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Beyond the jobs-versus-environment dilemma? Contested social-ecological transformations in the automotive industry

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ABSTRACT

The transport sector is the major contributor to accelerating CO_2 emissions, with the highest proportion stemming from road transport and passenger cars. At the same time, the automotive industry drives economic growth, contributes to state revenues and is an important employer. This article departs from this so-called jobs-versus-environment dilemma to discuss barriers and potentials for transformative change in the Austrian automotive (supplier) industry with a special focus on workers and trade unions. Based on a Cultural Political Economy perspective, we *firstly* analyze the materiality of the Austrian automotive industry and *secondly* link these structural features to meaning-making and the articulation of crisis construals and imaginaries by workers and their representatives. This analysis helps to better understand the challenges for more transformative change but *thirdly* also to examine entry points for such a transformation from a labor perspective. We characterize the materiality of the Austrian automotive industry around six interconnected features and identify an improvement, a diversification and a transformation imaginary. Despite a widespread perception of incremental change among the workforce in the automotive industry, we find that there is strong confidence in their knowledge and expertise that could also support a more systemic mobility transformation. As such, the transformation of the Austrian automotive industry exemplifies both the strategic dilemmas and potentials of social-ecological transformations.

1. Introduction

The transport sector is the single most important contributor to the climate crisis and accounts for 27% of CO_2 emissions in the EU. Passenger cars and the automotive industry comprise the largest share of transport-related emissions [1]. In Austria, road transport accounts for one third of CO_2 emissions, and emissions continue to rise annually [2]. After cautious climate and energy policies, the new conservative-green coalition government set a target in 2020 to reach climate neutrality by 2040 [3]. So far, however, the government has not agreed on successive policies and time lines to achieve this goal.

Research in the (un)sustainability of the mobility sector has highlighted behavioral change and user acceptance, especially for the uptake or refusal of e-mobility or shared mobility [4–7]. Hence, research on the resilience of the automotive sector "tends to focus on the consumption and use of motor vehicles […], while neglecting the logics underpinning their supply" [8, see also 9,10]. Unraveling these logics encompass an emphasis on the political economy, that is, the structure of the automotive industry in particular, to better understand how consumption and use patterns interact with the production of cars. Such a perspective that links individual consumption and mobility behavior to production enables to frame the transformation of the automotive industry as an essential lever for mobility transformations [11]. This includes, amongst others, a *reduction* in the production of passenger cars and a *conversion* of the automotive industry towards alternative production lines [12,13]. This transformative perspective causes conflicts and resistance in countries that economically rely on the production of passenger cars or parts of them such as Austria or Germany [14]. Furthermore, a production-based perspective sheds light on labor and the role of workers and trade unions in social-ecological transformations [15]. Environmentally unsustainable industries such as the automotive sector employ millions of workers worldwide which makes their positioning

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essential for legitimate and "just transitions" [16–19].

This article departs from this so-called jobs-versus-environment dilemma [20,21] and discusses potentials and barriers for a social-ecological transformation of the Austrian automotive industry from a labor perspective. Political economy and labor perspectives are currently underrepresented in transition and transformation research [8,10,20]. We use the term transformation – rather than the more frequently used transition – to capture "the deeper structures and contested socio-ecological processes" [10] that characterize the incumbent fossil-fuel system but also to emphasize the structural and disruptive change that exceeds mere incremental and technological change (e.g., a transition from internal combustion engine to electric cars) [9,10,22]. Our analysis of transformative change in the automotive industry is informed by a Cultural Political Economy perspective that connects the materiality of social relations (i.e., the political economy of the automotive industry, or *structuration*) to the articulation of strategies, projects and visions (i.e., how people give meaning to the material world, or *semiosis*) [23]. In doing so, we focus on the conflicting economic and socio-technical imaginaries of workers in the Austrian automotive industry and ask how these imaginaries relate to – and could be mobilized for – more transformative change.

Our analysis evolves from a qualitative and transdisciplinary social research design. We conducted 27 qualitative interviews with representatives from work councils and trade unions, but also with state representatives and management of the automotive supplier industry in Austria between 2018 and early 2020. We selected the work councils based on their role in the Austrian automotive industry (aiming for a share of larger and smaller companies) as well as their geographic location (aiming for a fair share of interviews in the three most important automotive regions Styria, Upper Austria and Vienna). We complemented the interviews with two focus groups with work council and trade union representatives in November 2019 and January 2020. These focus groups provided a social context where workers' representatives could "collectively generate, negotiate and express perceptions and meanings" [24]. In doing so, the focus groups also contributed to the transdisciplinary character of the research process [25] that started with the formulation of a common research question in close cooperation with Austrian labor organizations, especially the Chamber of Labour. We are aware that interviewing work councils and trade unionists can grasp workers' perceptions only indirectly and that the spectrum of their perceptions is not necessarily reflected in these representatives, resulting in a loss of interesting nuances. On the other hand, work councils and trade unionists have a privileged insight into company specific developments, problems and moods that make them a – better accessible – choice for interviews. Desk research complemented the branch analysis on the structure of the automotive industry.

The article is structured as follows: In the next section, we discuss recent advancements in transformation research, focusing on political economy (including the state), labor and trade unions. Section 3 then characterizes the materiality of the Austrian automotive industry in economic structures and political institutions around six interconnected features. Section 4 connects this materiality to the articulation of economic and socio-technical imaginaries and discusses how workers construe the crisis and imagine change in the automotive industry along three types of crisis construals and imaginaries. Section 5 carves out entry points for transformative change that takes both the structural features of the automotive industry and the economic and socio-technical imaginaries into account. In doing so, we show that the Austrian automotive industry exemplifies some of the strategic dilemmas of social-ecological transformations and contribute to a complex understanding of the contested nature of these transformations. Furthermore, our analysis contributes to environmental labor studies and just transition research to make sure that "a socio-ecological transformation of economy and society […] is not carried out on the back of workers but actively involves and strengthens their demands for social security and decent work" [26].

