Energy is an essential element in the development of modern society. Modern energy carriers such as electricity are part of our everyday life and provide us with numerous services. At the same time, energy harnessing and use has been the cause of significant environmental impacts such as acidification of forests and lakes, destruction of eco-systems and climate change. We have built our energy systems on non-renewable sources and with no care to impacts. These systems need to be changed. The transition towards sustainable energy systems has started but many challenges lay ahead.

Policies can help mobilize the multiple actors involved in building and managing energy systems towards desirable directions. How are energy policies defined and implemented? Also, new directions can be given to the market and society through guidelines and incentives. Economic and institutional barriers can be removed in order to promote desirable futures. How can institutions and markets be created to promote and develop sustainable energy systems? In addition, instruments can be designed to speed up innovation processes.

This course is offered annually to fifth year master’s students. Previous courses have been highly rated by the students. In the overall course evaluation, students considered the course far above average particularly in terms of content and pedagogical level of the lectures, literature, balance of activities, and use of the BILDA platform. We have taken new steps to further strengthen the course particularly with a stronger integration of the various course activities.

**Objective and scope of the course**

In this course, we look into energy planning and policy, as well as policy implementation processes. Our purpose is to evaluate how energy policies are defined and implemented and institutions and markets are created to promote and develop sustainable energy systems. Studied examples include mainly Europe and developing countries.

This course provides a framework for understanding the subject energy policy and planning, and for acting. First, we want students to understand the strategic role that policies play in the formation of energy systems. Secondly, we want to increase awareness among energy professionals about how
encompassing the challenges are that they have to face as they enter professional life. Whether or not they will work directly with energy policy, their professional work will be affected by the policy lines that are being defined at global, national and regional levels.

Thirdly, we provide students with a good basis for dealing with energy policy either as planners, or implementers of energy policies and projects. Students will review different policy examples: analyze the policy objectives, the implementation process and outcomes.

**Expected outcomes**

At the end of the course, students should be able to: (i) understand how energy policy is designed and implemented; (ii) identify policy processes; (iii) identify the role of different stakeholders; and (iv) assess outcomes. They will also be able to understand how energy policy instruments affect energy system investment decisions and public behavior.

**Target Group**

This course is aimed at engineer and Master Students in the last semester of their education. The course is useful to acquire understanding about policy and institutional issues in the context of energy, which are seldom covered in any depth in other courses of the engineering programs. It will be of particular interest to students who aim at working with public organizations, municipalities, governmental agencies, and multilateral organizations. In addition, since energy markets are strongly affected by policy, the course program makes it of interest for students who aim at managerial jobs in industry and consultancy companies. The course is key for students that aim at doing research on socio-technical issues.

**Pre-requisites**

The students should have basic knowledge about energy systems issues related to supply and demand, as well as overall ideas about key issues in the global energy agendas. They should also be familiar with the interaction between the different parts of the energy system. In particular, the course Energy and Environment (MJ2413; forth year course) is a desirable preparation for this course. Although not a requirement, it is advisable that students take the course MJ2470 (Climate Change Mitigation Tools) which runs in parallel with this one. Together, these two courses provide an excellent preparation on energy and climate policy issues. Good English capability in speaking and writing is required.

**Course Content**

**Factors governing Policy Design:**

The factors influencing the design of energy policy such as historical development of energy systems, ideologies, socio-economic changes and objectives, technology options available in the short and long run and synergies with other policies will be discussed in relation to current international and
national contexts, and the role played by different stakeholders.

**Policy Instruments and Approaches (policy processes)**

The student will learn about regulatory and economic instruments used in energy policy. How do these instruments affect the development of the energy system? Energy policies in European and developing countries’ contexts will be discussed and analyzed in the form of case studies. The perspectives of various stakeholders will be considered (i.e.: private sector, government, institutions, users and international agencies).

**Policy Assessment**

The impacts of energy policies (economic, technological, social, environmental sustainability) will be assessed. The influence of policies on investment decisions and users’ behaviour, as well as the assessment of energy policy outcomes will be discussed. Policy successes and failures will be discussed and analyzed. Students will learn to use SWOT-analysis in assessing the energy policy. Indicators for policy follow up are discussed.

**Course Activities**

This section provides an overview of course activities which also give basis for grading. For details of each activity, please see the specific activity instructions (attached). Course activities are planned in such a way that students will review and analyze energy policy processes ranging from resource and technology availability to assessment of results. Activities are developed within the context of specific country cases and are progressively linked. For example, the introductory exercise generates discussion on the energy policy context of a given country. Students will identify the mechanism that the country has used to build their energy path. During the subsequent activity students will analyze how countries are using or could possibly use energy policy instruments to promote renewable energy deployment, and the SWOT analysis will assess the impact of specific policies. Finally, the climate interactive exercise will illustrate a particular application of the concepts. Group and individual performance will be evaluated.

To understand policy, it is necessary to understand the intertwined relations between regulatory mechanisms and market dynamics in a context of multiple interacting actors. This understanding can only come through reading, practicing and exercising. To activate the students in the topic, on-campus and web-based discussions will be generated around specific topics. To generate the discussion, reference literature and some questions will be provided. The detailed instructions will be posted in Bilda. Students are encouraged to further search literature from the internet and use references in their discussion. The discussions among the group will be monitored by the mentors.

