Externalities Handout

Mr. Burns: Owns nuclear power plant which dumps nuclear waste into a stream.

Lisa: Owns a fishing firm that catches fish in the same stream.

MB: Marginal benefit to Burns of one more unit of power produced

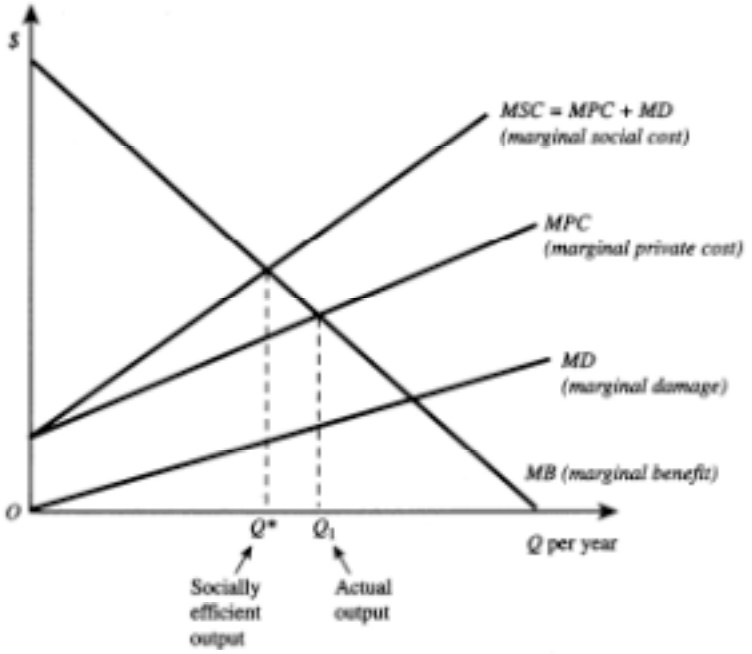
MD: Marginal damage caused to Lisa's business from pollution caused by one more unit of power

MPC: Marginal private cost (to Burns) of producing one more unit of power

MSC: Marginal social cost (to Burns *and Lisa*) of producing one more unit of power

"Free Market" outcome:

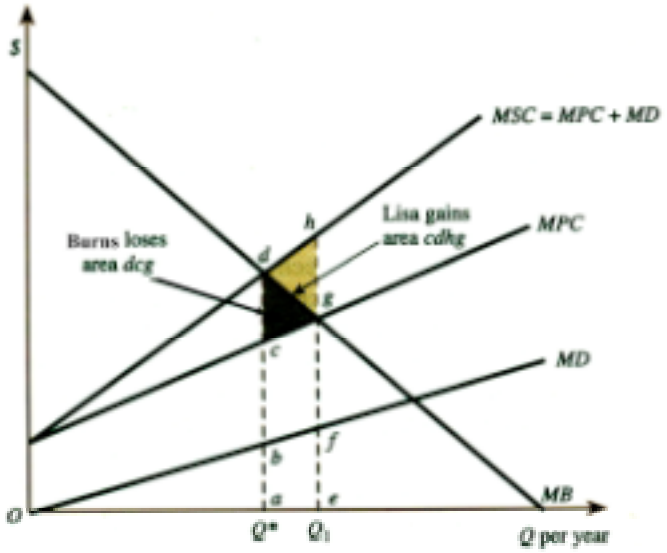
Actual output will exceed social optimum because Burns pays nothing for using up the resource of clean water



Socially efficient outcome:

Output is reduced to the point where the social marginal benefit equals the social marginal cost

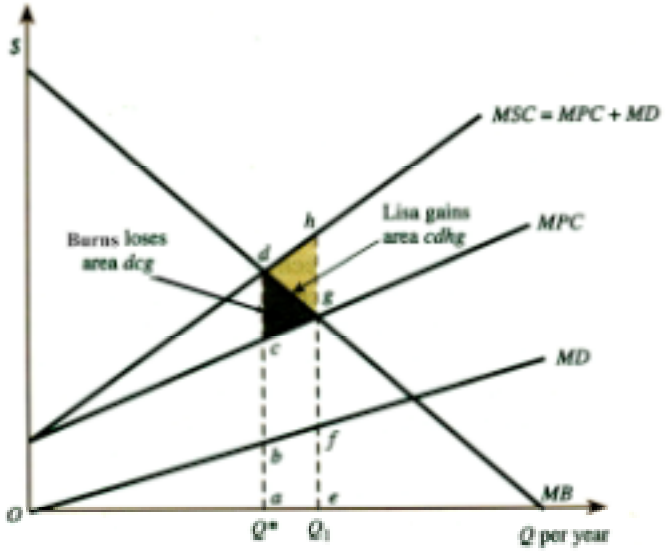
Burns loses dcg, but Lisa gains abfe=cdhg which is larger



