

CSLS

Center for Sustainable
Logistics & Supply Chains



MEASURING INDUSTRY'S TEMPERATURE

AN ENVIRONMENTAL PROGRESS REPORT ON EUROPEAN LOGISTICS

Alan McKinnon and Moritz Petersen

EXECUTIVE SUMMARY

This report summarises the results of a survey of over 90 senior executives to determine the extent to which their businesses are working to improve the environmental sustainability of their logistics operations, mainly by cutting carbon emissions. Logistics activities account for around 10-11% of global CO₂ emissions and will be difficult to decarbonise because of their very heavy dependence on fossil fuel and high forecast growth rate. So, to what extent are efforts underway to get European logistics onto a net-zero emission pathway?

- 30% of the companies consulted were considered to be **'leaders' in sustainable logistics**. They had relevant strategies in place or being implemented, have set absolute carbon reduction targets for their logistics operations and measure related CO₂ emissions at a disaggregated level.
- At the other end of the scale, 15% of business do not currently **measure** their logistics emissions, and a third have yet to set targets for reducing these emissions.
- There is a close alignment of **environmental and commercial objectives** in the decarbonisation of logistics. Around 40% of respondents (60% of those in leading companies) reckon that half or more of CO₂-reducing measures also cut costs.
- The three most **cost-effective ways** of decarbonising logistics are considered to be shifting freight from road to rail, improving vehicle utilisation and switching transport operations to renewable energy.

- Three-quarters of the respondents reckon that **digitalisation** will have a transformational impact on logistics over the next five years. Improvements to supply chain visibility, advances in transport management systems, innovations in vehicle routing and online logistics platforms are expected to make the greatest IT contributions to logistics decarbonisation.
- Despite a general acceptance that net-zero logistics will require much greater sharing of logistics assets, managers reported that several constraints still inhibit **logistical collaboration**. They include competitive pressures, data privacy concerns, management culture and a lack of trust.
- There is a high demand for **new knowledge and skills** to manage logistics operations in a more environmentally sustainable way. Respondents identified several topics on which further advice and training are required.
- Opinions varied widely on the likelihood of the **EU Green Deal** cutting freight CO₂ emissions by the targeted 90% by 2050, though there was much greater consensus on public policy initiatives likely to drive down logistics emissions.
- The survey results help to allay fears that the **Covid-19** crisis will weaken or reverse companies' efforts to decarbonise their logistics. Almost 70% of the respondents, and 87% of those in the 'leading' category, indicated that the recovery from the pandemic would either have no impact or a positive effect on their logistics decarbonisation efforts.

The overall conclusions are that the logistics decarbonisation process is underway and getting integrated into many companies' strategic planning. However, between a quarter and a third of businesses are still at an early stage in this process. On the whole, providers of logistics services appear to have a greater capability to manage the decarbonisation process than the users of these services. In outsourcing logistical activities, companies effectively transfer much of the responsibility for their decarbonisation, though they can still exert an influence on the process through their procurement procedures.

The report includes short case studies in which eight companies outline sustainable logistics initiatives they have undertaken: Procter & Gamble, Stora Enso, Kuehne+Nagel, Tata Steel, Saint-Gobain Isover and Transporeon, Vlantana, Bertschi, and LKW Walter. The report concludes with a series of recommendations for the various stakeholders in the European logistics industry.

FOREWORD

2020 was a pivotal year in many respects for the global business community requiring co-operation in areas normally subject to fierce competition. Arguments for environmentally friendly policies once ignored or side-lined, not least because of the fear of reducing profitability, are now central to senior management thinking. Companies were wary of incurring a 'first mover disadvantage' if stakeholders, in particular customers, were not demanding environmental improvement. Whilst there was business leadership on this issue, it was rather limited. Today there is wide recognition of the environmental challenges ahead and the need to cut carbon emissions to a small fraction of their current level. Businesses are also discovering that this can be done in ways that are commercially beneficial. So what effect is all this having on the management of logistics operations in Europe?

To help answer this question F&L and KLU conducted an online survey of senior management across a broad spectrum of European businesses in September 2020. This was designed to 'measure the temperature' of the logistics sector on environmental issues, particularly regarding climate change. The survey was strongly supported by senior managers across the industry who both provided an insight into their own companies' sustainability efforts and expressed their professional views on a range of related topics. We are very grateful for their participation in the survey. We also want to thank the companies that provided short case studies for inclusion in the report.

We hope that these survey results will enlighten and inspire the wider logistics sector in its pursuit of environmental improvement. The F&L community in partnership with KLU see this study as part of a larger initiative to drive greater logistics sustainability in the post-Covid world - *Building Forward Better* for people, profit and our planet.

Alan C. McKinnon
Professor of Logistics
Kühne Logistics University

Philip Evans
Secretary General
The European Freight and Logistics Leaders' Forum



This illustration was created during the F&L online meeting on November 12th, 2020 as a summary of the presentation and panel discussion about the survey results.

INTRODUCTION

The urgency and scale of the emissions reduction challenge in logistics are daunting

In a recent speech¹, Antonio Guterres, Secretary-General of the United Nations, explained that ‘making peace with nature is the defining task of the 21st century. It must be the top, top priority for everyone, everywhere.’ It must also become the top priority for businesses everywhere. They, after all, are responsible, directly or indirectly, for the vast majority of global emissions and most of the damage being done to ecosystems. It is also in their commercial interest to conserve the environment because as Guterres observed, ‘nature always strikes back – and it is already doing so with growing force and fury’. Extreme weather events associated with climate change are already estimated to be costing the global economy around \$195 billion per annum², a figure rising by 20% per annum. With the planet currently warming faster than at any time in the climatic record going back 3 million years we are in what the WMO³ calls ‘truly uncharted territory’. The territory is similarly uncharted for many businesses which have never before been asked to transform themselves so dramatically and so quickly.

Given the gravity of this situation, it is hardly surprising that over the past few years, there has been a step-change in the commitment of governments and businesses to tackle climate change. Following the Paris Climate Agreement of 2015, the declaration of a climate emergency⁴ and recent launch of the ‘Race to Zero’ initiative⁵, the threat is today being taken much more seriously. Over 110 countries have now committed to being net-zero carbon by 2050 or earlier⁶, while the EU Green Deal aspires to make Europe the first carbon-neutral continent

by 2050. The decision of the new US Administration to rejoin the Paris Climate Agreement and preparations for the critical COP26 meeting in Glasgow in November 2021 are further building momentum. With over 1,100 large companies now aiming to be net-zero carbon by 2050 at the latest, the business world is seriously engaging with the global effort to drive down greenhouse gas (GHG) emissions. We are witnessing a stronger alignment of the three ‘Ps’ of planet, people and profit in which

environmental goals are being given much greater prominence. In the light of these recent developments, this is a good time to assess the extent to which logistics and supply chain management is engaging with the global pursuit of a low carbon future. Logistical activities account for around 10-11% of global CO₂ emissions and, by common consent, will be difficult to decarbonise.⁷ They are undertaken by businesses large and small across all industrial sectors essentially hard-wiring the



logistics decarbonisation process into the economy. This makes it difficult to get an overview of this process and to determine if it is proceeding at a rate which will deliver the required emission reductions by 2030 and beyond.

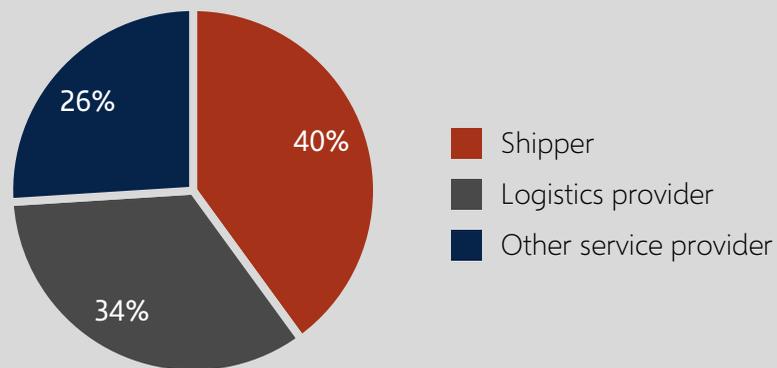


Figure 1: Sample by type of organisation

To gain this overview, we conducted an online survey of senior managers during September 2020. A total of 92 participated, representing many large European-based users (i.e., shippers) and providers of logistics services, with annual turnovers ranging from many billions of Euros to under €10 million. Figure 1 gives a breakdown of the sample by type of organisation.

40% of the respondents represent shippers, most of them from the Fast Moving Consumer Goods (FMCG), food & drink and chemical sectors. Roughly a third of the respondents work for logistics service providers. The remaining quarter represents other service providers like IT services, infrastructure providers, pallet pool agencies or customs brokers. The composition of the sample is not representative of EU industry as a whole. Some

sectors are well represented, while others, such as automotive and pharmaceuticals, had relatively low participation. It does, however, include many of Europe's largest logistics providers and freight forwarders to which a broad cross-section of the continent's industry outsources its freight transport and warehousing operations. Concerning their size, more than half of the companies in our sample have an annual turnover exceeding €1 billion. A breakdown is shown in Figure 2.

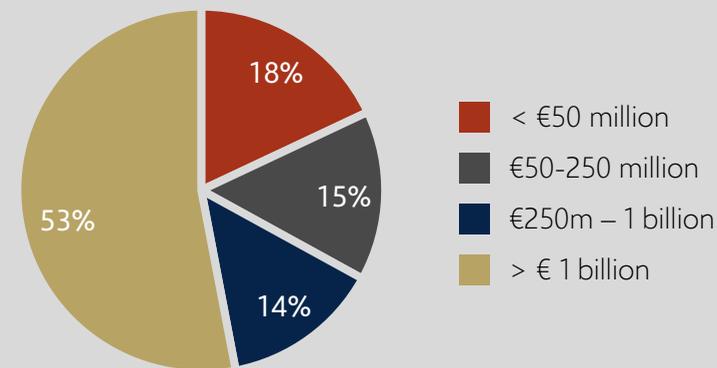


Figure 2: Sample by annual company turnover

More than 70% of our respondents either have general management roles in their companies or are senior managers from the logistics and supply chain field.

