University of Basel

Exploring Possible Futures

Video Transcript

Systems and markets

When we talk about economic modelling we naturally talk about markets. But you will often stumble upon models that do not really have a market setting or firms making choices. But those are equally important models in energy and environmental economics. Before we go into more detail on our model design, let us therefore first get an overview of those different model approaches. By now we have seen that there are a lot of potential options to design an energy system. You can satisfy energy demand by relying on a set of fossil plants, or you can go nuclear, or maybe green, or have a mix of all of those. Basically, there's an unlimited number of combinations how our energy supply could be designed.

The big question is, which of those combinations should we choose? And that is where modelling economics markets and incentives enter the stage. Here we can differentiate between a system, or a bottom up perspective, and a more market, or top down perspective. A model with a system perspective often accounts for a lot of technical detail of the underlying system, the bottom up aspect. But does not really model market structures. It aims to identify the best option out of all the possible ones. In economics we also term this the social planner perspective, or benevolent dictator basically, a virtual entity deciding what the best solution for everyone would be.

Like this. In mathematical terms, it's just the optimum. A model of a market perspective aims to represent the incentives of the involved actors, and which choice they would take to identify the option that will emerge in the market setting. Often those models are more aggregated on the underlying technical details and focus on the choices and tradeoffs the actors can make, the top down view. The two approaches may sound pretty different, but you will learn that they have a lot in common, supplement each other, and often can also be transferred into each other. Let's use all four options again as an example.

In a system perspective, you would need some criterions for the different options you can base your choice on, like costs or emissions. The social planner model would then simply identify the option with the least costs or the least emissions. From a market perspective, we could assume that firms decide about which type of power plants they want to construct. This means that you have individual actors making choices. For example, they can base their decisions on how much money they earn by selling the energy to consumers, or by accounting for the environmental impacts their choice has. We will have a look at both approaches and their relation during the course.