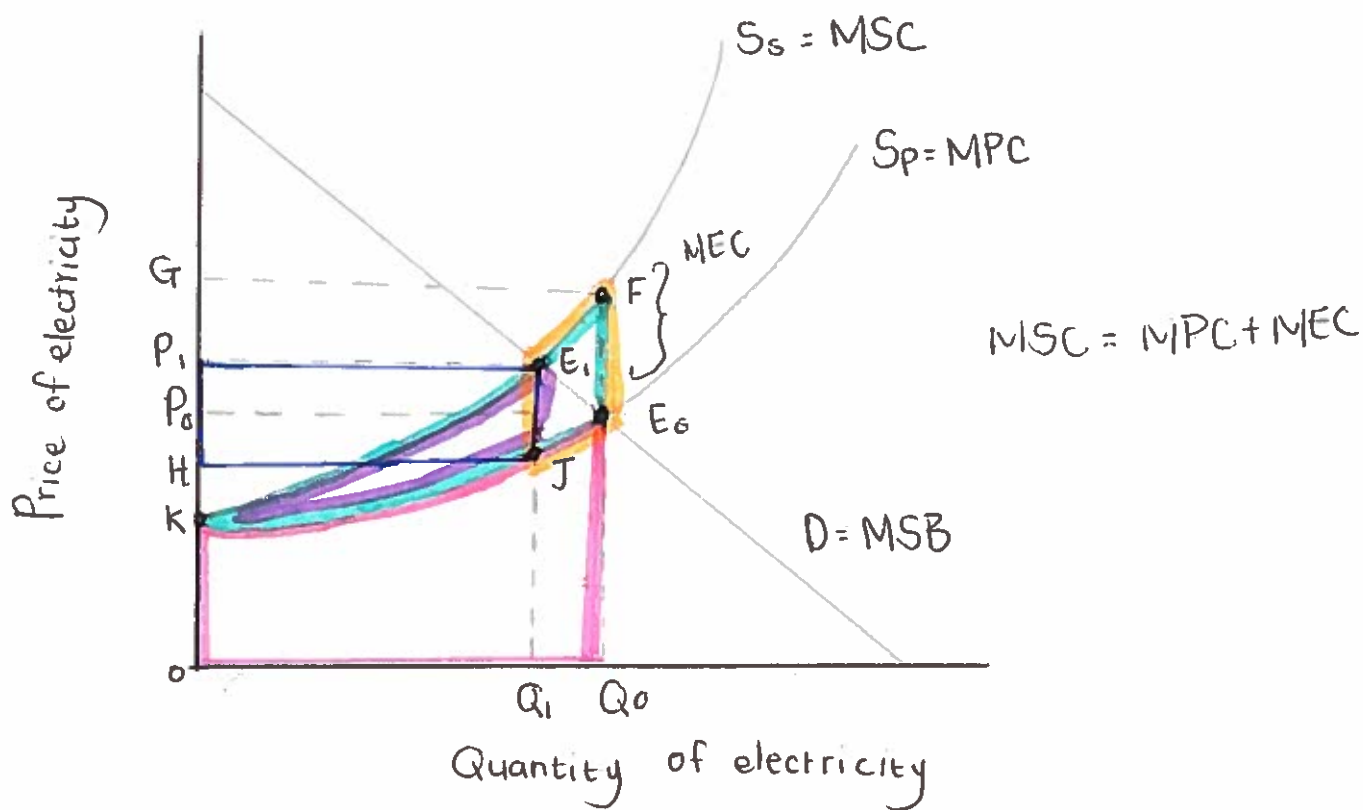


Negative production externality: Example: when a coal fired power station pollutes the air & water used by nearby livestock & crop farmers



- Initial equilibrium: E_0 at price P_0 & Quantity Q_0 .
- Social supply curve $S^s = MSC$ - shows external cost of pollution.
- It also indicates the negative externality raises the social cost of providing electricity above the private costs of the supplier.
- By producing Q_0 units of electricity, the supplier incurs a marginal private cost of $Q_0 E_0$ and a marginal external cost of $E_0 F$, which makes up the marginal social cost of $F Q_0$.
- At private equilibrium E_0 - Total private cost = $K_0 Q_0 E_0$ & total external cost = $K E_0 F$
- If externalities were taken into account, the social equilibrium would be at point E_1 ; where social supply (MSC) = demand (MSB)
- At E_1 , only Q_1 units are produced (which is less) at price P_1 (which is higher)
- Thus from a social point of view, the negative production externality present causes inefficiency in a competitive market in the form of over-provision & under-pricing of the good in question.

- Secondly in moving from E_0 to E_1 , the externality has not been eliminated, merely reduced from KE_0F to KJE_1 .
- Latter is an optimal level, because farming community will accept this negative externality from electricity generation in exchange for the value it adds.

How would the government internalise?

- Pigouvian tax - this tax attempts to internalise the externality, by forcing the parties to include the external effects of their actions in their cost & benefit calculations.
- Remember negative production externality leads to an over-provision & under pricing of the good.
- By levying a Pigouvian tax on the externality causing party, government can increase producer's marginal private cost to the level of the marginal social cost.
- ∴ Levy an ad valorem tax, on price charged by power station, that is % tax = to corresponding value of externality.
- The tax would = E_0F at price Q_0F (OP_0) and JE_1 at price Q_1E_1 (OP_1), thus shifting the private supply curve S_p to $S_s = MSC$.
- * For this tax to be efficient, it must = marginal external cost at the new social equilibrium.
- At Q_1 , the marginal external cost is the vertical difference between MPC & $MSC \rightarrow JE_1$.
- At point E_1 , the tax per unit of output is JE_1 , & the internalised externality equals KJE_1 .
- Net effect of policy - large portion of original externality JE_0FE_1 has been eliminated.
- Tax generates tax revenue of P_1E_1JH