Lecture - 14

Energy Resources, Economics and Environment

Externalities

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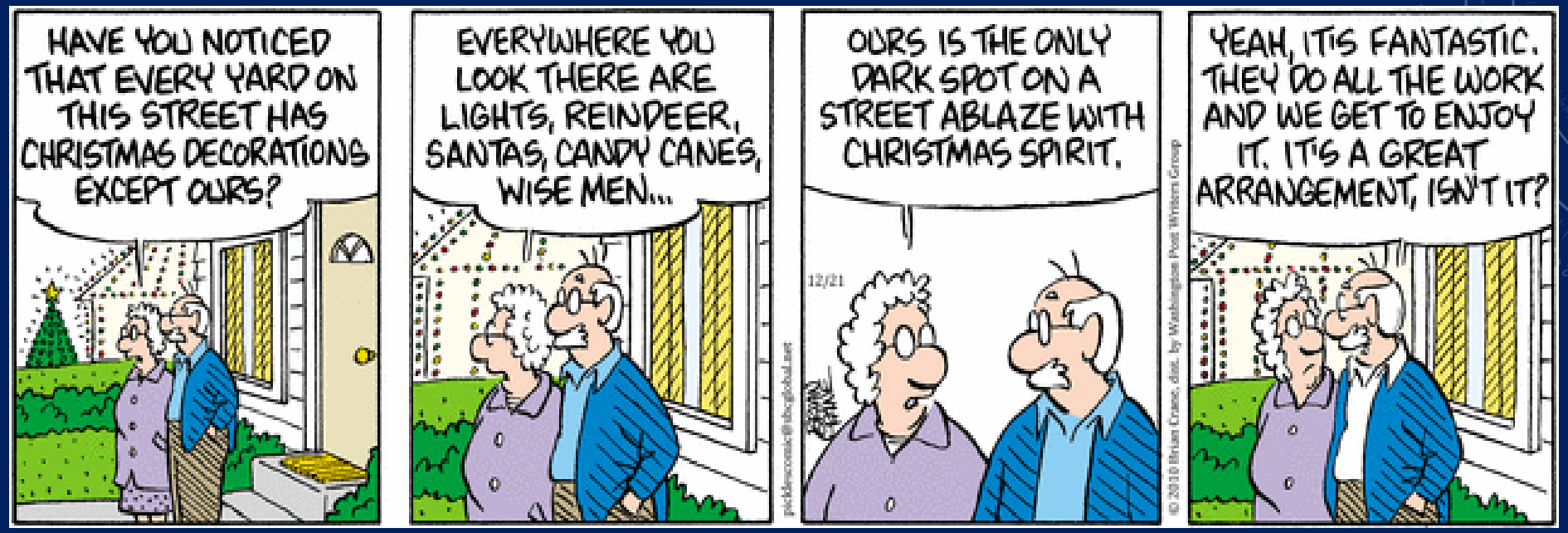
Externality

- An externality exists when the consumption or production choices of one person or firm enters the utility of another entity without that entity’s permission or compensation

