UNIVERSITY OF PATRAS
DEPARTMENT OF ECONOMICS

ENERGY ECONOMICS

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Winter Semester
Lecture 8th
Energy Policies

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Energy Economics-Energy policies

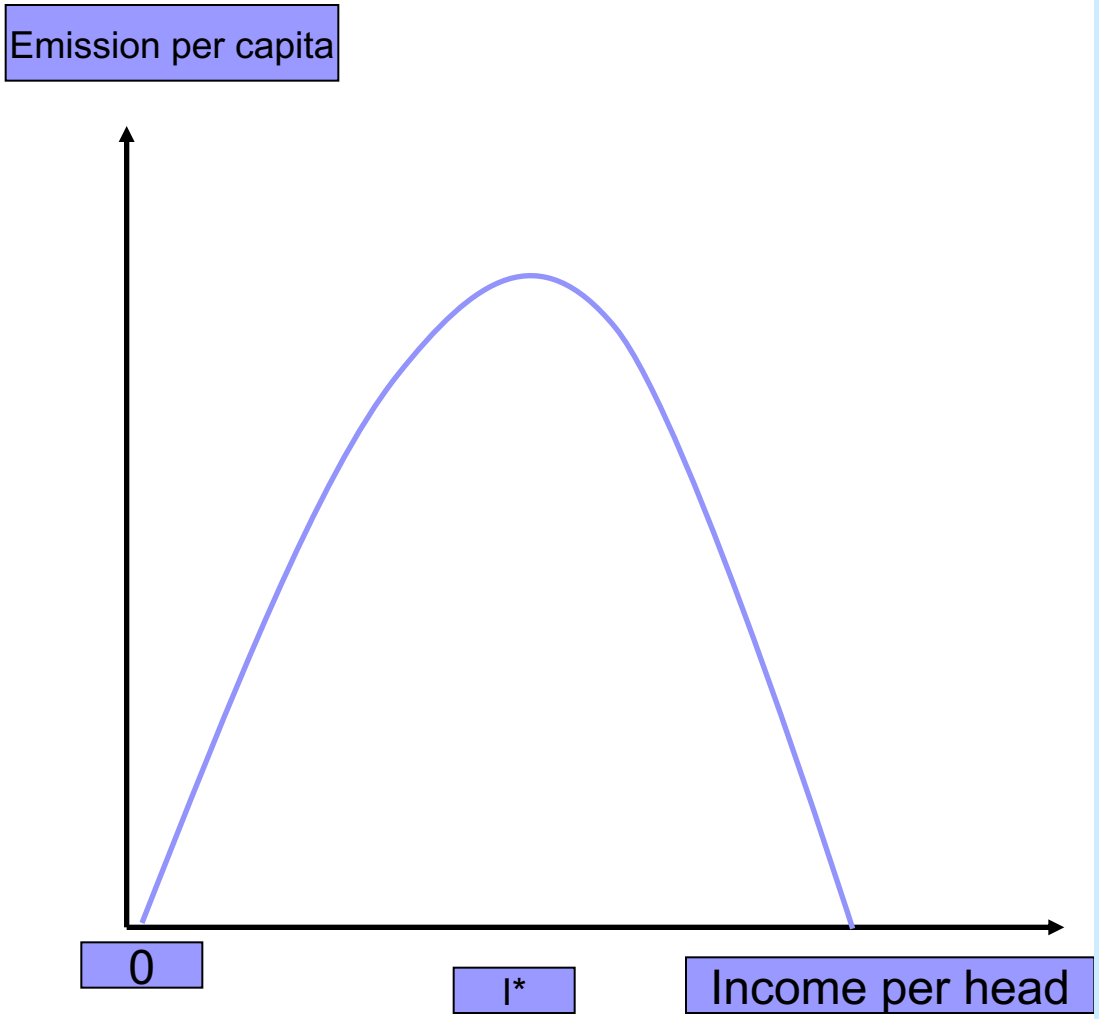
The term "energy policies" could be used in a broader sense but include different meanings.
There are a number of reasons why governments should proceed with the enforcement and use of policies in this area. These concern:

1. Adjustment of power supply systems
2. Liberalization of energy markets
3. Development of domestic energy sources
4. Developing specific energy technologies
5. Improving security of energy supply
6. Development of conservation of energy sources
7. Minimize the environmental impact of energy systems
8. Strengthening sustainable development
9. Ensure Affordable Energy Prices to Households-Businesses?
10. Climate change!!!

Possible reasons

- Knowledge barriers
- Economic barriers
- Organizational barriers
- Split incentive
- Bounded rationality

Enviromental Kuznets Curve



The EKC is a hypothetical relationship between various indicators for environmental degradation and per capita income. It assumes that environmental quality decreases at an early stage of economic growth and improves in later stages as the economy grows. S. Kuznets (1955) hypothesized that the relationship between per capita income and environmental contamination is in the form of an inverted U curve.

