



Teachener

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## Technology Assessment

# SYLLABUS

in cooperation with

**Helmholtz Centre for Environmental Research UFZ**  
Leipzig, Germany

### 1. Name of the Teaching Module

Technology Assessment

### 2. Brief description of the subject matter

Technology development always impacts societies and produces losers and winners. It is impossible to predict or even to envision all potential consequences of technological developments. The interdisciplinary research field of technology assessment (TA) observes and analyzes trends in science and technology. Thus, scenarios are developed to fathom opportunities and risks of developments that technologies pose for societies. The knowledge created is contributed to the public discourse and delivers advice for political decision making. Technology assessment often takes a risk perspective but is broader than technological risk assessments alone. Within this module students will be introduced to the perspective, basic principles, main goals and functions of technology assessment. Technology assessment will be introduced by taking a historical perspective on how technological change and social implications of the use of technologies are seen and understood by societies throughout the last centuries. It will be shown how the idea of assessing impacts of technologies on societies became institutionalized in order to advise policy since the 1970s.

TA relies on manifold methods. In the frame of this module the basic idea of Life Cycle Assessment will be introduced more precisely. It will be shown how SSH issues can be taken up within the method of LCA. Throughout the units of the module theoretical and methodological aspects will be linked to examples from energy research and energy technology development. Based on group work exercises students will work out some of the contents.



### 3. Complete SSH problems description

- It has been observed for centuries that technological change always impact societies and creates winners and losers. Each technology (or family of technology) has unforeseeable implications for society. Nowadays it is considered that impacts of technologies on society have to be analyzed, assessed and evaluated.
- Since the 1970s the assessment of technologies has developed as an interdisciplinary research of technological impacts on society. TA became institutionalized in many countries to generate knowledge for public discourse and policy advice. TA institutions play a crucial role and shape research on and development of energy technologies.
- A basic understanding of assumptions, principles, and main goals of TA as well as its functions in society and policy is useful for those who do research and develop energy technologies.
- A major challenge for TA is: how to integrate societal perspectives into the assessment of technologies. Methods and approaches to deal with this issue will be part of the module in order to trigger awareness to this point.

### 4. Learning outcomes

#### a) Knowledge

The students will learn about the idea, concept, role and institutions (actors) of technology assessment and how it applies to energy technologies. The module will allow the students to expand their knowledge about the methods, basic assumptions, main goals and TA's role in and for society and policy. This includes knowledge about the relation and difference between TA and risk assessment, current trends in TA, and some specific methods such as sLCA.

#### b) Skills

The content of the module will enable the students to apply their newly gained knowledge on TA in further studies of energy issues. They will become aware of the importance of technology assessment for a socially acceptable technological development. By practical exercises and work with TA reports students will acquire skills in analyzing reports and deriving relevant information from texts. Students will learn how to apply knowledge to examples from practice.

#### c) Social competencies

Through practical exercises and group work students acquire social competencies such as collaborative work.

### 5. Form of classes

- The module will consist of 3 sessions (see point 8) of 4 hours each. These lessons can be taught connectedly on one day or on three single days. If the module is taught on



one day it is required to have breaks between the sessions and a bigger break between the second and third session.

- All sessions will combine group work exercises, traditional lecture format to introduce the issues of technology assessment, and discussions.
- No homework tasks are foreseen.

## 6. Teaching methods

- Lecture
- Power Point Presentation
- Exercise
- Group work
- Discussion.

## 7. Classes plan

### 1. Session – Introduction to TA, History and goals of TA: Group work exercise, lecture supported by PowerPoint Slides

**Time:** 4 hours

- 10 minutes introduction by the teacher – overall goal of the module 5 min, introduction to the group work exercise 5 min
- 20 min group work
- 20 min discussion of the group work results
- 45 min lecture on historical perspective on technology assessment

#### Description of the task

- Introduction of the module
- Starting point: Interactive Exercise at the beginning that pick up the students with their daily experience and area of study
  - Choice between two examples for the exercise (the teacher has to choose if he/she use both or only one of the examples)
  - Example 1: EU energy goals – Teacher briefly introduce the main goals outlined in the EU Energy Roadmap; Students are asked: Imagine you are politicians and have to achieve these goals within your country. How can these goals be achieved?
  - Example 2: Heating your home – Students are asked: Imagine, you are a homeowner or work for a company that owns homes and you have to organize a heating system for the house. How will you decide on the technology/energy source that should be used?
  - Lecture on history and goals of technology assessment



### Materials needed

- material for group work e.g. TA documents, guiding questions
- PowerPoint Presentation
- Projector, Computer

### Teacher-student / student-student interaction

- Traditional lecture
- Discussion
- Group work

## 2. Session – Technology Assessment today – Goals, Tasks, and Actors Group work exercise, lecture supported by PowerPoint Slides

**Time:** 4 hours

- 10 Minutes introduction
- 30 Minutes text based group work
- 20 Minutes discussion of the group work
- 30-60 Minutes lecture – *to be specified, potentially it remains optional*

### Description of the task

- Group work: based on a TA report on e.g. geothermal energy (*or another TA report on energy issues – t.b.d.*) students are asked to answer questions on goals, tasks, functions, issues/dimensions of TA
- Lecture – on Goals, Tasks and Actors of TA

### Material needed

- Prepared Material of the TA report – *to be clarified*
- PowerPoint Presentation
- Projector, Computer

### Teacher-student / student-student interaction

- Traditional lecture
- Discussion
- Group work

## 3. Session – Technology Assessment today – Methods and techniques of Technology Assessment

**Time:** 4 hours



### Description of the task

- Lecture on actors and methods of technology assessment; focus on methods for systemic analytic approaches that allows to include societal aspects in the analysis of the technological system: sLCA

### Materials needed

- PowerPoint Presentation
- Projector, Computer

### Description of the task

- Lecture on LCA and sLCA

### Teacher-student / student-student interaction

- Traditional lecture format
- Discussion student-student and student-teacher

## 8. TM assessment methods & criteria

- *Class by class verbal evaluation*
- *Workshops and group work results evaluation*

## 9. Literature and other materials

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