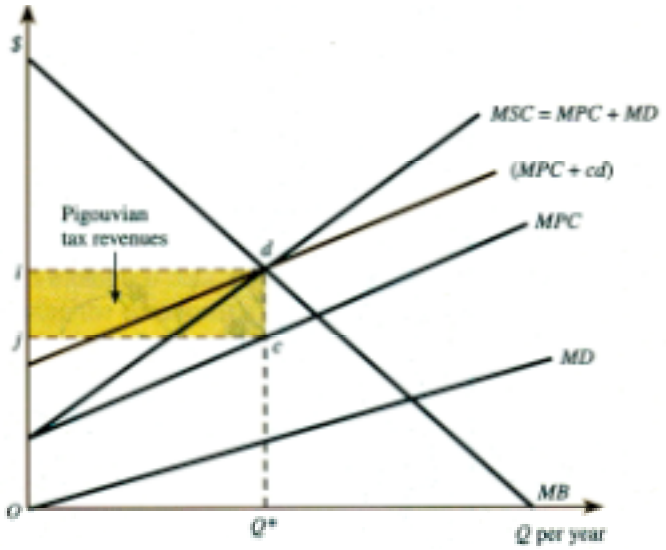
Using Taxes or Subsidies Reduce Pollution

Optimal Production is Q*

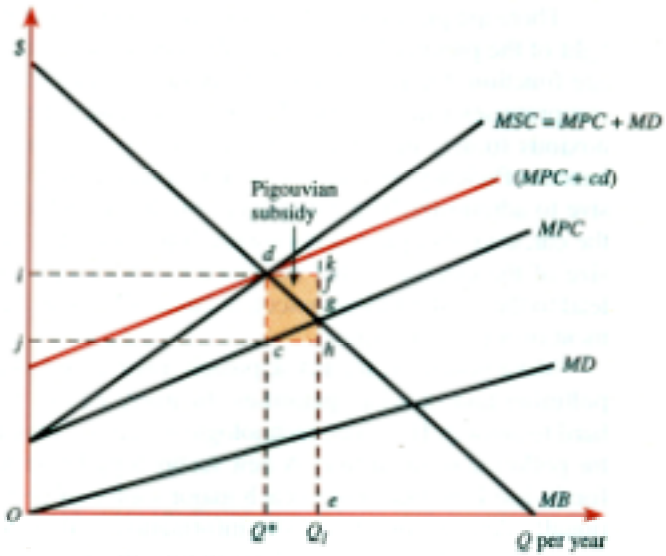
(same figure as on previous page)



