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## Internet Platforms for and Authenticity and Non-Superficiality in Education on Sustainability

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www.sustainicum.at

**SUSTAINICUM COLLECTION**  
EDUCATIONAL MATERIAL FOR SUSTAINABILITY

Home

Dear Platform Users!

In times of energy and resource abundance we have forgotten how to recognize and understand simple interrelationships that are relevant for sustainable action. Moreover, university graduates should be able to provide information, since they will be heavily involved in future design processes. For that reason, it is important to us that all students be confronted with the issue of sustainability, similarly to how university graduates used to have a basic understanding of philosophy. All students should have dealt intensively with sustainability at least once in their life; following the example of the *Leuphana University of Lüneburg*, where all beginning students complete a teaching unit on sustainability, and also like "Common Body of Knowledge" required by the Vienna University of Economics and Business.

On this continually expanding platform you will find resources from the four categories of **Building Blocks, Teaching Methods, Lecture Notes** and **Teaching Modules**, which



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**www.bioenergytrain.eu**

European cooperation for higher education  
**BioEnergyTrain**

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Université de Liège **3** PEPs CHEMICAL ENGINEERING

**www.bioenergytrain.eu**

**Master in Bioresource Value Chain**

The MSc Curriculum Bioresource Value Chain Manager will provide the education to manage, optimise and innovate bioresource supply chains in regional contexts and to optimize resource utilization within the framework of the emerging bioeconomy and objectives of the SET-Plan.

**Module 1**  
The bioresource value chain as a flow of biomass resources  
20 ECTS

- Bioresources: Types and biological fundamentals, physical, chemical and energetic features
- Bioresources: Types, physical, chemical and energetic characterisation
- Bioresource cycles
- Bioresources and biobased products

**Module 2**  
The bioresource value chain as a network of interconnected technologies and products  
15 ECTS

- Bioresource conversion routes
- Bioresource utilisation technologies
- Process Modeling and Optimization Methods

**Module 3**  
The bioresource value chain as a flow of economic transactions  
20 ECTS

- Bio-economy, circular economy fundamentals
- Business models for bioresource utilisation
- Industrial economics of the bioresource value chain
- Regional economics

**Module 4**  
The bioresource value chain optimization and innovation  
15 ECTS

- LCA of bioresource chains
- Innovation management in the bioresource chain
- Renewable based energy mixes and biomass

Thesis 30 ECTS  
Practical casework 15 ECTS  
Optional Courses 5 ECTS

Université de Liège **4** PEPs CHEMICAL ENGINEERING

## recording an ordinary lecture



<http://ocw.mit.edu/courses/linguistics-and-philosophy/24-08j-philosophical-issues-in-brain-science-spring-2009/video-lectures/lecture-17-theories-of-consciousness-that-neuroscientists-take-seriously/>

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## screen recording + voice

**Steady State Diffusion Through Non-Diffusing Component**

A ⇒ Diffusing  
B ⇒ Non-diffusing

$N_B = 0, N_A = \text{constant}$

$$N_A = \frac{N_A}{N} \frac{C D_{AB}}{(x_2 - x_1)} \ln \left[ \frac{\frac{N_A}{N} - y_{A2}}{\frac{N_A}{N} - y_{A1}} \right]$$

$N = N_A + N_B = N_A$

$$\frac{N_A}{N} = \frac{N_A}{N_A} = 1$$

$$N_A = \frac{C D_{AB}}{x_2 - x_1}$$


[https://www.youtube.com/playlist?list=PLbMVogVj5nJSOgW8GYe\\_nJ3MYfnCQ3XXM](https://www.youtube.com/playlist?list=PLbMVogVj5nJSOgW8GYe_nJ3MYfnCQ3XXM)  
Chemical - Mass Transfer Operations I

