

21E16100 Energy Business and Innovation (6cr)

SYLLABUS

Version 4, 30.4.2021

Instructors' contact information	Course information
<p>Name: Jouni K Juntunen E-mail: jouni.juntunen@aalto.fi Office Hours: Via Zoom by appointment</p> <p>Name: Ines Peixoto E-mail: ines.peixoto@aalto.fi Office Hours: Via Zoom by appointment</p>	<p>Status of the course: M.Sc. degree, an elective course at Aalto University.</p> <p>Academic Year, Period: period V, 2021</p> <p>Location: Online course</p> <p>Language of Instruction: English</p> <p>Course Website: https://mycourses.aalto.fi/course/view.php?id=27482</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

After completion of the course the student should be able to:

- 1) Describe current energy market and its' challenges.
- 2) View energy production and consumption as socio-technical system. Develop an understanding of the complexity of sustainability transitions and how it is influenced by energy policy. Critically analyze systemic change with the help of transition and innovation theories (multi-level perspective, strategic niche management, technological innovation systems.)
- 3) Recognizing how energy industry can collaborate in order to innovate more sustainable and more inclusive businesses.
- 4) Understand relations, processes, organizations and dynamics of 'co-provision' / prosumerism.
- 5) Recognize and develop various business and financing models that can be used in energy business.

4. ASSESSMENT AND GRADING

Group work final report and presentation and peer evaluation (Max 50 points, compulsory)

Group assessment. max 40

Individual evaluation based on peer feedback from group members, max 10 points

Personal assignments 4 pcs (Max 50 points, compulsory)

3 x writing assignment (+peer assessment 3x2 papers), max 30 points

2 x literature quiz assignment, max 20 points

Course Grading is according to the scale from 0-5.

5. ASSIGNMENTS, GROUP WORKS AND EXAMS

Personal assignment 1 is due: 10.5.2021 (Letter to editor) (peer assessment) *

Personal assignment 2 is due: 17.5.2021 (Infrastructural consumption) (peer assessment) *

Personal assignment 3 is due 18.5.2021 15:00-16:00 (Literature quiz 1)

Personal assignment 4 is due: 19.5.2021 (Business models) (peer assessment) *

Personal assignment 5 is due 3.6.2020 9:00-10:00 (Literature quiz 2)

*Peer assessment of assignments: Deadline is 3 days from the paper submission deadline

Group work priority topic vote is due:	21.4.2021
Group work project plan is due:	2.5.2021
Group work draft report for commenting is due:	23.5.2021
Group work comments for peer group to be given:	25.5.2021
Group work presentation upload to Panopto:	30.5.2021
Group work final report and peer evaluation is due:	31.5.2021
Group work presentation feedback session:	1.6.2021

6. READINGS

Selection of academic articles. Required pre-readings for each lecture (2-3 articles per lecture) unless otherwise stated.

7. TECHNOLOGY IN USE

- Oodi
 - Registration to the course
- MyCourses
 - <https://mycourses.aalto.fi/course/view.php?id=27482>
 - Central access point for the key information
 - Up to date syllabus
 - Reading materials
 - Links to video materials
 - Lecture slides after lectures
 - Assignments (description and submission)
 - Peer assessment of assignments
 - Grading information
- Zoom
 - All real time session take place in Zoom.
 - Passcode for all sessions: EBI2021
- Presemo
 - Collaboration on real-time sessions
 - <http://presemo.aalto.fi/ebi2021/>
- Slack
 - For asynchronous communication
 - Fastest way to get responses
 - Two different types of channels used: 1 General channel for all and 2 Group specific channels for group works
 - https://join.slack.com/t/energybusines-gli4754/shared_invite/zt-orz2lryv-wr00xE2knTJWnmlWNQ7Rvw