Charge Pigouvian tax cd for every unit produced

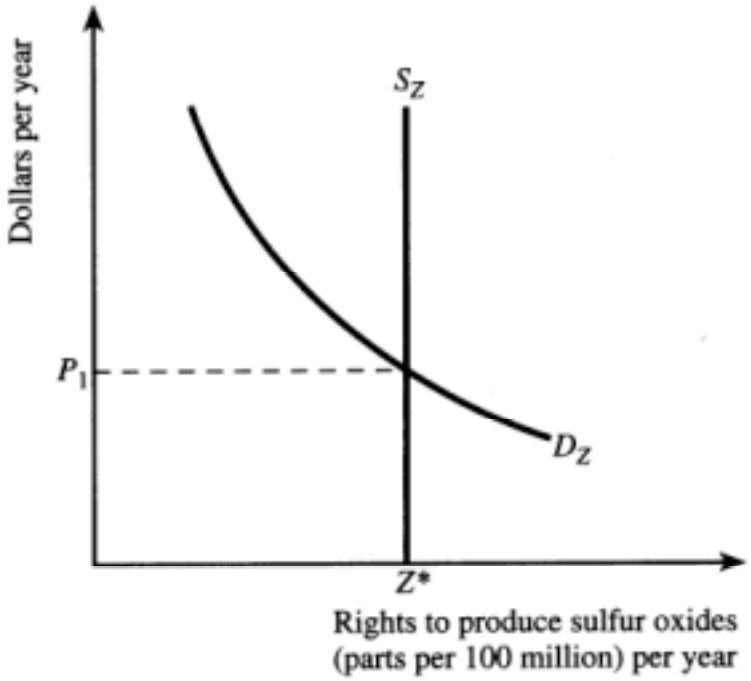


Pay Pigouvian subsidy cd for every unit less than Q_1



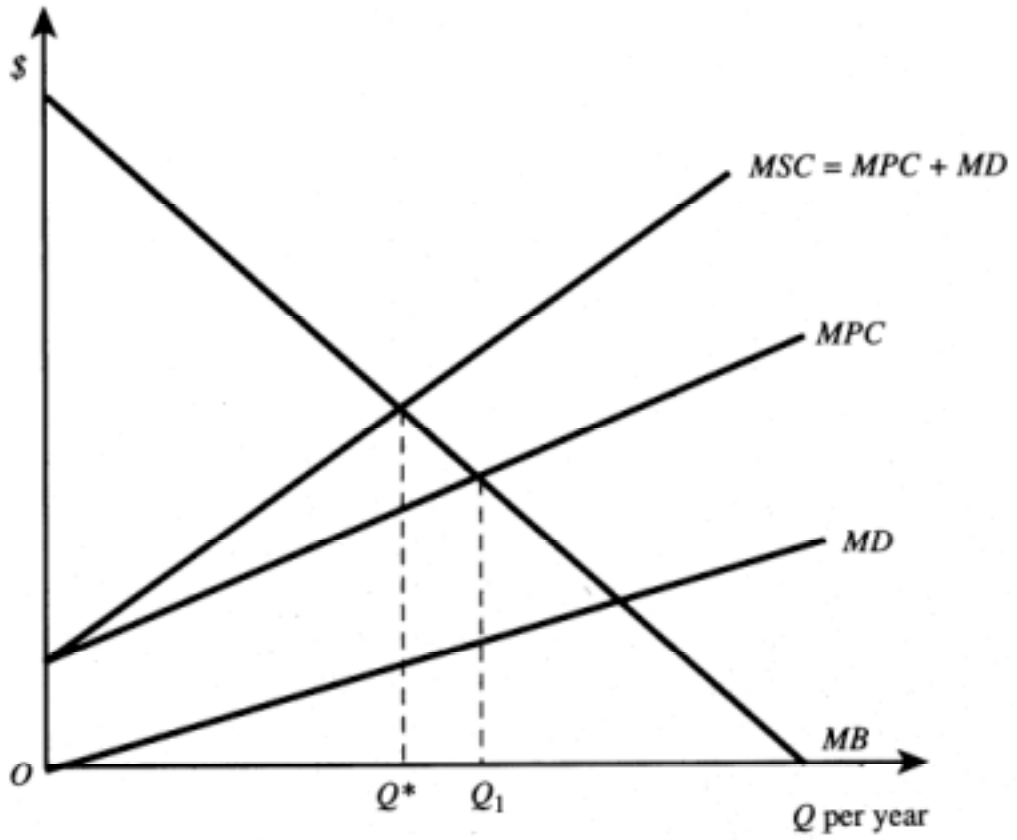
Pollution Permits

Rosen Fig 5



The Coase Theorem

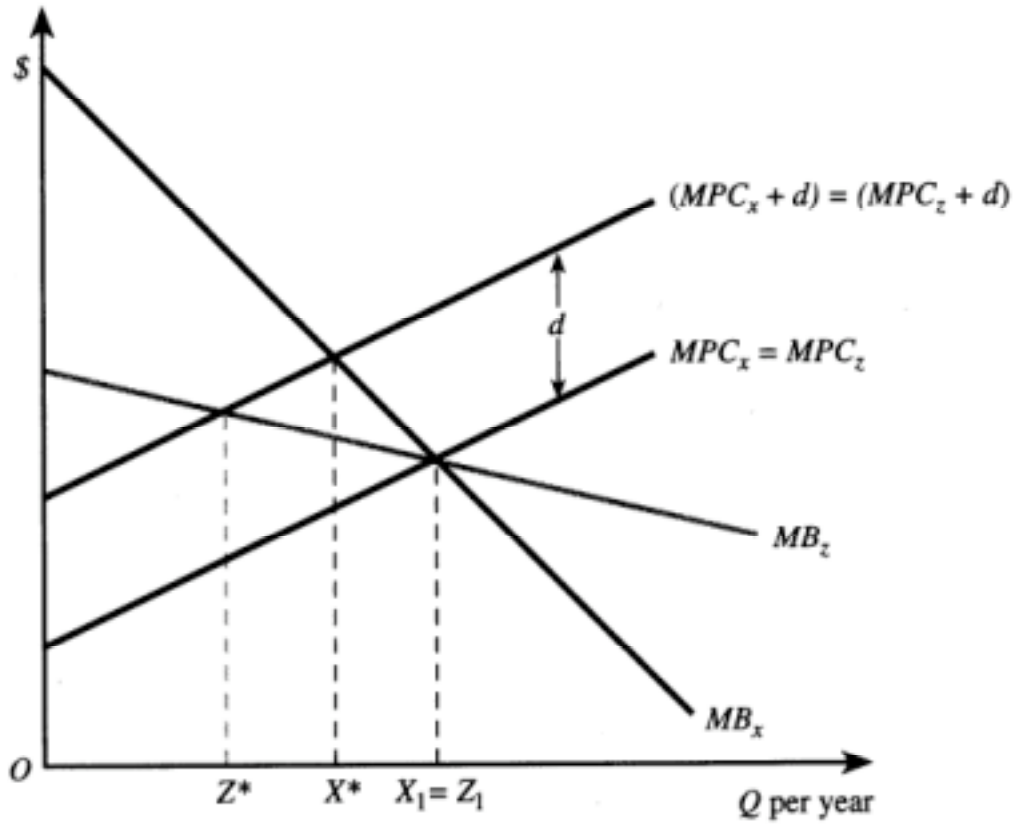
Rosen Fig 6



Regardless of who gets the property rights, the socially efficient amount of production should occur. Allocation of property rights affects distribution of resources but not efficiency.

Regulation

Rosen Fig 7



Two firms, X and Z

Identical MPC's and profit maximizing outputs $X_1 = Z_1$

Different MB schedules

Suppose it is known that the marginal damage at the efficient level of output is $d

Efficiency requires that each firm produce at the point where MB = MPC

Optimal response would be a much greater reduction in output for firm Z than for firm X, because it is 'easier' for Z to reduce its output than for X to do so