Companies are at different stages in the 'greening' of their logistics operations. Using the survey data, we identified a group of leading companies on the basis of two criteria: their progress in establishing a sustainable logistics strategy and the setting of absolute carbon reduction targets for their logistical activities. These 'leaders' represented just under 30% of the total sample.

In this report, we differentiate their responses to illustrate what might currently be regarded as best practice in logistics decarbonisation.

This report summarises the results of the research under the following ten headings:

1. Strategy development
2. Target setting
3. External pressure
4. Emission measurement
5. Decarbonisation initiatives
6. Digitalisation
7. Supply chain collaboration
8. Skills requirements
9. European Green Deal
10. Impact of Covid-19

It also includes a series of short case studies in which several companies that participated in the survey outline sustainable logistics initiatives that they have successfully undertaken. It concludes with a set of recommendations aimed at all logistics stakeholders.

1 STRATEGY DEVELOPMENT

More than half of the companies have a sustainable logistics strategy in place or are implementing one

The general development of logistics strategy has been much researched and debated, but to what extent are companies devising strategies specifically to improve the environmental sustainability of their logistics operations? We divided the development of a sustainable logistics strategy into five stages and invited respondents to indicate at what stage their businesses were in the process. A third of companies already had a strategy in place with another fifth currently implementing one (Figure 3). Only 9% claimed not only to have no strategy but also no formal sustainability initiatives. The likelihood of a company having a sustainable logistics strategy is partly a function of size. The proportion of businesses with such a strategy was twice as high in the over €1bn revenue category as in the under €50m category (Figure 4).

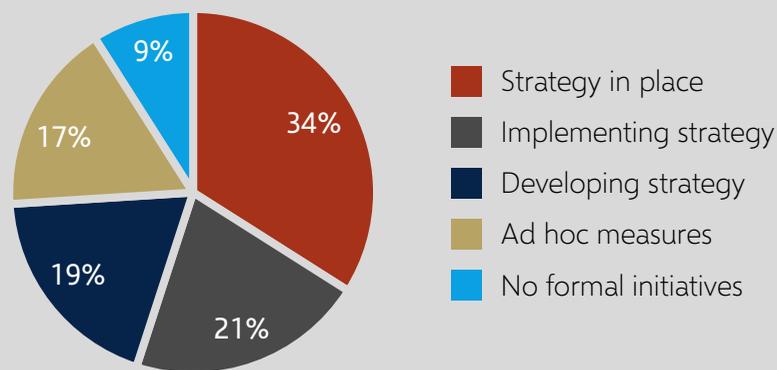


Figure 3: Stage in sustainable logistics strategy development

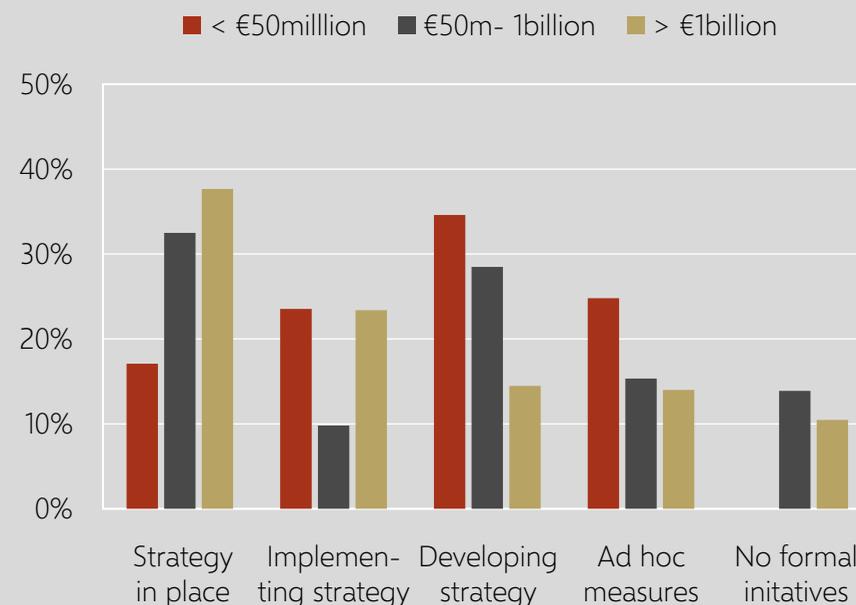


Figure 4: Stage in sustainable logistics strategy development by annual turnover

Twice as high a proportion of logistics providers had a sustainable logistics strategy in place as shippers, no doubt reflecting the fact that logistics is their core business. As most shippers outsource much or all of their logistics to Logistics Service Providers (LSPs) and perform relatively few logistical activities themselves in-house, they may feel less need to develop such a strategy. They can, however, include environmental competence as a selection criterion when choosing LSPs and possibly develop joint sustainability initiatives

with them. There is, after all, an important strategic dimension to the procurement of logistics services which can be shaped in a way that promotes wider adoption of good environmental practice.⁸

'Transport sustainability only works if it is built into overall business strategy.'
Pietro D'Arpa, Procter & Gamble

Among those companies considered to be 'leaders' momentum to decarbonise is strongly building, though more at a corporate level than within the logistics function. There was a surprisingly large gulf between the opinions of respondents from leading businesses and the rest on this issue (Figure 5). Those in the leading category are the pace-setters, potentially gaining greater competitive advantage from being more environmentally-progressive as we move into a lower carbon world.

	Leaders	Rest
Momentum at a corporate level	92%	46%
Momentum within the logistics function	72%	33%

Figure 5: Share of respondents believing substantial momentum is building to decarbonise logistics operations

One indicator of a company's green credentials is the degree to which its environmental performance features in the appraisal of senior management. Respondents were asked to what extent this applied in their businesses on a scale of 0 to 100. The overall average was a mid-range figure of 48, though it was higher for the leading companies (62) and significantly lower for LSPs (39). Securing a higher level of managerial enthusiasm for environmental, social and governance (ESG) objectives will probably require their more formal integration into executive appraisal schemes.

'Looking at stakeholder capitalism initiatives underway among partners of the Forum, there is no question that we need a new low carbon model that is both efficient from an environmental point of view and socially inclusive, but that can also be scaled up and accelerated.'

Margi Van Gogh, World Economic Forum

'We shouldn't fool ourselves. We are far from being on the right track. If we continue with business-as-usual we won't get our emissions down by the required amount. We need to scale up.'

Frank Andreesen, Covestro

CASE STUDY FROM KUEHNE+NAGEL

Sustainability is a social responsibility and the duty of everyone. In line with this principle, Kuehne+Nagel has been continuing the company's sustainability strategy with an expanded focus since the end of 2019. With the new "Net Zero Carbon" programme, Kuehne+Nagel assumes responsibility for more sustainable logistics hand in hand with customers and partners. The programme replaces the "KN Green" one which, since 2010, has successfully achieved its environmental goals.

Since 2020, the company compensates for its own CO₂ emissions. The focus here is on reducing CO₂ emissions through savings in water and energy consumption as well as recycling measures. Emissions that cannot be avoided are offset by investing in certified nature-based projects that work towards the UN Sustainable Development Goals (SDGs).

Another goal is to make all freight movements by suppliers in the Kuehne+Nagel network (airlines, shipping lines and haulage companies) CO₂-neutral by 2030. The goal is being pursued through identification, avoidance, reduction and compensation of CO₂ emissions.

Kuehne+Nagel works closely with customers, partners, suppliers and transport companies to reduce CO₂ emissions from transport and optimise the sustainability of the entire supply chain. This enables the company to offer customers various solutions in a holistic approach to the greening of supply chains: from measuring emissions with industry-leading calculation methods, to proactive reduction through selection of lower-emission transport routes, completely emission-free loading with, for example, biofuel, to the offsetting of remaining emissions and the issuing of certificates to confirm this.

Several services provided by Kuehne+Nagel are automatically CO₂-neutral. Since 2020, all Less-than-Container Load (LCL) shipments in the sea freight sector have been made CO₂-neutral by Kuehne+Nagel. The Full Container Load (FCL) service KN Pledge is also automatically CO₂-neutral as are bookings via the regional online booking platform eShipAsia. Further CO₂-neutral services are being planned.

Seaexplorer, developed by Kuehne+Nagel, is the first tool that creates CO₂ visibility in maritime logistics. It gives customers insight into the CO₂ emissions of various maritime transport services, regardless of the shipping company, and thus the possibility to choose the most environmentally friendly transport alternatives. The platform can show a CO₂ savings potential of up to 50% for individual routes.

Transport emissions that cannot yet be avoided through CO₂ reduction via alternative energies or optimised transport routes can be reduced to zero through CO₂ offsetting. For this purpose, Kuehne+Nagel participates in nature-based compensation projects worldwide, which ensure that CO₂ is removed from the atmosphere. These voluntary CO₂ offsetting measures support the 17 United Nations Sustainable Development Goals (SDGs). Kuehne+Nagel generates CO₂ credits from a global portfolio of environmental projects, for example in Kenya, Peru and Indonesia. Each CO₂ credit is subject to an external verification process and represents the avoidance or elimination of one tonne of CO₂.



2 TARGET SETTING

A third of companies now set absolute carbon reduction targets for logistics

Another indicator of companies' commitment to decarbonise their logistics operations is the nature of the targets they set to cut their carbon emissions. Until recently, the vast majority of these targets were expressed in terms of carbon intensity, in other words, CO₂ emissions relative to the level of logistical activity as measured by tonne-kilometres, vehicle-kilometres, pallet throughput etc. There has been a natural reluctance to commit to reductions in total emissions as that might inhibit the future growth of the business.⁹ The carbon budgets for differing degrees of global warming, however, are defined in absolute terms, as are the carbon reduction targets set by governments. Carbon-intensity-based targeting can now be seen as a transitional stage to the adoption of targets which cut total emissions, regardless of business growth, ultimately to net zero.

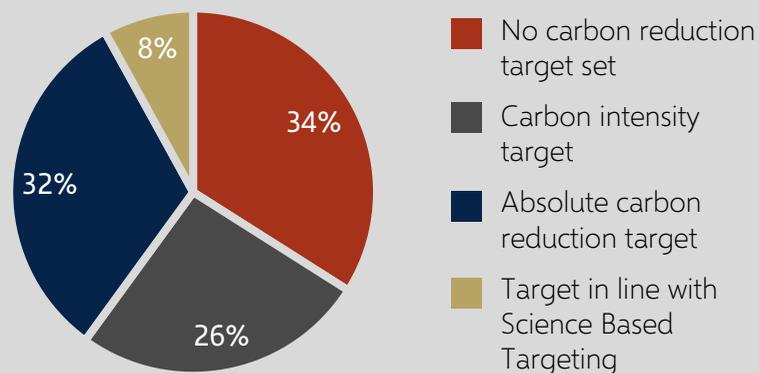


Figure 6: Types of carbon reduction targets

The Science Based Target initiative (SBTi) was set up in 2014 to advise companies on how to achieve this, effectively aligning their targets with the climate science.¹⁰

'We are seeing from a very low base an exponential growth in the number of our key customers setting zero carbon targets for Scopes 1, 2 and 3 emissions by 2050. They are now starting to require the same of their suppliers.'

Allan Lerberg Jørgensen, A.P. Moller-Maersk

Only 8% of the businesses were setting carbon reduction targets for logistics in line with the SBTi (Figure 6). This partly reflected the relatively low participation of the logistics sector in the SBTi.¹¹ In November 2020, only around 5% of the 1090 companies signed up to the initiative belonged to this sector. A third of the companies surveyed are setting absolute carbon reduction targets but independently of the SBTi. Among LSPs, this proportion rises to 42% (Figure 7). Overall, a quarter of the businesses still define their targets in terms of carbon intensity.

'Increasingly, financial institutions are demanding and rewarding climate ambition and transparency – their investments will prioritize first movers who have a sustainability strategy, set Science Based Targets and are disclosing emissions performance.'

Angie Farrag-Thibault, World Economic Forum

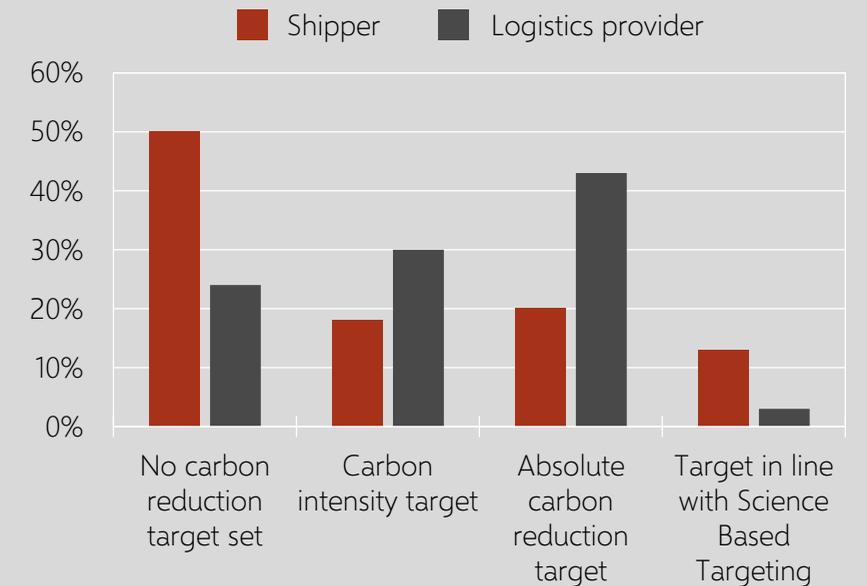


Figure 7: Types of carbon reduction target by type of business

More worryingly, a third have not yet set any target for reducing their logistics emissions. The majority of companies in this latter category are shippers, many of which will probably have set targets at a corporate level but not yet disaggregated them by function. Many of these shippers will also be outsourcing much of their logistics to LSPs and so effectively 'piggybacking' on their carbon reduction targets.

3 EXTERNAL PRESSURE

Pressure to improve logistics sustainability is building but needs to be strengthened

Efforts to improve the environmental performance of a business are often internally motivated, sometimes by a senior executive keen to champion the cause. There are also external pressures on companies to reduce their logistics emissions. The survey enquired about the sources and strength of these pressures, using a six-point numerical scale. Four sources, customers, government, shareholders and environmental organisations, received the highest mean ratings. Figure 8 gives an overview of which sources are perceived to exert strong pressure. Almost half of the leaders sense strong pressure from both customers and governments. At the other extreme, financial institutions appear not to have much effect at present though their

	Leaders	Rest
Customers	46%	18%
Government	46%	13%
Shareholders	19%	21%
Environmental organisations	28%	14%
Competitors	3%	4%
Financial institutions	4%	3%

Figure 8: Sources of strong external pressure to improve logistics sustainability

influence is likely to increase as the levels of investment in new low-carbon assets and infrastructure rises steeply over the next decade.



Figure 9: Sources of strong external pressure by type of business

The group of industry 'leaders' assigned significantly higher average scores to the top four sources of external pressure, suggesting that they are more sensitive to these pressures, particularly from customers and shareholders. Figure 9 gives an overview of the sources of strong pressure experienced by shippers and LSPs. Customers play a much larger role for LSPs whereas shippers get more pressure from shareholders and environmental organisations.

CASE STUDY FROM STORA ENSO

Stora Enso is one of Europe's largest manufacturers of pulp, paper and other forest products. In 2019 one of the company's divisions investigated options to improve its logistics set-up for the Italian market. The aim was to raise the customer service level, taking account of delivery reliability, cost and carbon emissions. Four Nordic mills served the Italian market, and customer inventory was held in seven different locations. Following a transport network design study, a decision was made to establish a central hub in Northern Italy. This enabled the company to hold inventory closer to the market, shortening order lead times for customers call-offs, improving delivery reliability and reducing the logistics carbon footprint. Developing this new hub also created the potential to utilize rail and intermodal transport solutions. This was a good illustration of how, in optimizing its logistics network, Stora Enso pursues sustainability in accordance with the triple bottom line.

Implementation of the new logistic network in Italy has resulted in a broad range of economic and environmental improvements: 10% increase in delivery reliability, higher vehicle utilization, transport cost savings, modal shift to rail and intermodal services, a 40% reduction in carbon emissions and, to date, no safety incidents reported across the new logistics set up.

The main managerial 'learnings' from this logistical restructuring were that a business must have an intimate knowledge of ordering patterns, its IT-systems are critical and adopting a two-leg strategy of distributing product via a national hub increases economic and carbon efficiency while improving flexibility. It is also likely that this strategy will mitigate future truck constraints and access restrictions.



4 EMISSION MEASUREMENT

85% of the surveyed companies measure their logistics CO₂ emissions in some form

The much-cited maxim ‘if you don’t measure it, you can’t manage it’ applies just as much to CO₂ emissions as to all other aspects of business. As companies embark on a logistics decarbonisation programme, measuring these emissions is one of the first things they must do. Unlike in the early days of carbon auditing in the logistics sector, established methodologies and reporting standards are now available and widely adopted, particularly those of the Global Logistics Emissions Council.¹² So, what proportion of businesses are currently measuring these emissions and in what ways? Across the full sample, 85% of firms measure their logistics CO₂ emissions. 100% of the ‘leading’ companies do so (Figure 10). We then differentiated companies in terms of two criteria: their ability to disaggregate logistics emissions and their willingness to

	Leaders	Rest
Not measured	0%	19%
Aggregate level for internal use	16%	22%
Aggregate level for external use	19%	26%
Disaggregated for internal use	23%	13%
Disaggregated for external use	42%	20%

Figure 10: Extent to which companies measure logistics CO₂ emissions

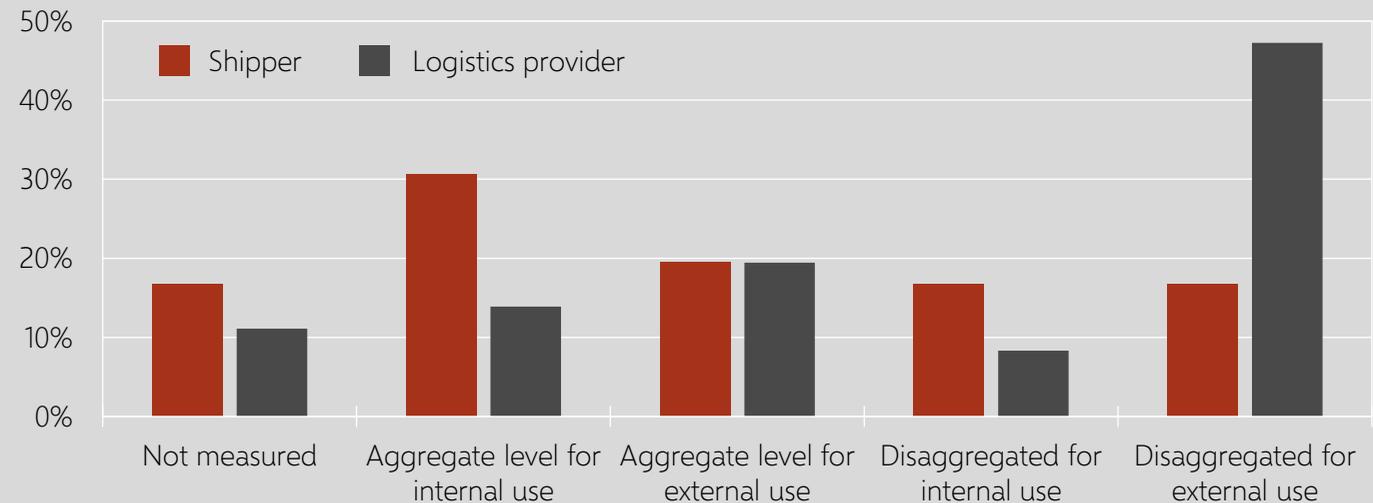


Figure 11: Logistics CO₂ measurement by type of business

report the data externally. A quarter of the entire sample and more than 40% of leaders can both disaggregate the emissions data and make it available for external use, the highest level in our schema. LSPs exhibited a much greater capability in this respect than shippers with just under half of them in this highest category (Figure 11). They, of course, are coming under increasing pressure to provide client-specific and even consignment-specific emissions data, making emissions measurement a core competence, certainly among the larger operators. By contracting out logistical activities, shippers

effectively outsource the measurement of the related emissions. This may largely explain why only 17% of shippers fall into the top emission measurement category, and another 17% of them do not measure logistics emissions themselves.

‘Since they often result in cost savings, lots of work on efficiency measures is now considered simply as good business practice, so not necessarily counted as a ‘sustainability initiative’ anymore’
Angie Farrag-Thibault, World Economic Forum

CASE STUDY FROM VLANTANA

Sustainability initiatives should not be put on hold even though we are living through turbulent times due to the pandemic. The road freight sector should not delay its sustainability efforts but rather go forward at a faster pace. Our policy in Vlantana is to continue implementing our sustainability strategy. As an essentially innovation-driven company, we have not postponed our plans to add LNG trucks to our current fleet of over 1,550 EURO VI trucks. We continue to pursue these plans, not only because of our commitment to the community to conduct our business sustainably, but also to meet the expectations of our long-term partners to devise tailored transport solutions that are both efficient and sustainable.

When our first LNG trucks arrive in January they will be deployed on specific corridors and schedules to suit cargo owners' expectations, and drivers' working and rest time regulations while maintaining a high level of truck utilisation. Our holistic approach of integrating the use of alternatively-fuelled trucks into our operational planning is calculated to save approximately 35 – 40 tonnes of CO₂ per year per truck. Only by combining these trucks with a tailored system of resource allocation will it be possible to achieve the required level of truck utilization and value-add. This tailored resource planning system is only possible with the application of digital solutions in our newly implemented Fleet Management System. Other sustainability measures, including the use of nitrogen-filled tyres and an Eco-safe driver training scheme, are lowering fuel consumption, slowing wear-and-tear and improving road safety.

The success of Vlantana's sustainability initiative is built on mutual interest, visibility (a feature that has been found to be crucially important during these disruptive times), openness between manufacturer, shipper and carrier and, of utmost importance, our tailored system of resource allocation.



CASE STUDY FROM PROCTER & GAMBLE

In P&G, the announcement of ambitious transport sustainability objectives has always coincided with a change in Key Performance Indicators. The recently announced Ambition 2030 target of an emission reduction of 50% by 2030 (against a 2020 baseline) follows the adoption of the GLEC standards to measure and report Scope 3 transport emissions. The previous 2020 target (for a 20% reduction in truck-kms) was underpinned by two important new KPIs and reporting standards: the so-called P&G TINA Calculator to track intermodal tonne-kms and a KPI called Cubefill. Most of P&G's external communication on transport sustainability in the past has focused on the modal shift it has achieved with the TINA program. However, the new Cubefill KPI has also had a major impact internally.

So, what exactly is Cubefill? It all started with a critical review of the definition of a 'full' truckload. In the early 2000s P&G defined a truck as 'full' if it carried more than 30 Pallets. This was already a very 'generous' definition as a Euro Trailer can theoretically carry 34 Euro Pallets (120x80), 33 pallets after space is released for the safe operation of forklift trucks. A survey of the industry revealed that while there was widespread use of weight data (driven by legal compliance), other definitions of full trucks varied a lot. Number of pallets is essentially a measure of surface area occupied. Some transport companies were only tracking the length in meters of trailer space used. Only in a handful of cases did we find companies that were tracking the percentage fill of internal

trailer volume, and typically only where goods were manually stacked on the vehicle floor (i.e., 'deadpiling').

A decision was taken to adopt globally Cubefill, alongside weightfill, as a fundamental KPI to accurately measure real truck utilization. At the start of the program Cubefill was between 40 and 50%, especially in markets where pallets were used consistently across the P&G network. Raising this KPI proved challenging but, with a lot of ingenuity, creative solutions were found. It became clear that a new modular logistic unit other than the pallet was needed to drive up trailer cube utilization.

The Smartbox project, led by GS1 Germany, offers part of the answer. This stacks a series of standard boxes to a height of 2.4 meters and may eventually transform Cubefill utilization especially for slow-moving, high-value SKUs. This time the effort is collaborative across the industry as only widespread adoption will bring a step-change in the utilization of transport assets. Since its introduction of Cubefill in Europe P&G has increased this utilization by 10 - 15%. A good result, but still with much room for improvement. Not surprisingly it is also a key strategy in the company's new Ambition 2030 Program.



5 DECARBONISATION INITIATIVES

Modal shift and improved vehicle loading are deemed to be the most cost-effective interventions

Logistics emissions can be reduced in many ways; most of them mutually reinforcing. This wide variety of decarbonisation options can be divided into five general categories¹³:

1. reducing demand for freight transport
2. shifting freight to greener modes
3. improving vehicle utilisation
4. increasing energy efficiency
5. switching to cleaner, lower-carbon energy

The survey asked respondents what they considered to be the three most cost-effective ways of reducing logistics CO₂ emissions in rank order. They were free to suggest any options using their own words. Their 202 suggestions were grouped into ten classes and weighted according their rankings (Figure 12). On this basis, freight modal shift (category 2) was deemed to be the most cost-effective option by a substantial margin. This was followed by improvements to vehicle loading (category 3).

‘There is a lot of focus on shiny objects – innovative vehicles and alternative energies – when we need more supply chain management and operational management skills. I am so reassured that by the survey when most of the respondents said that the two main actions are modal split and efficient vehicle loading.’

Sergio Barbarino, Procter & Gamble / ALICE

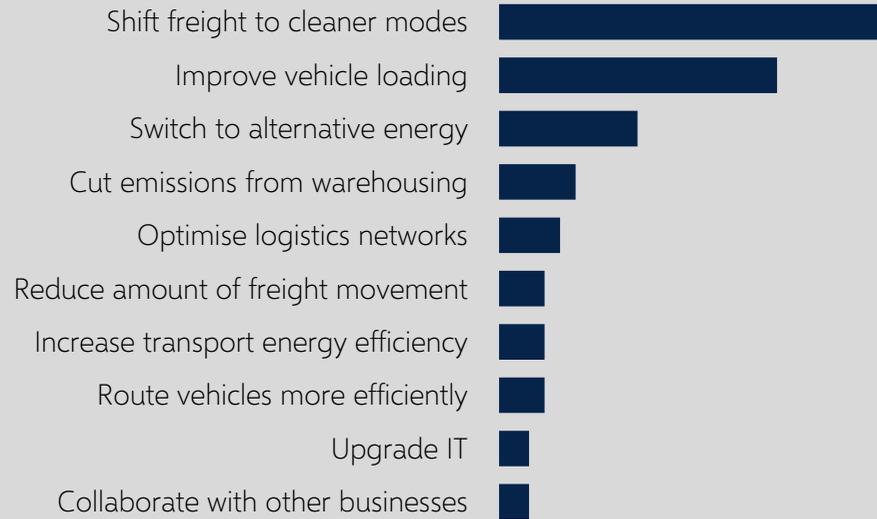


Figure 12: Most cost-effective way of reducing logistics CO₂ emissions by weighted number of responses

Between them, these two essentially operational initiatives accounted for approximately 53% of all the suggestions. It is encouraging that these operational options commanded such strong support because they can have the advantage of being relatively quick and cheap to implement. Switching to alternative energy (category 5) came third in the assessment, though increasing energy efficiency (category 4) was well down the ranking, despite the fact that measures such as driver training, aerodynamic profiling and vehicle light-weighting have all been shown to have low carbon mitigation costs and short payback periods.

In fourth place came initiatives that cut emissions from warehousing, an activity which accounts on average for around 10-12% of total logistics emissions and is generally considered to be easier and cheaper to decarbonise than freight transport operations.¹⁴ Among the most popular suggestions under this heading was on-site generation of renewable electricity by solar and/or wind-power. There are already examples of solar panels not just meeting the warehouse’s energy demands but also providing zero-carbon energy to other users. This offers the prospect of carbon-negative warehousing offsetting emissions from companies’ freight transport operations thereby helping logistics systems as a whole to reach net zero.

‘There is not enough talk about cost, because sustainable fuels and new technologies will be expensive. But the good news is that many shippers are prepared to pay for them.’

Otto Schacht, Kuehne+Nagel

The classes of initiative rated fifth and sixth, respectively optimising logistics networks and reducing the amount of freight movement, belong mainly to category 1. It is often said that the most environmental-friendly vehicle-km is the one that it is not run. Respondents envisaged reducing the overall demand for freight movement by rationalising inbound freight flows, sourcing more supplies locally, the redesign of supply chains, improved network planning and product swap arrangements.

It is difficult to explain the low rating of improved vehicle routing, upgrading IT and collaboration, as it has been shown

all three can yield substantial emission reductions. Many respondents may simply have subsumed these measures within other more highly-rated initiatives and not felt the need to separately identify them. As discussed in the next section, both IT and collaboration play a key role in improving vehicle utilisation, while more efficient vehicle routing may have been considered integral to the optimisation of logistics networks. Computerised vehicle routing and scheduling (CVRS) may also have been considered a mature, widely-adopted technique offering little additional CO₂ savings. If so, this would underestimate the impact of recent advances in CVRS with the application of big data, predictive analytics and machine learning. Responses to a later question about digitalisation acknowledged the potential contribution of these vehicle routing innovations to decarbonisation.

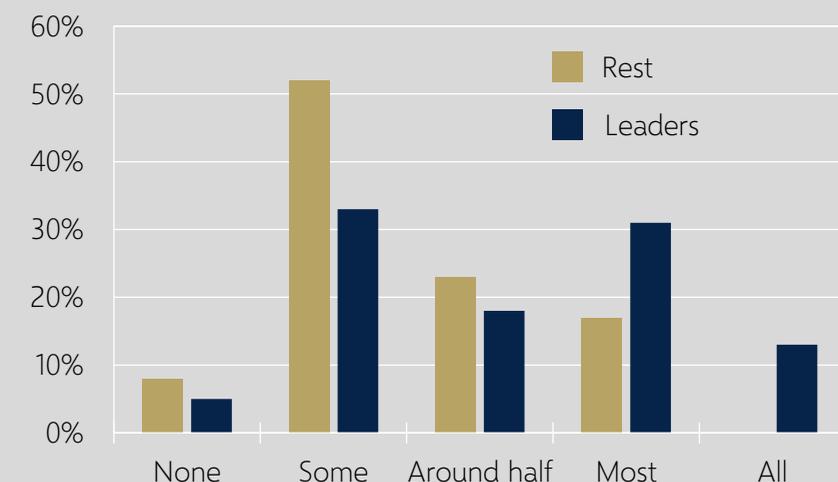


Figure 13: Proportion of logistics CO₂-reducing measures also cutting costs

CASE STUDY FROM TATA STEEL EUROPE

Tata Steel launched its Zero Carbon Logistics framework in May 2020. It establishes a very clear connection between the company's strategy, several material SDGs (Sustainable Development Goals) and logistics sustainability. Its goal is to make sustainability "business as usual" for deliveries to Tata's customers. Sustainability is now being integrated into the design and operation of the network. Tata does not only optimize on cost but also takes the carbon footprint of its logistics network into account.

Zero Carbon Logistics helps to embed sustainability in Tata Steel Europe's daily logistics' operations, but its focus on collaboration also makes it an excellent tool to improve the dialogue with customers, suppliers, and other stakeholders on sustainability. Tata Steel Outbound Logistics spent over 1.5 years designing an emissions factor library (with excellent support from the Product Sustainability Team). This library forms the solid foundation of the framework and is a significant improvement compared to the generic emission factors published on government websites that were used previously. The library has been calibrated where possible with actual emissions. It now allows mapping of the network with improved granularity so that emission hotspots can be identified, and reliable emission reports generated for our customer deliveries.

While on the subject of cost-effectiveness, the survey also tested the frequently-made claim that many decarbonisation measures also save money and so can be justified on commercial as well as environmental grounds. Respondents were asked, from their company's experience, what proportion of carbon-reducing measures in logistics have also yielded a cost saving. 95% of the sample said that at least some of them saved money, while 40%

The "Improve" component of the framework offers Outbound Logistics colleagues a clear insight into how they can positively influence the carbon footprint of the network. The focus is on improvements to the network, choice of transport mode, fleet efficiency, energy use and packaging.

Innovation will play an increasingly important role when conventional eco-efficiency improvements have reached their limits. Tata is, for example, already working together with Delft University, the Port of Amsterdam, barge partner PTC and H2Fuels on a project to retrofit an inland river vessel with a solid hydrogen fuel cell.

Collaboration is at the heart of the framework. Tata is actively cooperating with customers and suppliers, but also with industry platforms and knowledge centres like universities.

Tata Steel Outbound Logistics believes in transparency and open-sharing of knowledge and best practices. In early 2021 it will publish emission targets for 2030 and launch its Supplier Sustainability framework.



indicated that half or more combined a cost and carbon saving (Figure 13). This latter proportion rose to over 60% in the case of the leading companies. The survey therefore provided empirical evidence that in the management of logistics operations environmental and commercial objectives are quite closely aligned, giving companies a substantial amount of 'low hanging fruit' to harvest.

6 DIGITALISATION

Digitalisation has the potential to be a decarbonisation game-changer

Digitalisation has become the collective term for a range of developments in information and communication technology (ICT), including cloud computing, big data, predictive analytics, 5G, artificial intelligence, blockchain and the internet of things. There is general agreement that it is having a major impact on logistics and supply chain management, but how big is this impact? Respondents were asked to rate on a scale of 1 (no impact) to 6 (transformational) how it has affected logistics over the past five years and will affect it over the next five. Their answers suggest that we are on the cusp of a digitalisation revolution. Retrospectively, just over a fifth of the sample rated its impact over the past five years as high or transformational (Figure 14). This proportion leapt up to three-quarters when respondents looked forward five years. LSP's retrospective and prospective scores were generally higher than those of shippers, reflecting their role at the cutting edge of many of these logistics ICT developments.

	past 5 years	next 5 years
Total sample	22%	74%
Leaders	25%	85%
Logistics Providers	38%	86%
Shippers	9%	64%

Figure 14: Share of respondents rating impact of digitalisation as "high or transformational"

'Digitalisation is not new. Data was being exchanged online 20 years ago. When it comes to sustainability it is new. Now we create visibility by putting CO₂ emission data on every invoice.'
Otto Schacht, Kuehne+Nagel

Digitalisation has the potential to be a decarbonisation game-changer. It can enhance the efficiency of logistics operations in many different ways by a substantial margin, with many of these efficiency gains translating into lower carbon emissions. The survey asked what aspects of digitalisation are likely to make the greatest contribution to logistics decarbonisation between 2020 and 2025. Improved supply chain visibility got the highest rating, closely followed by vehicle telematics, advances in transport management systems, innovations in vehicle routing, and online logistics platforms (Figure 15). 3D printing, on the other hand, received a relatively low rating, despite recent evidence that its uptake is accelerating and it has the potential to reduce freight demand.¹⁵ This result may be due partly to the composition of the sample and partly to respondents seeing this technology as having a longer-term impact on CO₂ emissions. A notable feature of responses to this question was the close similarity between average scores awarded to the various digital innovations by the representatives of shippers and LSPs. This was one of several questions eliciting a high level of consensus between LSPs and shippers.

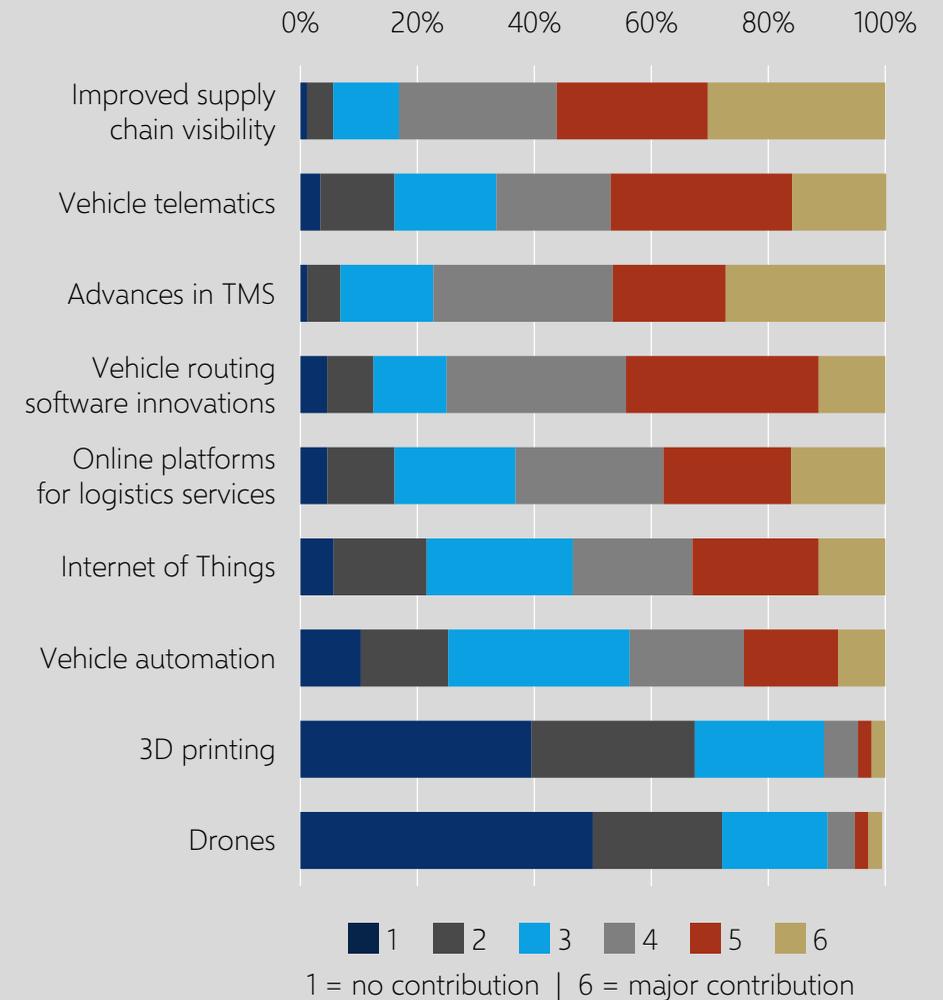


Figure 15: Likely contribution of digital innovations to logistics decarbonisation (% of responses)

7 SUPPLY CHAIN COLLABORATION

Collaborating to cut logistics emissions is still a challenge for many companies

Supply chain collaboration, which has been much discussed and researched over the past thirty years, has now been given new impetus by the pressing need to cut carbon emissions. The pursuit of net-zero emission targets will require a much greater degree of logistics asset sharing and hence closer collaboration between businesses across the supply chain. Respondents were asked to what extent their companies currently collaborate with different types of partner. On a scale of 1 to 6, scores averaged between 3 and 4 for the degree of collaboration with suppliers, customers, LSPs and IT providers. Figure 16 shows the percentages of logistics service providers and shippers indicating that they collaborate very closely with their partners (5 or 6 on the scale). Co-operating with competitors on logistical

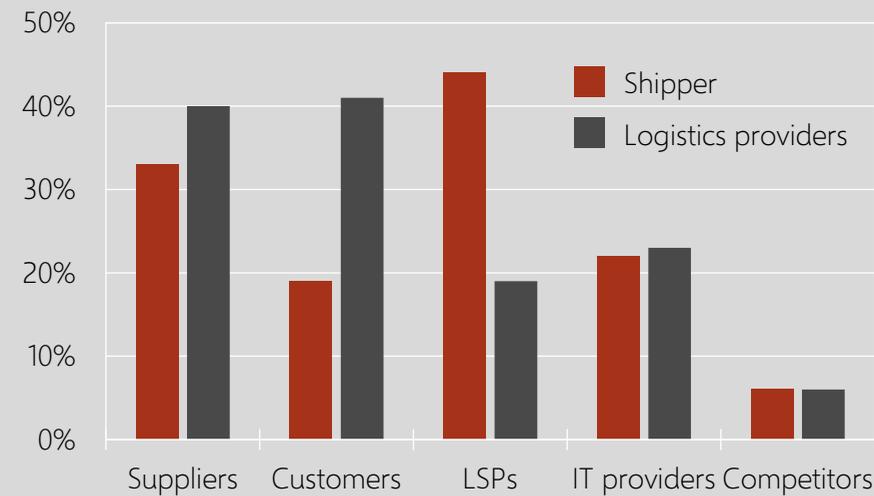


Figure 16: Extent of intensive supply chain collaboration

‘How can we reach scarily ambitious emission targets while meeting customer demand for eco-friendly products and circular supply chains. When we go for greener solutions, our whole value chain needs to be there with us.’

Johanna Pirinen, Stora Enso

activities, in what is now widely known as ‘horizontal collaboration’, is least common. The leading companies have a slightly higher propensity to collaborate with suppliers and customers than the sample as a whole. They also claim to derive much greater environmental and economic benefit from collaboration than the rest of the sample. The environmental and economic benefits of supply chain collaboration were thought to be evenly balanced except among the leading companies for which the benefits were deemed to be predominantly environmental.

What are the barriers impeding higher levels of inter-company collaboration? In a ‘free text’ question survey participants were invited to list three barriers in order of importance. Figure 17 classifies their responses and ranks them. On this basis, the most

‘If we do not step-change on collaboration and partnerships between different actors, carriers, suppliers, customers and retailers, we are not going to meet the sustainability goals.’

Pietro D’Arpa, Procter & Gamble

critical barrier, by a wide margin, was competitive pressure. This partly explains why collaboration with competitors is still a comparatively rare occurrence, despite the fact that there are well-publicised examples of competitors successfully co-ordinating their logistics in ways that improve efficiency and cut emissions. The next two barriers had similarly weighted frequencies and are closely related: a company’s preference to act independently and its management culture. Reluctance to



Figure 17: Barriers to supply chain collaboration weighted by numbers of response

collaborate is also partly attributed to concerns about data privacy, lack of trust in potential partners, the fear of infringing competition law and a lack of neutral third-party agencies (or 'trustees') capable of managing the collaboration process. The overall message to emerge from these responses is that raising the current level of logistical collaboration may be difficult and require action, advice and assurances on a number of fronts.

'Alongside collaboration, procurement is key. Logistics service providers may already be prepared to measure and cut emissions. It is only when shippers make decarbonization matter in the procurement process that they are given a clear incentive to do so.'

Moritz Toelke, Smart Freight Centre

CASE STUDY FROM LKW WALTER

This case study is about two customers who contacted us with a similar challenge: reducing CO₂ emissions from international transport within Europe. Both had set clear and ambitious mid-term goals and publicised them in the press. They were under pressure to achieve them. After going through several, unsuccessful projects, they decided to engage an intermodal transport company. They chose LKW Walter, a major European intermodal operator with an excellent record of carbon reduction.

Our intermodal team analysed the problem and proposed several solutions. They have proved quick and clean, able to deliver immediate results and grow with shipment volumes and can be organised our way. The main pillars of success were:

- *Switch from road to intermodal services saving*, depending on the route, over 60 % of CO₂ emissions.
- *Drop trailer systems*, avoiding unnecessary empty mileage. Inflexible slot systems at over-filled warehouses cause much unnecessary empty running in Europe. Logistics planners are often forced to dispatch a consignment to meet a delivery slot but in a way that under-uses the vehicle fleet. The use of drop trailers allows the customer to preload when resources are available (very often in the night) optimising their costs and giving us the flexibility to 'Swap and Drop' (i.e., pick up a full unit and leave an empty one).

- *Load consolidation*, switched from using Standard units to Intermodal Mega-trailers, adding 20% more carrying capacity per shipment.
- *Vehicle fill*: a combination of higher pallets and loose loading of boxes helped to maximise space utilisation (now achieving up to 95% fill).

The resulting carbon savings have been substantial. For example, on a single lane between Germany and Poland with 150 full truck loads per week, 450 kg of CO₂ were saved per shipment. That represents an annual saving of 3.5 million tonnes of CO₂.

On the basis of their experience of the new system one of the two players commented: 'Even if road might be cheaper on occasion, we must work with each other and grow the intermodal network for a cleaner world'. CO₂ reduction is a priority for most companies, so that this success story could apply to many other players in the market. Transforming mindsets may be challenging, but seeing these results motivates us to overcome the hurdles. Consumers also value these environmental improvements and are likely to reward companies that make them.



8 SKILLS REQUIREMENTS

Meeting sustainable logistics targets will require greater managerial knowledge and skill

Improving the environmental sustainability of logistics requires the acquisition of new managerial skills. The fact that many companies' environmental efforts are underway and gathering momentum suggests that they have already built up competences in this field. The survey, however, uncovered a strong desire to increase expertise in the planning and implementation of sustainable logistics. 30% of the respondents rated the need to increase this level of expertise as high or very high, while only 9% felt that there was no need to gain additional skills. They were invited to suggest topics on which skills needed to be enhanced. This elicited 44 responses which we have classified into five major subject areas and ranked by the percentage of mentions they received.

These survey results may help institutions such as universities, training agencies and NGOs specialising in the environmental aspects of logistics to develop curricula for executive programmes in this field.

Methods of improving sustainability (36%)

Under this heading were requests for technical advice on a broad range of subjects including advances in vehicle technology, material handling innovations, switching to non-fossil energy sources, intermodality and recyclable packaging.

Knowledge of sustainability principles and trends (18%)

This helps managers to understand the changing nature and scale of the environmental challenge and to keep abreast of public policy developments.

Measurement and reporting of emissions (17%)

As discussed earlier, only a third of the companies surveyed currently disaggregate their logistics emissions and only a fifth then report these disaggregated figures externally. To raise these percentages in line with the general effort to improve environmental transparency across the supply chain, many managers will require more advice and training. Particular interest was expressed in the calculation of Scope 3 emissions and the ability to compare the carbon intensity of different freight transport modes on a consistent basis.

Environmental change management (16%)

This relates to the behavioural dimension of sustainable logistics, helping managers to motivate colleagues, employees, suppliers and customers to prioritise environmental improvement and secure greater buy-in for green initiatives.

Strategy development (13%)

With 50% of the companies still to develop and implement a sustainable logistics strategy, this is clearly an area in which many managers would benefit from some guidance. Particular questions were highlighted under this heading including how you optimise the balance between commercial and environmental objectives, how you factor sustainability into return on investment (ROI) calculations and how you engage supply chain partners in the strategy development process.

9 EUROPEAN GREEN DEAL

Managers need persuasion that ambitious Green Deal emission targets are achievable

In December 2019, the EU announced its Green Deal to address the problems of environmental degradation and climate change.¹⁶ It incorporated a forecast to reduce CO₂ emissions from transport, both freight and passenger, by 90% over the next 30 years. Although at the time of the survey the European Commission had not yet published its detailed Green Deal plans for the decarbonisation of transport¹⁷, we invited respondents to indicate their level of confidence in the carbon reduction target for freight transport being achieved by 2050. This was done on a numerical scale between 0 and 100. Across the whole sample, a slight majority doubted that it would be achieved, whereas leading companies were significantly more optimistic (Figure 18). LSPs were also significantly more confident that the target will be met than shippers.

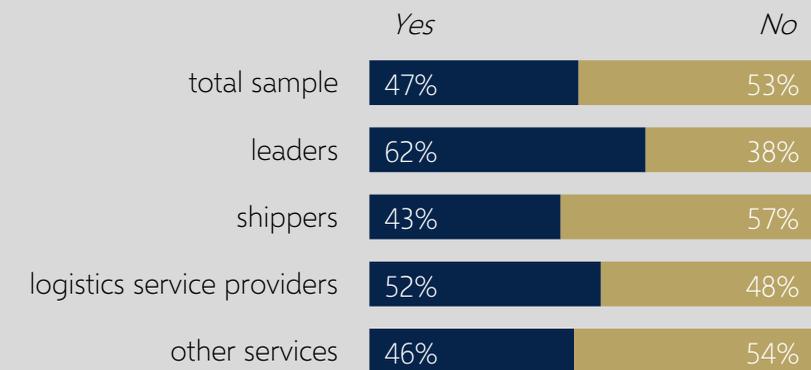


Figure 18: Confidence in Green Deal achieving 90% emission reduction for freight transport by 2050

‘Sustainable logistics, from our perspective, is mostly about system efficiency. This is win-win-win. A win for operators, a win for customers and a win for the environment.’
Annika Kroon, European Commission

The survey probed this subject in greater depth, asking what factors might prevent the EU from meeting its ambitious freight transport CO₂ target. Five main constraints were highlighted. The most important was considered to be a reluctance on the part of EU policy-makers to make changes that are sufficiently radical. To some extent, this might be the result of the second most highly rated constraint, an inadequate level of public funding. Third in importance came the current structure of the European freight market. Under this heading, respondents possibly had in mind the high fragmentation of the European trucking industry and lack of coordination between national rail freight networks. They also felt that there was still a great deal of uncertainty about the decarbonisation pathways that would lead to a near net-zero freight transport system by 2050. This uncertainty is well illustrated by the current debate over the choice of low carbon energy source for long haul trucking, with batteries, hydrogen fuel cells, electrified highways, biogas and synfuels all in contention.¹⁸ The last of the five major constraints is the length of time it takes to restructure logistics systems. This implies that deep decarbonisation of European logistics will

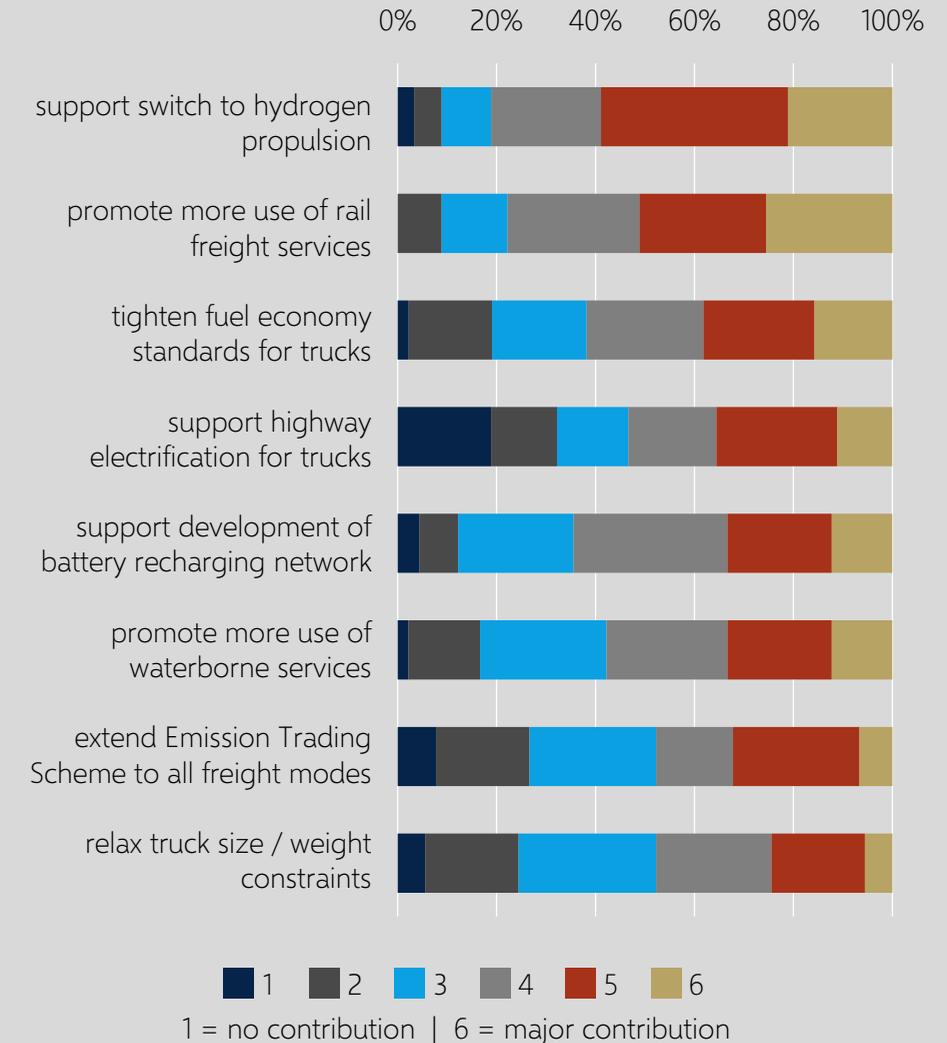


Figure 19: Rating of policy measures by likely effectiveness in cutting logistics CO₂ emissions (% of responses)

require a spatial redistribution of warehousing and terminal capacity which, given the long life of these physical assets, will be a relatively slow process and one that will be difficult for public policy-makers to control. The survey also sought views on the likely effectiveness of a range of other public policy interventions in cutting logistics emissions (Figure 19). Two measures shared the top score, supporting a switch to hydrogen and promoting the use of rail freight services. This is consistent with the EU statement that hydrogen will play a key role in the Green Deal and traditional EU transport policy preference for modal split. Close behind, on a second tier in the ranking, were tightening fuel economy standards for trucks, extending battery recharging networks and promoting a modal shift to waterborne transport. On a third-tier are extending the European Emission Trading Scheme (ETS) to more freight modes, supporting highway electrification for trucks and relaxing truck size or weight constraints. Several respondents also suggested other transport policy initiatives, including greater internalisation of the environmental costs of freight transport, financial incentives for a switch to low carbon vehicles and promoting wider uptake of IT innovations.

CASE STUDY FROM BERTSCHI

Founded in 1956 by Hans Bertschi, this small family business from Dürrenäsch, Switzerland has grown into a leading provider of intermodal transport services for the chemical industry around the world. Bertschi AG remains a family business owned by 2nd and 3rd generation family members with the founder's philosophy still deeply embedded in the culture of the company. It has successfully grown into a business with 3,100 employees in 38 different countries, owning and dispatching over 37,500 chemical containers globally.

Thanks to the environmentally-friendly intermodal transport concept, Bertschi saves over 200,000 tonnes of CO₂ emissions annually by comparison with pure road transport. This is equivalent to the average emissions from driving a car 37,000 times around the world! The environmentally-sustainable transport of products has always played a major role at Bertschi. This focus can be found in many projects in which Bertschi has actively pioneered and promoted intermodal transport.

Developments in Eastern Europe: Since 1989 multiple subsidiaries and offices in Poland, Slovenia, Hungary, Rumania, Bulgaria, Turkey and Russia were integrated into a dense pan-European network, giving Bertschi an asset-based logistics structure with 14 terminals, local management, and intermodal services. The region's huge growth

potential makes it a very important part of Bertschi's business strategy, shifting freight from road transport to the more environmentally-friendly rail mode.

Modal shift to Turkey: In 2018 Bertschi strengthened its business relationship with a leading rail operator to expand the movement of chemicals intermodally to Turkey. Besides the ecological optimization of round-trips, the partnership has also improved equipment availability at loading points in the west.

Bertschi on the Silk Road: The transport connection between China and Europe - also known as the new Silk Road - is being strongly promoted and expanded. The major project initiated by China, called One Belt One Road, will require investment of approximately 1,000 billion US dollars and include the construction of railway lines, roads, ports and power plants. On 26th May 2017, Bertschi pioneered a new Silk Road service with a train of 3,000 tons, loaded with 82 Bertschi ISO-tank containers running from Korla in Western China to Europe. It took only 18 days to move this trainload of chemical products from the plant in China to destinations in Germany and France, combining speed of delivery with eco-efficiency.



10 IMPACT OF COVID-19

Recovery from the pandemic is having a limited impact on companies' logistics decarbonisation plans

How might recovery from the Covid-19 pandemic affect companies' efforts to reduce their logistics emissions? There has been much discussion in recent months about the need to take advantage of the Covid-19 crisis to 'build back greener'. At the height of the lockdown in April / May 2020, CO₂ emissions from freight transport worldwide dropped by around 30%¹⁹, though as the level of economic activity has rebounded so too have logistics emissions. Fears have been expressed that in recovering from the crisis, many companies will prioritise commercial objectives and relax or abandon environmental commitments. The survey results should help to allay these fears because almost 70% of the respondents indicated that the recovery of

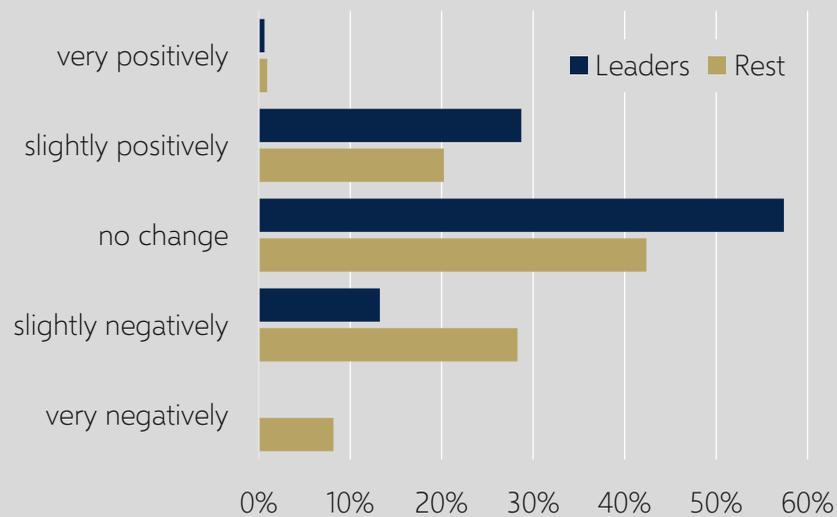


Figure 20: Effect of Covid-19 recovery on CO₂ reduction efforts (% of responses)

their businesses from Covid-19 would either have no impact or a positive effect on logistics decarbonisation efforts. The leading companies were even more optimistic with 87% anticipating no change or a beneficial effect (Figure 20).

Responses to a related question shed light on why many respondents expect the environment to benefit from several trends that the Covid-19 crisis appears to be accelerating. The most highly rated of these trends, with a mean score of almost 5 out of 6, is the digitalisation of logistics, a development already considered by many of the respondents to be on the eve of a major expansion and likely to support decarbonisation (Figure 21). Also highly ranked was a closely related trend, the automation of logistics processes, which for the foreseeable future will probably be associated with materials handling and terminal operations. The pandemic has revealed the vulnerability of labour-intensive logistics activities to disease, no doubt encouraging many businesses to further reduce their dependence on manual labour. In second place was companies giving greater priority to resilience in the management of their supply chains. Previous studies²⁰ have suggested that measures which enhance resilience can also cut emissions. Such measures include the localization of product sourcing, the reshoring of production and the relaxation of just-in-time (JIT) regimes. It is noteworthy that 40% of respondents assigned scores of 4 or more to the likelihood of JIT replenishment being eased, particularly as this has been one of the most enduring and pervasive business paradigms of the past forty years.

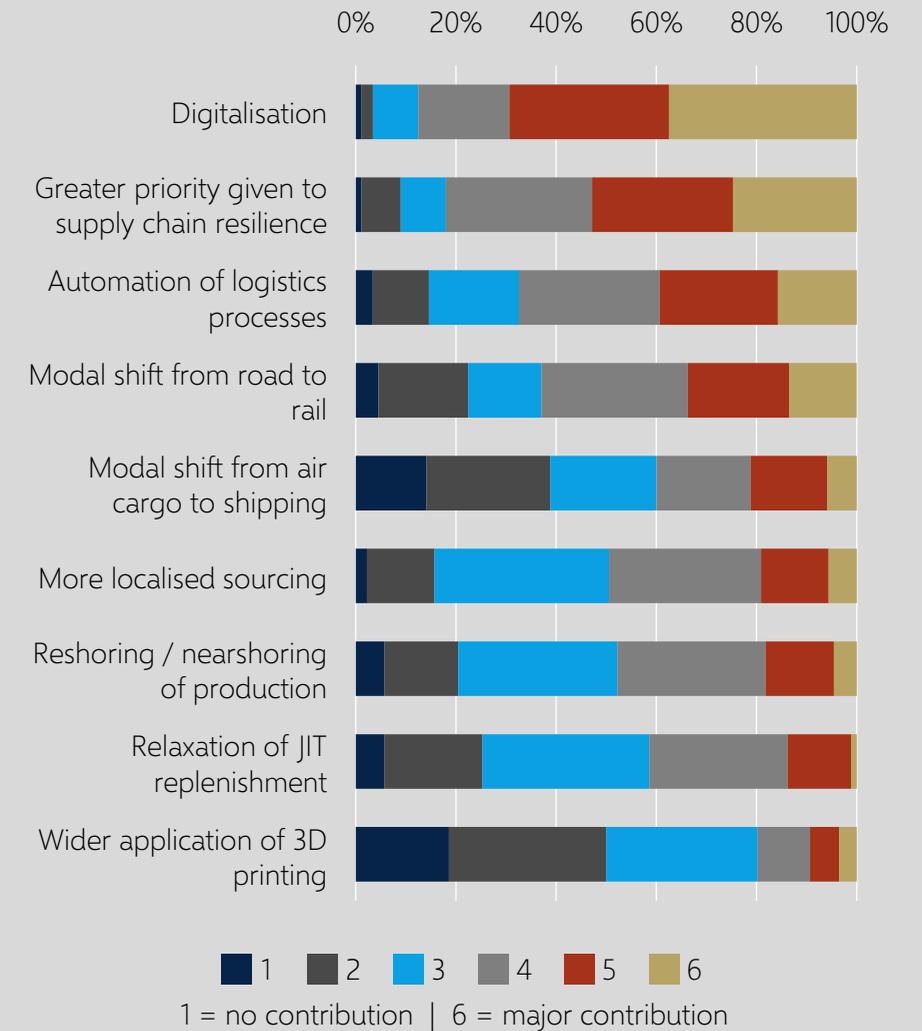


Figure 21: Logistics-related trends likely to be accelerated by Covid-19 crisis (% of responses)

Three-quarters of the respondents were also in this upper bracket in their assessment of the likely impact Covid-19 has on the modal shift to rail. A recurring theme in the survey was high expectation of the prospects for European rail freight services. As these services are generally considered to have performed well during the pandemic, Covid-19 may have helped to boost these prospects. The pandemic may not only catalyse a modal shift from road to rail. Much of the sample also believed that it would promote a displacement of long-haul freight from aviation to shipping, in other words to a mode with an average carbon intensity between 50 and 100 times lower²². The crisis seriously disrupted the global air cargo market. As roughly half of air cargo moves in the bellyholds of passenger aircraft the collapse in passenger air services cut global air freight capacity by around a quarter and it has still not recovered to its pre-Covid-19 level.²¹ The survey responses may reflect a short-term reaction to this disruption of air cargo operations which may not be sustained in the longer-term. Although 3D printing found wider application during the pandemic²³, particularly in the manufacture of medical equipment, it received the lowest average rating as a trend likely to be reinforced by the Covid-19 experience. This partly reflects the composition of the sample because the main uptake of this technology has so far been in sectors, such as aerospace, automotive and health, which were under-represented in the survey.

CASE STUDY FROM SAINT-GOBAIN ISOVER AND TRANSPOREON

This case study illustrates how digitalisation can simultaneously increase operational efficiency, service quality and environmental performance across a large road-based distribution system. It relates to the German distribution operations of Saint-Gobain Isover, Europe's leading manufacturer of mineral wool insulation materials. Around 50,000 trucks a year leave the company's four plants to deliver 5 million cubic metres of insulation material to meet 134,000 customer orders. These vehicles run approximately 21 million kilometres a year in total.

Distributing these construction materials presents several logistical challenges. Demand is highly seasonal and deliveries highly time-critical because even short delays can interrupt work on building sites. Orders arrive at short notice and destinations can be changed at only a few hours' notice. This makes it a very difficult transport operation to plan and execute. Where the pattern of demand is so variable, it is very difficult to maintain a high level of customer service while trying to achieve a high level of vehicle utilisation. Under-utilisation of vehicle capacity results in more truck-kms, fuel consumption and emissions.

In an effort to optimise this trade-off, Saint-Gobain Isover engaged logistics platform provider Transporeon and its Real Time Visibility partner Sixfold to install a Time Slot Management system with extensive tracking-and-tracing of the company's deliveries. This is one of several cloud-based logistics applications that Transporeon

provides for its broad portfolio of shippers, suppliers, retailers and carriers. Saint-Gobain Isover were then able to track 90-95% of all its deliveries to the minute, predicting the precise arrival time in more than 90% of all cases, a best-in-class offering.

In addition to tracking-and-tracing the new system will comprise dynamic slot-time management (slot-swapping based on accurately estimated-time-of-arrival (ETA) data), smart transport assignment and optimised transport execution. This will offer a stream of service and operational benefits. Service quality will be enhanced by more reliable delivery, resulting in fewer fines for late arrival, greater delivery transparency and more accurate ETAs. On the operational side, waiting times, driver interaction time, vehicle idling and empty running will all be reduced while overall vehicle utilisation will be raised. Improved vehicle fill and reduced vehicle idling should significantly cut fuel consumption and CO₂ emissions per tonne of product delivered. The new vehicle monitoring system will also permit the tracking of CO₂ emissions across Saint-Gobain Isover's delivery network, upgrading the company's transport emission analysis and reporting.

TRANSPOREON



RECOMMENDATIONS AND CONCLUSIONS

Adopt best practices in sustainable logistics

The most progressive companies tend to have a number of defining characteristics. They take a strategic view of the environmental sustainability of their logistics operations and recognise that there is a close alignment of economic and environmental goals. Further, they have strong carbon measurement capabilities, set absolute carbon reduction targets, more actively engage in supply chain collaboration and anticipate digitalisation transforming their business to the benefit of the environment over the next five years. They are setting a 'direction of travel' for other companies to follow as the decarbonisation of logistics becomes an ever-greater corporate priority.

Liaise with public policy-makers

Industry stakeholders identified what they consider to be the logistics policy initiatives most likely to deliver the EU Green Deal goals for freight transport. The European Commission needs to work closely with the freight and logistics industry in formulating its Green Deal plans and in trying to overcome the various barriers which respondents reckon may obstruct the implementation of these plans.

Acquire skills in sustainable logistics

Devising and implementing a sustainable logistics strategy requires detailed knowledge of a range of technical, operational, environmental, behavioural and policy issues. Many survey respondents acknowledged that across the industry, this knowledge is currently lacking. There is a need for more training programmes to equip managers with the knowledge, skills and tools that they will require to transition their logistics systems and supply chains to a net-zero world.

Devise a logistics decarbonisation roadmap

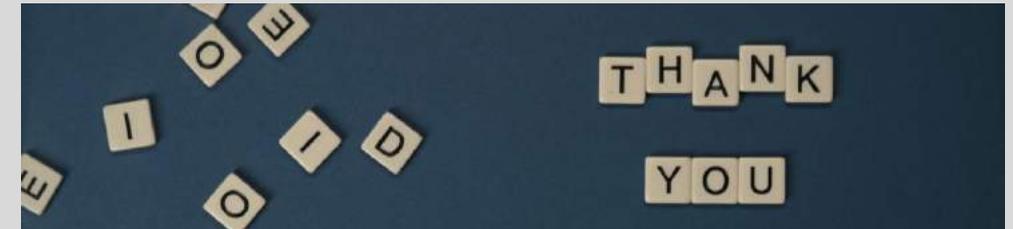
Companies need to phase the deployment of different decarbonisation measures over differing time periods. Switching from fossil fuels to zero-carbon electricity, distributed by batteries, overhead cables and hydrogen, will ultimately be needed to reach carbon neutrality, but this will be a longer-term process. Meeting near-term carbon reduction targets will require a greater emphasis on the initiatives deemed to be the most cost-effective by the respondents, namely freight modal shift and improved vehicle loading, both essentially managerial options. Prioritising operational and behavioural approaches to decarbonisation over the next 5-10 years will reduce the total amount of logistics energy that has to be 'de-fossilised' by the switch to renewables thereafter.

Incentivise logistics and IT service providers

According to the survey, logistics service providers are generally further ahead than shippers in developing and implementing sustainable logistics strategies, measuring emissions and setting carbon reduction targets. This is both understandable and important as they are the specialists to whom the vast majority of European logistics activity is outsourced. They must continue to drive the decarbonisation process and must be incentivised to do so by making the transport procurement policies of the shippers more environmentally-sensitive. There is a particular onus on the providers of rail freight services to respond to the strong industry support, expressed in the survey, for the use of modal shift as a primary means of decarbonisation. There are also high expectations of businesses providing ICT services to the logistics sector to use their platforms and systems in ways that enhance decarbonisation efforts.

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The *Warming Stripes* used in this report represent the annual average temperatures globally from 1850-2019. They were designed by Ed Hawkins (University of Reading) and are used under the CC BY 4.0 license. Create your own stripes under showyourstripes.info.

The photos used are "Aerial Photo of Empty Meandering Road in Between Forest" by Kelly Lacy and "Text" by Tima Miroshnichenko from pexels.com, and "Shipping container pattern" by Guillaume Bolduc from unsplash.com.

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Contact: Prof. Dr. Moritz Petersen, Director CSLS | Großer Grasbrook 17 | 20457 Hamburg, Germany | www.the-klu.org



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Contact: Philip Evans, Secretary General | Avenue Louise 146 | 1050 Brussels, Belgium | www.europeanfreightleaders.eu