2. Political economy, labor and trade unions in transformation research

In the course of the accelerating climate crisis, contributions and references to "societal", "social-ecological", "sustainability" or "Great" transformations have increased in the last decade [27–31]. Ever more alarming IPCC reports [32,33] and the dramatically failed climate conference in Copenhagen in 2009 fueled the impression that "sustainable development" was failing or, at least, was too weak [34]. At the same time, transformation has been introduced in distinction from transition although they are often used interchangeably. According to Eckersley [31], a transition describes a "shift from one system of provisioning to another", for example, from combustion engine cars to electric cars in the mobility system. Transformation, in turn, implies more radical, systemic and non-linear changes in shape and form that alter societal characteristics with regard to economic structures, political institutions, material and energy flows, and socio-cultural practices [28,35]. Transformation therefore enables a critical reflection on the "depth and direction of societal change", although the distinction is fluid. "That is, some socio-technical transitions may be transformational from the standpoint of the relevant socio-technical system, but not from the standpoint of the larger social formation" [31]. The shift to renewable energy in the mobility sector (electromobility) may, therefore, lead to a rebound effect when embedded in a capitalist growth economy. At the same time, however, it may also help to catalyze new forms of ownership, democratic control or a reduction in material and energy flows [31], depending on framework conditions, conflicts and political struggles [22]. In a recent typology, Kreinin [16], for example, distinguishes between "neoliberal political economy", "ecological modernization" and "social-ecological transformation" to describe different ideal type reactions to the climate crisis. Rather than a market-oriented business-as-usual trajectory or incremental change and adaptation, transformation as a "fundamental system change" [36] thus targets and challenges power relations to disrupt unsustainable industries, especially in the fossil-fuelled political economy [11].

The political economy of the fossil-fuel energy system is key to understand the path dependency in the mobility sector and, through this, barriers for social-ecological transformations in general and the automotive industry in particular [8–10,14,37]. Newell [9] highlights that "the 'incumbent' regime of existing actors and interests, that benefit from on-going reliance on a fossil fuel economy […] will not give up their position easily" (p. 27) and indeed try to shape transition in their favor. For the automotive industry, Mattioli et al. [8] carve out five characteristics that support car dependency and prevent comprehensive sustainability transformations that include a reduction of the productive output of the sector: the sheer scale and economic significance, the high capital intensity that makes it 'too big to fail', the endemic overcapacity, low (and historically declining) profit margins and the focus on multipurpose automobiles. These characteristics of the automotive industry support political clout, continued market expansion and lock-in mechanisms on the consumer side. A critical political economy perspective thus investigates the question of how the automotive industry is structured and organized to better understand power relations, barriers and prospects for transformative change. As such, "political economic analyses challenge much of the existing energy transition literature that describes fuel switches and technological innovation without thematising relations of power or the historical significance of capitalist eco-social relations of energy" [10]. To better understand these differences, Manderscheid [38] distinguishes three types of change in the mobility sector: a shift in the propulsion technology (*Antriebswende*), a change in traffic patterns (towards public transport, *Verkehrswende*) and a radical transformation of deeply embedded (material and discursive) mobility patterns of modern societies (*Mobilitätswende*). Only the latter includes capitalist dynamics and socio-cultural orientations that (re) produce the "car hegemony" [39]. With an explicit focus on the drivers of change in the automotive industry, Röttger [40] furthermore

differentiates between state, world market, corporate and democratic forms of conversion.

The state – at the regional, national and EU level – plays a crucial role in both securing the dominant economic structures and as a potential driver of change. As critical state theory has shown, the state relies on private capital accumulation to provide tax revenue and employment that serve as the material basis for legitimacy [14,41,42]. This makes green growth strategies, that is, a greening of the automotive sector through technological improvements, more likely than deeper mobility transformations. Furthermore, it means that the accumulation strategy in the automotive industry is strongly connected to the respective state institutions, projects and hegemonic visions, that is, that the interests of the automotive sector are also present within the dominant orientation of the state and its personnel [43,44]. At the same time, the state is, however, also a crucial institution to counteract the negative effects of the social-ecological crises. As Eckersley [31] argues, "states are better placed than any other actor or organization to facilitate socio-ecological transformation given their powers to regulate, tax, spend, redistribute, and procure and to perform these tasks in ways that are more or less responsive and accountable to citizens". In doing so, the state is not a neutral regulator but the "material condensation" of societal relationships of forces [45], thus securing dominant power relations and discourses. Hence, the state is considered a social relation which implies a historicist understanding of the state [46]. Whereas current state policies and visions strongly align with the interests of the automotive industry, the state is a contested terrain where other interests, e.g., in favor of a mobility transformation towards public transport, are also present – usually in a weaker position [see e.g., 14].

Inspired by Cultural Political Economy (CPE), we stress the political economy of social realities – including the state –, but connect this materiality to the articulation of strategies, projects and visions, that is, how people give meaning to the material world [23,47]. Hence, CPE emphasizes the power-shaped interplay of materiality (*structuration*) and meaning-making (*semiosis*). For the automotive industry, Haas [39] describes this interplay as "car hegemony" which refers to the

> material and ideological penetration and fixation of modern societies by the automobile, which is supported by consensual arrangements, primarily in the spheres of cultural and everyday life, but also in the sphere of production and by coercive moments. Car hegemony is armoured by the development of infrastructure and by diverse legal framework conditions.