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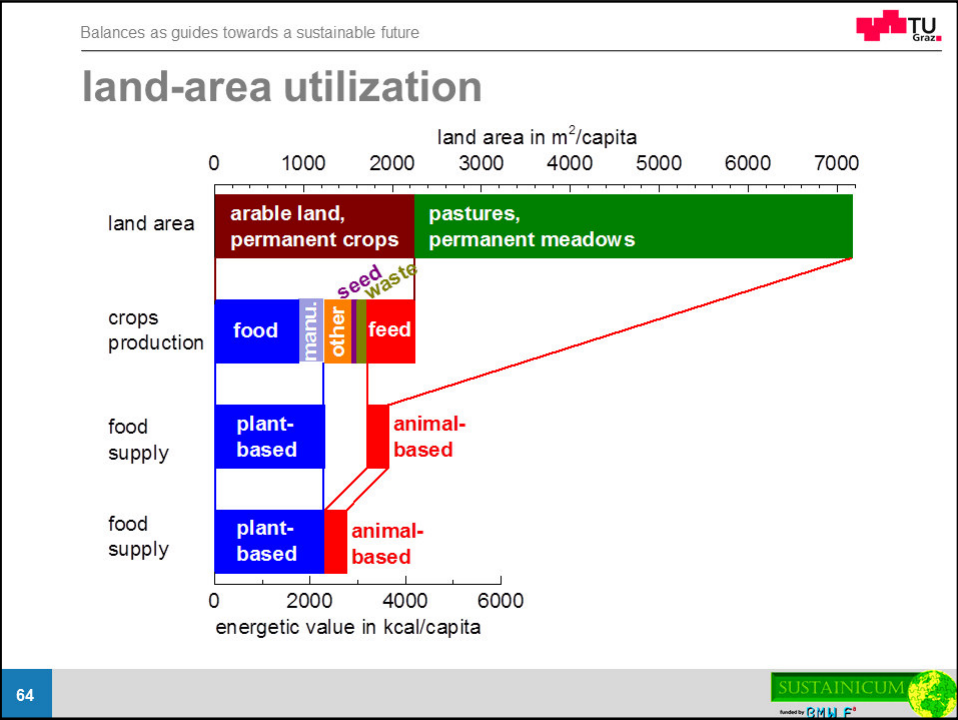
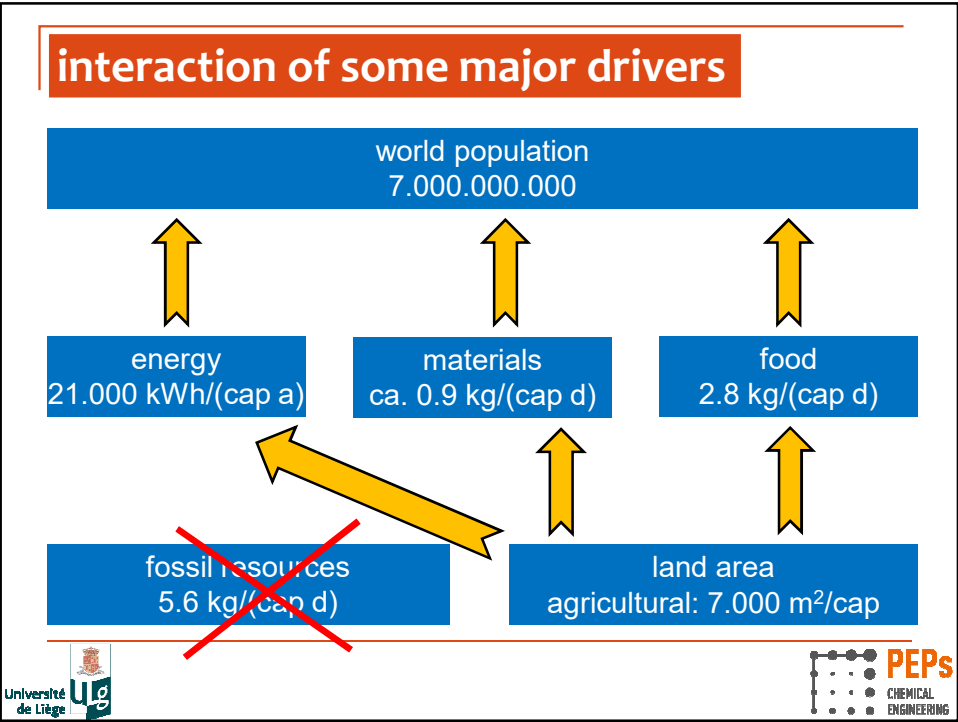
## chosen recording environment



photo reproduced with permission: © Olivier Borsu, IFRES - ULg, 2016

## screenshot from final video

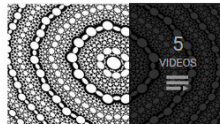




## upload

www.YouTube.com, search my name

<https://www.youtube.com/channel/UCSetzKjFSOtF18oWxpRoQ2g>



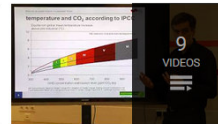
others



Thermal Unit Operations



presentations



Balances as guides towards a sustainable future

## proposal

internet platform collecting teaching material on sustainability

- material: presentations, manuscripts, videos (link to YouTube)
- editable files, high quality
- short introduction characterizing scope and audience
- authors: experts in their field
- content: lectures, modules, presentations for general society (studium generale)

