

THE SHAPE OF TOMORROW'S SUPPLY CHAINS

The Science of Sustainability



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FOREWORD



Today, sustainability has replaced cost, value and speed as the dominant topic of discussion among purchasing and supply professionals. Companies are waking up to the benefits of a more sustainable approach and the efficiencies it can deliver. However, maintaining an efficient, streamlined supply chain has become increasingly challenging due to rising fuel prices and globalisation.

The Government's ambitious targets for business to make a 60% carbon footprint reduction by 2050 is placing additional pressure on companies striving to meet the demands of customers, while increasing profits and keeping costs down.

In an attempt to unravel the complexities of the sustainable supply chain, Oracle has commissioned a study by The Future Laboratory, looking at how current trends in the development of sustainable supply chains will create new opportunities and business models. The preliminary stage of the study involved a survey of 56 key purchasing and supply directors from major businesses in the UK.

With the survey revealing that a third of UK businesses will focus on sustainability above all other considerations in the coming year, this report also offers key insights into future trends that will impact supply chain professionals and a thought-provoking perspective on how these businesses might address the challenge of the green supply chain.

While it is pleasing to see so many companies adopting strategies to address the issue of sustainability, our report reveals that many businesses are simply 'cherry picking' areas of their supply chain to improve. This is not good enough. Until businesses can understand the environmental impact of every aspect of their extended supply chain, they will be unable to accurately assess their sustainability credentials.

Industry experts involved in this report include, Oracle, The Future Laboratory, Cranfield School of Management, Macquarie Graduate School of Management, Sydney, The Logistics Research Centre at Heriot-Watt University, The European Logistics Users Providers and Enablers Group, The Chartered Institute of Logistics and Transport, The Soil Association and The Sustainable Procurement Task Force.

“It is time to design supply chains from the customer backwards. By building in more flexibility or ‘agility’ in their supply chains, companies will better respond to customer demand.”

Martin Christopher, senior lecturer at Cranfield School of Management

“Companies need to learn from the wider business world and consider the human element of supply.”

John Gattorna, professor of supply chain management at Macquarie Graduate School of Management, Sydney

“The current supply chain model is old-fashioned, restrictive and lacking in innovation. It is time that companies seize the opportunity to reduce costs and increase efficiency by making radical changes to supply chain management through co-operation and collaboration.”

Patrick Dixon, supply chain futurist



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INTRODUCTION

A broken chain that needs fixing

Whether it is a choice made in the design studio, farming methods used in the fields, the treatment of workers in the factory, or the selection of transportation across continents, the supply chain is long and complex and its impact on the environment and the economies and societies it touches is profound.

In a new industry survey and report for Oracle, by consumer insight agency The Future Laboratory, experts encourage the purchasing and supply community to examine the chain more closely.

Considering that 75% of a business' carbon footprint comes from its supply chain – this is an area where the most difference can be made in terms of reducing environmental impact and driving cost efficiencies.

The Future Laboratory report investigates the trends that will impact supply chain professionals addressing this challenge:

Configured to, assembled to order

Future supply chains will be designed from the customer backwards, rather than from the factory outwards. As Martin Christopher, professor of marketing and logistics at Cranfield School of Management says, what customers desire will be on demand and more importantly, made to order.

It is surprising then, that our survey revealed that decision makers in the supply chain currently have little or no interest in wider consumer issues, and place consumer intelligence very low on their 'must know' priorities. Yet this is in spite of the fact that many of the issues currently affecting their ability to make decisions are driven by consumers themselves, according to The Future Laboratory co-founder and report editor Martin Raymond.

Image is everything

Consumers are increasingly concerned about a brand or product's so-called SECH rating (its social, ethical, cultural and health footprint). Along with non-government organisations, consumers are setting the agenda for everything: from organic food purchases and anti-sweatshop labour practices, to the growing trend for buying localised products that can demonstrate their 'good citizen' credentials.

Collaboration

Only by openly sharing data and knowledge will every aspect of the supply chain – from buyer, to haulier, to supplier and their suppliers – be able to drive efficiency. However, many decision makers within the industry see data sharing in terms of risking their competitive edge.

Our experts believe collaboration can extend even further. Why should half-empty trucks pass each other on the way to the same destinations? Why should consumers wait for three trucks to deliver their online orders when one could do the job?

