

Does sustainable technology require sustainable business models? An automotive industry case study.

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Few industry sectors have come under greater pressure to develop more sustainable product technologies than the automotive industry, and indeed examples of radical innovation in this sector are starting to emerge. Frequently, this product innovation also promises to create substantially different cost structures, brings new participants into the industry, and changes the way in which cars are owned and used.

However, while myriad start-up enterprises have emerged around innovative automotive technologies, and while significantly different business models have been proposed, the mainstream industry and the leading vehicle manufacturers have thus far retained their dominance of the market for new cars, have retained their traditional value chains from materials supply right through to dealerships, have retained their traditional business model, and have retained their brand strategies more or less intact.

Such innovation as has occurred in terms of business model, business process or market branding strategy has tended to be confined, incremental, marginal and conservative. While the need for significant further progress is undeniable, and while there is now legislative force to compel future compliance with carbon reduction targets in key markets like the European Union and Japan, the interests of preserving the existing business structures appear to have the potential to reduce the real rate of change in introducing novel technologies that could enable faster progress.

This paper argues that the existing dominant industry, reinforced by a broader social construct of the role of the car, acts as a powerful force in guiding technology development along some pathways and not others. That is, while it might be the case that the effective utilization of innovative automotive technology might be greatest or optimized under novel sustainable business models, the incumbent industry overall shows a tendency to resist change in the business model which in turn will reduce the benefit of the innovative technology. This highlights a more general problem for any industry: the need to balance continuity and change, or to ensure a fit between the short term and the long term.

The paper will draw upon examples and data from the industry around the world to illustrate the line of argument adopted. It will show the vanishingly unimportant impact of new entrants; the strategic control of new technologies by established vehicle manufacturers; the potentially destabilizing impact of Better Place; and the significance of multiple technology pathways into the future which means that there is unlikely to be 'one best way' as far as sustainable innovation in the automotive industry is concerned. The paper is grounded in transitions theory as articulated by authors such as Frank Geels and Rene Kemp, but combines that with the business model theorists such as Osterwelder.