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Discourses about EU Transport Decarbonisation: Towards a Paradigm Shift?

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Abstract

The development and introduction of new technologies are central to achieving sustainable transitions. Policymakers are important in enabling a successful transition. However, discourses about EU transport decarbonisation reveal multiple policy approaches to technology innovation, both in terms of decarbonising the car and building new alternative fuels infrastructure for transport. A discursive institutionalist analysis of two separate but interdependent communicative discourses on road transport decarbonisation shows the complexities of facilitating transformative change. This shift requires coordination at all levels involving different actors and sector coupling to successfully decarbonise road transport.

Keywords: EU road transport policy; transport decarbonisation; sustainable transition; discursive institutionalism; alternative fuels infrastructure

The European Union (EU) 2030 climate and energy policy objectives aim to facilitate a sustainable transition to a low-carbon economy by 2050 and include a transformative change in EU transport policy. Previously, EU transport liberalisations created traffic growth leading to congestion and increased air pollution, because all transport modes continue to rely almost exclusively on fossil fuels. Thus, transport decarbonisation necessitates a change from fossil fuel dependency to renewable energies (van Lier and Macharis 2015). Transition studies see these changes through a socio-technological multi-level perspective (Geels 2011; Hoffmann *et al.* 2017) that emphasises a bottom-up process starting with niche-industry innovation and then progressing to socio-technical regime changes. Other areas of transition studies (Avelino 2017) discuss the role of agents in generating change, including the role of policymakers as actors of change (Ingeborgrud *et al.* 2020; Meadowcroft 2005; 2011). Moreover, analytical frameworks of sustainable mobility (Holden 2008; Banister 2008; Givoni and Banister 2013) illustrate the challenges in changing existing mobility structure and behaviour instead of discussing how technological innovation and technology policies (Meckling and Nahm 2018) can lead to structural changes. Sustainable mobility and socio-technological approaches are both important for understanding how to implement societal changes. Thus, there is a need to investigate the link between EU sustainable transport policy (Whitelegg 1993; Tinch 2001; Janic 2006), industrial policy (Meckling and Nahm 2019) and energy transition (Slominski 2016) to understand EU policy approaches to sustainable transitions and technological developments in decarbonising road transport.

Technological innovation and the phase-in of new technologies are central to EU sustainable mobility policy programmes (European Commission 2017a; 2017b; 2017c; 2018) and broader EU green growth agendas, like the Green Deal (European Commission 2019; 2020). The question of policy approaches to technological innovation is important for sustainable transitions in road transport because they affect the speed and direction of socio-technical regime changes (Azar and Sandén 2011; Meckling and Nahm 2018; 2019); especially the role of the state in managing the transition is important (Meadowcroft 2005). Actors including the European Commission, the automotive sector, the energy sector, public authorities and non-governmental organisations (NGOs) have different ideas about how to support technological innovation and how to create transformative change as new technologies are phased-in and become mainstream. Moreover, every policy field has a distinct public philosophy (Schmidt 2008, 307) and a purpose to fulfil, which influence their understanding of

problems and solutions, thereby generating different ideas about how to facilitate transport decarbonisation and the extent of institutional change. Thus, analysing the relation between these EU policy discourses helps understand the process of sustainable transition in road transport.

This article addresses the following research questions: What actors have a more prominent role in the EU governance system in relation to transport decarbonisation? Are there differences between policy areas or between approaches? Using discursive institutionalism (Schmidt 2008; 2010; 2011), the article analyses which actors have a prominent role in EU communicative policy discourses focusing on two separate but related discourses on transport decarbonisation. The first discourse is about technological policy approaches to reducing emissions and centres on the issue of technology neutrality. It is part of the EU industrial policy but crosses over into transport policy and climate policy. The second discourse is about alternative fuels infrastructure because transport decarbonisation requires moving from fossil fuels to renewable energies, hence new fuels infrastructure must support the new low-emission cars coming onto the roads, which involves a policy discussion about developing alternative fuels infrastructures. Importantly, successful transport decarbonisation is contingent on both discourses. The article argues these two separate, but interdependent policy discourses are important for facilitating transport decarbonisation and will lead to the remaking of existing institutions.

