Intro to Economic Analysis: Microeconomics

EC 201 - Day 14 Slides

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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

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- This is a bit confusing in words, let's look at some examples

Negative Consumption Externality

- Consider our cigarette example again: suppose it costs society $6 for every dart smoked

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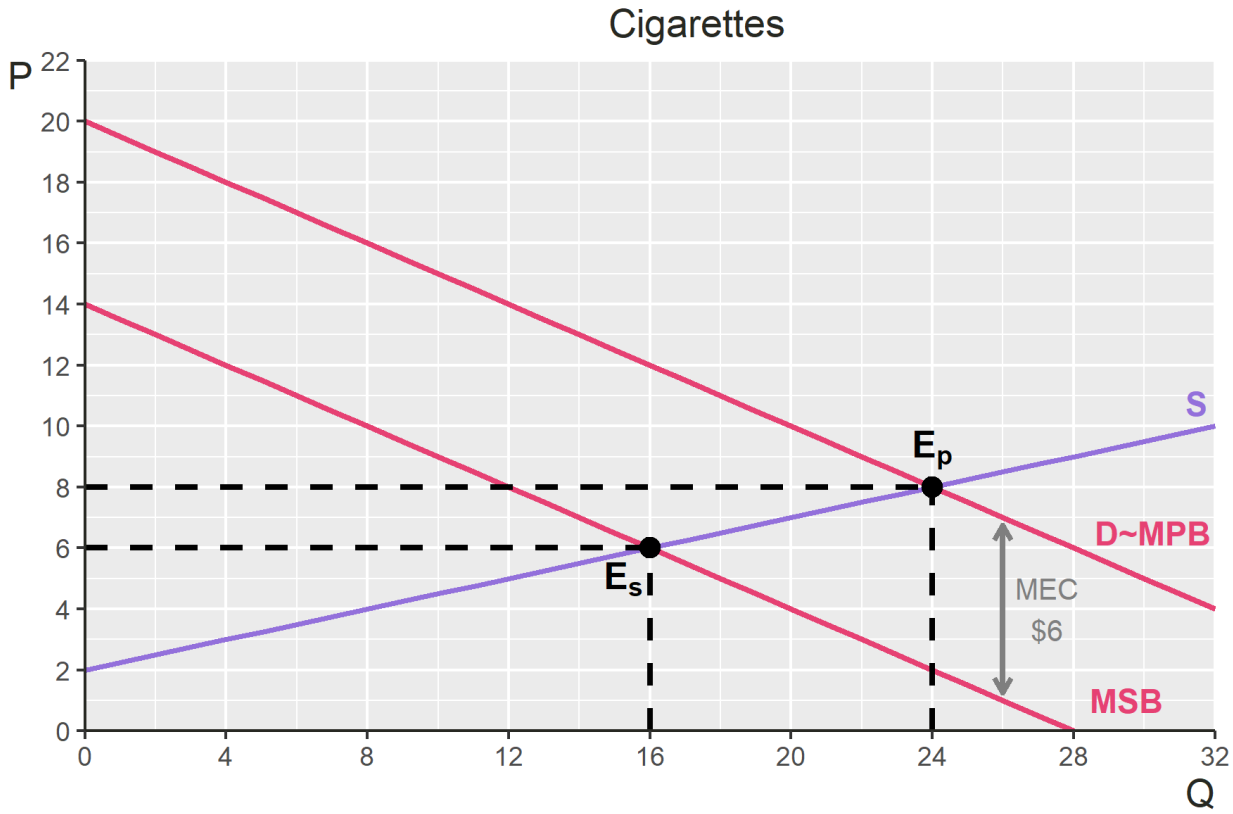
- Since MEC= \$6, we get the following diagram



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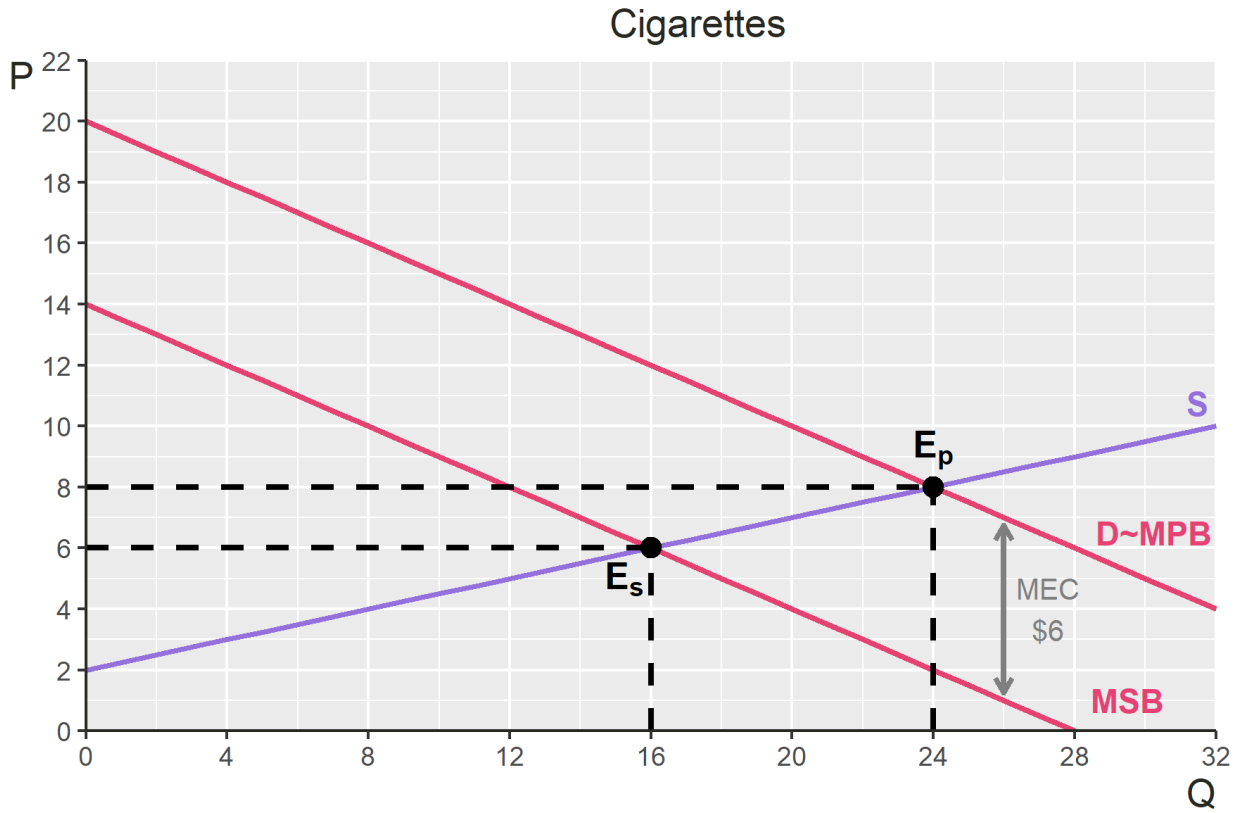

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[1] Another term for externality

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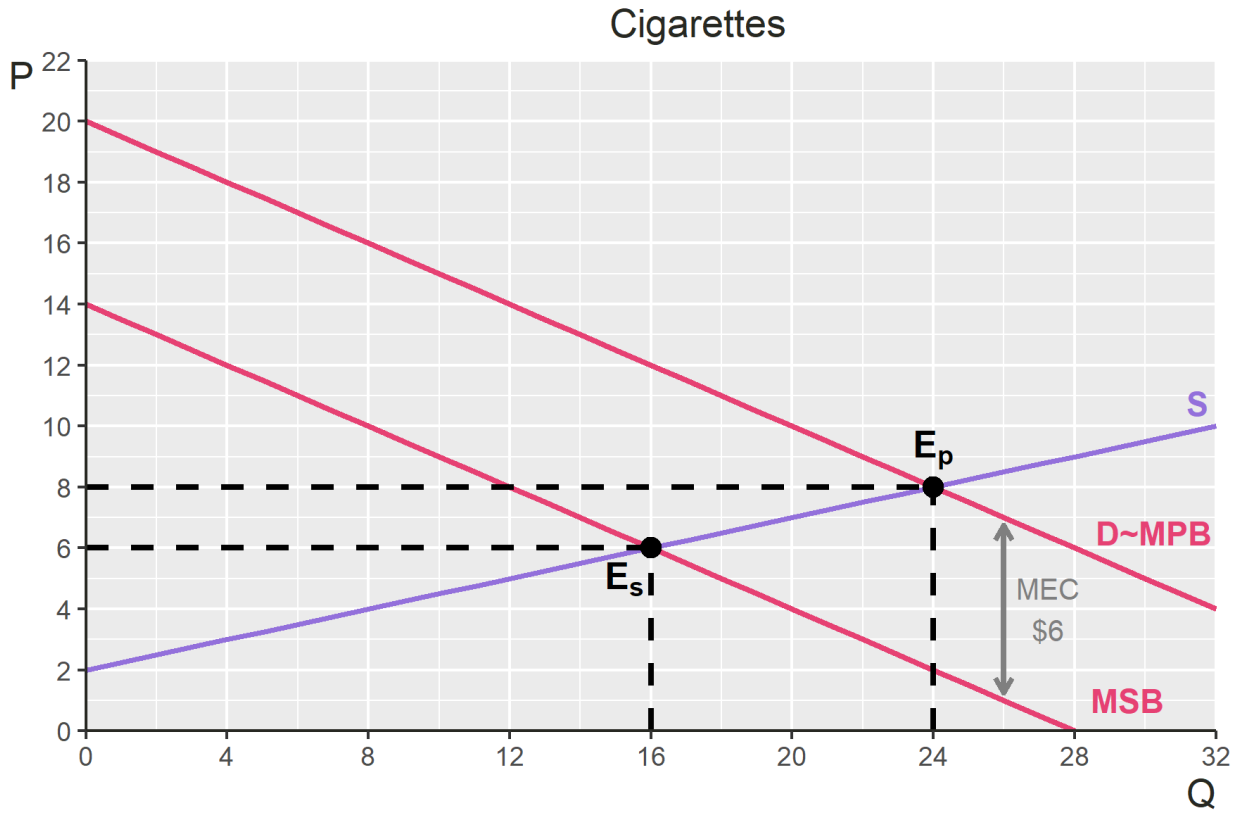