Hence, state politics, everyday practices but also material structures and discourses play an important role in understanding power relations and path dependencies but also the entry points for transformation. According to CPE, discourses have the capacity to guide political-economic practices which may re-produce or transform the material structures of the political economy. In turn, material structures have a strong influence on the emergence and the content of discourses as they shape the corridors of what is considered imaginable. Jessop [23] refers to the, always selective, discursive formations guiding political-economic practices as "economic imaginaries". These imaginaries frame "individual subjects' lived experience of an inordinately complex world" and thus "give meaning and shape to the 'economic' field".[1]

Imaginaries are particularly important in times of crises when societal actors compete to influence crisis construal, management and outcomes [51], and different directions become imaginable. Thus,

> a crisis is a moment for contestation and struggle to construe it and inform individual and collective responses. This involves, among other issues, delimiting the origins of a crisis […], identifying – rightly or wrongly – purported causes […], determining its scope and effects, assessing in broad terms whether it is a crisis 'in' or 'of' the relevant arrangements; […] reducing its complexities to identifiable causes that could be targeted to find solutions. [52]

While many studies focus on economic and socio-technical imaginaries by management [53–55], technicians [56–58], bureaucracies [51] or users [59], we are particularly interested in the role of labor, that is, workers and trade unions, and how they make sense of (and try to influence) crisis and transformation processes in the automotive industry [60]. In fighting for the interests of workers, trade unions represent important agents for supporting or preventing social-ecological transformations [61]. Generally in favor of decarbonization, trade unions often face internal tensions and conflicts arising from concerns over job losses in the traditionally unionized fossil-based industries that social-ecological transformations imply [62,63]. This is exemplified in the so-called jobs-versus-environment dilemma [20,21]. Consequently, strategies and visions for a "just transition", a term coined by unions [17], largely remain defensive and – even if they are proactive – often confined to variants of ecological modernization rather than social-ecological transformation [20,62,64].

With regard to the climate crisis, Thomas and Doerflinger [62], for example, differentiate between opposition, hedging and support as ideal-type union strategies. In another conceptual typology, Barca and Leonardi [65] differentiate between business unions and social (or community) unions. The former tend to see the safeguarding of current production and employment levels as a prerequisite for negotiations which narrows their strategies towards technical improvements. The latter, in turn, put reproduction at the center of their vision which extends class identity along community and ecological interrelations and enables to criticize technological fixes and productivist visions. Moving beyond ecological modernization strategies, Barca [66] employs the term *working-class environmentalism* to reconcile the jobs-versus-environment dilemma through the integration of care and reproduction [see also, 65,67]. In situating labor as a decisive intermediary for society-nature relations, "workers – broadly defined as those performing physical labor, including non-paid housekeeping and life-supporting work – are the primary interface between society and nature" [66, see also, 68,69]. Such a perspective frames environmental and climate politics not as something external and specific to certain elitist interests, but as inseparable from societal (re)production and public health [65]. In the following, we analyze the transformation of the Austrian automotive industry from a political economy perspective and link it to crisis construals, imaginaries and strategic entry points for workers and trade unions.

3. The political economy of the Austrian automotive industry

We characterize the materiality of the Austrian automotive industry in economic structures and political institutions around six interconnected features [11, see also, 70,71]. *First*, the Austrian automotive industry is a *growth sector* with high significance for the Austrian economy and employment levels. The sector accounts for 8% of industrial production and in the past 20 years, production has tripled, while that of the entire industry has only doubled. More than 76.000 thousand people are directly employed in the automotive industry, which is more than 10% of the industrial workforce [72]. Many other branches, such as the plastic, textile, rubber or engineering industries, produce for the car industry [73]. Furthermore, there are indirect employment effects

[1] Such a perspective also resonates with research on socio-technical imaginaries in Science and Technology Studies (STS). Jasanoff and Kim [48], for example, define socio-technical imaginaries as "collectively held, institutionally stabilized and publicly performed visions of desirable futures". Imaginaries refer to deeply held collective perceptions that are reflected in scientific and technological projects and emphasize the politics and power that shape expectations and visions. STS studies have focused primarily on understanding how future-oriented narratives legitimize certain pathways while excluding others [49] but tend to neglect the political economy of transformation processes [50].

beyond the narrow production of cars and their components: car repair shops, gas stations, cabs, road construction, trade in equipment and insurance. Since 2000, the number of jobs in the industry has risen by 55%, while total industrial employment has grown by only 2% over the same period. Though there was a significant slump in 2009 and 2010 due to the economic and financial crisis, by 2012 the production volume had already returned to pre-crisis levels – yet the number of employees only in 2016 (FV Fahrzeugindustrie 2019). The massive slump in sales, as a result of the COVID-19 measures changed this growth trend that has already slown down since 2019. The long-term implications of the slump are not yet foreseeable. However, massive state interventions point to a recovery of the branch rather than a transformative reset, and the automotive industry still stands for economic success, long-term growth and jobs.

Second, Austria mainly serves as an automotive *supplier industry*, producing components for international corporations. Worldwide, Original Equipment Manufacturers (OEMs) dominate globalized production networks and control and play off suppliers and their workforce due to their strategic position in the market [74]. The power asymmetries between OEMs and Austrian suppliers are expressed in high cost and productivity pressures. Many suppliers complain about increasing pressure from OEMs to disclose cost and price calculations and increased requirements regarding certification and pre-financing of development services. The Austrian-Canadian group Magna is the only company that assembles complete cars for foreign OEMs, which makes the corporation and its business model an exceptional case.[2] As Table 1 shows, most of the other companies are either suppliers for OEMs (e.g., AVL, MIBA, Greiner) or are subsidiaries of OEMs or large transnational supplier corporations (e.g., BMW, Bosch, ZKW, MAN). Almost 70% of the workers in the automotive supplier industry work for subsidiaries of transnational corporations with headquarters abroad. Therefore, key decision-making power lies mostly outside of Austria, and the ability to actively shape transformation pathways is limited. The Austrian local management is generally bound by instructions with decision-making power limited to the operational level. Work councils have little room for maneuver, especially since they lack a competent counterpart for negotiations on the operating strategy. In addition, managers often have little local ties and are hardly receptive to concerns from the workforce.

Third, and connected to the supplier role in the global division of labor, the Austrian automotive industry is highly *dependent on exports*. The export quota accounts to almost 90% and more than half of the exports are directed to Germany. Foreign direct investments strengthen this link. Table 1 shows that four of the ten largest automotive companies in Austria are headquartered in Germany. In addition, almost exclusively German OEMs operate subsidiaries in Austria that produce and develop components for the German headquarters (e.g., BMW, MAN for VW).[3] These subsidiaries implement detailed production plans but refrain from strategic decisions in Austria.

Table 1
Top 10 Austrian companies in the automotive industry ranked according to revenue and number of employees in 2018.