- Panopto
 - Group work video uploads

8. PRELIMINARY SCHEDULE

Date / Environment	Topic	Readings / material	Assignment Due Date
Tuesday 20.4 13:15-16:00 Zoom 135 min	Introduction Course practicalities & Group work introductions	<p>Session 1 Lecturer: Jouni Juntunen https://aalto.zoom.us/j/68991688151?pwd=WDB1dHBXcUU4VEpaZmszNmxCWENHZz09 Passcode: EBI2021</p> <p>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.</p> <p>There will be a mandatory group work during the course. This group work represents 50% weight in total grading. Group work topics are provided by companies and organizations working in energy sector. Also, there are research focused group work options depending on the course student intake and interests. The case companies include</p> <p>Aetlan (2 groups, G1&G2) Fortum (2 groups, G3&G4) Motiva (2 groups, G5&G6) Aalto (2 groups, G7&G8) Fourdeg (1 group, G9)</p> <p>Research project supervised by Aalto would be focusing to Transition risks of energy utilities.</p> <p>Topic overviews are presented during the first session and everyone should give a vote for 1st and 2nd priority topic via MyCourses by 21.4.</p> <p>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. Groups are created on 22.4.</p> <p>Course introduction and practicalities. Group work introductions G1-G8.</p>	Vote 2 priority topics via Mycourses by 21.4. midnight.
Tuesday 27.4 13.15- 16:00 Zoom 90 min	Simulation	<p>Session 2</p> <p>Facilitators: Jouni Juntunen & Ines Peixoto</p> <p>World Energy https://www.climateinteractive.org/programs/world-energy/</p>	Video (1) and reading (n1) is due for the lecture

		<p>Reading: York, R. 2018. Energy Consumption Trends Across the Globe. In D. J. Davidson & M. Gross (Eds.), <i>The Oxford handbook of handbook of energy and society</i>: 165–178. New York: Oxford University Press.</p>	
<p>Tuesday 27.4 16.00- 16:45</p> <p>Zoom 45 min</p>	<p>Group work kickoff</p>	<p>Meeting with groups Fortum (G3 and G4) 16:00-16:45 (Zoom)</p> <p>In this meeting, groups meet a representative. 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). The final presentation video is due 30.5.</p>	
<p>Wednesday 28.4. 9:00-15:45</p> <p>Zoom 45 min</p>	<p>Group work kickoff</p>	<p>Meeting with groups</p> <p>Motiva (G5 and G6): 9:00-9:45 (Zoom) Aalto (G7 and G8): 10:00-10:45 (Zoom) Fourdeg (G9): 14:00-14:45 (Zoom) Aetlan (G1 and G2) 15:00-15:45 (Zoom)</p> <p>In this meeting, groups meet a representative. 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). The final presentation video is due 30.5.</p>	
<p>Thursday 29.4 13.15-16:00</p> <p>Zoom 165 min</p>	<p>Sustainability transition approaches</p>	<p>Session 3</p> <p>Facilitator: Jouni Juntunen & Ines Peixoto</p> <p>Flipped classroom / Gallery walk via Zoom and Google docs</p> <p>Multiple teams will be formed to work with different Sustainability transition approaches. Each team prepares a poster of assigned approach and prepares to present it to other students in the “gallery walk” session. The session will be concluded by short lecture where communalities and differences of different transition approaches discussed.</p> <p>Readings for group works (for all): Markard J, Raven R, Truffer B. 2012. Sustainability transitions: an emerging field of research and its prospects. <i>Research Policy</i> 41: 955–967.</p> <p>For groups (skim through before the session): <i>Multilevel perspective group</i></p>	<p>Reading (n2) is due for the lecture</p>

