REPRODUCTION OR TRANSFORMATION: THE ROLE OF COHERENCE IN PUBLIC TRANSPORT POLICIES FOR SUSTAINABILITY TRANSITION IN THE STATE OF SÃO PAULO

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ABSTRACT

Sustainable transitions involve not only a phase of creation and adoption of new technologies and processes, but also a dynamic of destruction and destabilization of consolidated sociotechnical regimes. This research investigated, through content analysis, the recent set of policies developed by the State of São Paulo, aimed at reducing greenhouse gas emissions and decarbonizing the land transportation sector. Based on the proposed analysis framework, it was possible to verify that the Plans analyzed tend to focus more on the dimension of the emergence and diffusion of new low-carbon transportation technologies, to the detriment of actions aimed at weakening established regimes.

Keywords: Policy mix; Transportation sector; Sociotechnical regimes; Energy.

INTRODUCTION

Sustainability transitions depend on a broad set of public policies (policy mix) to overcome the barriers imposed by dominant regimes. A large part of the literature specialized in the subject of socio-technical transitions, as well as those interested in achieving the Sustainable Development Goals (SDGs), points to the coherence of public policies as something fundamental for the transition (Consoni; Camilo, 2023). In other words, from one system to another, which implies technological changes, in user practices and in the structures of institutions (Markard; Raven; Truffer, 2012).

In addition to these aspects, Kivimaa and Kern (2016, p. 206) highlight the need for this set of instruments and policies that support transitions to

sustainability to "involve both policies aimed at 'creating' the new and 'destroying' (or withdrawing support from) the old". This distinction aims to facilitate the identification of elements that are potentially missing from the set of existing public policies from the perspective of transitions.

The relevance of this type of analysis lies in the fact that sociotechnical transitions involve not only a phase of creation and adoption of new technologies and processes, but also a dynamic of destruction and destabilization of consolidated sociotechnical regimes (Turnheim; Geels, 2013). In other words, the Schumpeterian process of creative destruction necessarily involves the confrontation of the old with the new and, eventually, the supplanting of the former by the latter.

In the Brazilian case, according to data from the Greenhouse Gas Emissions and Removals Estimation System, "Transportation" ranked third in the ranking of categories emitting CO2 equivalent in Brazil in 2022, due to its high dependence on fossil fuels, behind only the categories "Land Use Changes and Forests" and "Agriculture". The State of São Paulo (SSP) is the main emitter in the Transportation category, responsible for 34% of these emissions, the vast majority of which come from road transportation.

Seeking to mitigate this and other impacts, in 2021, SSP formalized its adhesion to the "Race to Zero" and "Race to Resilience" 2050 programs, through State Decree 65.881/2021, within the scope of the United Nations Framework Convention on Climate Change, under the coordination of the SSP Secretariat of Environment, Infrastructure and Logistics (SEMIL). Under this decree, the Climate Action Plan 2050 – PAC 2050 and the State Energy Plan 2050 – PEE 2050 should be drawn up and implemented, formulated with the aim of subsidizing different state public policies for energy transition.

These plans express the efforts of the SSP Government to promote the transition to less carbon-intensive sociotechnical systems, especially in sectors such as energy and transportation. Considering that coherence is a necessary element to make the transition viable, this article questions to what extent the Plans proposed by the SSP enable the emergence of new low-carbon transportation

technologies, to the detriment of strengthening regimes that weaken decarbonization actions? This research investigated the recent set of policies, developed by the SSP, aimed at reducing GHG emissions and decarbonizing the land transportation sector. This analysis is necessary since the action plans proposed in the State should support different state public policies for energy transition.

MATERIALS AND METHODS

Part of the literature on sustainable transitions identifies, in addition to the structural elements of systems (actors, networks, institutions and technologies), some key processes for the development, diffusion and use of new technologies in emerging technological systems (Bergek et al., 2008). These key processes are defined as functions necessary to overcome different lock-ins (technoeconomic, political-institutional, social and cognitive) existing in systems.

Based on the analytical framework proposed by Kivimaa and Kern (2016), the main processes involved in the dynamics of system transitions were listed. **Table 1** presents these processes and their characteristic instruments for the "creative" dimension, supporting niches of new technologies and the "destructive" dimension, with policies aimed at destabilizing established regimes.

