

Journée du GERPISA n°215, chercheurs

**Urban electro-mobility and the role of incumbents
in driving sustainability transition**

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Ecole Normale Supérieure de Cachan
Room 120, Building Cournot
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After a long period of technological stability and incremental improvements in heavy vehicle powertrains, the industry is now facing an era of ferment, particularly in the city/transit bus sub-segment. In terms of volume, city buses are a small segment, with 25,000 buses produced per year in North America and EU. However, high stress impact, frequent starts and stops, and very little steady operation on the road, make the urban bus segment a particularly demanding market for testing and validating new engine types. City bus operators tend to use their buses for significant periods, sometimes for the entire lifespan of the vehicle, which is a clear advantage when testing new technologies. In contrast, distribution trucks are used for only 2–4 years before the operators sell them to other firms. These factors combine to make city buses an important niche for the introduction of new technologies. Within the EU, both the large integrated manufacturers, Daimler, IVECO, Scania, Volvo and MAN and small niche players such as VDL, van Hool and Solaris, are active in this segment and try out different technologies: gas engines, diesel-electric stand-alone hybrids, plug-in electrical hybrids and fully electrified powertrains. The rapid technological development is now making a complete electrification of heavy urban traffic possible, with huge benefits for air quality, noise, attractiveness of public transport and new opportunities for creative urban planning.

According to the multi-level perspective on sustainability transitions developed by Frank Geels and others, established firms (incumbents) are defenders of existing technologies at the “regime level”, whereas new entrants at the niche level are the promoters of new technologies. This presentation challenges the idea of firms as actors on either regime or niche levels. Based on a comparative analysis of technology strategies in the heavy vehicle industry, we show that established firms develop several alternatives simultaneously and are active at both levels. This means that incumbents’ technology strategies determine important parts of the required niche–regime interactions. Moreover, some incumbents adopt a dualistic approach, keeping regime and niche level activities separate. Other firms, such as Volvo Trucks and Buses, develop integrated strategies to create a basis for economies of scale and leverage their niche activities to impact upon the regime level. The success of integrated strategies, however, depends on the support of public policies and investments. Such bridging policies are relevant both for linking early niche markets to broader regime-level markets, and, as we will show, for supporting further technological advancements of niche markets.