The article starts by outlining the analytical framework of discursive institutionalism. The second section introduces different approaches to sustainable transitions and outlines two types of institutional remaking. The third section analyses EU communicative discourses concerning policy approaches to transport decarbonisation focusing on innovation in the automotive sector. The fourth section analyses the separate but interdependent EU communicative discourse that focuses on developing alternative fuels infrastructure and the emerging new energy-transport nexus. The fifth section brings these two discourses together to assess their implications for future EU policies on transport decarbonisation. Finally, the article concludes that sustainable transition in transport is a very slow process that challenges EU climate goals and existing institutions.

Analytical framework and methodology: discourse institutionalism

According to discursive institutionalism, discursive practices enable an analysis of the role of agents and ideas in policy change. Such focus distinguishes this analytical framework from the other new institutionalist approaches (Fitch-Roy *et al.* 2019, 4). Studies applying discursive institutionalism to

energy policy have investigated EU lobbying (Fitch-Roy *et al.* 2019), EU policy instruments (Lauber and Schenner 2011) and diplomacy (Herranz-Surrallés 2016). These studies highlight broader climate discourses relating to policy change. However, there is less research on the role of ideas in policy change concerning transport policy, except for biofuels (Palmer 2010; 2014). Thus, a discursive institutionalist analysis of transport decarbonisation can contribute new insights into the role of agents and ideas in remaking institutions as part of sustainable transition.

Ideas exist at different levels, where "normative ideas speak to how policies offer solutions to the problems at hand, how programmes define the problems to be solved then, and how both policies and programmes mesh with the deeper core of principles and norms of relevant scientific disciplines or technical practices" (Schmidt 2008, 307). Public philosophies exist at a deeper level relating to worldviews and ontological positions, whereas policy programmes are broader agendas, such as EU sustainable mobility packages, and policy solutions are more specific policy initiatives, like the EU directive on alternative fuels infrastructure. Whilst public philosophies are long-lasting ideas, programmatic ideas aim to address wider societal challenges. Nonetheless, both levels of ideas are important for policy transformation, especially as sustainable transitions entail structural and normative changes that remake institutions and societies.

Policy programmes address specific policy agendas or societal problems: for example, the EU Energy Union addresses both market liberalisation and climate change. A policy programme addressing a specific societal problem, like transport emissions, cut across several policy fields that each have their own distinct public philosophies and policy ideas. Such policy programme requires these distinct policy fields to interact with one to facilitate transformative change, like sustainable transitions. This requires remaking institutions and changing existing path dependencies (Patterson 2021). Indeed, "the politics of sustainability transition requires a redefinition of societal interests" (Meadowcroft 2011, 73). The process of change is complex, with multiple overlapping and nested actions occurring in parallel, sequentially and simultaneously (ibid).

The redefinition of societal interests occurs through communication. Here "sets of ideas once embedded within formal political processes can mediate between interest groups and influence which voices are 'heard' in political debates and which are not" (Kuzemko *et al.* 2016, 99). Moreover, actors who have normally been involved in one policy field have to engage with actors from other policy fields who are also concerned with solving the same societal problem, but from a different policy perspective. These communications contribute towards redefining societal interests. Communication

between actors in different policy fields not only enables coordination and sustainable transitions, but it also legitimates change and exposes challenges in achieving change.

