Green Technology Adaptation: State-Owned Enterprises versus Second-Best Taxation*

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Abstract

Green technologies, such as renewable energy, often require adaptation to local conditions such as high humidity, high altitudes, or specifics of a country's infrastructure to achieve a maximal technical efficiency and a long lifetime of investments. This poses a problem for green technology transitions, as adaptations usually imply protected IP rights and thus market imperfections that can lead to higher prices and thereby a lower uptake of the green technology. An alternative could be to use state-owned enterprises (SOE) to adapt and promote green technologies, such as public utilities. However, many empirical studies find SOEs to be less efficient. In this theoretical contribution, we investigate the question whether a green technology transition that requires some r&d is better driven by private firms or an SOE. We adapt an existing model to this setting, derive possible market outcomes from this model, investigate r&d and production decisions of private firms and an SOE, and finally compare the two options with regard to their welfare implications. Our results show that there are cases where the cost inefficiency of the SOE dominates but also cases where an SOE is the preferred choice, as it has incentives that are closely aligned to societal objectives. Most importantly, this is not solely a question of comparing costs, but rather of comparing different market outcomes; e.g., the use of an SOE can avoid the often found problem of overinvestment in r&d by private firms and, in many cases, an SOE will induce a wider diffusion of the green technology.

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