		<p>Geels, F., W. 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. <i>Research Policy</i>, 31(8/9): 1257–1274.</p> <p><i>Strategic niche management group</i> Schot, J., & Geels, F. W. 2011. <i>Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy</i>. In F. W. Geels, M. P. Hekkert, & S. Jacobsson (Eds.), <i>The Dynamics of Sustainable Innovation Journeys: 17–34</i>. London: Routledge.</p> <p><i>Technological Innovation Systems</i> Bergek, A., Jacobsson, S., Carlsson, B., Lindmark, S., & Rickne, A. 2008. Analyzing the functional dynamics of technological innovation systems: A scheme of analysis. <i>Research Policy</i>, 37(3): 407–429.</p> <p><i>Transition Management</i> Kemp, R., & Loorbach, D. 2006. Transition Management: A Reflexive Governance Approach. <i>Reflexive Governance for Sustainable Development</i>: 103–130. http://www.elgaronline.com/view/9781845425821.00015.xml, April 6, 2020, Edward Elgar Publishing. Watch: https://www.youtube.com/watch?v=8YYK4icS1gU</p>	
29.4.			Project plan for group work
Thursday 6.5 13:15-16:00 Zoom 135 min	Public policy and energy transitions	<p>Session 4: Lecture Lecturer: Paula Kivimaa</p> <p>Recap of MLP, current research areas, relations to other literature streams: https://youtu.be/Tm6xVb-TXgk</p> <p>Readings: Kivimaa, P; Kern, F (2016). Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. <i>Research Policy</i>, 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. <i>Journal of Cleaner Production</i> 19(16): 1812-1821</p>	Readings (n3&n4) are due for the lecture
Tuesday 11.5 13:15-15:00 Panopto 27 min Zoom 90 min	Role of users and communities in energy transitions	<p>Session 5: Lecture Watch Panopto Session 5 video before the session</p> <p>Role of users in energy transitions Q&A 13:15-13:45 Lecturer: Jouni Juntunen</p> <p>Energy communities 14:00-15:00 Lecturer: Salvatore Ruggiero</p> <p>Readings:</p>	<p>Reading (n5&n6) is due for the lecture</p> <p>Personal assignment 1 is due: 10.5.2021 (Letter to editor)</p>

		<p>Schot, Johan, Laur Kanger, and Geert Verbong. 2016. "The Roles of Users in Shaping Transitions to New Energy Systems." <i>Nature Energy</i> 1 (5): 16054.</p> <p>Walker, G., & Devine-Wright, P. 2008. Community Renewable Energy: What Should It Mean? <i>Energy policy</i>, 36(2): 497–500.</p>	
<p>Wednesday 12.5. 10:00-</p> <p>Zoom 30 min</p>		<p>Mid-term meetings with groups</p> <p>G7 10:00 – 10:30 Aalto G8 10:45 – 11:15 Aalto G3 11:30 – 12:00 Fortum G4 12:30 – 13:00 Fortum G5 13:15 – 13:45 Motiva G6 14:00 – 14:30 Motiva G1 15:00 – 15:30 Aetlan G2 15:45 – 16:15 Aetlan G9 16:30 – 17:00 Fourdeg</p>	
<p>Tuesday 18.5 13:15-14:55</p> <p>Panopto 50 min</p> <p>Zoom Q&A 85 min</p>	<p>Infrastructures of consumption & the competing conceptions of energy's role in society</p>	<p>Session 6a:</p> <p>Q&A: Infrastructures of consumption Lecturer: Jouni Juntunen 13:15-13:45</p> <p>Watch Panopto Session 6 before the session 6</p> <p>Session 6b: Lecture</p> <p>The competing conceptions of energy's role in society Lecturer: Inês Peixoto 14:00-14:55</p> <p>Literature quiz 15:00-16:00</p> <p>Readings:</p> <p>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</p> <p>Horta, A. 2018. Energy Consumption as Part of Social Practices: The Alternative Approach of Practice Theory. In D. J. Davidson & M. Gross (Eds.), <i>The Oxford handbook of handbook of energy and society</i>: 31–44. New York: Oxford University Press.</p> <p>Beamish, T. D., & Biggart, N. W. (2017). Capital and Carbon: The Shifting Common Good Justification of Energy Regimes. In C. Cloutier, J.-P. Gond, & B. Leca (Eds.), <i>Research in the Sociology of Organizations</i> (Vol. 52, pp. 173–205). Emerald Publishing Limited.</p> <p>Optional readings:</p>	<p>All readings (n7-n9) are due for the lecture</p> <p>Personal assignment 2 is due: 17.5.2021 (Infrastructural consumption)</p> <p>Personal assignment 3 is due: 18.5.2021 (Business models)</p>