the following partially substituted  
due to events

## EESD2016

Bernard Mazijn:  
superficial in dealing with sustainability challenges

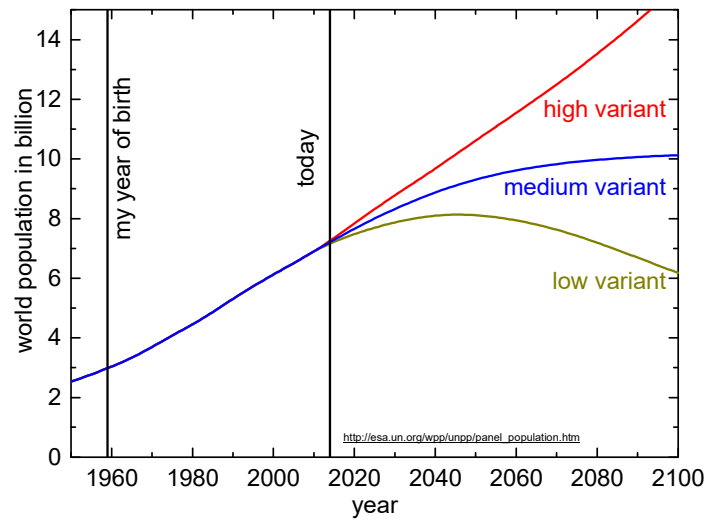
Richard F. Vaz, Scott J. Jiusto:  
important for students: authenticity



