

## **Sustainable growth with renewable and fossil fuels energy sources**

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How to control climate change and to spur clean energy are among the most important challenges facing the world today. We think the failure of existing policies on climate change is the fact that implementation of renewable energy is spurred by intermittent and uncertain flow of monetary subsidies to renewables' price. Such a short-run policy leads investment in renewables to be suboptimal since investors do not perceive climate change policies as a long lasting government commitment. We believe that a more fruitful approach to tackle climate change should take into account that investors in renewables react positively to a stock of commitment and reputation of the policy makers on the long run. To this end, the novelty of this paper is constituted by modeling a stock of public capital which captures intensity of long run commitment to support new technology developments. We first present the decentralized economy and study the behaviour of agents in each sector: the final good sector, the energy services, the consumers and the government. We characterize both the decentralized equilibrium and the first-best optimum solutions. Next, we show how the optimum can be implemented by an appropriate flow of public capital, comparing the relative effectiveness of current monetary subsidies with government reputation and commitments, in order to enable policy strategies.