Shale Gas

KAL: The Economist

Positive Externality



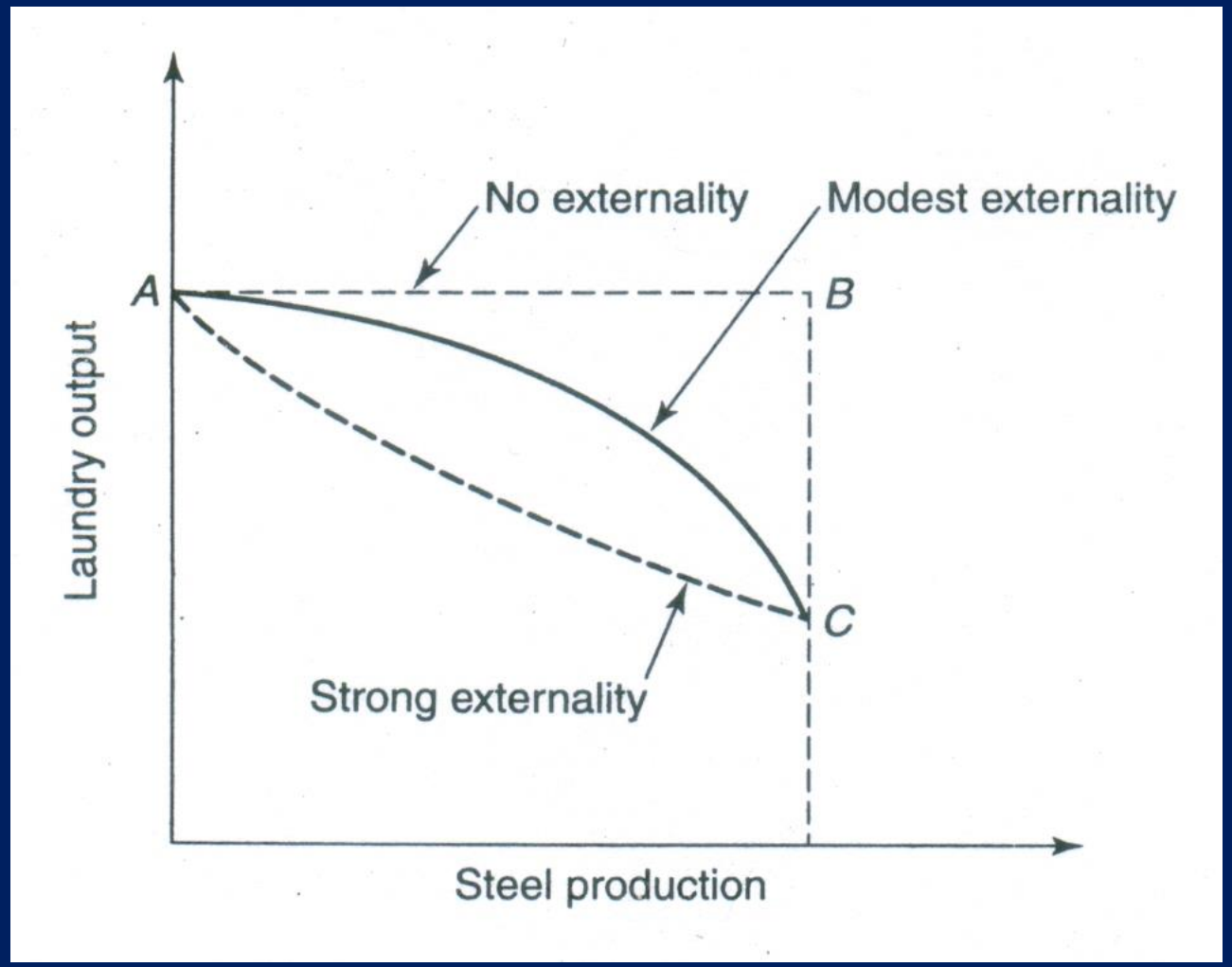
Pickles By Brian Cane

http://www.economicsandethics.org/lighter-side/

Externality

