# Intro to Economic Analysis: Microeconomics

## EC 201 - Day 14 Slides

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Department of Economics - University of Oregon

10 November 2021

# Logistics

- Homework 5 due this Saturday at 11:59pm
- Next news assignments posted, due tonight at 11:59pm
- Midterm grades with grade update to come

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- You are welcome to read all of chapter 10, and doing so will broaden your learning and help you with the homework, but 10.1 should be sufficient

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  - Due to the fact that negative supply shifts are upward, as usual, the opposite of the above statement is true for supply
- More precisely, social demand (resp. supply) will be equal to private demand, shifted up/down (down/up) by the exact amount of the MEB/MEC

# Externality Notation

- Typically, when discussing externalities, social demand is refereed to as **Marginal Social Benefit (MSB)**, while private (normal) demand is referred to as **Marginal Private Benefit (MPB)**

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  - Moreover, I am fine if you use normal S/D always instead of MPC and MPB
- This is a bit confusing in words, let's look at some examples

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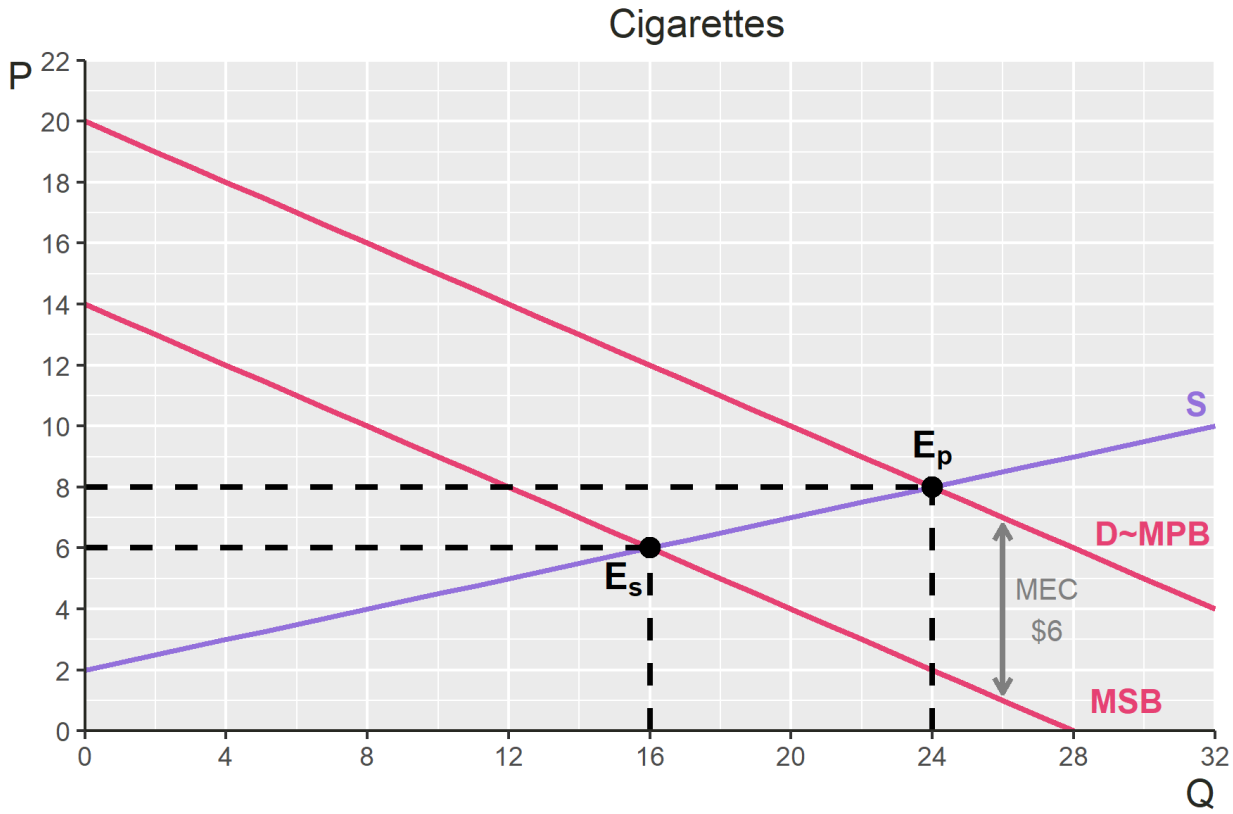
- Since MEC= \$6, we get the following diagram



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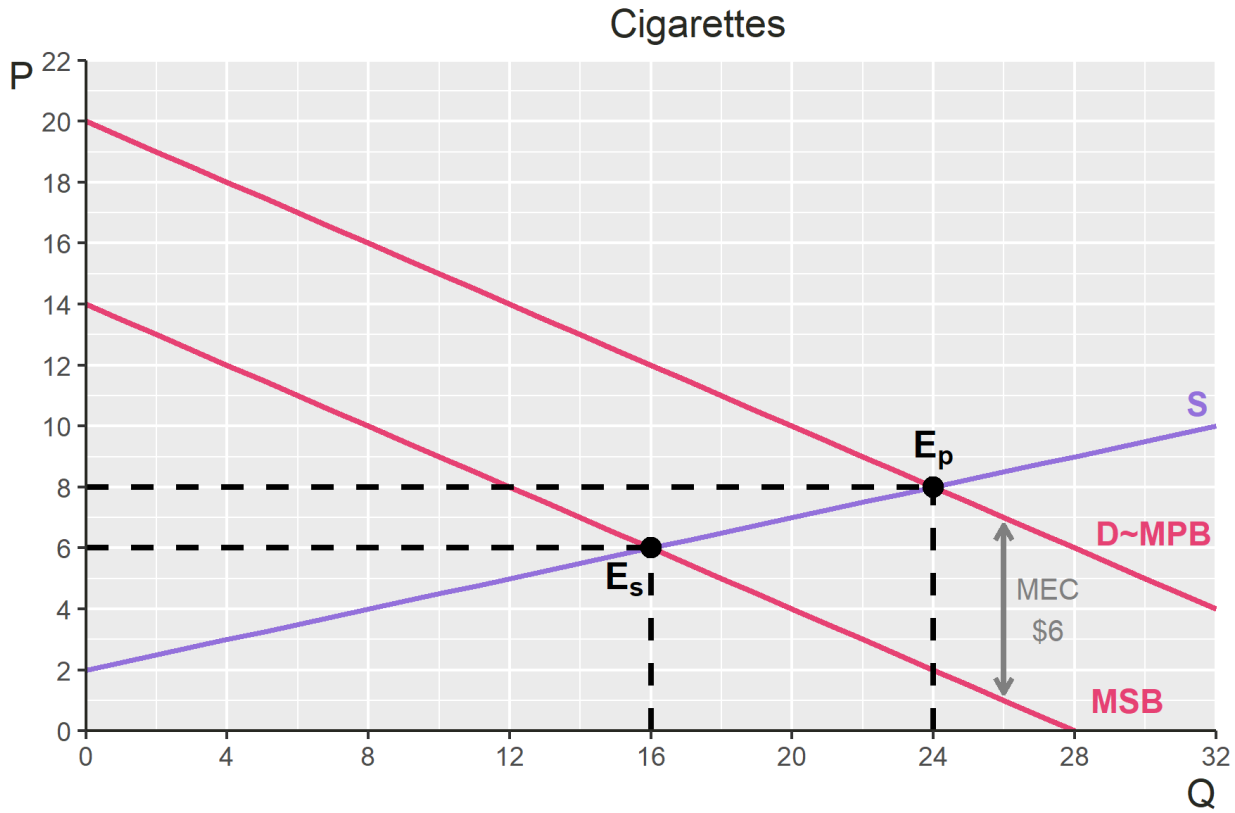


- The social equilibrium, $E_s$, what society wants people to trade at, due to the spillover[1]

[1] Another term for externality

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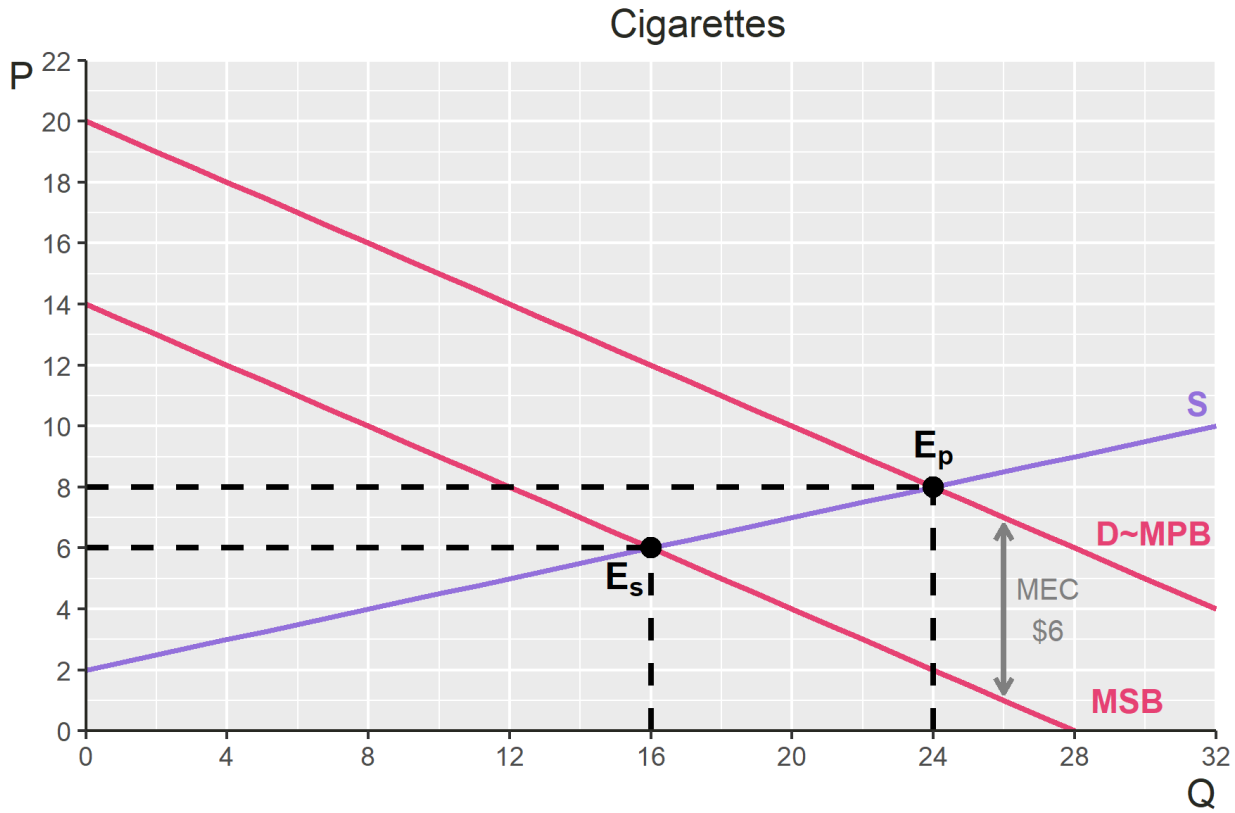