Company	Revenue (in Million Euros)	Employees in Austria/ worldwide	Headquarter (Country)
Magna Steyr	5.350	9.300/13.500	Canada
BMW Motoren	3.647	4.647/n.s.	Germany
AVL	1.750	4.150/10.400	Austria
Greiner	1.631	n.s./10.785	Austria
KTM	1.560	3.625/4.303	Austria
Bosch	1.359	3.044/407.485	Germany
ZKW	1.340	3.528/9.250	Germany
MAN Truck & Bus	1.084	1.929/n.s.	Germany
MIBA	985	2.818/7.377	Austria
Rosenbauer	909	1.397/3.516	Austria

Fourth, and despite its supplier role, the Austrian automotive industry differs from other supplier regions (e.g., in Central/Eastern Europe or Eastern Germany) with regard to its *high research and development (R&D) quota* and the large proportion of high-skilled workers [75,76]. More than 70% of the supplier companies have local R&D services [77], and Austria follows a 'high road' model with knowledge-intensive and flexible production that requires highly qualified workers [78]. Research has identified the quality and extent of vocational training in Austria as a relevant factor for this high road model [75]. Through investments in R&D, the family business AVL in Styria, for example, has become a leading developer of electric and hybrid drive systems. Other small and medium-sized enterprises (SMEs) have also advanced towards so-called 'hidden champions'. These economically successful companies – mostly family-run businesses – are world market leaders in their respective fields and are characterized by a high degree of R&D and international orientation [77].

Fifth, the Austrian automotive industry is highly *dependent on the internal combustion engine (ICE) technology* (see Fig. 1). In 2018, the production of ICEs and transmissions accounted for a quarter of the industry's total production value (four billion out of roughly 16 billion euros) [72]. This persistent focus on the ICE technology is linked to the relatively high profitability of the highly-developed conventional powertrain systems as well as to the specialization of German OEMs on big ICE cars. This is also reflected in the R&D activities of domestic companies: In 2018, improvements of conventional powertrains were still considered as the most important field of product innovation by many companies [77]. Furthermore, the focus on the ICE technology is also linked to R&D activities in universities (of applied sciences) that shape and are shaped by the visions and imaginaries of engineers and managers [57].

Sixth, state policies and institutions co-constitute the economic structures of the Austrian automotive industry and play a crucial role in securing these dominant structures. Due to its economic importance, net tax revenues from the automotive industry in 2019 accounted for about 10 billion euros [79]. In return, *indirect subsidies* that strengthen the dominant business model (privately owned cars with ICE technology) amount to 1.3 billion euros per year. These include tax benefits such as the so called 'diesel privilege', flat-rate company car taxation and other benefits for motorized individual transport [80]. In addition to these instruments that support the existing business model, funding schemes increasingly target the ecological modernization of the industry by promoting electric vehicles. On the demand side, the government has set up buying incentives for electric and hybrid cars as part of its climate and energy strategy [81]. As a response to the slump in car sales resulting from the COVID-19 pandemic, the Austrian government has increased this subsidy from 3000 to 5000 euros per vehicle in June 2020 [82]. On the supply side, there are various programs for R&D funding that focus on the improvement of the ICE, e-mobility, fuel cells, alternative fuels and automated driving [83].

At the EU level, *environmental and industrial policies* shape the structures and transformation corridors of the Austrian automotive industry [11]. The EU vehicle fleet emission standards currently present the most important incentive for the ecological modernization of the automotive industry. The standards support the gradual reduction of CO_2 emissions and the shift from ICE vehicles to non-fossil fuel vehicles but do not

[2] Rosenbauer can also be considered an OEM as the company designs and produces complete fire-fighting vehicles. Although part of the automotive industry, we do not consider Rosenbauer a classic OEM as it does not produce passenger cars and serves a niche industry in the automotive sector. The same holds true for KTM, a company specialized in off-road motorbikes.

[3] This was also true for the Opel facility in Vienna that was absorbed by the French PSA group only in 2017.

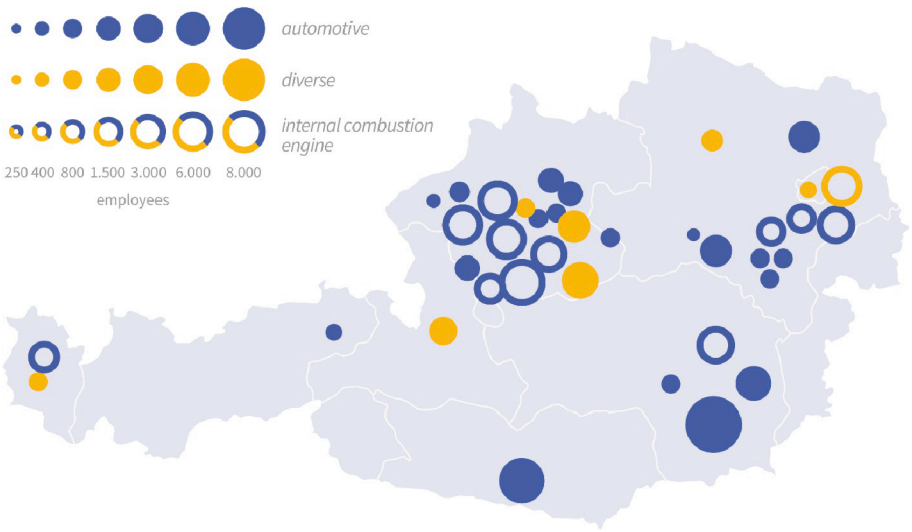

Fig. 1. Austrian companies in the automotive industry differentiated into (supplier) companies that a) mainly produce components for the automotive industry (blue), b) produce components for various industries (yellow), and c) rely on the ICE technology (circles). The size of the dots/circles correlates with the number of employees in 2018. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

incentivize transformative change [84]. For example, climate targets in line with the Paris Agreement set an emission saving target of about 7.2 million tons of CO_2 for the transport sector by 2030 [85]. The emission savings from the current EU vehicle fleet emission standards, however, account only for 0.7–1.2 million tons by 2030 [86]. Apart from explicit environmental regulation, industrial policies frame the structural conditions of the automotive industry. After three decades of neoliberal reform, the recent decade has seen a revival of industrial policy in the EU that has culminated in the proclamation of the European Battery Alliance as an Important Project of Common European Interest (IPCEI) in 2017. The IPCEI framework enables to suspend strict competition and state aid rules and therefore actively support the establishment of a European battery value chain. Led by German and French manufacturers (e.g., Volkswagen, Daimler, BMW, Renault, PSA/Opel), the restructuring of the European automotive industry is currently led by incumbent actors [11].

At the institutional level, the "extensive cooperation between employer- and employee interest groups in the form of the Austrian *social partnership* has a strong influence on Austria's political system" [87] in general and on policy making in particular [88]. Although the foundations of this partnership have changed in recent years (as the conservative-led government broke with major agreements), the labor organizations still largely back company strategies on the grounds of securing employment through economic growth and competition [20,87,88]. This strategy negotiates gradual *improvements* of and within existing structures and prevents more transformative change in the automotive industry. At the same, however, arrangements that have evolved from the social partnership (e.g., qualification schemes for workers, workers' participation at the company level) may also prove essential for legitimizing more transformative change.

4. Workers' crisis construals and imaginaries in the automotive industry

We connect the materiality of the Austrian automotive industry to meaning-making and the articulation of crisis construals and imaginaries by workers and their representatives. Based on the assumption that the ecological crisis entails crisis tendencies and (transformative) change in the automotive industry, we analyze how workers construe this crisis and how they imagine the industry to change in the course of this crisis. This enables us to better understand how they see their own role in such a process and to identify entry points for transformative change. In the interviews and focus groups, three (ideal) types of crisis construals and imaginaries emerged [see also 89]: (1) the predominant *improvement imaginary* that adheres to the ICE technology; (2) the *diversification imaginary* that mainly builds on the transition to e-mobility; and (3) a *transformation imaginary* that, yet weakly developed, questions automobility and envisions a more comprehensive mobility transformation. Fig. 2 provides a graphical illustration of the interactions between materiality and meaning-making from a workers' perspective.

First, most of the interviewed work council members incorporate an *improvement imaginary*, that is, they are confident in incremental improvements of the ICE technology. As one interview partner put it: "I am absolutely convinced that we will continue producing combustion engines even on a large scale" (work council member, OEM supplier, 13 March 2019). The imaginary is mainly directed towards improvements of the diesel engine as well as synthetic fuels or biofuels, coupled with lightweight construction and material efficiency.

> After all, we need the diesel to reduce CO_2 emissions. It is inherently 16–20% better than the gasoline engine in terms of CO_2 emissions. We see even greater potential in the field of e-fuels, in synthetic fuels. I think everyone has seen that CO_2 emissions can be reduced by two thirds. (work council member, focus group, 23 January 2020)

Whereas these workers acknowledge – or at least do not explicitly negate – the challenge posed by the ecological crisis, they tend to underestimate the *depth* of both this crisis and the implications for the automotive industry: "Right now, the automotive industry is in a mini-crisis" (work council member, supplier company, 10 September 2019). The imaginary is furthermore accompanied by a skeptical assessment of e-mobility – without presenting alternative transformation pathways:

> These are dreams of the future in which I do not believe. Because I think that e-mobility will not prevail, my personal opinion. First of all, people are being lied to, because the production and recycling of e-mobility is certainly not better than diesel or gasoline. […] and then you have to get the electricity from somewhere. (work council member, OEM supplier, 25 March 2019)

Second, the *diversification imaginary* that mainly builds on the transition to e-mobility, is prevalent, although to a lesser extent than the first one. This imaginary basically envisions a gradual shift towards alternative drive engines: "In ten years, we will probably continue to work in the same areas – the question is only the proportion. Our areas of work

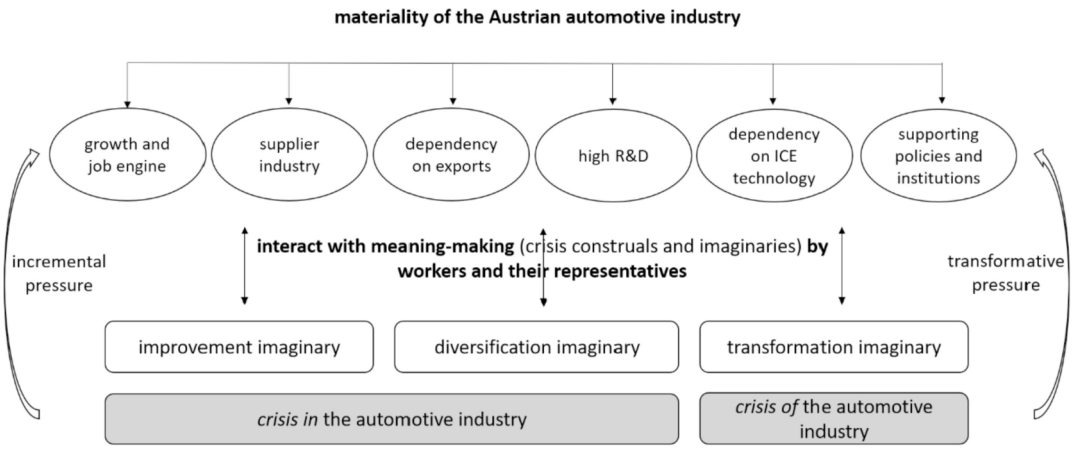

Fig. 2. Cultural Political Economy of the Austrian automotive industry from a workers' perspective.

will be combustion engine, the electric battery and the fuel cell" (work council member, automotive supplier, 5 June 2019). Whereas proponents of diversification acknowledge the partial shift towards e-mobility, they do not envision an eventual phase-out of the ICE technology – an imaginary that is definitely prevalent in scientific and political discourses. The imaginary is also in striking contrast to those of the company management, as a recent study suggests [77]. This skepticism towards a complete transition to alternative drive engines is substantiated both ecologically and socially:

> This electro hype is already getting a little cracked, thank God. A more holistic view is growing, which I find quite positive. It's not just that the electric car emits less in the city. That is nice. But you have to look at the entire production cycle, right up to the scrapping and later on to the disposal. (work council member, focus group, 20 Nov 2019)