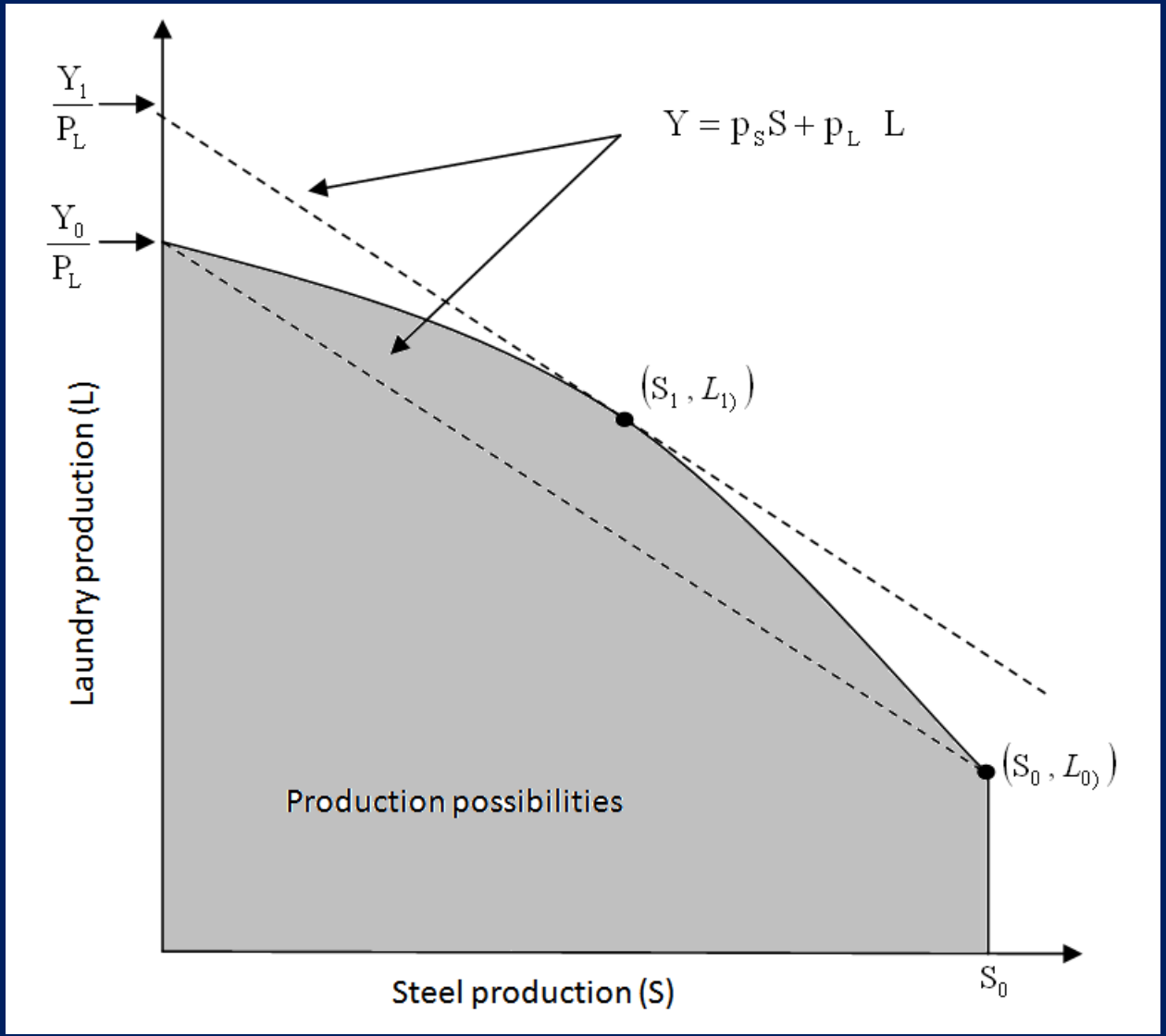
An externality exists when the consumption or production choices of one person or firm enters the utility of another entity without that entity's permission or compensation

