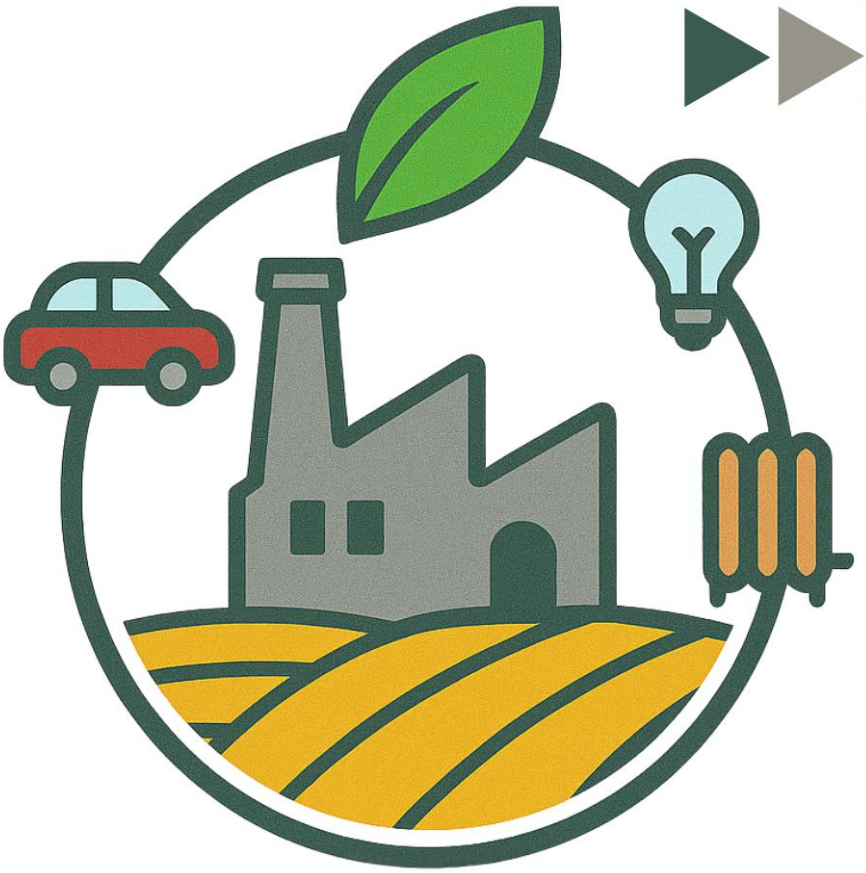

WORKSHOP ON ECONOMICS OF BIOENERGY

GRENOBLE, OCTOBER 9-10, 2025

ORGANIZED BY:

UGA Université Grenoble Alpes

GAEL Laboratoire d'Économie Appliquée de Grenoble

Chaire Énergie et Prospérité

VENUE:

MAISON DE LA CRÉATION ET DE L'INNOVATION

339 AVENUE CENTRALE - 38400 SAINT-MARTIN-D'HERES

Thanks to

Organization committee

Thierry Brunelle, Senior Research Fellow CIRAD, CIRED

Guy Meunier, Senior Research Fellow INRAE, PSAE

Nandeeta Neerunjun, Assistant Professor Université Grenoble Alpes, GAEL

Stéphane Robin, Researcher CNRS, GAEL

Margaux Sinceux, Research Assistant CNRS, GAEL

Alban Thomas, Research Director INRAE, GAEL

Practical information

Workshop venue

The workshop will take place on the campus of Université Grenoble Alpes at:

- Maison de la Création et de l'Innovation (MaCI),
- 339 avenue Centrale - 38400 Saint-Martin-d'Hères
- Map
- Campus Mobile UGA Application

How to come from Grenoble train station by tram?

- Line B-Gières Plaine des Sports
- Stop: Gabriel Fauré (around 50 metres from the MaCI).

How to buy your tickets?

