

### PhD course Spring 2026:

#### Advanced Energy Systems Analysis on the EnergyPLAN model

Again in the spring of 2026, Aalborg University, Denmark, hosts its annual EnergyPLAN PhD course. The course has been conducted every year since 2005. The course gives an introduction to advanced energy system analysis using the EnergyPLAN model. The course consists of onsite lectures taking place in Aalborg on 27-30 April and online sessions on 5 May, 12 May and 19 May 2026. Once you have completed the course and passed the online exam, you will receive a course certificate. Registration and payment must be completed [here](#) before 6 April.

After the course, the participants are expected to be able to understand methodologies of advanced energy system analysis and to be able to use the EnergyPLAN computer model as a tool in making energy system analysis.

The course is conducted as a combination of lectures and workshops of a total of 4 days (32 hours) and assignments of a total of 6-7 days (52 hours). Results of assignments will be presented by the participants at the online exam.

Participants who pass the course will receive a diploma. Requirements are to perform an analysis using EnergyPLAN, to present the analysis at the online exam on 19 May 2026 and to pass the exam.

#### Contents:

The course starts with an introduction to EnergyPLAN (installation, using, constructing new data sets) and proceeds to focus on the use of the model in

- sustainable cities and communities
- technical analyses of large-scale integration of wind
- analyses of exchange with external electricity markets
- combinations of different renewable energy technologies
- designing flexible energy systems using flexible technologies such as heat pumps, hydrogen storage, pumped storage etc.
- district heating systems versus individual houses and zero energy buildings
- designing energy systems based on multiple criteria

|              |   |
|--------------|---|
| Organiser    | Professor Henrik Lund, e-mail: <a href="mailto:lund@plan.aau.dk">lund@plan.aau.dk</a>   |
| Lecturer(s)  | Poul Alberg Østergaard, Henrik Lund, Jakob Zinck Thellufsen, Brian Vad Mathiesen and Alisson Aparecido Vitoriano Julio  |
| ECTS         | 5   |
| Time         | Onsite on 27-30 April and online on 5, 12 and 19 May 2026   |
| Length       | 5 days and assignments of 6-7 days (see above)  |
| Place        | In-person attendance at Aalborg University, Rendsburggade 14, 9000 Aalborg, Denmark followed by online Q&A sessions and online exam   |
| Fee          | PhD fellows enrolled at a Danish university: Free<br>PhD fellows enrolled at a university outside Denmark: 120 EUR<br>Professionals (consultancy, industry, etc.): 1200 EUR |
| Registration | Registration until 6 April 2026 via this <a href="#">link</a> . Registration is binding.  |
| Payment      | Payment upon registration. <b>Credit card payment is required.</b>  |
| Deadline     | 6 April 2026  |



AALBORG UNIVERSITY  
DENMARK

## Preparations prior to the course

1. Install EnergyPLAN from [energyplan.eu](http://energyplan.eu)
2. Consider how you wish to use EnergyPLAN – preferably in your PhD project – alternatively in independent analyses only made for the PhD course (notice that this will be on the agenda for the first morning) - fill in form on Moodle (obligatory request to finalize enrollment).
3. Read the FIDE guide (Finding and inputting data to EnergyPLAN) from [energyplan.eu](http://energyplan.eu) and consider what data you will need to do 2.
4. There are a number of training exercises at [energyplan.eu](http://energyplan.eu). You are expected to do these beforehand as this will enable you to make more advanced independent analyses during the actual course: <https://www.energyplan.eu/training/exercises/>
5. Read the articles
  - a. EnergyPLAN – Advanced Analysis of Smart Energy Systems  
<https://doi.org/10.1016/j.segy.2021.100007>
  - b. Reviewing EnergyPLAN simulations and performance indicator applications in EnergyPLAN simulations, <http://dx.doi.org/10.1016/j.apenergy.2015.05.086>
  - c. Reviewing optimisation criteria for energy systems analyses of renewable energy integration, <http://doi.org/10.1016/j.energy.2009.05.004>
  - d. Smart Energy Systems for coherent 100% renewable energy and transport solutions, <http://doi.org/10.1016/j.apenergy.2015.01.075>
  - e. Smart energy Denmark. A consistent and detailed strategy for a fully decarbonized society <https://doi.org/10.1016/j.rser.2022.112777>
  - f. Heat Roadmap Europe: Combining district heating with heat savings to decarbonise the EU energy system, <http://doi.org/10.1016/j.enpol.2013.10.035>
  - g. A renewable energy scenario for Aalborg Municipality based on low-temperature geothermal heat, wind power and biomass, <http://doi.org/10.1016/j.energy.2010.08.041>
  - h. Energy balancing and storage in climate-neutral smart energy systems <https://doi.org/10.1016/j.rser.2024.115141>

