Environmental and ecological economics

International Baccalaureate · IB Diploma · Environmental Systems and Societies · HL

Scope and prerequisites

This handout covers selected HL topics for the course first assessed in 2026; it is not the whole syllabus.

Prerequisites: read the stated quantities and units, and use arithmetic and the model conditions below.

The examples are original and fictional: they are not real measurements or real student investigations.

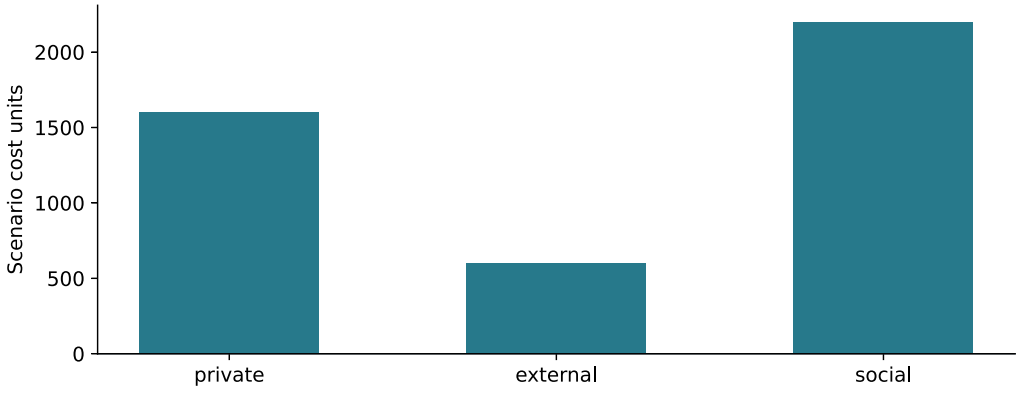
Environmental economics: costs beyond the market price

What would explain this observation?

- A cheap product can impose waste or pollution costs on people who did not buy it. Its market price may omit part of its environmental cost.

Build the model

- An **externality** is a cost or benefit affecting a third party that is not fully reflected in a transaction.
- Environmental economics examines incentives and valuation, including instruments such as taxes, subsidies and tradable permits.
- Ecological economics also questions growth assumptions and emphasizes ecological limits and relationships between the economy and its supporting systems.
- externality: A transaction effect on a third party not fully reflected in its price.
- **social cost** : Private cost plus external cost within the stated model.



Social cost = private cost + external cost = 1,600 + 600 = 2,200 units

Choose evidence that can test it

- In a simplified model, marginal social cost equals marginal private cost plus marginal external cost.
- A pollution charge can alter incentives, but selecting a charge requires evidence and a stated objective.
- Monetary totals do not by themselves settle distribution, irreversibility, uncertainty or whether a service can be substituted.

In the lab: Construct a transparent table with a common currency, time period and system boundary. Separate measured expenditure from estimated environmental damage. Compare at least two valuation assumptions, identify who pays and who benefits, and consider a non-monetary indicator such as habitat condition. Label these as classroom scenarios rather than forecasts.

Work from known quantities

- Known: producing one item costs the producer 8 units, while the scenario estimates an external cost of 3 units.
- Social cost is 11 units per item.
- For 200 items, private cost is 1,600 units and estimated external cost is 600 units, giving 2,200 units total under this model.
- If external damage is estimated at 1–5 units per item, the social-cost range is 1,800–2,600 units.

Your turn: Private cost is 6 units per item and external cost is 2 units. Calculate social cost for 50 items.

Check the conclusion and its limits

- A money value is an assumption-dependent estimate, not a measurement of intrinsic ecological value.
- A policy that lowers total cost can still place a disproportionate burden on a vulnerable group.

Not true: The cheapest market price necessarily identifies the smallest total environmental cost. Market price reflects private costs. External costs - pollution, health damage - fall on others and are absent from the price, so the cheapest market option can carry the largest total cost.

Key:

- An externality is a cost or benefit affecting a third party that is not fully reflected in a transaction.

- In a simplified model, marginal social cost equals marginal private cost plus marginal external cost.
- Watch for: A money value is an assumption-dependent estimate, not a measurement of intrinsic ecological value.

Write from a social cost of 900

- Private cost is 5 units per item and the estimated external cost is 4 units. The scenario covers 100 items.
- Find the total social cost. The cheapest market price can omit external costs.

Write from a corrective tax

- The same external cost (4 per item) is collected as a tax on the producer.
- What must the market price now carry? Private 5 + tax 4 = 9 – the full social cost moves into the price.

Write from 1,000 of social cost

- A second scenario has 200 items, private cost 3 each and external cost 2 each.
- Find the total social cost: $200 \times (3 + 2) = 1{,}000$ – externality times quantity scales the gap.