In addition to these ecological reservations, social reasons are mentioned against a complete transition towards e-mobility:

> This is also a social question. […] Porsche is building a Tycan, which you can charge to 80% in 80 min. The thing is splendid. You can have it for 150,000 euros, hardly worth mentioning. And then they [Porsche drivers] drive around and see themselves as part of the elite, and our members are not allowed to drive anywhere because unfortunately, the Golf 6 is stinky. But the rich have free ride with their electric cars. (manufacturing trade union representative, 25 January 2019)

Third, and hardly found in our interviews, is a *transformation imaginary* that envisions a more systemic shift in mobility patterns towards public transport systems. Only a few interviewees expressed – rather cautious – hints in this direction, as exemplified in this statement:

> The way I see it, there will be massive changes. This development cannot be stopped and I don't know whether individual traffic will be the top priority. I believe that much will have to go into the public transport, especially in the urban centers. Car manufacturers are reacting to this with car sharing, making cars available, so there are approaches. But I think they will become much more radical. (work council member, automotive producer, 22 October 2019)

Whereas the interviewee adopts a profound crisis diagnosis and indeed envisions a far-reaching transformation of the automotive industry, he is at the same time skeptical with regard to the transformation pathway of his own company: "A relatively large amount is happening in autonomous driving. They are already doing that, but everything is targeted at private transport. I think – that is just my personal opinion – that this is not enough" (work council member, automotive producer, 22 Nov 2019).

In sum, improvement and diversification were the two dominant imaginaries amongst our interviewees and hardly any workers' representatives responded to a transformation imaginary. Whereas the former two construe a *crisis in* the automotive system (that can be overcome through an ecological modernization of the industry), the third imaginary construes a *crisis of* the automotive industry that requires – and can be mobilized for – a more transformative restructuring of the mobility system in general and the automotive industry in particular. These dominant articulations that perpetuate incremental crisis construals and change imaginaries are linked to and interact with the materiality of the Austrian automotive industry (see Fig. 2). Many of the companies where we conducted interviews produce (for the) ICE technology. This economic and technological path dependency narrows the imagined horizon of the workers and the potential for change of existing branches. As a work council member told us: "Our machines are particularly designed for our product. You cannot simply convert them" (focus group, 20 November 2019). Therefore, the less a company is specialized in a particular component for the ICE technology and the more it conducts its own R&D, the more likely do workers imagine a more diverse range of products and components. This is particularly pronounced among the workforce of the so-called hidden champions whose innovation activities actively influence developments in the automotive sector.

Furthermore, companies' ownership structures play a role for the crisis construals and imaginaries of workers. Hidden champions are usually financially strong and innovative family enterprises with a relationship of trust between the workforce and the management. This trust relationship tends to have a positive effect on the transformation perception of the workers and fosters the conviction of being able to actively shape technological change. The situation is different in the subsidiaries of large OEMs or suppliers. Here, the workforce has less room for maneuver, and (job) insecurity is consistently higher than in the family enterprises. One work council member even said: "When you are inside a corporation, you are gagged [*geknebelt*]" (focus group, 20 November 2019). Conflicts with the headquarters, job cuts, work concentration, intensified competition with other sites of the same group and a lack of appreciation on the part of the management tend to encourage a passive and more conservative attitude towards change. Under these conditions, the incremental crisis construals and imaginaries can also be seen as a desire for safety and normality in a situation where workers are put under constant pressure of change.

Yet, despite the difficult position of subsidiaries in the automotive value chains and production networks, they also have structural power resources. Even if OEMs dominate the production networks, workers in their subsidiaries and supplier companies have a considerable structural disruption potential due to the organization of supply chains according to the just-in-time and just-in-sequence principle. Coordinated strikes

can severely disrupt the production process [90,91]. One work council even sees this as a "huge power factor" that workers would have to become more aware of in order to increase their ability to deal with conflict (work council member, 22 October 2019).

Incremental crisis construals and imaginaries are also linked to a certain normalization of automobility, an "automobile consensus" [92] that is anchored by everyday practices: "It is a question of behavior. […] The claim for individual mobility will not decrease. Not everybody likes to go by train, where it smells because there is a crowd of people sitting inside" (work council member, OEM supplier, 13 March 2019). This cultural norm of individual transport is also reproduced by the management:

> I think, in general, it's always about comfort. That means, the highest degree of individual freedom in mobility is simply the vehicle. Public transport can never be that developed […]. I just go down, sit in my car and drive wherever I want. (manager, automotive cluster Upper Austria, 30 November 2018)

In these views, mobility practices and decisions are taken for granted and mobilized for incremental imaginaries.

5. Entry points for transformative change in the automotive industry from a workers' perspective

As seen above, transformative change in the automotive industry is beyond the imagination of most of the workers' representatives. However, our research revealed a general awareness of the ecological crisis that may be politicized for a more systemic transformation of the automotive industry. In the following, we identify four entry points for such a transformation that takes both the materiality of the industry and the meaning-making within the workforce into account. Following Röttger [40], we furthermore reflect on the drivers of transformative change in arguing for a state-driven and democratic conversion of the automotive industry that integrates labor and environmental interests at the expense of world market and corporate conversion.

5.1. Workers' confidence in their own qualification and expertise

Despite the incremental crisis construals and imaginaries, the workers showed a high confidence in their own qualification and expertise. This is exemplified in the following quote: "These people [fellow workers] are indeed great. […] There is a kind of collective intelligence. They always make the best of it. As we proverbially say: They make butter out of shit" (work council member, OEM supplier, 13 March 2019). This collective intelligence makes the companies resilient to crises. The work council members of Austrian subsidiaries of international automotive supplier companies, for example, see these qualifications as a kind of security that protects them from further deterioration of their labor conditions: "The only thing we have left is our know-how" (work council member, automotive supplier, 21 May 2019). Some even frame it as the main factor preventing dismissal: Our know-how "is the only reason why they haven't shut us down yet" (work council member, military vehicle producer, 19 March 2019).