Economic growth in its early stages is accompanied by increased pollution. But as growth is maturing, income is spreading to lower income strata. Consequently, at the final stage of development, the relationship between contamination and growth is reversed, so that we have a simultaneous increase in per capita income together with a reduction in

Criticism concerns:

Lack of form or relationship

Econometric specialization

The inability to explain the process through which the treatment is performed

Energy Markets

- Violation of the following leads to market failures in energy markets.

1. Completeness of markets for all goods and services.
2. Information is free.
3. No barriers of entry-exit.
4. Perfect divisibility for goods and services
5. Efficient property rights.

The role of externalities

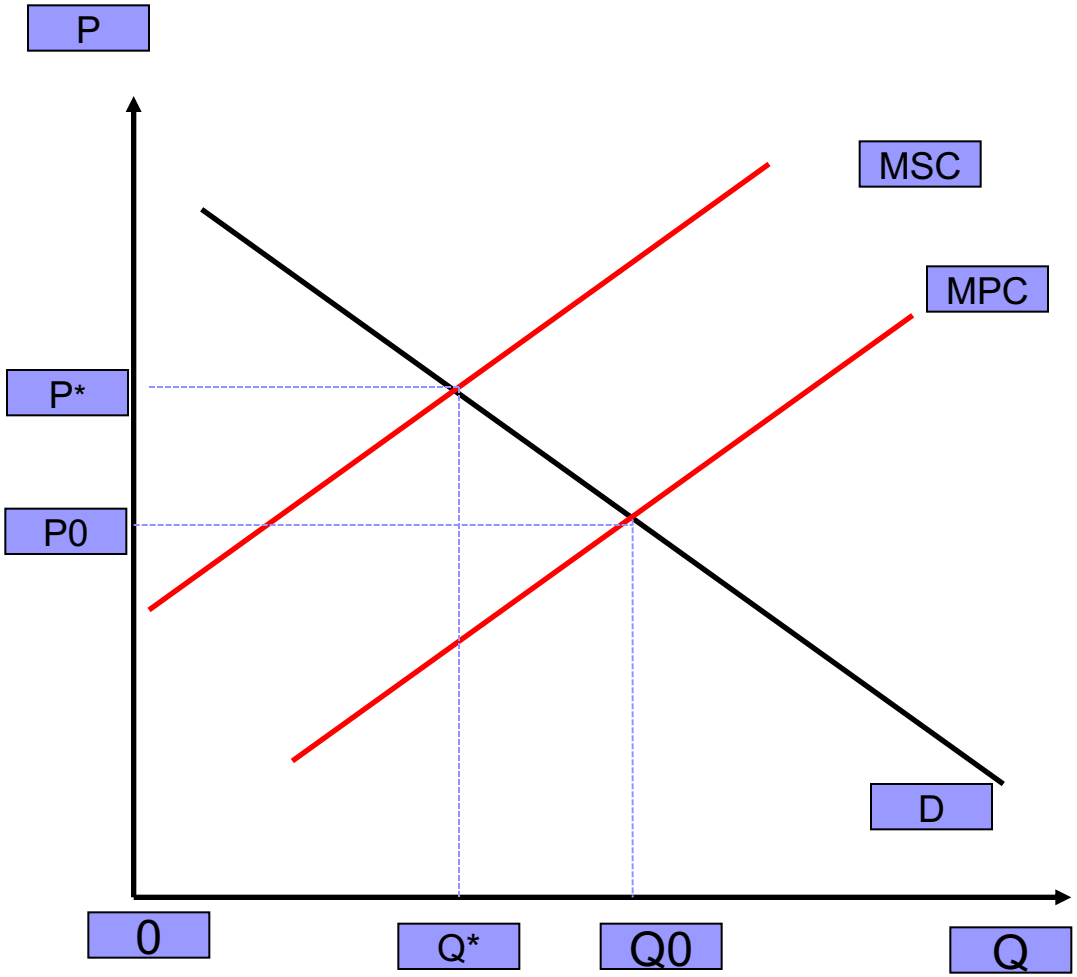
- Externalities take place when an agent with an energy affects the utility of others, the agent's welfare is influenced by the activities of other agents, and finally when he does not face all the consequences of his actions.
- Positive / Negative-Exhaustible / Non Exhaustible & Financial / Technological

Spectrum of goods

- Two key features to classify goods and services (Jointness-Exclusivity)
  Pure private goods: oil, gas,
  Clean public goods: air, national defense
  Quasi Private: oil stocks
  Ouasi public: private beach