Discursive institutionalism follows a logic of communication (Schmidt 2008, 314), where actors express their ideas through discourses and communicative interactions facilitate policy change. Vivien Schmidt identifies two levels of communication: coordinative discourse and communicative discourse. The coordinative discourse mainly takes place behind closed doors, through either technical working groups or legislative decision-making, involving civil servants, experts, and politicians (ibid). However, this article only analyses the communicative discourse. The communicative discourse occurs in the political sphere involving a broader range of actors, including politicians, interest groups and the media (308-11). Several narratives influence policy change, which helps to "explain not only a messier and more contingent process of change, but also about the structure of the new paradigm" (Kern *et al.* 2014, 525). These narratives are articulated by actors, who compete for dominance and influence over the policy agenda. The actors involved represent different interests and ideas. Actors communicate their ideas to a wider audience with the aim of shaping policies; simultaneously, they are confronted with new ideas through these communicative policy discourses. Taken together, these interactions can enable new ideas to gain dominance, thereby facilitating change. In other words, actors' "discussion and bargaining over the nature of the ideas to define policies for the institutions means that the individuals shape very much the institution" (Peters 2012, 121). In general, industry actors have structural and economic power, which enable them to influence policy agendas and protect the status quo. Nevertheless, non-industry actors are important for sustainable transitions as they challenge the status quo by introducing new ideas that might gain power and dominance. Indeed, actors can become agents of change by stepping "outside of existing institutions and persuade others of the need for change" (Patterson 2021, 20). Moreover, the "*nature* of change that takes place will be related to the specific battle of ideas that make up debates about how to proceed and to the compromises struck" (Kuzemko *et al.* 2016, 100). The actors involved in the transport decarbonisation discourses include incumbent as well as new industry actors in both the energy and automobile sectors, environmental organisations and public authorities, in addition to EU institutions. These actors engage in communicative discourses at different levels of governance resulting in multiple policy narratives.

In this article, the analytical focus is on EU communicative discourses about sustainable transitions in road transport, specifically transport decarbonisation. The article analyses these communicative discourses focusing on the role of central actors, including the European Commission, industry actors

and green organisations, identifying these actors' ideas about how to manage the transition, especially how the relationship between their different ideas – that is, public philosophies and policy programmes – shape sustainable transitions at the EU level. This analysis brings together the two separate communicative discourses about technology policies and alternative fuels infrastructure policies to show how they are interrelated and dependent on each other for a successful sustainable transition.

This article is based on a qualitative study combining expert interviews and document analysis. Seven semi-structured explorative interviews were carried out with Commission administrators from different Directorates-General and interest groups representing the car sector, environmental groups, the power sector and local authorities. The actors were chosen to represent different roles in transport decarbonisation, thereby enabling an analysis of their different perspectives on how to facilitate institutional remaking towards a low-emission society. The purpose of the interviews was to explore the actors' ideas about sustainable mobility policy, technology policy and energy transition to understand the EU communicative discourses on transport decarbonisation. The documents analysed included EU policy papers relating to the three EU sustainable mobility packages (2017-2018). The EU policy documents were analysed together with the stakeholders' position papers, reports from international organisations and media coverage. Whilst the interviews took place in 2017-2018, the communicative discourses have subsequently evolved, and the document analysis brings the discourses up to date with these latest developments, thereby showing the transition to a decarbonised transport era. The data analysis focused on three themes: climate change, technology neutrality and the changing energy-transport nexus, with the aim of understanding the challenges in facilitating a sustainable transition in the EU.

Approaches to sustainable transitions

The approaches to phasing-in and mainstreaming new technologies into society are important for a successful transition to a low-emission society. Technology policies are part of industrial policies; therefore, the implementation of industrial policies is central to governments' intervention to promote clean technologies and to foster change in mature industries (Meckling and Nahm 2018, 523). Here, "'technology-neutral policy' typically refers to policy that promotes technologies with no or low carbon emissions but does not specify which such technologies should be supported" (Azar and Sandén 2011, 135). However, governments "can 'declare war' on existing technological regimes, but they do so more rarely – because they must represent a broader range of social interests and concerns,

and generally seek to avoid serious economic dislocation" (Meadowcroft 2005, 488). It is difficult for policymakers to bet on the right technologies because a decision today will lock in future infrastructure: for example, decisions about nuclear energy or 19th-century railway construction have created deep-seated path dependency in both policy and infrastructure development (Meadowcroft 2011, 72). Thus, policymakers are hesitant to bet on one emerging technology, in case it does not deliver the desired policy objective; instead, they prefer a bottom-up policy approach.

