02.05</p>	<p>Myths of innovation –</p>	<p>Session 4: Lecture Guest Lecturer: Janne M. Korhonen</p>	<p>All readings (3-5) are due</p>

13:15-16:00 R038/U006	what we can learn from innovation	<p>Readings:</p> <p>Lemley, M. A. (2012). The Myth of the Sole Inventor. Michigan Law Review, 110(5), 709–760. h</p> <p>Bradshaw, G., & Lienert, M. (1991). The invention of the airplane. In Proceedings of the Thirteenth Conference of the Cognitive Science Society(pp. 605–610).</p> <p>Edgerton, D. (1999). From Innovation to Use: ten (eclectic) theses on the historiography of technology. History and Technology, 16, 1–26.</p> <p>Optional reading:</p> <p>Jenkins, J., Swezey, D., & Borofsky, Y. (2010). Where Good Technologies Come From: Case Studies in American Innovation. Oakland, CA.</p>	for the lecture
Tuesday 07.05 13.15-16.00 R038/U006	Sustainability transition approaches	<p>Session 5: Lecture</p> <p>Readings:</p> <p>Markard J, Raven R, Truffer B. 2012. Sustainability transitions: an emerging field of research and its prospects. Research Policy 41: 955–967.</p>	Reading (6) is due for the lecture
Thursday 09.05 13:00-15:15 R028/Q101	Public policy and energy transitions	<p>Session 6: Lecture</p> <p>Readings:</p> <p>Kivimaa, P; Kern, F (2016). Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. Research Policy, 45(1) pp. 205-217.</p> <p>Kivimaa, Paula; Mickwitz, Per (2011). Public policy as part of transforming energy systems: framing bioenergy in Finnish energy policy. Journal of Cleaner Production 19(16): 1812-1821</p> <p>Short meeting with groups 1-3 15.15-16.00</p>	<p>Readings (7&8) are due for the lecture</p> <p>Assignment 2 deadline is 13.05</p>
Tuesday 14.05 13:15-16:00 R038/U006	Role of users and communities in energy transitions	<p>Session 7: Lecture</p> <p>Readings:</p> <p>Schot, Johan, Laur Kanger, and Geert Verbong. 2016. “The Roles of Users in Shaping Transitions to New Energy Systems.” Nature Energy 1 (5): 16054.</p> <p>Short meeting with groups 3-6 16.00-16.45</p>	Reading (9) is due for the lecture
Thursday 16.05 13:15-16:00 R028/Q202	Climate & Energy Policy Negotiation Game	<p>Session 8: Simulation</p> <p>World Energy https://www.climateinteractive.org/programs/world-energy/</p>	Assignment 3 deadline is 20.05
Tuesday 21.05 13:15-16:00 R028/Q202	Business models & Developing world and energy	<p>Session 9: Lecture</p> <p>Readings:</p> <p>Bolton, R., and M. Hannon. 2016. Governing sustainability transitions through business model innovation: Towards a systems understanding. Research Policy 45 (9): 1731–42.</p>	Readings (10-12) are due for the lecture

	challenges and opportunities	<p>Friebe CA, von Flotow P, Täube FA. Exploring the link between products and services in low-income markets—evidence from solar home systems. <i>Energy Policy</i> 2013;52:760–9.</p> <p>Guest Lecturer: Sara Lindeman</p> <p>Readings: D’Agostino, Anthony L., Peter D. Lund, and Johannes Urpelainen. 2016. “The Business of Distributed Solar Power: A Comparative Case Study of Centralized Charging Stations and Solar Microgrids: The Business of Distributed Solar Power.” <i>Wiley Interdisciplinary Reviews: Energy and Environment</i> 5 (6): 640–48.</p> <p>Optional reading (business models): Richter, M. 2012. Utilities’ Business Models for Renewable Energy: A Review. <i>Renewable and Sustainable Energy Reviews</i> 16 (5): 2483–93.</p>	
Thursday 23.05 13:00- 16:00 R028/ Q202	Energy Tech Financing	<p>Session 10: Lecture</p> <p>Guest Lecturer: Shaheer Hussam</p> <p>Readings: Ghosh, Shikar & Nanda, Ramana. <i>Venture Capital Investment in the Clean Energy Sector</i>. HBS, Aug 2010</p> <p>Wohlsen, Marcus. What Google Really Gets Out of Buying Nest for \$3.2 Billion. <i>Wired Magazine</i>, Jan 2014</p> <p>Wesoff, Eric. Letter from Sand Hill Road. <i>Greentech Media</i>, Jan 2016</p> <p>Optional reading: Khosla, Vinod. <i>Renewable Energy – Maintech</i>. Khosla Ventures, Apr 2009 https://www.khoslaventures.com/wp-content/uploads/Google-4-22-09.pdf</p>	All readings (13-15) are due for the lecture
Tuesday 28.05 13:15- 16:00 R038/U0 06	Group work	Session 11: Final presentations	

8. COURSE WORKLOAD

Classroom hours	26h (70% lecture attendance obligatory)
Group work	50h
Pre-readings and individual home exercises	74h
Exam	4h
Total	160h (6 ECTS)

9. ETHICAL RULES

Aalto University Code of Academic Integrity and Handling Thereof>

<https://into.aalto.fi/pages/viewpage.action?pageId=3772443>

Policy on freeriding

Our principle is that each group makes sure that all group members contribute to the group work process and outcomes. If there is a problem with lack of contribution, please consult Jouni Juntunen. In case all other group members agree, it is possible for us to give a particular group member a lower grade than the others, or fail him/her altogether. Please make use of this possibility, it has been done before.

Peer Evaluation Form for Group Work

Your name _____

Write the name of each of your group members including you in a separate column. For each person, indicate the extent to which you agree with the statement on the left, using a scale of 1-4 (1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree). Total the numbers in each column.

Evaluation Criteria	Group member:	Group member:	Group member:	Group member:	Group member
Attends group meetings regularly and arrives on time.					
Contributes meaningfully to group discussions.					
Completes group assignments on time.					
Prepares work in a quality manner.					
Demonstrates a cooperative and supportive attitude.					
Contributes significantly to the success of the project.					
TOTALS					

Feedback on team dynamics:

1. How effectively did your group work?
2. Were the behaviors of any of your team members particularly valuable or detrimental to the team? Explain.
3. What did you learn about working in a group from this project that you will carry into your next group experience and to working life?

Adapted from a peer evaluation form developed at Johns Hopkins University (October, 2006)

10. OTHER ISSUES

- Registration to course: via Weboodi, closes one week before the start of the course.

- Retrieving Course Materials: all materials available through MyCourses