



Virtual Hessen International Summer University Darmstadt 2021 – Course Outline

# In Transition to a Pure Green Energy Economy

## CLASS HOURS

Total: 95 contact hours (online seminar, tutorials, self-study, academic paper, photo series, 1 contact hours = 45 minutes). Please consult program schedule below for more details.

## ACADEMIC DIRECTOR

Name: Prof. Dr. Sebastian Herold

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## 1) INFORMATION ON THE COURSE CONTENT

### COURSE DESCRIPTION

The prospects of an energy system and a whole economy relying solely on renewable energy is the topic of the International Summer University „In Transition to a Pure Green Energy Economy” at Darmstadt University of Applied Sciences. It combines scientific knowledge taught in English with hands-on experiences during field trips to companies and public institutions. The International Summer University brings together technical and business perspectives and focuses especially on three challenges on the way towards a green energy economy:

- 1. Transforming supply:** Technology as driver for real competitive renewable energies.
- 2. Transforming demand:** Smart homes and smart cars for smart people.
- 3. Transforming business:** Strategic impacts for business models.

### LEARNING OBJECTIVES

#### A pure green energy economy

- Driving forces, ingredients and status quo
- International and national political aims
- Technological and economical transition pathways

#### Transforming supply

- Competitiveness of renewable energies and regimes of promoting them
- Potentials for different renewable technologies
- Challenges of an ever-increasing share of renewables for the energy system

#### Transforming demand

- Flexibilities of different consumer groups and demand side management as business case
- Smart grids, meters and devices: Redesigning the electric infrastructure
- Electric mobility as changing factor for the energy industry

#### Transforming business

- New players, new roles, new business models in the power industry
- The future of gas in a pure green energy economy
- The “prosumer” as new ideal of the energy system of the future?

**Online site-visits (subject to change):**

- EUREF-Campus, Berlin  
A real-world 'laboratory' for the energy revolution with over 150 companies and startups working on the campus area with its own, innovative and CO2-neutral energy concept
- BMW Welt, Munich  
BMW exhibition: BMW's vision of the future of mobility with pure electric vehicles and autonomous driving

**COURSE MATERIALS**

Slides and script. Recommendations for additional readings can be found in the script. Course material will be posted on Moodle and/or Slack.

**TENTATIVE CLASS SCHEDULE**

<i>Date</i>	<i>Topic</i>
Jul 04, 2021	<b>Welcome Ceremony</b>
Jul 05, 2021	<b>Towards a pure green energy economy</b> Contexts, concepts and challenges
Jul 06, 2021	<b>Renewable energies</b> Technology, potentials and competitiveness
Jul 07, 2021	<b>Laboratory for the energy revolution</b> Live stream from CO2-neutral EUREF-Campus, Berlin
Jul 08, 2021	<b>How do we want to live?</b> Urban development and energy saving
Jul 09, 2021	<b>Integrating renewables into the energy system</b> Redesigning the electrical infrastructure
Jul 12, 2021	<b>Promoting renewable energies</b> The German experience
Jul 13, 2021	<b>Consumers &amp; prosumers offering flexibility</b> Demand side management for big industry and everyone's home
Jul 14, 2021	<b>The future of electric mobility</b> Live stream from BMW Welt, Munich
Jul 15, 2021	<b>How does it all fit together</b> Sector coupling, costs and outlook
Jul 16, 2021	<b>Examination</b> Presentation & discussion of project results
Jul 17, 2021	<b>Closing Ceremony</b>
Jul 31, 2021	<b>Deadline for submission of papers</b>

## 2) INFORMATION ON CLASS PARTICIPATION, ASSIGNMENTS AND EXAMS

### ASSIGNMENTS

Active participation on a regular basis, preparation for final paper and presentation.

### EXAMS

Students prepare a paper that analyses the energy transformation so far in their own countries and asks whether it is in line with the requirements of the Paris Agreement on limiting global warming. The papers have to be submitted by July 31, 2021. On the last day of the class, students present their findings/research up to this date together with the results of a photo series on the topic of "Our Future Way of Life – Urban Energy Transition" (details will be given on the first day of class). During the program, students receive further support to write their papers.

### PRACTICE MATERIALS

Online handouts, slides and additional literature.

### PROFESSIONALISM & CLASS PARTICIPATION

Students are expected to attend both the academic seminar and one tutorial each day (depending on the time zone)

### MISSED CLASSES

No more than two academic seminars and two tutorials can be missed for a successful completion of the course module. If students miss a lecture, it is their own responsibility to obtain information on the topics.

## 3) INFORMATION ON GRADING AND ECTS

### ACADEMIC STANDARDS

Upon successful completion, 6 ECTS will be awarded for the class. One credit is equivalent to 25-30 hours student workload.

### GRADING SCALE

Percentage	Grade		Description
90-100%	15 points	1.0	very good: an outstanding achievement
	14 points		
	13 points	1.3	
80-90%	12 points	1.7	good: an achievement substantially above average requirements
	11 points	2.0	
	10 points	2.3	
70-80%	9 points	2.7	satisfactory: an achievement which corresponds to average requirements
	8 points	3.0	
	7 points	3.3	
60-70%	6 points	3.7	sufficient: an achievement which barely meets the requirements
	5 points	4.0	
0-60%	4 points	5.0	not sufficient / failed: an achievement which does not meet the requirements
	3 points		
	2 points		
	1 point		
	0 points		

This course description was issued on February 22, 2021. The program is subject to change.