# Investigating the degrowth paradigm though prospective modeling: the case of France

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# *INVESTIGATING THE DEGROWTH PARADIGM THROUGH PROSPECTIVE MODELING: THE CASE OF FRANCE*

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**Overview**

The development paths followed by a fraction of humanity in the last decades seem to have led humanity as a whole in front of a complex, multi-facetted crisis. Non-renewable resources depletion and dramatic environmental impacts, including climate change issues, seriously question the sustainability of the intensive economic metabolism of industrialized societies as well as the possibility to eternally match the fast-increasing world energy and material demands.

As a way to address these issues, many take a stand in favor of a "green growth", with the hope that technological progress will eventually enable a decoupling of energy and material throughput and environmental burdens from economic growth. Others instead advocate for a specific slowdown of the economic activity in "high consumption" countries: a "*sustainable Degrowth*". ([Kallis, 2011], [Latouche, 2010], [Schneider et al., 2010], [Research&Degrowth, 2010], [Bayon et al., 2010])

Throughout the last decade, significant theoretical work has been done to outline the key features of what is now consolidating as a *complex and multifaceted political project.* For the "wealthiest" countries, where the ecological footprint per capita is greater than the sustainable global level, Degrowth may be envisioned as *a voluntary, socially sustainable, equitable, smooth downscaling of production and consumption, and thus throughput, to an environmentally sustainable level*, "that increases human well-being and enhances ecological conditions at the local and global level, in the short and long-term''[Kallis and Schneider, 2008].

Yet, the possible socioeconomic outcomes of such a project still remain uncertain. For instance, while GDP degrowth is *not per se* an objective of Degrowth, a project of Degrowth is very likely to entail a decrease in GDP as a *consequence* of the downscaling of production and consumption [Kallis, 2011, Martinez-Alier et al., 2010, Schneider et al., 2010]. However, in the current capitalist system, economic growth may not be an option, but rather a structural imperative ([van Griethuysen, 2010],Douthwaite, 2012],[Farley et al., 2013]): an inversion or a slight slowdown in economic growth quickly translates into dramatic social tensions, rising unemployment rates, poverty, and increasing government debt in the short term, as well as potential environmental harm in the medium or long term due to lower investments in environmental protection or industrial maintenance [Bayon, 2010].

Therefore, several questions remain unanswered. In particular, we would like to focus here on the following issues: what concrete proposals could initiate such a transition? What could such paths induce in terms of energy consumption and GHG emission mitigation? What structural or institutional obstacles must be overcome and how? Etc. In what follows, we will first describe the modeling tool that we developed in order to investigate the possible consequences of a Degrowth transition, and then present the first results.

**Method**

Applied macro-models are useful tools to investigate such complex questions ([BarcelonaWG, 2010], [Victor and Rosenbluth, 2007], [Victor, 2008]). In this perspective, we have developed a dynamic simulation macro-model of the French (formal) economy to explore different Degrowth scenarios based on combinations of various proposals and strategies issued from the social movements[BarcelonaWG, 2010].

Our model features a sectorial disaggregation of the French economy into 38 branches and a detailed representation of the French fiscal apparatus and public administration budget. It has been built using data from the French national accounts, and from INSEE, mainly for the period 1978-2012. The model allows us to run medium to long term simulations (starting in 2010 and up to 2040 and after).

Figure 1 shows the simplified structure of our modeling approach. In a nutshell, hypotheses relative to the evolution of the final demand for each sector are derived from surveys carried among different social groups, and relative to the implementation of various degrowth proposals. The production is driven by the final demand, via an input-output analysis, and determines the amount of labor required. Energy consumption and GHG emissions are derived from the production level and structure via hypotheses on intensity coefficients. The socio-economic impact depends on policies. For the sake of simplicity, there is no explicit monetary sector in our model. Given the complexity of the system considered and the uncertainty surrounding hypotheses, our development is made according to priority on results intelligibility and model transparency. In this perspective, various uncertain parameters and relationships related to highly complex or poorly understood mechanisms, or deriving from agents behaviors or political choices, are kept exogenous and are subject to sensitivity analyses.

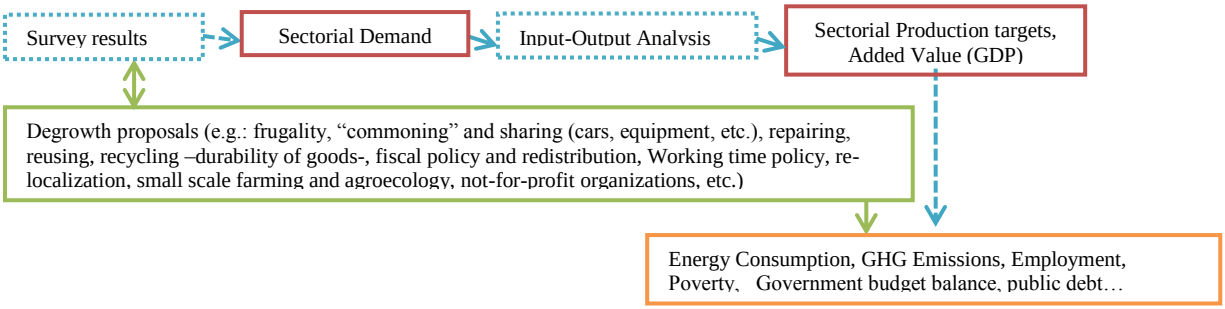


**Figure 1: Simplified structure of our modeling approach**

**Results**

Carrying sensitivity analyses on the different parameters affected by Degrowth proposals allows us to explore their possible socioeconomic and environmental impacts. In particular, we demonstrate the consequences in terms of energy consumption and GHG emissions of quantitative and structural changes in the final demand, resulting from evolutions towards more frugal, "downscaled" lifestyles (reduction in consumption, repairing, recycling) and social practices ("commoning", sharing). We compare the mitigation potential of such changes to the potential of more technical factors (e.g.: evolution in energy and GHG intensity of the different sectors, etc.). This allows us to identify leverages that could play a key role in a degrowth transition, and that will merit special attention.

Besides, combining different proposals into various scenarios makes it possible to study interactions or synergies, and to identify Degrowth strategies that may have a relevant potential for addressing both environmental and socio-economic issues. In particular, attention is given to the articulation between grassroots initiatives and top-down institutional changes.

**Conclusion**

In order to explore the possible energy consumption and GHG emission mitigation potential of Degrowth as a political project of paradigmatic social change, we have developed a specific model. Our results complement existing technical approaches of energy problems by highlighting the importance of structural, cultural and social, non-technical factors. The first results demonstrate that energy and environmental issues should be considered in the broader frame of the collective elaboration of a societal project; this paper brings preliminary valuable elements to open this debate, and calls for further interdisciplinary research in this area.

This work is part of a broader research framework that will, in the future, combine and complement our macroeconomic modeling approach with a technical analysis of the energy sector.

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