- The social equilibrium, $E_s$, what society wants people to trade at, due to the spillover[1]
- The private equilibrium, $E_p$, is where we are at

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# External Cost and External Benefit

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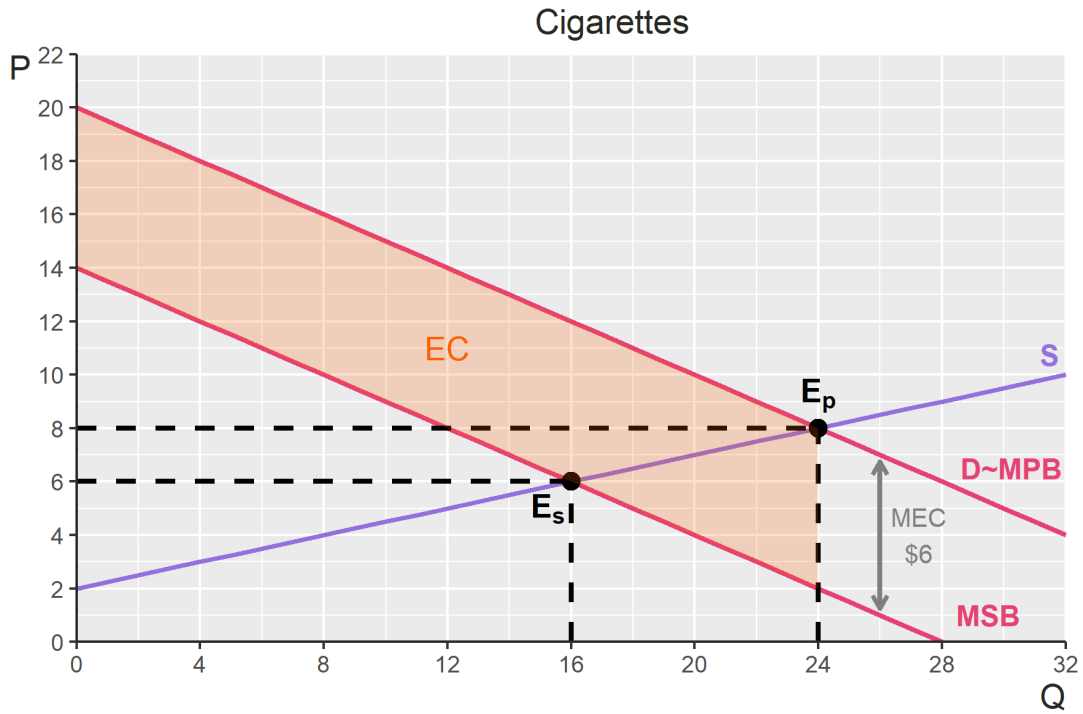
- EB is counted *positively* into TS, while EC is counted *negatively* into TS
- EB and EC will always be parallelograms. The area of a parallelogram is $b \cdot h$
- EB is equal to the MEB times the amount traded, EC is equal to the MEC times the amount traded

$$EB = MEB \cdot Q^*$$
$$EC = MEC \cdot Q^*$$

# Negative Consumption Externality

- What is EC in our cigarettes market, assuming the market is at private equilibrium?




$$EC = b \cdot h = 24\,(20 - 14) = (24)\,(6) = 144$$

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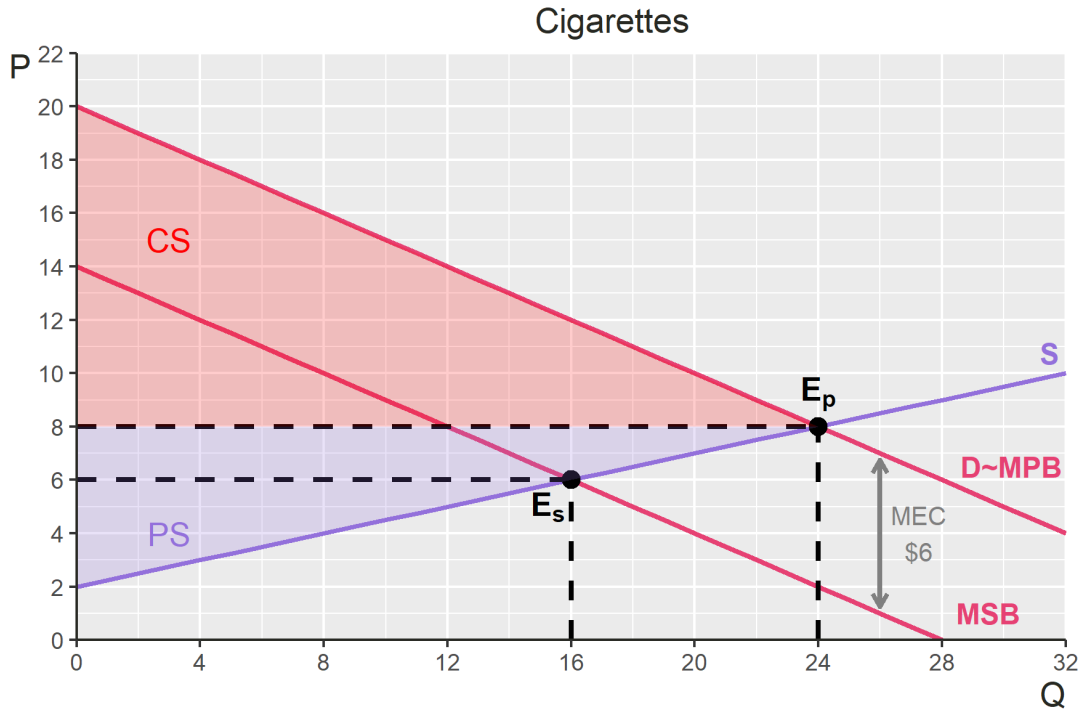
- What is CS+PS in our cigarettes market, assuming the market is at private equilibrium?




$$CS = \frac{1}{2}(24)(20-8) = 144$$

$$PS = \frac{1}{2}(24)(8-2) = 72$$

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- Thus, total surplus is in private equilibrium is

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- Can we do better?

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- How much do we tax them?
- The exact amount of the marginal external cost!

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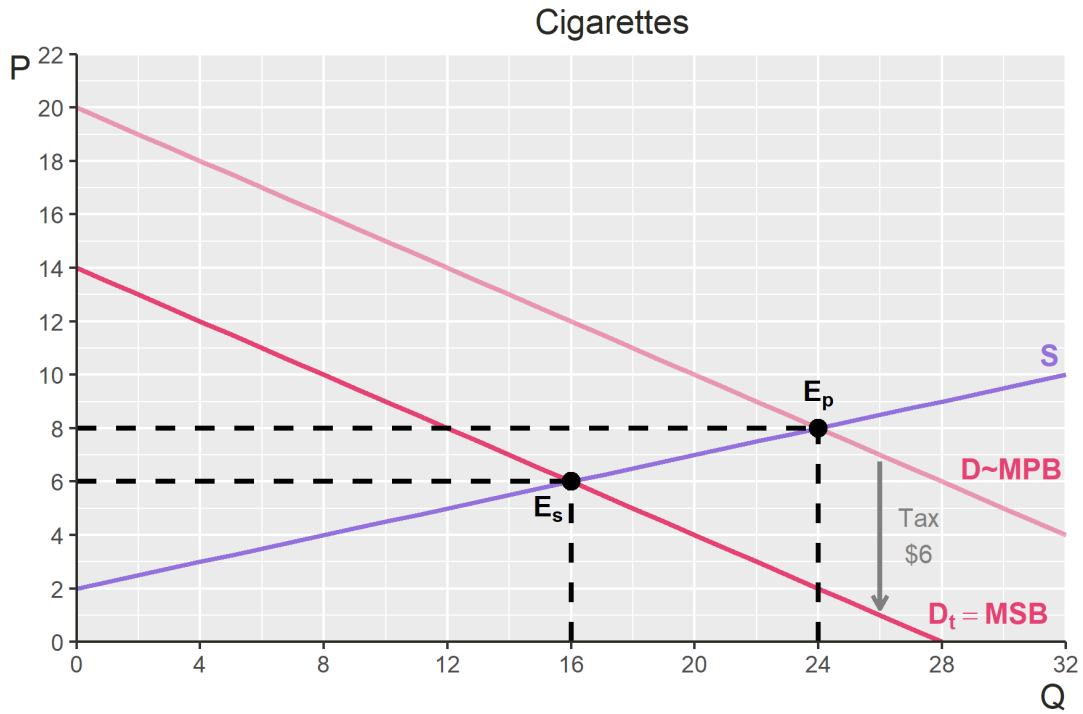
- Under a \$6 tax, demand just *becomes* MSB:



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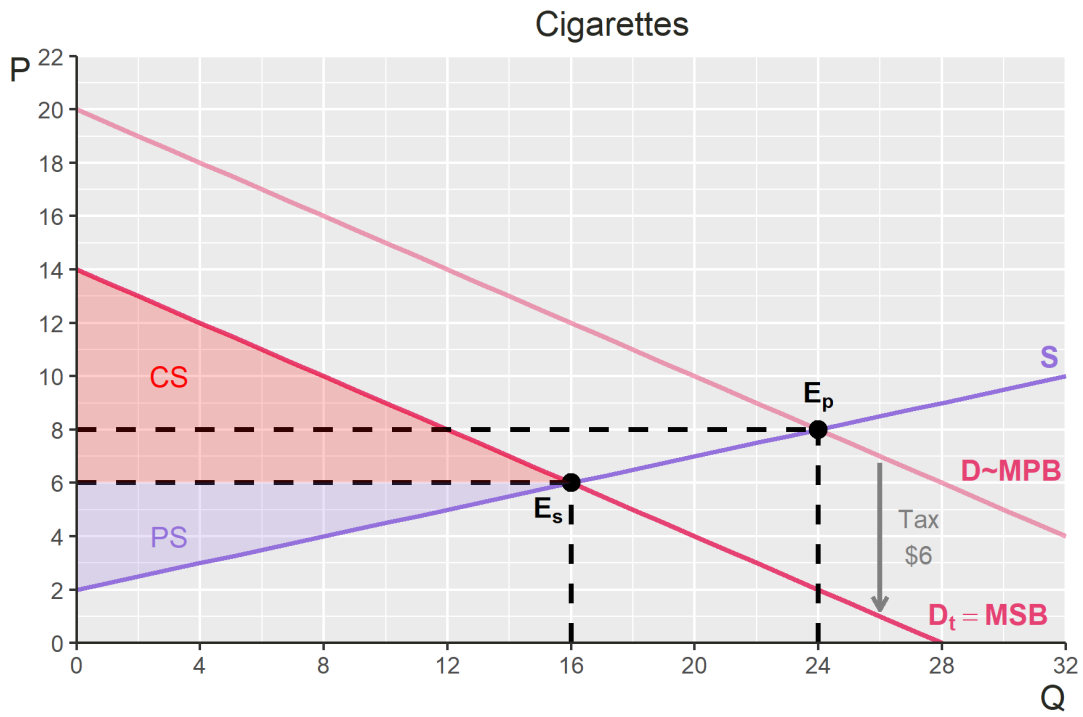
- CS and PS are as expected:




$$CS = \frac{1}{2}(16)(14-6) = 64$$

$$PS = \frac{1}{2}(16)(6-2) = 32$$

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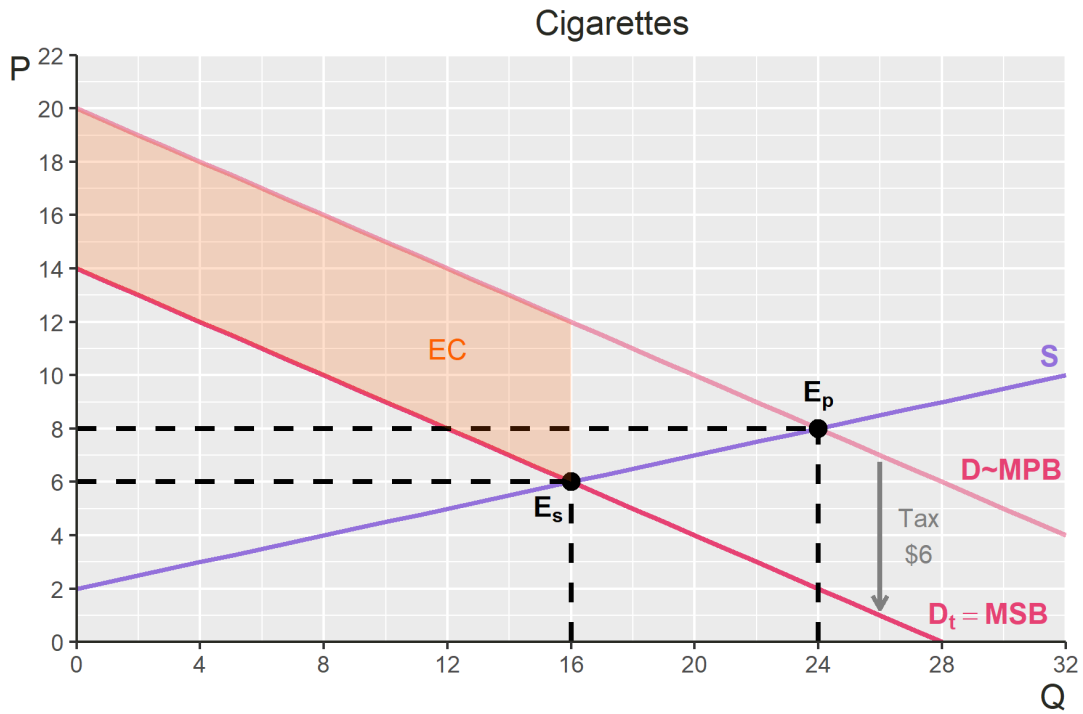
- The EC is now given by




$$EC = (16)(6) = 96$$

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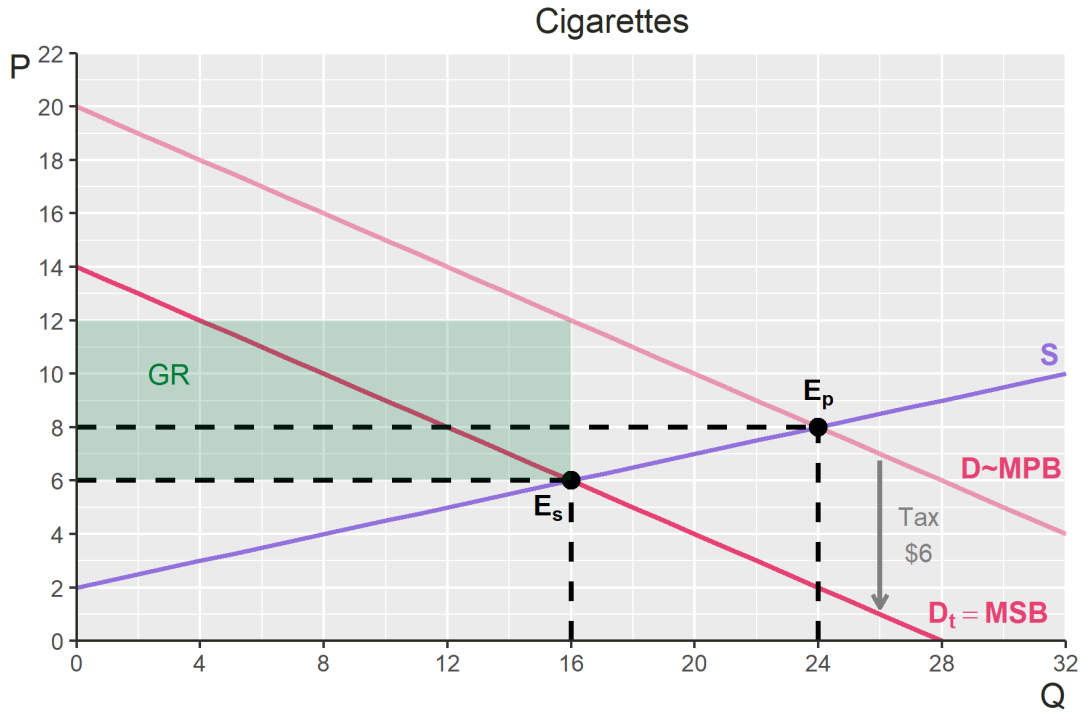
- And now, we have some GR

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- Therefore, taxation actually *induced* efficiency
  - This is the key lesson: a tax will fix an negative externality

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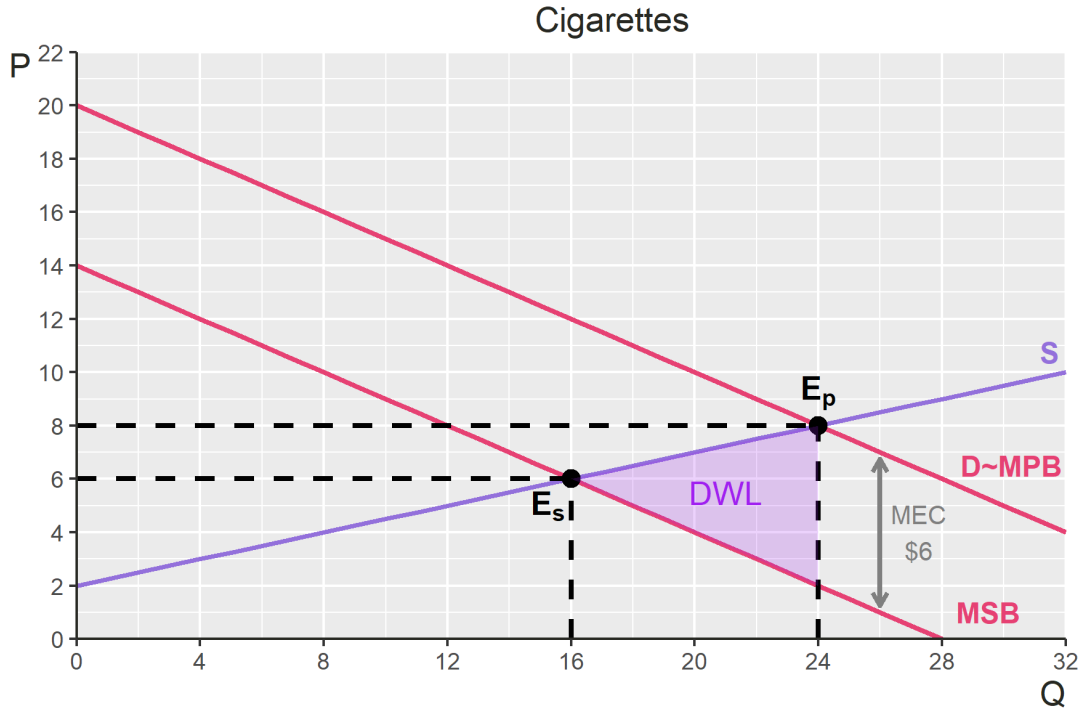
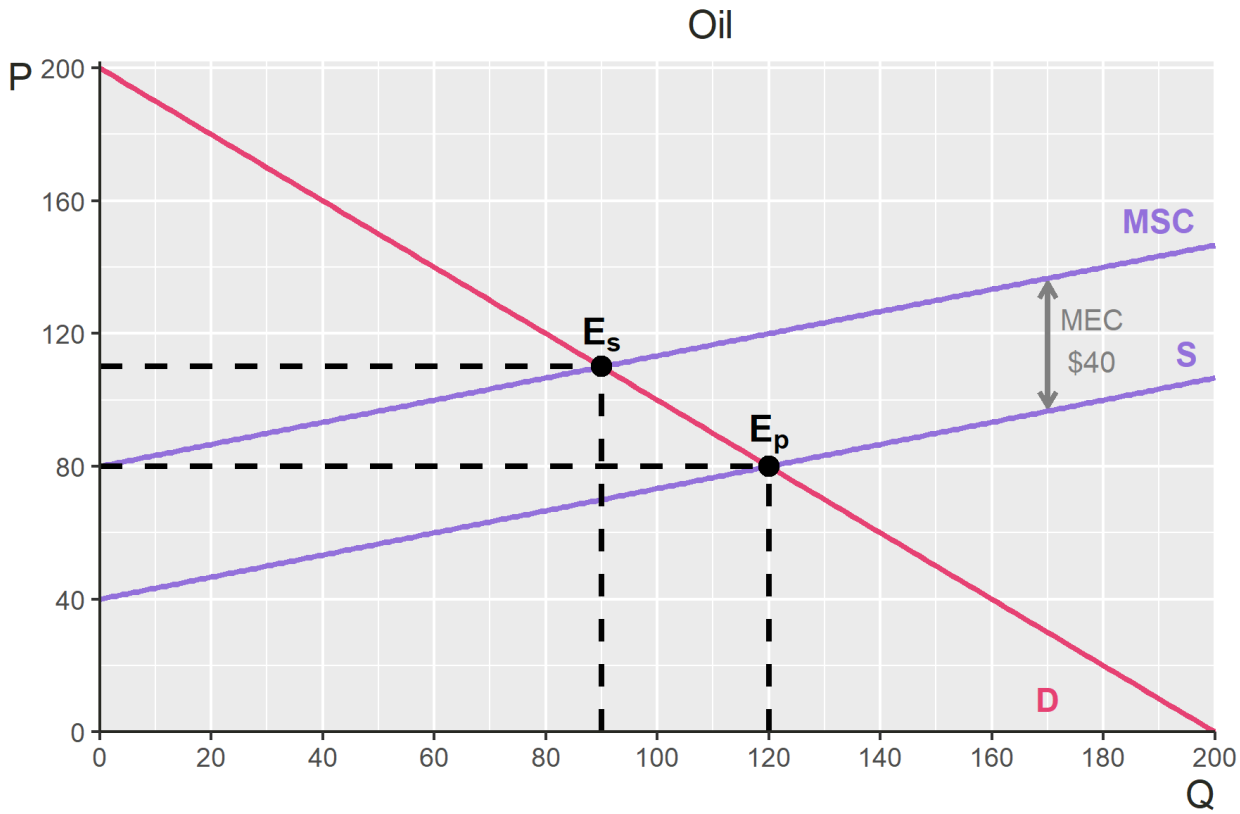
- Therefore, DWL before the tax is given by




