



Université Libre de Bruxelles
Institut de Gestion de l'Environnement et d'Aménagement du Territoire
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JOB OFFER

Life Cycle sustainability Optimisation for Regional land use Planning

2 year Post-doc position on **spatial optimization and life cycle assessment**

We offer

In the framework of the FNRS MIS project “Life Cycle sustainability Optimisation for Regional land use Planning” we offer a **2 year full time post-doc position** focussing on spatial optimization and life cycle assessment (starting before July 1st 2017).

The **major and long term** aim of this FNRS MIS project is to make the analytical power of life cycle thinking available in regional land use planning. The main reasoning for this aim is that when deciding on how to use agricultural and forestry territory, it would be very relevant to take into account the total life cycle sustainability performance of the products and services produced on the territory. And to optimize these performances on the territorial level. This will become very relevant in the context of a transition to a low-carbon society, the circular economy and the bio-based economy in which the agricultural and forestry territory will play an important role. Next to its continued role to produce food, feed and fibre, the agricultural fields and forests are expected to provide us biomass for energy, and increasingly for bio-based products (e.g. bioplastics, fine chemicals) in order to reduce GHG emissions, while safeguarding the regulating, supporting, provisioning and cultural ecosystem services. **How could we sustainably manage and plan these transitions and land use changes on a territorial level to satisfy demands and CO₂ reduction targets while minimizing other sustainability impacts?** Choices could cause displacement of impacts to other locations, to other stages in production chains or to other types of impacts (cfr. food-vs-fuel debate). A life cycle perspective of the products produced on the territory (through “**territorial LCA**”) would allow to take such effects into account in the decision making (on this aspect there is a parallel vacancy for a PhD scholarship in the same project). By, additionally, linking this with **multi-objective optimization** on territorial level, we could support decision making with already optimized land use scenarios, instead of performing iterative scenario building and evaluation steps.

In the context of this project, and in the context of the Belgian low-carbon society pathways, **the post-doc will develop a spatial multi-objective optimization model** which optimizes land allocation and biomass use to minimize environmental impacts on a territorial level. This optimization will be fed by territorial life cycle assessment results of the current Walloon meat-production-related agricultural territory as a baseline and of several alternative biomass-for-energy land uses (by the PhD candidate of parallel vacancy) and analyses based on geographic information systems (GIS). As such the post-doc is expected to build a meta-model where GIS, LCA and optimization are linked.

The post-doc will be part of the research team of [Prof. Wouter Achten](#) (ULB - IGEAT). Parts of the project will also be executed in collaboration with [CIRAIG](#) and GERAD, UQAM Montréal, Canada.

We look for

The ideal candidate

- holds a **PhD** (after defence) in Bio-science engineering, Environmental Science and Management, Environmental Engineering, Engineering, Agricultural Sciences or any other project relevant domain and which was obtained since **max 5 years** before July 1st 2017.
- has **solid knowledge and experience with spatial optimization tools and models**, and with **geographical information systems**.

- has knowledge on, or experience with life cycle assessment (**LCA**), environmental impact assessment (**EIA**), and strategic environmental assessment (**SEA**)
- has knowledge, on **land-based/biological production systems** in general (e.g. agriculture, forestry, biomass production, etc.), and more specifically on biomass-for-energy systems.

Further, the candidate has strong analytical skills, has a quantitative reflex, can approach complex issues in a systematic way and has the capacity to work autonomously towards objectives and deadlines. The candidate should be fluent in written and spoken English, and have good communication (written and oral) skills and be able to work in group and guide junior researchers. Active knowledge of French is considered an added value, but not a prerequisite.

The post-doctoral researcher is further expected to be prepared to contribute to the further development and daily activities of the research group (e.g. contribute to building related project proposals, follow up of project related master thesis and doctoral thesis students, participating in seminars, etc.).

Work environment

Founded in 1834, Université libre de Bruxelles (<http://www.ulb.ac.be>) has a long tradition of excellence in Research with four scientific Nobel Prizes, one Fields Medal, three Wolf Prizes and two Marie Curie Excellence Awards. It is one of the largest and best Research Universities in Belgium, with a student population of 24,000 and with almost 1,600 PhD in progress, in partners with 20 Doctoral schools. ULB has considerable experience with European funding programmes and is involved in more than 160 projects financed by both the 7th European Framework Programme and Horizon 2020.

The **Institute for environmental management and land-use planning** (IGEAT – <http://igeat.ulb.ac.be>) is an interdisciplinary education and applied research Institute. Scientific staff is about 40 interdisciplinary researchers. The group Environmental, Societal and Land Management (GESTe) is one of the research units of IGEAT. This multidisciplinary team specializes in environmental assessment in the broad sense. The group masters assessment techniques for products and services (e.g. LCA, LCC and SLCA), projects (e.g. environmental impact assessment), as well as for plans (e.g. strategic environmental assessment) and programs and policies. Next to their evaluation function, these competences are also used to nourish smart land management (including rural areas, landscapes, forests, ...) for which the team employs an ecosystem approach.

The research group around Prof. Wouter Achten (2 post-docs, 5 PhDs, 1 research collaborator) focusses on life cycle thinking research and has activities on life cycle sustainability assessment, social LCA, Input-Output LCA, spatio-temporal LCA, land use and ecosystem services in LCA etc., and this in the context of food systems, waste management, circular economy and bio-based production systems.

Apply

For further information on the position or the research project you may contact Wouter Achten (wouter.achten@ulb.ac.be; +32 2 650 43 22). To apply, you should send

- a **motivation/cover letter** stating your motivation, and past experiences with which you can contribute to the project
- an **extensive scientific curriculum vitae** (including list of publications, presentations, acquired funding, ...) and contact details of 3 references
- a **full text digital copy of your best scientific output** so far.

to wouter.achten@ulb.ac.be no later than **March 15th, 2017**. Job interviews will be planned on the **24th of March**. The starting date should be before July 1st, 2017

Keywords

Spatial optimization; Life cycle thinking; Sustainability; GIS; agricultural production