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External Cost and External Benefit

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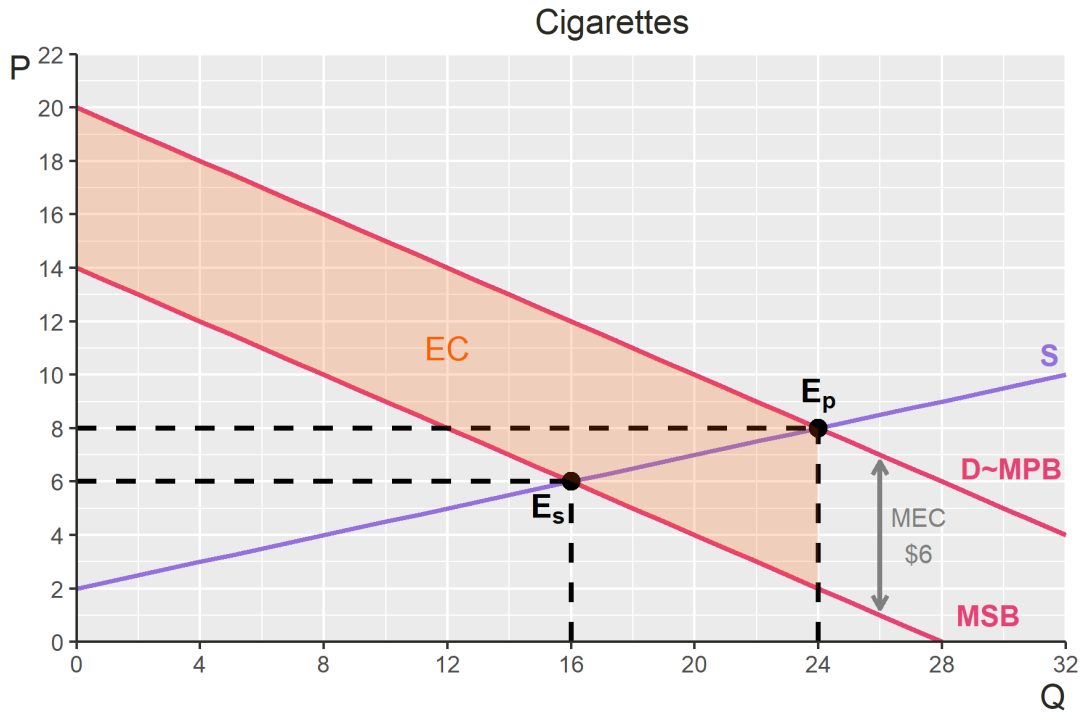
- EB is counted *positively* into TS, while EC is counted *negatively* into TS
- EB and EC will always be parallelograms. The area of a parallelogram is $b \cdot h$
- EB is equal to the MEB times the amount traded, EC is equal to the MEC times the amount traded

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

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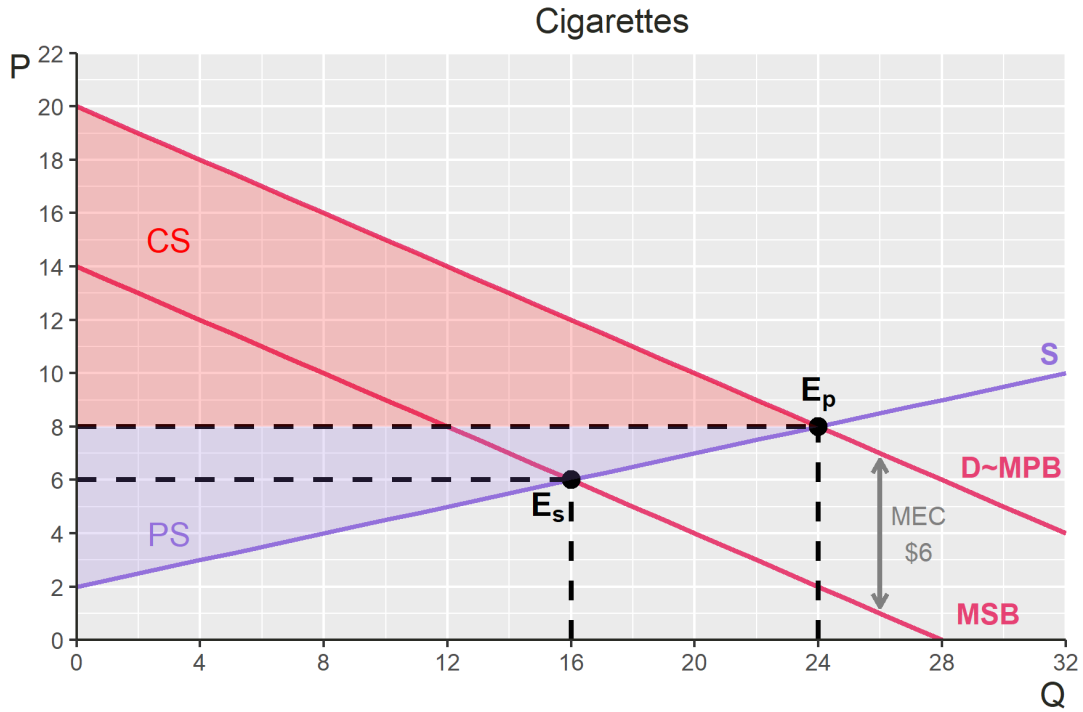
- What is CS+PS in our cigarettes market, assuming the market is at private equilibrium?



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

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

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- Thus, total surplus is in private equilibrium is

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- Can we do better?

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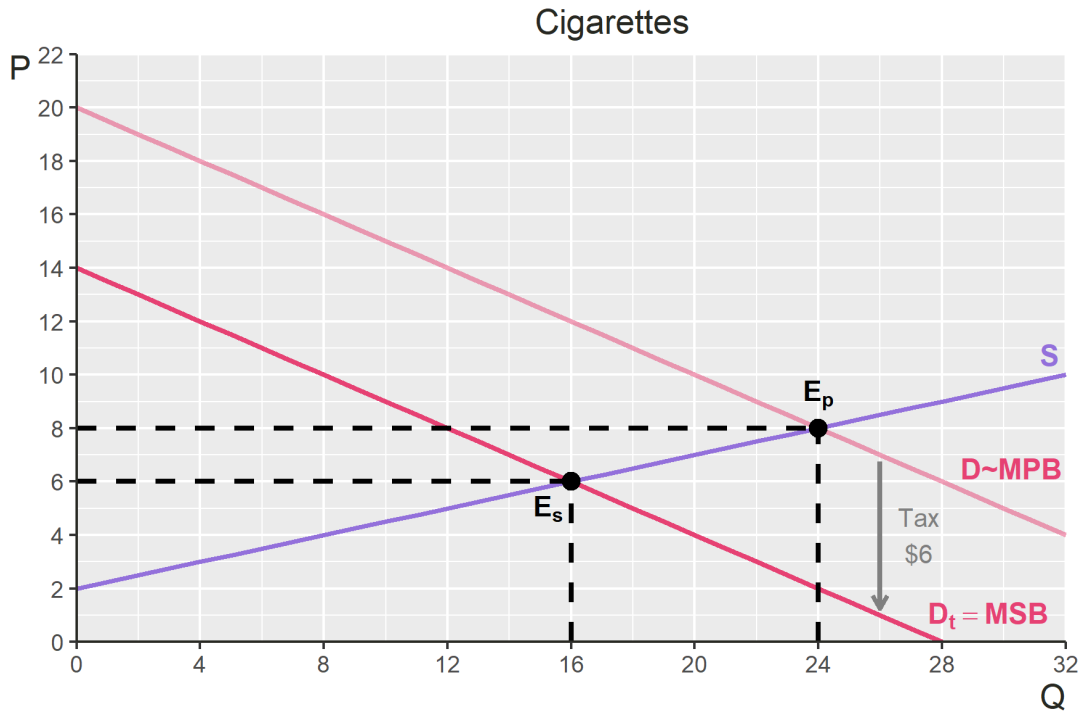
- The exact amount of the marginal external cost!

Negative Consumption Externality

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



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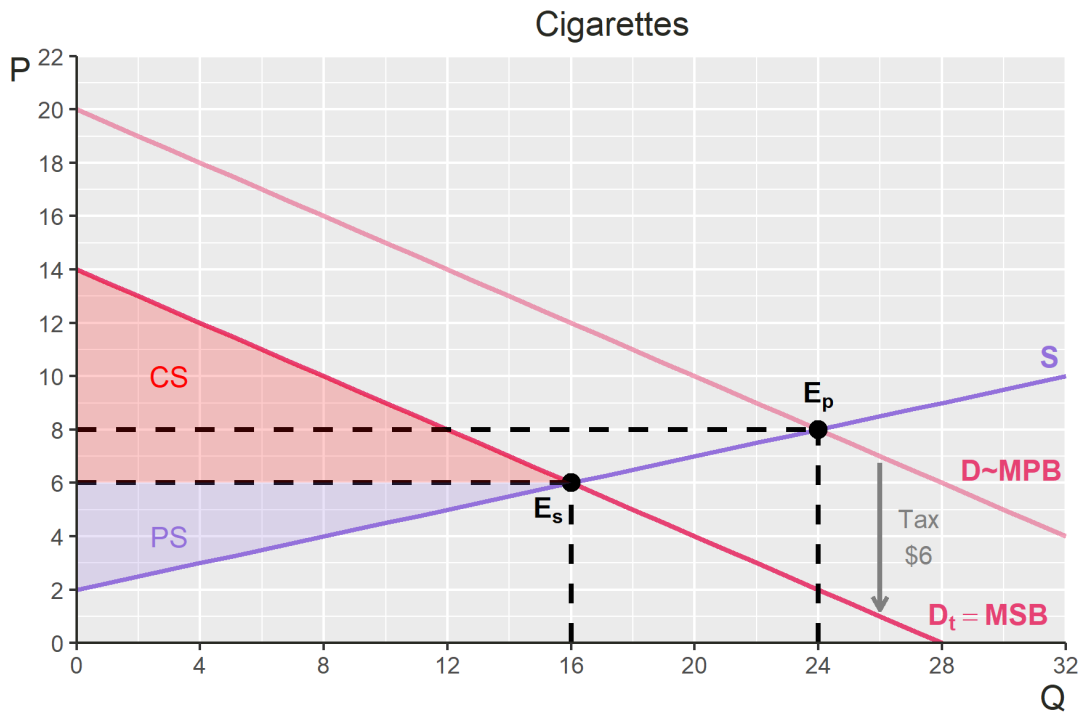
- CS and PS are as expected:

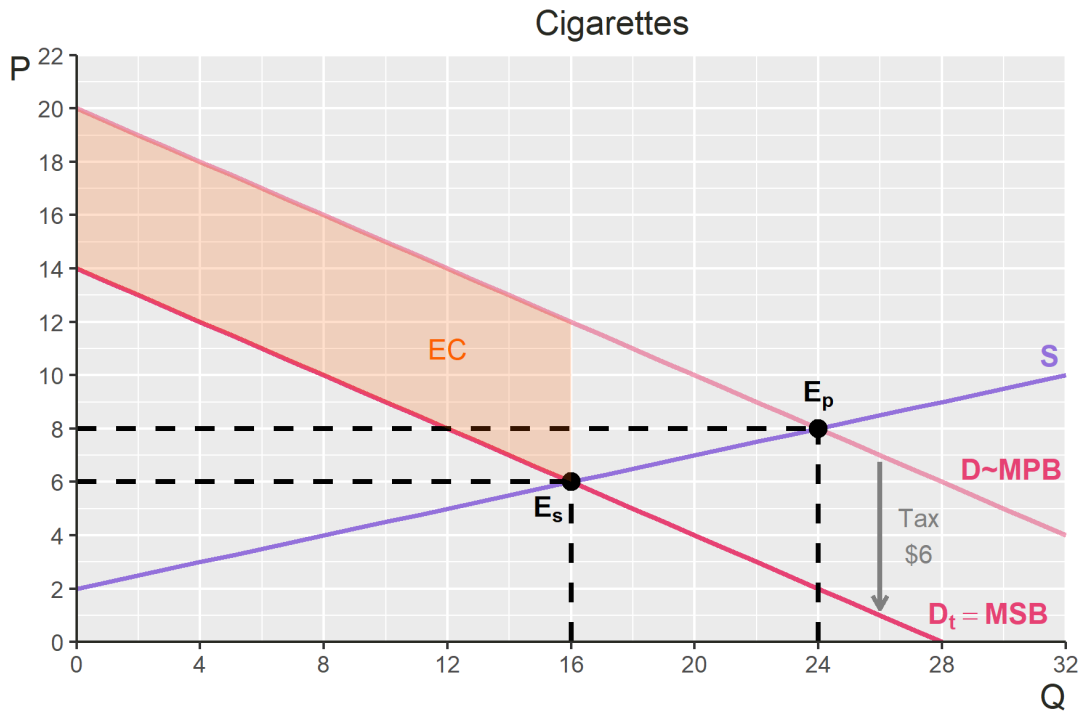


$$CS = \frac{1}{2}(16)(14-6) = 64$$

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

Negative Consumption Externality

- The EC is now given by



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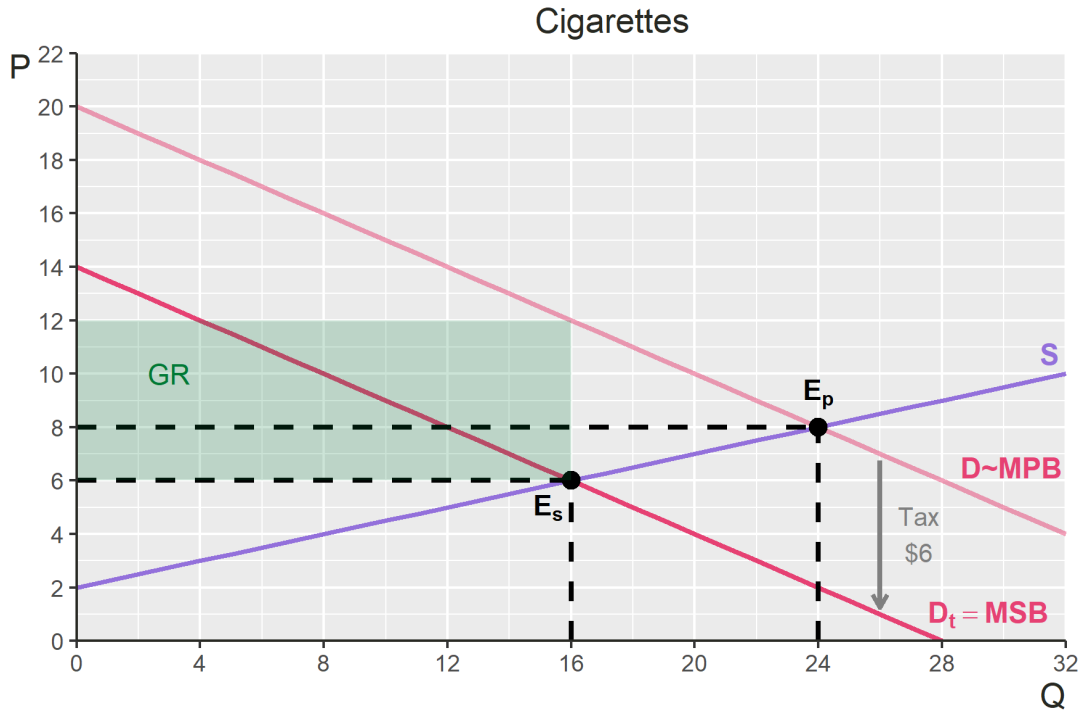
Negative Consumption Externality

- And now, we have some GR



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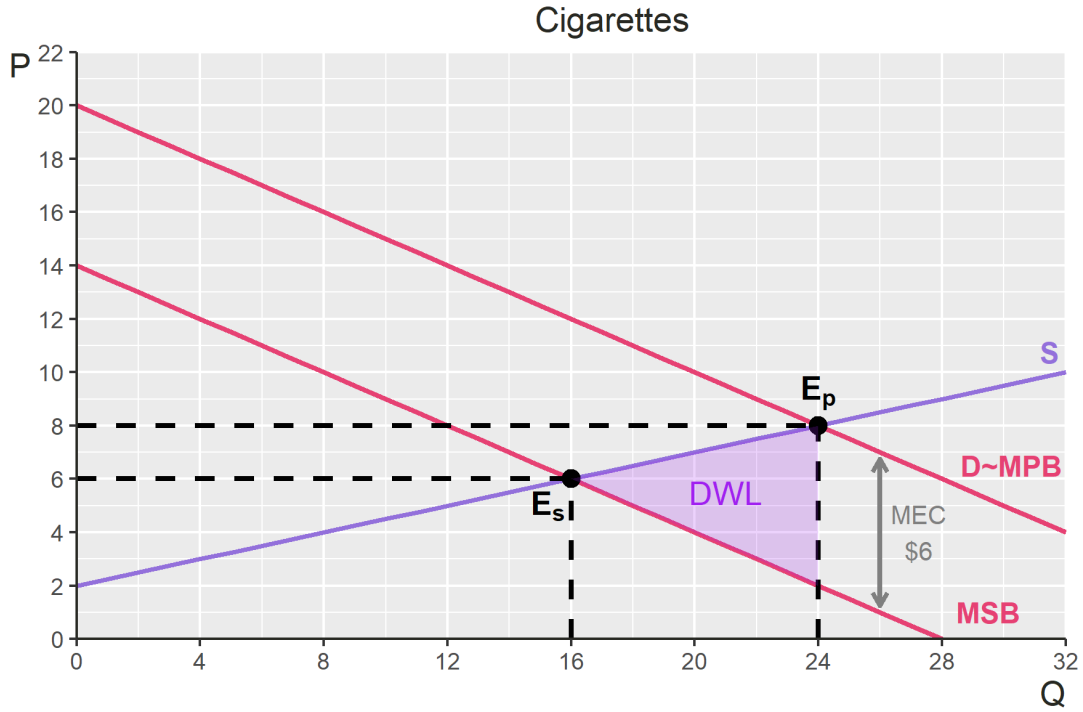
  - This is the key lesson: a tax will fix an negative externality

Negative Consumption Externality

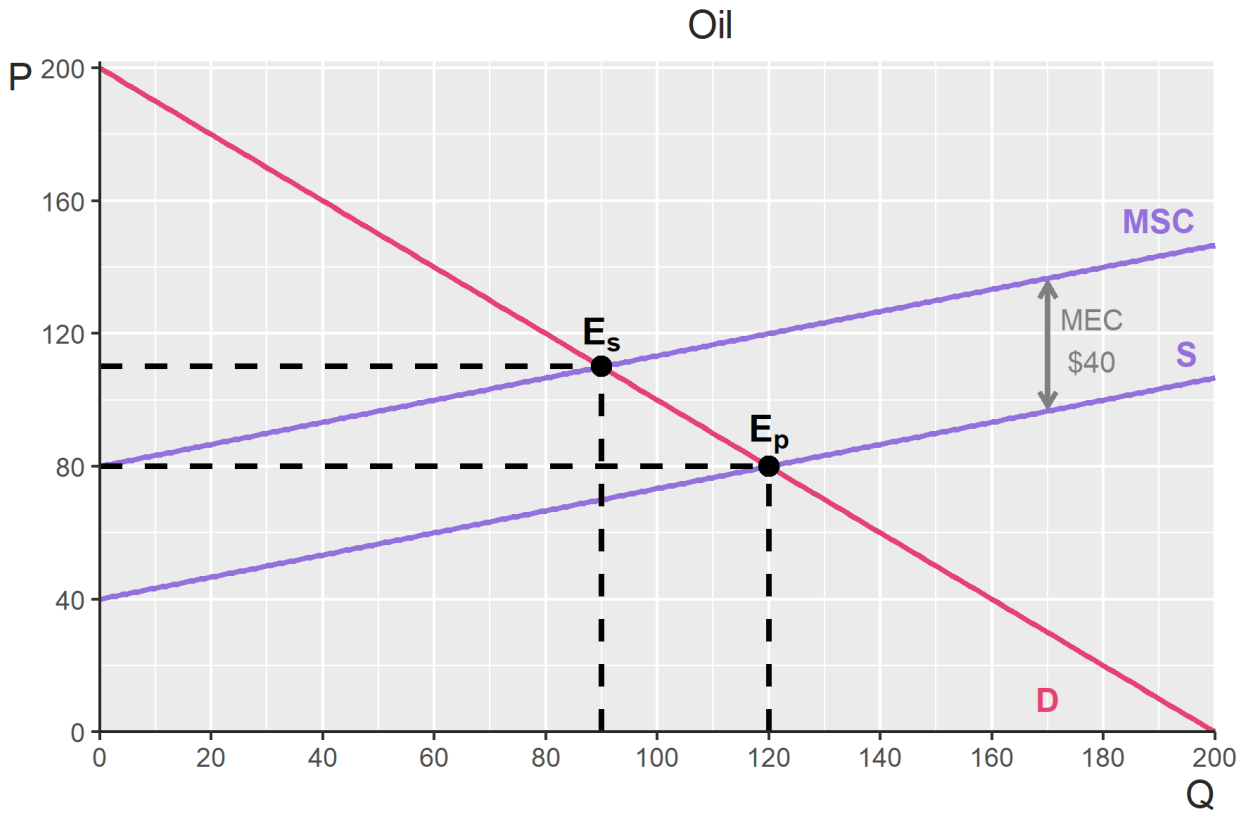
- Therefore, DWL before the tax is given by