$$DWL = \frac{1}{2}(24 - 16)(8 - 2) = 24$$

# Negative Production Externality

- Suppose there is an MEC of \$40 for every barrel of oil made



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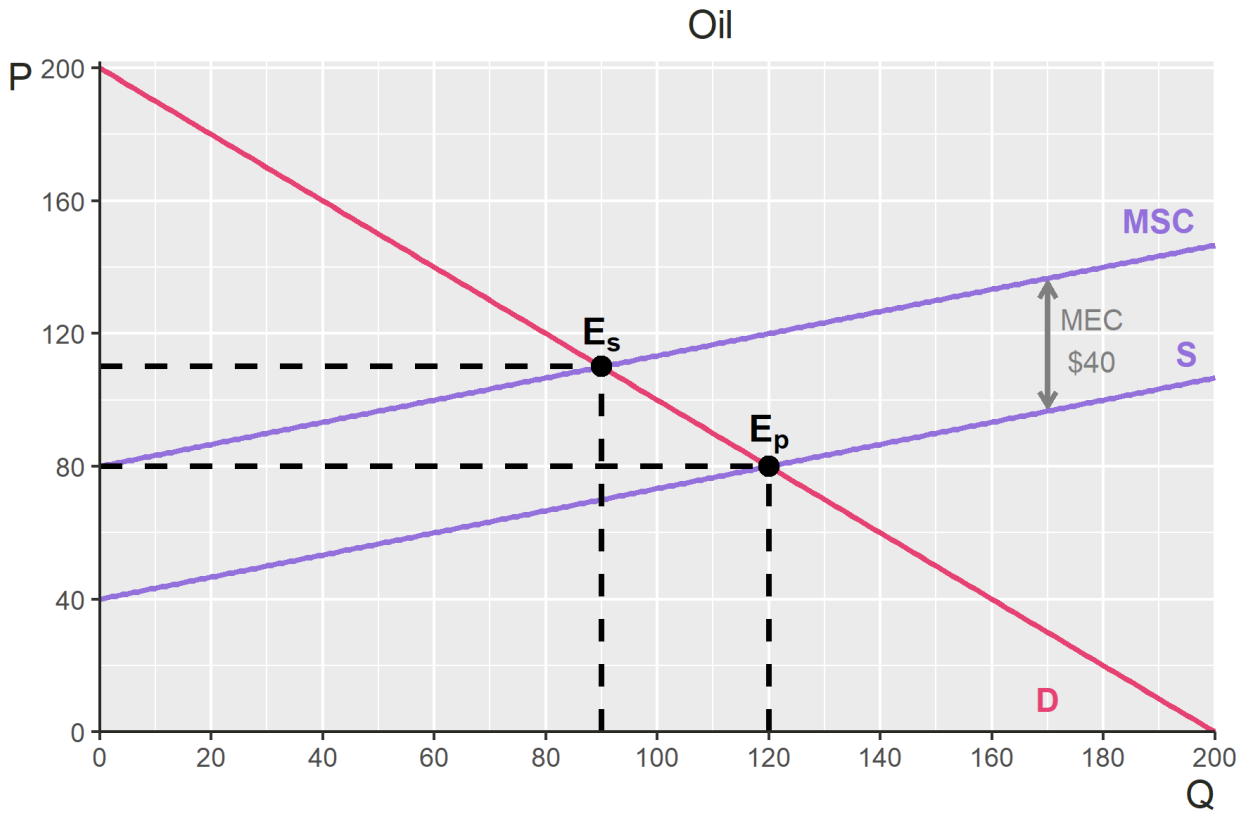
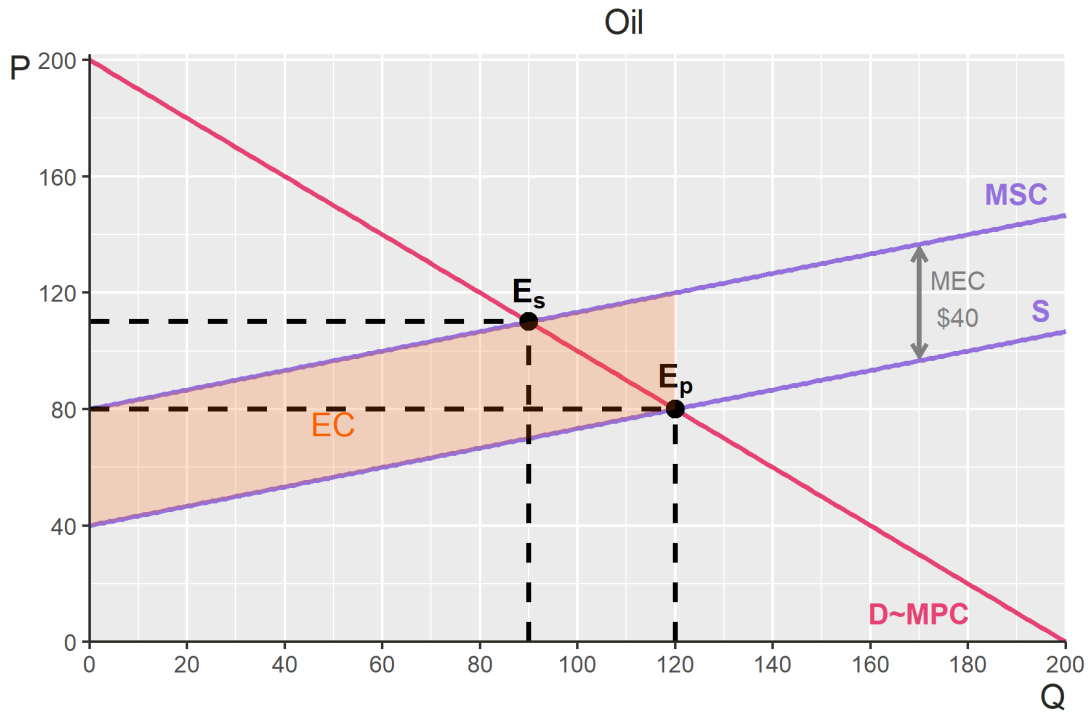



- $E_s$ what society wants people to trade at, while the $E_p$ is where we are at

# Negative Production Externality

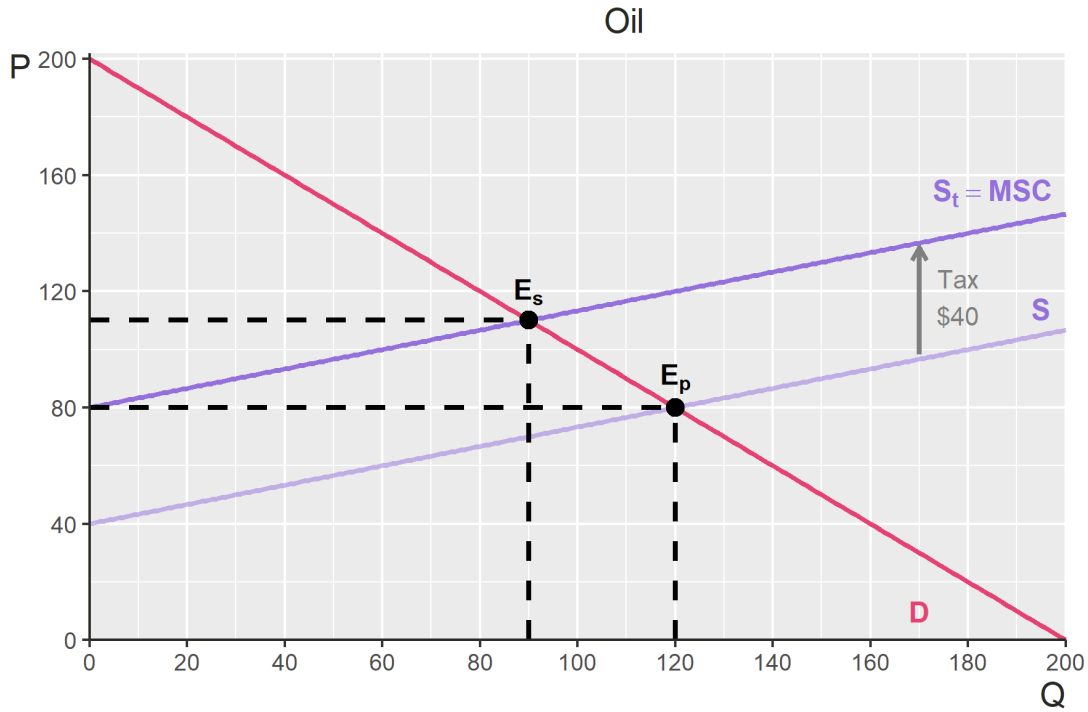
- What is EC?