- https://www.reso-m.fr/70-ou-acheter.htm

Gala dinner at Brasserie des Antiquaires

- 7 rue de la Paix – 38000 Grenoble - Map

Contact

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Program Day 1

Thursday, October 9

From 12:00	**Welcome and Lunch**
13:15-13:30	**Nandeeta Neerunjun, GAEL** **Opening address**
13:30-14:15	**Michael O'Donohue, Toulouse Biotechnology Institute** ***A primer on bionergy technologies***
14:15-15:00	**Guy Meunier, PSAE** ***Subsidies and rebound effect with incomplete carbon pricing: an application to biogas***
15:00-15:45	**Olli Tahvonen, University of Helsinki** ***Optimizing forest carbon sinks with bioenergy, carbon capture, and storage***
15:45-16:00	**Coffee Break**
16:00-16:45	**Louis Dupuy, APESA** ***Assessing the impacts of biogas production innovation: a multi-disciplinary perspective***
16:45-17:30	**Stéphane Robin, GAEL** ***Outlook for biomethane production in France considering gas grid constraints***
19:30	**Dinner**

Program Day 2

Friday, October 10

From 08:30	**Welcome Coffee**
09:00-09:30	**Alban Thomas, GAEL** ***A brief overview of bioenergy policies in a context of climate change***
09:30-10:15	**Alexandre Gohin, SMART** ***Economics of biofuels***
10:15-11:00	**Julie Wohlfahrt, LAE** ***Assessing the sustainability of bioeconomy systems at the territorial scale***
11:00-11:15	**Coffee Break**
11:15-12:00	**Siwar Saadaoui, ECOSYS** ***Quantifying primary biomass production capacity and supply: A cost function approach to assess global and regional potential***
12:00-12:45	**Jean-Marc Callois, DRAAF** ***Activating the potential of diffuse biomass***
12:45-13:15	**Discussion**
13:15	**Take away Lunch**

Each slot lasts 45 minutes. Indicatively, each presentation lasts 30 minutes, followed by 15 minutes of Q&A.

Abstracts

Michael O'Donohue, **Toulouse Biotechnology Institute**

A primer on bionergy technologies

Guy Meunier, **PSAE**

Subsidies and rebound effect with incomplete carbon pricing: an application to biogas

Bioenergies from dedicated crops or wood have faced substantial criticisms due to their significant land requirements. Certain bioenergy pathways, such as biogas generated from crop residues, manure, or food waste, appear to be exempt from this criticism. However, these feedstocks are byproducts of agricultural activities that generate emissions not covered by current climate policies in most countries. We analyze the optimal subsidy to biogas production in a second-best setting where emissions from food production and fossil gas are under-taxed. We show analytically how the indirect effect of the biogas subsidy on food production should be taken into account, as well as the welfare implications.

Olli Tahvonen, **University of Helsinki**

Optimizing forest carbon sinks with bioenergy, carbon capture, and storage

Current climate polices to maintain the global mean temperature below 1.5–2 ℃ rely heavily on removing carbon from the atmosphere and particularly on developing bioenergy, carbon capture, and storage (BECCS). We present a generic model and a high-dimensional empirical model for combining BECCS and carbon enhancement in existing forests. Our generic model reveals a capture and storage unit cost level above which the properties of maximizing the values of wood production and carbon sink appear opposite to those in the current models without carbon capture and storage. Our high-dimensional empirical model solved by reinforcement learning includes a detailed model on wood production economy, an individual-tree-based mixed-species model on forest growth, a 15-state variable model for carbon in forest soil, and a realistic description of biomass use for wood products and bioenergy. Using current estimates for carbon price and unit costs of capture and stor! age, we obtain the result that a higher carbon price decreases rotation length in boreal forestry, increases wood production and its value, and decreases carbon stored in trees and forest soil. Integrating carbon enhancement in forests and carbon capture and storage aids in mitigating potential adverse effects of carbon capture and storage on land use, food prices and biodiversity. However, it is possible that BECCS benefits wood production while climate change mitigation suffers.

Louis Dupuy, **APESA**

Assessing the impacts of biogas production innovation: a multi-disciplinary perspective

Biogas production in France is the subject of numerous controversies surrounding both the resources used (available territorial biomass) and the resulting energy vector (biogas). This results in tensions threatening the economic model on which the current sustained extension of biogas production plants rests. In this contribution, we present the ongoing multi-disciplinary assessment of a new biogas production technology, based on in situ biological methanation combined with biological hydrogen production. Combining qualitative and quantitative methods, our assessment shed some light on the challenges associated with the development and expected deployment of this new technology. We notably stress the importance of tackling various sources of uncertainty regarding the technology and properly anticipating the local context and biomass availability. We observe that there is no one-size-fits-all blueprint for the decentralised production of biogas.