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

Negative Production Externality

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



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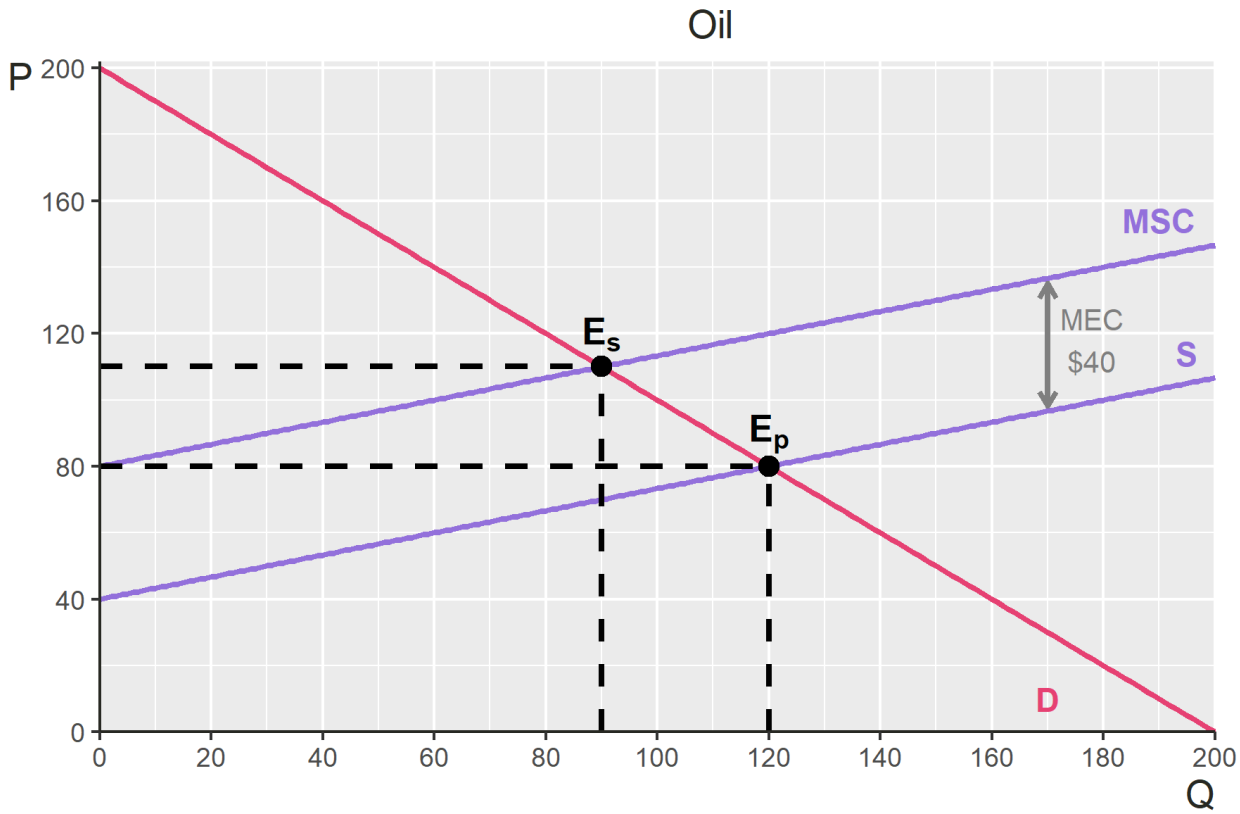

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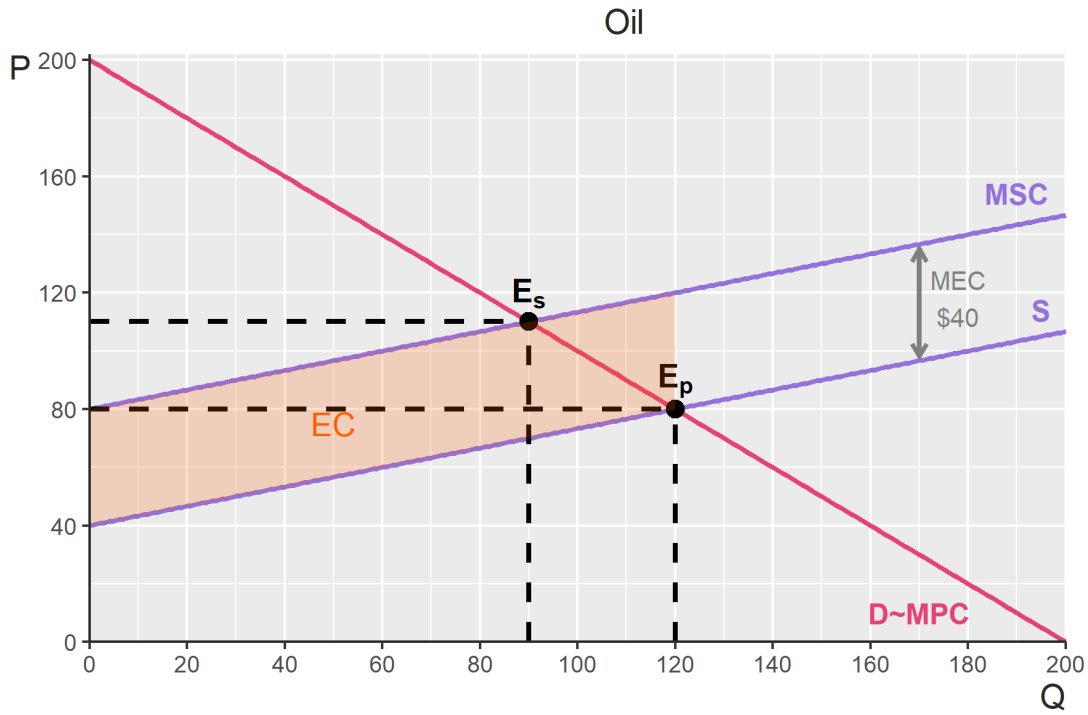
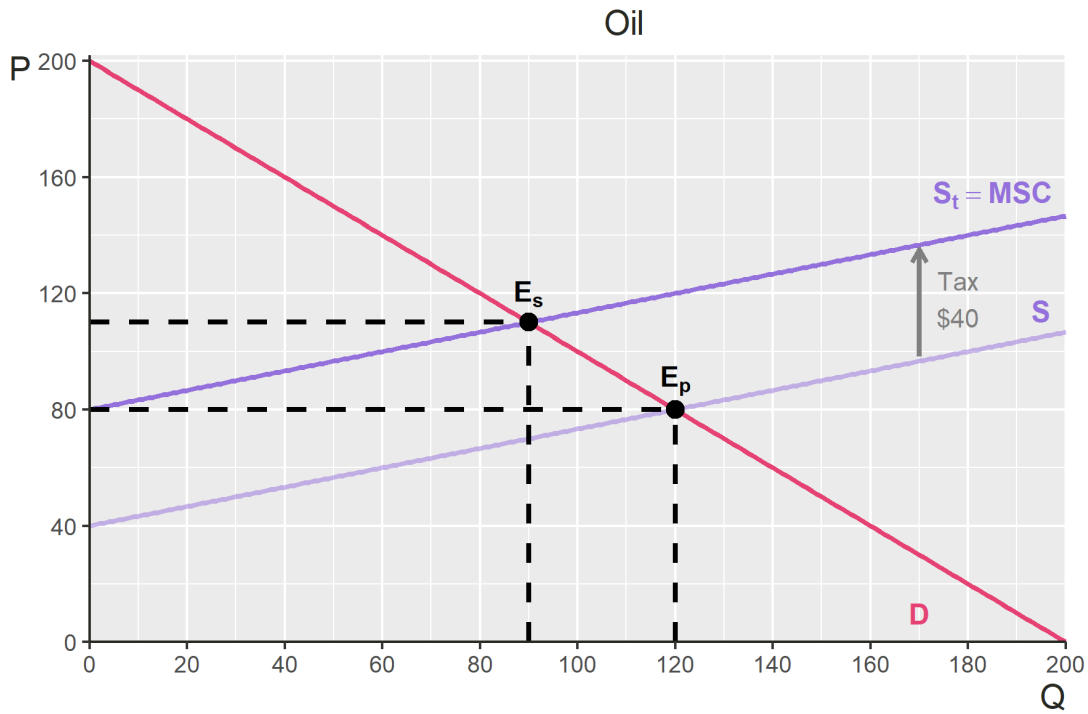
- What is EC?