According to the multi-level perspective (Geels 2011), technological ideas originate from niche innovation, with some technologies becoming mainstream and thereby creating socio-technical changes that might lead to regime change. This bottom-up approach to transition favours technology-neutral policy approaches. However, regime change "requires concepts of deliberate discontinuation of socio-technical regimes i.e., a variety of political efforts to bring an end to a well-established, stable and socially embedded regime" (Hoffmann *et al.* 2017: 392). Here, "political signalling serves to reduce uncertainty and promote coordination of market actors around emerging substitute technologies" (Meckling and Nahm 2019, 470). Political signalling occurs in the form of long-term climate goals and policy programmes articulated by policymakers to a wider public audience, including industry actors, who participate in communicative discourses. Existing governance systems and institutions need to manage this transition by developing new policy programmes and individual policy initiatives that facilitate socio-technical changes, which in the case of road transport replace the existing fossil-fuel fleet with a low-emission fleet.

Political signalling alone is not sufficient to facilitate change, it is also necessary to remake the existing institutions to accommodate the transformative change from a fossil-fuel paradigm to a low-emission paradigm. Here, James J. Patterson (2021, 35) identifies two types of institutional remaking. The first type is "comparative improvement [and] refers to substantive and feasible improvements within a given case"; this substantive improvement may be endogenous to the case itself, like reducing emissions, and is a comparative improvement on existing measures. The second type is "directionality of institutional change [and] refers to the trajectory of institutional development over time, as it is influenced by attempts to remake institutions within a given case" (ibid). Compared to the first type, the second type emphasises a temporal shift in power and authority. Simultaneously, "the changes must be judged against some sort of normative criteria" (37). In this article, the normative criterion is transport decarbonisation. Indeed, the EU 2030 climate goals signal socio-technical changes that necessitate remaking existing institutional structures. Hence, EU

communicative policy discourses are important for understanding sustainable transitions in decarbonising the road transport sector.

Communicative discourses in the EU

Transport decarbonisation and reducing emissions

The overarching public philosophy in EU industrial policy is competitiveness. This is evident in the Juncker Commission's industrial policy and the von der Leyen Commission's European Green Deal (European Commission 2019): both strategies emphasise green growth and the competitiveness of European economies and businesses. Moreover, this normative worldview is reflected in the Commission's policy programme for sustainable mobility, which "focuses on helping the European automotive industry and the mobility sector to prepare for the future by setting the right conditions and incentives for the industry to be globally competitive, as well as to generate innovation, growth and jobs" (European Commission, 2017b, 3). This public philosophy of competitiveness is translated into technology-neutral policies, whereby policies should incentivise market penetration and reduction in CO_2 emissions (9), instead of dictating which technologies are appropriate. This is evident in the EU's approach to sustainable transition in the automotive sector.

The automotive sector, as an actor, has a strong position in the EU communicative discourse. Indeed, the automotive industry is one of the most powerful sectors in the EU, with a long history of successfully lobbying both the EU and national governments (Dionigi 2017; Skete 2017; Corporate Europe Observatory 2017). The automotive sector's structural and economic power is evident as it employs 8 million people, represents 4 per cent of EU GDP and contributes €120 billion to the EU's trade surplus (European Commission 2017a, 5). For example, ACEA, the European association of car manufacturers, argues that "the auto industry is the backbone of prosperity in Europe" (ACEA 2021, 1). Its discourse claims that transport decarbonisation will disrupt European growth and jobs, thereby challenging the EU climate goals and sustainable transition. Indeed, EU car emissions standards and fuel efficiency policies are important for the car industry, as EU legislation influences the research and development in emission technologies. Importantly, the relationship between the EU and the automotive industry represents a consensus-driven agreement on technological transformation, and "such coordination inherently prioritizes the interests of incumbent firms that benefit from the existing technological regimes" (Meckling and Nahm 2018, 521). As such, large sections of the European car industry have traditionally attempted to maintain regime stability (Wells

and Niuwenhuis 2012, 1682). This is evident in the Dieselgate scandal, which revealed how some car manufacturers deliberately cheated instead of developing technologies that adhered to emissions regulations (Ewing 2017; Posaner 2018; Corporate Europe Observatory 2017). In short, the automotive sector has used its structural power to challenge EU emission legislation, thereby reducing the speed of EU transport decarbonisation and sustainable transition.