## dinner with foie gras

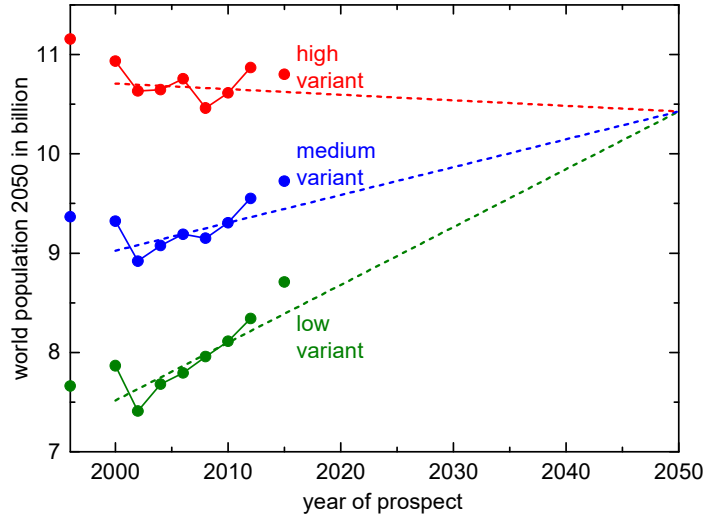


## world population

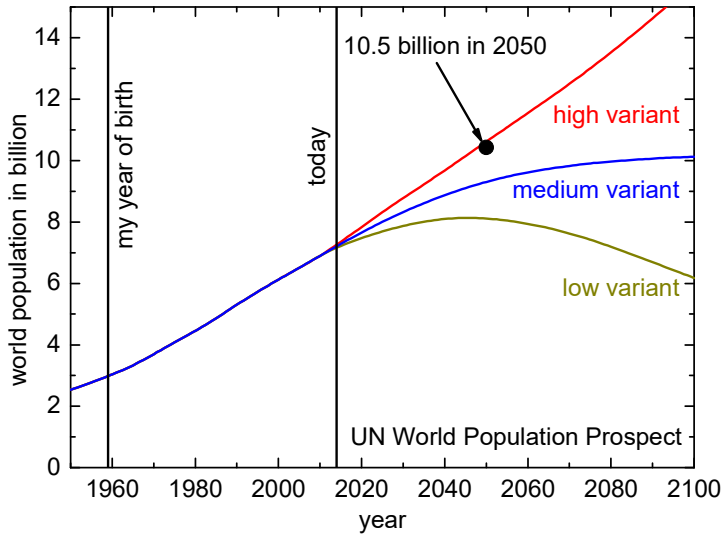




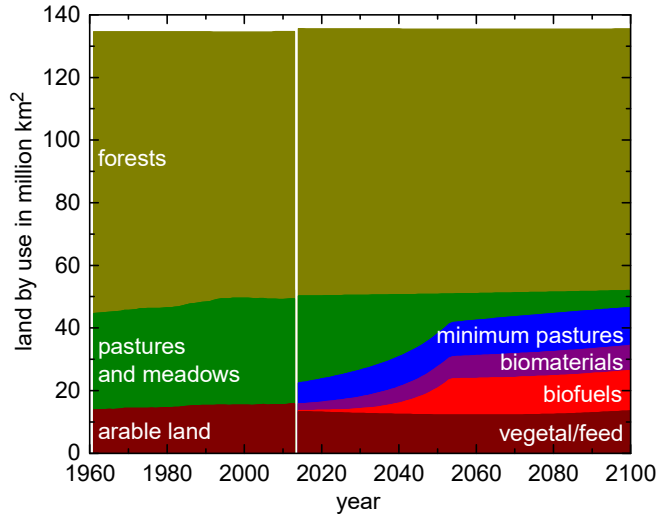
## development of prediction for 2050



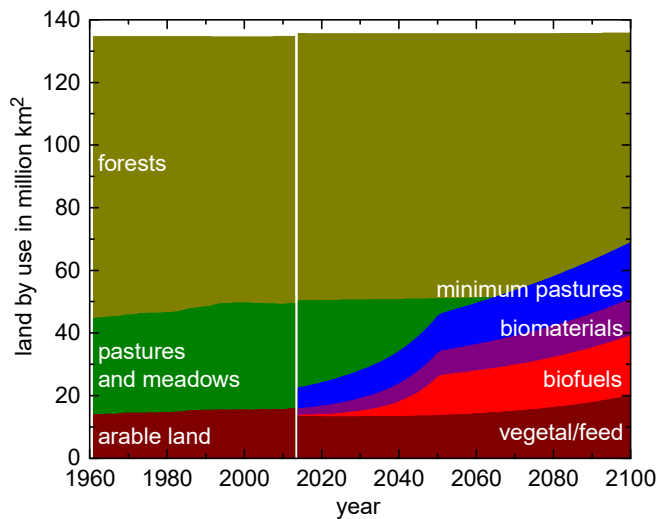
## world population prospect



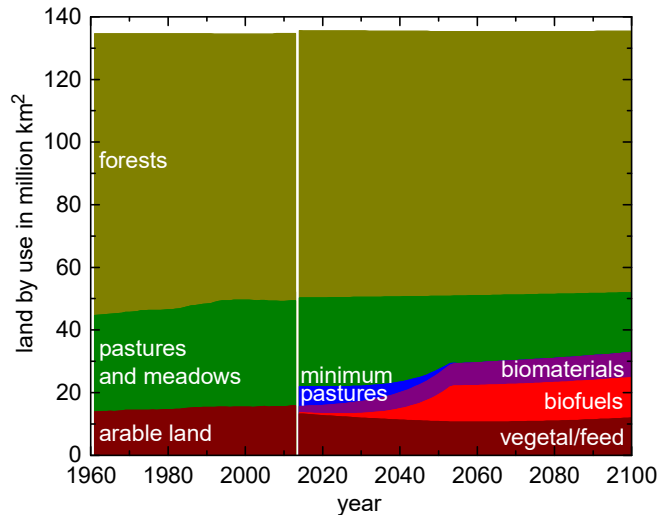
## land-area use: +1.5°C, medium pop. variant



## land-area use: +1.5°C, high pop. variant



## land-area use: +1.5°C, medium pop., vegetal



## technology vs. behaviour

'unsustainable' behaviour ⇒ no technology can help  
'sustainable' behaviour (less children, less animal-based food  
⇒ current technology is sufficient

⇒ behaviour is the actual driver

⇒ who shall educate society, if not us?

we may not be superficial in dealing with sustainability

we need to be authentic, if we want to educate others

need to bring this across also on internet platforms

## INTEGRATED PROJECT WITH FOCUS ON ENERGY TRANSITION AND CIRCULAR ECONOMY FOR DEVELOPING ENGINEERING STUDENTS' SOFT SKILLS



G. Léonard, A. Pfennig, D. Toye, C. Gomme, S. Lambert, N. Job,  
A. Léonard, T. Manfredini and M.-N. Dumont



### Abstract

We report the experience of an integrated project for master students in chemical engineering to **acquire soft skills** and address **challenges related to energy transition**.

Different teaching techniques were used and they did not perform equally well. This project represented **challenges for students** that had to master technical and soft skills, **but also for the teaching team** that needed to work together to follow up and assess students.

### Objectives of the integrated project

The case study was to **make Reunion Island as energy independent and CO<sub>2</sub>-neutral as possible by 2030**.



### Mentoring and assessment

8 professors and scientists mentored and assessed the project. Different tools to ease the mentoring and encourage the acquisition of soft skills were proposed:

Impact of following idea on:	Students	Teachers
Shared on-line portfolio	Good for internal communication ✓	Not really used ✗
Presentations of progress reports every two weeks	Work overload for presentations ✗	Good for internal communication ✓
Agreement of field experts to be contacted	Students rather relied on internet ✗	No impact
New team leaders in turn every fortnight	Prevented clear group structure ✗	No impact



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