



**Eseia International Online Summer School 2024**  
16<sup>th</sup> — 27<sup>th</sup> September 2024

# **Net Zero Solutions for Climate Friendly Energy Production**

Draft 12.8.2024

Arranged by  
North Savo Energy Cluster partners in Finland  
and together with ESEIA (European Sustainable innovation alliance) network in Europe.



**Co-funded by  
the European Union**

# ESEIA International Online Summer School 2024

## Course Information $H_2$

### Objectives

Net zero solutions will have an important role in future energy systems when aiming to carbon neutrality for stopping the global warming. Students will receive comprehensive overview of solutions aiming to net-zero suitable to use both in energy consumption and production sectors.

After completing the course:

- student have a clear understanding of the content and aim of future fossil free scenario and he or she is familiar with the measures with which it is possible to achieve these goals
- student knows also how apply them in work life context and he or she has ability to plan research projects that serve the goals of the fossil free scenario.

### Teaching Methods

The Summer School 2024 is on-line course arranged in September 2024 during weeks 38 and 39.

The course is evaluated based on activity on the course and the returned assignment (with grading scale passed (P) – failed (F))

The results of group work assignment should be presented 27.9.2024.

### Learning material

The material will be given via Moodle during the course. The Moodle environment for this course will be open for introduction on 01.09.2024.

It will be given an overview of different net zero solutions (Clean energy production, CCUS and synthetic fuel production, Energy efficient utilization of energy in buildings, Balancing energy production and utilization, Decarbonization of mobility).

### Practical training and working life connections

- A part of lectures (related to different net zero solution technologies) are given by representatives of industrial companies.
- The topics of group works have working life connections.

### Students use of time and load

- the on-line course is arranged during weeks 38 and 39
- the lectures are given during week 38 daily from 3.00 to 6.00 pm
- week 39 is reserved for group works (supervise is given daily from 3.00 to 6.00 pm)
- 27.9.2024 from 3.00 to 6.00 pm is reserved for presentation of group works.

### Prerequisites

Higher education degree.

The official language of the course is English.

### Registration

Registration will be open 1.8.2024—**15.9.2024** on the following site:

Please register [HERE](#) if you don't have Finnish personal identification number. If you have Finnish personal identification number please register [HERE](#).

### Fee info

Participation in the Summer School is free of charge, but attendants are responsible for covering all other possible costs.

### Organizer

The course will arranged together with North Savo Energy Cluster partners in Finland and with ESEIA (European Sustainable innovation alliance) network in Europe.

### Contact information

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## Programme

1st week (38): 16.9.—20.9.2024, 2nd week (39): 23.9.—27.9.2024

Lecture topics (week 38)					
EEST time	Monday 16.9.2024	Tuesday 17.9.2024	Wednesday 18.9.2024	Thursday 19.9.2024	Friday 20.9.2024
from 3.00 pm to 6.00 pm	Introduction and Fossil free scenarios	Clean energy production	Energy efficient utilization of energy	Balancing renewable energy production and utilization	Decarbonization of mobility
15.00— 16.00 (3 pm- 4 pm)	Welcoming words Jarno Ruusunen, Savonia UAS  Facilitation Teija Honkanen, Savonia UAS	Carbon capture, storage and utilization for production of synthetic fuels Sumitomo	Zero energy buildings Nuno Domenigues	Sumitomo Energy Storage Technologies  15.30 Case study, (HLV, Hyvinkään lämpövoima (Electricity boiler)	Decarbonation of mobility, overview lecture Nuno Domenigues  15.30 Elbuss Portugal/Lissabon
16.00— 17.00 (4 pm- 5 pm)	Introduction, Future fossil free scenarios	Production of synthetic fuels Andritz	Energy Communities Tietoevry  16.30 Building AI energy control system Mohammed Mokcheha	Sand storage Polar Night  16.30 Case study (Savon Voima Joensuu)	Finnavia Airport Company  16.30 VR Group Railway company
17.00— 18.00 (5 pm- 6 pm)	How to make a winning proposal ESEIA	4GDH 4G District Heating VTT Technical Research Centre Finland	Motiva/ESEIA	Case study (Varkauden aluelämpö )  17.30 ESEIA	ESEIA
Group works (week 39)					
	Monday 23.9.2024	Tuesday 24.9.2024	Wednesday 25.9.2024	Thursday 26.9.2024	Friday 27.9.2024
Supervise is given from 3.00 pm to 6.00 pm	Orientation to group works	Group work	Group work and peer review	Group work	Presentations of group works