

ECON-A4000 - Economics of Global Challenges

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Return method: through mycourses by the deadline or by joining the session on March 16.

Problem Set 1: Question 2

In this question, we consider how to construct a supply from data for fossil-fuel resources, and how to determine a tax for their use.

1. In this video you find the instructions for this problem: ([link](#)). You may use any software for this exercise, a simple spreadsheet app, STATA, or similar.
 - Using the downloaded data, please draw then the supply curve for each fossil-fuel resource type: the total quantity on the horizontal axis and the cost of production on the vertical axis.
2. Next we want to obtain a supply curve for carbon from this data. Let us focus on oil: we want to transform the oil supply data into “carbon units”. One barrel of oil is 0.43 metric tons CO₂/barrel (this number is from US EPA, ([link](#))). The number is not exactly correct for this data, but this does not undermine the point of the exercise.
 - Assuming that any given deposit will be supplied as soon as the price in the market exceeds the cost, you can find out how much carbon in total will be released at any given price level for oil. You may now draw this supply curve of carbon.
 - Suppose that there is a carbon budget for oil: 50% of the total available quantity of carbon in the oil deposits should be left in the ground. What is the critical price for oil that would reach the target? In other words, to make sure that the carbon budget

is not exceeded, the oil sellers should not receive a market price that exceeds the critical price. What economic instruments could achieve this outcome? Based on the lecture, provide at least two instruments and elaborate how they could be implemented.