

# Open position for PhD researcher:

## Understanding business models for sustainable local energy solutions

(23-01-2023)

### Context

#### **imec**

imec is a world-leading research and innovation hub in nanoelectronics and digital technologies. The combination of our widely acclaimed leadership in microchip technology and profound software and ICT expertise is what makes us unique. By leveraging our world-class infrastructure and local and global ecosystem of partners across a multitude of industries, we create groundbreaking innovation in application domains such as healthcare, smart cities and mobility, logistics and manufacturing, and energy.

As a trusted partner for companies, start-ups and universities we bring together close to 4000 brilliant minds from over 97 nationalities. Imec is headquartered in Leuven, Belgium and also has distributed R&D groups at a number of Flemish universities, in the Netherlands, Taiwan, USA, China, and offices in India and Japan. All of these particular traits make imec to be a top-class employer.

#### **IDLab research group @ Ghent University/ imec**

The Internet Technology & Data Science Lab (IDLab) is an imec research group at Ghent University and the University of Antwerp. IDLab focuses its research on internet technologies and data science. Bringing together more than 300 internet experts, we develop technologies outperforming current solutions for communication subsystems, high speed and low power networking, distributed computing and multimedia processing, machine learning, artificial intelligence and web semantics. IDLab has a unique research infrastructure used in numerous national and international collaborations.

IDLab collaborates with many universities and research centers worldwide and jointly develops advanced technologies with industry (R&D centers from international companies, Flanders' top innovating large companies and SMEs, as well as numerous ambitious start-ups).

The IDLab techno-economics team where this vacancy is offered <http://technoeconomics.idlab.ugent.be/> consists of engineers and economists who are supporting decision makers by translating technological innovation into business opportunities and challenges in different application domains like smart cities, smart mobility and smart energy. The group aims at providing research insights that help companies and policy makers in their decision making. Our research aims to put forward methodology-backed insights that combine technical solutions with their expected economic impact like costs, benefits and related business models.

## Business models for sustainable local energy solutions

Contemporary energy challenges lead to an increased importance of local energy solutions. The installation of local sustainable energy sources, like PV-panels, heat pumps, etc. can lead to lower dependence on fossil fuels. A good fit between local supply and local demand can lead to higher degrees of self-sufficiency for specific neighborhoods or communities and therefore a lower dependence on the energy grid. Electrical vehicles can be charged at off-peak times to allow for a lower peak usage. Intelligent solutions like smart optimization techniques can help to optimize all these decisions.

Next to the traditional players in the energy domain like energy suppliers, transmission system operators (TSO) and distribution network operators (DSO), new actors like energy managers, charging pole operators, etc. are entering the domain. Digital platforms can enable different digital solutions in the energy domain like optimizing the use of energy in a specific residential area by matching the demand curve of residents, retailers and electric cars to each other and to the (renewable) energy generation.

For all of them, several techno-economic trade-offs need to be made. Decision makers can be informed by cost-benefit analysis studies for different potential investments like photovoltaic cells or a local heat network that recuperates the heat from a nearby factory. Calculating levelized cost of energy (LCOE) for different local energy solutions can help to identify the most sustainable solutions that are also financially viable. Next to that, understanding the impact of changing local energy ecosystem on the business models for both traditional and novel actors forms an important research challenge.

In order to face the different research challenges in this interdisciplinary domain, we are looking for a researcher who is able to combine technical and economic insights and has a strong interest in the energy domain. The researcher will work within the international research project RENergetic <https://www.renergetic.eu/> as well as other national as well as international cooperations in the same domain.

## Job description

### The job

- Under the supervision of a professor and a postdoc researcher in the team, you will prepare a PhD dissertation over a duration of about 4 years.
- You perform cutting-edge research in the domain of techno-economic evaluation of smart energy solutions
- You publish and present results both at international conferences and in scientific journals.
- You validate your research by considering concrete use cases and discussing with public and private actors in the field.
- You tightly collaborate with IDLab colleagues within the techno-economic teams, as well as in other teams where appropriate.
- You will be involved in different research projects related to your PhD topic, in the framework of national and European funded research cooperations, and collaborate with research partners from industry.

- You will assist the research group with limited educational tasks.

#### Job requirements

- Holder of a Master degree in Computer Science, Computer Science Engineering, Electrical Engineering, IEOR or Commercial Engineering.
- Strong interest in economic evaluation of technological projects.
- Strong analytical skills for designing and implementing abstract models.
- Experience with object-oriented programming and scripting languages is a plus.
- You work independently, have a strong feeling of responsibility and are able to commit to timing and milestones set forward by different research projects.
- You are a team player and have strong communication skills.
- A good knowledge of English (oral and written) is a must. Any knowledge of Dutch (oral) is a plus.

#### Our offer

We offer a challenging, stimulating, young and pleasant research environment where you can contribute to solving real-life problems for technological innovations with a clear societal as well as economic value. The work is done in close collaboration with ICT and energy industry players in Flanders and Europe. The UGent doctoral school program offers possibilities for following a range of courses or trainings of your interest. We foresee a competitive remuneration and the possibility to obtain a PhD degree in Engineering.

## How to apply?

This PhD position is available immediately (starting date not later than Sept 1<sup>st</sup> 2023, but preferably earlier) and is open until the vacancy is filled. The position is not open for post-docs.

Apply asap by sending an email to prof. Sofie Verbrugge. Your application should include

- your resume (curriculum vitae)
- motivation letter (indicating both your technical and economic background/interest as well as any specific research skills)
- a copy of your diploma and diploma supplement (with overview of all courses followed)

## More information

Sofie Verbrugge – [sofie.verbrugge@ugent.be](mailto:sofie.verbrugge@ugent.be)