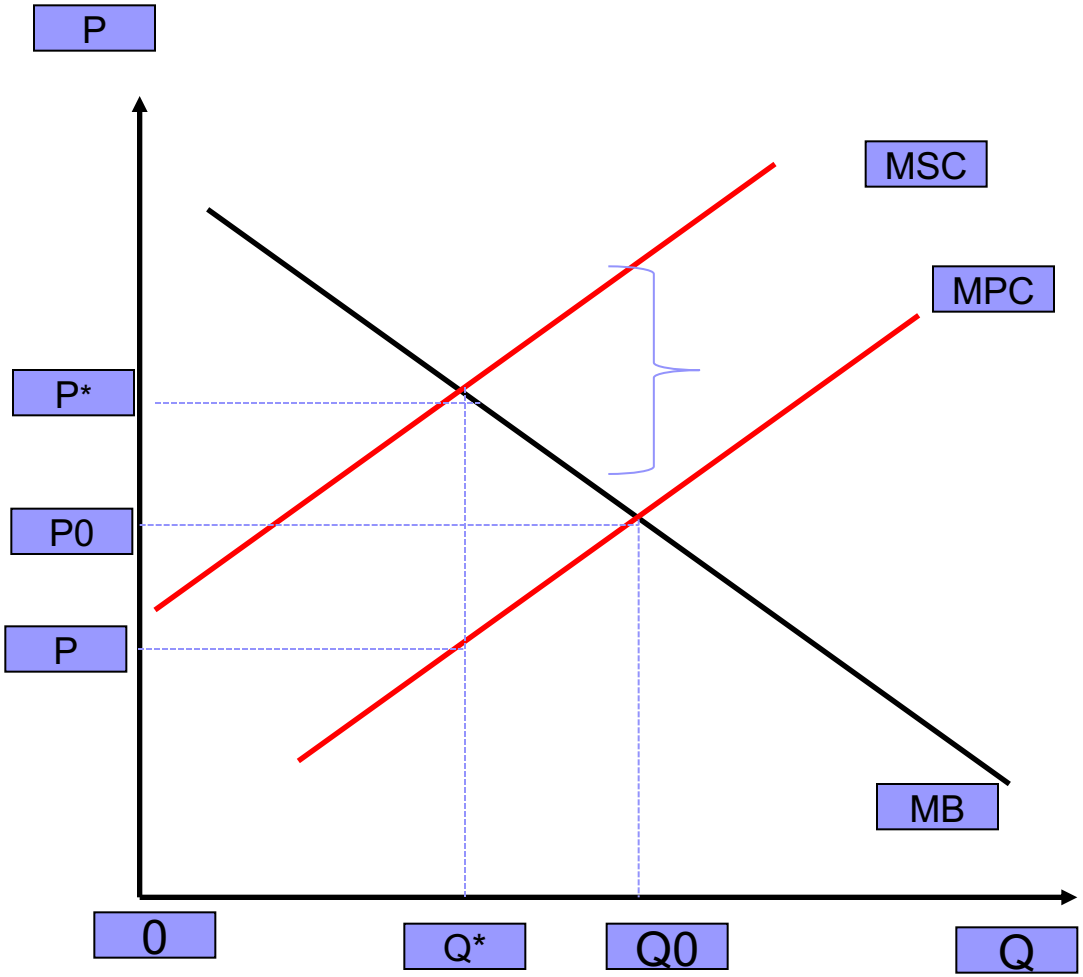
	Divisible	Non-divisible
Exclusive	Pure private	Quasi-Public
Non-exclusive	Quasi private	Pure public

Private vs Social Costs I



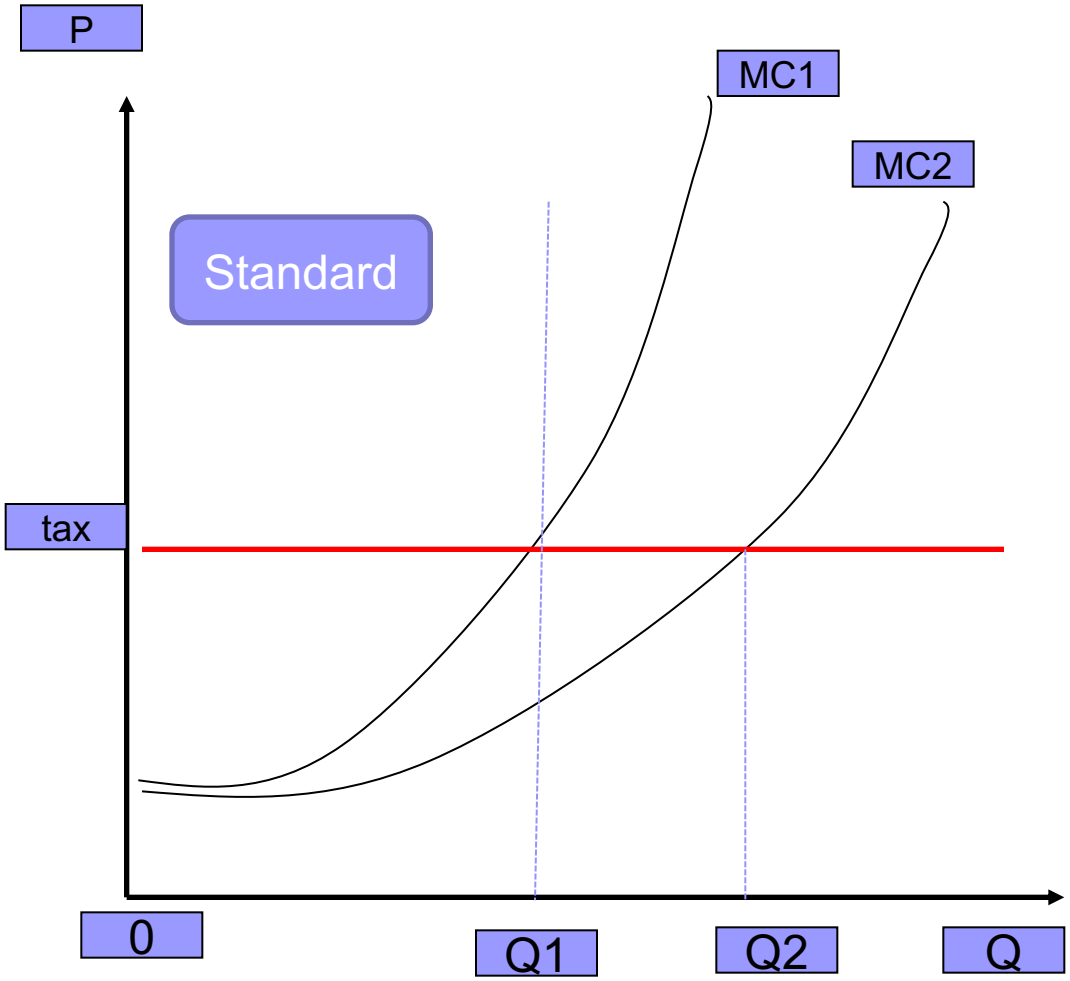
When an activity creates externality then society is called upon to face the costs of this impact.
Markets tend to use forms of energy inefficiently.