$$EC = b \cdot h = 120\,(80 - 40) = 4800$$

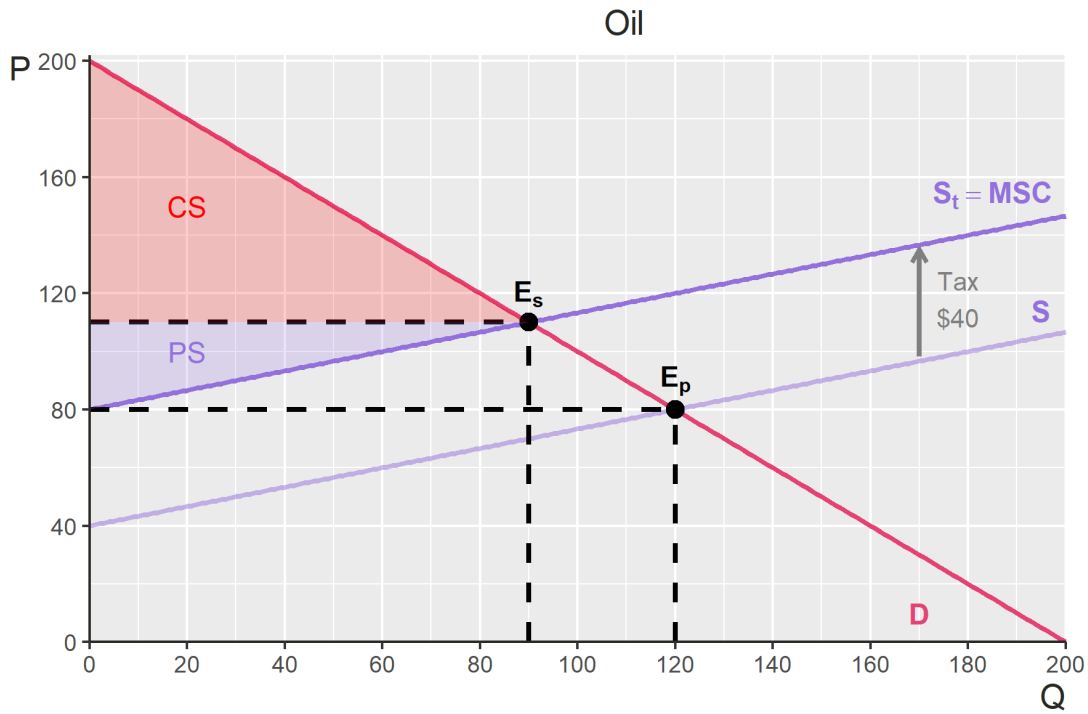
# Negative Production Externality

- Suppose we implement a \$40/unit producer tax to try to diminish production, so that our new supply line is just equal to *MSC*:



# Negative Production Externality

- CS and PS are:



# Negative Production Externality

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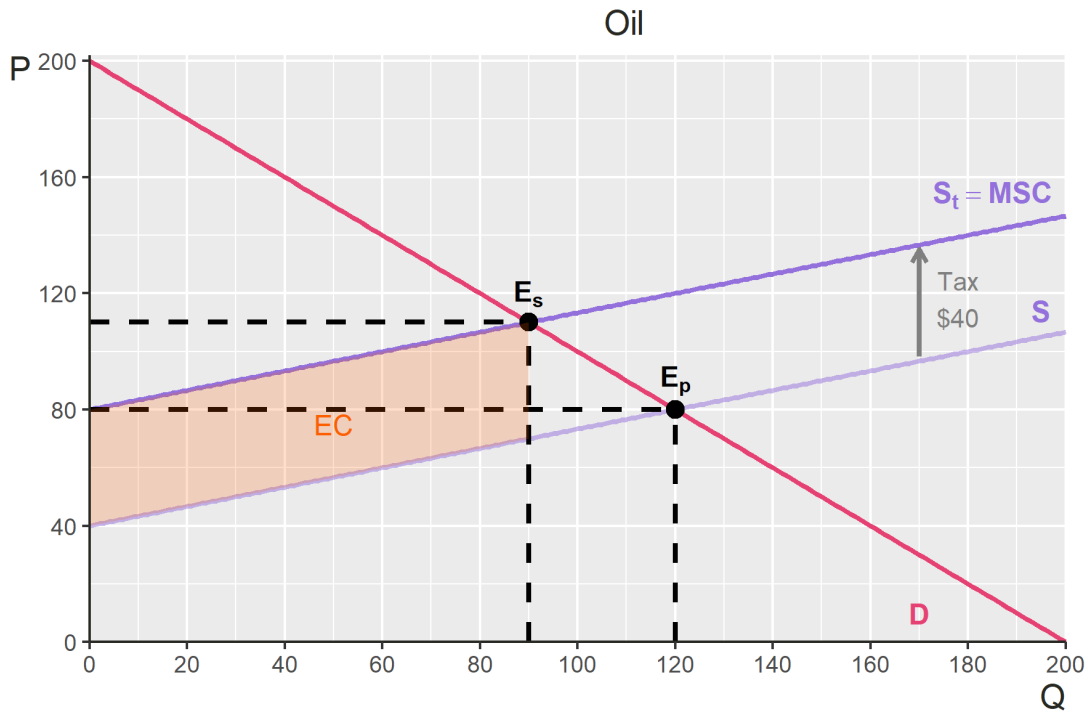
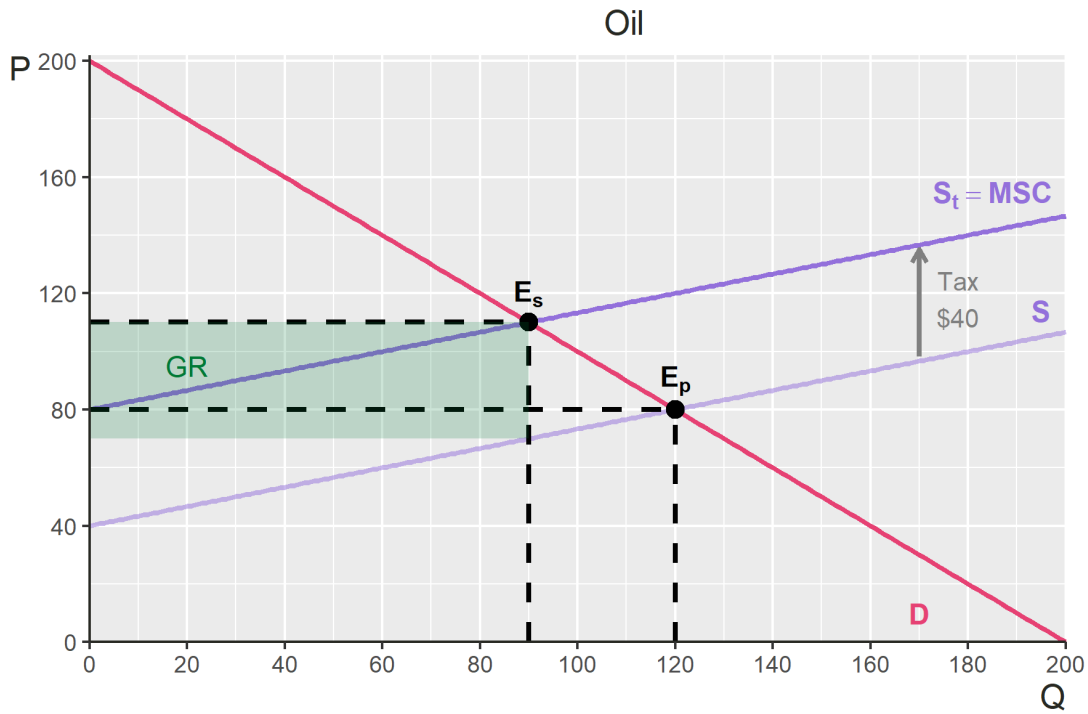



