Hanze University of Applied Sciences Groningen

Course: Energy Transition: context, policy and good practices — credits: 5

Course code	SUVH20ETCPP
Name	Energy Transition: context, policy and good practices
Study year	2022-2023
ECTS credits	5
Language	English
Coordinator	W.P. van der Gaast
Modes of delivery	Teaching method 1
Assessments	Energy Transition: context, policy, good - Report

Learning outcomes

Take perspectives on future developments which, taken together, form the context for designing, deploying and diffusing energy solutions for low, zero or negative emission pathways for meeting national, EU and global energy and climate goals.

- Students will be able to identify and prioritise (technology) solutions for sustainable, low-emission energy systems in light of countries' societal, economic and environmental strategies.
- Students will have a clear understanding of energy system dynamics, including barriers and enablers for prioritised solutions.
- Students will be able to develop a basic plan for implementing a sustainable energy solution at the scale of a community or a country, including a business plan and stakeholder consultation process.
- Students will have an understanding of effectiveness of energy and climate policy and what factors determine this.
- Students will be able to assess climate resilience of sustainable energy solutions in light of climate change impacts.
- Students will become acquainted with the different legal systems (common law, civil code) and how law functions within the European Union.
- Students will be able to identify different sources of law and the different disciplines of law (e.g. consumer law, contract law, administrative law).

Content

As introductory module for the Master Sustainable Energy System Management, module Energy Transition will provide a broad overview of aspects that relate to successful development and transfers of low or zero emission energy technologies, both in developed and developing countries. These aspects will, first, be technical by considering the technical potential for meeting global energy demand while striving for net zero greenhouse gas emissions globally by mid-century. Next, the module will focus on aspects related to affordability of these technology options, both in developed and developing countries, whereby it is, a.o., assessed whether and how the economic benefits of renewable energy technologies outweigh their costs. While the resulting economic potential is already a strong indicator of the feasibility of an energy technology in a country, its eventual potential depends on how well the technology is received by society and thus becomes socially acceptable.

After assessing tools and methods for determining a socially realistic potential for renewable and other low emission technology options, the module will turn towards implementation. A key insight to be obtained is that success of implementation depends largely on how well we understand the (market) systems for implementation. By analysing, characterising and attributing the enabling policy and business environment for a technology, including who are the key stakeholders in pursuing a technology, systemic barriers and enabler for technology implementation can be identified and addressed for more efficient (market) systems. Based on these insights – what are prioritised, socially realistic energy technologies and what needs to be done for their implementation at desired scales – policy targets and instruments can be formulated as concrete actions to shape energy and climate strategies. The module will highlight examples of the complexity of policy making. After all, policy making does not take place in laboratories, where contexts can be controlled, but are implemented in highly complex environments, where they co-exist with other policies, that target the same consumers and enterprises, possibly in contradictory ways. Let alone that EU Member States follow EU-level directives and must incorporate these in their national laws. The module will address these complexities by explaining potential policy interactions (e.g. between energy and climate policies) and how these can affect the effectiveness of individual policies.

Also, in the Module, an introduction into European law will be provided, for a better understanding of how EU-level energy and climate policy making works; a more detailed programme on European law will then follow in Module 3. Finally, Module 1 will extend the context for (renewable) energy decisions to climate resilience of energy systems. The rationale for adding the latter is the increasing importance of climate change adaptation. Naturally, SESyM has a focus on low-emission energy technologies which contribute to reducing greenhouse gas emissions. However, there is a growing concern that the effectiveness of low-emission energy systems can be affected by climate change impacts, such as solar PV becoming less efficient with higher temperature, wind turbines increasingly switched off due to heavier storms and small scale hydro plants threatened by lower water levels due to lower precipitation

levels. Consequently, robust energy systems require consideration of climate change impacts and solutions to adapt to these.

Included in programme(s)

European Master in Sustainable Energy System Management

School(s)

Institute of Engineering