Private vs Social Costs- Pigouvian tax



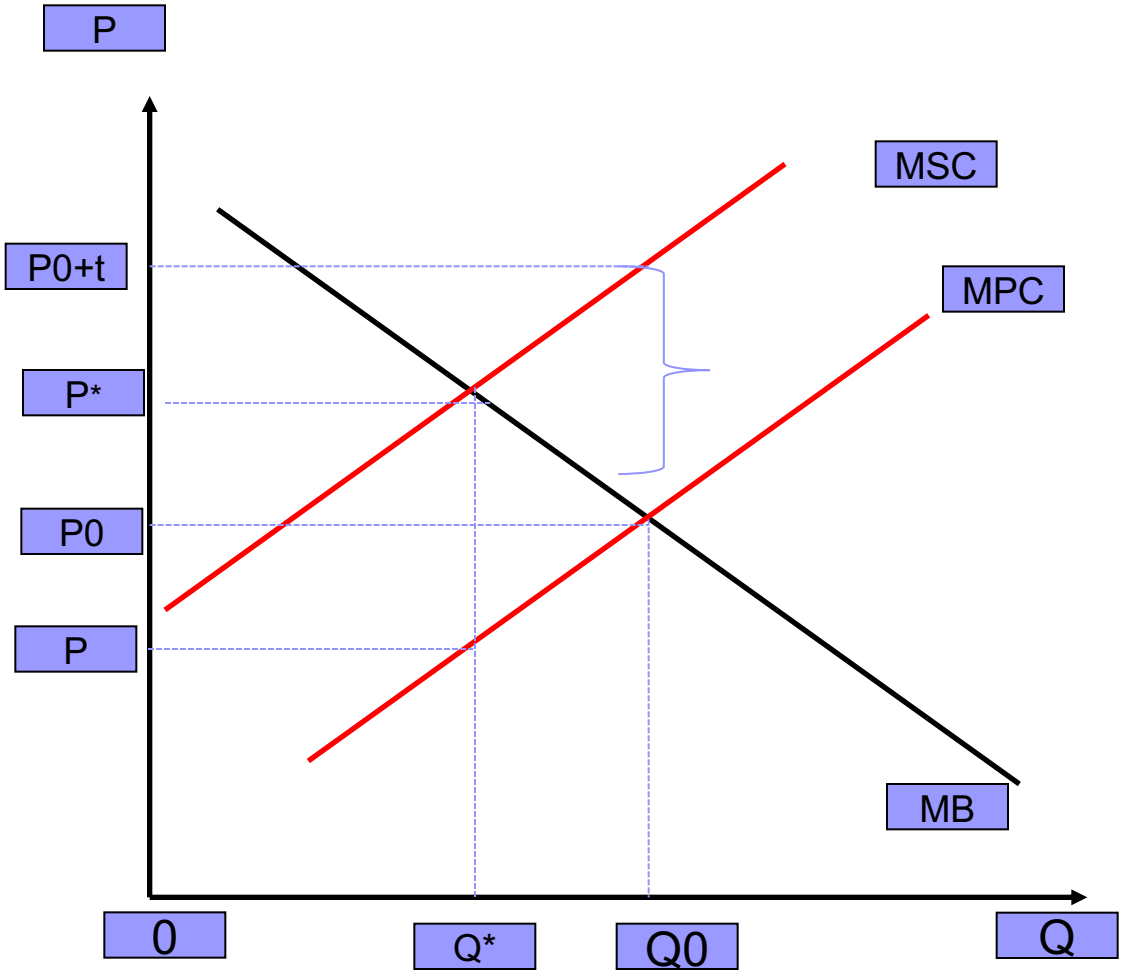
Two possible measures
1)Piguvian tax
2) Limit on production

Tax vs Standards



The tax permits the polluter to be polluted according to the marginal cost of reducing its emissions.
A standard defines a quantity, regardless of cost
Ramsey-Boiteux principle

Who bears the tax?