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

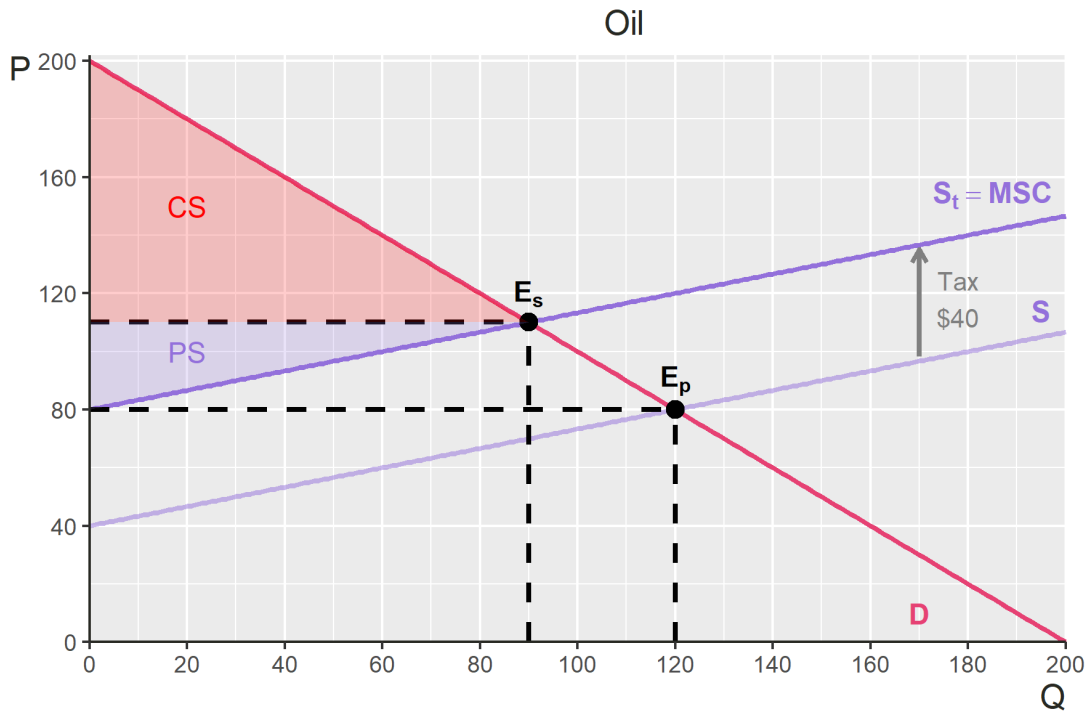
Negative Production Externality

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



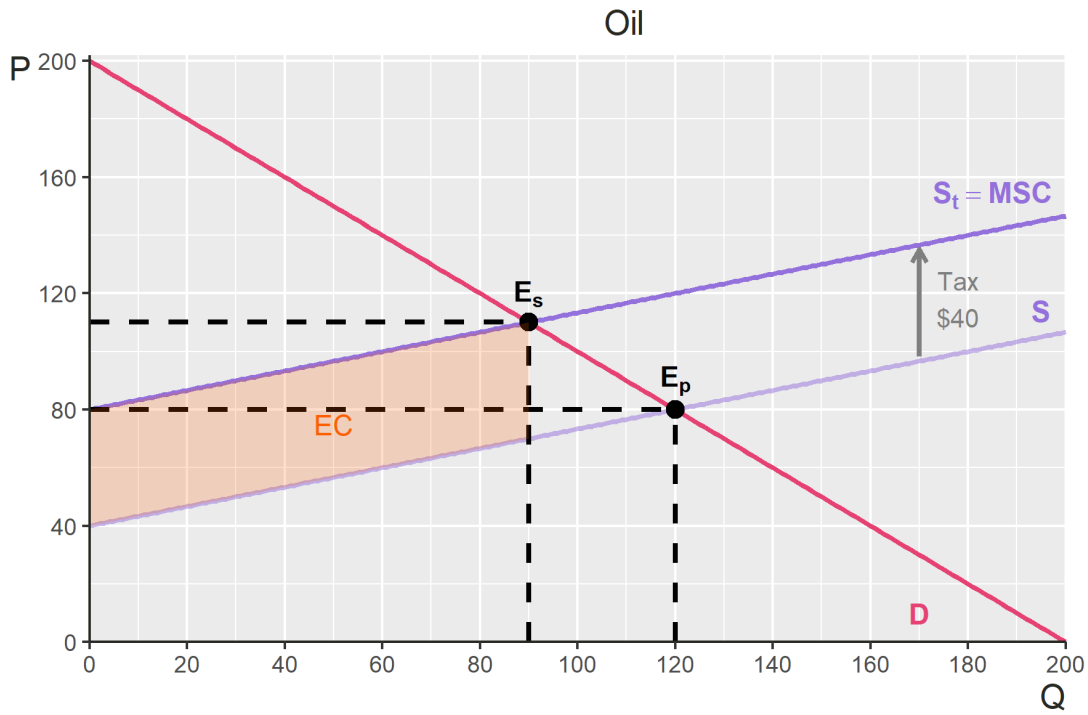
Negative Production Externality

- CS and PS are:



Negative Production Externality

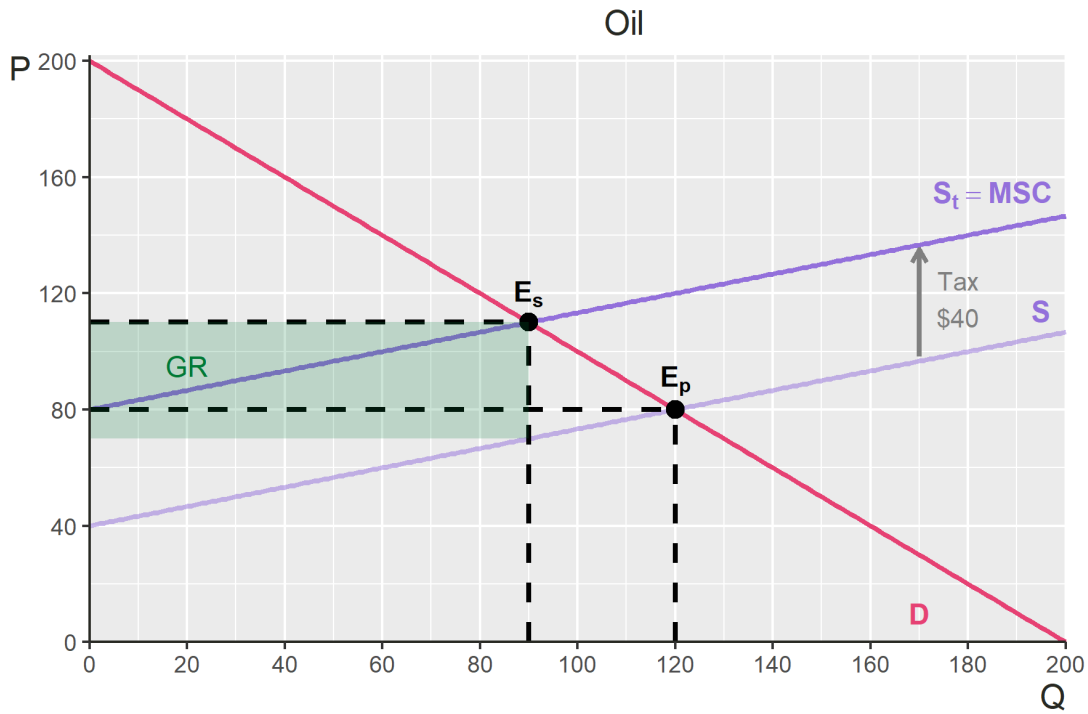
- The EC is now given by



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

Negative Production Externality

- And now, we have some GR



Negative Production Externality

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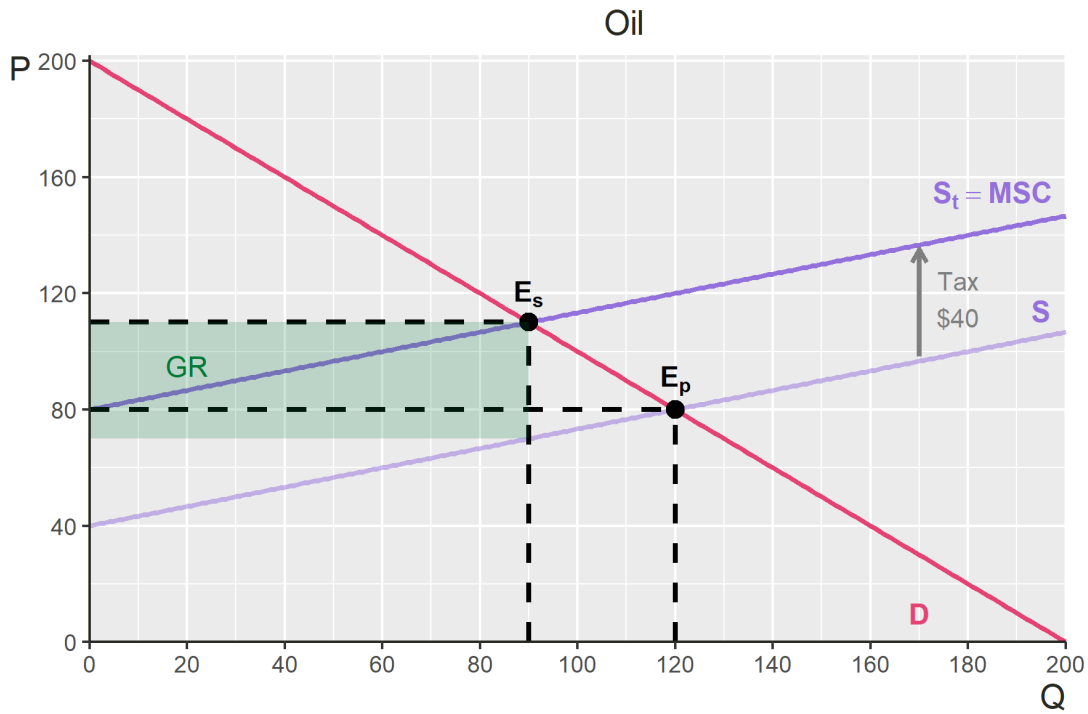
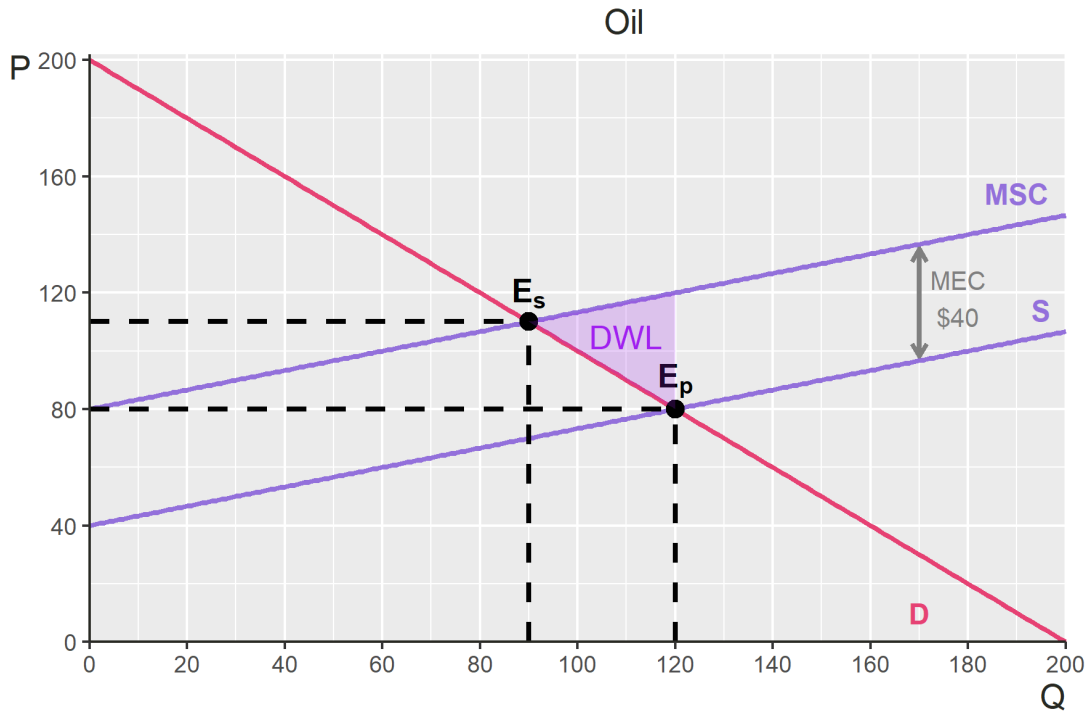


- Again, GR exactly cancels out with the new EC

Negative Production Externality

- Therefore, DWL before the tax is given by



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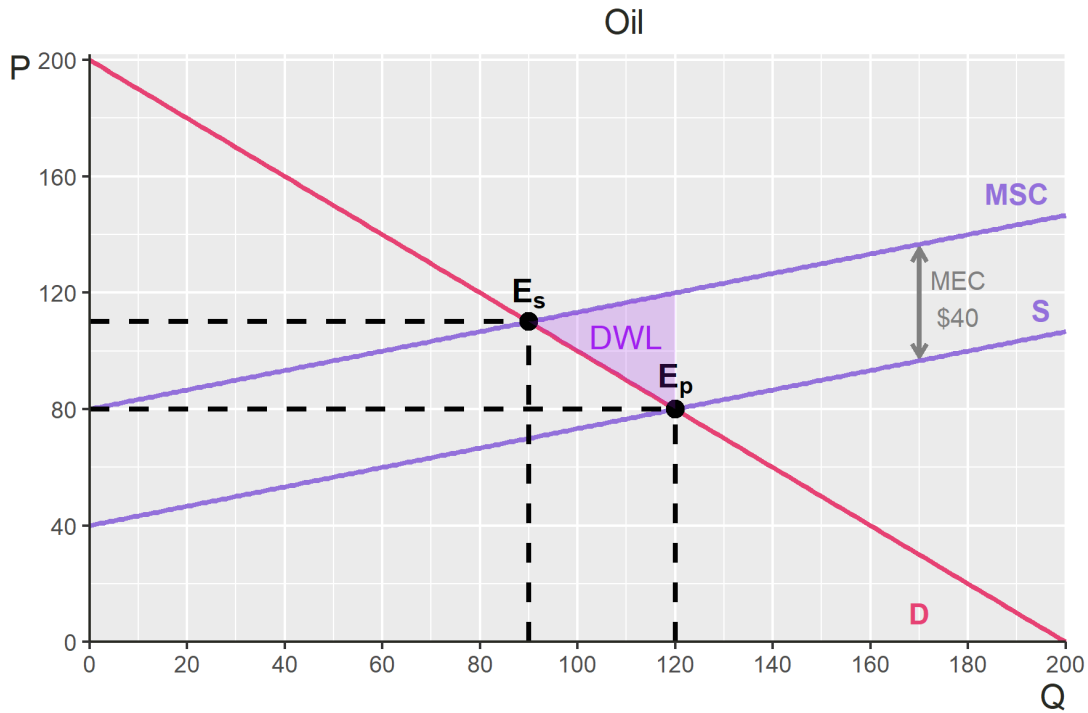


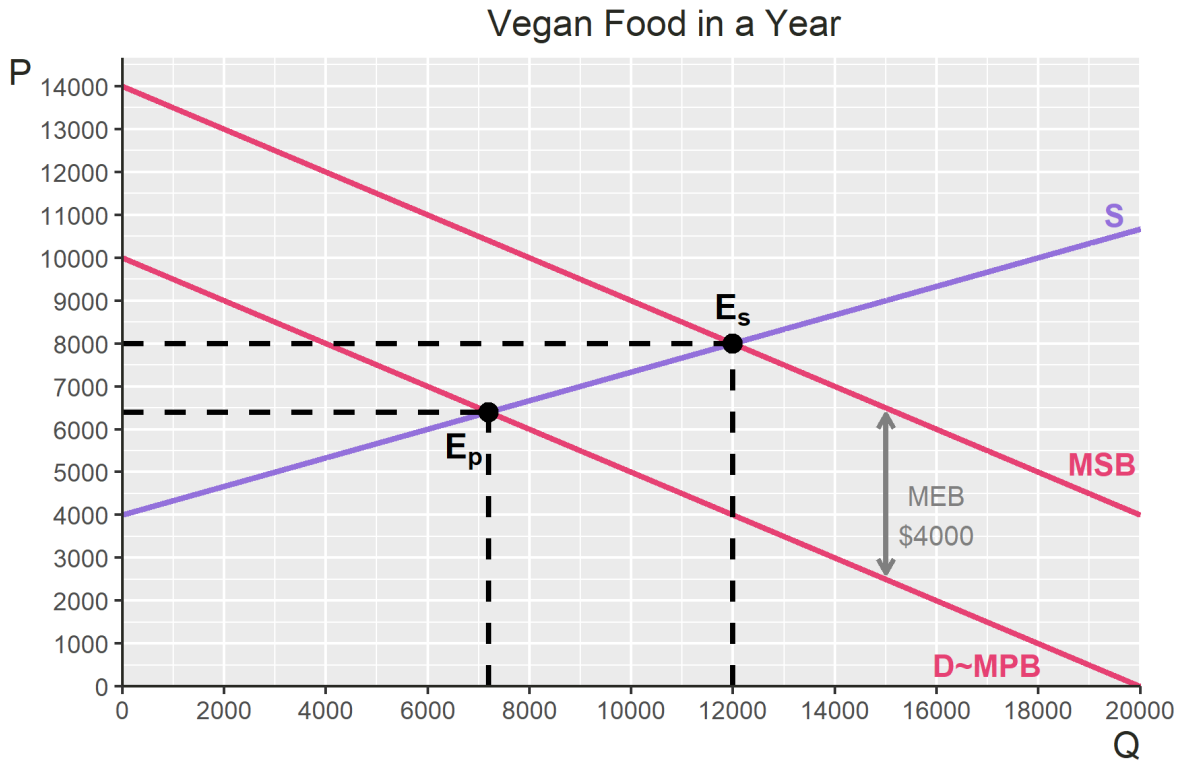
- I leave it to you to calculate the areas of these figures, and email me with any questions

Positive Consumption Externality

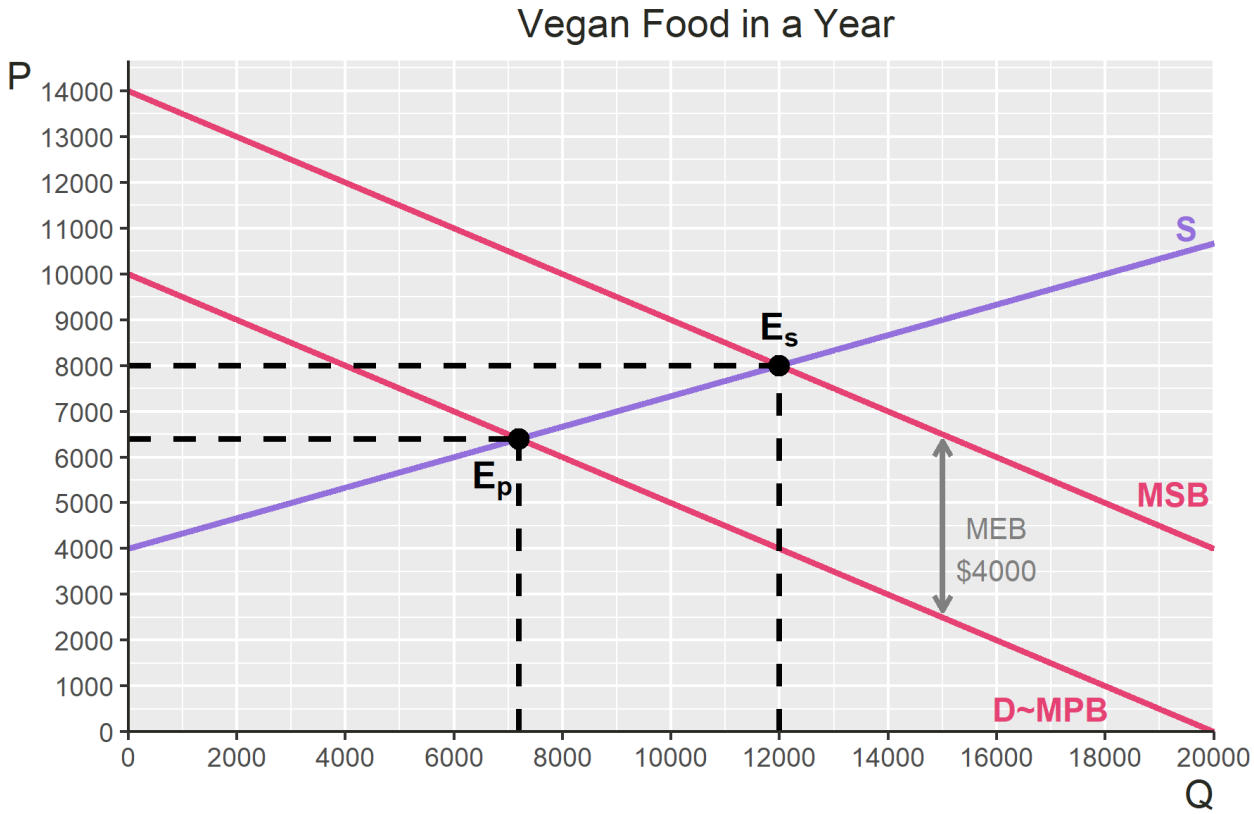
- Consider the market for vegan food, consumed during the entire year (this uses the same numbers as our solar panel example)