Externality – Steel Mill , Laundry



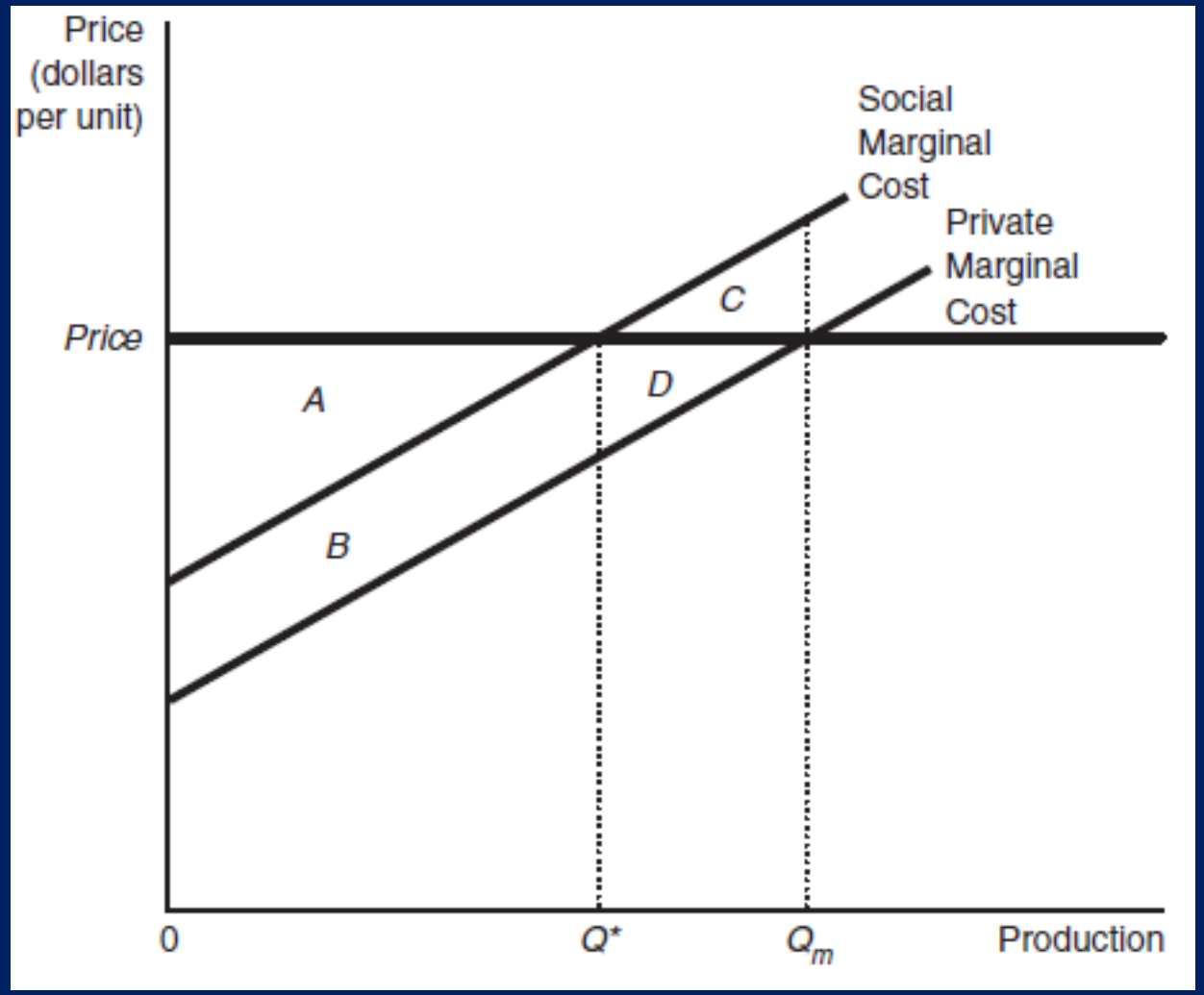
Source: Kolstad

Externality (Example)



