10 ECONOMICS FOR SUSTAINABILITY

10.1 STUDY-GUIDE: KEYWORDS, OVERVIEW OF THE CHAPTER.

The numbering is the same as in the transcripts

10.1.1 INTRO
Overview, Links to relevant databases.

10.1.2 ENVIRONMENTAL PRESSURES AND ECONOMIC TRENDS
GDP grows exponentially.

Strong correlation between GDP and other aspects of our world.

10.1.3 GDP
Definition of economic growth

Definition of GDP: - added value approach

       - income approach (income factors are labor, capital, land)

GDP was intended to measure production and economic activity.

Missing elements, not included in GDP: inequality / unpaid work / ... / quality of environment

Extra interview with Joseph Stiglitz is NOT part of the obligatory teaching material.

10.1.4 GDP AND ENVIRONMENTAL PRESSURES
Actual situation: - richer countries have higher emissions per capita

       - the big countries are on an intermediate level of emissions

Typical evolution of a country: Kuznets curve: period of increase - peak - decrease.

- increase = industrialization

- peak = shift towards less heavy industries and services

- decrease = environmental regulations

Kuznets curve is a correlation, not necessarily a causal relation.

Production vs consumption based emissions; why is it different, why is it important.

Consumption approach is more fair.

Definition of carbon footprint.

10.1.5 DRIVERS OF ENVIRONMENTAL IMPACT
Decomposition analysis: IPAT

Special case: Kaya decomposition of greenhouse gas emissions (2 technological factors)

Kaya decomposition for the world: 2 technological factors are slightly decreasing, GDP and population are strongly increasing.

Kaya decomposition for Belgium: 2 technological factors are decreasing, GDP is strongly increasing, population is slowly growing. As an endresult: CO_2 emissions are slightly decreasing since 1990.

Relative decoupling: Emissions are growing slower than GDP

Absolut decoupling: Emissions are decreasing even with growing GDP

10.1.6 FRAMEWORKS OF SUSTAINABLE DEVELOPMENT

Definition of sustainable development by Brundtland.

Different types of capital in economics:

- physical capital: physical infrastructure

- human capital: number of people and their skills

- natural capital: renewable and non-renewable sources; level of pollution

- social capital: institutions, police, legal system, ...

Weak sustainability: total capital is not decreasing, substitution is allowed.

Strong sustainability: all four subcapitals are not decreasing.

Example1: Adjusted Net Savings

Example2: Donut economy concept

10.1.7 EXTERNALITIES

Definition of externality

example of influence of other production

example of influence of other consumption

example of partial of total compensation

Principle of a normal market of supply and demand

Influence of externalities

Definition of market failure

10.1.8 PUBLIC GOODS

Definition of public good: non-rivalry & non-excludability

"Lower emissions" as a public good

Free riding behavior

Example of 2 countries: incentive to free ride, free riding is the dominant strategy, leading to market failure.

Need of government intervention in the case of market failure

National level: government intervention is possible

International level: no strong institutions

10.1.9 ELINOR OSTROM

Field of study of Elinor Ostrom: management of local commons (=public goods)

Tragedy of commons: classical view that public goods are overexploited if there are no government interventions.

Surprising contribution of Ostrom: communities often succeed in managing commons in a sustainable way without government intervention;

Ostrom conclusion is based on observation in rather small communities with mechanisms to deny access to outsiders and to expel noncompliant users.

Tragedy of commons or Ostrom: which principle is prevalent in global community?

10.1.10 ENVIRONMENTAL POLICY

The need of public intervention due to the market failures (externalities & public goods)

Possibilities of intervention: regulation, prohibition, subsidies, taxes (and combinations)

10.1.11 COST EFFICIENCY
marginal abatement cost curve (MAC)

total cost when imposing identical reductions to 2 companies

total cost when imposing reductions according to marginal cost

10.1.12 PRICE BASED INSTRUMENTS VERSUS LEGAL STANDARDS
Price based instruments: cost efficient

Legal standards: in most cases not cost efficient

Dynamic efficiency: further reduction in coming years

Yearly taxes: new technologies can improve the MAC, triggering more reduction projects

10.1.13 GREEN TAX REFORM
Double dividend policy

- tax triggers users to implement reduction projects

- tax income can be used with a sustainability impact (1.subsidies for PV or 2.investment in social policy or 3.Labor policy).

Arguments to choose for one of the 3 options.

Regressive effect: it makes income distribution more unequal

Carbon tax is regressive because it requires a higher percentage of the household income of poorer households ==> 2.

Carbon tax tends to hold back economic activity ==> 3.

Double dividend policy = carbon tax + labor policy investments

Tax bads, not goods

10.1.14 TAXES VS SUBSIDIES
Taxes and subsidies, disencouraging the bad and encouraging the good alternative seem equally effective, but they are not:

Rebound effect 1: subsidies are partly effective, but miss the underlying consumption activity

Rebound effect 2: subsidies are an extra budget that may be used for carbon intensive activities

Additionality: subsidies should trigger investments that would not be taken without subsidies; that is not guaranteed

Matthew effect: subsidies should impact the poorer part of society, but the often have higher impact on the richer part

Subsidies lead to higher taxes, especially on labor.

Examples of bad subsidies or bad tax exemptions: salary cars - subsidies for non-sustainable agricultural activities

Carbon tax improvement: actually different energy consumption are taxed in different ways because they are submitted to different tax systems.

The graph shows that 30% of energy use is not taxed, while others are taxed at high rates.

Extra TEDx talk on Carbon Pricing is NOT part of the obligatory teaching material.

15 Links with other challenges

Link with climate and biodiversity:

- the market uses to much fossil fuels because its negative externalities are not taken into account

- the market does not provide enough effort for biodiversity because its positive externality is not taken into account

- principle of freeriding makes greenhouse gas reduction very difficult

Link with demography

- better economy --> higher GDP --> higher population and higher emission/capita --> higher CO2 emissions. It is difficult to avoid this chain.

Link with Buildings/mobility

- the market brings too much car traffic because negative externalities are not taken into account. Smart road pricing might be a solution.

- subsidies for salary cars are an example of bad subsidy

Link with raw materials and circular economy

- the market leads to lots of material extraction because negative externalities are not taken into account

- deposit refund system for one way packaging

Link with energy

- PV / battery / electric car subsidies suffer from the Matthew effect.

- the energy of heating households is not taxed in a good way. The taxation of all energy carriers should be aligned with full social cost.

10.2 GENERAL GUIDELINES FOR EXAMS

Typical questions are:

- Definitions, terminology: be able to explain the definition, give examples
- Graphs: be able to explain and interpret the graphs
- Principles: be able to explain, give examples