The mainstreaming of new low-emission cars will change the existing socio-technical regime, as the technological innovation in low-emission cars has reached a tipping point, and these new types of cars, mainly electric cars, are entering mainstream markets. Moreover, several car brands, including Volkswagen, Ford and Jaguar, have publicly committed themselves to phasing out their production of fossil-fuel cars by 2025-2030, many of the manufactures will instead focus on electric cars. Whilst ACEA (2021) recognises the automotive sector is investing in battery technology, it continues to argue for less challenging emission targets for cars and vans, leaving the door open for other technologies. Thus, the automotive sector prefers comparative improvement as an approach to institutional remaking.

Whilst the maturity of new technologies has been important for car companies, the political prioritisation of the climate agenda has helped facilitate this shift as well. Several actors said that the climate change agenda is an important factor in the EU sustainable mobility discourse (Interview A 2018; Interview C 2018; Interview G 2018). One interviewee (Interview C 2018) said this was regrettable and would prefer change to be driven by technology, instead of climate targets. Indeed, the EU is seen as a central actor in driving the transition (Hoffmann *et al.* 2017, 404; Interview A 2018). One example of how the EU is driving change is the 2017 sustainable mobility policy programme, which aimed to facilitate transport decarbonisation (European Commission 2017a; 2017b; 2018). The policy programme focused "on helping the European automotive industry and the mobility sector to prepare for the future by setting the right conditions and incentives for the industry to be globally competitive, as well as to generate innovation, growth and jobs" (European Commission, 2017b, 3). Thus, the public philosophy of competitiveness influenced the policy programme, which proposed technology-neutral policy solutions to reduce emissions.

The policy proposals in the 2017 sustainable mobility programme have now been adopted. The policy proposals revised existing legislation on fuel standards, Regulation 2019/631 on emission standards for new passenger cars (*Official Journal of the European Union* 2019a) and new light commercial vehicles, Directive 2019/1161 (*Official Journal of the European Union* 2019b). The policy

programme also proposed promoting clean and energy-efficient road vehicles, in addition to an action plan on alternative fuels infrastructure. This technology-neutral policy programme does not push the industry to develop new technologies, instead improving existing technologies. The Commission is planning to publish a revised version of Regulation 2019/631 later in 2021 and once again strengthen emissions standards for cars and vans. This revision is part of the European Green Deal agenda and the effort to meet EU 2030 climate goals. These continuous legislative revisions demonstrate the EU's role in pushing an incremental transport decarbonisation, where EU policies are central for facilitating a top-down transport decarbonisation that leaves it up to the industry to develop appropriate technological solutions to meet overall EU climate goals. Indeed, the Commission, especially the Directorate-General for Industry (DG GROW) and Directorate-General for Mobility (DG MOVE), believe that they should not put all the eggs in the same basket, thereby preferring technological neutrality (Interview F 2017; Interview G 2018).

Whilst EU legislation concerning emissions and fuels follows a technology-neutral policy approach, the Commission has simultaneously established a European Battery Alliance in response to Chinese investments in battery technologies (Interview G 2018). The Commission wants to support the European battery sector against outside competition (European Commission 2020a), especially from Chinese companies. Importantly, China's industrial policy promotes batteries, including electric vehicles, with the aim of enhancing its industrial competitiveness and becoming a global leader (Meckling and Nahm 2019, 475-6). Thus, the Chinese strategy threatens both Europe's battery and automotive industries as batteries become integral to the energy transition. Indeed, the overarching public philosophy of the Commission, especially DG GROW, is to protect and promote EU competitiveness. One of the interviewees (Interview A 2018) supports the idea of competitiveness, arguing: "If we postpone transition, European brands will suffer and lose out to China". Thus, the European Battery Alliance illustrates how the Commission also applies a directional institutional remaking approach to technology policies to protect European industries from external competition, thereby deviating from its technology-neutral policy principle.

Nevertheless, actors differ on policy approaches to transport decarbonisation, especially those deviating from technology neutrality, with some expressing concerns about resources to support research and development in different technologies as well as concerns about betting on the wrong technology as the Commission had previously done with diesel (Interview C 2018; Interview E 2018; Interview F 2017). Furthermore, one of the interviewees (Interview E 2018) sees the EU approach to transport decarbonisation as incremental because it is easier for the industry and works for the

politicians. An incremental policy approach to sustainable transition, like the comparative improvement type identified by Patterson (2021, 35), to change (? Delete?) requires a longer transition period and attempts to balance the demands for an ambitious climate change agenda and industry's wishes to stall the transition. Overall, transport decarbonisation creates not only socio-technical regime changes in the automotive sector but also wider structural changes to fuels infrastructure, which necessitates remaking institutions to enable sector coupling between the automotive and electricity sectors. Yet, the overarching policy ideas continue to be competitiveness and green growth.

Establishing an alternative transport fuels infrastructure

Another important dimension in the communicative discourse about transport decarbonisation is establishing an alternative fuels infrastructure for the new low-emission vehicles. Infrastructure investments are long-term commitments; once created, they are difficult to alter, as we are witnessing with the energy transition. Indeed, the decarbonisation of the power sector has been a political priority for many years, but energy transition is only now gaining pace (Interviewee D 2018). Here, path dependency is rooted not only in physical infrastructure, but also in the structural power of the incumbent actors and existing institutions. The "fossil fuel and transport systems have been intrinsically inter-linked historically and practices in each area have tended to both influence and support certain, carbon intensive, practices in the other" (Kuzemko *et al.* 2016, 97). As the previous section showed, the powerful automotive sector has until recently constrained changes, and only supported comparative improvements in the revisions of existing legislation. Yet, EU policy approaches to transport decarbonisation influence the creation of a new energy-transport policy paradigm based on low-emission and renewable energy sources to power the transport sector. Thus, this directionality of institutional change is creating radical institutional changes over time as the technological innovations in both transport decarbonisation and energy transition lead to a paradigm shift. This is evident in the communicative discourse about the development of alternative fuels infrastructure for transport.

The energy transition started decades ago with the first windmills, and discourses about phasing out fossil fuels in the power sector are intrinsically linked to climate change discourses. Moreover, "the transition of the power sector is a precondition for the decarbonisation of transport" (Interview D 2018), because it needs to supply the transport sector with renewable energies, especially electricity.

A new electro-mobility governance system will contest existing orthodoxies, thereby destabilising the established paradigm, just as a new socio-technical paradigm creates new winners and losers (Kuzemko *et al.* 2016, 100). The oil industry, which has dominated the energy sector for the past century and often challenges climate change, will be a loser, whereas the renewable energy sector, especially the electricity industry, will be the winner. Consequently, successful transport decarbonisation will challenge the current relationship between the oil sector and the transport sector, thereby shifting power and authority in both sectors.

Two interviewees argued that a new energy-transport paradigm necessitates building a new eco-system bridging the two different sectors (Interview B 2018; Interview D 2018). In practice, this development of a new energy-transport paradigm requires cooperation between automotive manufacturers, renewable energy companies and public authorities to manage the transition to a fully decarbonised transport sector by 2050. Until recently, the Commission did not discuss sector coupling. Specifically, the 2011 Transport White Paper did not integrate the power sector into its policy programme (Interview A 2018; European Commission 2011). Previously, the EU focused on biofuels and fuel quality to reduce emissions; however, recent developments in battery technologies mean that the Commission has recognised the importance of electrification for transport decarbonisation (European Commission 2020a). Indeed, the 2020 Transport White Paper links transport decarbonisation to the revision of the renewable energies directive, the alternative fuels infrastructure directive and the energy performance of buildings directive (European Commission 2020b, 3-6). This indicates a new approach, where sector coupling becomes an important part of the transport decarbonisation discourse. The shift in the Commission's communicative discourse reflects technological progress in mainstreaming low-emission cars as part of the energy transition, and the increased political prioritisation of the climate change agenda. Moreover, it indicates a temporal shift that will lead to a radical change in existing institutions, because the Commission has to build new institutional frameworks that are grounded in normative ideas of climate change and decarbonisation as well as the current ideas of growth and competitiveness.

Several actors have raised the question of supply and demand of electricity in facilitating the transition to transport decarbonisation. The car industry is specifically concerned about the correlation between consumer preferences and the deployment of alternative fuels infrastructure (ACEA 2018). Consumer preferences for low-emission vehicles depend on availability of alternative fuels infrastructure. Thus, investment in alternative fuels infrastructure is important for the uptake of low-emission vehicles. Here, one interviewee noted that cities are important for "pushing electro mobility […] because it can

solve the issue of air quality" (Interview B 2018). Specifically, cities are important drivers for change by pushing the roll-out of alternative infrastructure, notably charging points. Simultaneously, another interviewee said that the new "charging infrastructure needs to be backed up by sufficient power generation and a very robust distribution grid" (Interview D 2018). The European association for the electricity sector, Eurelectric (2015), sees the question of electricity supply to electric vehicles as a question of smart charging and managing demand, including charging cars when electricity demand is lower, for example, at night. Another concern raised by interviewees is about how to manage vehicle-to-grid in relation batteries and smart charging, that is, bidirectional energy, where the vehicle provides electricity to the grid or a building (Interview A 2018; Interview D 2018). This part of the communicative discourse on alternative fuels infrastructures relates to the European Battery Alliance and the question of batteries as storage devices that not only use electricity from the grid, but also provide electricity to the grid. Compared with the discourse on policy approaches based on comparative improvements in the automotive sector, the discourse about sector coupling focuses more on the practicalities of establishing a new alternative fuels infrastructure, especially electro-mobility, to facilitate the uptake of electric cars. Thus, this discourse emphasises policy solutions that will enable sector coupling and thereby instigate institutional change.

Simultaneously, it is widely recognised that for the EU to meet its 2050 climate and energy goals, the last combustion engine car must be sold between 2030 and 2035. Thus, there is a sense of urgency in coupling the electricity and the automotive sectors to establish an alternative fuels infrastructure for low-emission cars. Furthermore, as a BMW lobbyist pointed out, "consumers are increasingly turning to electric vehicles", and the lobbyist calls for "policymakers to accelerate charging infrastructure deployment to support the roll-out of electric mobility on a mass scale" (Simon 2020). The Commission is an important agent of change, yet several interviewees believed that the Commission preferred an incremental approach to radical institutional change. Specifically, one of them argued that the Commission has "no appetite for big change" (Interview E 2018). Nevertheless, the Commission appears to have adapted its incremental approach, recognising in 2020 that it "must shift the existing paradigm of incremental change to fundamental transformation" (European Commission 2020b, 2). Thus, the long-term perspective on establishing alternative fuels infrastructure and the urgency of meeting the climate deadlines have challenged the existing idea of institutional improvement. As this section has shown, the communicative discourse on alternative fuels infrastructure is supported by multiple actors, who see transformative institutional change as the solution to transport decarbonisation.

Discussion: remaking institutions to achieve transport decarbonisation

This section brings together the two communicative discourses about road transport decarbonisation and an alternative fuels infrastructure to discuss the challenges in creating a new low-emission governance paradigm for road transport. Returning to the research questions set out in the introduction, this section focuses on how the different policy approaches influence the overall progress towards road transport decarbonisation and on the role of actors as agents of change. Overall, this section discusses the discursive shifts in road transport decarbonisation and their implications for sustainable transition, pointing to a more transformative approach to sustainable transition.

