Collaboration, innovation, transformation

Ideas and inspiration to accelerate sustainable growth - A value chain approach

wbcsd consumption & value chain

About this document

Over the next few decades, businesses will face many challenges related to the environmental sustainability of their value chains (i.e. the full life cycle of a product or service) – whether it's meeting new environmental regulations, securing enough water, energy or other resources for their daily operations, or managing the needs and expectations of their stakeholders.

Meeting today's challenges, while at the same time planning for future needs, is difficult. That's why the World Business Council for Sustainable Development (WBCSD) has developed this guide.

The guide is designed as a practical "how-to" tool, providing both ideas and inspiration to help businesses improve the environmental sustainability of their value chains. Using a practical step-by-step approach, it outlines the concrete actions businesses can take today to become more environmentally sustainable, along with examples from WBCSD member companies that have already successfully adopted a Sustainable Value Chain approach.

The guide was developed by the WBCSD's Sustainable Value Chain Workstream, with leadership from Unilever and The Coca-Cola Company. It includes case studies from AkzoNobel, The Coca-Cola Company, Henkel, Philips, Procter & Gamble, SABIC, Solvay, Sompo Japan Insurance, TNT, Umicore and Unilever.

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Message from the Co-Chairs

"Working together to establish sustainable value chains benefits everyone."

The world is facing social and environmental challenges of a magnitude we have never seen. According to the WBCSD Vision 2050, we need to almost double agricultural output and increase resource efficiency up to tenfold, in order to keep up with the demands of our growing population. At the same time, we need to dramatically reduce carbon dioxide emissions, conserve water and minimize waste, in order to protect our fragile ecosystem from the threat of climate change. This will help preserve our natural resources for generations to come.

These are challenges that impact all of us – governments, businesses, nongovernmental organizations and consumers alike. That's why it's essential that we work together to assess and solve the environmental and social issues we face – transforming the way we produce and consume products and services – and in doing so, improving the sustainability of our value chains.

For businesses, this means better understanding the environmental impacts of products and services throughout their life cycles. It also means identifying "hot spots," the intervention points within the value chain that have the greatest potential to improve the environmental impact of the system as a whole. In many cases, this means finding new ways of working with suppliers, industry groups, customers and consumers at different points in the value chain.

As the case studies in this guide demonstrate, assessing and improving the sustainability of value chains makes great business sense for everyone. And one of the critical keys to success is collaboration across companies, sectors and geographies.

We hope that this guide will help both small and large companies embark on, or further improve, initiatives that make their value chains more sustainable. Through our collective actions, we also hope that we continue to progress toward the WBCSD Vision 2050 that "nine billion people will live well, and within the limits of the planet."

Paul Polman
CEO, Unilever

Bea Perez
Chief Sustainability Officer,
The Coca-Cola Company

Sustainable value chains deliver business benefits

The main objective of this guide is to help companies improve the environmental sustainability of their value chains efficiently and effectively.

Defining the terms

Value chains are an integral part of strategic planning for many businesses today. A value chain refers to the full life cycle of a product or process, including material sourcing, production, consumption and disposal/recycling processes.

Environmental sustainability is about using natural resources in a way that doesn't threaten future generations' ability to use those resources.

A ***sustainable value chain approach*** enables both business and society to better understand and address the environmental challenges associated with the life cycle of products and services.

What's in it for business?

A more sustainable value chain can provide numerous advantages to businesses, including:

- Fueling top-line growth and productivity.
- Assuring continuity of supply.
- Creating new markets.
- Adding value to customers and consumers.
- Optimizing energy consumption.
- Reducing waste.

In addition, the case studies featured in this guide demonstrate some of the many benefits companies have achieved by creating a more sustainable value chain including:

Creating competitive advantage: By improving the sustainability of their value chains, companies create competitive advantages in different ways; new product lines addressing market needs; improved reputation and increased brand value; better efficiency and thus lower costs; and new business models focusing on value (i.e. services instead of products). The Philips, TNT and AkzoNobel cases show that there is consumer/customer demand for sustainability.

Advancing innovation: The only way to create and speed up sustainable innovation is to collaborate openly and actively with a large number of organizations. For example, the Philips case study shows how collaboration is generating new business models. In addition, the Procter & Gamble case study demonstrates how the company made a series of innovations in order to increase the sustainability of a single, simple product.

Creating shared value: By changing their business models, exploring new market segments and enhancing credibility and trust in the market, companies can create shared value for both themselves and their communities. For example, the Procter & Gamble case study illustrates how innovation can create benefits along the entire value chain; both consumers and companies use less resources and save money.

