Abstract

We look at the short and long term effects of a shale gas boom in an economy where energy can be produced with coal, or shale gas, or a clean energy source. In the short run, a shale gas revolution has counteracting effects on CO2 emissions: on the one hand it allows countries to substitute away from coal which in turn reduces CO2 emissions everything else equal; on the other hand the shale gas boom may increase pollution as it increases the scale of aggregate production. In the long run a shale gas boom tends to increase CO2 emissions as it induces firms to direct innovation away from clean innovation towards shale gas innovation, and we show the possibility of an infinitely delayed switch from shale gas to clean energy. We then derive conditions on the parameters under which, as a result of the above trade-off, the shale gas revolution reduces emissions in the short-run but increases emissions in the long-run. We then use data on electricity production to calibrate the model.