Rigorous measurement and careful analysis

The 56 supply chain and procurement directors polled say they have clear and proactive policies for sustainability. However, promoting sustainability isn't a case of pick and choose, says Mike Bernon, senior lecturer at Cranfield School of Management.

In the future, non-governmental organisations and the media will be smarter in embarrassing companies that mislead the public on sustainability. As a result, their efforts must be supported by rigorous measurement and careful analysis. Technology will play a crucial role, helping companies assess the economic, environmental and social benefits of supply decisions.

The supply chain is complex and sustainability is a broad concept. The profession's policies and reporting mechanisms must reflect this.



RESEARCH FINDINGS

Focus on sustainability

Five years ago, the dominant talk among purchasing and supply professionals was cost, value and speed. Things have changed. Companies are now waking up to the benefits of a more sustainable approach and are beginning to consider the measures required for a sustainable supply chain:

- A third of those polled said they would be focusing on sustainability above all other considerations in the coming year, compared with just 23% who would be prioritising value
- The largest group (36%) thought collaboration would best ensure success, ahead of legislation (32%), technology (13%) and pressure from investors and consumers (11% and 4%)

Shared distribution, reduced waste

Collaboration begins by sharing logistics data. With free-flowing, standards-based data on tap, companies polled said they could better predict wastefulness throughout the supply chain, as well as identify opportunities for joint value creation. There are signs that companies are now experimenting with shared distribution, however:

- Only 7% wanted to consider such an advanced form of collaboration, as others feared a loss of commercial control and reliability by working so closely with other companies and competitors

Regulatory pressure

Pressure is also filtering down from the board, as business leaders realise the risks associated with a supply chain scandal. Cutting the cost of waste and energy from today's inefficient supply chains also makes sound business sense, particularly against a background of rocketing fuel costs.

- Increasing regulation is seen as an important force for change for 64% of those polled, but the entire supply chain and its service partners must all work together to develop solutions

Clear and proactive policies

Major retailers are leading the pack in terms of setting ambitious targets to drive environmental improvement.

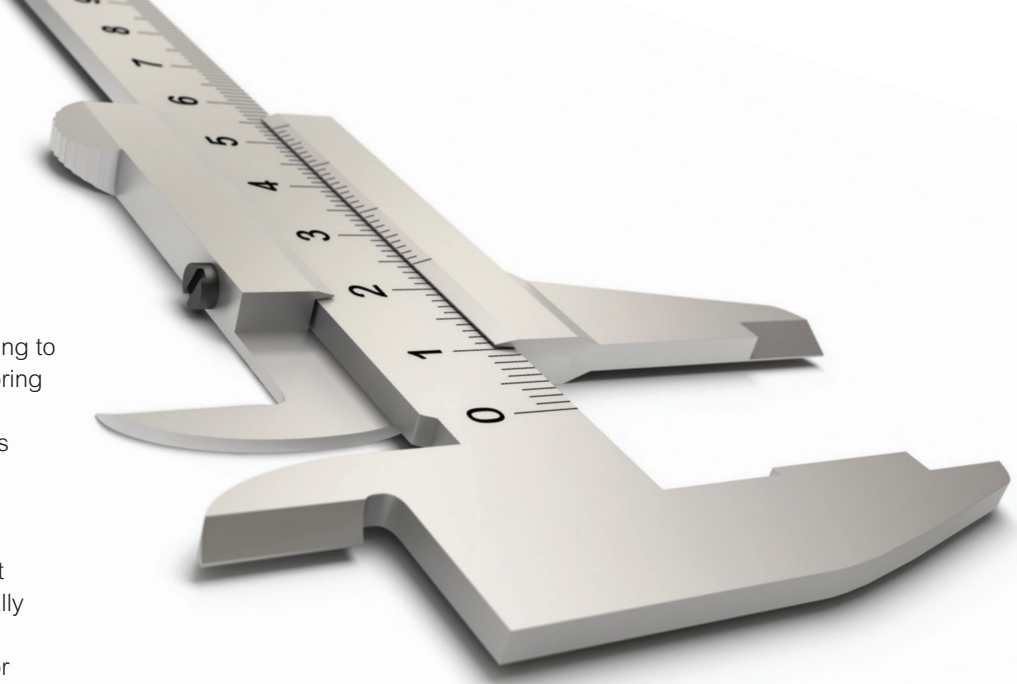
And they are putting the supply chain



at the centre of this effort:

- 75% of retailers polled said their organisation had 'clear and proactive' policies regarding sustainability
- Of these, 62% were benchmarked across all areas including performance in supply chain management and procurement, while the rest were benchmarked across all areas except supply chain management
- Of those who said their company had no proactive policies for sustainability, the lack was particularly noticeable in the area of supply chain management. A small minority said their company had lacklustre policies for sustainability (4%) or placed profit before sustainability (2%)





Failing to measure up

As it stands, companies are struggling to determine their approach for monitoring sustainability in the supply chain:

- As many as 18% of the companies polled had no formal process for measuring sustainability success
- The largest minority approached independent regulators (30%), but others tackled the process internally (20%), relied on software and middleware programmes (21%), or passed responsibility onto suppliers to provide information (11%)

Technology: Enhanced visibility

Technology will provide the crucial link in joining collaborative networks and enhancing visibility across the value chain:

- 48% of those polled wanted predictive software to allow them to calculate the impact of their decision or those of their suppliers
- Meanwhile, 41% expressed interest in smart containers or RFID technology that can provide information about the movement of products, or energy usage through a supply pipeline
- The majority of those polled (61%) expect localised warehousing to become more commonplace over the next five years, as companies shorten supply chains to cut emissions and road usage

What our experts conclude:

- Sustainability is on the agenda for purchasing and supply chain professionals. They understand the business drivers, but they haven't determined how it can be applied across all aspects of their work
- Companies are still limited to measuring the sustainability of their own business operations – and not yet that of their suppliers and customers and consumers of their products
- Supply chains are often old-fashioned, restricted and lacking in innovation. Few companies have full visibility of what suppliers, customers or hauliers are doing, so cannot design waste out of their supply chains
- Collaboration is key to a sustainable supply chain. However, the practice is not yet widespread as many companies fear a loss of commercial control by working closely with competitors

THE SHAPE OF THINGS TO COME

Despite the reticence of supply chain managers and businesses in some areas to embrace the future, as the report indicates, there are a number of clear and viable trends and solutions already emerging.

In the next section, below, our experts consider how these are set to change the way the industry defines its goals and determines its parameters for sustainability.

Carbonomics

Slowgistics

Speed is no longer always of the essence for today's supply chain professionals, with many considering slower forms of logistics as a complement to faster modes. Options considered include the use of slower routes, including coastal shipping, canals and rivers and even airships. Given the rate that congestion is clogging up motorways, these forms of transport might actually compare favourably with road transport.

As purchasing and supply professionals weigh up the benefits of sustainability versus speed, experts predict a move towards slower forms of freight transport. Britain's canals are already enjoying a revival and coastal shipping could take some of the load from roads. And if current developments are successful, airships could also present another option for sustainable freight transport.

A more sustainable freight transport sector will be characterised by increased use of canals and airships that ship goods in environmentally friendly, lighter-than-air blimps. Another more controversial option is longer, heavier vehicles, or super trucks that carry more goods per truck to increase overall efficiency of lorries.

Adrian Dickinson, innovations director at DHL Logistics, would like to see the introduction of airships, or transport blimps that could move heavy goods across the country.

"Transport blimps cruise at a low altitude to avoid interference with other aircraft and, as they require little ground infrastructure, they could link easily to other transport modes." With the way road congestion is heading, Dickinson argues that "even if these blimps moved at 50mph, they could compare favourably

with speeds of HGVs on the motorway."

Technology will play an important role in helping companies plan the transportation mix. Tools will provide visibility so companies can regulate the slow, regular rhythm of boats from China or barges along the waterways, alongside the rapid response by air, rail or by road.



"Inland waterways currently account for only 0.6% of all freight in the UK, but could offer massive savings in energy efficiency, generating only around 30g-40g of CO2 per tonne-km, compared to more than 138g per tonne-km for HGVs and 867g for long haul airfreight."

'CO2 Emissions from Freight Transport in the UK, 2007 report'. Alan McKinnon, director of the Logistics Research Centre at Heriot-Watt University

What's happening now?

Californian aircraft manufacturing company Aeros is currently developing the Aeroscraft ML866, a lighter-than-air blimp with more than 465 square metres of floor space that could be used to transport freight.

