

Successfully anchoring sustainability

Impetus for new rail and circular
economy business models

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Whitepaper

by Infront Consulting & Management and
KPS on the BVL Triple Transformation study:
Digitalisation, sustainability, and resilience
as guidelines for future-proof value chains



Successfully anchoring sustainability Impetus for new business models Rail and Circular Economy

Whitepaper by

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as part of the BVL study

**Triple Transformation:
Digitalisation, sustainability, and resilience as
guidelines for future-proof value chains**

from the series

**TRENDS AND STRATEGIES IN LOGISTICS AND
SUPPLY CHAIN MANAGEMENT**

Triple Transformation – challenge and opportunity

The competitiveness of industries and sectors is currently under significant pressure. Geopolitical upheavals, negative economic developments, new and far-reaching regulatory interventions, planning uncertainty and substantial factor cost increases are the main causes of it. In recent years, supply chains have been intensively optimised or redesigned in terms of availability and greater control competence. Flows of goods, transport routes, order volumes and structures are subject to a high degree of dynamism. Backup solutions are becoming more important, and the realisation of multimodal transport solutions is contributing to sustainability goals. Asset strategies are also being increasingly reconsidered by service providers and shippers in many areas to secure capacities. Access to infrastructure has become the focus of all players in recent years.

While sustainability was the emerging trend in the BVL study "Trends and Strategies in Logistics 2020", the new edition of the study released at the end of 2023 shows that the high expectations have not yet been met. Dealing with diverse and complex challenges ties up management capacity and resources. Although the current study shows that sustainability has become even more relevant and that a high level of ambition is anchored in the company's objectives, programmes and implementation measures have often been

de-prioritised for various reasons. Cybersecurity has become more prominent on the agenda and the shortage of skilled labour is hampering project progress in many companies. At the same time, the pressure to act to increase sustainability has increased, for example with the rise in taxation of CO₂ emissions and the rise in the price of CO₂ certificates.

The parallelism and intensity of the various relevant trends have, therefore, increased further in recent years. This requires companies – in industry, retail, and logistics – to design business processes and strategies that take account of digitalisation, sustainability and resilience requirements.

We are convinced that measurable and long-term effective contributions in sustainable logistics processes and supply chains can be achieved if it goes hand in hand with strengthening the competitiveness of companies and sectors. Solutions are needed that are geared towards stability, meet customer requirements, and enable efficiency, productivity and innovation through a high degree of digitalisation.

The realisation of ambitious, sustainable target images only works to a limited extent via partial concepts of individual companies. It requires the courageous reorganisation or

redesign of business and operating models in value creation networks, which must exhibit a high degree of flexibility.

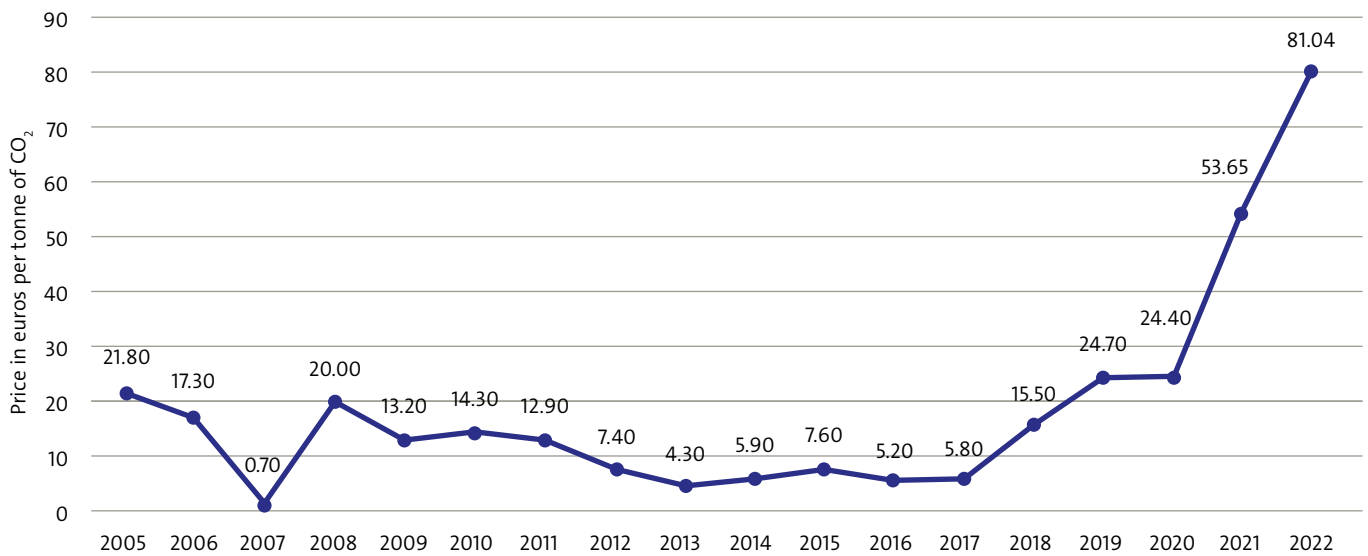
In this white paper, we highlight opportunities, potential and action corridors for progress in sustainability. These are based on the role of logistics players as active shapers and drivers of change, better activation of rail as a mode of transport for multimodal transport systems, a holistic approach to designing circular economic cycles and a plea for greater openness to collaborative partnership models.

