Sectoral dynamics and technological convergence: an evolutionary analysis of eco-innovation in the automotive sector

We know from evolutionary theory that sectoral characteristics are important to innovation. This paper investigates if sectoral characteristics also are important to eco-innovation, a hitherto under-researched theme. We argue that research into possible sectoral patterns in eco-innovation is key to understanding green industrial dynamics and the greening of the economy. This paper investigates to what degree the economy is greening horizontally (sector-wise). Starting with a sectoral case study, we undertake a longitudinal analysis of the breath and strength of the greening of the automotive sector from 1965 to 2012, focusing on powertrain technologies. The empirical analysis is based on patent data amongst big car producers and focuses on identifying changes in two main aspects: (1) the convergence/divergence of firms’ green strategies and technologies within the automotive sector; and (2) the contribution of alternative key green technological trajectories relative to the dominant design. Our findings indicate that the evolution of relative green patenting has followed a positive, linear growth over the last decades with increasing participation of alternative propulsion technologies and increasing convergence of automakers’ strategies towards a diversified portfolio.