

PhD Position on Energy Systems Modeling

Ref. BAP-2026-583

At the division of Applied Mechanics and Energy Conversion (TME) of the Department of Mechanical Engineering at KU Leuven, and embedded in EnergyVille, a dynamic research group led by Prof. Erik Delarue focuses on advanced modeling of energy systems and markets. Our research spans various critical areas including unit commitment, system planning, equilibrium modeling, agent-based modeling, renewables integration, energy policy, and energy market design. In the Energy Systems Integration and Modeling (ESIM) research group, PhD students and post-docs work on modeling and applications to energy and climate policies.

<https://www.mech.kuleuven.be/en/tme/research/energy-systems-integration-modeling>

Project

With the Green Deal, the EU has the ambition to become carbon neutral by 2050. This will imply a massive transformation of our entire energy system. This transformation includes a change in the use of our primary energy vectors, as well as in end-use sectors. On the supply side, an increased level of electrification will be crucial. CO₂-free electricity generation will come largely from a massive deployment of renewables. To support this transition, we develop and deploy energy system models.

We are currently looking for two PhD candidates:

A first position focuses on the pricing of heat in district heating networks. Drawing on our expertise in electricity market design and operation, in this PhD we aim to model and evaluate the impact of heat market design and the interactions within multi-vector energy systems to secure revenue streams (e.g. waste heat valorisation and energy flexibility services to the electricity market). We further aim to identify and evaluate financing mechanisms in relation to their applicability for different types and scales of district heating solutions. This PhD research will take place in the context of a larger international project with the EU LIFE programme.

A second position is in context of a research project on Small Modular Reactors (SMRs). The growing industrial interest in SMRs signals a shift from their traditional role as baseload electricity producers toward flexible applications as an enabler of fossil-free and reliable heat and power in energy-intensive industry. This project will develop cost-effective, integrated solutions for variable electricity and steam at chemical sites, and develop advanced control strategies and design nuclear plant and other components to guarantee safe and highly flexible reactor operation. As part of this project, this PhD position focuses on optimizing SMR participation in electricity markets, and also assesses the broader energy system impacts of a broader roll-out of SMRs that co-produce electricity and process steam.

If you are interested/motivated to do research in this domain, we encourage you to notify us/apply via the procedure explained below.

Profile

We are looking for a highly motivated, enthusiastic and communicative researcher with a Master of Science degree in Engineering or a related field, from a reputable institute. Candidates with a background in a.o. economics, operations research are also encouraged to apply. You should have obtained excellent study results.

Candidates should have a strong interest in energy, especially in energy system operation and planning, as well as energy markets, policy and modeling. Experience with Matlab/Python/GAMS/Julia is a plus. Applicants should also have good English communication skills.

The candidate can start from existing energy systems models and dedicated expertise available in the research group and will collaborate with other research group members.

Offer

KU Leuven is among the top European universities. It is a key player in the field of energy research, also through the collaboration within EnergyVille.

We offer:

- A doctoral scholarship for four years (net monthly salary of about ~€2,500) and a PhD degree in Engineering, if successful
- A highly specialized (doctoral) training, making the candidate an expert in energy systems modeling.
- The opportunity to collaborate with international partners in a European project and participate in international conferences.
- Multiple benefits (health insurance, access to university infrastructure, and sports facilities)

We aim for a start as soon as possible.

Interested?

Applicants should express their interest by sending an email to Prof. Erik Delarue via the dedicated email address jad@kuleuven.be. The email should *strictly* contain the following information in the text body, in bullets:

- Name

- Master degree (Master specification, University + Country, Year obtained)

- Master thesis (Title, Year, Supervisor)

- A one-paragraph (up to half an A4 page) statement explaining the motivation for applying for this vacancy at KU Leuven. We strongly encourage you to visit the research group's website (see link above) and have a look at some of the recent publications.

Please also attach an academic CV to your email.

Please do not directly apply in the online system as referred to below. This will be only necessary for selected candidates in a second stage.

Note that if you do not receive a response to your email within two weeks, this means you have not been selected for the second stage.

Decision: as soon as a suitable candidate applies, so do not wait till the end date (indicated here below) to apply.

For more information please contact prof. Erik Delarue via jad@kuleuven.be.

You can apply for this job no later than October 31, 2026 via the online application tool :
<http://www.kuleuven.be/eapplyingforjobs/light/60751769>

KU Leuven strives for an inclusive, respectful and socially safe environment. We embrace diversity among individuals and groups as an asset. Open dialogue and differences in perspective are essential for an ambitious research and educational environment. In our commitment to equal opportunity, we recognize the consequences of historical inequalities. We do not accept any form of discrimination based on, but not limited to, gender identity and expression, sexual orientation, age, ethnic or national background, skin colour, religious and philosophical diversity, neurodivergence, employment disability, health, or socioeconomic status. For questions about accessibility or support offered, we are happy to assist you at <[a href="https://www.kuleuven.be/wieiswie/en/person/g0003537"](https://www.kuleuven.be/wieiswie/en/person/g0003537)>this email address.