Stéphane Robin, **GAEL**

Outlook for biomethane production in France considering gas grid constraints

The development of biomethane production represents a major challenge for energy transition policies. To benefit from public support through feed-in tariffs, production sites must be located close to natural gas distribution networks in order to inject their output. While numerous studies have assessed production potential by considering the availability of inputs for anaerobic digestion, to our knowledge no research has focused on the constraints of injection into distribution networks. The study presented here aims to evaluate the limitations imposed by the existing distribution network on the development of biomethane production in France. This work is a collaboration between economists from GAEL and operations research scholars from G-SCOP.

Alban Thomas, **GAEL**

A brief overview of bioenergy policies in a context of climate change

The main features of European bio-energy policies are presented with a particular focus on their application in France and their integration in climate and energy strategies. We discuss the use of foresight studies and interdisciplinary scientific research for policy guidance and recommendations, based on modelling and scenarios involving climate, technological and economic trends.

Alexandre Gohin, **SMART**

Economics of biofuels

The biofuel policies defined in the mid 2000 have been controversial for two main reasons, on their impact of farm commodity price first, on their climate effects due to land use changes. We will review the different models used to tackle these issues and how they can potentially inform forthcoming French debates on the bioenergy.

Julie Wohlfahrt, LAE

Assessing the sustainability of bioeconomy systems at the territorial scale

Pathway towards sustainability, yet it raises critical questions concerning their environmental and social performances. This presentation addresses the challenge of assessing the sustainability of territorial bioeconomy systems. We first examine a case study on the sustainability assessment of a miscanthus-to-bioenergy supply chain in France, which reveals the limitations of a mono-product, single-value-chain perspective. Such an approach fails to capture the inherent complexity of bioeconomy systems, which are characterized by diverse actors, interdependent relations, and their embedding within broader socio-ecological dynamics. To overcome these limitations, we are developing MAELIA, an integrated assessment and modelling platform designed to assess territorial bioeconomy and agricultural systems. We illustrate its application through ongoing work on the co-construction and evaluation of alternative energy scenarios for the Grand Reims territory. We c! onclude by advancing the hypothesis that the sustainability outcomes of bioeconomy systems—and particularly bioenergy systems—are highly contingent upon the agricultural and bioeconomic models guiding their development.

Siwar Saadaoui, ECOSYS

Quantifying primary biomass production capacity and supply: A cost function approach to assess global and regional potential

Dedicated lignocellulosic crops feature prominently in mitigation pathways, yet deployable contributions depend on strong food-security and environmental guardrails. We develop a two-part framework to quantify and interpret the sustainable contribution of primary biomass from dedicated crops. First, we construct spatial cost-ranked capacity curves on a global 5′ grid by intersecting a stringent marginal-land mask (screening for low conflict with food production, carbon storage, biodiversity, water, and soil quality) with pixel-level economic land value (annualized via net-present-value rent), fine-scale machine-learning yield maps for five crops (Miscanthus, Eucalyptus, Poplar, Willow, Switchgrass), and region-specific operating-cost ratios. This produces internally onsistent cost–quantity relationships globally and for seven World Bank regions. Second, we estimate econometric cost functions (parsimonious cubic forms with region and country heterogeneity) to recover average- and marginal-cost schedules, the efficient scale where average cost bottoms out, and the onset of diseconomies of scale, yielding region-specific biomass supply curves.

Jean-Marc Callois, DRAAF

Activating the potential of diffuse biomass

A great part of the potential of bioenergies is spatially scattered. Various policies aim at harnessing this potential, in particular for methanization and fuelwood. However the development of these forms of bionergy is quite uneven, and is not directly related to physical availability. In this communication, we present the dynamics of bioenergies in the Auvergne-Rhône-Alpes region, for 3 particular sources of biomass : methanizable biomass, fuelwood from hedges and miscanthus. We then analyse the various factors that explain de development of bioenergies based on diffuse biomass. We focus in particular on the role of local public-private governance, and more generally on organisational factors. Our results show that an efficient co-ordination at various geografical scales is crucial for activating the latent potential.

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Workshop website