Enhancing stakeholder relationships: By collaborating to achieve a common goal, companies can build stronger, trusted and lasting relationships with contributors along their value chains, including business partners, customers, consumers, nongovernmental organizations, authorities or other stakeholders. For example, through sustainability initiatives, Philips, SABIC, Umicore and TNT have considerably reinforced their relationships with customers. In addition, Coca-Cola and Unilever have created a strong partnership with Greenpeace – which has traditionally kept its distance from businesses – based on a shared interest in sustainable refrigeration. At the same time, Procter & Gamble has built an unusual relationship with competitors to drive change in washing habits.

Managing risk: Failing to consider risks such as resource scarcity, strong regulations (including product bans), or consumers shifting away from some products, may have a significant impact on a company's long-term performance. The examples of Solvay and Henkel demonstrate how companies are looking at new tools to evaluate a risk that is currently difficult to measure.

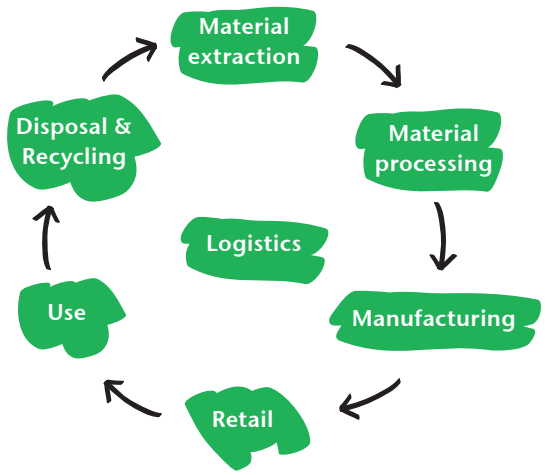
Creating systemic change: By working collaboratively across industries that share similar interests, as well as in partnership with NGOs and government organizations, leading businesses can change the dynamic of an entire industry sector. Not only can they demonstrate what is possible, they also can accelerate changes in both technology and business practices. The example of Procter & Gamble describes how a group of companies and stakeholders are driving change in the whole detergent value chain and consumers' washing habits. Similarly, Coca-Cola and Unilever are actively contributing to transform the refrigeration process globally.

A step-by-step framework to develop a sustainable value chain

The framework below outlines the specific steps businesses can take to develop a sustainable value chain. It's based on a standardized model of the value chain, which includes six different phases, from raw materials, to production, to end-of-life and recycling (see Figure 1).

While this model works well in most cases, it may need to be adjusted for some business sectors, in particular for service companies.

Figure 1:
A standardized model of the sustainable value chain



A five-step approach

The framework includes five steps, which are similar to the steps used in project management:

1. ***Assessment:*** enables companies to understand necessary improvements or "hot spots" and identify relevant actions.
2. ***Identification of solution:*** examines potential solutions and selects the best solution for implementation.
3. ***Development of project plan:*** identifies all the necessary actors, and plans each step of the project in detail.
4. ***Implementation:*** activates the plan.
5. ***Assessment of results:*** measures the success of the plan, and enables the company to determine how to make improvements, as needed.

Each step of the framework is important because it enables businesses to identify and implement improvements to the sustainability of their value chains in a systematic way. In addition, each helps to answer the questions listed in Figure 2 below.

Figure 2:
Key questions addressed by the five-step approach

1. Initial assessment

- What is the environmental issue?
- Why should it be addressed?
- Who are the affected parties?
- What are the potential solutions?
- What impacts are most prominent?

2. Identification of solution

- What is the most sustainable solution?
- What have the affected parties to say about it?
- What is the impact on production?

3. Development of project plan

- How will the selected solution be implemented?
- Are all actors on board?

4. Implementation

- Is the implementation going as planned?
- Are adjustments necessary?
- Are all partners satisfied with the progress?

5. Assessment of results

- Did the solution successfully address the environmental issue?
- What went right/wrong?
- What can be learned from it?
- What impact did it have on the company?

A detailed look at each step of the model

Step	Activities	Tips
1 Initial Assessment	• Determine problem and/or opportunity. • Conduct a Life Cycle Assessment to identify focus areas (“hot spots”). • Identify external drivers (e.g., market supply-demand balance, consumer needs, public pressure, regulations, and competitors). • Map relevant organizational aspects (e.g., capabilities, resources, existing processes, company corporate social responsibility and overall strategy). • Identify actors in the value chain and other affected stakeholders. • Brainstorm potential solutions.	• Use external expertise if needed, and incorporate this into your own solutions and experience. • Continuously improve Life Cycle Assessments-build on what you have, and look for improvements. • Focus on the “hot spots” rather than try to address all the issues at once. • Look for relevant partners beyond the company, and even the value chain.

2 Identification of Solution	• For each of the potential solutions assess:
	  • Financial, technical and operational feasibility.
	  • Value-add of new product or service.
	  • Alignment with corporate strategy and company’s core competencies.
	  • Business model required.
	  • Risk and opportunities.
	• Involve appropriate actors and stakeholders in the assessment.
	• Select preferred solution.
		When selecting the preferred solution:
		• Consider the information gathered in the initial assessment (i.e., Life Cycle Assessment results, drivers, organizational aspects, and participants and stakeholders).
		• Keep customer/consumer requirements in mind.
		• Reflect on how to manage collaboration with participants and stakeholders.
		• Consider requirements for training and maintenance when working with new technologies.
		• Consider potential complications with regulations that may vary across markets.

Step	Activities	Tips
3 Development of Project Plan	• Develop a detailed project plan to design, develop and implement the selected solution, including clear objectives, measurable targets, actions, milestones, timelines and resource allocation. • Formalize support from top management. • Assess the need for collaboration to drive scope and scale, and to ensure cost competitiveness. • Obtain commitment from partners, and agree on scope, objective and timelines.	• To avoid problems down the road, ensure that partners' expectations are aligned with the project objectives, and that their expected contributions are clearly set in advance. • Aim big, to reach economies of scale and minimize cost.
4 Implementation	• Assemble team and create/modify internal structures. • Collaborate with partners. • Systematically undertake planned actions to design, develop and implement selected solution. • Manage internal and external communications. • Regularly monitor performance and progress toward set objectives to identify and execute opportunities for improvement.	• Stick to your project plan, but also have a long-term view and stay flexible, to address unexpected problems, and seize opportunities. • Strengthen the relationship and foster open and honest communication with partners and other stakeholders. • Learn from the initiative and your partners to build expertise within your company.
5 Assessment of results	• Assess the results in terms of their impact on the company, partners and other stakeholders, and the overall sustainability of the value chain. • Identify key success factors and lessons learned to be considered in other initiatives. • Communicate results internally and externally.	• Improve the company's license to operate, the informal approval granted by the community in which you conduct business, by showcasing your successes. • Raise customer/consumer understanding of sustainable solutions. • Strengthen internal buy-in for sustainability-related initiatives.

Critical success factors

The successful implementation of a sustainable value chain is dependent on many factors, particularly the following five:

1. Leveraging the power of collaboration.
2. Understanding customer and consumer needs, and proactively encouraging them to make new choices.
3. Identifying "hot spots" to focus on the changes that will have the greatest impact.
4. Ensuring healthy supply/demand in order to reach economies of scale.
5. Committing to the initiative.

Each of these is explored in more detail in the section below.

1. Leveraging the power of collaboration

Global issues such as climate change, water stress or waste management are highly complex; therefore it's impossible for one company, or even a single industry, to achieve substantial progress on its own. The most effective solutions involve collaboration among businesses, nongovernmental organizations, policy makers and other stakeholders.

At the same time, working with different partners, who have varying motivations, organizational cultures and requirements, can prove challenging. That's why it's essential to maintain open communication from the very beginning.

The following three tips can help ensure any collaboration sets the stage clearly at the start, and continues smoothly throughout the partnership.

a. Reach a common understanding

At the beginning of any partnership, it's important that all partners share a common understanding and approach to their collaborative initiatives. This includes:

- Possessing the same vision and understanding of sustainability.
- Trusting each other enough to align agendas and opinions.
- Committing to long-term engagement and collaboration.
- Sharing knowledge and required information with the proper competitive safeguards as necessary.
- Providing sufficient resources, along with an enthusiastic, committed contact person.

If expectations are not clarified and/or not realistic, companies may not meet stakeholder expectations. This, in turn, could generate negative comments or activism from influential nongovernmental organizations, and could diminish customer/consumer support.

Featured case studies: Philips, AkzoNobel

b. Expect a diverse value chain

Value chains differ from industry to industry and company to company. They may include suppliers, distributors, customers and other businesses, as well as consumers. In addition, as diverse partners participate in a given initiative, behaviors may change, and markets may move accordingly.

Different organizations also have different organizational cultures. For example, private businesses, nongovernmental organizations and public authorities all have different priorities, timeframes and approaches to tackling issues. In addition, even within the same organization, these cultures may vary by geographic region. For instance, regulations, standards and other national or local requirements may differ across markets, with some markets providing limited, if any, incentive to adopt environmentally friendly solutions.

For all these reasons, it is essential to carefully consider cultural and geographic differences, and accommodate these as part of your project plan. If you can do this successfully, it can help minimize potential delays, while avoiding uncomfortable situations.

Featured case studies: Unilever/Coca-Cola, P&G

c. Reflect on how to work with competitors

When companies in the same industry work together, they can leverage their respective knowledge and experience, and reach a wider pool of consumers and customers. Industry collaboration also sends a powerful message to stakeholders and generates a greater impact on the environment.

However, when collaborating with companies who are direct competitors, it is essential that governments, other stakeholders or even members of the companies themselves don't perceive this behavior as anti-competitive. Therefore, great care must be taken to ensure that collaborative ventures do not breach any rules or codes of competition, and that each company is clearly committing to the project or initiative on an individual basis.

In some cases, this may require involving an independent third party, or widening the diversity among partners, to ensure that companies can work closely together and share information as appropriate, without either losing a competitive advantage, or compromising competitive codes.

When working with competitors, companies must ensure that they always comply with the relevant rules or codes of competition.

2. Understanding customer and consumer needs and proactively encouraging them to make new choices

Engaging with customers and understanding changes in consumer behavior can provide companies with valuable information as they develop new sustainable solutions-particularly in formulating the value proposition of these new solutions.

This involves understanding the key drivers behind customer and consumer needs, in order to develop solutions that appeal to them. Although some customers or consumers may be especially interested in "green" or environmentally sustainable solutions without any other extra benefits, it also is important to develop products and solutions that simultaneously meet other customer and consumer needs, such as added performance, value and sustainability.

In addition, encouraging consumers to try new products and services may sometimes either require fundamental changes in consumption habits, or involve a price premium. In these cases – as well as any time a company introduces new sustainable products and services – it's essential to develop a comprehensive communications strategy that proactively encourages them to make new choices. The right communications strategy can help a company effectively create awareness and clearly communicate the benefits of a new product or service – both for consumers and customers, as well as for the environment.

This, in turn, involves developing clear messages, being honest about the impact and benefits of new solutions, and using the right communications channels to encourage customers to purchase the new solutions. At the same time, it's important to remember that creating a more environmentally sustainable product – even if it meets customer or consumer needs very well – won't make every company the industry leader.

Companies should be honest about their solution's overall sustainability impact. Clearly defining and communicating the benefits of new environmentally sustainable solutions is critical. This is particularly important when the success of the new product or solution requires consumers or customers to change their consumption patterns or habits, or pay a premium price.

Featured case studies: Solvay, P&G

3. Identifying "hot spots"

Life Cycle Assessments enable companies to assess the environmental impacts generated during every phase of the life of a given product or service. They also allow companies to identify "hot spots," the areas of improvement within the value chain that are likely to yield the greatest environmental benefit. This, in turn, enables companies to make informed decisions, and prioritize potential changes in their value chains.

Preparing a Life Cycle Assessment often involves the cooperation of many partners, so it uses the most reliable data along every step of the value chain. It is therefore important that all parties involved understand the objective, scope and timelines of the study-both to ensure consistency and accuracy in the information they provide, and to reduce potential delays.

Using an independent, external third-party organization to conduct a Life Cycle Assessment can ensure that any sensitive information is not disclosed to the different contributors involved in the analysis, such as competitors or suppliers. An external third party can also provide an independent opinion about the environmental benefits of a given product or solution. This provides added credibility and reassurance for stakeholders when the company eventually brings the product or solution to market.

In many of the case studies featured in this guide, a Life Cycle Assessment has contributed to promoting Life Cycle thinking inside the organization by showing its impact on a wide range of business activities.

Consistent, reliable information from Life Cycle Assessments can help companies make informed decisions about the benefits of a new initiative, product or service - and make changes that create the greatest possible impact.

Featured case studies: Umicore, SABIC, Henkel, Solvay

4. Ensuring healthy supply/ demand in order to reach economies of scale

As the case studies in this guide demonstrate, sustainable value chains can successfully compete with traditional, and often less expensive, value chains, as long as companies are able to create economies of scale. This, in turn, involves creating a healthy balance between supply and demand.

In many cases, creating a more sustainable value chain requires developing or incorporating new technology, increasing research and development costs, or creating marketing campaigns or training programs – all of which impact a company's bottom line. It's therefore imperative that companies ensure that there is sufficient demand for a proposed product or service, so they don't incur a financial loss.

It is important that companies ensure there will be sufficient demand for any new products or services before investing in changes to their value chains. This is particularly true when these changes involve increasing investments in research and development, new technology, marketing and promotion.

