

# **Biofuels transitions, power and sustainability: lessons for global governance from Brazil**

Paper proposal for the International Workshop “Politics and governance in sustainable socio-technical transitions”, Berlin 20-21 September

Governance issue addressed: “*Agency & Power: political contests over system innovations*”

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## *Abstract*

Arguably the world's most ambitious transport biofuel programme so far, launched in Brazil in 1975, has recently gathered speed and attracted renewed interest as a result of rising concerns for climate change and energy security. The introduction of sugarcane-based bioethanol as transport fuel transformed, but at the same time enabled the survival of the prevailing car-centred transport regime, threatened by the oil crisis. The simultaneous collapse of sugar prices in the world market provided a convenient way for the military regime to safeguard its legitimacy by integrating an existing niche-technology (alcohol production) into the dominant transport regime, thereby satisfying both the powerful sugar lobby, and the car industry – the engine of the Brazilian “economic miracle”. The strongly government-led transition carries elements of technological substitution and reconfiguration pathways (Geels and Schot 2007), yet without completely fitting into either one.

The shift from military to civilian rule, the economic crisis, drop in oil prices, phasing out of subsidies to alcohol fuel, and the loss of consumer confidence could have killed the biofuel sub-regime in the 1990s. Instead, the alcohol fuel programme was kept alive, mainly for local air quality and employment reasons, allowing continuous increase in productivity of alcohol sector. Increase in oil prices, together with growing climate concerns have created new windows of opportunity for the biofuel sub-regime, the invention of the ‘flex-fuel’ vehicle triggering the final breakthrough. The left-wing government’s poverty reduction policies created space for another niche solution, production of biodiesel, aimed at solving regime problems (fuel supply, imbalance in refinery capacity between petrol and diesel production) and provide rural incomes.

This paper examines the ways in which power relations among regime actors and outsiders have both shaped and been shaped by the Brazilian biofuel transition. Galtung’s (1971) three-dimensional concept of power, originally intended for analysing centre-periphery relations in international politics, provides the framework

of analysis. It parallels the analysis of core and marginal regime members (Smith et al., 2005), and integrates the ‘hard’ (e.g. economic and structural) and ‘soft’ (symbolic and ideological) dimensions of power – the latter being of key importance in creating legitimacy, shared visions and expectations.

The integration of the sugar/alcohol industry into the transport regime modified its membership, without fundamentally changing regime rules or leading the transport sector to a fundamentally more ‘sustainable’ pathway. Many of the centre-periphery relationships that prevailed at the inception of the biofuel programme have remained largely unchanged and perpetuated through the use of ideological power by the core regime members in their legitimisation efforts. Key power shifts relevant for the transition pathway include the declining role of the government, the progressively increasing influence of the national oil company in supporting biofuel use; the emergence of national technology cluster (including biotechnology) around ethanol production; and the decline of the industrially backward, but politically crucial sugar/alcohol sector in the Northeast.

The paper concludes by looking forward – analysing the challenges for the emerging global ‘biofuels governance’ caused by the extension of the range of regime actors beyond Brazil’s borders – to countries potentially importing ethanol and biofuel manufacturing technology.

## **References**

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