Producers receive less surpluses with tax.
What about consumers? What is the role of demand elasticity?

Policies in the Energy sector

1. Communication Mechanisms
2. Economic mechanisms
3. Normative mechanisms.

Technology Neutral

1. Energy or carbon taxes
2. Emissions trading

1. Energy efficiency standards
2. Energy efficiency obligations
3. Energy efficiency labeling

Investment subsidies or fiscal incentives
Voluntary agreements
R&D subsidies

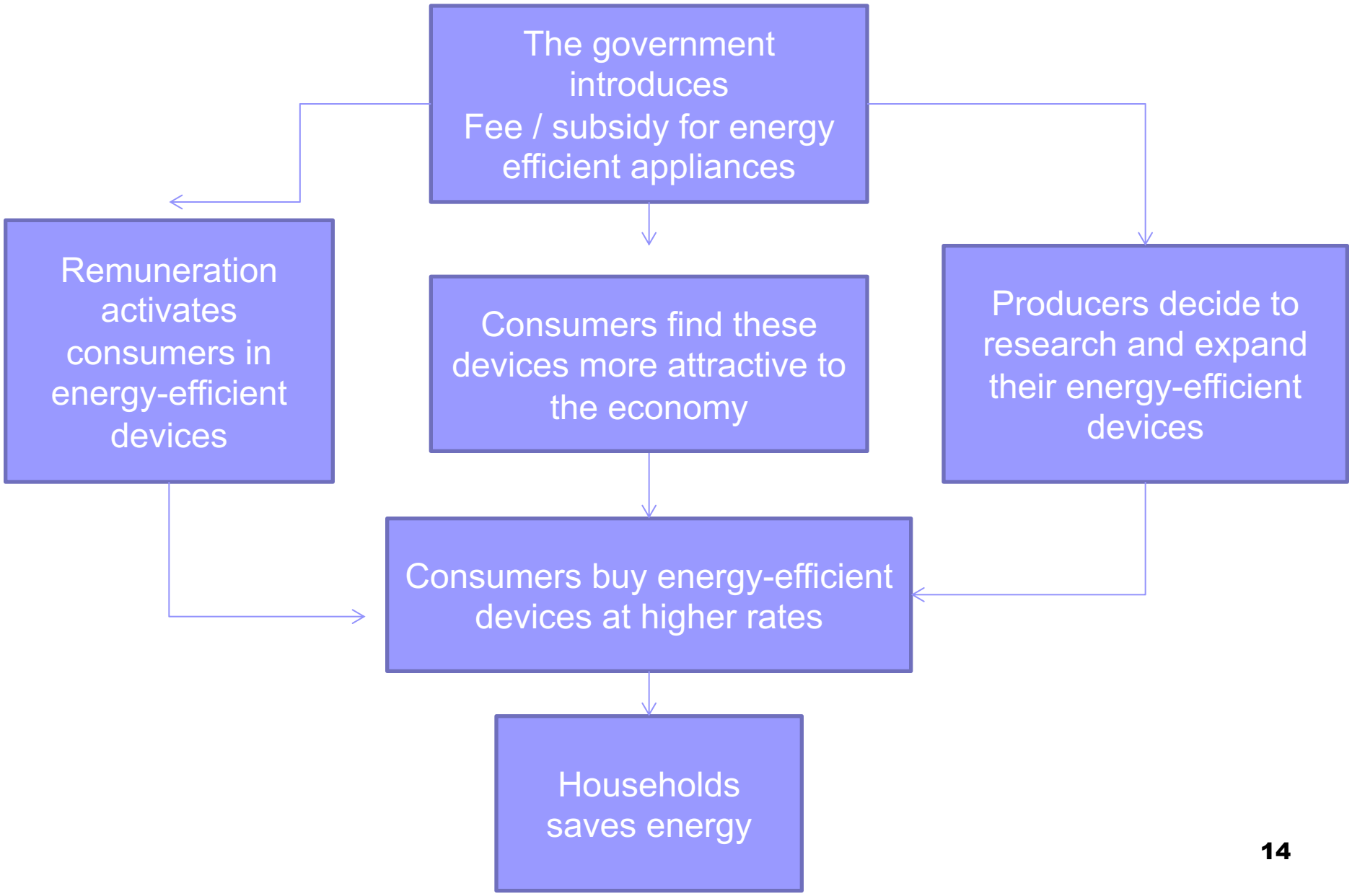
1. Feed-in tariffs
2. Renewable obligations

