



<b>Course</b>	<b>Solar Economy and Smart Grids, 3 ECTS credits</b>
<b>Year and period</b>	M.Sc. 1-2; 7-11.8.2017
<b>Teacher(s)</b>	Professor, D.Sc. Christian Breyer, LUT Professor, D.Sc. Jarmo Partanen, LUT Professor, D.Sc. Olli Pyrhönen, LUT Docent Pasi Vainikka, Principal Investigator VTT Docent Jouni Keronen, CEO Climate Leadership Council
<b>Person(s) in Charge</b>	Professor Christian Breyer, LUT
<b>Additional Information</b>	The course topics are related to sustainable development.
<b>Aims</b>	After having passed this course the student will be able to:  - understand the basic processes of Solar Economy and Smart Grids - recognise the key properties of global climate challenges, solar economy, electricity market models, wind and solar power technologies, energy storage/ sector bridging technologies and the smart grid concept - recognise the most important aspects, chances and challenges of transition from existing energy systems to sustainable energy systems.
<b>Content</b>	During the course the student will become familiar with the properties and application areas of:  1. Climate change 2. Solar economy 3. Wind power technology 4. Solar power technology 5. Energy Storages 6. Power-to-X (gas, fuels, chemicals) 7. New electricity market 8. Demand response 9. Smart Grid concept  The course is also suitable for doctoral studies.
<b>Modes of Study</b>	<ul style="list-style-type: none"><li>- Introductory lectures and exercises 24 hours</li><li>- Team work and a limited project work 20 hours</li><li>- Presentations of the results of the team work/ project work 8 hours</li></ul>

	<ul style="list-style-type: none"><li>- Independent work is needed 26 hours</li></ul> Total workload 78 hours
<b>Evaluation</b>	Final grade 0 – 5. Evaluation: <ul style="list-style-type: none"><li>- project work 70 %</li><li>- presentation 30 %</li></ul>
<b>Study Materials</b>	Lecture notes
<b>Prerequisites</b>	Previous studies either in electrical engineering, environmental engineering or energy engineering are recommended.