Indicators of changing resilience and potential tipping points in the automotive industry

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Through innovation and wider socio-economic processes, large sections of the economy have been known to rapidly (and often irreversibly) transition to alternative states. One such sector currently undergoing a transition is the automotive industry, which is moving from a state dominated by internal combustion engines to one characterised by low-emission vehicles. While much research has focused on early warning signals of climate and ecological tipping points, there is much to be done on assessing the applicability of these methods to social systems. Here we focus on the potential for tipping points to occur in the sale of electrical vehicles in various markets, including Norway and the UK. Early indicators that this new state is being approached are considered through the use of novel data sources such as car sales, infrastructure announcements and online advert engagement. We then map out the socio-technical feedback loops which may drive these tipping points. Consideration is also given to the resilience of the wider automotive industry to previous economic shocks.