		<p>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.</p> <p>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>Thursday 20.5 13:15-16:00</p> <p>Zoom 135 min</p>	<p>Business models & Energy business challenges in emerging markets</p>	<p>Session 7: Lecture</p> <p>Business models Lecturer: Jouni Juntunen 13:15 – 14:15</p> <p>Reading:</p> <p>Richter, M. 2012. Utilities' Business Models for Renewable Energy: A Review. <i>Renewable and Sustainable Energy Reviews</i> 16 (5): 2483–93.</p> <p>Optional reading: 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>Energy business challenges in emerging markets Guest Lecturer: Sini Numminen 14:30 – 15:45</p> <p>Watch two videos before the session: https://www.youtube.com/watch?v=77HUUdJ7Tij0 https://www.youtube.com/watch?v=gup-cgPelzw</p> <p>Reading: D'Agostino, A. L., Lund, P. D., & Urpelainen, J. (2016). The business of distributed solar power: A comparative case study of centralized charging stations and solar microgrids. <i>Wiley Interdisciplinary Reviews: Energy and Environment</i>.</p>	<p>Readings (n10-n11) are due for the lecture</p> <p>Personal assignment 4 is due: 19.5.2021 (Business models)</p>
<p>Tuesday 25.5 13:15- 16:00</p> <p>Zoom 135 min</p>	<p>Perspectives on energy investing and finance</p>	<p>Session 8 Perspectives on investing and finance</p> <p>Investments of multinational energy companies 13:15-14:15 Lecturer: Jouni Juntunen</p> <p>Energy Tech Investing and Financing Guest Lecturer: Shaheer Hussam 14:30 – 16:00</p> <p>Readings: Ghosh, Shikar & Nanda, Ramana. <i>Venture Capital Investment in the Clean Energy Sector</i>. HBR, Aug 2010</p>	<p>All readings (n12-n13) are due for the lecture</p>

		Flesner, et. al - 'Making Corporate Venture Capital Work' - MIT Sloan Review. Jun 2019 Optional reading: <i>Hawk, Steven - 'Inside the Secret World of Venture Capital' Jun 2018</i>	
Friday 28.5 13:15-16:00 Zoom 135 min	Myths of innovation – what we can learn from innovation	Session 9: Lecture Guest Lecturer: Janne M. Korhonen Readings: Lemley, M. A. (2012). The Myth of the Sole Inventor. Michigan Law Review, 110(5), 709–760. h Edgerton, D. (1999). From Innovation to Use: ten (eclectic) theses on the historiography of technology. History and Technology, 16, 1–26. Optional reading: Bradshaw, G., & Lienert, M. (1991). The invention of the airplane. In Proceedings of the Thirteenth Conference of the Cognitive Science Society(pp. 605–610). Jenkins, J., Swezey, D., & Borofsky, Y. (2010). Where Good Technologies Come From: Case Studies in American Innovation. Oakland, CA.	All readings (n14-n15) are due for the lecture
Sunday 30.5 23:59		Upload 15 min final presentation video to Panopto: https://aalto.cloud.panopto.eu/Panopto/Pages/Sessions/List.aspx?folderID=fb5ea308-50ba-4384-b526-ace001142aad One from each group uploads. Watch all the presentation videos on 31 st of May.	Submission of group presentation to Panopto
Tuesday 1.6 13:00-16:00 Zoom	The final session: Group works	Session 10: Final presentation discussion session Order of the group works: 13:10 - 13:25 Aetlan 1 13:25 - 13:40 Aetlan 2 13:40 – 13:55 Fortum 1 13:55 – 14:10 Fortum 2 14:10 – 14:25 Motiva 1 Break 14:40 - 14:55 Motiva 2 14:55 – 15:10 Aalto 1 15:10 - 15:25 Aalto 2 15:30 – 15:45 Fourdeg	Assignment 5 (Literature quiz 2) is taking place 3.6 9:00-10:00

9. COURSE WORKLOAD

Classroom hours	70 % common real time session attendance obligatory. Details released in the beginning of the course.
Group work	60h
Pre-readings and individual home exercises	120h

Total	160h (6 ECTS)
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10. 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:

- How effectively did your group work?
- 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)

11. OTHER ISSUES

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