1. Transformation towards sustainability stagnates despite increasing pressure to act

The results of the BVL study show that the relevance of sustainability has steadily increased in recent years and is expected to continue to do so in the future. Sustainable behaviour is not only seen as part of social responsibility but is also increasingly associated with strategic competitive advantages. Two-thirds of logistics and SCM managers state that their companies have set specific targets for reducing CO₂ emissions. Both shippers and logistics providers are focussing on the ecological component of sustainability.

This is closely linked to the pressure to act resulting from financial burdens. In Europe, particularly in Germany, CO₂ emissions are increasingly being taxed. The lorry toll on German roads currently charges 200 euros for the emission of one tonne of CO₂.¹⁾ In addition, the price of CO₂ emission allowances has risen dramatically in recent years. The gradual shortage in the supply of emission allowances means that their price will continue to rise in future.

Figure 1: Price development of CO₂ emission allowances



Source: Statista 2024

Logistics is one of the largest sources of greenhouse gas emissions. In Germany, its share of CO₂ emissions is around 20%.³⁾ Road freight transport accounts for over 95% of total freight transport emissions.³⁾ These levers are addressed by the most frequently mentioned, initiated projects and programmes: Conversion of company premises, optimisation of journey utilisation and use of alternative drives and transport modes.

The forecasts regarding sustainable transport requirements in the 2020 BVL study indicated significant growth. However, this has not materialised.

It is striking that, according to the BVL study results, the adaptability of companies in the area of sustainability is actually only rated

as mediocre and has stagnated since 2016. In our experience, the reasons for this are that there are too few solutions that are directly applicable and that the focus of programmes and measures continues to be on costs and risk avoidance. In addition, the results of the study show that responsibility is shifted back and forth between politicians and companies as well as between logistics service providers and shippers. From the point of view of many of the respondents of the study, the possibility of exerting influence is perceived as low. Shippers and logistics service providers place the main responsibility for sustainable business practices with politicians. This understanding slows down development, even though reliable and binding framework conditions are an indispensable prerequisite for companies to invest in sustainability.

Another major obstacle is the low willingness of customers to pay for sustainable solutions. In addition, there is a lack of human and financial resources for investments in technologies and processes to implement a holistic transformation to sustainable supply chains. The combination of these factors makes it difficult to achieve progress in designing holistic and sustainable value-creation networks.

2. Logisticians and supply chain managers as enablers and drivers of sustainable value-creation networks

The perception of logistics and supply chain management (SCM) in companies and among the public has increased significantly in recent years. This mainly relates to ensuring the ability to deliver products, parts, and services. At the same time, transparency with regard to the provision of services has moved further into focus. One example of this is the Corporate Social Responsibility (CSR) directive, which obliges companies to report on greenhouse gas emissions.⁴⁾ Supply chain managers and logisticians, shippers and service providers must work together to find suitable answers to higher and more complex requirements.