The ship canals between Liverpool and Manchester have seen a revival in recent years. Last October, Tesco started to use barges to transport wine along this route. As a result it has taken 50 lorries off the roads every week and reduced carbon emissions by around 80% along those routes.

Statistics:

- The big ticket in terms of reducing emissions in distribution will come from rail, with almost two-thirds (59%) of respondents expecting a greater use of railways for freight transport in the future.
- Further options considered include use of coastal shipping (by 27% of those polled); canals and rivers (16%); and even airships (21%).

THE SHAPE OF THINGS TO COME

The carbon economy

The push towards this greener, more ethical approach to supply management is driven partly by current or potential regulation. Carbon trading is set to become a reality for more businesses and carbon taxes are on their way. But pressure is also coming from consumers. The public would rather buy goods and services from companies with good ethical reputations and they would prefer to work for them.

What's happening now?

The Waste Electrical and Electronic Equipment (WEEE) directive and Restriction of Use of Hazardous Substances (ROHS) directive are two examples of new rulings for environmental management in the supply chain.



What's happening now?

Outdoorwear supplier, Patagonia, has taken a multimedia approach to educating customers about the environmental impact of products through the supply chain. Its mini website, loaded with photos, videos, facts and figures, leads users through the complexities and ambiguities of sustainable supply chain management and encourages debate through an open forum. Facts are also on tap about how many boxes are recycled at its distribution centre, the total energy used for each product, as well as its CO2 emissions, distance travelled and waste created.

Nestlé has been reported to dispute the very basis of the carbon footprint [ClimateChangeCorp.com, 9 April 2008, Supply chain reporting: Pandora's box of emissions?]. Focusing on one single environmental aspect such as the carbon footprint, without considering others, such as water use, can be misleading, said a Nestlé spokesperson.

Statistic:

- Just under half of those surveyed (48%) wanted predictive software to allow them to calculate the impact of their decision or those of their suppliers and customers.

Unravelling complexity in a never-ending chain

Measuring the environmental impact of what we buy is not a straight-forward proposal.

A hybrid-electric car may have a low environmental impact once it is on the road, but what is the ecological impact of making not one but two (petrol and electric) engines?

And how far should the measurement extend? For a potato you can measure the fertiliser in the soil. But what about the energy used to make those fertilisers? What about how the potato is cooked once it is purchased? As Edgar Blanco, executive director at the MIT Centre for Transportation and Logistics points out, "companies could be counting processes in a never-ending chain. What about emissions produced making the machines that farm the crop?"

The often-quoted example to illustrate this comes from the 2007 Cranfield University report for Sainsbury's, that found it was six times more carbon efficient to fly roses in from Kenya than to ship them from Holland where they are grown in heated greenhouses.

Supply chains are long and complex, the naysayers said. Measuring everything from the fertilisers in the soil and the machinery in the production line, to delivery to stores and emissions from landfill, would be too complicated, too costly and far too time-consuming.



"If a company is offshoring in China, Chinese pollution also becomes its problem."

Alan Waller, vice-president for supply chain innovation at the consultancy Solving International and chairman of the European Logistics Users Providers and Enablers Group



A consistent set of standards

There is a growing number of standards available for sustainability reporting. The guidelines from the Global Reporting Initiative are becoming the most common framework for reporting not just environmental but also economic and social sustainability. And in 2010 the International Standardization Organization will publish its own standard for social responsibility: ISO 26000.

Once the British Standards Institute has completed its specification for the measurement of carbon throughout the lifecycle of products and services, carbon labels will begin to appear on a wider range of products and services.

The Carbon Disclosure Project (CDP), a collaboration between institutional investors that asks the world's largest companies to report on their direct emissions, is spreading its reach by asking companies listed on London's FTSE 350, New York's Standard & Poor's 500 and other global stock indices to send carbon disclosure questionnaires to their suppliers. CDP is using the supply chain as a tool to spread environmental sustainability across the globe. In China, where energy is cheap, there is less economic pressure to increase energy efficiency. But as CDP has outlined, if suppliers are scrutinised by their purchasers they will feel under pressure to report on and produce lower emissions.

"As more products are counted and as more understand the concept of embedded carbon, there will be more options available to assess and monitor performance. Watchdog magazines and websites could rank the environmental

"Without global agreement, companies will struggle to compare carbon data. There needs to be ground rules and consistent standards in place."

Alan McKinnon, director of the Logistics Research Centre at Heriot-Watt University

performance of products for consumers. And financial and investment houses will continue to benchmark performance via services such as the Dow Jones Sustainability Indexes," claims Mike Bernon, senior lecturer at Cranfield School of Management.

"There is a role for the accounting profession to create a set of clear and transparent rules for everyone to abide by. Technology will no doubt play a part in collecting the data, but at the moment we are missing the framework to put the data into," said Adrian Dickinson, innovations director at DHL Logistics.

"There's certainly a need to measure, but with a plethora of organisations coming up with different approaches, we need to make sure what we measure is relevant."

Steve Agg, chief executive at the Chartered Institute of Logistics and Transport



What's happening now?

Companies including Dell, HP, Cadbury Schweppes, Imperial Tobacco, Nestlé, PepsiCo and their suppliers are currently trialling carbon disclosure questionnaires as part of the Carbon Disclosure Project - a collaboration between institutional investors that asks the world's largest companies to report on their direct emissions.

Major retailers are leading the pack in terms of setting ambitious targets to drive environmental improvement. And they are putting the supply chain at the centre of this effort. In January 2007, Marks & Spencer launched Plan A – its 100-point, £200m (€253m, \$397m) eco-plan to become carbon neutral, send no waste to landfill and promote sustainable and ethical sourcing.

Statistics:

- Unfortunately, companies' aspirations are a step ahead of results. Three-quarters of those polled (75%) in our survey said their organisation had 'clear and proactive' policies regarding sustainability. Of these, 62% were benchmarked across all areas, including performance in supply chain management and procurement.
- Technology is not a barrier to success, with only 5% stating they do not have the tools required to help them measure progress. What does concern 18% of respondents, however, is a lack of standardisation for benchmarking success.

THE SHAPE OF THINGS TO COME

Micro-Facturing

Printing products at home

New and cheaper rapid prototype printers that are designed for the home are set to appear over the coming five years, and these will allow people to literally print products in the comfort of their own home.

Lasers and sintering tools inside these 'fabricators' or printers, either weave or cut out products at rapid speeds, and by using a programme downloaded from the net, or a product spec, allow the user to produce a range of synthetic products that are useable and recyclable.

Domestic or local bureau versions of these printers are set to hit the market over the next five years. Home shopping will literally be that – with products being manufactured in our homes, or in the local 'print' shop, rather than delivered to our doors. Other brands are simply using technology and the latest design solutions, along with lightweight materials to reduce the weight of their products, or to make them more ergonomic for storing, in order to reduce their overall use of energy.

“Long term, many brands are already experimenting with new and more efficient ways of delivery on value, and doing so closer to the home. Current rapid prototyping is a very new way of making concept models in the car, household furniture and design industries.”

Martin Raymond, co-founder, The Future Laboratory



Growing produce in transit

Yet another idea being explored by Dutch research student Agata Jaworska, is to use the time, space and relative temperature differences associated with transportation to grow fresh produce.

In one study, Jaworska analysed the supply chain of a mushroom and designed biodegradable packaging that uses the darkness and heat of the truck to spore and grow oyster mushrooms which arrive fully grown at the point of delivery.

What's happening now?

A growing number of shipping and freight companies are now looking at this idea as a serious option to supplying our tables with ultra fresh, low carbon impact foodstuffs. Brands like UPS, DHL, FedEx-Kinkos and the shipping company Maersk, are all becoming involved in the production of goods of varying kinds in transit.

Postponement:

Reversal of factory consolidation

Currently, most supply chains are designed from the factory outwards. Organisations focus on how to get the most efficiencies from their manufacturing plants by producing things in large batches, less often and in a smaller number of factories.

But this structure no longer suits today's fast moving, demand-driven, highly competitive and unpredictable market. It is time to design supply chains from the customer backwards.

One solution that will accelerate in its use will be what is known as postponement. Here organisations source components and materials from cheaper markets overseas. When they complete the manufacture of products closer to the final market.

What's happening now?

Bang & Olufsen, the Danish luxury TV and sound system maker, assembles and packages final goods in a separate production plant. This way, it can configure products to customers' specific demands for features, colour and size without having to build large stocks of configurations that may not be used. Inventory is reduced and response time improved.