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



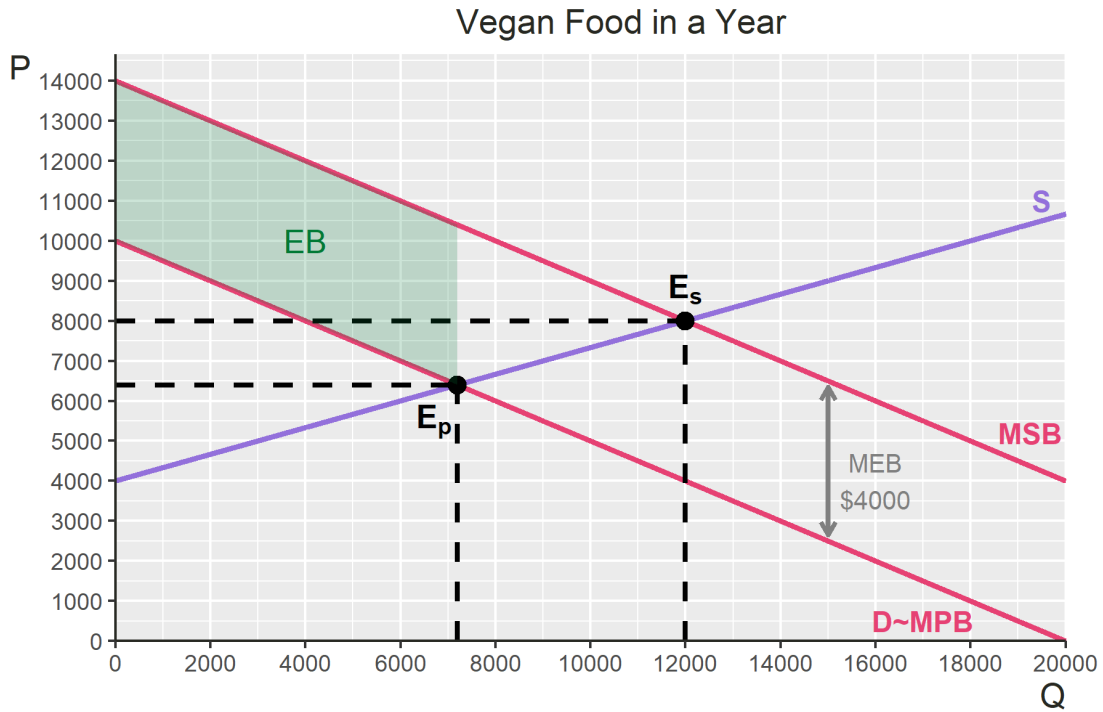
Positive Consumption Externality



- 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

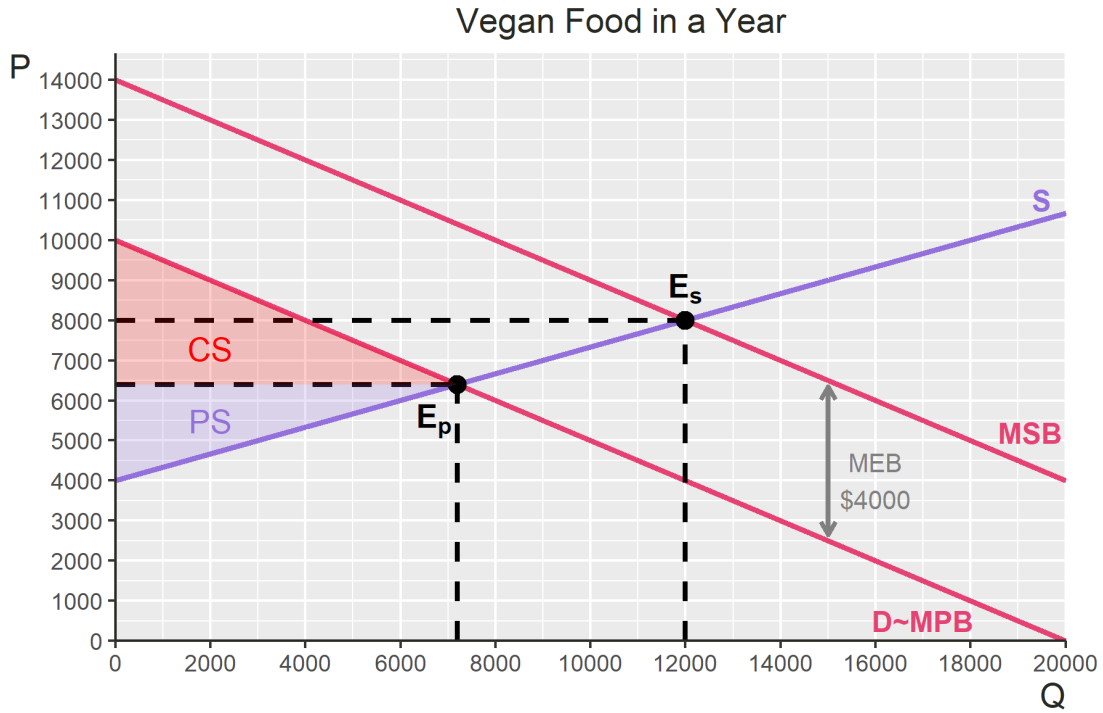
- What is EB in private equilibrium?



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

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

$$TS = CS + PS + EB = 12.96M + 8.64M + 28.8M = 50.4M$$

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- Can we do better?

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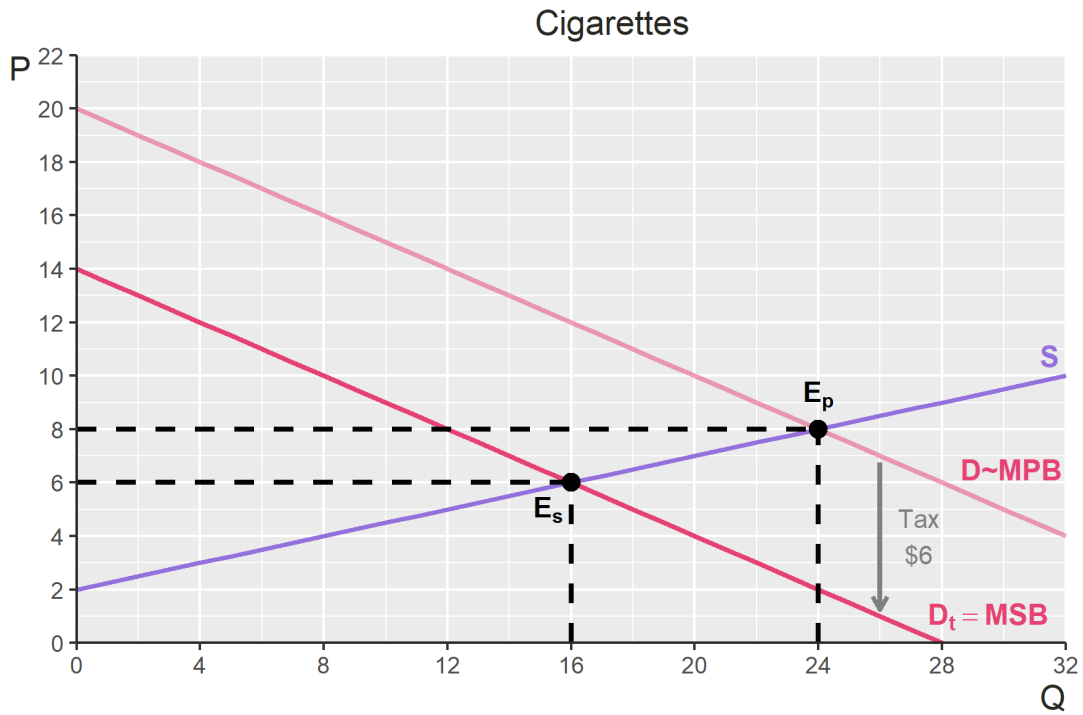
- How much do we pay them?
- The exact amount of the marginal external benefit!