Energy Policy Evaluation

- Two main criteria for evaluation. Ex-ante & ex-post
- Efficiency-Connects efficiency with what you need to achieve the targeted policy
- Profitability - To what extent has the policy implemented achieved the desired result? Has the implementation of this measure been significant?

$$\ln\left(EI\right)_{it} = a\ln\left(P\right)_{it} + bEnPol_{it} + e_{it}$$

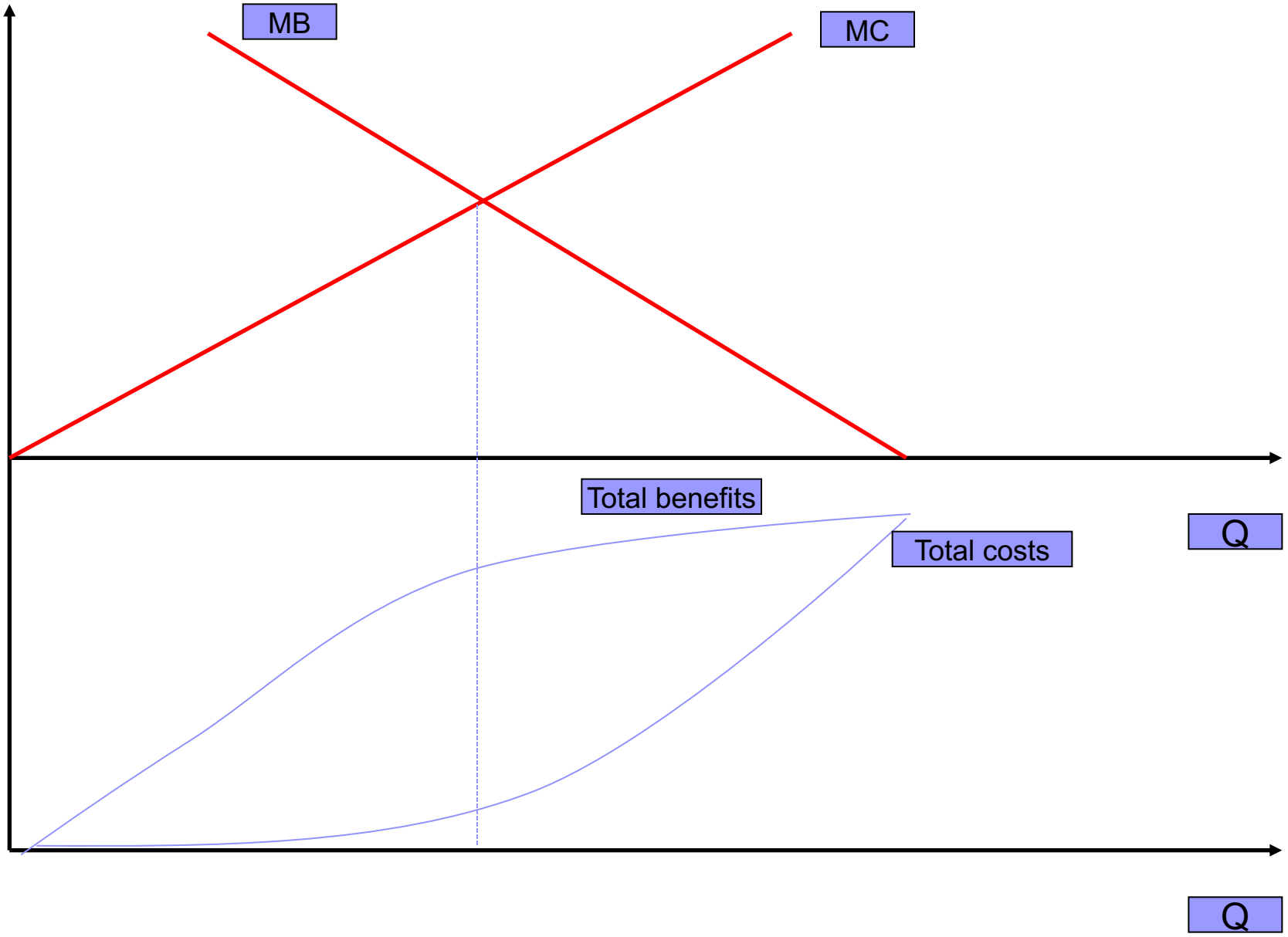
Energy policies-An example



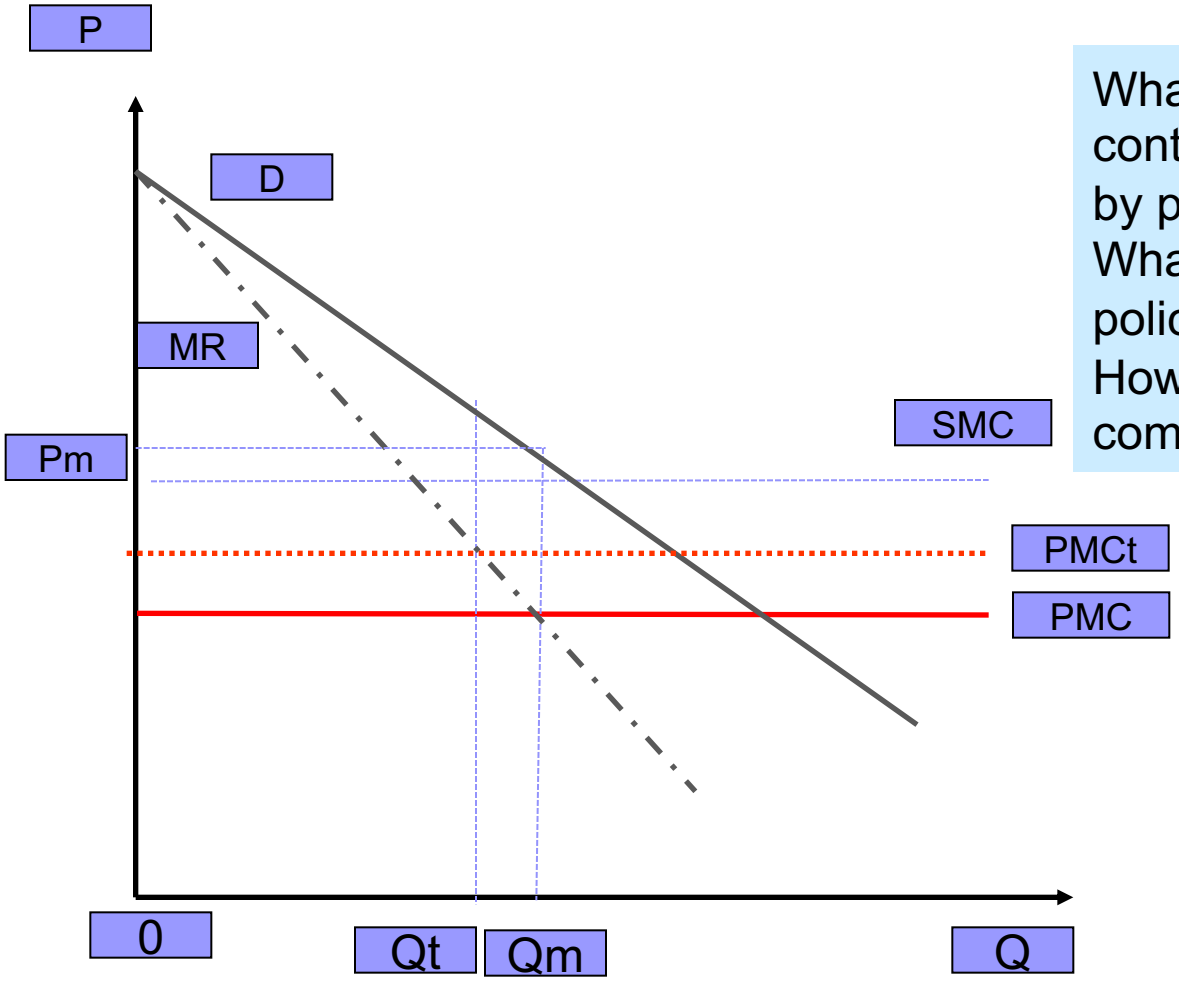
Coase Theorem and Property rights

- "where there is costless bargaining between the generator and the victim of an externality, the optimal outcome will emerge so long as either party holds the pertinent property right-it does not matter which one"