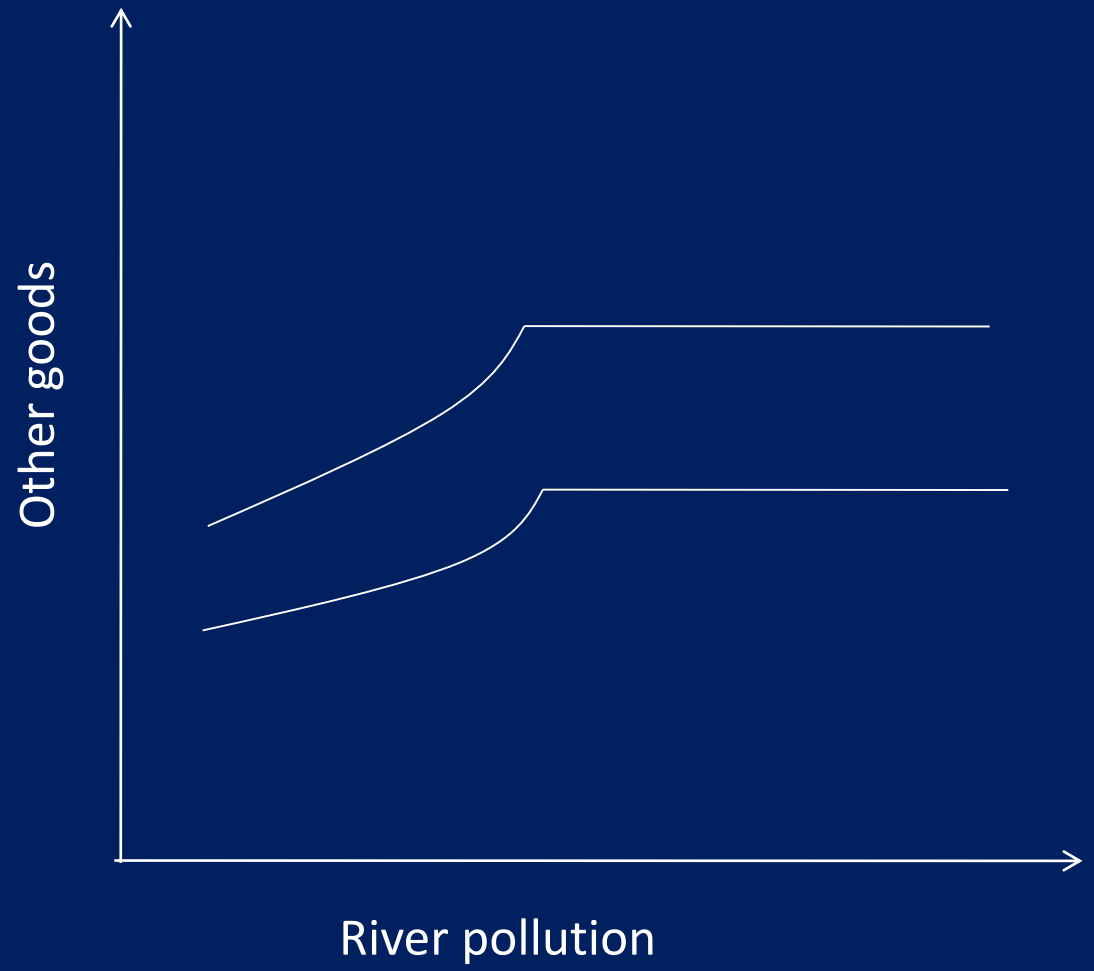
Source: Kolstad

Marginal cost including Pollution

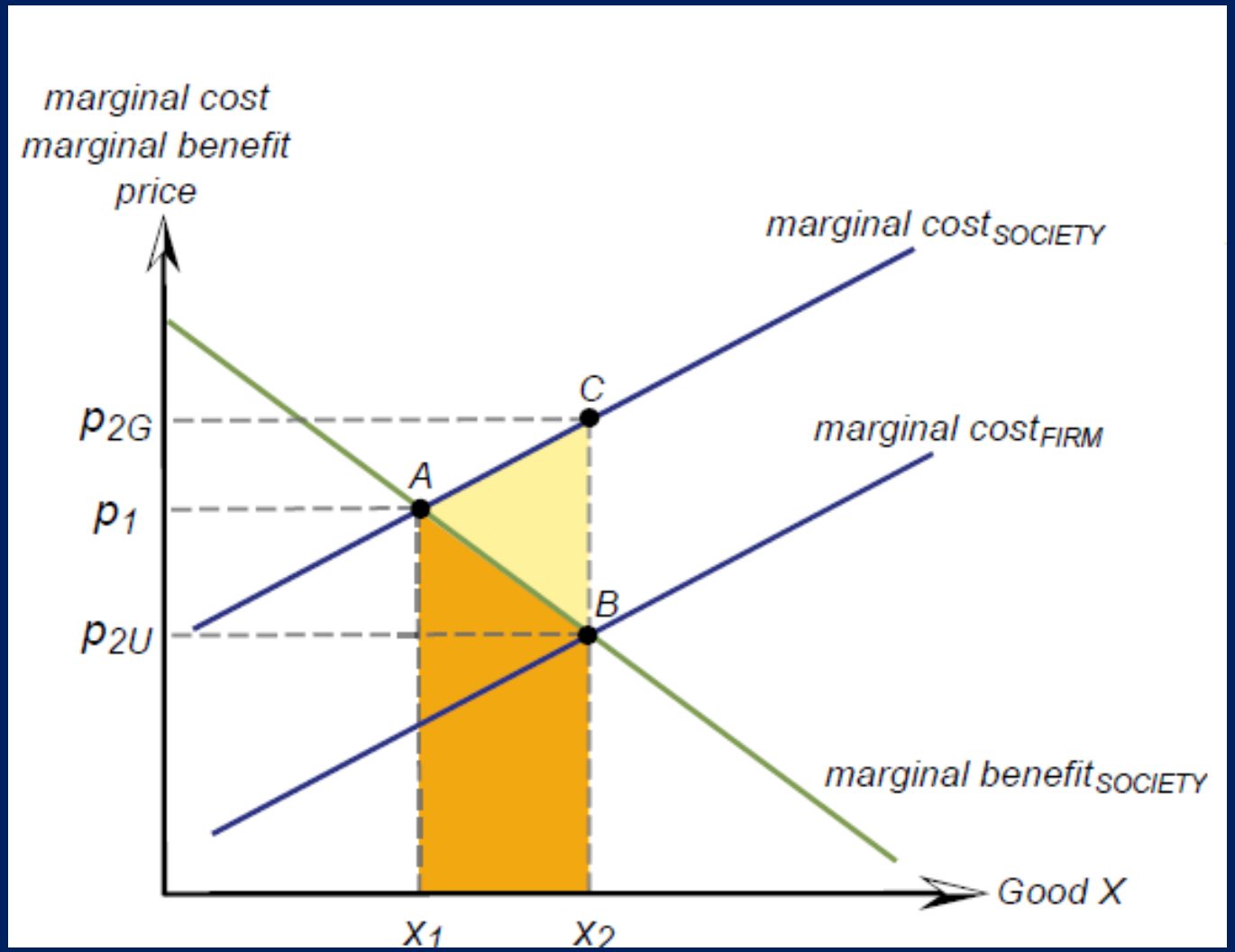


Source: Tietenberg (2009)

Indifference curves with consumption externality



Effect of Externality



Source: ETH Lectures

Refinery Example (Callan and Thomas)

- Supply P = 10.0 + 0.075Q
- Demand P = 42.0 - 0.125Q, where Q is thousands of barrels per day, P- Price in US$/ barrel
- S is Marginal Private Cost MPC and
- D is Marginal Private Benefit MPB

$$MPC = 10.0 + 0.075Q$$

$$MPB = 42.0 - 0.125Q$$

Refinery Example (Callan and Thomas)

