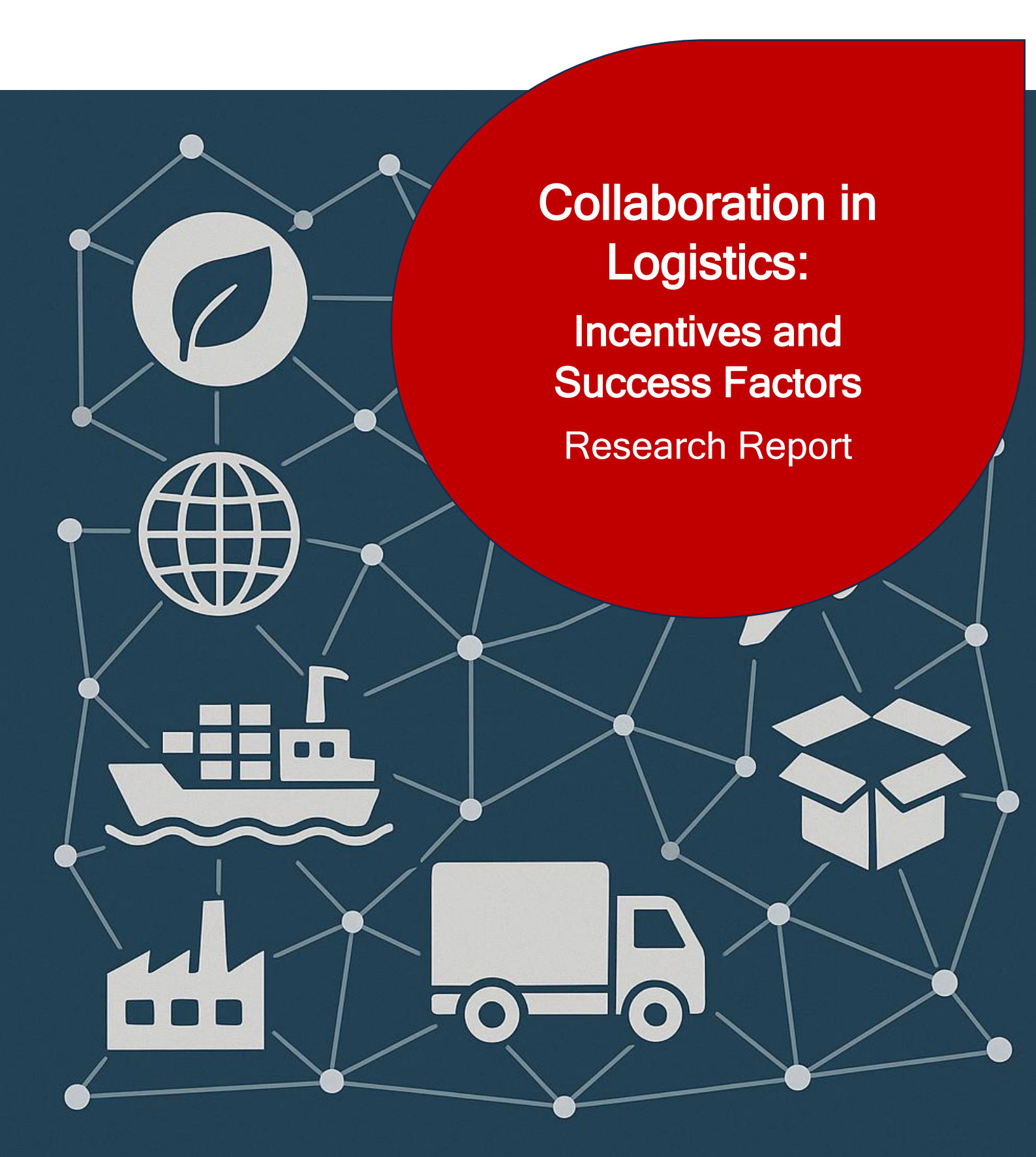




Collaboration in Logistics: Incentives and Success Factors Research Report

Collaboration in Logistics

Incentives and Success Factors

Research report

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Project summary

The primary goal of our research was to identify the reasons logistics companies choose to collaborate and to determine the factors that contribute to the longevity and success of such collaborations. We focused on collaborations because of their potential to make logistics operations more efficient, thereby decreasing the environmental impact of those operations.

To achieve our research goal, we conducted interviews with representatives of organisations dealing with logistics that have experience in collaborations, to learn about the collaboration process, how they approached it, and what they learned from it.

Our interviews showed that the basis for collaboration is a business case shared by all the collaborators. A business case can be derived from various domains. An incentive to collaborate can come from the desire to improve business operations, as a way to deal with developments and changes within the industry, or it can be a reaction to regulatory or normative pressures.

Once a common business case is determined, there is a phase of informing and screening a potential collaborator, which leads to a decision on whether there is a fit among potential collaborators or not. A fit refers to both technological fit, such as similar business activities, suitable size, and compatible procedures, as well as cultural fit, such as similar company cultures, values and principles. Determining a fit leads to the initial trust necessary to enter collaborations.

Actual collaboration starts with clear agreements that need to ensure that all the expectations are articulated and that all parties are satisfied with the costs and benefits of the collaboration. The phase of implementing the agreement is also the phase when the ultimate trust is built if partners keep to the agreement and demonstrate a positive collaborative behaviour, or in other words, justify the initial trust. Ultimate trust often leads to the continuation and expansion of collaboration.

Additionally, our findings suggest that there are ways in which collaboration can be stimulated, such as by ensuring an enabling environment or engaging an independent, neutral party to mediate the collaborations. However, there are also differences in the willingness to collaborate among companies. Those differences are derived from company values and cultures, as well as from the personal characteristics of people involved in decision-making about collaborations. Finally, in order to further stimulate sustainability initiatives, whether by individual businesses or through collaboration, there are several obstacles that need to be tackled, such as the absence of a long-term policy vision, insufficient investment support, and inadequate infrastructure.



Introduction

Collaborations in logistics hold significant potential to enhance operational efficiency by reducing transport costs and travel distances, thereby lowering energy consumption and minimising CO₂ emissions associated with logistics activities (Cruijssen, 2020; Klumpp, 2016). Such collaborations can be vertical, in the supply chain, or horizontal, where two or more firms at the same level in the supply chain, with

comparable logistics functions, collaborate (Cruijssen et al., 2007). Sharing of (underutilised or other) resources - transport and warehouse capacities, labour, processes, data, or knowledge - is one of the forms that such collaboration practices can take.

Collaborations in logistics have a huge potential to increase the sustainable performance of logistics activities, but our knowledge of the incentives for collaboration and the collaboration process is limited.

Regardless of the importance of collaborations in logistics for efficiency and, consequently, better sustainable performance, there are very few examples of real-life, successful, and longer-lasting logistics collaborations (Badraoui et al., 2024; Cruijssen, 2020; Ferrell et al., 2020). The existing literature has mainly focused on barriers to (horizontal) logistics collaborations (Abideen et al., 2023; Basso et al., 2019; Karam et al., 2021) and very rarely on enablers or drivers (Abideen et al., 2023; Badraoui et al., 2024). Even less attention has been paid to the process of logistics collaboration development, the steps that are undertaken and their characteristics, which result in a successful and long-lasting logistics collaboration (Jepsen, 2014).

Therefore, our aim in this research was to look into implemented, successful logistic collaboration initiatives in order to identify the incentives that led logistic service providers to embark on collaboration with other similar companies, as well as to define the features that lead to successful and sustained collaborations.

Research questions

The research was guided by two main research questions:



What are the incentives for logistics companies to start collaborating with each other (for the sake of sustainability)?



How can this collaboration be made successful?

Methodology

In order to answer our research questions, we approached logistics companies and companies that have a strong logistics component (such as production, wholesale and construction companies). They have been selected based on their experience in some form of collaboration. In addition, we had one professional association in our sample, gathering companies, educational institutions and the local government on issues linked to logistics. The role of the professional association included in the sample is to initiate and coordinate collaborative activities among companies in the field of logistics. Experiences and insights gained through organising and mediating collaborations among companies made it a suitable research participant.

We conducted interviews with 19 professionals working on logistics tasks in 13 companies and one professional association with experience in collaborations.

The role of the professional association included in the sample is to initiate and coordinate collaborative activities among companies in the field of logistics. Experiences and insights gained through organising and mediating collaborations among companies made it a suitable research participant.

We were assisted in accessing the organisations by the Logistiek Kenniscentrum, a triple helix organisation focusing on logistics; by partner organisations and individuals involved in the SMiLES project; as well as by Circulair Fryslân, an association of organisations, including logistics companies, committed to transition to circular economy.

Our sample comprised 19 logistics or supply chain managers, managing directors or owners of companies/organisations. We conducted a total of 17 semi-structured interviews, meaning in some cases there were several representatives of the same organisation present in the interviews (Appendix 1).

We recorded and transcribed the interviews. We coded the transcripts in order to find patterns across the interviews relating to our main questions.

Companies in our sample

There was a total of 14 organisations in our sample: 13 companies and one professional association. The companies in the sample had the following characteristics:

- Regarding the **business activities** of companies, seven companies in the sample were purely logistics companies, while six companies in the sample dealt with either production, wholesale or construction, but had an important logistics component (Figure 1).
- The companies in the sample performed (one or more of) the following **logistics functions**: order processing, inventory management, warehousing, road transport, multimodal transport, material/product handling, and packaging.
- There was the same number of **medium-sized** and **large** companies in the sample, six of each, and only one **small** company (as counted by the number of employees) (Figure 2).
- Eight companies in our sample were **family owned**, with the remaining five having other forms of ownership (e.g., shareholders) (Figure 3).

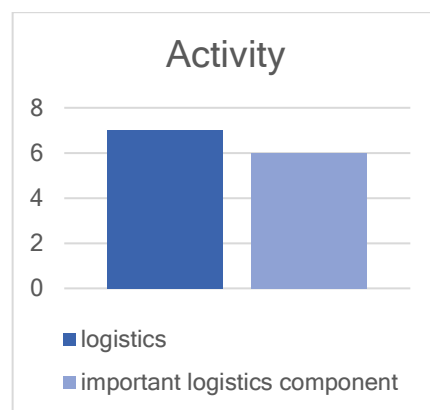


Figure 1: Business activity of companies in our sample

The companies we talked to were situated in the provinces of Drenthe, Friesland, Groningen, Overijssel, and North Holland.

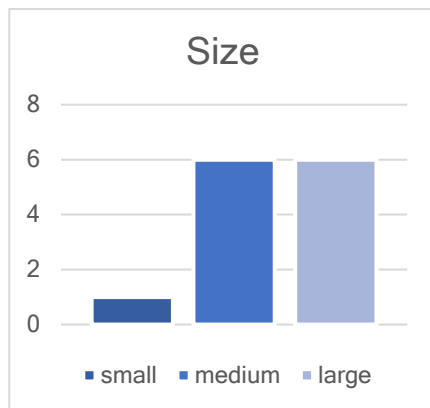


Figure 2: The size of companies in our sample as measured by the number of employees

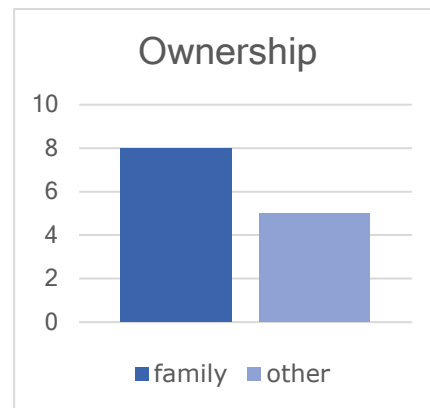
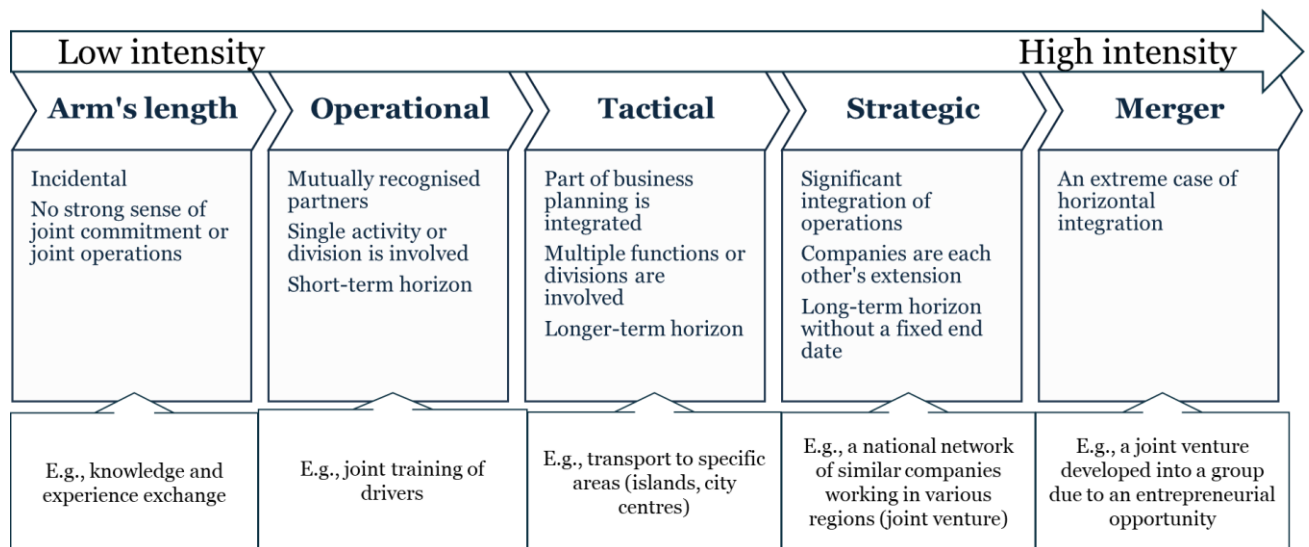


Figure 3: Ownership of companies in our sample

Collaboration examples

The collaboration examples in our sample varied in their intensity from quite incidental, ad hoc collaboration on, for example, exchanging warehouse employees with another company when the seasonal peaks are at different times in a year, to an initially incidental collaboration that gradually grew into a merger (Figure 4).

Figure 4: Collaboration examples in our sample



Based on Lambert et al. (1999); Pomponi et al. (2013)

The lowest level of collaboration is an **arm's length, incidental** collaboration. Examples are:

- knowledge and experience exchange (digitalisation, robotisation, ergonomics) (organisations A, B, C, D, E, F, H, I)
- filling up truck capacity with other party's load (companies A, H)
- staff exchange (warehouse) (company B)
- renting equipment (company C).

One level higher, there is **operational collaboration** with companies that are recognised as partners. This collaboration is still short-term and usually relates to only one activity. Examples of such collaboration are:

- membership in industry-related platforms/interest organisations (companies A, B, C, D, E, H, I)
- jointly executing a part of the contract won by a partner/competitor through a tender (companies C, H, L)
- delegating part of the work (companies H, J)
- participating in transport sharing platforms (companies A, G, K)
- joining working groups to solve mutual problems (city distribution, returnable packaging, charging network) (companies D, I)
- joint training of personnel (truck drivers) and organisation of open days in order to recruit potential staff (companies I, J).

Tactical level collaboration, of even higher intensity, refers to cases when a part of business planning is integrated with the collaborating companies. Usually, it is longer-term and involves more than one activity or function. Examples of such collaboration are:

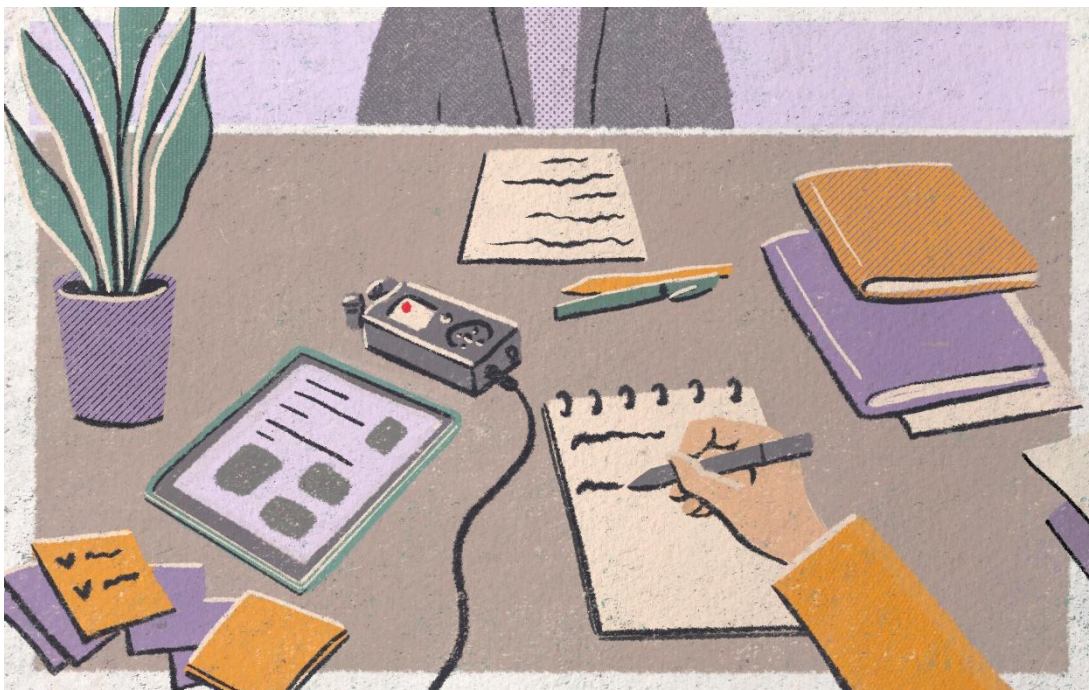
- dedicated team and resources working with a partner (co-sourcing) (companies G and H)
- transport to specific areas (islands, city centres) or division of territory (Randstad, North) (companies A, I, J, L, M).

When collaboration is at the **strategic level**, it usually takes the form of a more formalised joint venture where the operations are significantly integrated. This collaboration is long-term, usually without a fixed date. Examples in our sample are:

- forming a joint venture for a joint investment in specialised activities (company J)
- a national network of similar companies working in various regions (joint venture) (company N).

Finally, an **extreme case of collaboration**, i.e., horizontal integration, are mergers, where a group of companies becomes a new company. In our sample, we had the following examples:

- what started as a joint venture developed into a group (J)
- a decision to merge due to an entrepreneurial opportunity (M).



Findings

Incentives to collaborate

Well, you have to be able to get something out of it, so to speak. There really has to be an advantage to this. (P5)

The basis for collaboration is a common business case that is derived from business, industry, or regulative and normative levels.

As the above statement from one of our participants testifies, there needs to be a **sound, common business case for collaboration** for a company to decide to enter into a collaborative relationship. A business case means that there needs to be some kind of goal, need or benefit of collaboration, and this goal, need or benefit needs to be common or joint for all participating parties.

However, the incentive to collaborate can be derived from various levels: from the business itself; from the industry the business belongs to; or from the local, regional, national and/or supranational levels exerting regulative or normative pressures that can be best tackled through collaboration.

Business domain incentives

An incentive to collaborate can come from **the desire to improve business operations**, for example, to:

- **Increase efficiency** (e.g., combining loads in order to have a full capacity; dividing the territory to lessen kilometres driven, especially if empty)
- **Reduce costs** (e.g., by joint purchase for a better price; driving fewer empty kilometres, which is closely linked to efficiency)
- **Increase revenue** (e.g., more work, more goods)
- **Supplement capacity** (e.g., in case one's capacity is not enough to fulfil contractual obligations)
- **Provide additional/specialised/expert services** to satisfy customer demands and exploit a market opportunity (e.g., collaborating in order to provide electric trucks for a construction site or specialised transport for piping and tubing; joint investment in order to provide a new service, such as milk transport in a tanker truck)
- **Exploit a new business opportunity** with good potential (e.g., getting a new and bigger joint location)
- **Expand the customer base** in order to ensure stability (e.g., ensuring more sources of income and less dependency on a small number of customers by merging).

Industry domain incentives

Developments and challenges in the domain of the industry (digitalisation, innovation, labour market issues, etc.) create additional incentives to collaborate in order to:

- **Gain knowledge and/or exchange experience** (e.g., in implementing innovations, such as buying electric trucks or WMS and ERP software)
- **Tackle staff shortages** (e.g., through joint organisation of open days and joint truck drivers' training; by [warehouse] staff exchange - to both compensate for staff shortages in peak times and to provide variety for the staff)

- **Increase competitiveness** (e.g., through exchanging information on processes, getting inspiration, and creating networks).

Regulatory and normative incentives

Regulatory pressures (a need to comply with laws and regulations, e.g., zero emissions, truck levy) and **normative issues** (e.g., a need to preserve or improve reputation) result in the following incentives to collaborate in order to:

- Make a **stronger representation** towards the government in solving issues linked to sustainability transitions (e.g., electric charging infrastructure)
- **Find solutions for sustainability issues** that are too big to be solved on one's own (e.g., solutions for returnable packaging)
- **Undertake joint investments** when the needed investments are too large or too risky to be undertaken on one's own and when they can be shared among investing companies (e.g., charging points and electricity generation).



Sustainable performance as an incentive?

Increasing sustainability performance as such is **not an incentive to start collaborating**, except in cases when **sustainability issues are too large to be tackled on one's own** and needed changes **apply to the whole industry**. In those cases, increasing sustainability performance or complying with sustainability regulations can be an incentive for companies to start collaborating (as shown in regulatory and normative domains).

However, individual companies take actions **on their own** aimed at increasing their sustainability performance.

Examples of individual sustainability initiatives undertaken by companies are:

- Electric trucks (but usually not the whole fleet)
- HVO 100 fuel
- Sustainable packaging/foil/tape
- Repurposing packaging
- Solar panels
- Electric or hybrid company cars
- Waste separation
- Membership in organisations dealing with sustainability.

The collaboration process and the features that make it successful

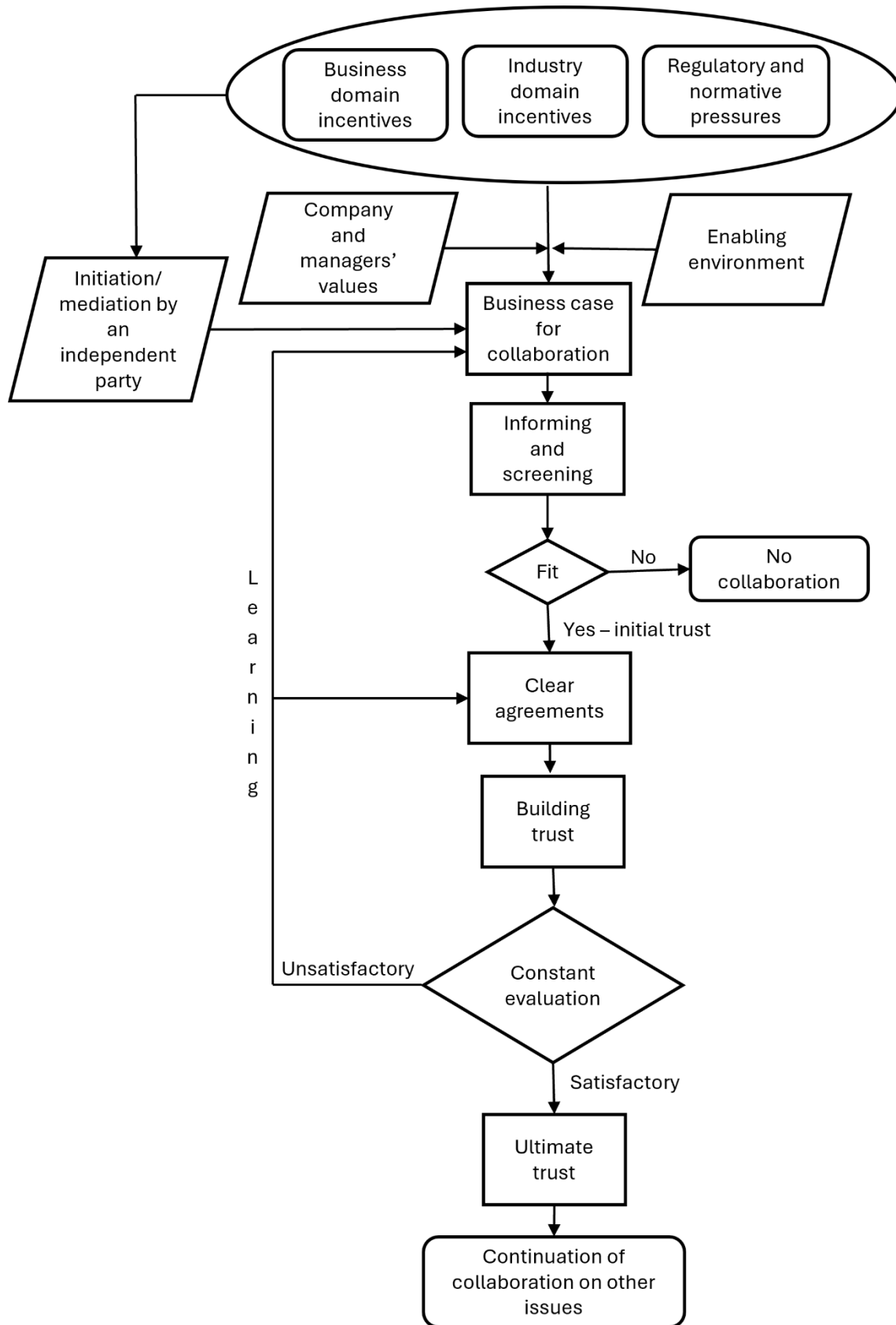
From the statements of our participants, we developed a process of collaboration, the one that should lead to the most promising results (see Figure 5).

In this process, we identified several important aspects and key phases that, if successfully completed, lead to a collaboration with a greater chance of long-term success.





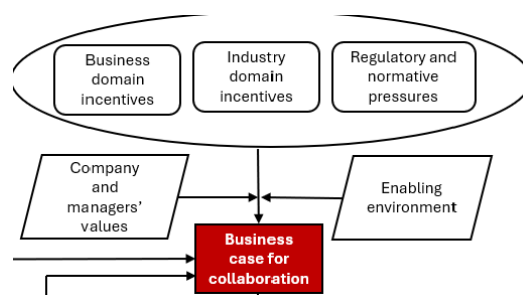
Figure 5: The collaboration process



The main phases of the process are elaborated below.

Common business case for collaboration

Collaboration starts when there is some kind of **common** business case for collaboration, that can be derived from the domain of the business itself, the industry or the regulatory or normative framework, as described in the section on Incentives to collaborate.



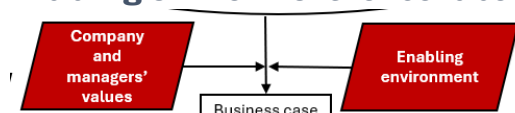
Initiation or mediation by an independent party

Defining what a common business case for collaboration is can be facilitated by an **independent mediator**, in a form of, for example, a **professional association** that will initiate and organise matters around collaboration, or a **neutral body** that will serve as somebody who can handle sensitive or confidential data of collaborators, especially if they are competitors.



Finding a common business case can be, in some cases, mediated by an independent party.

Enabling environment for collaboration



Certain environments are more conducive to finding a common business case and, consequently, forming a collaboration.

For example, if a company is **surrounded by other companies that would be a good fit** for potential collaboration, there seems to be a greater chance that those companies will get together to tackle some issues or create new business opportunities.

Moreover, collaboration **examples, success stories or best practices examples** can serve as a source of inspiration or encouragement to start looking for ways to fulfil needs or plans through collaboration.

Company and managers' values

Certain companies seem to be more open to collaboration than others. Research participants ascribe this difference to two factors: individual characteristics of managers who get to decide on and initiate collaborations, and to company's values and culture.

Participants in general agree that **establishing a collaboration very much depends on the kind of person who is involved** - some people are more open to collaboration. A collaborative initiative is often led by a few people who need to take the focus off the daily activities and devote their energy and time to forming and maintaining collaboration, even before the concrete benefits materialise. It is also necessary that collaboration has both management support and operations' involvement, because one without the other might not lead to success.

Some environments are more conducive to finding a common business case. Moreover, there is a difference in openness to collaboration among companies and people working there.

Certain **company values and cultures facilitate the establishment of collaborations**. Some characteristics of a company culture beneficial to establishing collaborations are: willingness to learn, a collaborative attitude that is nourished within a company, a long-term vision, and a business strategy that includes collaboration. Companies demonstrating such characteristics are also more willing to support and stimulate individuals within them to get involved in collaborations, by giving them the mandate and needed time.

Informing and screening



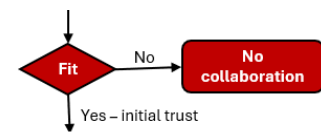
Collaboration is not entered into blindly but is preceded by **informing about and screening a potential collaborator**. This can involve getting to know each other by meeting, talking or visiting each other, or by checking the reputation and certificates. In some cases, it may also involve devising a list of requirements (such as in a tender) that a potential partner needs to fulfil, especially when a stronger partner collaborates with a weaker one.

After defining a common business case, potential collaborators usually first screen each other in order to determine whether there is a fit.

The informing and screening phase leads to a key decision moment in establishing a collaboration: concluding whether there is a fit among potential collaborators or not.

Establishing whether there is a fit

The image of the potential collaborator created during the informing and screening phase gives the



idea of whether the companies sufficiently fit each other so that a future collaboration would have a higher chance of succeeding.

Ideal partners demonstrate two forms of fit:

- **Technological fit**

An ideal partner most often **operates in the same branch**, i.e., deals in **the same or similar business activities** or works with **the**

same or similar, usually standard transport goods. Those conditions enable the activities to be more easily combined, unless the goal of collaboration is to complement activities (e.g., with specialised goods or services).

The partner is preferably of **the same size** and **in the same development phase**, most frequently a growing phase. This ensures the power balance and similar company vision and goals.

Research participants emphasised the importance of **similarity when the customer relations strategy** is concerned. Companies are sometimes reluctant to collaborate because of the fear that the level of quality of service they provide to their customers and the relationship they build with them will deteriorate if the service is to be (partially) delegated to a collaborator. Similar dedication to customer service and satisfaction reduces this fear.

Similar and compatible procedures, starting from safety measures to digital systems and participation in platforms, enable easier combination or consolidation of activities and data, and lead to more efficient collaboration.

- **Cultural fit**

Most of the research participants described a kind of fit that we named a cultural fit. It is described as dedication to **shared qualities, shared DNA, a fit with a company identity, the same basic principles, the same company culture**, a collaborator you can **connect with well**, a collaborator you can **build a relationship with**, a collaborator with a **vision that fits, a click that occurs** among collaborators. All these descriptions denote a quality which is often subjectively assessed.

Additional collaborator characteristics that contribute to the conclusion that there is a fit are:

- **Knowing each other** well, having a **positive previous experience** with a company or having a **good reputation** helps in deciding whether a fit is possible.
- **Geographic proximity** might foster making contact and getting to know each other, as well as help create the feeling of a cultural fit due to regional cultural similarities.

Finally, most of the research participants (but not all) would **not be willing to collaborate with a direct competitor**, except in some cases (please see Collaborating with direct competitors section).

A conclusion that a potential collaborator is a good fit leads to having **initial trust**, a kind of leap of faith that the collaboration will go well, and to the decision to start collaborating.

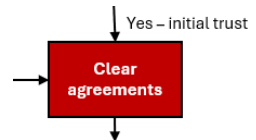
A fit is a condition for granting initial trust to a future collaborator.

However, if the informing and screening phase concludes that there is **no fit**, it is **not likely that the collaboration will be initiated**, as it seems that finding a fit has a prominent feature in the decision whether to collaborate or not.

Clear agreements

To ensure that collaboration yields desired outcomes for all involved parties, it is crucial to set clear agreements.

Making clear agreements is seen as a key to successful collaboration, regardless of potential previous connections with a collaborator or how much partners already know each other.



Clear and good agreements prevent assumptions about what is expected on both

sides and, moreover, make sure that other potential obstacles to collaboration, such as **fair distribution of costs and benefits** and clear articulation of needed **costs and investments**, are communicated in advance, understood, and agreed upon. Ultimately, clear and good agreements should ensure that all sides in the collaboration are satisfied.

Characteristics of clear agreements are:

- They are made **at the beginning** of the collaboration
- They detail the **structure of collaboration**
- They define the **expected performance**
- They are preferably **long-term**.

Building trust and constant evaluation of collaboration

The initial trust is either confirmed or abandoned during the process of building trust, where there is a constant evaluation of the collaboration and the partners involved concerning the agreements and expectations.

The subject of evaluation is the **fulfilment of the agreement**, such as having the **planned performance**, but also whether the collaborator is reliable, transparent and honest, i.e., whether the collaborator demonstrates a **positive collaborative behaviour**. Some characteristics of positive collaborative behaviour are:

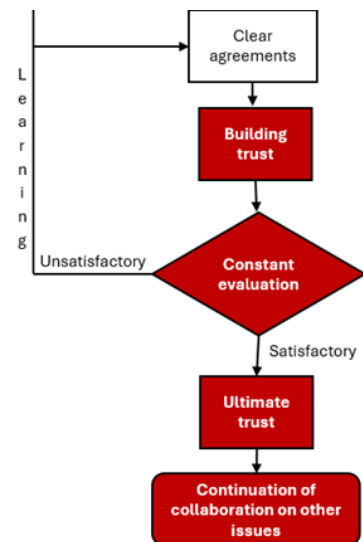
- **Reliability** - doing what you said you would do
- **Transparency** and **honesty** about potential problems in fulfilling agreements and about mistakes made
- **Regular communication** and short communication lines

- **Mutuality** - helping each other out, responding to others' needs and the situation, both giving and taking
- **Jointly looking for solutions** to problems
- **Investing time** even though it might not immediately bring revenue.

Building trust is a long process of actual collaboration where parties evaluate the fulfilment of the agreements. If successful, it leads to ultimate trust.

learning from mistakes. If the result of this phase is unsatisfactory, collaborators might go back to redefining their agreements, or even abandon the collaboration altogether, and embark on finding a common business case with another collaborator. However, if this phase is satisfactory, trust is continually being built, until it results in what one of our participants called the **ultimate trust**, leading to the **continuation of collaboration** and/or **expanding the collaboration** to other issues.

The phase of building trust, implemented through actual collaboration, is described by our research participants as a **learning phase**, the one of **trial and testing**, and of



The question of trust

Lack of trust is often mentioned in literature on collaboration as an important obstacle to forming collaborations. However, our analysis shows that even though trust is a “big issue” and very important, there is no such thing as “blind trust” that collaborations begin with. Collaborations begin with something that should better be called an **informed initial trust**. It is the trust in each other's quality and reliability, trust that the collaboration will work, resulting from the informing and screening phase.

Real or **ultimate trust** needs to be earned and built. It emerges from checking whether the initial trust is justified. Ultimate trust is formed after years of good performance, when the agreements are fulfilled not only once, but five, six or ten times, and is further stimulated when a problem is successfully tackled together with a collaborator.





Additional insights

The interviews conducted with our research participants provided us with additional insights into the issues of collaboration and sustainable logistics, which went beyond our research questions. We are sharing some of those insights here.

Obstacles to collaboration

In every phase of the process we identified, there can be circumstances, challenges and behaviours that could make some companies reluctant to collaborate or that could be reasons to stop the process of establishing collaboration. We identified the following

circumstances, challenges and behaviours standing in the way of establishing collaboration or successfully collaborating, as described by our research participants:

Each phase of the collaboration process has potential obstacles that can stand in the way of continuing with collaboration efforts.



Table 1: Challenges for logistics collaborations

Collaboration phase	Challenges
Incentives	• Complexity of logistics: not all activities can be combined in a way that there are benefits for all parties • Some business strategies are not conducive to collaboration, e.g., tailor-made, specialised, supplementary or value-added logistics services, niche types of transport services • There is no need to collaborate
Common business case for collaboration	• No business case: different interests, problems and needs make it difficult to find a common business case for collaboration; collaboration is not a priority; the company can perform all the tasks itself • Bad experience in previous collaboration • Dishonesty about interests in collaborating • Focus on short-term collaboration to solve a short-term issue, and a lack of long-term vision • Short-term interest (e.g., profit) • Lack of a common goal • Lack of awareness of the benefits that can be derived from collaboration • Fear of: ○ Losing identity with the customer ○ Losing reputation due to an unreliable collaborator ○ Losing uniqueness ○ Collaborator becoming a competitor ○ Losing confidential business insights ○ Sharing a resource that might become a competitive advantage (e.g., energy) ○ Losing staff • Unsuitable collaborator's characteristics: ○ Size of the company (e.g., too small) ○ The phase the company is in (e.g., decline) ○ Physical distance • Legal and regulatory issues (e.g., conditions for certification; safety regulations for transport of specific goods; insurances in case of sharing) • It is difficult to let go and compromise • Personal attitudes and a lack of willingness to collaborate • Sometimes it is difficult to go beyond just talking about it
Informing and screening	• Being aware of the bad reputation of a potential collaborator • A potential collaborator that is not able to fulfil expectations
Fit	• Different cultures, values and identity (<i>different cultures is the most frequently mentioned reason</i>) • Different strategy for customer relations • Different goals • Different targeted level of service

	• General fit
Initial trust	• General difficulties in granting initial trust (in spite of informing and screening, and identifying a fit): ○ Not being sure that the customer will be satisfied ○ Wanting to maintain/pursue own quality
Clear agreements	• Deciding on the leader; power differences • Having all sides satisfied, especially if not all parties have the same needs • Adjusting the way of working • Making compromises • Lack of balance between the partners regarding costs and benefits • Anticipating all needed costs and investments
Building trust	• Adhering to agreements • When collaboration is not related to core activities and profit generation: ○ Few people carry the initiative ○ Collaboration costs time and energy ○ It is difficult to maintain enthusiasm about collaboration ○ People maintain focus on daily activities and operations, neglecting collaborative activities

Collaborating with direct competitors

While direct competitors can collaborate under specific conditions, such partnerships remain rare in logistics.

Even though some participants stated that they would not collaborate with their direct competitors, **such collaboration is possible**, and it is happening. Examples are:

- Developing joint solutions applicable to the whole industry (e.g., reusable packaging)
- Renting equipment to a competitor
- Jointly executing a tender won by a competitor
- Delivering non-standardised goods for a competitor that the competitor has no capacity to deliver
- Joint training of staff and joint organisation of open days.

From these examples, some **conditions** can be derived that are favourable for the establishment of collaboration among competitors:

- **Collaboration does not concern core activities or key operations**, but issues that are of joint interest and that provide solutions for the whole industry. The characteristic of such collaboration is that, usually, there are **no profit expectations** behind the activity.
- Collaborators **complement each other** and **do not compete** with each other through the collaboration activity. This is mostly the case when competitors become customers.
- As mentioned earlier, **an independent, neutral mediator** who would handle sensitive data can facilitate establishing collaboration among competitors.

Logistics and sustainability

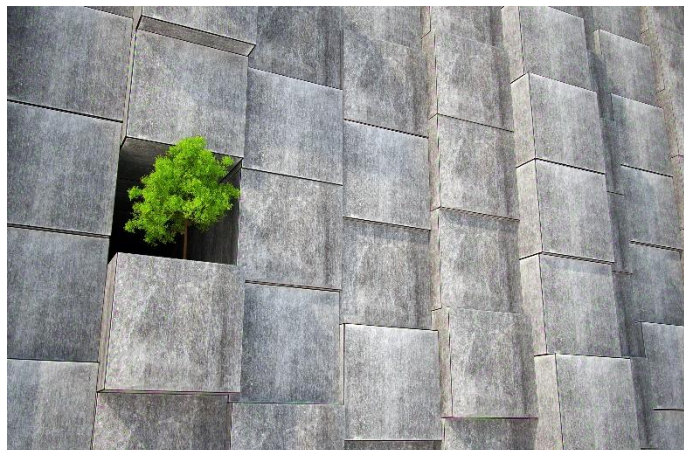
There is almost unanimous agreement among our research participants that **sustainability** has become increasingly important in **logistics**, especially in recent years, and it is here to stay. This is also evident from higher awareness and **more frequent sustainability initiatives undertaken by companies**.

Sustainability in logistics is an increasingly important topic.

The participants perceive **governmental pressure** as the main driver of sustainability initiatives. However, there is a growth in **customer demand** as well, for example, when electric trucks are a requirement for the implementation of some contracts, such as in construction. Some participants perceive adhering to sustainability requirements and following sustainability trends as a necessity for a **competitive position**. A few participants expressed a view that undertaking a sustainability initiative should not be exclusively dependent on regulations, but **should come from businesses' own initiative**, such as a commitment to corporate sustainability.

Many of the participants have a positive attitude towards sustainability in logistics. They see companies becoming more open to sustainable initiatives, which are being introduced not only top-down, but also bottom-up, through internal company rules and employee involvement. This group of participants considers sustainability to be common sense, as **more sustainable approaches can yield savings and increase efficiency**.

However, there are also those who see many challenges in sustainability requirements. Such requirements make things **more complicated** and **impractical** (an example given was zero-emission zones in cities), they are **not realistic** and, therefore, **not yet feasible**. They sometimes “go too far” and **come in the way of efficiency** (instead of increasing it, as seen by some other participants). Transition towards sustainability goes **too fast** and **costs money**. Some participants doubted the genuineness of sustainability actions by companies, stating they were more “for the show” than undertaken out of actual commitment to sustainability.



