

# Greenflation, Climateflation and Monetary Policy: The Dynamics of Sustainable Transition

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**Keywords:** Monetary Policy; Climateflation; Environmental Economics; Interacting Agents; Evolutionary Dynamics.

**JEL codes:** E52, E58, C73, Q50.

## **Abstract**

This paper presents a dynamic model integrating monetary policy, firms' investment decisions in renewable and fossil-fuel-based technologies, and climate-related inflation dynamics. The model studies the evolution over time of the share of green and non-green investments for electricity generation in an economy. This decision is based on a profit-driven replicator dynamics. Large-scale renewable energy investments are capital-intensive and characterized by large upfront costs, making them particularly susceptible to changes in financing costs (Schnabel, 2023). The recent marked rise in global interest rates poses risks to the profitability of renewable energy investment compared to fossil fuel-based systems (Egli et al., 2018). This can hinder the environmental transition and alter the equilibrium of the economy. A monetary authority interacts with the firms' investment decisions through interest rate control via an augmented Green Taylor Rule (Jawadi et al., 2023). The latter considers how the carbon emissions from the electricity-generating plant affect inflation. The prevalence of non-renewable technology in the economy contributes to the rise in the frequency of adverse climatic events that disrupt product supply and increase prices, i.e., "climateflation". However, transitioning to a sustainable economy can often imply expenses related to resource scarcity, adaptations, and environmental regulation compliance that generate inflationary pressures, i.e., "greenflation" (Gourdel et al., 2022). By analysing the evolutionary process, the equilibria, and their stability properties for parameter changes in technology costs, efficiency, emissions, monetary policy targets, and climate-related risks, this model helps address a relevant central bank's dilemma. On the one hand, it could strongly target inflation and its "climateflation" and "greenflation" components with the concrete risk of slowing down sustainable investment and the pace of decarbonisation; on the other, it can be softer in the monetary tightening to not undermine the green transition, at the cost of resulting partially inconsistent with the objective of price stability.

**Note:** All the chapters of my Ph.D. thesis have been published in scientific Journals. To send an original contribution to participate at the "XXIV Edizione (2024) del Premio SIE", I developed this paper as an extension of the Ph.D. thesis Chapter 4: "The Effects of a Green Monetary Policy on Firms Financing Cost". This work addresses the same topic and uses a similar methodology. Thanks.

## References

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