Suppose

Marginal External Cost (MEC) = 0.05Q

Marginal Social Cost (MSC) = MPC + MEC

MSC = (10.0 + 0.075Q) + 0.05Q

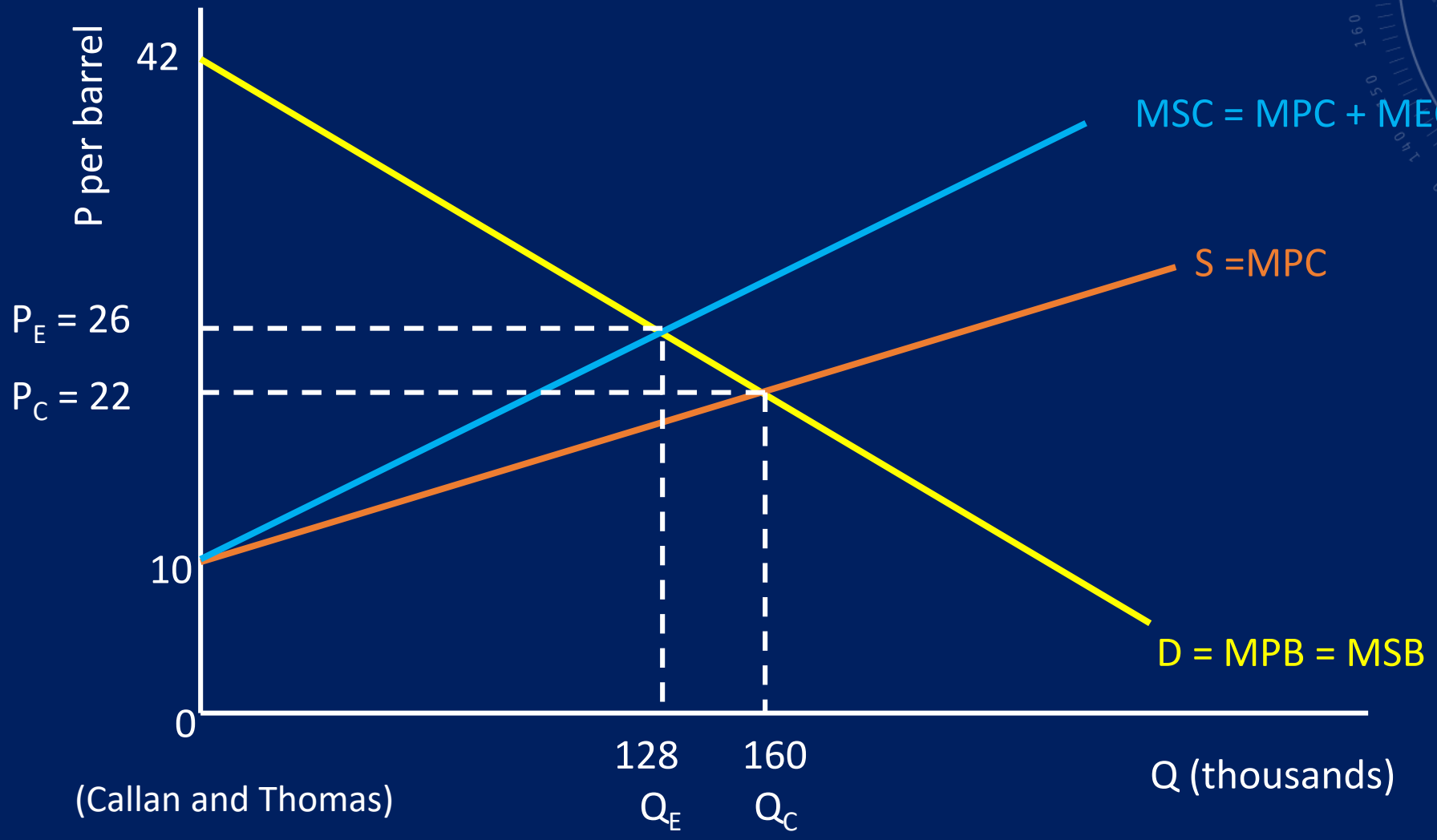
= 10.0 + 0.125Q

Marginal Social Benefit (MSB)= MPB + MEB

If there are no external benefits, MEB= 0

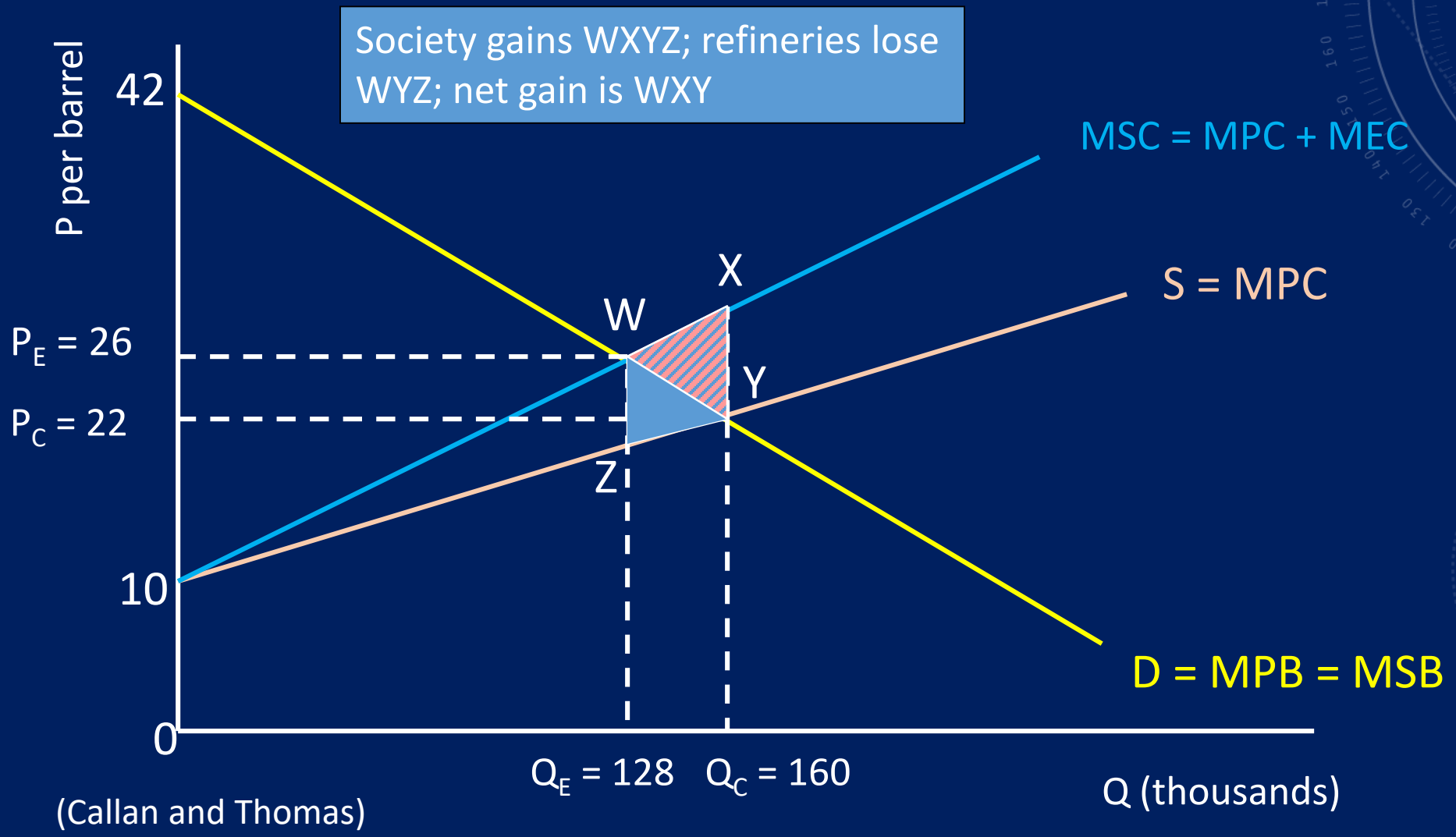
MSB = MPB

Refinery Market equilibrium



(Callan and Thomas)

Measuring Society's Net Gain
Refinery Market



(Callan and Thomas)

References

- Charles Kolstad, Environmental Economics, Vol. 1, Oxford University Press (1999).
- Tom Tietenberg, Lynne Lewis, Environmental & Natural Resource Economics, 9th Edition, Pearson Education, Inc. (2009).
- Scott Callan, Janet Thomas, Environmental Economics and Management: Theory, Policy and Applications, Cengage Learning, Edition 4 (2006).

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Property Rights and Coase Theorem

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Property Rights

- Enforceable property rights – stealing illegal
- If not – goods not excludable – cannot be rationed using prices
- Garbage not excludable – if no laws to prevent littering

Question of property rights

- Should we have the right to clean air?
- Should we be entitled to elimination of the pollution? Should we be entitled to compensation for pollution damage?
- Should polluters have the right to pollute?

Examples in Coase's paper

- Straying Cattle (Cattle Raisers Herd) or Farmers Crops
- Tall Building blocking air currents of a Wind Turbine
- Building cast shadow on Cabana, Swimming area, sunbathing area of a hotel
- Delta air vs Kersey, State of Atlanta vs Kersey

Property Rights

- Who should have the rights – polluter or victim
- Steel factory or Laundry (Kolstad)
- Refinery or Car factory (Kolstad)
- Steel Factory or Hotel/ Resort (Tietenberg)
- Refinery or recreational users (Callan/ Thomas)
- Doctor or Confectioner (Coase)

Coase Theorem

Nobel Laureate 1991

Ronald Coase 1910-2013

In the absence of transaction costs, the allocation of resources is independent of the initial assignment of property rights

