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If electric trucks are the solution, what are the problems? A study of agenda-setting in demonstration projects

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ABSTRACT

This paper explores individual and collective agenda-setting processes in demonstration projects. It contributes to transition studies by showing how multi-actor collaboration in demonstrations and the resulting alignment of agendas aid social embedding of new technologies. The research questions address, first, the extent to which individual actors can dominate shared agenda-setting, and second, how the experience of participating in demonstrations influences actors' individual agendas. An analytical model operationalizes agendas based on an adjusted multiple streams approach of problems, solutions, and institutional contexts. The model is applied in a comparative analysis of two electrified distribution truck demonstrations. All data presented were collected in 25 semi-structured interviews and an online workshop. The analysis shows how leading actors may dominate agenda-setting dynamics by imposing considerable influence on the selection of problems and specification of solutions. However, it also illustrates how other involved actors can influence the configuration of technological solutions during the demonstration project. The analysis results highlight how collaborative agenda-setting can lead to the creation of coherent packages between multiple streams, leading to changes in the individual agendas of the involved actors.

1. Introduction

Transitions studies consider understanding actors and their relations to be an important prerequisite for the development and diffusion of sustainable technologies [1–3] as well as for managing and governing transitions [4]. Concurrently, the underlying problematization of sustainability transitions is characterized by wickedness, which implies a lack of clarity on where the actual problem lies, the ambiguity of available information, and the conflicting nature of the involved decision-makers' values [5]. Addressing such wicked problems requires actors to adopt flexible and dynamic approaches. One perspective that captures the dynamic and fluid character of actor involvement in transitions is the concept of agenda-setting. An agenda can be defined as a selection of problems to focus on at a given point in time, and agenda-setting refers to the process of reducing an endless stream of potential problems "to the set that actually becomes the focus of attention" [6,p. 3].

Actors develop their individual agendas strategically and in correspondence to their perceptions of the importance of different problems as well as underlying assumptions about possible solutions at a given moment in time [7,8]. Thus, any agenda an actor comes to accept needs to be considered fragile and temporary as perceptions may change. Moreover, each individual actor has limited agency and is dependent on others to realize their agenda [9,10]. Therefore, to move transitions forward and enable collaborative action, actors need to collectively set shared agendas [11]. Additionally, the ability to govern transitions rests on broad actor networks sharing a "sustainability vision" that legitimizes one pathway over other potential options [12]. Such shared agendas enable alignment around what problems to address and how to realize agreed upon visions for society [13,14]. Furthermore, interactions and temporary alignments between actors change their individual agendas [15]. Therefore, it is important to understand how a shared agenda-setting process unfolds, as well as how it affects agendas of individual actors.

Experiments with certain technology solutions, i.e. demonstrations, have been shown to lead to the formation of legitimized transition pathways [16]. Demonstration projects are a particular type of collaboration arena which enable agenda-setting processes and a temporary alignment between the participating actors in the context of transitions and technological innovation [2]. Previous research also discussed how

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local projects may offer possibilities to "(re)define agendas" both within the original setting of the projects and potentially beyond by attracting more members and resources for future initiatives [17].

Transition studies assign a prominent role to demonstration projects to nurture radically new technological alternatives [18]. In particular, strategic niche management emphasizes the role of demonstrations as niches that provide a temporary protection to new technologies from an existing socio-technical environment [19,20]. One important function of protection is empowerment, which refers to the development of strategies to make the niche technology sufficiently competitive. To achieve empowerment, participating actors need to link the niche technology to wider social change processes [19]. However, existing research provides insufficient understanding in at least two areas. Firstly, strategic niche management explains change in a manner that pays too little attention to both the potential tensions between powerful actors that are capable of structuring broad societal agendas during transitions and the dynamism of the temporal settings such change occurs in [21,22]. More attention should hence be directed towards the ability of powerful actors to advocate for specific technology configurations [10], in particular in the context of demonstration projects [23]. Secondly, it remains unclear how the interaction between different actors can affect collaborative agenda-setting or how experiences during collaborative agenda-setting, in turn, affect actors and their individual agendas.

The objective of this paper is to address these two dimensions by investigating individual and collective agenda-setting processes in demonstration projects. To fulfill this objective, we make use of a comparative case study of two urban demonstration projects of electrified goods distribution trucks with dissimilar technology choices and different actor constellations. Indeed, in Stockholm the municipality was leading a project to test night-time deliveries with a plug-in hybrid vehicle (PHEV), while the project in Gothenburg was headed by a vehicle manufacturer wishing to operate fully battery electric vehicles (BEV). Data was collected in 25 semi-structured interviews with all participating actors and an online workshop. Based on interview and observation data, we explore two research questions: 1) To what extent can individual actors dominate a shared agenda-setting process in demonstration projects? 2) How can the experience of participating in demonstrations influence the individual agendas of the participating actors?

In the next section, the theoretical framework is introduced, followed by a presentation of the methodological underpinnings, including case selection, data collection, and analysis in Section 3. Section 4 offers detailed insights into the empirical observations from the two case studies. Consequently Section 5 analyses the relationship between individual and project agendas and answers the study's research questions. Finally, Section 6 rounds off the paper with concluding remarks and discussion points.

2. Theoretical framework

2.1. Agenda-setting in transitions research and the multiple streams approach

The term *agenda* has been used in diverse ways in transition studies. Authors have referred to "long-term transition agendas" [24], "sector development agenda" [25], "green agenda" [26], "electricity decarbonisation agenda" [27], "sustainability agenda of urban planners" [28], or "competing societal, policy and corporate agendas" [10] among others. The wide variety of agenda concepts advocated in transition studies appears to spread across three main dimensions.

First, the agenda concept is commonly used to study transitions from a policymaking perspective examining dynamics at the EU level [29,30], national level [31], regional and municipal levels [32,33] or across multiple policy levels [34]. Second, much discussion is found around the research agenda of transition studies as a research community [18,35,36]. Third, numerous studies focus on describing particular transition agendas [37]. Often this features detailed descriptions of particular *transition arenas* [38] and the *governing of transitions* [12,39].

Our study builds on this third research field by exploring individual and collective agenda-setting processes in demonstration projects in the transport goods sector. Looking at previous transition studies concerned with agenda-setting dynamics, the multiple streams approach by Kingdon has proven a valuable conceptual starting point [8,15,40,41]. For Kingdon [6], the agenda-setting process reduces the almost endless strain of "conceivable subjects" decision-makers could act upon "to the set that actually becomes the focus of attention" (p. 3). In other words, the agenda can be defined as the list of problems that receive considerable attention at a given moment in time. The precondition for a problem to be promoted to the heights of the agenda, however, is inherently linked to the alignment of the problems stream with the other two independent units, i.e. the solutions stream and politics stream [6].

The multiple streams approach fundamentally shares some assumptions with core transition concepts. For instance, the popular multi-level perspective builds on the notion of "windows of opportunity" where influencing the direction of transitions is temporarily made possible [42–44]. The notion of windows of opportunity links back to the idea that existing systems may become destabilized at particular moments in time, and alternative socio-technical system configurations may emerge [45]. Elzen, Geels, Leeuwis and Van Mierlo [46] argue in favor of Kingdon's approach to examine such transition opportunities.

Kingdon's approach, in essence, maintains that the alignment, or coupling between otherwise independent streams of problems, solutions and politics is needed to realize the change potential of these windows of opportunity. While problem representations are plentiful, solutions are considerably rare as they depend on the ability of interested actors to align the particular solution with both political realities, and problems which are presently regarded as societally relevant [6]. Elzen et al. [46] argue that from a transition perspective, the question becomes how solutions can become aligned with particular problem representations into coherent packages that are attractive to different actors.

2.2. Agenda-setting in demonstrations

A critical factor for transitions research is identifying the situations where the alignment of solutions and problems becomes possible, and a window of opportunity opens [46]. We argue that the initiation of a demonstration project implies that participating actors seek to explore a certain solution in relation to a selection of problems. Thus, a demonstration project indicates that a window of opportunity has emerged, and the actors are engaged in agenda-setting.

The relevance of the participating actors being able to arrive at joint understandings during demonstrations has been established as a vital precondition for learning and upscaled technology diffusion during transitions [20,47]. In agenda terms, actors need to temporarily align their individual agendas. In the context of demonstration projects, we distinguish two different levels of agendas, the level of an individual actor and the level of a demonstration project. First, each participating actor in a local demonstration project hosts an individual agenda within their organization. Second, the accumulation of different actor agendas and their partial alignment during a demonstration constitutes a project agenda. Importantly, a shared project agenda represents a temporary agreement between the participating actors made to achieve the goals of

the demonstration.

However, it is a challenge to achieve alignment between actors as they often have different, even conflicting views on project strategy and implementation [48,49]. That is, at the start of a project, participating actors are likely to face fluidity of individual agendas as uncertainty prevails over the needed strategic choices. Complexity is high as actors need to be strategic to attain both the most important dimensions of their individual agendas and the shared project goals. What heightens complexity is that both these entities tend to be vaguely defined at the project start. In other words, realizing strategic aims for each individual actor is constrained by those of its surrounding partners [9].

The way the alignment between individual actors happens reflects the intricate nature of agency and power in transitions. On the one hand, following the principles of distributed agency and collective enactment, actor alignment develops through dialogue and endogenous steering, where multiple actors' perspectives evolve and synchronize, leading to single-loop and double-loop learning, joint sense-making and a shared understanding of goals and needed actions [50–52]. On the other hand, some actors may hold stronger positions to influence which solutions make it to the heights of the agenda [17]. For example, universities may influence agenda-setting by promoting the needs of local actors [53]. Municipalities may also hold central roles, as their sustainability agendas manifest in city planning practices and shape local preconditions [28]. Furthermore, incumbent firms may tactically engage in transitions to prevent radical agenda shifts or gain competitive advantages by promoting certain changes they expect to benefit from [27]. Therefore, the choice of a problem and a solution to be coupled is affected by roles and power distribution in a particular demonstration project.

Furthermore, while demonstration projects are temporary, individual actors are engaged in the transition process in the long-term. Whereas the fact of actor alignment during demonstration projects has been established [50], it is less clear whether and to what extent such alignment extends beyond achieving the purposes of the demonstration projects, i.e. how individual actors' agendas are affected by the experiences gained in the demonstration projects.

2.3. Adapting the multiple streams approach to study agenda-setting in demonstrations

We use Kingdon's multiple streams approach to conceptualize agenda-setting in demonstration projects at the individual (actor) and collective (project) levels. Following Elzen et al. [46], we adjust Kingdon's multiple streams of problems, solutions, and politics to shift the scope from top-down agenda-setting by policymakers towards a distributed and contested agenda-setting by a wide range of actors in the context of sustainability transitions. The three largely independent streams in our model (Fig. 1) are conceptualized as (1) solutions or technology configurations participating actors advocate, (2) problems that participating actors aim to address during the demonstration project, and (3) institutional contexts that reflect social norms and values, market systems, legal frameworks, and relevant political structures.

First, in our conceptual understanding, technology alternatives in demonstration projects constitute solutions looking for problems.[1] This conceptual choice is derived from the observation that the technology configuration project partners selected for their demonstration constitutes a temporarily accepted solution to all actors. Therefore, the technology-based solution needs to pre-exist. Otherwise, the implementation in the project is impossible. Simply put, one cannot demonstrate an electrified truck without having built one. Although the number of available solutions is limited, often several alternative solutions can be used to address the same problems which enables competition between these solutions. One example from the transportation sector is the competition between biogas and electrification as two alternative solutions to the sector's environmental problems [54,55].

Second, the problems stream, in stark contrast to the solutions stream, is more fluid [6]. It carries the problems that individual actors in the project are associating to the solution. For example, offshore wind projects were justified as valid solutions to counteract problems such as regional industrial decline, job insecurity or local energy deficiencies in Norway [41]. Agendas individual actors hold at the start of the demonstration are treated as rather unstable in transitions research [21]. Further, during a demonstration project different actors can hold divergent understandings of which problems the technology-based solution should help to address [2]. The successful alignment of the problems stream with one advocated solution during the demonstration is only possible when the divergent individual agendas are compounded into a project agenda. This alignment is relevant to study since the problems that the project decides to prioritize can influence which technology configuration is pursued.

Third, we propose an “institutional contexts stream” to complement the solutions and problems streams, acknowledging the interwoven nature of any technology configuration with social norms and values, legal frameworks, relevant political structures, and market conditions. This third stream constitutes an extension of the traditional political stream by Kingdon [6] and hosts the societal context in which decisions about the agendas are taken. Adjusting this third stream also accounts for the possibility of pre-alignments between certain solutions and problems. For example, a previous collaboration between actors may influence their understanding of what solution is desirable. Transitions studies have acknowledged both the role of policy in agenda-setting [56] and that no transition of any technology configuration becomes possible if the emergent technology is not embedded in the surrounding society [57]. Consequentially, an alignment of solutions and problems cannot be expected to happen in a social or contextual vacuum. To account for this, we distinguish two central dimensions in the institutional context stream [cf. 46], i.e. the institutional environment and the task environment. Following the definition proposed by Oliver [58], the institutional environment encompasses those contextual factors connected to the political and legal domain. The assumption is that organizations will seek to manage their relations to their institutional environment in correspondence to societal values, norms, and regulations. In contrast, the task environment is dominated by organizations' resource requirements and the interdependence among various organizations in the competitive market context [58]. As Elzen et al. [46] explain, task environments are characterized by “economic competitiveness, efficiency and financial performance” functioning as key selection criteria (p.264).

3. Research design and methods

3.1. Method selection, data collection and analysis

The overall analytical approach of this study originates in an interpretive paradigm which enables an exploration and interpretation of actors' perspectives and meanings and calls for qualitative research methods [59,60]. In line with that, this paper is based on a comparative case study of two demonstrations of electrified distribution trucks in Sweden. As argued by Yin [61], case study is an appropriate

[1] Elzen et al. [42] suggested to add the dimensions of a technology and market stream to replace the solutions stream. We coincide with this suggestion in associating technology with the solution stream, while we consider the market to be a part of the institutional stream, as explained below.

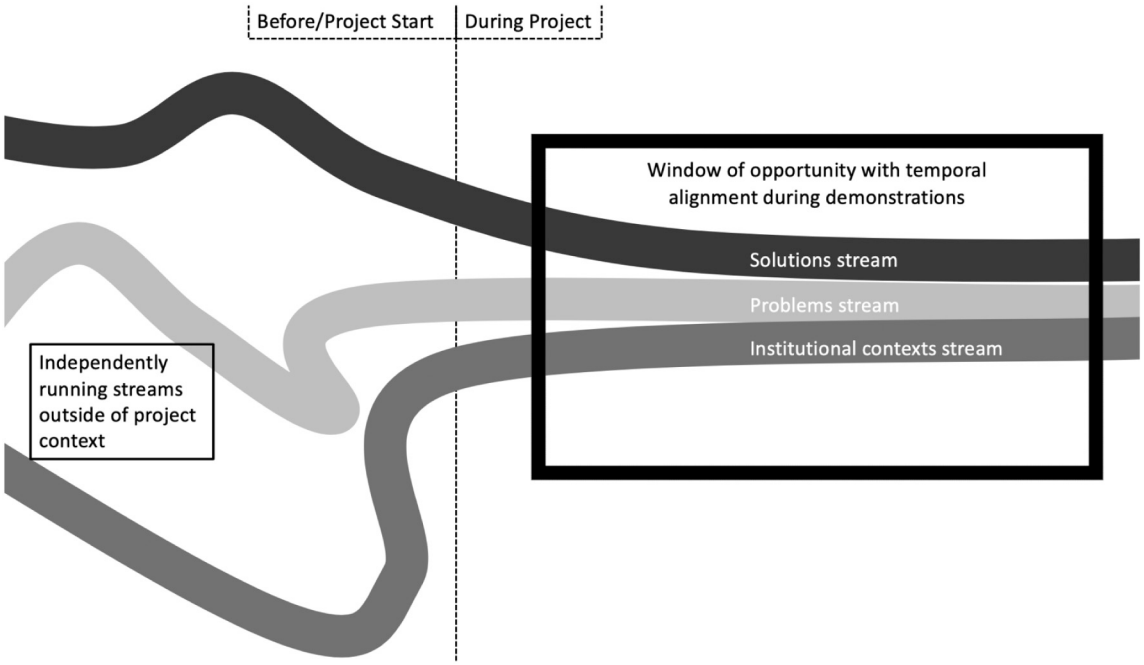

Fig. 1. Adapted model of the multiple streams and their alignment during demonstration projects

methodology when trying to explain complex social phenomena and answering explanatory research questions. In particular, a comparative case study allows for a precise delineation of relationships and constructs [62]. In this paper, using a comparative case study provided comprehensive answers to the research questions. The fact that the two studied demonstration projects opted for different yet relatively proximate technology choices (fully electric vs hybrid electric trucks) facilitated nuanced comparisons taking into account not only technical considerations but also actor constellations. Diving deeply into multiple exemplary cases enables tracing processes along the project timelines and allows for the provision of most plausible explanations for the observed phenomena [63]. Thus, we used an abductive approach of process tracing [64] to identify plausible explanations for the way individual agendas and collaborative agenda-setting dynamics co-evolved across the projects, which corresponds to the study's research questions.

Semi-structured interviews have functioned as a viable data source for recent studies in energy social science research taking an interpretivist stance [65,66]. According to Lin [67] interviews can be used for comparative case studies which "allows the researcher to see the phenomenon of interest in its context" when following an interpretivist approach and adding positivistic comparisons of those aspects that the individual cases do and do not share (p.176).

3.1.1. Case selection

The overall case of heavy road vehicles was selected since it is a relevant sustainability transitions arena where diffusion of alternative vehicle technologies is a prerequisite for reducing greenhouse gas emissions. Especially the electrification of distribution trucks offers the potential to reduce carbon emission where sufficiently clean electricity is available [68], can enable the reduction of noise emissions [69] and may even boost transport efficiency and reduce congestion where night-time operation is possible [70].

Over the past few years, battery electric trucks demonstrated a rapid technological development and an increasing commitment from key actors. For example, in autumn 2020, the two leading manufacturers this study observed newly announced ranges of upcoming electrified trucks. Preceding these announcements, both manufacturers, referred to as West and East in the remainder of the study, engaged in demonstration projects. In these demonstration projects a wide range of partners (vehicle operators, transport service buyers, city authorities, energy companies, research institutes) collaborated to formulate and align their visions and strategies with respect to the new technology. Due to such high pace of recent and ongoing developments, electrified distribution trucks are a case of transitions in the making [cf. 71] providing a possibility to study how individual actors' agendas can be aligned and transformed in demonstration projects.

Two demonstration projects were selected for this study, the implementation of two fully electric trucks of West for day-time goods deliveries and waste collection in Gothenburg and the utilization of a plug-in hybrid electric truck of East for night-time goods deliveries in Stockholm. To answer the study's research questions about the agenda-setting dynamics at both the project and individual actor level, it is important to trace similarities and differences between the selected demonstration projects and explain the implications of such comparison for the agenda-setting processes. The two selected projects provided a fruitful ground for a comparative analysis as they adopted different yet proximate technical solutions (fully electric vs. hybrid truck), accentuated different problems (emissions reduction vs night-time deliveries), were differently embedded in their institutional contexts (in particular in terms of the actors' task environments) and had different types of dominant actors with the largest influence over collective agenda-setting (a vehicle manufacturer vs a municipality formally leading the project).

Table 1
Summary of the interviews.

Demonstration project	Interview nr.	Stakeholder	Interviewee	Format
Gothenburg	1	Truck manufacturer West	Senior Manager	Phone
	2	Science Park	Project Managers[a]	Phone
	3	Logistics company	Quality and Environmental Manager	Phone
	4	Science Park	Project Managers[a]	Phone
	5	Truck Manufacturer West	Senior Project Manager	Phone
	6	Science Park	Project Managers[a]	Face-to-face
	7	Transport buyer	Transport Manager	Phone
	8	Logistics company	Quality and Environmental Manager	Phone
	9	Hauler	Senior Manager	Phone
	10	Waste management company	R&D Manager	Phone
	11	Truck manufacturer West	Senior Manager	Phone
	12	Truck manufacturer West	Senior Project Manager	Phone
Stockholm	13	City of Stockholm	Strategist	Phone
	14	Truck manufacturer East	R&D Manager	Face-to-face
	15	City of Stockholm	Strategist	Face-to-face
	16	Hauler	Quality, Safety and Environmental Manager	Face-to-face
	17	Truck manufacturer East	Senior Manager and R&D Manager[a]	Phone
	18	Transport buyer	Sustainability Manager	Face-to-face
	19	University	Researcher	Face-to-face
	20	Truck manufacturer East	Project Manager	Face-to-face
	21	Transport Consultancy owned by East	Project Consultant	Face-to-face
	22	University	Researcher	Face-to-face
	23	University	Researcher	Face-to-face
	24	University	Researcher	Face-to-face
	25	Truck manufacturer East	Senior Manager	Phone

[a] In these four interviews upon the request of our interviewee we conducted interviews with two interviewees present. No further alterations to the interview set up were made and the same interview guide was used.

3.1.2. Data collection and analysis

Data was collected in semi-structured interviews with project participants representing each actor in both demonstration projects.[2] In total, we conducted 25 interviews between spring 2019 – spring 2021, covering all actors from both projects. All interviews were conducted throughout the duration of the projects and the interview guides contained both questions regarding experiences before, at the start and during the project's duration. The interview guide was set up in the context of a broader research project and was used to prompt interviewees to share their experiences of the collaboration between participating actors and explain own and collective project objectives and results. For most actors one project participant was interviewed once, while in those cases where additional interviews were deemed necessary either different individuals were interviewed that had more insights into the project, or follow-up interviews were made with the same respondent to clarify remaining questions. The interviews were between 30 and 75 min long. 19 interviews were recorded and transcribed verbatim. For the remaining 6 interviews, recording was either not feasible in the interview setting, or not approved by the interviewee. In these cases, detailed interview summaries were written based on field notes. Table 1 summarizes the conducted interviews.

Interview data needs to be seen as a situated account by an interviewee and not an objective account of reality [72]. Therefore, we used three strategies to increase reliability. First, interview data was complemented with publicly available data from actors' websites and press releases which provided an overview of how the project goals and results were communicated publicly. Second, we include data from observations at meetings of the Swedish Electromobility Center (SEC) between 2019 and 2021. The SEC is a national center of excellence for electric mobility where automotive manufacturers, industrial partners, energy companies and research institutions across Sweden exchange information and discuss joint projects. Third, in autumn 2020, we held a half-day digital workshop with three representatives of the projects and two industry experts. The workshop was held within a larger research project of which this study is a part. The workshop discussions were recorded and complemented the dataset for the Stockholm case. The data collected was predominantly used to ensure that our analysis of interview data did not contradict the observations and discussions at the workshops. Only when it came to the third stream, the accounts provided by a representative from a hauler and a vehicle manufacturer at the workshop were actively used to extend our material on how market strategies became an essential contextual factor influencing which type of technology configuration became acceptable in Stockholm.

Interview transcripts were analyzed using the NVivo 12 software. We coded the transcripts along our theoretical framework. First, we identified citations referring to the streams of solutions, problems, and institutional contexts. Within each of these overarching codes, subcategories were derived based on the empirical material. For example, under the “problems” category, subcategories “emissions”, “noise”, “congestion”, “livable cities”, “driver environments” were added. Second, in parallel with the streams, we coded whether a citation characterized an individual actor or the overall project. For individual actors, we also distinguished between their agendas at the time of entry into the demonstration project and during or towards the end of the project. We used this coding structure to trace patterns of alignment of individual actors' agendas to form a shared project agenda, and to analyze how individual agendas transformed over time.

4. Results: agenda-setting in the two demonstration projects

This section elaborates on the patterns of agenda-setting in the two demonstration projects. To highlight the dynamic processes associated with the streams of solutions, problems and institutional contexts, we distinguish between agenda-setting at the beginning or before the projects and during the projects. We further use Tables 2–3 and Figs. 2–3 to visualize and summarize agenda-setting processes discussed in this section.

[2] We speak of project participants to directly refer to our interviewees and this is to imply that these are individuals that had an active role in the projects, while we understand the term actor as the involved organization or firm which participated in the demonstration project.

4.1. Gothenburg case

4.1.1. Agenda-setting before and at the start of the project

In the *Gothenburg* project, the truck manufacturer West, the actor that was to develop and deliver the vehicle, had the most influence on the choice of the solution. Building on previous experiences with hybrid-electric buses, West originally intended to demonstrate a hybrid electric truck. However, due to the fast-paced improvement in battery technology, West, already in the beginning of the project, altered the solution in favor of a fully electric truck. To ensure as long of a range as possible, West planned for a truck configuration with a maximized battery capacity, i.e. five battery packs. The other partners (e.g. the logistics company and the supermarket chain which acted as a transport buyer) considered the project as a test bed for West's technology prototype and regarded it as a privilege to participate in the project.

At the same time, at the beginning of the project, most of the partners did not consider electric trucks as the only option for future heavy vehicles. Both the logistics company, the hauler and the waste management company considered alternatives including biogas trucks, hydrogen trucks and Electric Road Systems. Thus, while the partners used this demonstration project to test the specific option of a full electric truck, their overall strategies included an evaluation of different technological solutions.

The first problem identified in the Gothenburg project was the emissions from trucks used for urban goods transportation. The project was initially framed in terms of emission targets and mitigating climate change, which was well in line with the strategies of participating actors. At the time of project initiation, West, the waste management company, the hauler, the logistics company, the transport buyer, and the City of Gothenburg all had high environmental profiles and leadership ambitions in their sectors with respect to addressing the problem of emissions. In the interviews, a few alternative problems appeared, such as noise and congestion in cities, and maintaining an attractive city center. While actors recognized these problems to be increasingly relevant, they were not originally connected to the goals of this project.

Several characteristics of the institutional context stream in the Gothenburg case can be highlighted at the time of the project initiation. In terms of the institutional environment, all actors experienced regulative pressures to reduce emissions and start adopting fossil-free transportation solutions. An Interviewee at West expressed that participating actors experienced policymakers *"pushing for cutting the emission quite hard and we have a lot of CO_2-focus. Actually, more than we expected and even faster."* (Interview 1). Further, due to a lack of experience with electric trucks, there was uncertainty about the technology, in particular range anxiety, or uncertainty about how long an electric truck can drive without charging. Related to this, the interviewees also discussed the uncertainty about potential availability and technical characteristics of the charging infrastructure as well as the degree of governmental support.

In terms of the task environment, the project was built on pre-existing partnerships. Indeed, the City of Gothenburg, West and the waste management company previously collaborated in multiple projects; the logistics company was an established partner of the transport buyer, and the hauler implemented deliveries for the logistics company in Gothenburg. These established partnerships contributed to a better understanding between actors and an openness to align individual agendas.

4.1.2. Agenda-setting during the project

Although West had a leading role in designing and specifying the fully electric truck solution, both truck operators (the waste management company and the hauler) were also highly involved in adjusting the solution to the needs of their respective applications. For example, the waste management company demanded specific range and load characteristics, as well as selected a truck model with a smaller chassis to ensure better accessibility in the streets of Gothenburg. Further, a West engineer described his exchange with a senior manager at the hauler as follows *"he is quite[…] a stubborn person and quite frank and he says that: "You should not build a truck that we can't use for commercial usage. You shouldn't build long range to have some kind of bragging. […] And we listened to that, so we actually took away two full battery packs, so now it's three battery packs instead of five, […] we were afraid that we would have maybe a bit too short range, but it doesn't look like we have that."* (Interview 1). This indicates how specifications were performed in close dialogue between the partners. In the course of the project, a public charging station was built so that the demonstrated solution could also include charging infrastructure and service. The implementation of the charging station was initiated by West and was performed in collaboration with a local energy company. A West representative discussed how experience with this charging station helped reveal challenges related to public charging, including high competition among different urban transport applications around lunchtime.

As the project proceeded, new problems were added to the original problem of emissions reduction. Actors discussed a possibility to test night-time solutions for goods deliveries to address congestion and noise problems. For the waste collection application, however, this alternative was not considered feasible, since the main source of noise for regular waste collection trucks stems from emptying garbage bins rather than the combustion engine.

Another problem that became connected to the project during the implementation was the drivers' working environment. The investigation of drivers' experiences initiated by West, showed that the drivers experienced much better working conditions in an electric truck, with lower noise and a possibility to talk to each other when working in pairs. Therefore, several interviews highlighted this improved work environment as one key benefit of electric trucks. For instance, an interviewee at the logistics company stressed that *"there is a shortage of about 6 000 drivers. That's a huge problem for the industry and some of them [haulers] think that these types of investments will also attract younger drivers"* (Interview 3). Similarly, a senior engineer at West argued: *"You even get less stress disorders and you probably minimize the risk of getting hearing impairments, so there are some really good advantages."* (Interview 1).

The institutional context was also transforming during the project. Some aspects of the institutional environment retained their relevance, while becoming increasingly connected to the problems and solutions that the project focused on. For example, the actors' pre-project concerns about the charging infrastructure resonated well with the experience of installing and using a public charger in the project. Further, in parallel to the project implementation, electrification of goods transportation gradually became a widely accepted future development alternative for the industry, while regulatory pressures to decrease transport emissions persisted. Therefore, actors were eager to implement the lessons learned in the project and started adopting more ambitious strategies. For example, in late 2020, West announced their long-term strategy which included aiming for 100 % fossil-free vehicles by 2040. The logistics company was satisfied with the proof that logistics associated with an electric truck (route planning, charging) could be successfully implemented. They further raised an urgent need to switch to fossil-free transportation, highlighting that inaction may increase the risk of going out of business. Therefore, they engaged in disseminating the project results and considered putting pressure on the partner haulers to make them more proactive in adopting fossil-free solutions. Reflecting on the project results, the hauler and the transport buyer considered continued use of the truck on commercial grounds. The waste management company was more reserved, highlighting that a continued use of electrified trucks was conditional upon access to the particular truck model tested in the project.

One aspect of the institutional environment that lost relevance during the project implementation was the range anxiety. This can be explained by a continued rapid development of the battery technology together with positive demonstration results confirming that electric trucks can successfully perform in urban applications. For West, such

Table 2
Overview of the streams in Gothenburg.

Components/sub-components of the streams	Label	Actor predominantly supporting/associated with agenda item	Pre-aligned before/ start of project	Aligned during project
Solutions stream				
S1	Solution of battery electric vehicles	West	YES	YES
S1a	Maximized vehicle battery capacity	West	YES	NO
S1b	Flexibly adjusted battery capacity	Hauler and waste management company	NO	YES
S1c	Small vehicle chassis	Waste management company	NO	YES
S1d	Public opportunity charging infrastructure	West	NO	YES
Problems stream				
P1	Problem of emissions	All	YES	YES
P2	Problem with driver environments	Hauler, waste management company and logistics company	NO	YES
P3	Problem of congestion	Hauler	NO	YES
Institutional contexts stream				
IC1	Institutional contexts stream relating to institutional environment		NO	NO
IC1a	Range anxiety	West and logistics company	YES	NO
IC1b	Uncertainty over charging infrastructure	West, logistics company, waste handling company and hauler	YES	YES
IC1c	Regulatory pressure	All	YES	YES
IC1d	Legitimacy	West, transport buyer, hauler and waste management company	NO	YES
IC2	Institutional contexts stream relating to task environment		NO	NO
IC2a	Established collaborations	West and hauler	YES	YES
IC2b	Operational routines	Hauler, logistics company waste management company and transport buyer	NO	YES
IC2c	Distribution of cost and responsibility	All	NO	YES

positive results enabled the plans to proceed with electrification of regional trucks as the next step.

During the project, actors also engaged in a dialogue around several market-related topics which constitute the task environment. One key issue is the distribution of costs among participating actors: since the purchasing price of an electric truck is considerably higher than a diesel one, new business models were called for to ensure that adopting an electric truck could be profitable for operators. Another aspect of the

Table 3
Overview of the streams in Stockholm.

Symbol of solution	Label	Actor predominantly supporting/associated with agenda item	Pre-aligned before/start of project	Aligned during project
Solutions stream				
S1	Solution of plug-in hybrid vehicles	East	YES	YES
S1a	Off-peak operations	All	YES	YES
S1b	Depot/Public opportunity charging	East and hauler	YES	NO
S1c	Depot/Privat opportunity charging	City of Stockholm	NO	YES
S1d	Special noise reduction measures	University and hauler	NO	YES
S1e	Special route optimization tools	Transport consultancy and university	NO	YES
Problems stream				
P1	Problem of noise	City of Stockholm	YES	YES
P2	Problem of livable cities	City of Stockholm	YES	YES
P2a	Congestion	City of Stockholm and hauler	YES	YES
P2b	Daytime deliveries	City of Stockholm and transport buyer	YES	YES
P2c	Flexibility in urban spaces	City of Stockholm	NO	YES
P2d	Secure and walkable environment	City of Stockholm	NO	YES
P3	Problem of emissions	All	YES	YES
Institutional contexts stream				
IC1	Institutional contexts stream relating to institutional environment	–	YES	YES
IC1a	Regulatory pressure	All	YES	YES
IC1b	Legitimacy	All	NO	YES
IC2	Institutional contexts stream relating to task environment	–	YES	NO
IC2a	Flexibility for vehicle customers	East	YES	YES
IC2b	Assessment of transport efficiency	All	YES	YES
IC2c	Established collaborations	City of Stockholm, university, and East	YES	YES
IC2d	Possibility for policy innovation	City of Stockholm	YES	YES

task environment is the adjustment of the truck to the needs of a particular application. To specify the truck correctly, a manufacturer needs a much more detailed understanding of how the vehicle is being used. While such information could be exchanged about particular trucks used in the demonstration, at the fleet level this is competitive information, which logistics companies do not want to share with their partners. Therefore, the demonstration increased an awareness among project participants about potential issues that the alignment of operational routines may involve. Table 2 and Fig. 2 summarize agenda-setting in the Gothenburg project.

4.2. Stockholm case

4.2.1. Agenda-setting before and at the start of the project

The solution selected in Stockholm was based on the procurement specifications that the municipality and the local university had jointly developed. East thus needed to supply a plug-in hybrid vehicle that offered the possibility of fully electric driving in a predefined geographic area (city center) to allow for localized noise reduction. However, East had certain freedom in designing the vehicle and decided to use a vehicle with a very limited electric driving range of 10 km, which implied that the truck relied primarily on a combustion engine outside the city center, e.g. when driving to collect the goods at the hauler's logistics terminal located outside Stockholm. The underlying rationale of East was linked to concerns of keeping vehicle costs low and offering considerable flexibility to the hauler operating the vehicle. Furthermore, the hauler and the transport buyer had full discretion in adopting a suitable route that matched the technological capability of the supplied vehicle. One central aspect of the solution tested in Stockholm was off-peak operations, i.e. the truck delivered goods during night-time. In particular, the municipality described the overall goal of the project as enabling off-peak goods transport. The charging solution that was used to enable the operation of the vehicle was financed by the EU funding the project received. Both a charger at the premises of the hauler and a charger at a public loading zone were planned as a part of the project.

Many of the most central problem representations, which our interviewees highlight, are closely coupled to the goals of the municipality. Thus, Stockholm especially highlighted the problem of noise as central for the project: goods deliveries should not disturb the citizens whenever they are performed. An East representative summarized the problematization behind the project as following: *"It's not so much a technical project to test the truck, it's not for that. It's just to test, how silent can it be, and what does Stockholm need to know about that."* (Interview 17). The focus on noise was further amplified by the desire of the participating university to solve the research challenges associated with measuring the relative noise emissions of transport vehicles due to the social dimension of noise perception in relation to background noise. Stockholm also had ambitious goals in relation to increasing the city's livability for its citizens. This led to including the problems of day-time delivery traffic and traffic congestion into the project agenda. Finally, the hauler, the transport buyer and the municipality highlighted the emissions problem when discussing their goals with the project.

The institutional contexts of the transport industry played a vital role in how the project progressed. The institutional environment was characterized by increasing regulatory pressures to reduce emissions from road transportation which fostered an interest among large transport buyers in Sweden to evaluate alternative fuel technologies. However, none of the available low-emission transport solutions were prevailing at the time of the project start. In the interviews, the hauler and the transport buyer shared uncertainty about the most promising ways to increase their environmental performance.

Several characteristics of the task environment were influential at the beginning of the project. First, East's interest in a plug-in hybrid rather than a fully electric solution was driven by the manufacturer's tradition to offer what they refer to as "flexibility" to their customers implying that all trucks needed to have a sufficient range to be able to drive on different routes. Furthermore, a project engineer at East asserted that the demonstration was not a regular project where technical optimizations take the central stage, and claimed that the main aims were to question the daily practices in the transport industry and highlight the implications of night-time operations. In line with that, all project partners raised questions over the regulatory, social and economic implications of shifting deliveries to the night-time. Especially those project partners with an economic dependency on road

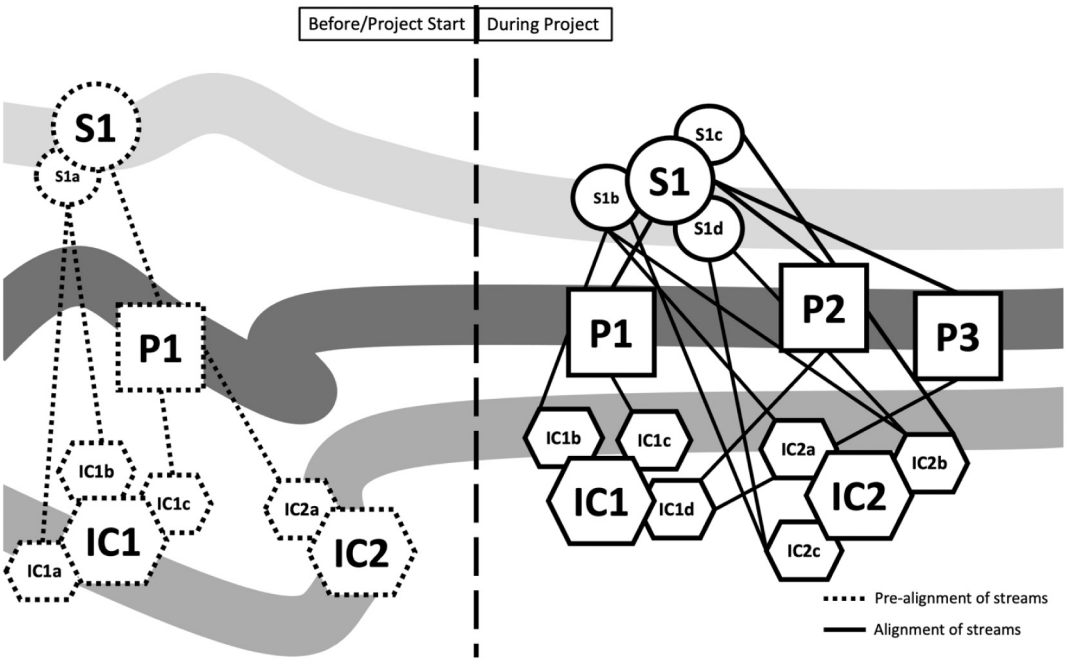

Fig. 2. Displaying streams in the agenda-setting process in Gothenburg.
Note: the visualizations provided in Figs. 2–3 are the result of data analysis by the authors. The items within the three streams and the connections between them reflect how different problems, solutions and institutional contexts are inter-related in these demonstration projects.

transportation raised concerns over a need to gain detailed assessments of the transport efficiency of electrified trucks for urban deliveries. Additionally, previous collaborations between East, the Stockholm municipality and the sound lab of the contributing university laid the groundwork for a strong focus on noise reduction in the current project. Finally, the municipality wanted to investigate the potential of a policy innovation that would switch from a general ban of heavy trucks in the city center during night-time towards functional requirements based on noise levels.

4.2.2. Agenda-setting during the project

While the use of a plug-in hybrid truck during off-peak times remained the core of the solution throughout the Stockholm project, several major adjustments were made to some other aspects of the solution. Based on the initial results of noise measurements, the project decided to adopt a more stringent noise reduction approach and added more silent material handling equipment. Next to this, measurements collected for the analysis of transport efficiency enabled optimization of the delivery routes via geofencing tools. Finally, the project group decided against installing a charger on public roads and instead located infrastructure for opportunity charging on a privately owned territory. *"We also looked into the solution of electrifying a public loading zone. And that's something we learned. I don't really think that's a good solution"* (Interview 15). The main reason for this change were concerns from the municipality's project leader over security issues and the reduced flexibility to the future development of urban spaces in Stockholm.

The problem representation remained largely intact: the three key problems of noise, livable cities and emissions reduction remained central during project implementation. However, two additional themes emerged within the problem of livable cities. First, at the time when the project group considered installing charging equipment in public loading zones, the importance of keeping public spaces flexible and attractive for citizens became evident which resulted in leaving public chargers outside the project scope. Second, during the project it became apparent that night-time deliveries needed to be avoided on the days with the most active night-life (Friday-Saturday) for the sake of citizen safety. The deliveries within the project were therefore scheduled Sunday to Thursday thus signaling that this problem became a part of the project agenda.

Several factors in the institutional context became stronger and more explicitly connected to the selected problems and solutions during the project. Within the institutional environment, the legitimacy of the off-peak solution increased as the assessments of the transport efficiency showed significant improvements of delivery efficiency and accuracy compared to day-time operations on the same route. As one of the interviewees put it, *"I do think that this particular project really paved the way for testing it in other environments, because it's a very (...) precise impact shown, which I think is pretty cool honestly. But okay, in Stockholm you can save 38 percent on average by driving in the night, maybe you can do it in Madrid as well?"* (Interview 21). This also affected the task environment, where successful adjustments of the operational routines by the drivers resulted in increased openness of the hauler to night-time operations. Furthermore, the project results supported the municipality's increased push for permanent regulatory change towards a removal of night driving bans in Sweden. Finally, for East the successful experience with the plug-in hybrid truck enabled continued use of this flexible solution in later projects. Table 3 and Fig. 3 summarize agenda-setting in the Stockholm project.

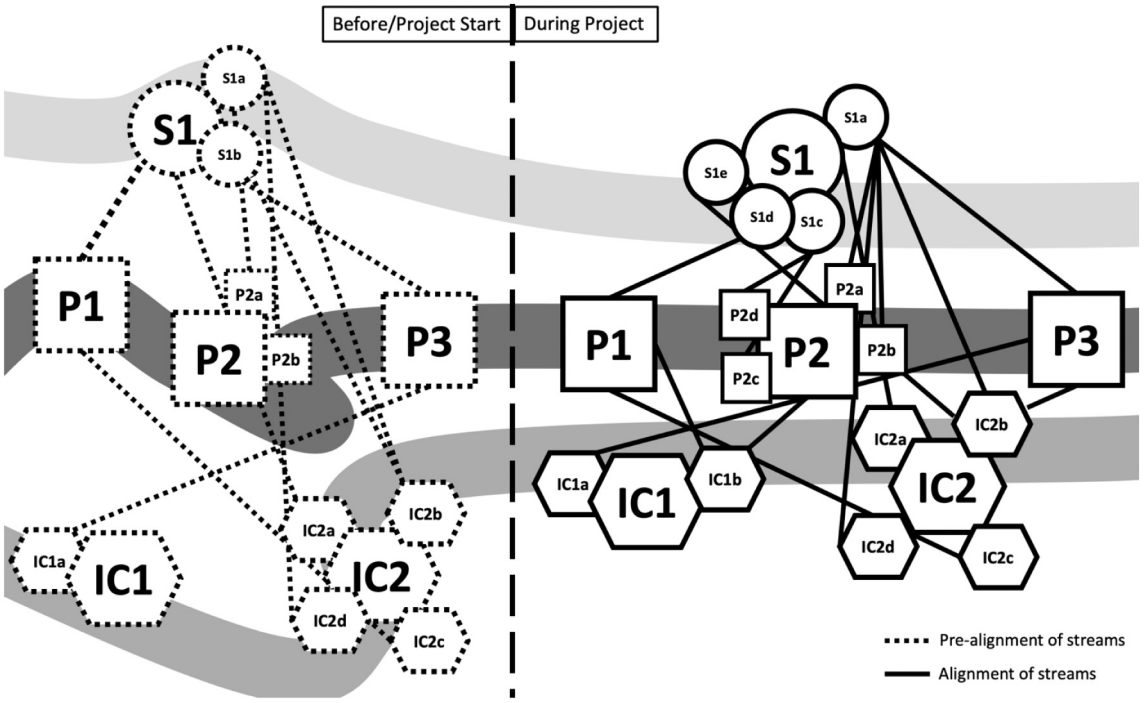

Fig. 3. Displaying streams in the agenda-setting process in Stockholm.

5. Comparative analysis

5.1. The role of individual actors in shared agenda-setting

The first research question addressed to what extent individual actors can dominate a shared agenda-setting process in demonstration projects. The results of our study highlight the balance between, on the one hand, the influence of the most powerful actors [17], and on the other hand, the dynamics of mutual actor alignment [50,73].

Thus, in both projects single leading actors had considerably higher influence on the formation of the shared project agenda compared to the other participating actors. Such influence manifested primarily in the choice of the solution and at least a part of the problems included into the project agenda. In Gothenburg, the decision of West to test the technologically advanced solution of a fully electric truck coupled with the problem of emissions reduction largely predefined the scope of project-level agenda-setting. Similarly, in Stockholm, the municipality's intention to explore off-peak deliveries as a solution to the problem of noise shaped how the remaining actors could engage in collective agenda-setting.

A partial explanation to why leading actors could hegemonize agenda-setting dynamics stems from their power over vital resources. In particular, in the Gothenburg project, West was acknowledged as the prime organization to coordinate the efforts of all other participating actors, mainly due to their skills in the technical domain and insights into the vehicle's capacity. For instance, a manager at the transport buyer described the role of a senior engineer from West as *"very much the key player in the entire project and really the … a gatekeeper as well, who kind of controls a bit the information"* (Interview 7). As West at that time was the only incumbent truck manufacturer close to an actual product launch of fully electrified heavy trucks, the other actors joining the demonstration felt privileged to be invited to participate. Furthermore, being native to Gothenburg and among the leading industrial firms in the region, West was presented with opportunities to establish support, for instance, from the municipality, which provided a public fast charger to the project. As for the Stockholm project, the participating actors were dependent on the municipality's ability to gain legal approval for lifting the night-time driving bans. Moreover, both projects received external public funds, which gave the lead organizations considerable financial control over their projects relative to other partners. Such dominance of individual actors in a shared agenda-setting confirms previous studies that highlighted how powerful and resourceful actors can effectively advocate for certain technology configurations [10,17].

The results of this study further complement previous knowledge by showing how the type and particular expertise of the leading actor can influence shared agenda-setting in demonstration projects. In Gothenburg, a leading truck manufacturer delivered a state-of-the art electric truck and wanted to test it under as realistic as possible conditions. Therefore, technical considerations like validating the reliability of the technology were in focus during the project. That is why, for example, a technically advanced waste collection application was selected for the project, moreover, the tested truck operated in exactly the same routes that are normally used for waste collection. The technical focus of the project also explains a careful adjustment of the battery capacity of the delivery truck according to the requirements from the hauler. In contrast, in Stockholm technical considerations played a minor role. This explains why the technical solution in Stockholm looked so different, as the main problematizations driven by the municipality could be aligned with a plug-in hybrid electric truck, despite the limited driving range. The project leader at the municipality argued that even using a plug-in hybrid truck, they fulfilled the set goals. This included reaching a better understanding of the transport efficiency of electrified trucks operating at night, the challenges of accurate noise measurement relative to background noise, and the use of charging infrastructure.

However, a clear dominance of the leading actors did not mean that other actors could not influence shared agenda-setting, in particular in cases where different actors held conflicting views [48,49]. In both projects, the adopted solutions were adjusted in response to the concerns of the participating actors that held the most knowledge about daily truck operations. For example, in Gothenburg the waste management company successfully argued in favor of a smaller chassis for their application and the hauler was behind the changes in battery size for the delivery truck. In Stockholm, East enjoyed considerable liberties to adjust the technical solution they deemed most applicable for the project, while the concerns the hauler and the transport buyer had about the transport efficiency contributed to the emphasis on route optimizations. These results contribute to the studies highlighting the crucial role of actor alignment for the success of the demonstration projects [73] by explaining how such alignment is built. In our examples, the actors' initially unsynchronized concerns originated from their task environments. Therefore, as these concerns became integrated into the tested solutions, the respective aspects of their task environments also became integrated into the projects' institutional context streams.

Interestingly, several problems that were not an explicit part of the individual agenda of any participating actor at the start of the projects, were added to shared agendas during the projects as a result of dialogue, endogenous steering, and joint sense-making in-between the participating actors [50,52]. For example, in Gothenburg, the problem of the drivers' working environment was not originally explicitly connected to the project agenda. However, as project results showed a positive impact on the drivers' working environment, this problem became coupled both with the fully electric solution and the institutional context of the involved actors. Similarly, in Stockholm, while the overall problem of livable and attractive cities was central to the project from the start, the more nuanced problems of flexible and secure walking spaces were formulated and added to the agenda during the project.

5.2. Transformation of individual agendas during the demonstration projects

The second research question addressed how the experience of participating in demonstrations can influence the individual agendas of the participating actors. To answer this research question invites discussing two change processes that the previous sections revealed.

First, the results suggest that the solutions stream became considerably more detailed and concrete in the eyes of the actors. In line with Jørgensen [21], the actors in our case studies entered the projects still with overall fluid individual agendas. As the actors engaged in and made sense of joint actions in the projects, their agendas became more specified. Trucks' technical specifications, delivery routes, precision and time-efficiency, cost structure, charging characteristics, and regulatory implications were all among the parameters explored and articulated during the projects. Correspondingly, in both projects multiple modifications to the demonstrated solutions were initiated under the duration of the projects. In Gothenburg, the technology configuration saw considerable adjustments in increasing the flexibility of available battery configurations, operating with an unusually small chassis for a refuse truck and the implementation of public opportunity charging. In Stockholm, adjustments to the solution concerned avoiding public opportunity charging, introducing special noise reducing material handling equipment and developing novel route optimization tools. The fact that these adjustments were made can function as a first indication of how profoundly the participating actors have influenced each other.

The more important question, however, is if any of these alterations are likely to have lasting effects on the agendas of the actors beyond the scope of the project. Based on the accounts of our interviewees both projects empowered participating actors to explore crucial details about operating electrified trucks and influenced individual agendas. A good example to exemplify the influence on individual agendas comes from Gothenburg. The interviewees from Gothenburg discussed what an important role it played that flexible battery configurations were made available for the battery electric truck. The waste collection company

reported that they used the results from the project to confirm that a truck with maximum capacity could operate on all but one of the existing routes. Furthermore, the hauler explained that being able to scale down the battery sizes is a vital part of being able to identify viable business models. A senior engineer at West even claimed that based on these positive experiences the CEO of the hauler was *"quite excited, so he wants to take the next steps now and look for how can he charge at his terminal and how can he buy even more trucks"* (Interview 5). Moreover, a senior manager from the logistics company the hauler is working for argued that the lessons learned locally can be disseminated to inform the strategies of other Swedish haulers. She argued that *"they have a close relationship with our other haulers, I mean [name of hauler]. So, we can help them share their knowledge and the best practice, between them."* (Interview 3). Such implications for actors' future strategies illustrate how their experience in demonstration projects can have influence beyond the projects themselves and provide an insight on the dynamics of transitions in the making [22,46].

Second, the tested solutions became strongly connected to certain problems for the participating actors. The overviews included in the results section (Fig. 2 and Fig. 3) clearly indicate that our interviewees reported additional problems or nuances of problems emerging during the project. Elzen et al. [46] have highlighted the important role of the formation of a "coherent package" between the three streams, as robust alignments are argued to influence the future agenda of individual actors. In our view changes to the individual agenda observable in both Stockholm and Gothenburg indicate the emergence of what Normann [41] referred to as coupling between the streams.

In Gothenburg, at the project start the actors argued that the predominantly voiced concern among them was to address the problems related to vehicle emissions, which they hoped a battery electric truck may help to counteract. During the project it emerged that the implemented solution can also be linked to counter problems with the work environments of professional drivers and the reduction of congestion. This indicates the formation of new and intensified couplings between the solutions stream and the problems stream. Our analysis, however, also revealed that these couplings between these three problems and their corresponding solution can hardly be explained without the substantial alignment with the institutional contexts stream, which can be interpreted as the emergence of an increasing coherent package between all three streams. In Gothenburg the justifications for the demonstrated solution now build on the linkage to the problem of driver environments and the underlying legitimization in the institutional environment, as Section 4.1.2 highlights. The interaction between the different actors thus appears to have changed both the scope of possible alignments between the streams, and the list of relevant agenda items that the participating actors agree upon. The impact of this justification was also discussed in previous studies pinpointing how actors can strategically use it to shape markets [55].

In Stockholm there were no additional problems that became coupled to the solution. However, new problem aspects emerged which once more indicate the increase in the coherence between all three streams. The project enabled various stakeholders to gain firsthand experiences with technology configurations that enabled off-peaking and provided experience with vehicle charging. The off-peaking dimension of the solution is a clear example of the emergence of coherent packages, as it became strongly linked to all three problems and both the institutional and task environment. Based on these linkages the hauler voiced a strong commitment to scale-up the operations of electrified vehicles in the night-time. In particular, the hauler was pleased by an increase in transport efficiency, which, on the one hand, was a part of their task environment, and on the other hand, helped to address the problems of emissions and congestion. An East manager was also satisfied with off-peaking: *"what was very interesting [in the Stockholm project] was the night delivers and to see that the vehicles became … I think it was 30 precent more efficient when delivering during the night, and that is of course something that is really interesting for the electrified vehicles"* (Interview 25). She went on to explain that these positive results encouraged East to continue plug-in hybrid technology development. The changed individual agenda was also visible at the municipality with our interviewee explaining how the project experience made them question existing legislation and started to enact changes. *"The current issue is the noise regulation […] the local traffic regulations are quite old, most of them are from the 1970s and then people saw that a general [night-time driving] ban was then only way of achieving it. Now we believe that maybe we can do it … more sophisticated solutions to really let in the good solutions"* (Interview 15).

These illustrative examples from Gothenburg and Stockholm underline the emergence of increasingly coherent packages between the problem-solution couplings and their broader societal context, represented by the institutional contexts stream, during the demonstrations. Looking at this outcome from the perspective of the social embedding of technologies and niche empowerment [19,57] invites the interpretation that these traces of increased coherence may correspond with an overall increased likelihood of technology diffusion of the demonstrated solutions. Therefore, in this theoretically driven argument, the observed alignment between and changes to individual agendas could be treated as an indicator of the relative success of both projects in influencing the on-going transition beyond the project scope.

6. Conclusions

Based on a comparative case analysis of two demonstrations of electrified distribution trucks, this paper addressed individual and collaborative agenda-setting processes in demonstration projects. The results of this study contribute to the discussion around the consequences of actors' engagement and collaboration on the development of sustainable technologies [2] and the dynamics underlying transitions in the making [71].

More specifically, addressing our first research question, the results explain how certain participating actors can temporarily attain the capacity to dominate collective agenda-setting processes during the demonstrations. The application of an adapted multiple streams approach enabled us to explore how during demonstrations, the control over vital resources and technological or operational expertise empowers actors to influence the choice of solutions, and to some degree even the problems that become associated with them. Next to this, the results also indicated a possibility for other actors to influence the projects' solutions by integrating important aspects of their respective task environments into the projects' shared institutional context. These results contribute to the scholarly debate on the socio-political strategies of powerful actors [10] and the way they at particular moments in time may exert influence over broader societal agendas [22].

Moreover, corresponding to our second research question our analysis focused on providing plausible explanations for the influence that collective agenda-setting processes had on the individual agendas of the participating actors, thus, adding depth to the discussion of demonstrations as windows of opportunity [42]. Our results indicate that coherent packages [46] between the three streams emerge through collaborative agenda-setting and enable changes in the agendas of individual stakeholders. These results contribute to strategic niche management studies by uncovering the processes crucial for niche empowerment and societal embedding of new technologies [19,57].

It is important to highlight that this study follows a predominantly interpretivist approach and is focusing on the unique dynamics in the local context of both urban projects in Sweden which limits the generalizability of the results. Therefore, future studies need to explore the role demonstrations play for agenda-setting dynamics in different and more diverse contexts. Furthermore, additional studies following a more longitudinal approach on the dynamics in the heavy vehicle industry are warranted to understand the long-term impact demonstrations have on broader transition agendas, as our study can only report on the agenda-setting dynamics relating to a temporary alignment of individual

agendas during the projects. Finally, studies which rely on the reconstruction of agenda-setting dynamics based on interviews are limited by the willingness of actors to openly share their experience, thus more methodological diversity in future studies is desirable.

Beyond the already mentioned implications for the energy social science research community, the paper has implications for policymakers. Policymakers hold considerable stakes in demonstration projects as the projects are reliant on their support. Increased awareness of the individual agendas of actors like vehicle manufacturers, haulers, logistics companies and transport buyers enables the evaluation of the suggested coherent packages, and the solutions they entail, and can support an assessment if they are "relatively better" [74] compared to the problematized unsustainable existing systems. In other words, understanding the origins of proposed technology configurations and their relationship to certain problems, institutional environments and task environments makes it easier for policymakers to assess the objectives of various actors and evaluate their potential societal ramifications. A final implication can be derived from insights into how a particular actor constellation in a demonstration project influences the choice of the project's solutions and problems. While a project led by an established industrial partner tends to focus on advancing the technological frontier, a project led by local authorities is more likely to focus on social implications of technology use. By taking these findings into account, demonstration projects can be more consciously designed to match the desired socio-technical changes.

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.

Data availability

The authors do not have permission to share data.

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