COLLEGE OF MANAGEMENT OF TECHNOLOGY
MANAGEMENT OF TECHNOLOGY SECTION

ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Technology policy and the energy transition

Autumn, 2019

Number of credits: 2

ROOMS:
TBD

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Course website/moodle: http://www.moodle.epfl.ch CDM/Master/MGT 408

General presentation

How can governments tackle climate change while maintaining reasonable economic growth even in the short term? How can they turn on the green innovation machine? This course takes the Climate Change "Grand Challenge" as a case for studying the capacity of advanced as well as developing economies to move their whole economic system towards a green growth path. The notion of Grand Challenges describes societal needs – addressing complex and multi-disciplinary issues – which require the mobilization and allocation of R&D and innovation resources and capacities to some pre-defined areas of knowledge exploration and exploitation (energy, infrastructure, clean technologies). The objective is to review and discuss effectiveness, efficiency and costs of the various economic and technology policy mechanisms that need to be deployed. We will analyze the centrality of economic incentives – taxes and right prices (to reflect future scarcity of goods and thereby induce technical changes); of R&D and innovation and last but not least of the improvement of operational efficiency and diffusion of existing technologies and infrastructures.

Didactic approach

The first 5 weeks will be devoted to formal presentations about the economic fundamentals and challenges of environmental and technology policies. Weeks 4 to 6 will also include time devoted for teams to work on the country cases and discussions about possible directions and issues. The first part of week 6 will be devoted to the discussion of the individual essays that will be assigned on week 2 and due to week 5. The last week will be devoted to the presentations of country cases by each team.

Learning objectives

At the end of the course, the students will be able to:

- Understand and discuss the key concepts of environmental and knowledge externalities as the micro-foundations of the economics of environmental and technology policy.
- Understand and analyze the complex relationships between environmental policies and technology policies.
- Generate and organize information about specific cases.

Course material

Power point presentations of the lectures will be posted a few days before each class.
A list of readings will be provided a few days before the start of the course. Students should use these readings as background material.

Grading

- **Final project (75% of the grade)**

The aim of the final project is to analyze the energy transition strategy of a country. Each team of 4 students selects a country among the proposed ones and announces it in week 3. Each team has to write a policy brief and to prepare a presentation. The policy brief and the presentation are both due in week 7.

- **Individual work (25% of the grade)**

Each student will write a very short essay on a specific issue (proposed by the lecturers). The issues will be randomly assigned in week 2. The essays are due in week 4.

Calendar, topics and assignment

Week	Date	Topics, activities	Due assignment
1.	8/11	• D. Foray: General introduction • Teams formation (team of four students)	
2.	15/11	• D. Foray: Designing mission-oriented innovation policies • C. Ayoubi: Environmental and technological policies for the energy transition (1) • Random assignment of individual essays	
3.	22/11	• C. Ayoubi: Environmental and technological policies for the energy transition (2) • G. Pellegrino: Measuring green innovation • Choice and discussion of case studies – with C. Ayoubi and G. Pellegrino	
4.	29/11	• C. Ayoubi: A more drastic approach – from tackling market failures to finding a unique technical solution • Teamwork with supervision (1)	
5.	06/12	• D. Foray and C. Ayoubi: Quandaries in solutions to Grand Challenges • Teamwork with supervision (2)	Individual essays
6.	13/12	• C. Ayoubi: Discussion on individual essays • Teamwork with supervision (3)	
7.	20/12 h. 8 am	• Teams presentations	Presentations and policy briefs of the case studies