More detailed information on each activity will be provided during the course. All materials related to the lectures (i.e. ppt presentations) and literature will be available in BILDA. Further clarifications can be provided by the instructors.
**INL1- Home assignment. Introductory exercise (1 hp)**

This activity entails to 1 hp. It illustrates the significance of the current energy path for specific country-cases. Questions to be analyzed include: What are the country’s main national energy agenda? How has sustainability concerns influenced the definition of national goals? Does the country have a clear climate agenda, for example? What is the institutional status of energy in the country’s agenda? What are the main objectives defined for the energy sector? What are the key elements of the country’s energy policy? Each group shall prepare a hand-out containing the country profile. On campus students will analyze and deliver their results in the form of a handout and an oral presentation. Distant-based students will analyze and deliver their results in the form of a handout and active participation in a web discussion.

**SEM1- Energy Policy Instruments Seminar/Lectures(1 hp)**

This activity entails to 1 credit. A series of lectures and seminars will provide guidance in the understanding of the course topic. The lectures are held by Professor Semida Silveira (course examiner) and invited lecturers (see separate lecture program). Minimum 75% attendance/participation is required. A seminar will be held on energy policy instruments, continuing the discussion on a specific country policy. On campus students will write a handout according to specific instructions and present their results. Distant-based students will write a handout according to specific instructions and actively participate in a web-discussion.

**SWOT exercise. PRO1 - Exam Task (1,5 hp)**

This activity entails to 1,5 hp. After the lectures, seminar and web discussions, the students will be ready to do a policy assessment exercise. In this exercise, students will be asked to make a SWOT analysis of a given national energy policy. In the SWOT analysis, the perspective of different stakeholders will be taken into account while the strengths, weaknesses, opportunities and threats (SWOT) related to the policy are reviewed. On campus students will deliver a written report and present their results. Distant-based students will deliver a written report and discuss their results in a web discussion forum.

**Climate Interactive exercise. ÖVN1 (1 hp)**

This exercise is based on an interactive tool developed at MIT (http://eeocw.org/environmental-negotiation/climate-diplomat-post-2012-climate-negotiation) A tool available at www.climateinteractive.org will be used to support the analysis. Students will assume the role of a negotiating party in the UNFCCC process (e.g. country representatives) and will negotiate commitments with each other. After the exercise, the students should have understood the complexities of multilateral negotiations involving national agents attempting to cooperate for climate change mitigation. Students are encouraged to be very active in the exercise.

**TEN1- Examination (1,5 hp)**
The objective of the course examination is to verify understanding of the key concepts and relationships in the context of energy policy. Students will receive a task to be developed in groups. Some research in compiling information and providing a critical view will be required. The work should be presented in a final written report. It will be essential to elaborate on the reasoning around the policy processes, mechanism and outcomes to show that the course outcomes have been reached.

**Course evaluation**

Right after the final activity, we kindly ask all students to respond to the evaluation form available in BILDA. Notice that the evaluation is anonymous. Through BILDA, we can see if a student has made the evaluation but we cannot identify the student's individual answers. The results are aggregated and provide important feedback to the course organizers for further development of the course.

**Course grading**

The full completion of this course entails to 6 credits distributed as follows.

<table>
<thead>
<tr>
<th>Course activity</th>
<th>Credit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INL1-Home assignment</strong></td>
<td>1</td>
<td>🍀 Introductory exercise (evaluation based on (i) handout and (ii) oral presentation * (on campus students) 🍀 Introductory exercise (evaluation based on (i) handout and (ii) active participation in web discussion (distant-based students)</td>
</tr>
<tr>
<td><strong>SEM1-Seminars/Lectures</strong></td>
<td>1</td>
<td>🍀 Seminar on energy policy mechanisms (evaluation based on (i) handout and (ii) oral presentation * (on campus students) 🍀 Seminar on energy policy mechanisms (evaluation based on (i) handout and (ii) active participation in web discussion (distant-based students)</td>
</tr>
</tbody>
</table>
### Notes:

1. **Individual performance is also evaluated. This implies active participation. On campus students are asked to take part in the presentation of at least two of the activities marked with *. **

2. **Course activities 1 to 4 include tasks (i) and (ii) which are equally weighted for the purpose of evaluation.**

### Grades will be according to the following scale:

- A: 90 – 100
- B: 80 – 89
- C: 66 – 79
- D: 56 – 65
- E: 50 – 55
- F: Failed

### Time schedule for the course

The attached dates and time should be reserved for planned activities in the course. A full schedule containing details on planned activities, and deadlines will be available in BILDA

### Other information
The course has a BILDA site. Access to it is essential so that you can receive all information pertaining to the course. The web discussions will also be made through BILDA. A course evaluation is available from previous year. We kindly request the use of BILDA for all the communications related to the course development. In this way the administration of the information will be easier and the response faster.

**Recommended literature**

This list provides references of work on energy and climate policy which is relevant for the course. Information under the corresponding folder in bilda will indicate the compulsory readings required for each course lecture/seminar/exercise. Notice that the compulsory readings may not be the same as the ones in this list.

**Building Sustainable Energy Systems, Swedish Experiences**


**The link between energy & human activity**


. Mallon, K. (Editor).

Earthscan Publications. 2006.

**Renewable energy policy country profiles 2011 version.**

Based on policy information available in March 2011. Prepared within the Intelligent Energy Europe project. Available at http://www.reshaping-res-policy.eu/

**Energy Security and Climate Change Policy Interactions. An Assessment Framework.**

International Energy Agency, 2004

. Available at
Rethinking 2050: A 100% Renewable Energy Vision for the European Union

European Renewable Energy Council, 2010. Available at: