

# Education for the biobased economy



Many challenges, current and future, lie ahead in a transition to a sustainable biobased economy. Meeting them requires knowledge and education on a variety of topics related to technology, economy and society.



WAGENINGEN UNIVERSITY  
WAGENINGEN UR

# Why we need education for a biobased economy

The number of people in the world is growing, as are the levels of well-being and prosperity. It is possible for all nine billion humans to have a relatively high level of prosperity and welfare in 2050. For this to happen, however, will require major changes in the way we deal with food, animal feed, materials and energy. Right now, materials and energy are often produced from fossil fuels, and this should increasingly be replaced by biomass in the future. The main challenge for the current generation of students is to work on improving resource efficiency and the use of land in order to meet all these needs, while not forgetting climate, biodiversity, multiple land use, recreation and social issues.



*'The business community is looking for people with a particular specialisation related to the biobased economy who also see the bigger picture. Wageningen University provides them.'*

Wageningen University currently offers its students two bachelor minors, one master specialisation, internships, thesis work, innovation projects and Massive Open Online Courses (MOOCs). There are also PhD courses and biobased thesis topics, as well as introductory and advanced courses for professionals and teachers in vocational & higher professional education.



## Bachelor courses and minors

### **Biobased transition**

The transition to a biobased society requires more than just technological solutions: it involves the development of new production lines, innovative business models and regional logistics chains. The challenge is to actually use these new materials and processes to create a sustainable society, both in the Netherlands and on a global scale.

#### Courses:

- Biobased economy
- Biobased business
- Sustainability analysis
- Biobased logistics

### **Biobased technology**

The focus of this minor is technical innovation strategies that aim to replace fossil fuels with renewable resources. Both the production of biomass and biorefinery & the conversion to materials, chemicals and energy are considered. This creates insight into opportunities for new production chains, from biomass to end product.

#### Courses:

- Biobased economy
- Bioresources
- Biorefinery
- Renewable sources and (bio)chemical production

## Master programmes

The MSc level offers a number of courses on the biobased economy. Together they form an interdisciplinary specialisation called Environmental and Biobased Technology. The list of courses is available on [www.wageningenUR.nl/ebt](http://www.wageningenUR.nl/ebt).

## Massive Open Online Courses (MOOCs)

The MOOC 'Towards a biobased society' is designed for prospective students. This introductory course covers various biobased topics. A MOOC at university level will follow in the academic year 2016-2017.

### Internships, thesis topics and innovation projects

Master students will individually and as part of a multidisciplinary team participate in innovation projects on behalf of businesses and public organisations. This allows them to gain experience with project work, while combining knowledge and theory with practice.

This includes for instance:

- Biomass production with algae (AlgaePARC) or seaweed (sea farm)
- Sugar beet as raw material for soda bottles
- Making rubber from dandelions
- Bioasphalt with lignin

### PhD programmes and courses

PhD students can follow biobased courses: graduate schools VLAG, EPS and PE&RC offer courses and summer schools that are open to PhD students and professionals from the industry or knowledge institutions.

For instance, the course 'Microalgae process design – from cells to photobioreactors' is offered by the VLAG Graduate School together with the BioSolar Cells research programme. The PhD course 'Biorefinery' is a successful training school for PhD students and professionals from the public sector as well as SMEs. EPS offers the course 'Bioenergy production from crop plants and algae'.



## Courses for professionals

Wageningen UR offers one and two-day courses for professionals, such as teachers in vocational and higher professional education. Wageningen Academy provides a broad introductory course that covers relevant topics from biomass production to processing, supply chains and products, including technical aspects, sustainability, policy and regulation.

## Centre for Biobased Economy (CBBE)

Within the Centre for Biobased Economy (CBBE), Wageningen University joins forces with seven educational institutes and the private sector to work on the biobased economy. This partnership within CBBE allows higher education institutions to train future pioneers in the biobased transition.



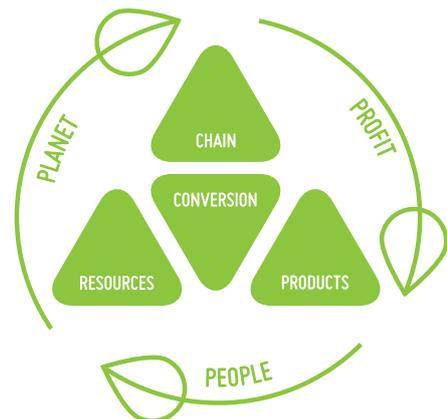
## Why Wageningen University?

Many professors, teachers, scientists and programme directors work together on the biobased transition from their different disciplines at Wageningen. This takes place based on a multidisciplinary, holistic approach, using the many pilot facilities at Wageningen UR, such as AlgaePARC, Accres and CAT AgroFood, as well as production facilities for products such as bioplastics, chemicals and packaging materials.



## Education based on biobased research and partnerships

Education at Wageningen University is done in close cooperation with other educational institutes and research programmes within and outside of Wageningen UR. Research by Wageningen UR focuses on the following topics and processes:



With this range of biobased education, training and courses, Wageningen UR is training people to be ready for a green future.

You can find out more about the biobased education, training and courses by Wageningen University and Wageningen UR on our website.

[www.wageningenUR.nl/biobasededucation](http://www.wageningenUR.nl/biobasededucation)

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