Policies for EU & Nordic Bioenergy market

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Lecture Outline

- Basic concepts
- Bioenergy Markets & Policy
- Policy for EU bioenergy
Environmental Pollution → Economic externality → Market failure (inefficiently allocation of economic resources/ improper allocation of property rights)

Ronald Coase………
Poorly allocation of property rights → Environmental problems → Solved by market based policies
To diminish environmental problems ➔ Policy tools

a) Command and control (t/year)
b) Subsidies (EUR/investment)
c) Tax (EUR/t)
d) Emissions Trading (EUR/t)

Last 2 are economic policy tools (Price on emissions)
Last 3 are market based tools
Command-and-control regulatory programs.

a) Traditional...& it is less flexible ..... *(didn’t take into account the different associated costs and compliance options that plants face, while some can do less costs...& others can face higher costs....)*.

b) Polluter needs to take specific actions to reduce emissions *(ex. by installing a particular technology or meeting a specific performance (standard))*.
c) Often appropriate for the pollutants…which emissions at any particular point or region do not exceed health-related thresholds.

d) No incentive for firms to innovate or apply…. reductions technology…that require by the standard.
Market-based environmental policies

a) Greater flexibility for firms and appropriate …..to reduce GHG emissions.

b) Achieve environmental objectives at lower overall costs.

c) Incentive to inventors and investors who develop and deploy lower-emitting technologies

d) Incentive to the user who uses lower emitting technologies

e) Freedom to private market…. about thriving and expanding their technologies.
## Different Types of Policy for promoting Bioenergy

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Carbon markets & Climate actions
Carbon tax:

A carbon tax is the price that determines the level of emission.

- It is the opposite of ETS.
- Cost = \( \sum \) of emissions = Tax
- No cap on emissions.

Subsidy:

To encourage a particular economic action...payment...by govt.;
- Opposite of a tax.
European Union Emissions Trading System (EU ETS):

It is the world’s Oldest and largest multi-sector GHG trading program.

Currently in its 3rd phase……run from 2013 through 2020.

Consistent with the emission reductions targets included in the Kyoto Protocol

→ It sets a cap on emissions and requiring entity to keep a permit for each tonne of emitting CO$_2$. 
→ If entity doesn’t have a permit… must have to either cut back on their emissions or…..buy a permit from another entity (who already cut back on their emissions).

→ Creates a market of tradable allowances for emissions among the EU member states.

→ Cost on Emission= Price of buying/ selling a permit

→ The level of the cap determines the level of emissions (the required cuts in emissions cause the price) & the number of available permits.
**ETS**

- **Pollution Price**
- **P_{ETS}**
- **D^d for Pollution right**
- **Permit = Quota limit**
- **Pollution quantity**

**Carbon tax**

- **Pollution Price**
- **C_{tax}**
- **Q^***
- **D^d for Pollution right**
- **Pollution quantity**
Emissions trading – basic models
Baseline-and-Credit:

Set emissions limit either in terms of absolute emissions or emissions per unit of output.

Firms that emit below... baseline limit...create credits and sell.... to firms that emit more than their baseline limit.

Slightly similar to a cap-and-trade program (The baseline limit creates the scarcity and trading generates a value on those GHG emissions).
Cap-and-Trade:

It sets a maximum level of pollution, a cap, and distributes emissions permits among firms that produce emissions.

- a) Set a maximum limit on emissions
- b) Entities requires sufficient permits to cover each unit of their pollutions
c) Broad flexibility in the means of compliance. Entities can comply by

- Undertaking emission reduction projects at their covered facilities or

- Purchasing additional emission allowances (or credits) from the government through an initial allocation or auction or

- Trading from other entities (that have reduced emissions below the amount of allowances held).
UN Framework Convention on Climate Change (UNFCC):

Approved in 1992, entered into force 1994
197 ratifiers
Treaties...Kyoto Protocol (KP), Paris agreement...

