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Option values of low carbon technology policies: how to combine irreversibility effects and learning-by-doing in decisions

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Abstract

In this paper, the political dilemma of the deployment of a large-size low carbon technology (LCT) is analyzed. A simple dynamic model is developed to analyze the interrelation between irreversible investments and learning-by-doing within a context of exogeneous uncertainty on carbon price. Contrasting results are obtained. In some cases, the usual irreversibility effects hold, fewer plants of the LCT should be developed when information is anticipated. In other cases, this result is reversed and information arrival can justify an early deployment of the LCT. More precisely, it is shown that marginal reasoning is limited when learning-by-doing, and more generally endogenous technical change, is considered. When information arrival is anticipated the optimal policy can move from a corner optimum with no LCT deployment to an interior optimum with a strictly positive development.

Keywords investment, option value, learning-by-doing

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