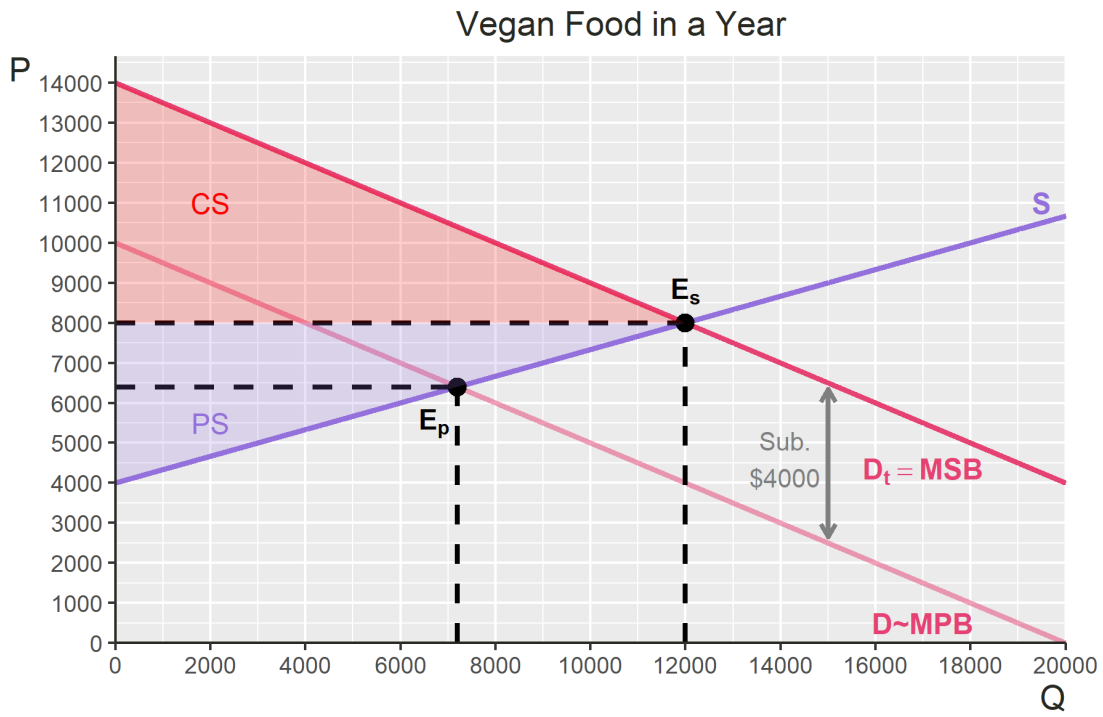
Positive Consumption Externality

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



Positive Consumption Externality

- CS and PS are as expected:

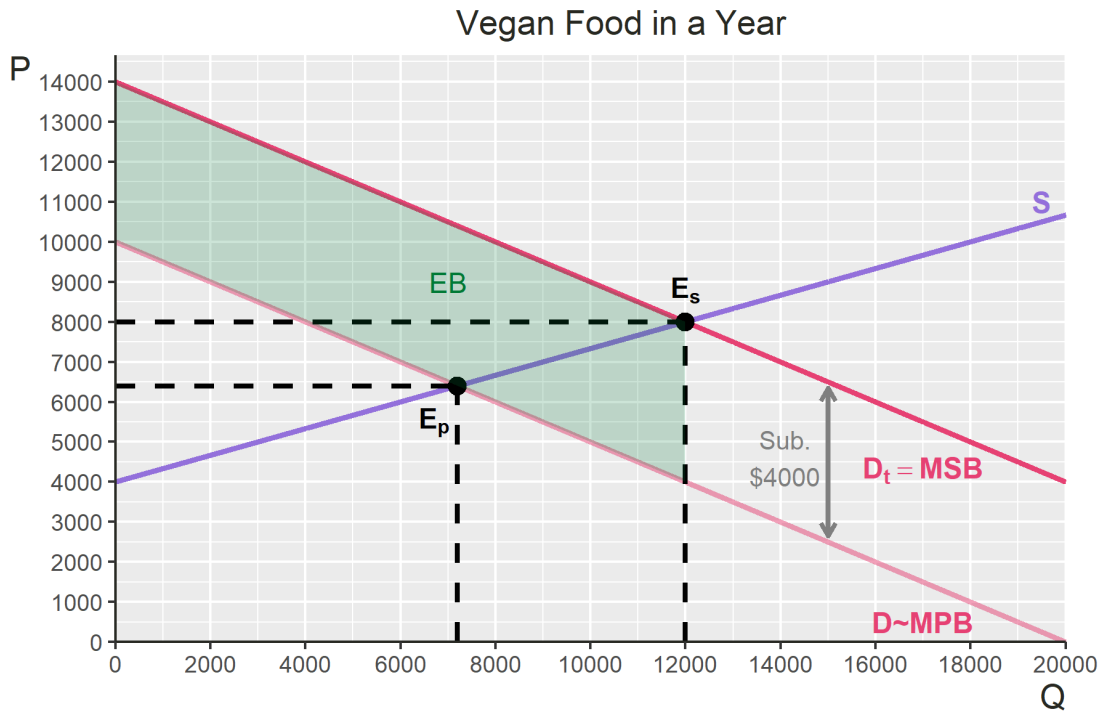


$$CS = \frac{1}{2}(12000)(14000 - 8000) = 36M$$

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

Positive Consumption Externality

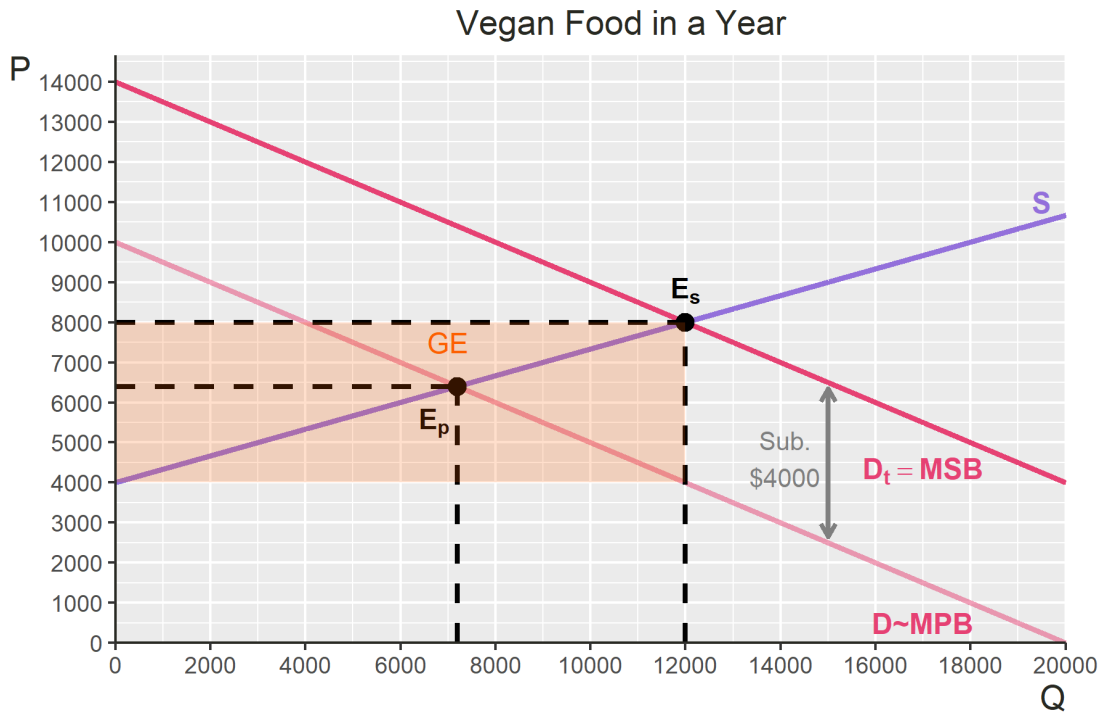
- The EB is now given by



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

Positive Consumption Externality

- And now, we have some GE



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

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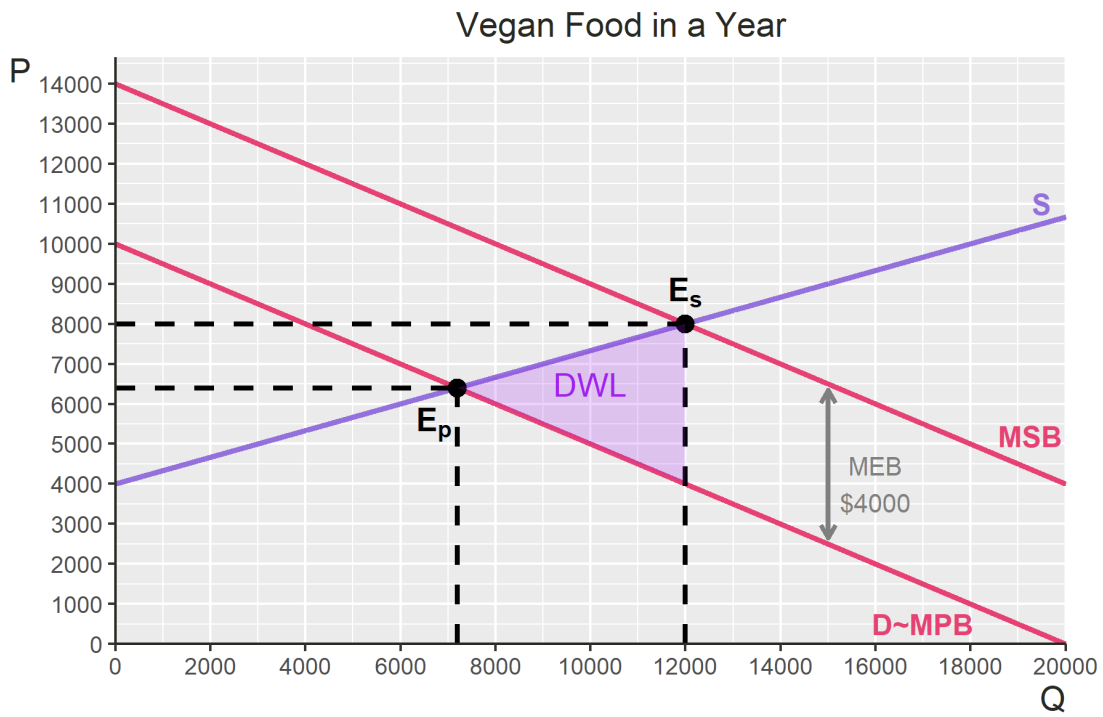
- Therefore, the subsidy actually *induced* efficiency
  - This is the key lesson: a subsidy will fix a positive externality

Positive Consumption Externality

- Therefore, DWL before the subsidy is given by



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

Aside: Coase Theorem

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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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