Kyoto Protocol:

→ A treaty of UNFCCC
Approved in 1997, entered into force in 2005
192 parties (...& Not USA)
→ Two commitment periods-

→ Specific goals are
   Sets emissions targets for **developed countries**
   Support developing countries in mitigation and adaptation of climate change
   Flexible mechanisms for meeting the targets
   Emission monitoring, reporting and verification
Clean Development Mechanism (CDM):

A flexible mechanism of KP defined in 2007

A emission-reduction commitment under the KP to implement .....emission-reduction project in developing countries.
Conference of Parties (COP):

195 UNFCCC (United Nations Framework Convention on Climate Change) signatories are Parties.

Came into force in 1994 (Rio de Janeiro in Brazil) and since then.... every year the ‘parties’ met at different venues at the end of the year....to discuss about cutting GHG emissions in the atmosphere.
COP-3 (Kyoto, Japan) rise to the Kyoto Protocol → set obligations on the rich and industrialised countries to cut GHG emissions by assigned amounts → KP run into trouble.

COP-21 (Held on 30 November to 12 December, 2015 in Paris) → known as the 2015 Paris Climate Conference

→ Aim to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C.
Negotiations about bringing in an agreement that not just for the rich and industrialized… action for all countries

**COP 21 status:**

Until the 55 parties who generates more than 55% of global’s GHG have not ratifying the agreement → the agreement will not binding for its member states.
The largest producers of CO2 emissions worldwide in 2015, based on their share of global CO2 emissions

- China: 28.03%
- U.S.: 15.9%
- India: 5.81%
- Russian Federation: 4.79%
- Japan: 3.84%
- Germany: 2.23%
- Korea: 1.78%
- Canada: 1.67%
- Iran: 1.63%
- Brazil: 1.41%
- Indonesia: 1.32%

Source: Germanwatch, Statistia 2015
The largest producers of CO2 emissions worldwide in 2016, based on their share of global CO2 emissions

- China: 28.21%
- U.S.: 15.99%
- India: 6.24%
- Russian Federation: 4.53%
- Japan: 3.67%
- Germany: 2.23%
- Korea: 1.75%
- Iran: 1.72%
- Canada: 1.71%
- Saudi Arabia: 1.56%

Source: Germanwatch, Statista 2016
Cumulative CO₂ Emissions 1850–2011 (% of World Total)

- United States: 27%
- European Union (28): 17%
- China: 16%
- Russian Federation: 9%
- Japan: 8%
- India: 6%
- Canada: 4%
- Mexico: 4%
- Brazil: 3%
- Indonesia: 3%
- Rest of the World: 2%

http://bit.ly/11SMpjA
USA and China formally ratified the Paris climate agreement at the G20 meeting in China in September 2016.

Until December 2016, 194 UNFCCC members have signed the treaty and 127 of which have ratified it.
COP 24 (Katowice, Poland. Dec 2018)

Agreed on 2015 or Paris Agreement

USA left Paris agreement

China took the leading role...
Certification:

According to FAO… It is *a procedure by which a third party* gives *written assurance that a product, process or service is in conformity with certain standards*.

The organization performing the certification is called certifier or certification body.

The certificate demonstrates to the buyer that the supplier complies with certain standards.
Standards:

Standards are defined by ISO as

... documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines or definitions, to ensure that materials, products, processes and services are fit for their purpose.

...... standards are not only used for standardization and "guidelines", i.e. for capacity building....

Product standards

Process standards.
First, the standard-setting can be done by any party.

The producer (first party) can set the standard... **producers' interests** are likely to be reflected in the standard.

The buyer (second party) can set the standard... **business interests** will be reflected in the standard.

Second, if the standard-setting & certification body are the same body... can cause conflicts of interest ➔ because, would like to see high implementation rates of its standard, or have a bias against certain types of producers.

Third, a conflict of interest might arise depending on who pays for the certification costs.
Labeling:

According to FAO....A *certification label is a label or symbol indicating that compliance with standards has been verified*.

Label is usually controlled by the standard-setting body.

The label can be owned by the certification body.

It is a form of communication with the *seller* end consumer.
Policy and status of EU bioenergy
→ European Commission (EC) found … to manage global warming level at below 2°C (i.e. compared to 1990s level) …. developed countries would have to lessen their GHG emissions around 80-95% by 2050.

→ European Union (EU) set their goals …develop the 1st directive.

→ The problem of 1st directive was different country energy structure and rules were different.