This confidence in their qualification and expertise may serve as an empowering entry point to transformative change in the automotive industry. Their skills allow the workers – at least in some supplier companies – to produce alternatives to cars, as the following statement suggests: "If you work in the automotive industry, you can of course supply any other area because the automotive area is one with the highest requirements" (work council member, automotive supplier, 16 April 2019). At the moment, workers generally put their expertise at the service of process and product innovations *within* the automotive system or the core business of their companies. Occasionally, however, workers also go beyond this. For example, a work council member of a military vehicle producer told us about a product idea that workers developed, not primarily to open up a new profitable product line but to meet a perceived social need:

> We have often suggested, and also drafted on the drawing boards, the construction of fire engines. Just look at Greece, Portugal and other regions where fires are common and where the normal fire brigade rather rapidly reaches its limits. We said: Okay, let's take a track vehicle and re-design it. […] But the management said, we don't do this. We aren't interested.[4] (work council member, military vehicle producer, 19 March 2019)

These asymmetric power relations that hardly allow the workforce to participate in decision-making processes and strategic product development proves to be a strong barrier for transformative change. The dominant profit orientation does not only collide with the logic of workflows and innovation processes, but also systematically limits the ability to react to societal challenges and develop transformative innovations: "There are only pure managers nowadays, business economists who look at every cent and forget about humanity – controllers!" (work council member, focus group, 23 January 2020).

According to our interviews, the workers in the automotive industry show what Dörre et al. [94] have called a "disparate consciousness". The expected persistence of individual automobility (yet ecologically modernized or diversified) is contrasted with a high level of confidence in their own qualification and expertise that also shows an awareness of the ecological crisis and transcends individual job security: We have to "pull ourselves together, otherwise we will poison ourselves completely" (work council member, OEM supplier, 13 March 2019). Another work council confirms that there are colleagues

> who are principally concerned: What is the overall ecological and energetic situation? CO_2 footprint, etc. […] There are, of course, colleagues that deal with these things but it is not a topic that comes from the majority of the workforce and is brought through the work council to the management, for example. (work council member, automotive supplier, 5 June 2019)

Hence, workers show high trust in their own qualification and expertise and selectively also an awareness of the more radical implications of the ecological crisis. At the moment, this disparate consciousness is, however, rather kept low than activated towards more transformative change – both by the management and the trade unions.

5.2. Strategic reorientation of unions towards social unionism

As strategic representatives of the workforce, trade unions are in a key position to mobilize and politicize crisis construals and imaginaries of workers towards more transformative change. At the moment, however, trade unions tend to reinforce the jobs-versus-environment dilemma rather than actively politicize the disparate consciousness of their members:

> I believe that what we do can best be described as a matter of balancing things out and looking, where things contradict each other, what is the higher-order asset. And very often, the individual interest that people have is in contradiction to the societal interest. If you ask a car mechanic about his view that the future is electric […] if you ask him what he thinks about it, he will ask himself what this personally means for him. And when you calculate that seven out of ten mechanics won't have a job in the future, then he will rather be

[4] Such proposals recall movements for the conversion of military production in the course of the Cold War. In the 1970s, for example, workers at Lucas Aerospace in the UK developed the *Lucas Aerospace Shop Steward Plan* to propose alternatives to military production. Although the Labour Government eventually dismissed the plan, it still constitutes one of the most famous examples for workers' engagement in transformation processes [93].

against it. But he still doesn't want to eat all the dirt that the cars blow out. And as trade unions, we are certainly in a situation where it is important to deal with such contradictions: when they say, 'make sure that I have my job', although that may be contradictory, but they want that we dedicate to this. (manufacturing trade union representative, 25 January 2019)

Whereas our findings suggest that our interview partners take the ecological and climate crisis seriously, trade union representatives tend to underchallenge their members in reducing them to their role as job owners:

As a union, we aren't responsible for the world's fortune but we are first and foremost a lobby for workers. What the individual wants, can be in contradiction to the desirable developments of the beautiful big world. (manufacturing trade union representative, 25 January 2019)

Hence, Austrian trade unions tend to push for individual job and income security [see also 65,95]. In line with the dominant improvement and diversification imaginaries, safeguarding current production (and employment) levels are seen as a prerequisite for negotiations, and environmental concerns are met with technical improvements. Such a defensive union strategy that pursues a productivist and preserving strategy over reproduction and ecology [65] is a plausible one in times of crisis. The expected job losses in core union sectors such as the automotive industry threaten to erode the organizational power of unions, making the preservation of jobs a priority. However, trade unions also deprive themselves of finding a more active stance in the transformative restructuring to come and of politicizing the connections between individual economic reproduction (through jobs) and the wider ecological crisis and societal reproduction. In other words, they miss the chance "to reinvent themselves as social movements, not only responsible for the working conditions of their members, but for their general living conditions as well" [21]. Although such a reorientation is marginal at the moment, some work councils actively demand such a position:

As a union, you are a true lobby for workers. And I think at the ÖGB [Austrian Trade Union Federation] and at the top, they could seize this a bit more by saying to the 'Sir politicians': 'Okay, we have a clear vision. […] We have a vision that you can't privatize everything that the community owns. Because it doesn't belong to you!' So a bit more politics for the general society. (work council member, automotive supplier, 5 June 2019)

The disparate consciousness does not mean that workers activate their knowledge and skills for the production of alternative goods and services. But unions may not underestimate but challenge their members to politicize this dynamic tension for more transformative change. Such a strategic reorientation resonates with "social (or community) unionism" [see also, 26,65]. According to Räthzel and Uzzell [21], social unionism defines unions as "actors in the production process, whose role is not only to defend jobs but also to question the given forms of production and develop alternatives. It conceptualises unions as representing not only the interests of workers at work, but in society at large". Such a strategy, therefore, breaks with consolidated unions' vision of an undisputed connection between production and employment and converges immediate workplace-related questions with struggles for ecological and societal reproduction [26,65].