Green growth and competitiveness are the overarching public philosophies about sustainable transitions in the EU, where the Commission frames its policy strategies as win-win solutions for the industry. Here, the sustainable mobility policy programmes have aimed to facilitate transport decarbonisation by improving existing technology, and this comparative improvement has led to stricter rules on emissions and fuel efficiency. The alternative discourse wants instead to establish new institutions to roll out an alternative fuels infrastructure, thereby shaping the trajectory of institutional development over time, leading to radical institutional transformation. Importantly, these two different discourses attempt to address the same policy problem – transport decarbonisation – and compete to influence change. This competition of ideas is important, because it takes more than one narrative to influence change (Kern *et al.* 2014, 525). As this article has shown, the alternative fuels infrastructure discourse has become dominant, as both the Commission and the automotive sector are turning towards more radical change, that is, electro-mobility. The 2020 Transport White paper, specifically its Flagship 1 "boosting uptake of zero-emission vehicles, renewable & low-carbon fuels and related infrastructure" (European Commission 2020c, 1), addresses the alternative fuels infrastructure discourse. By connecting the energy transition and the transport decarbonisation discourses, the Commission is moving away from incremental improvements in existing technologies towards supporting transformative change. The two communicative discourses are dynamic; they are both concerned with how to manage change, which is a key element in the policy transformation; the Commission combines both comparative improvements emphasising emissions reductions and more temporal (this is unclear) radical institutional changes that generate shifts in power and authority (Patterson 2021, 35). The policy approach of transformative change will also influence the role of actors in the existing EU communicative discourse.

The shifting role of different actors in transport decarbonisation is important for understanding change. Historically, the automotive sector's structural power has leveraged concerns about jobs and competitiveness to reduce the speed of transport decarbonisation whereas alternative views, mainly from environmental groups, have had a marginal role in EU communicative discourses. However, discursive institutionalism recognises "that ideas and discourse can also provide power, as actors gain power from their ideas at the same time that they give power to their ideas", which includes actors who "may lack power of position" (Schmidt 2011, 120). The political prioritisation of climate change, the progress in energy transition and developments in battery technology have given the power sector, especially the electricity sector, the ability to challenge the automotive sector's discourse of regime stability. The power sector, together with other actors, has offered the Commission a tested policy solution, thereby enabling their ideas of transport decarbonisation to gain dominance in the EU political agenda. Although the automotive sector still represents an economic and structural power, it has started to internalise the policy discourse of alternative fuels infrastructure that was initially put forward by actors, who have been marginal in EU road transport policy discourse. This shows how new actors can enter a policy field and, over time, shape ideas of change. Moreover, this shift in discourse leads to a remaking of the existing institutions in road transport, as the sector moves away from oil towards renewable energies, mainly electricity, and will thus have to create new institutions.

The challenges in remaking institutions that govern road transport entail more than simply investing in alternative fuels infrastructure. The International Energy Agency (2020, 154) forecasts that electric vehicles will have a 7 per cent global market share in 2030. Thus, the implementation of a transformative change to achieve transport decarbonisation requires coordination between different levels of governance, including cities, which demand investment in charging infrastructure to tackle emissions, industry actors and member state governments as well as the EU. Thus, further research is needed on the multi-level governance coordination and sector coupling to understand the temporal institutional shifts in road transport and climate policies.

Conclusion

This article has examined two alternative communicative discourses to achieve EU transport decarbonisation, which demonstrate the different technological and institutional directions that the automotive sector is moving towards as part of the transition to a sustainable transport sector. The

communicative policy discourse reflects technological optimism highlighting how the new technologies, especially electro-mobility, are close to a commercial breakthrough. This optimism is seen in the alternative fuels infrastructure discourse, which emphasises the practicalities of building a new governance system and infrastructure for alternative transport fuels, most notably electricity, thereby promoting a radical change in existing institutions.

Today, the climate change agenda drives communicative policy discourses about technology innovation and energy transition. This is evident in the EU sustainable mobility policy programme's support for alternative fuels infrastructures with the overall aim of decarbonising EU road transport. The communicative discourse on technological development demonstrates how actors recognise that transport decarbonisation means a paradigm shift from fossil fuels to a new alternative fuels infrastructure. This transition challenges the existing power balance in the EU's transport policy. The incumbent automotive sector has long used its economic and structural power to dominate this discourse, but new actors, especially the power sector, are now challenging the automotive sector's position as they see transport decarbonisation as part of their ongoing energy transition. Finally, a successful sustainable transition in road transport has implications for governance systems, and we need to know more about the directionality of institutional change, especially the shifts in power and authority amongst the involved actors, to understand the challenges for implementing alternative fuels infrastructures and thus meeting the EU 2050 climate goals.

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