The Problem of Social Cost, *Journal of Law and Economics* 1-44 (1960)

Coase Theorem

- Proper assignment of property rights, even if externalities are present, will allow bargaining between parties such that efficient solution results, regardless of who holds rights
  - Assumes costless transactions
  - Assumes damages are accessible and measurable

What I showed in that article, as I thought, was that in a regime of zero transaction costs, an assumption of standard economic theory, negotiations between the parties would lead to those arrangements being made which would maximise wealth and this irrespective of the initial assignment of rights. This is the infamous Coase Theorem, named and formulated by Stigler, although it is based on work of mine.

Extract from Coase's Nobel Lecture

Coase – Paper Example

- Confectioner – two mortars and a pestle – 60 years of operation on a street
- Doctor – no difficulty for 8 years – till he built a new consulting room next to confectioners kitchen – noise from machinery prevented him from examining patients – specifically for chest diseases
- Legal action to stop use of machinery

Coase Example

- Court ruled in favour of Doctor – injunction against use of machinery
- Bargaining possible – Confectioner could pay the Doctor for loss of income - moving to a costlier / inconvenient location, curtail activities, build a wall or mitigate noise

Coase Example

- Confectioner willing to do this if payment to doctor less than fall of income if he changed mode of operation, abandoned operation or switched his operation to some other location
- What if the confectioner had won the case?

References

- Charles Kolstad, Environmental Economics, Vol. 1, Oxford University Press (1999).
- Tom Tietenberg, Lynne Lewis, Environmental & Natural Resource Economics, 9th Edition, Pearson Education, Inc. (2009).
- Scott Callan, Janet Thomas, Environmental Economics and Management: Theory, Policy and Applications, Cengage Learning, Edition 4 (2006).