→ 1996-2003 after …negotiation among the member countries, the 2nd package came into force.
→ 2<sup>nd</sup> directive also failed to reach all it aims

→ The new package came on 10 January 2007, in to the concept of competition.

→ The EC called it as "Energy Policy for Europe" and highlighted the importance of completing the internal energy markets.

→ EU set their goals for energy and climate to be attained by 2020 by its ‘climate and energy package’. These targets are recognized as “20-20-20” targets.
Targets for 2020

20 % reduction of GHG emissions
20 % share of renewable energy in the energy consumption
20 % Improvement in the energy efficiency
Way of achieving H2020 target by EU 3rd Package

Figure source: Khanam 2017
→ In 2007, EU member states set their national targets for 5.75% share of biofuels in Europe within 2010

→ Settled on .... biofuels technology road map.
EU Biofuels promoting tree

2003, May: Biofuels directive – targets set
2004: Targets for 2005
2005: Evaluates progress
2006: Evaluates progress
2007: Targets for 2010
2008: Second evaluation
2010: 5.75% share for biofuels in Europe
2010: “2nd Generation” Integrated biorefining complexes
2020: “1st generation” Improving present processes
2030: EU anticipated future roadmap on Technology
2050: EU biofuels promoting Steps

Report progress (Dec, 2005: 2%)

Figure source: T. Khanam
Applying sector of bioenergy policy in EU

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<td>Producers incentives</td>
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<td>Authorised quota</td>
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<td>systems for producers</td>
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→ EU energy policies mainly appear as a form of production subsidies.
Progress

The EU made progress to meet its 2020’s targets (According to the ‘State of the Energy Union report’)

• Between 1990 and 2015, the EU cut greenhouse gas emissions by 22% and is well on track to meet its 2020 target

• In 2015, the estimated share of renewable energy in the EU's gross final energy consumption was 16.4%, up from 8.5% in 2005

• The renewable energy report 2017 states that 25 EU countries are expected to meet their 2015/2016 interim renewable energy targets

• Energy efficiency in 2014 the EU's primary energy consumption was only 1.6% above its 2020 primary energy consumption target.

• If countries implement all the necessary EU legislation, the 2020 target should be reached.
Figure 1: Renewable energy shares in the EU vs. Renewable Energy Directive (RED) and National Renewable Energy Action Plan (NREAP) trajectories (based on EUROSTAT, Öko-Institut)
Climate and energy framework for 2030

Objectives:

.....to achieve a more competitive, secure & sustainable energy system to meet its long-term 2050 GHG reductions target.
2030s target:

• At least a 40% reduction in GHG emissions by 2030, compared to 1990
• At least 27% of renewable energy in the EU
• Energy efficiency increase to 30% by 2030
• The completion of the internal energy market by reaching an electricity interconnection target of 15% between EU countries by 2030.

(Info source: European Union)
Proposed policies for 2030:

→ A reformed EU ETS

→ New indicators for the competitiveness and security of the energy system (ex. price differences with major trading partners, diversification of supply and interconnection capacity between EU countries)

→ A new governance system (based on national plans) for competitive, secure, and sustainable energy. These plans will follow a common EU approach.
30 November 2016, EC released a package of draft legislative proposals designed to help achieve these targets.

The measures include draft proposals on electricity market design, renewables, and energy efficiency.

The EU aims to achieve an 80% to 95% reduction in greenhouse gases compared to 1990 levels by 2050.
European Commission (EC) to take three crucial steps:

Reduce GHG emission,
Increase carbon stock and
Comprise the emission into the bioenergy production.

A threatening factor is related with the utilization of forest biomass for energy production- the ‘payback’ time.
European Academies' Science Advisory Council (EASAC) suggested 
European Commission (EC) to contain the payback period.

Carbon emitting though cutting trees and carbon stocking though 
new planting and growing sustainability that restrain global warming 
to 1.5 °C above pre-industrial levels.
Bioeconomy (2018)

The European way to use of natural resources

• A renewed bioeconomy strategy supporting the transition to a sustainable and circular bioeconomy.
• Fits wider EU priorities and policies (climate, circular, innovation, food, energy, trade, industry, agriculture, fisheries and marine, etc.).
• And fulfilling global commitments (SDGs, Paris Agreement, etc.)

Exercise???
Thank you