Table 1. The analytical framework

Code	Process
Creative (niche support)	
C1	Knowledge creation, development and diffusion
C2	Establishing market niches/market formation
C3	Price-performance improvements
C4	Entrepreneurial experimentation
C5	Resource mobilisation
C6	Support from powerful groups/legitimation
C7	Influence on the direction of search
Destruction (regime destabilization)	
D1	Control policies
D2	Significant changes in regime rules
D3	Reduced support for dominant regime technologies
D4	Changes in social networks, replacement of key actors

Source: Adapted from Kivimaa and Kern (2016).

RESULTS AND DISCUSSION

The analysis of the actions and mitigation measures provided for in the 2050 Climate Action Plan – PAC and the 2050 State Energy Plan – PEE 2050 demonstrate (**Figure 1**) a predominance of actions and goals aimed at creating rather than destabilizing the regime. Most of the actions are aimed at e*stablishing niches and forming markets* (C2), *influencing the direction of the search* (C7) and *legitimizing new technologies* (C6). This is because a significant portion of the actions in the plans are aimed at replacing fossil fuel sources with alternatives that present neutral (or even negative) net emissions balances and increasing the efficiency of the transportation system, such as biogas, biodiesel, ethanol and electrification. However, there is no detail on how this should occur, which ends up favoring processes of this type due to the replacement goals.

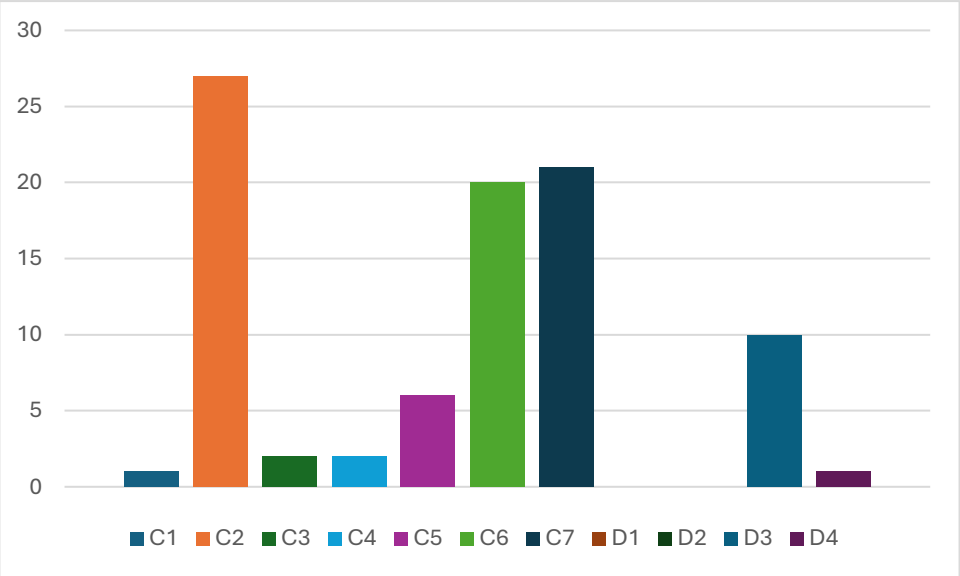

Figure 1. Actions and processes in Action Plans

On the other hand, the extent of the regime's destabilization appears much more timidly, with only 2 processes covered by the actions. Among these, *reduction of support for dominant regime technologies* (D3) stands out due to the actions aimed at reducing the participation of certain technologies in public fleets and changing the composition of energy sources. Other important processes such as *control policies* (D1), *significant changes in regime rules* (D2), and *changes in social*

networks, replacement of key actors (D4) are not properly covered by the actions and measures provided for in the Plans.

CONCLUSION

Based on the proposed analysis framework, it was possible to observe that the Plans proposed by the SSP tend to focus more on the dimension of the emergence and diffusion of new low-carbon transport technologies, to the detriment of actions aimed at weakening established regimes. In addition, many of the actions involving the processes of *influence in the direction of the search* (C7) and *legitimation of new technologies* (C6) point to different technologies in parallel, which tends to attenuate their effectiveness. However, it is important to emphasize that, in terms of Action Plans, the SSP has made its planning; it remains to be seen how internal governance will be established and whether it will be able to promote new technologies and discourage the current emission regime.

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