$$EC = (90)(80 - 40) = 3600$$

# Negative Production Externality

- And now, we have some GR



# Negative Production Externality

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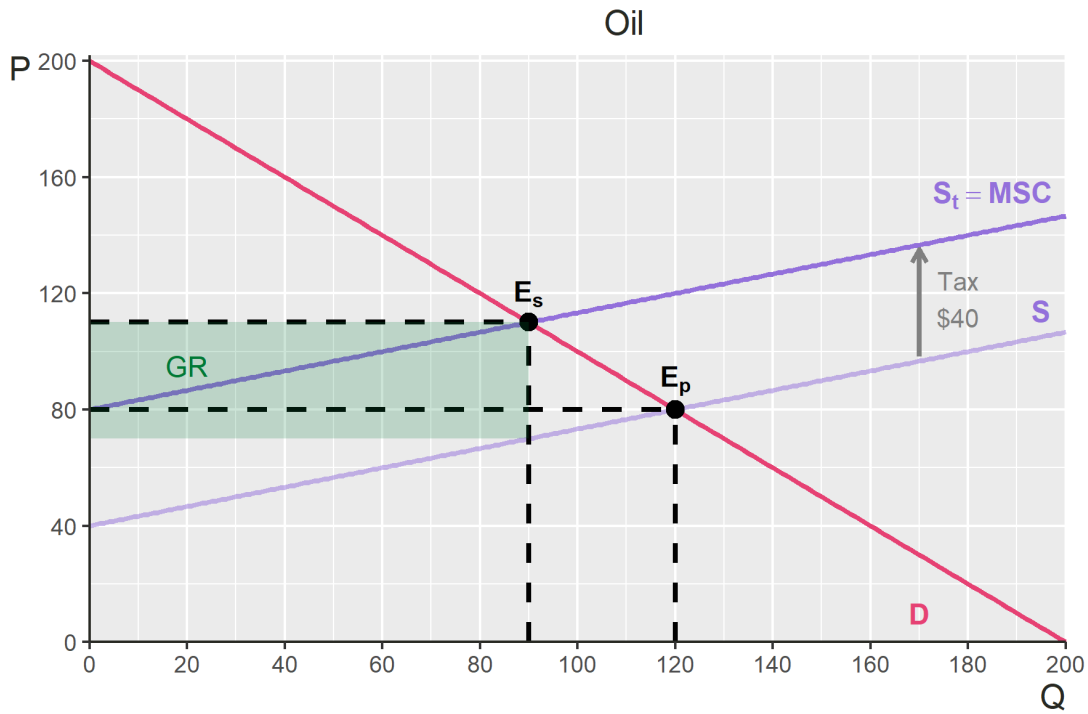
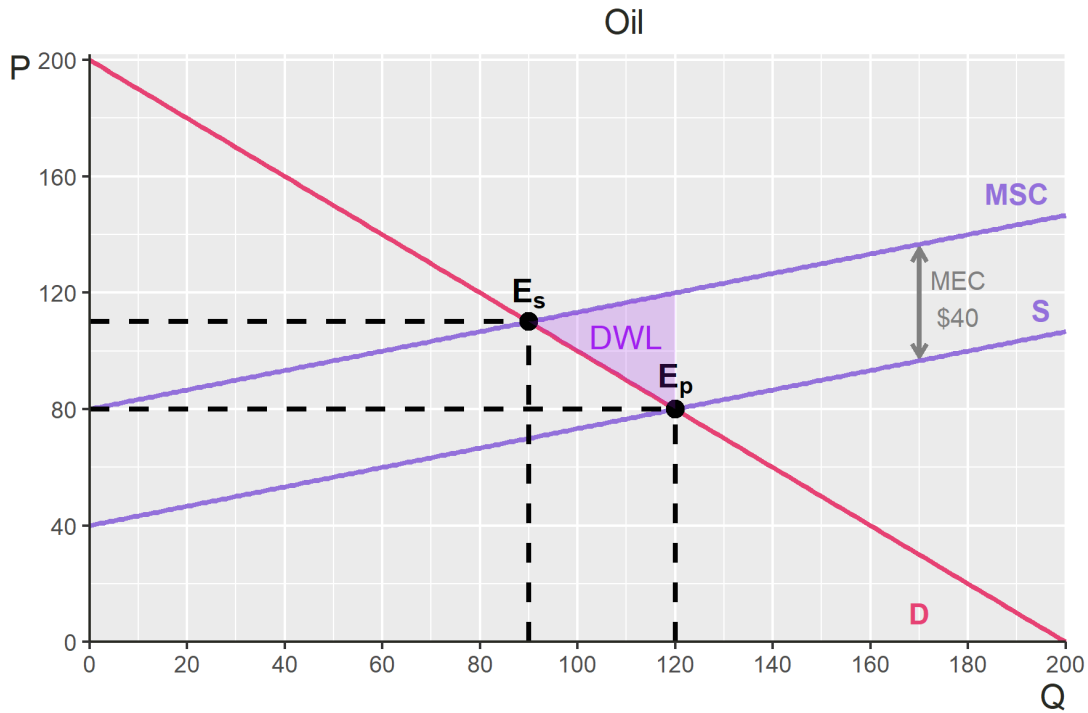



- Again, GR exactly cancels out with the new EC

# Negative Production Externality

- Therefore, DWL before the tax is given by



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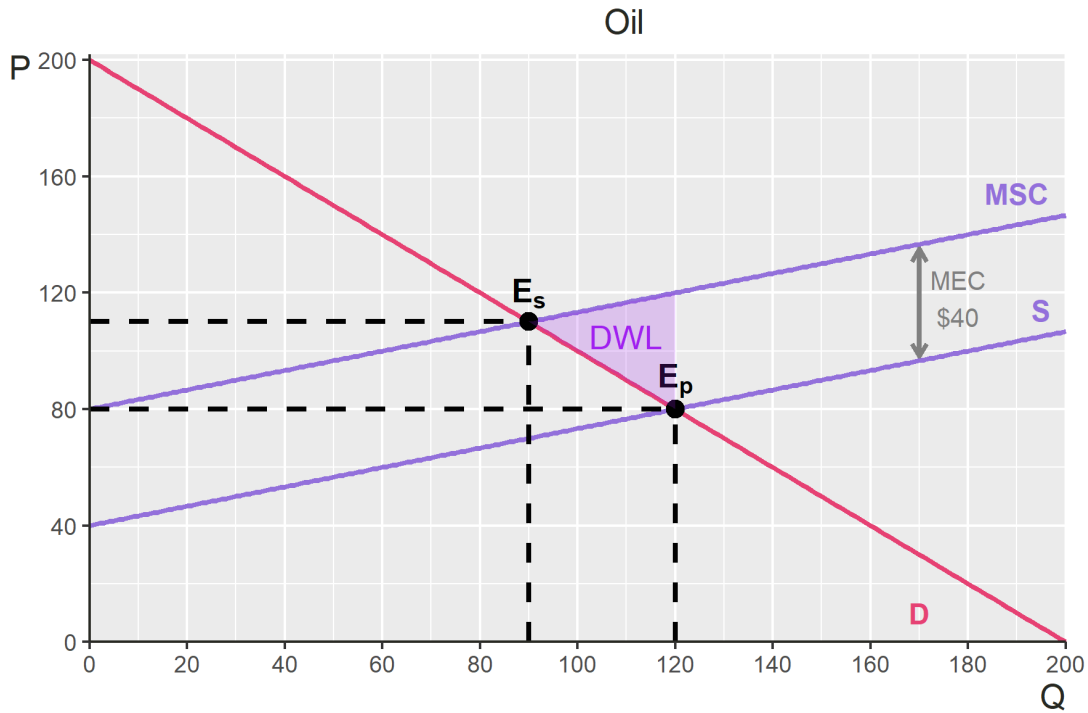


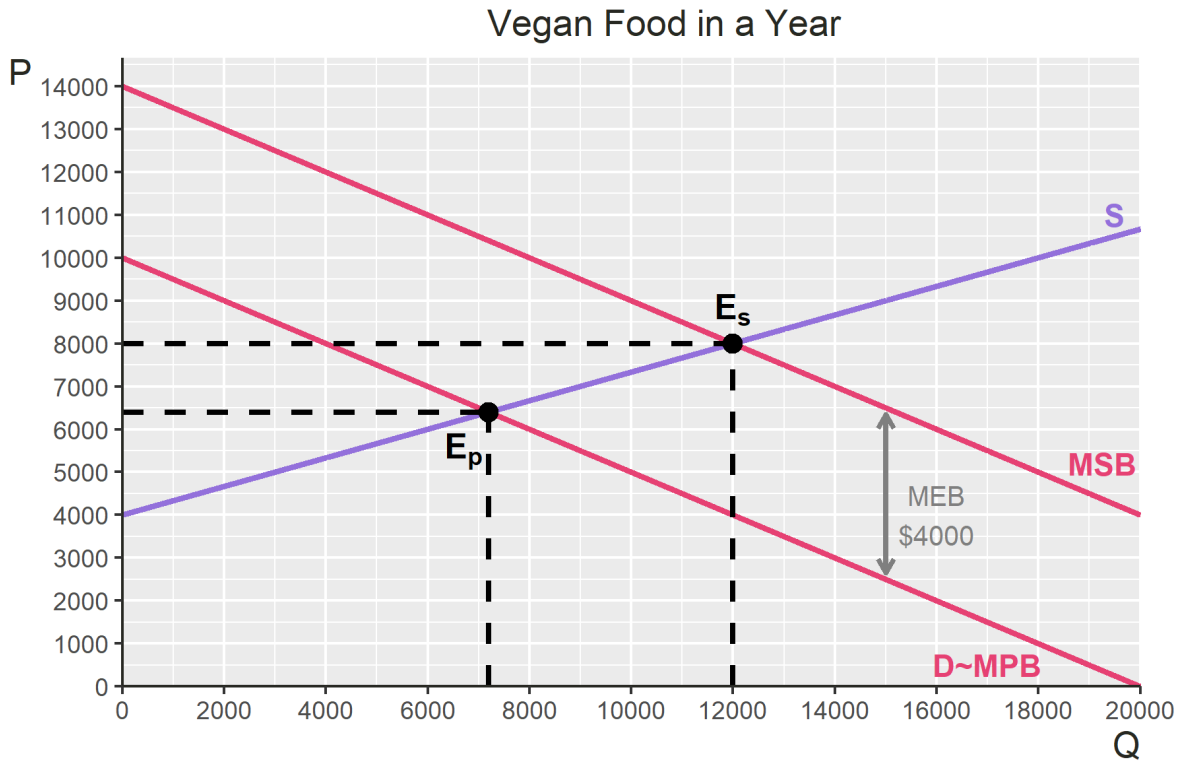

- I leave it to you to calculate the areas of these figures, and email me with any questions

# Positive Consumption Externality

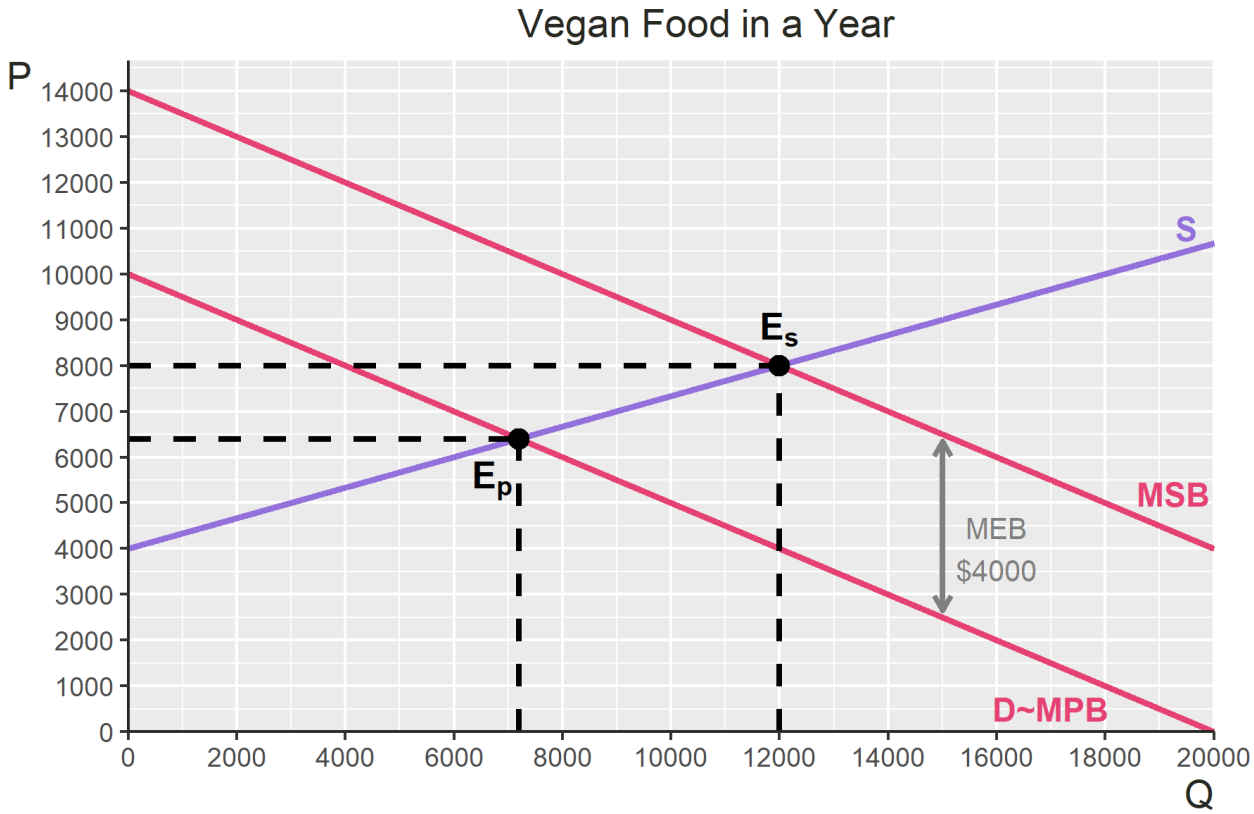
- Consider the market for vegan food, consumed during the entire year (this uses the same numbers as our solar panel example)

