Externalities, part 2

Refresher on positive externality example from last time:

Demand and supply:

$WTP = 100 - Q_M^D$

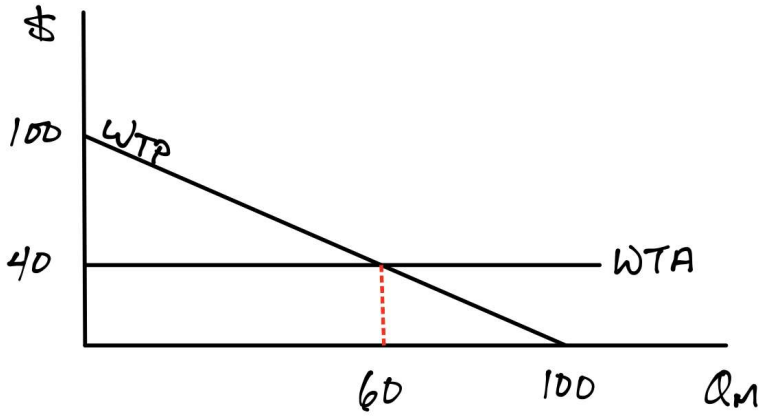
$WTA = 40$

Externality:

Generates $5 benefit for every unit traded

$MB_e = 5$

Equilibrium:



Marginal social benefit:

$MSB = WTP + MB_e$ Private benefits (WTP) plus external benefits ($\mathrm{MB_e}$)

Condition for efficient Q:

$MSB = WTA$

Now, find the efficient Q:

Construct the MSB curve:

$$MSB = WTP + MB_e$$
$$MSB = (100 - Q_M^D) + (5)$$
$$MSB = 105 - Q_M^D$$

Find Q where it's equal to WTA:

$$MSB = WTA$$
$$105 - \boldsymbol{Q_M^D} = 40$$
$$\boldsymbol{Q_M^D} = 65$$

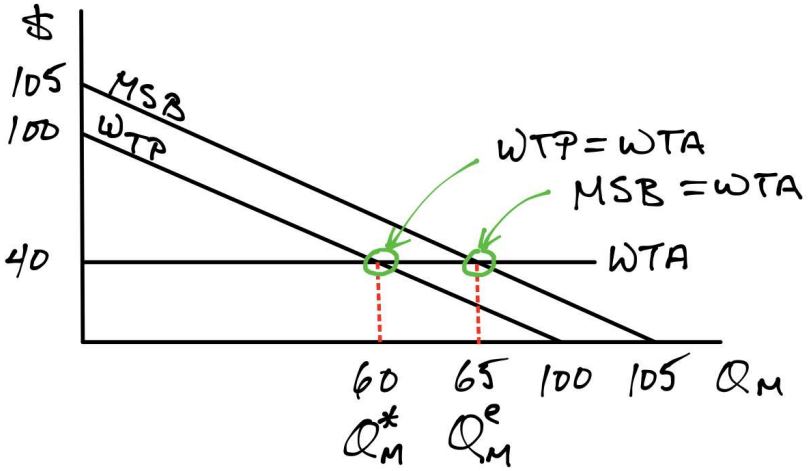
Call this Q_M^e to indicate it's the efficient Q:

$$Q_M^e = 65$$

Check it:

$$WTP = 100 - 65 = 35$$
$$MB_e = 5$$
$$MSB = 35 + 5 = 40$$
$$WTA = 40$$

$MSB = WTA$, no further improvements possible



To move the market to the efficient Q, can use a subsidy.