



Exploring Possible Futures

Video Transcript

From perfect to imperfect

Up to now, we've walked in a rather rosy modelling world in two regards. First, we have assumed that there's only a somewhat simple problem. For example, firms cause emissions which we want to avoid, as emissions cause environmental damages and are thus costly. Otherwise, our firms have behaved rather nicely. They do not try to manipulate prices or keep competitors out of the market. Second, we have assumed that we possess sufficiently many and powerful policy instruments to solve our problem. For example, we have a tax on CO₂ emissions that all emitters have to pay and can thus reduce these emissions if we want to.

This world could be called a first-best world, as we have only a simple problem and sufficiently powerful policy instruments we can, in principle, ensure that the best possible outcome is achieved. Many problems in environmental and energy economics are of a less benign type. We often have to cope with several problems simultaneously and have only inadequate policy instruments at hand. For example, we might face a situation where an incumbent firm has a power to keep new entrants and new technologies out of the market and have no or only blunt instruments to stop this behaviour. Or we could have policies that some firms can dodge, like an imperfect tax that firms can partially avoid.

Also, it often happens that we need information from firms to set a policy, such as information how costly it is to reduce emissions. And firms could have little incentive to give us truthful information, but rather exaggerate these costs to avoid high environmental taxes. In each of these cases, we are in a situation where we have to make the best out of limited means. There is no chance that we can achieve a first-best solution where all problems are solved the best possible way. Rather, we have to aim for a second-best solution where we try to get the best outcome that is possible with limited means.

I think I do not have to point out that this is usually the more realistic setting in energy or environmental policy. However, it is much more difficult to find the best possible outcome in such a setting. In this course, we will do this for the simplest case where first-best solution is out of range. The case where we want to reduce emissions of a set of firms, but some of these firms have market power. In the next step, we will discuss how to address this problem in a model and what the differences are between a first-best and a second-best solution. To keep things simple, we will do this for the case where there is only one firm that is the monopoly.

Then, we will go back to our model world of the previous examples. In this world, we will now assume that one firm, using one technology - coal, in our example - has market power where the other firms behave competitively. Our dominant firm will thus drive to produce a quantity that keeps the price high. This could be achieved either by producing less than in a competitive setting or by trying to keep competitors out of the market. You will see what happens to our model world if we introduce such a big player in our electricity market. In particular, you will see what happens to consumer prices and how the big firm reacts to policy instruments.

Again, we will ask you to examine and discuss the results first and then we'll explain the model in more detail.