# Positive Consumption Externality

- Consider the market for vegan food, consumed during the entire year (this uses the same numbers as our solar panel example)
- Suppose the marginal external benefit, through health expenses and environmental costs, is \$4000



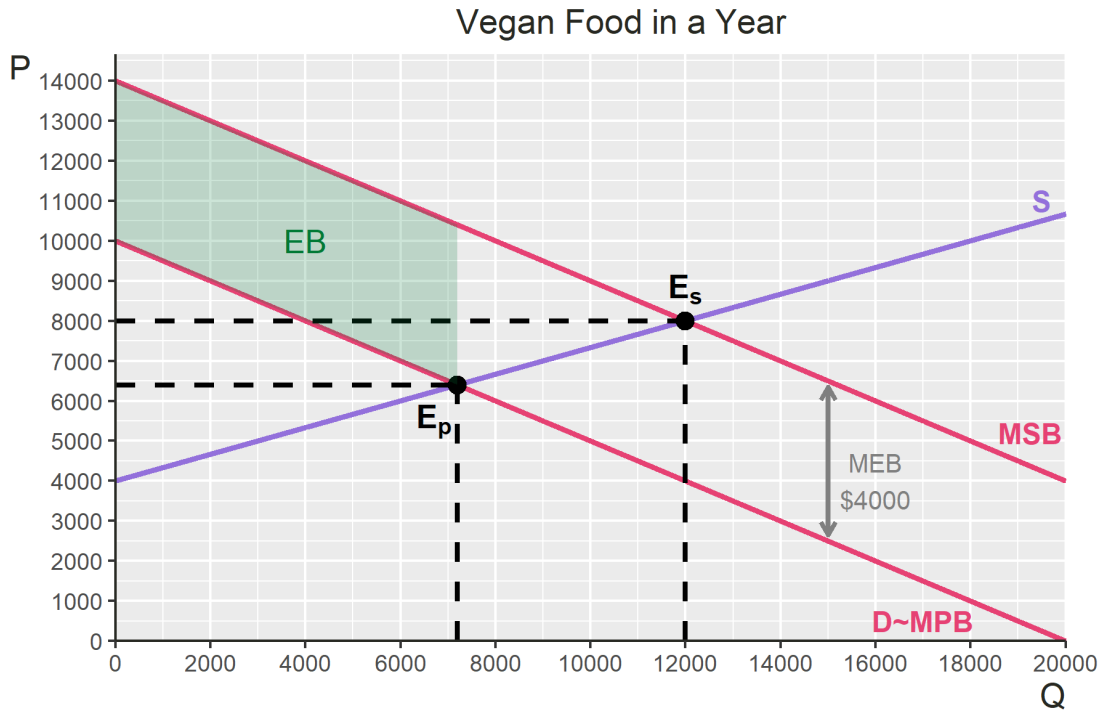
# Positive Consumption Externality




- $E_s$, how much vegan food society wants to be consumed, due to the benefits, while $E_p$ is what happens in reality

# Positive Consumption Externality

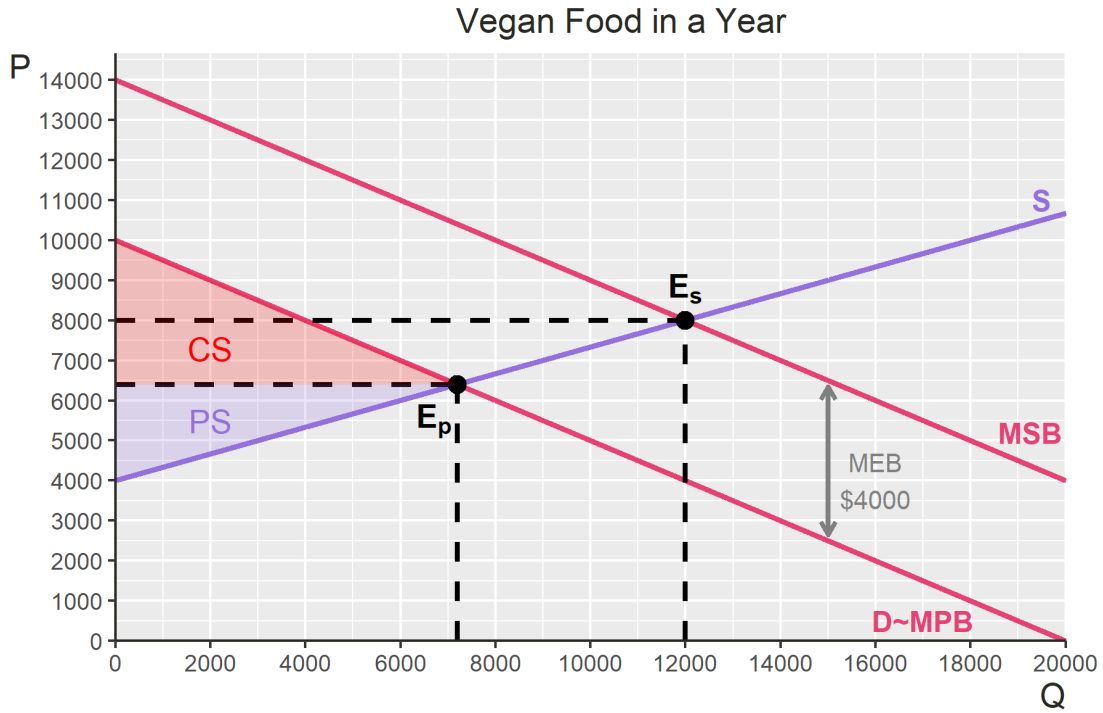
- What is EB in private equilibrium?




$$EB = b \cdot h = 7200\,(14000 - 10000) = 28.8M$$

# Positive Consumption Externality

- What is CS+PS in private equilibrium?




$$CS = \frac{1}{2}(7200)(10000 - 6400) = 12.96M$$

$$PS = \frac{1}{2}(7200)(6400 - 4000) = 8.64M$$

# Positive Consumption Externality

- Thus, total surplus is in private equilibrium is

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- Can we do better?

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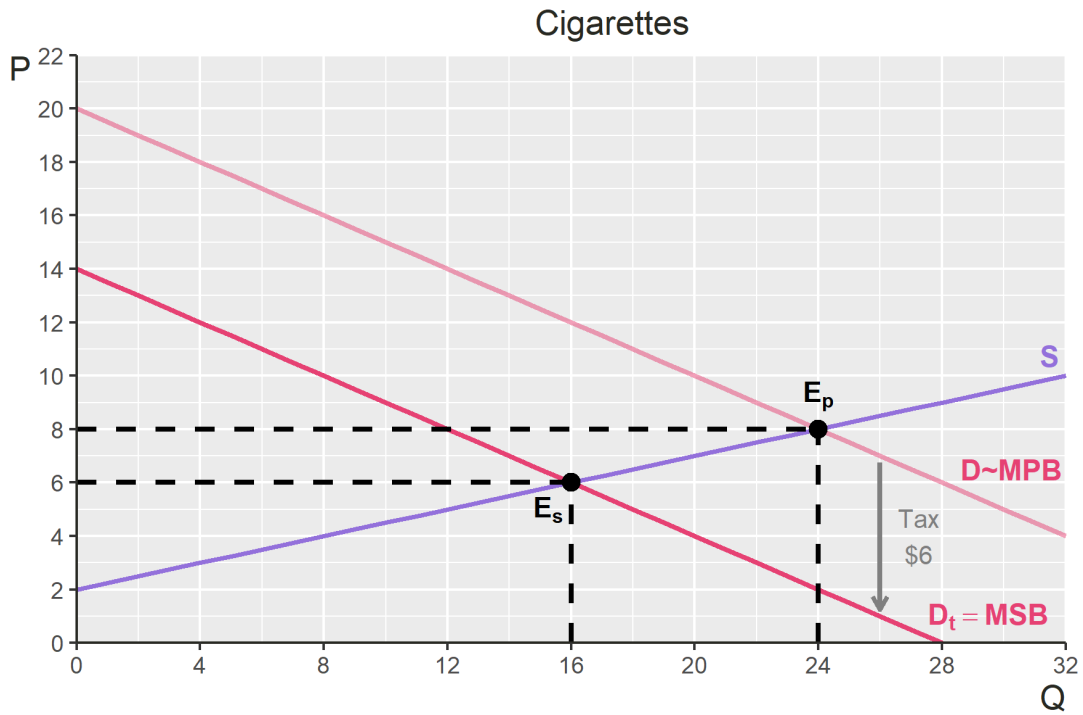
- How much do we pay them?
- The exact amount of the marginal external benefit!