The course is conducted as a hand-on workshop based on each participant making an energy system analysis individually or in a group. The idea is to combine inspiration from lectures with work on your own analysis.



Lecturers: Henrik Lund, Poul Alberg Østergaard, Brian Vad Mathiesen, Jakob Zinck Thellufsen and Alisson A. V. Julio

See Sustainable Energy Planning Research Projects [here](#).

## Programme

Venue 27-30 April 2026: Room 3.429, Aalborg University, Rendsburggade 14, DK-9000 Aalborg

|                     | Monday 27 April<br>(HL/JZT)   | Tuesday 28 April<br>(HL/BVM)   | Wednesday 29 April<br>(HL/PAØ)   |
|---------------------|---|--|--|
| 09:00<br>-<br>12:00 | <p><b>Introduction</b></p> <p><i>Welcome and programme</i> (HL)</p> <p><i>Introduction to Energy System Analysis and EnergyPLAN</i> (HL)</p> <p>Participants' presentations of PhD projects and suggestions for energy system analysis - Part 1</p>                                     | <p><b>Smart Energy Systems</b></p> <p><i>Smart Energy Systems integrating electricity, heat and transport systems</i> (BVM)</p> <p>Work on individual analyses. Lecturers will be available.</p> | <p><b>Study and scenario design</b></p> <p><i>Optimisation Criteria in high RE systems</i> (PAØ)</p> <p>Work on individual analyses. Lecturers will be available.</p>                                |
| 13:00<br>-<br>16:00 | <p><b>How to get data and set up a model</b></p> <p>Participants' presentations of PhD projects and suggestions for energy system analysis - Part 2</p> <p><i>Setting up an EnergyPLAN model and finding the data</i> (JZT)</p> <p><i>Simulation strategies in EnergyPLAN</i> (JZT)</p> | <p><b>Workshop</b></p> <p>Work on individual analyses. Lecturers will be available.</p>  | <p><b>Workshop</b></p> <p>Work on individual analyses. Lecturers will be available.</p>  |
| 18:00               | <p><b>Dinner</b></p>  |  |  |
|                     | <b>Thursday 30 April<br/>(JZT/AAVJ)</b>   | <b>Tuesday 5 May ONLINE(PAØ)<br/>Tuesday 12 May ONLINE (JZT)</b>   | <b>Tuesday 19 May ONLINE (HL)</b>  |
| 09:00<br>-<br>12:00 | <p><b>Empirical cases</b></p> <p><i>Climate Neutral Scenario The IDA 70% CO2 reduction scenario using EnergyPLAN</i> (JZT)</p> <p><i>Carbon Management in Energy System Modelling: A CCUS Module for EnergyPLAN</i> (AAVJ)</p>  |  | <p><b>Participant presentations (mandatory exam)</b></p> <p>Online presentation of analyses and results followed by questions. 20 minutes per group/person.</p> <p><b>Feedback on the course</b></p> |
| 13:00<br>-<br>16:00 | <p>Work on individual analyses. Lecturers will be available.</p>  | <p><b>Q&amp;A online sessions (optional)</b></p> <p>Time will depend on participants' time zones. Likely 12:00-15:00 CET</p>   |  |