Through mergers & acquisitions, consolidations, strategies for vertical integration into the value chain and digital players entering the market with new platform models, the

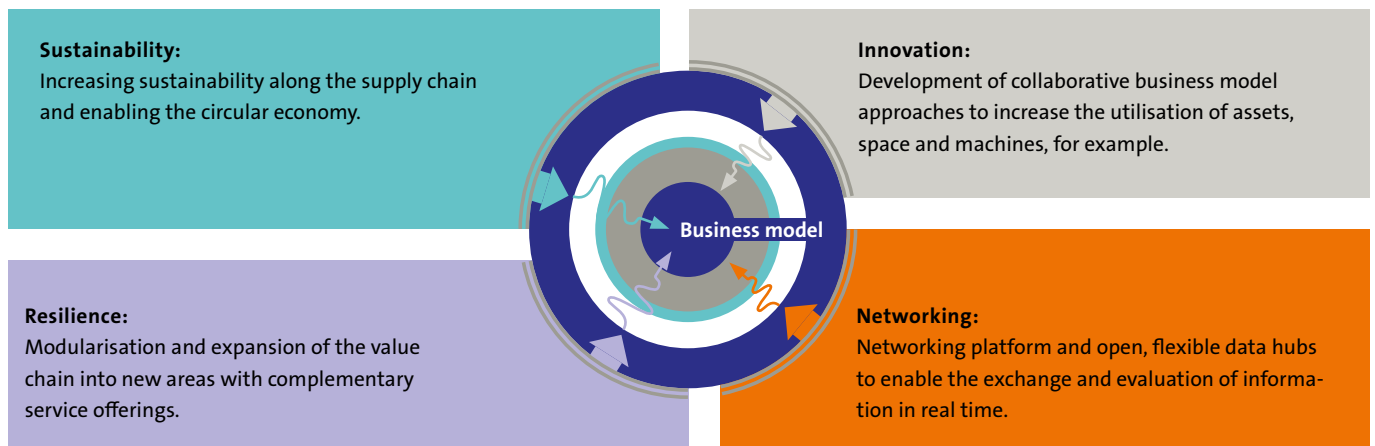
landscape of players and their roles is changing dynamically. Companies are experiencing, for example, that long-standing suppliers and customers become competitors at the same time by extending the depth of the value chain. The reorganisation of business processes to meet sustainability criteria is not decoupled from permanent efforts to consolidate one's own position in the market in uncertain and volatile times.

With their ability to design and manage stable supply chains, optimise resources, and support the supply chain, logisticians have decisive levers at their disposal to strengthen their competitiveness and reduce their environmental impact. For many companies, an expanded understanding of their tasks in the sense of a holistic "source-to-deliver" approach is gaining importance, which

is reflected in adapted organisational and responsibility structures and in networking with other players.

In order to recognise potential and seize opportunities, it is not enough to simply look at requirements and costs; business models need to be rethought and, in some cases, reimagined, and more collaborative approaches need to be developed, piloted, and implemented.

Figure 2: Logistics players as active creators of successful business models



Quelle: Infront Consulting

Logisticians and SCM managers can drive the transition to the circular economy. They can play an active role in the implementation of reverse logistics concepts and innovative models for offers and services (e.g. sharing platforms, leasing offers, pay-per-use models) and design and manage holistic material cycles with a "return-to-value" perspective.

This perspective leads to a change in self-image from efficiency-orientated implementers to innovative designers and solution providers. Logisticians and supply chain managers can fulfil their role as important drivers of the necessary transformation to sustainable value creation networks by promoting corresponding ways of thinking in companies, driving

technological integration, enabling multidisciplinary and agile teams and actively exchanging best practice solutions and developing standards in collaboration across sectors and industries.

3. In the short term, new and expanded business models in the rail market offer attractive potential for increasing sustainability in transport logistics

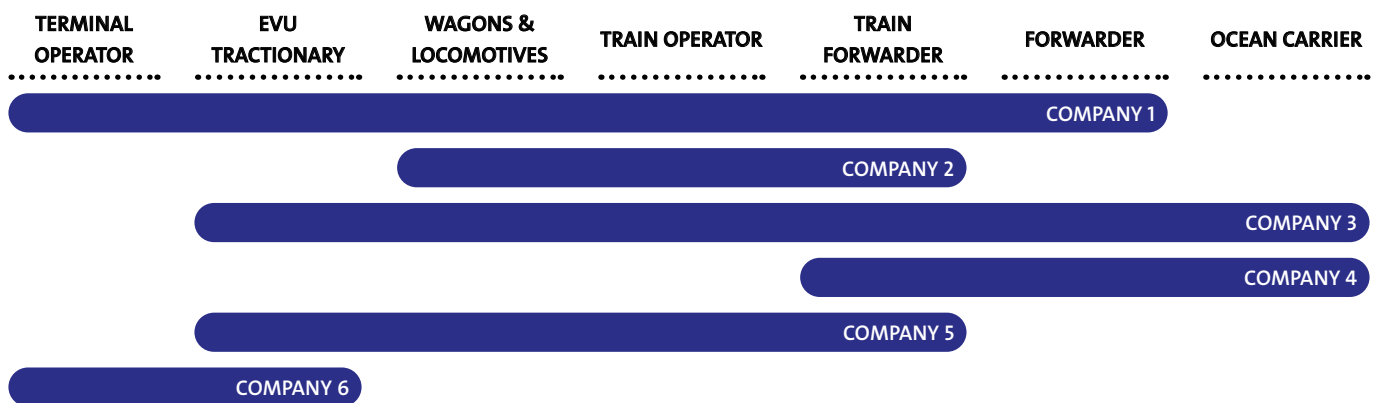
One option that can be implemented in the short term to decarbonise transport emissions is to make greater use of rail as a mode of transport. In addition to the more favourable CO₂ balance compared to road transport, rail freight transport also offers enormous potential in terms of capacity, service level and cost-effectiveness. One prerequisite for this is the customised design of the operating models. Despite long-standing transport policy goals, many players have had bad experiences with the use of rail, are currently experiencing massive limitations in infrastructural capacity or simply have neither expertise nor access to the rail system.

Integrated business models open up one-stop-shop product packages

Customer demand for integrated, easy-to-use end-to-end solution packages has also led to a vertical diversification of business models along the logistics chain in rail freight transport. Established models of forwarders and carriers have been further developed. By integrating key elements of the value chain, end-to-end control of processes and, therefore, better utilisation of all resources can be guaranteed. In doing so, leading players have designed operating models that ensure maximum utilisation and use of resources.

On the one hand, this has led to the creation of Europe-wide networks that can tap into economies of scale and balance the flow of goods. On the other hand, segment champions have specialised in certain regions, transport corridors or industries and have aligned themselves with specific customer benefits.

Figure 3: Integrated business models in rail logistics



Source: Infront Consulting

The leading and highly efficient players show that a consistently managed rail product can be at least on a par with, and often even superior to, other transport solutions in terms of reliability and punctuality, but also in terms of cost. Figure 3 provides a schematic illustration of how companies integrate along the value chain.

This development offers shippers and logistics providers the opportunity to integrate suitable rail solutions and providers into their supply chain. From the point of view of shippers and logistics service providers, it is crucial to find the models and providers that can be eas-

ily combined with the company's own logistics profiles and offer scaling and efficiency potential.

Maritime, container-based transport networks experienced a particular development boost in 2023. Ocean carriers are taking vertical diversification to the next level and building strong hinterland networks by acquiring rail and logistics service providers in order to offer their customers end-to-end process chains. Freight forwarders must position themselves in order to redefine their role in the market, but also to adapt their business models. There is still great potential in European over-

land transport. Intermodal solutions must be aligned and developed to the specific needs profiles of different logistics systems and networks (e.g. FTL, CEP, general cargo). Shippers are also increasingly working on setting up their own rail units. A strong lever lies in the combination of their transport flows with other partners and in the implementation and management of transport operations in joint venture companies.

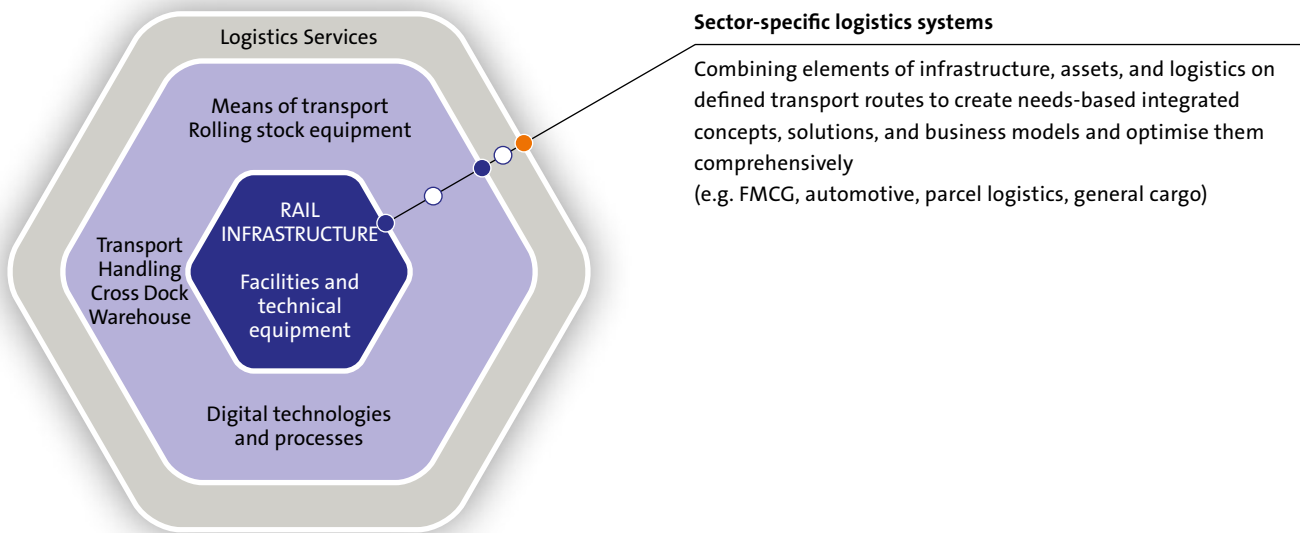
New and growing neutral pools for assets and resources open up additional options

The offerings and capacities of neutral asset and resource pools are being expanded, and new providers are tapping into growth segments such as automotive, intermodal and renewables. They offer the possibility of accessing freight wagons, locomotives, and terminals and deploying them with greater flexibility in the transport networks. At the same time, service providers for specific personnel, such as train drivers, wagon masters and dispatchers, are further developing their range of services and acting as fully comprehensive rail operations service providers.

Offers and optimisations of sector-specific systems instead of individual nodes and edges

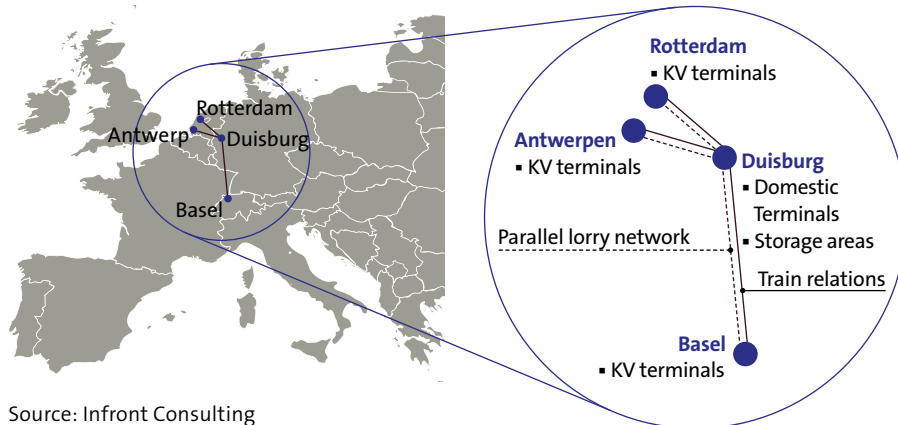
As capacities, resources, and investment funds will increasingly become bottlenecks in the future, segment-specific systems in rail freight logistics offer a new perspective for users and investors. Infrastructures, assets, transport, and logistics services will be holistically combined to create integrated solutions and business models. Terminals are not viewed in isolation during optimisation but are optimised as part of a system. The transport, technologies, and processes in the terminals are harmonised with each other.

Figure 4: Designing rail freight logistics as a system



Source: Infront Consulting

Figure 5: Logistics system using the example of the "chemical triangle"



Source: Infront Consulting

Customers and investors can identify and utilise high-performance systems and networks to secure critical capacities.

One example is the "chemistry triangle" (Fig. 5).

Digital platforms are becoming "virtual railway operators"

In order to simplify access to rail as a transport mode and optimise its use, various digital platforms have established themselves on the market in addition to the business models geared towards the flow of goods. These platforms offer transparency, support the booking of transport services from enquiry to invoicing and make it possible to compare and combine different offers. They are increasingly acting as virtual operators who significantly increase capacity utilisation and efficiency without having to assume responsibility for capacity utilisation themselves. As a supplement to independently operated networks and solutions, they offer opportunities to utilise the asset-heavy rail largely asset-light.

Rail Operations as a Service

The sum and combination of the various business models mean that both rail transport and the necessary control systems can increasingly be used as a modular and flexible as-a-service service. Service providers control the system and the processes, with shippers or logistics service providers providing assets such as locomotives, freight wagons and terminal capacities. This creates new networks with flexible and modular elements.

The positive effects of the newly established models on the market are already evident in that more and more shippers and logistics service providers are integrating rail more strongly into their supply chains and increasing the controllability of their rail-related processes. It is important to successively build up relevant knowledge about rail processes, to ensure constant access to core resources, and to optimise these resources at all times.

Core resources are understood to be the elements of infrastructure (e.g. train paths and terminals), assets (e.g. freight wagons, locomotives) and resources (e.g. locomotive drivers, wagon masters, dispatchers, and licences). Logistics companies can selectively procure their own assets or utilise asset pools. A prerequisite for successful management is often the establishment of central rail operations centres for optimal planning, management and tracking of rail transports.

Shippers and service providers combine their transport needs and rely on long-term joint ventures in order to bundle market and production factors and balance flows. In addition to the design of operating models and processes, governance, contracts and staff selection must be aligned with the main corporate goals.

4. In the long term, sustainability can only be achieved through a comprehensive reorientation towards a circular economy

Today's economy is primarily a linear model characterised by a "take-make-dispose" approach. Due to the shortage of global resources and the negative environmental impact, a holistic transformation to a sustainable and resource-conserving circular economy is necessary, in which products and materials circulate with the highest possible value retention, thus minimising the use of resources, waste and emissions. Although the circular economy offers a promising solution, the global circularity of products and materials is only 7.2 %.⁵⁾

The suitability of the products, high investment costs, and complex technical implementation represent hurdles to further penetration. All players are required to comprehensively adapt their strategies, business models, products, and processes to the requirements of the circular economy. This fundamental transformation can be tackled in modular steps and with proven methods. New sources of income and market opportunities can even be opened up along the way. New service and business models can also be tested and further developed incrementally.

Logistics as the backbone and enabler of the circular economy

Key factors for the transformation to circular business models are the transport, storage and reuse of materials and resources. Comprehensive reverse logistics processes form the backbone of the circular economy by organising the transfer of products from the end customer to recycling or reprocessing plants and back to production or retail.

Figure 6: Opportunities and potential of the circular economy

Recycling is now firmly established in Europe. Switzerland is a pioneer in recyclable materials with 94 %. Across Europe, the rates are between 80 % for glass, 72 % for aluminium cans and 47 % for batteries and rechargeable batteries.

However, the **Circularity Gap** is widening. Only a small proportion of the global economy is circular: 8.6 % in 2020 and only 7.2 % in 2022.



OPPORTUNITIES AND POTENTIAL

- Efficiency gains/cost savings
- Market access to new target groups and sales
- Capital inflow, increase in investment capacity

Source: Infront Consulting, Circle Economy Foundation

Transparency, platforms, and modular networking of digital technologies as a prerequisite for optimised circular supply chain processes

An essential prerequisite for designing efficient and competitive circular supply chains is the creation of transparency along the entire cycle. Detailed information on status of products and materials should cover the entire lifecycle, from the origin of the raw materials through the production and utilisation phase to recycling. Many companies are still endeavouring to achieve sufficient visibility in conventional forward logistics and, by expanding and using appropriate control systems, can take a significant step towards targeted end-

to-end control and optimisation of circular processes. The selection, empowerment, and coordination of the various players play a decisive role in this.

The networking of all players in the cycle, from producers to end users and recycling and processing plants, is facilitated by digital platforms. This networking not only facilitates the smooth exchange of information but also creates the basis for improved cooperation between all stakeholders.

The overarching aim of this networking is to ensure that all products and materials are visible throughout their entire lifecycle. In addition to connecting the individual players, the modular integration of digital technologies is essential. These enable real-time monitoring and tracking of products, which in turn enables precise control along the entire cycle.

Figure 7: Selected business models of the circular economy

CONCEPT	DESCRIPTION	BUSINESS MODELS
SHARE	<ul style="list-style-type: none"> ▪ Promoting the shared use of goods ▪ Second-hand markets 	NRail, WILSON.Share, mobile.de
OPTIMISE	<ul style="list-style-type: none"> ▪ Ensure longevity ▪ Avoiding waste and emissions 	Aleph Alpha, Toyota, RLG by Reconomy
RECYCLE	<ul style="list-style-type: none"> ▪ Recycling of materials ▪ Reprocessing of products 	Patagonia, CAT, Remondis
EXCHANGE	<ul style="list-style-type: none"> ▪ Replacing old materials ▪ Application of new technologies 	Rail-Flow, SkyTrain, modility

Source: Infront Consulting

Partnerships as a success factor for the circular economy

The transformation of the economy towards a circular system requires a fundamental reorganisation of supply chain management in order to design the necessary infrastructures and processes and establish them on the market. This transformation of the economy requires not only technological innovations, but also a radical change in the way we work.

This requires a rethink and a transformation of the business models of shippers and logistics service providers. The efficient utilisation of resources and the extension of the product life cycle offer opportunities that can be exploited boldly, especially by pioneers. Through new partnerships, targeted investments, the use of new technologies and the

development of sustainable business models, logistics can make a decisive contribution to overcoming the challenges of implementing a circular economy.

5. Positive mindset and cross-industry collaboration promote progress in sustainability transformation

The sustainable transformation of shippers and logistics service providers requires not only short-term but also long-term measures, which can only be successful if fundamental changes take place in the market. An essential key lies in the mindset of the players. The willingness to view new technologies and innovations as opportunities, evaluate them and implement them where necessary is crucial.

Another essential step is the networking of stakeholders. This collaboration not only offers the opportunity to share resources but also enables better adaptation to rapidly changing market conditions. Well-designed, long-term entrepreneurial models provide a framework for reliable collaboration, even in confidential areas such as data and costs. The formation of cross-industry ecosystems

also contributes to accelerating innovation. Solutions are implemented faster together, and resources are pooled. The exchange of best practices between companies from different industries enables a broader horizon and promotes an open culture of innovation.

Figure 8: Value creation in open innovation platforms

GENERATE KNOWLEDGE FASTER

- Working together on collective innovation challenges
- Continuous dialogue creates a common understanding and accelerates projects and pilots
- Company boundaries are overcome to realise end-to-end solutions for existing and new customers

DISCOVER TECHNOLOGIES

- Joint exploration of future-oriented technologies
- Access to key players, start-ups, and research institutions
- Benefit from the experts' in-depth knowledge in specific application areas