5.3. State policy and framework conditions

Our research also shows that the integration of workers into more transformative change requires the state to take strategic decisions at multiple scales (regional, national, supranational), that is, a "visible hand" that shapes and creates framework conditions for companies and workers [96]. As transformation research shows, purposive transformative change requires directionality, that is, politically negotiated *decisions* instead of innovation processes that focus on market choice alone [97–99]. This directionality usually does not come "spontaneously out of market forces" [100] as it requires "economic agents to take on risk and uncertainty" [96]. A work council member exemplifies this need for direction:

The state [*die Politik*] just has to take a direction and give a directive and say 'that's it'. […] There has to be a decision, that is the difficulty. So I think, the state is required to lead and then consumption will adjust accordingly. (focus group, 20 November 2019)

Another work council member also calls for a more active role of the state in shaping the transformation of the automotive industry:

What is needed from the state is an overall plan. […] And what it will certainly take, is […] support, so that you can try things. Because you will certainly realize things that you haven't known before. Of course, you can say, the companies should have to take this risk but I think these are societal topics where you have to say: 'okay, where do we want to go'. (work council member, OEM supplier, 14 March 2019)

On a more concrete level, transformative industrial policies [11,101] and active labor market policies enable coordinated industrial restructuring with economic security for workers at the same time. These policies are all the more important as the transformation of the automotive industry requires not only active investments in new technologies but also the coordinated phase-out of existing technologies such as the ICE. Historical examples, such as the coal phase-out in the UK, show that such structural transformations often have detrimental effects for workers and communities [102]. Phase-out policies, therefore, require active labor market policies to prevent for large-scale job loss and guarantee economic security. Green New Deal and Just Transition frameworks have introduced important proposals in this direction, for example, through suggesting a job guarantee for workers that are currently dependent on fossil fuel industries. In the course of such a just transition program, public expenditures would come up for "(1) income, retraining, and relocation support for workers facing retrenchments; (2) guaranteeing the pensions for workers in the affected industries; and (3) mounting effective transition programs for what are now fossil-fuel-dependent communities" [103]. Whereas such plans and policies could raise broader support for more structural transformations in the automotive industry, the proposals also tend to 'romanticize' the steering function of the state and neglect the material and ideological dominance of the automotive industry in current state policies and institutions. While this material basis of the state (e.g., tax revenues and employment) makes proactive state policies that disrupt the automotive industry more difficult, the establishment of transformative coalitions between environmental movements and workers – but also with wider civil society – may help to put pressure on the state [17].

5.4. Alliances with the environmental movement

Both the strategic reorientation towards social unionism and socio-economic security systems enable *and* require broad coalitions – and especially alliances with the environmental movement. Such coalitions have an important role in creating the political conditions for transformations, especially when incumbent actors openly resist or slow down transformative change [37,67]. Manufacturing trade unions often express concerns that adopting more transformative strategies could lead to a loss of members. While not generally unjustified, the resulting loss of organizational power may be compensated by the ability to form alliances [13]. Historically, trade unions actively took a stance *against* Austria's environmental movements. This is exemplified by the iconic conflicts against the first – and never activated – nuclear power plant in Zwentendorf, Lower Austria, in the 1970s and against a hydropower

plant in the ecologically sensitive wetlands of Hainburg near Vienna in the 1980s that resulted in the foundation of the Green Party. In both conflicts, trade unions took a tough stance on the side of corporate interests and energy producers and against the bourgeoning environmental movement. However, in recent years Austrian trade unions have increasingly brought up environmental challenges and – at the margins – fostered alliances with environmental movements and NGOs [87]. These burgeoning coalitions form an important entry point to be mobilized and strengthened for a transformation of the automotive industry. At the same time, these alliances may require an 'internalization' of nature and environmental politics as inseparable from societal (re) production rather than an 'add-on' to conventional union politics [68].

6. Conclusion

In this article, we discussed potentials and barriers for a social-ecological transformation of the Austrian automotive industry from a labor perspective. Drawing on a Cultural Political Economy perspective and a qualitative case study design, we connected the materiality of the automotive supplier industry with the articulation of crisis construals and imaginaries of workers and their representatives to come up with entry points for more transformative change. We characterized the materiality of the Austrian automotive industry around six interconnected features and identified three crisis construals and imaginaries (an improvement, a diversification and a transformation imaginary) that are connected to these material features. We finally carved out four entry points for such a transformation that take both the materiality and the meaning-making within the workforce into account: workers' confidence in their own qualification and expertise, a strategic reorientation of unions towards social unionism, state policy and framework conditions as well as strengthened alliances with environmental movements.

In doing so, we provide an important component in understanding the contested nature of social-ecological transformations and in interlinking environmental and social sustainability that go beyond both the Austrian case study as well as the automotive industry. Our analysis, however, only provide exploratory insights into the political economy of the automotive industry as well as workers' crisis construals and imaginaries that are still largely neglected in sustainability and transformation research. More empirical analysis in environmental labor studies are thus urgently needed to better understand and support sustainable, legitimate and empowering social-ecological transformations in and beyond the mobility sector. Based on our research, we encourage three research frontiers: *First*, and with regard to the political economy of the automotive *supplier* industry, our sectoral approach may be complemented with a Global Production Network approach [104] that aims at explaining patterns of unequal industrial development within the contemporary global economy and provides concepts to systematically analyze power relations between globalized companies in spatially dispersed networks. Furthermore, the role of labor in shaping and transforming production networks has been gaining increasing attention within this line of research [105]. *Second*, and with regard to the role of workers in transformation research, our focus on work council and union representatives may be advanced with more in-depth research into workers orientations and perspectives [106,107]. As already mentioned in the introduction, workers are by no means a homogeneous group, which means that nuances between different fractions of the work force (e.g., contract workers, white-collar workers, blue-collar workers, engineers) require more attention to fully grasp barriers and potentials for a social-ecological transformation from a labor perspective. *Third*, and with regard to the role of workers in *mobility* transformations, our approach may be complemented by highlighting the multiple identities of workers [71]. While we see the focus on workers as *producers* as an important contribution to transformation research, we do not intend to confine workers to this identity. Rather, workers are also, for example, mobile subjects on the way to work and in their leisure time which also influences their visions about the future of the mobility system.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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