1. Privately owned
2. State property regimes
3. Common property resources
4. Open access resources

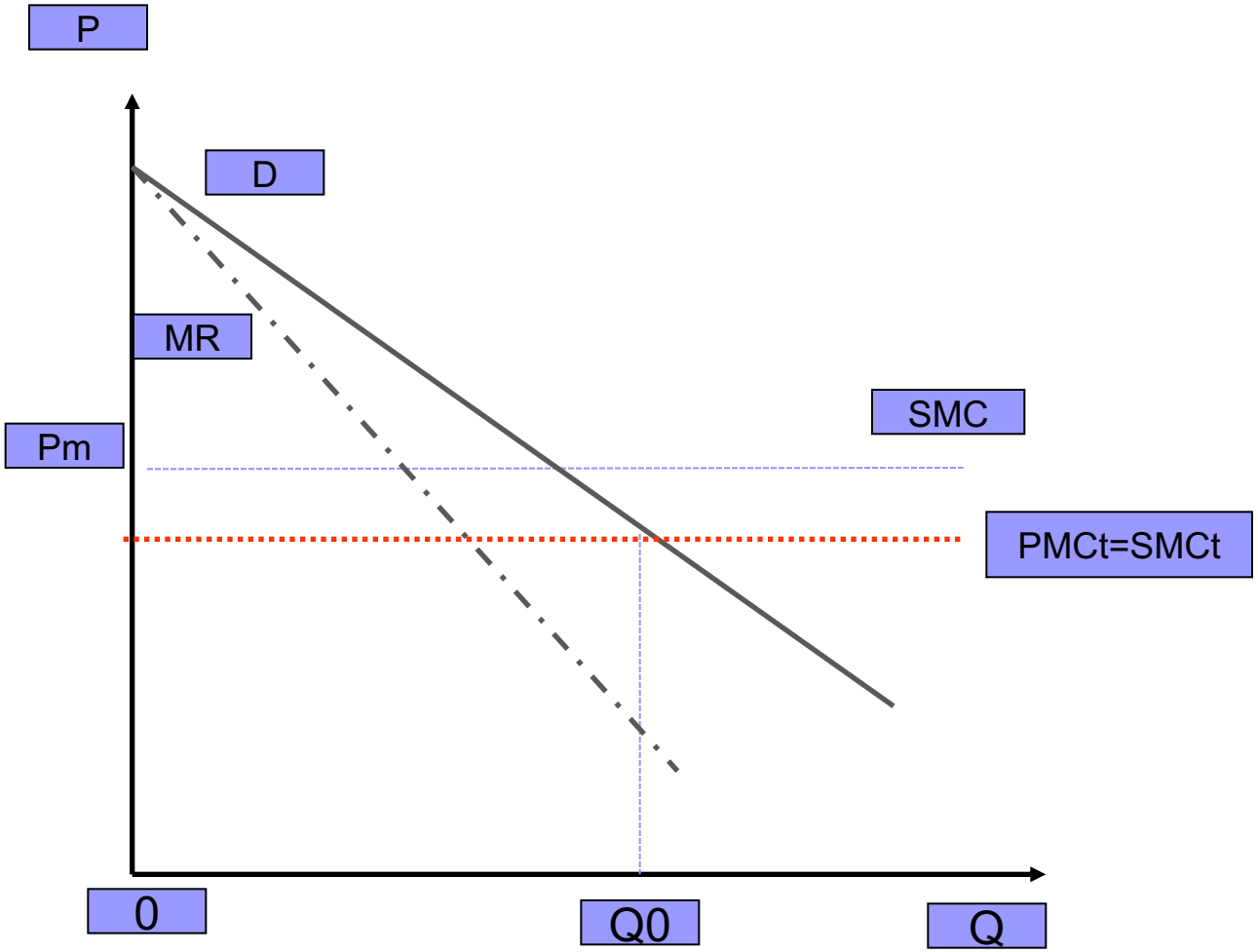

MB
MC
Total benefits
Q
Total costs
Q

Monopoly and externalities I

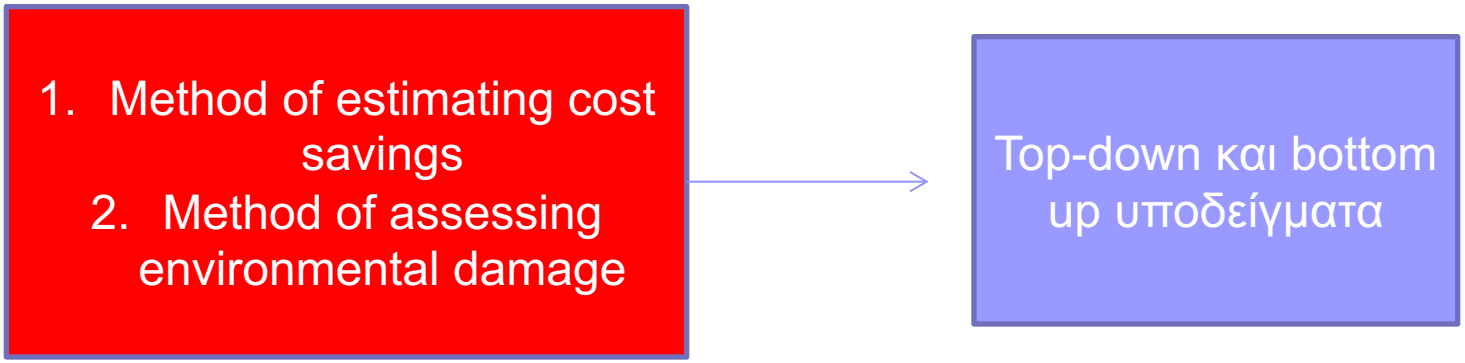


What happens if a monopoly contaminates the environment by producing its product?
What are the optimal coping policies?
How it differs from full competition?

Monopoly and externalities (Baumol and Oates 1988)



Evaluating Externalities



- Validation and quantification of weights.
- Spreading analysis and changes in pollution level.
- Return on physical impacts to loss-of-benefit financials
- How many of the existing externalities have already been internalized.

References

- Bhattacharyya, Subhes C. (2011) Energy Economics: Concepts, Issues, Markets and Governance. Springer. (κεφ.23)

- Evans, Joanne and Lester Hunt,(2009), International Handbook on the Economics of Energy. Edward Elgar (κεφ.31)