The **challenges** seen by logistics companies regarding the sustainability transitions in their industry can be grouped as follows:

Table 2: Challenges for sustainability transitions in logistics

Challenge	Description
Inadequate level of development of sustainable solutions to allow logistics to transition	Technology is often missing or is not developed enough. Example: Electric trucks have a limited possibility for fast charging and a limited driving range. There are concerns regarding the residual value of such a truck after a period of years, especially taking into account possible innovations (through which the present maximal driving range could increase).
Inadequate infrastructure	Inadequate infrastructure prevents the feasibility and scaling up of sustainability solutions in logistics. Example: There is a lack of charging points, which are a condition for having more electric trucks. The grid capacity is insufficient, which is a condition for having more charging points.
Risky investment in sustainable solutions	The initial costs for implementing some forms of sustainable solutions are higher than those for conventional solutions. There are concerns regarding what the right balance is between ensuring business continuity and undertaking significant financial investments. There are questions regarding what all to invest in (e.g., only in vehicles or also in infrastructure; what kinds of fuel options will be feasible in the future) and how to do that (e.g., alone or in partnership). However, investment decisions today will determine the way logistics will look like in the next six or seven years.
Sustainability still doesn't pay off	Clients in the supply chain often do not want to pay higher prices for sustainable logistics services, such as transport with an electric truck, while purchasing and operating such a truck is more expensive.
Insufficient number of practical success examples	Challenges of sustainability transitions in logistics result in an insufficient number of practical success examples that could stimulate (through inspiration and experience) a turn towards more sustainable practices. This is, however, slowly changing.
Sustainability transitions require long-term thinking	Short-term thinking, such as a focus on yearly profit, can jeopardise sustainability initiatives, because they typically pay off in the longer run. Commitment of companies to long-term thinking depends on many factors, such as ownership structure and company goals and strategy.
Some sustainability solutions can have unintended consequences	Unintended consequences make effective sustainability transitions complex. Examples: Returnable packaging, as a more sustainable solution, is expected to increase transport movement. Time slots in warehouses were aimed at increasing efficiency (and consequently resource usage), but when they are missed, trucks need to drive back and forth, again increasing transport movement.

Sustainability of logistics is heavily dependent on the sectors that logistics serves

Processes and practices within the sectors that logistics serves determine the boundaries of sustainability initiatives that can be undertaken in logistics services.

Examples:

In order to make construction logistics more sustainable, some changes in the construction industry have to be made, such as using lighter materials, introducing different processes, and thinking about the mobility at the construction site in a different way.

Last-minute ordering significantly increases logistics activities and create more pollution.

It is difficult to use the existing sustainable solutions, such as electric trucks, in sectors requiring heavy transport or long distances.

In the end, participants believe that **sustainability pressures can help stimulate the creation of collaborations** as a way to decrease the uncertainty and spread the risks linked to undertaking sustainability initiatives.



Conclusions

Collaboration in logistics is possible if there is a sound and common business case behind it. Improving sustainability performance is not a common business case for collaboration so far. However, regulatory pressures for sustainability in logistics can be a push to start collaborating on solving larger issues. **Working on sustainability issues which are of interest to the industry as a whole** can present a common business case that will bring logistics companies together in collaboration.

There are ways in which collaboration can be **stimulated**, such as by **ensuring an enabling environment** or through **the mediation of an independent, neutral party**. However, logistics companies **vary in their willingness to collaborate** and their openness to forming collaborations.

Establishing a successful and long-lasting collaboration is **a long process of testing and learning**. Each phase in the collaboration process can contain obstacles that, if not handled well, can terminate the collaboration.

In the end, we need to keep in mind that logistics is complex and **collaboration is not always possible** - not all activities can be combined in a way that creates benefits for all.

Recommendations

- To create **an enabling environment for logistics collaborations**, existing **successful collaboration examples** should be **disseminated** and used as case studies to provide details on the collaboration process and its success factors, as well as to be used as a source of inspiration.
- **Mediation of an independent party** should be considered as a way to facilitate establishing and maintaining (some forms of) collaboration, especially among competitors. This could be a role for professional associations or even a commercial business model.
- **Sustainability initiatives**, whether of individual companies or collaborative, would be further stimulated by **tackling some of the identified challenges**, for example by ensuring a **long-term policy vision**, **investment support** and the **availability of infrastructure**.
- A more **systemic approach** should be adopted in devising sustainable logistics solutions. Such an approach should take into account the complexity of logistics, as well as the whole supply chain and all related activities, in order to **avoid unintended consequences** and have a real impact on the sustainability of logistics.

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Appendices

Appendix 1: Interview participants and the organisations they represent

Code name participant	Function	Code name organisation	Organisation's (business) activity	Family firm	Company size
P1	logistics manager	A	logistics	yes	medium
P2	logistics manager	B	import & wholesale	no	medium
P3	general team leader warehouse	B	import & wholesale	no	medium
P4	logistics coordinator	C	B2B services & rental of equipment	yes	medium
P5	logistics assistant	C	B2B services & rental of equipment	yes	medium
P6	senior team leader logistics and transport planning	D	production & wholesale	no	large
P7	supply chain manager	D	production & wholesale	no	large
P8	managing director	E	production & wholesale	no	large
P9	initiator and coordinator	F	professional association	N/A	N/A
P10	quality and safety coordinator	G	logistics	no	large
P11	team leader meet & greet, safety inspector	G	logistics	no	large
P12	business manager	H	logistics	yes	medium
P13	contract manager - contract logistics	G	logistics	no	medium
P14	managing director and co-owner	I	logistics	yes	medium
P15	CEO	J	logistics	yes	large
P16	contract manager road & intermodal	K	production & wholesale	no	large
P17	managing director	L	construction	yes	large
P18	general manager	M	logistics	yes	medium
P19	managing director and co-owner	N	logistics	yes	small

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