“The cost of making things has never been as low and it is getting lower. But the cost of moving things has never been as high and it is getting higher. It no longer makes sense to move things [long distances], but it might make sense to make them in more places.”

Martin Christopher, senior lecturer at Cranfield School of Management



THE SHAPE OF THINGS TO COME

Collaborative distribution networks

Supply chain orchestrators

In the quest for collaborative supply chain management, this new business model brings companies together via a supply chain orchestrator. Rather than making products of its own, it oversees everything from product development and the sourcing of raw materials, to production planning and management, and shipping. This asset-light, but information-rich management company can spot problems quicker and shift activity to different elements of the supply chain even faster. It will know where there are empty trucks and where loads need to be picked up; where there are better opportunities for supply, and how to make routes more efficient.



What's happening now?
One example of a supply chain orchestrator is Hong Kong-based trading company Li & Fung. It aggregates customer requirements from major brands and then disperses these among thousands of suppliers in China and further afield. As a result of its greater volumes and access to such a large supply network, it achieves enhanced visibility and dramatic improvements in efficiency.

Local supply chain networks

In the quest to bring sustainability into the supply chain, innovation will come from a range of sources. Real progress, it seems, will be achieved through a collaborative approach. By bringing companies in a network closer together, they can better share information to improve visibility as well as provide an assurance of performance up and down the chain.

Innovation does not always have to be led by big business. Small farmers in Wales are making their mark by rethinking their supply chains against a backdrop of climate change and rises in the cost of transportation.



What's happening now?
Peter Segger has been promoting sustainability at his farm near Lampeter in west Wales for decades. The produce is organic and the farm is self-sufficient, regenerating all of its materials and fuel.
But a few years ago it became clear to Segger that sustainability efforts were being undermined if his produce was being shipped by oil-hungry trucks to supermarkets' central distribution centres across the country.
As a result, Segger and his partner Ann Evans turned their back on the supermarket distribution network, to sell 100% of their produce within Wales.
One quarter goes to their farm shop, one quarter to a shop in Lampeter, and half with his children to farmers' markets in Wales. "We are making more money, we are happier and it has changed our production," says Segger. "Instead of producing vast quantities of lettuces every year for the supermarkets, we now produce 60 types of vegetables in much smaller quantities."

Data sharing and distributed networks - Kimberly-Clark

Whether it is via cross-sector monitoring systems to track carbon emissions in real time, or software that allows standards-based data to be shared free of charge in order to improve the efficiency of networks, tomorrow's supply chains will be characterised by free-flowing information and collaborative networking.

"There is some evidence that collaboration and data sharing are already taking waste out of the supply chain," suggests Martin Christopher, professor of marketing and logistics at Cranfield School of Management. "10 years ago major supermarket groups such as Tesco would have never contemplated sharing point-of-sale data with suppliers. Now they do it readily over the internet. As a result, suppliers are able to see what is moving off the shelves and they are in a much better position now to replenish automatically." Only by openly sharing data and knowledge will every aspect of the supply chain – from buyer, to haulier, to supplier and their suppliers – be able to drive efficiency. But again, the views of our experts are contrary to those held by decision-makers within the industry, many of whom see data sharing in terms of risking their competitive edge. Of the 56 purchasing and supply chain professionals surveyed, only 7% wanted to consider

such an advanced form of collaboration. Others feared a loss of commercial control and reliability by working so close with other companies or competitors.

"In the future, it is value chains that will compete rather than individual firms," said Barbara Morton, director at Action Sustainability and Sustainable Procurement Ltd in her recommendations to the UK Government in 2006.

"At the corporate level there has been a huge change in mindset over the past year as companies have started to realise that they can actually have sustainability and make money. And if they do it right, that this could even be an opportunity to become more competitive."

John Gattorna, professor of supply chain management at Macquarie Graduate School of Management, Sydney



Virtual bazaars

Another form of collaboration could be through virtual marketplaces, where companies with niche offerings come together to sell their wares. By gathering in online marketplaces, suppliers achieve not only efficiencies, but also access to wider markets.

Web-based tools are already providing a useful way to group, channel and personalise products according to consumer demand.

Online auction site eBay uses the web's connectivity to direct potential buyers to sellers, while web retailer Amazon uses tools such as its recommendations service to channel demand according to web users' tastes or purchasing patterns.

Virtual marketplaces could also fuel innovation. Rather than specify exactly what the product should look like, buyers could set limits on emissions, or what temperature a building must achieve. "By focusing on an outcome rather than a specification, the market can respond through innovation.

"At the moment, smaller suppliers with innovative and sustainable solutions are finding it difficult to penetrate markets. By gathering in online marketplaces, suppliers achieve not only efficiencies but access to much wider markets."

Barbara Morton, director at Action Sustainability and Sustainable Procurement Ltd

What's happening now?
For Kimberly-Clark, the collaborative effort has begun by sharing warehouses and distribution networks with other suppliers. As a result of its work with Unilever and Reckitt Benckiser, it has increased deliveries to retailers without increasing carbon emissions through transportation. Kimberly-Clark has increased its number of weekly deliveries from one to three; reduced inventory in stores by 60% and out-of-stocks by 30%; and improved truck utilisation. According to Peter Surtees, director of consumer logistics at Kimberly Clark Europe, "The solution may look more expensive, but with collaboration the costs are the same."
For P&G, improving the efficiency of its supply chain began five years ago, when it overhauled its distribution operation. For Proctor & Gamble, aligning operations is a matter of sharing information such as shipment data or joint forecasting data.

Statistics:

- The majority (36%) of respondents in our poll say collaboration is the main driver for improving the efficiency of supply chains, ahead of legislation (32%), technology (13%) and pressure from investors and consumers (11% and 4%)
- Just under a third (30%) in our survey said they would focus on sharing logistics data to collectively reduce the environmental footprint in a supply chain
- Just over a quarter of heavy goods vehicles run empty every year in the UK (Source: Department for Transport 2007 Transport Trends.)

3 TIERS OF SUSTAINABILITY

Our research has uncovered future trends in the supply chain and highlighted the crucial need for sustainable efforts to be backed-up by stringent analysis and measurement. Currently, success can be broadly measured according to three tiers:

1. Getting the basics right

The majority of businesses are currently at this stage. Getting the basics right involves reducing daily carbon inefficiencies within the business, such as switching lights and PCs off when left idle, recycling paper and using more sustainable, greener forms of travel. The introduction of these simple measures to quickly reduce inefficiency and cut waste will have a limited impact on a business' carbon footprint.

2. Learning to think sustainability

Companies are beginning to realise the need to embed sustainability into supply chain operations. This can only be achieved when companies assess their impact across a wide range of operations. On the supply chain side this includes supplier management, product design, manufacturing and distribution optimisation.

3. The science of sustainability

Given the current climate, businesses must strive to reach this stage by starting to measure and record now. This is especially true given the emergence of regulations and standards – driven at both an industry and governmental level. Auditing and benchmarks provide a framework governing sustainable supply chain operations and enable clarity around the environmental impact of specific actions or tweaks to the supply chain network.

The role of Oracle technology

Maintaining a sustainable, streamlined supply chain is no mean feat, as this report highlights. However, the technology already exists to address many of the key challenges and trends identified. Historically, business applications focused on internal automation. However, Oracle's supply chain solution now extends automation beyond enterprise boundaries to include trading and distribution partners. This enables organisations to conduct business with multiple trading partners from a common transaction platform and successfully adopt collaborative operations, highlighted in the report as a key emerging practice within sustainable supply chains. The technology also allows companies to share real-time information with suppliers such as designs, forecasts, capacities and deliveries - enabling businesses to efficiently respond to dynamic market conditions. Although tightly integrated, Oracle's supply chain solution is interoperable with bespoke and third-party systems. Therefore, companies can implement modules based upon business priorities. For example, companies can start with Oracle's e-business procurement solution and then add a manufacturing or fulfilment solution in the future. Likewise, partners, suppliers and distributors can easily share information, leading to a collaborative exchange of information throughout the supply chain.

In order to outpace the competition and make sound supply chain decisions, companies need access to metrics that represent real-time functional performance. Oracle's supply chain solution features pre-configured, role-based information portals which use pre-determined key performance indicators and multi-dimensional analysis tools. Only with access to accurate, real-time information can businesses improve visibility, provide an assurance of performance up and down their supply chain, and implement lean, demand driven principles to ensure their increasingly complex, global supply chains are sustainable.



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