REDUCE IMPLEMENTATION COSTS

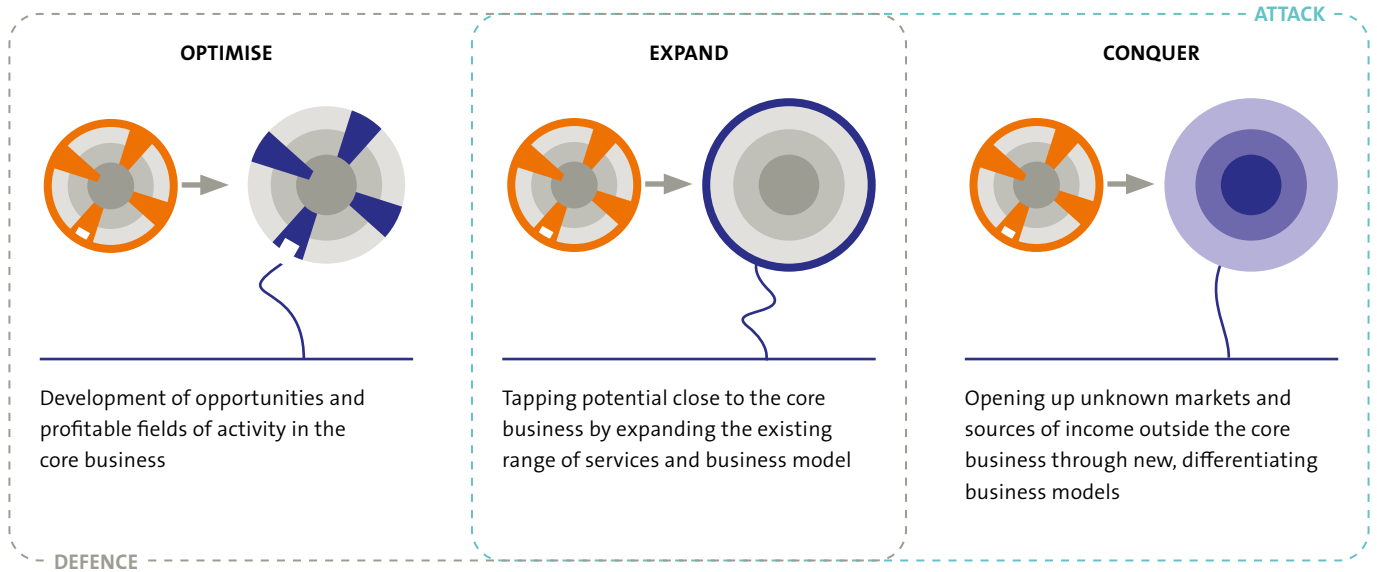
- Not reinventing the wheel, but learning from partners facing similar challenges
- Forces are pooled to become more cost-effective and efficient

Source: Infront Consulting

Practical experience shows that cross-industry ecosystems have a positive influence on the development of new service and business models. By working together in such networks, companies learn faster and benefit from the experience of other industries. This open approach not only accelerates the introduction of new ideas but also promotes collaboration and the exchange of knowledge across borders of their advantageous position

for the development and implementation of forward-looking business models in a constantly changing market dynamic. Logistics companies are called upon to recognise and actively shape their scope for action.

Figure 9: Action areas for logistics players



Source: Infront Consulting

6. Conclusion

In order to make supply chains competitive and successful in the long term, a comprehensive transformation in the areas of digitalisation, resilience and sustainability is of crucial importance. The relevance of a transformation towards sustainable business models has increased in recent years. However, despite the growing awareness of sustainability, there is a lack of successful implementation of solutions and practices among logistics companies that effectively promote sustainable business.

By introducing new and innovative business models and sustainable means of transport, logistics companies can significantly influence and steer the transformation to a sustainable economy. Rail, as a competitive and low-emission means of transport, is a particularly promising option for decarbonising transport in the short term, particularly due to its capacity advantages, high service level, and cost-effectiveness. The prerequisite for this is that new models and players are utilised and integrated into the market in a targeted manner.

In the long term, a transformation to a circular economy is necessary to address resource scarcity and negative environmental impacts.

For the sustainable transformation of the supply chain and the associated short- and long-term implementation of measures, the willingness and courage for fundamental change are required. This includes an opportunity-orientated attitude on the part of the players, a willingness to integrate new technologies and the formation of cross-company and cross-industry partnerships in cross-industry ecosystems. Such networks not only promote innovation but also enable a flexible approach to market changes by supporting the exchange of best practices and collaboration across industry boundaries.

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Berit Börke knows the logistics market and transport sector from different perspectives. She brings her expertise from research and science, leading positions in the transport and logistics industry, including as Managing Director of TFG Transfracht, CEO of TX Logistik AG and member of the Supervisory Board, to the design of new business models, digital transformation processes and the development and implementation of multimodal transport logistics systems as an impulse-giving consultant and implementation-focused sales manager.



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The management summary of the main study "Triple Transformation: Digitalisation, sustainability and resilience as guidelines for future-proof value chains" and other white papers can be downloaded at www.bvl-trends.de.

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