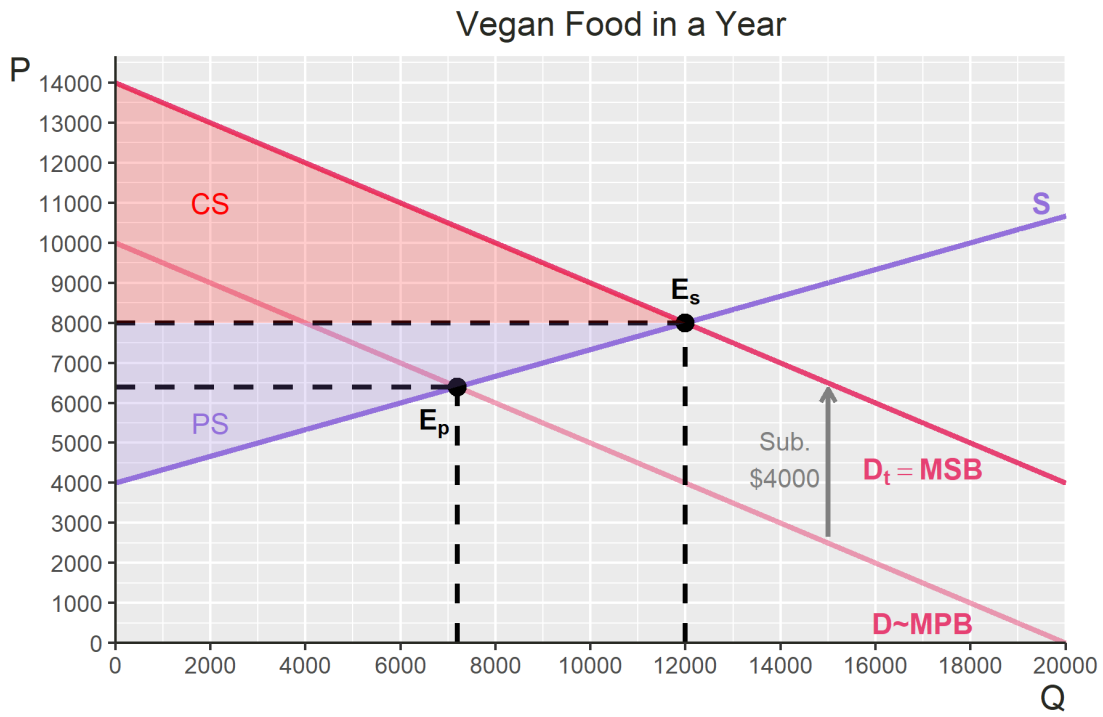
# Positive Consumption Externality

- With a \$4000 subsidy, demand becomes MSB:



# Positive Consumption Externality

- CS and PS are as expected:




$$CS = \frac{1}{2}(12000)(14000 - 8000) = 36M$$

$$PS = \frac{1}{2}(12000)(8000 - 4000) = 24M$$

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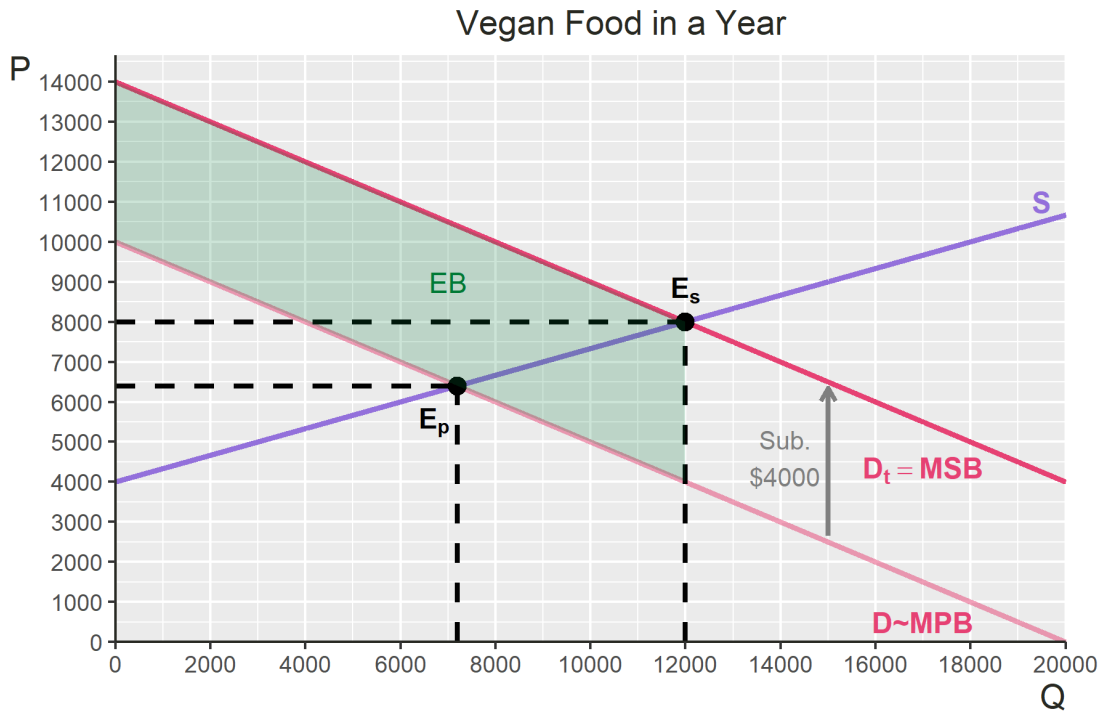
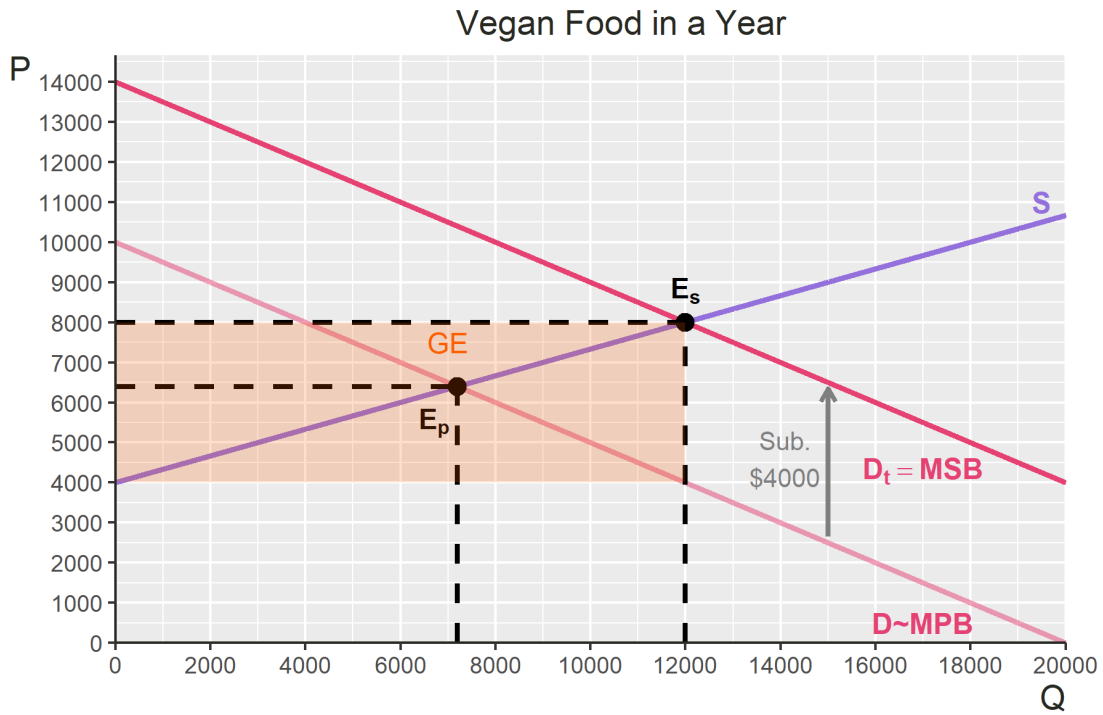



$$EB = (12000)(14000 - 10000) = 48M$$

# Positive Consumption Externality

- And now, we have some GE




$$GE = (12000)(8000 - 4000) = 48M$$

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$$TS = CS + PS + EB - GE = 36M + 24M + 48M - 48M = 60M$$

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  - This is the key lesson: a subsidy will fix a positive externality

# Positive Consumption Externality

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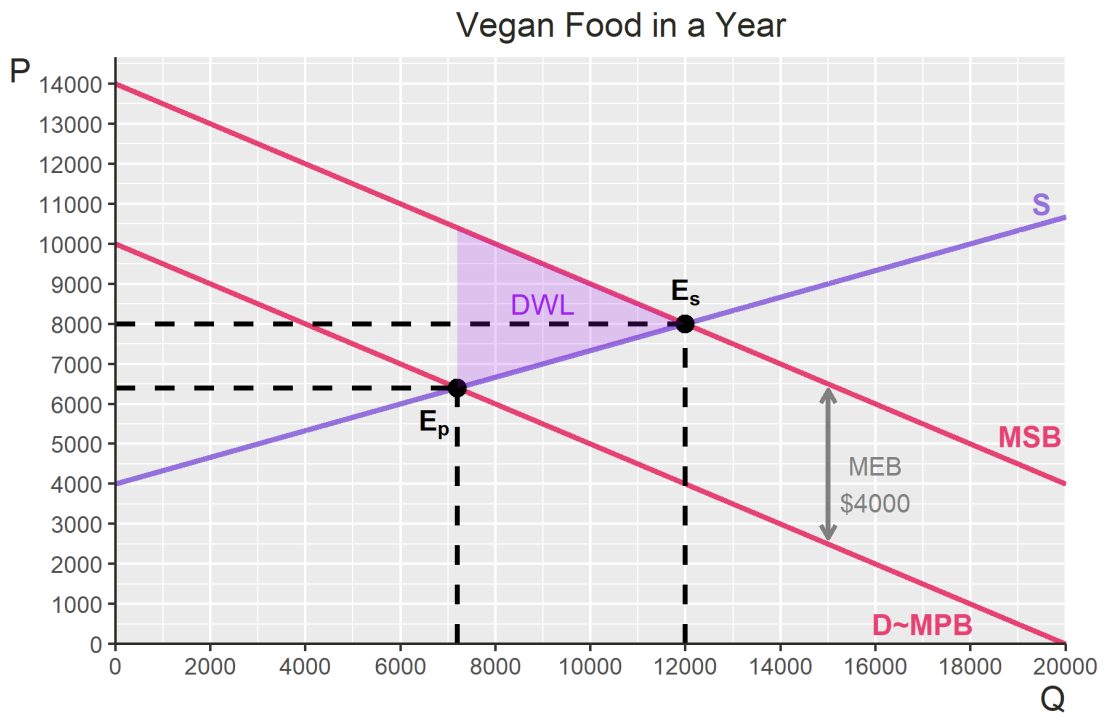


$$DWL = \frac{1}{2}(12000 - 7200)(8000 - 4000) = 9.6M$$

# Aside: Coase Theorem

- If property rights exist, transaction costs are low, and there are few parties involved, then private actors can bargain to eliminate the deadweight loss associated with an externality

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- You may see this here and there, but it is not common enough for me to dive into or test you on; it is just something that is commonly taught

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