Featured case studies: AkzoNobel, SABIC

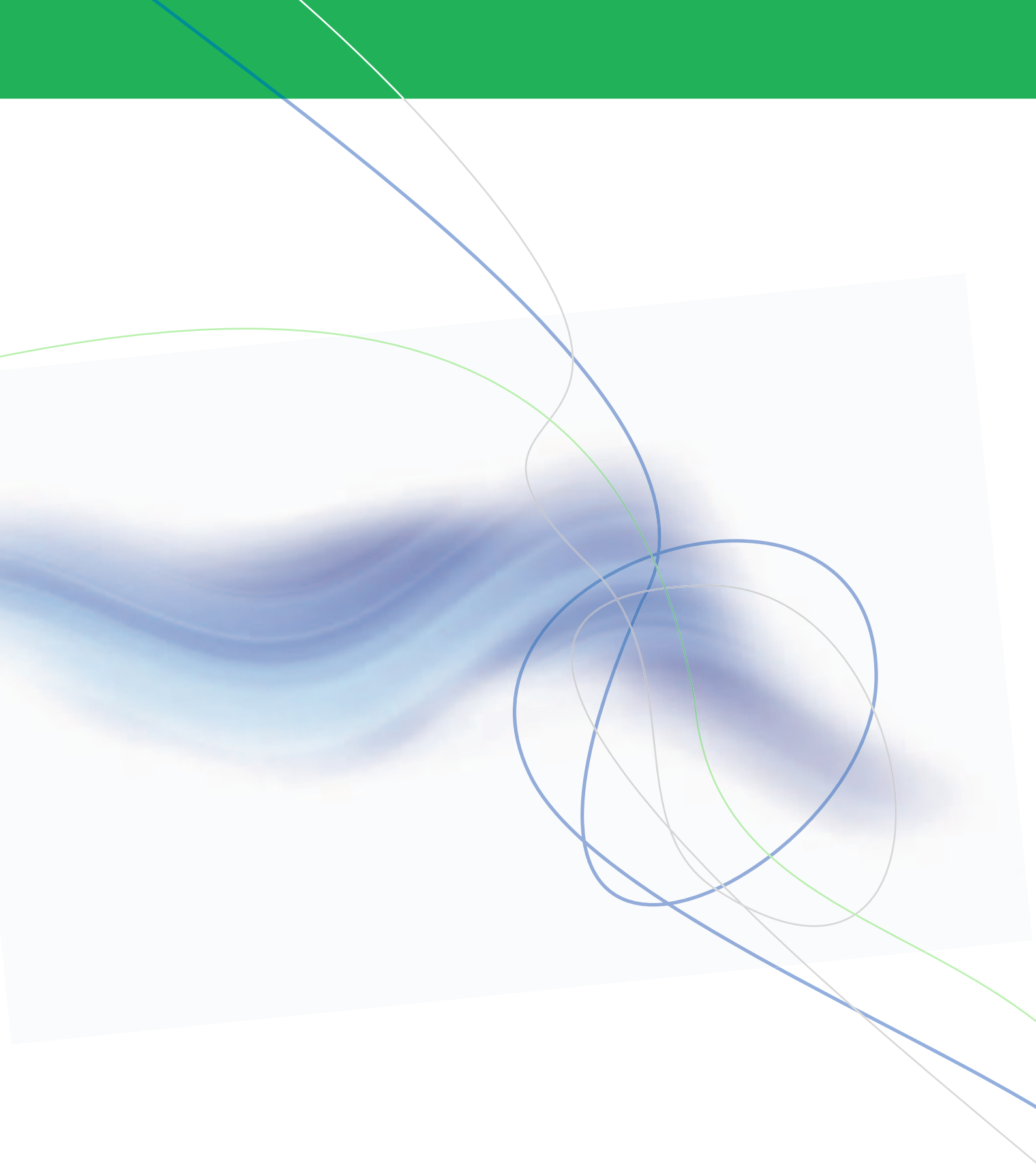
5. Committing to the initiative

Obtaining top management commitment will ensure that the project is supported internally, and that the appropriate amount of time and resources are allocated accordingly. To obtain this commitment, it is vital to develop a comprehensive business case that clearly outlines the value proposition.

Making this commitment public via a business case also sends a clear signal to all value chain participants, increasing their trust, and making them more comfortable to embark on the initiative.

Obtaining commitment upfront is essential in order to achieve buy-in, both within and outside the organization. Failure to do this could lead to criticism on behalf of influential parties, while diminishing customer/consumer support.

Featured case studies: Coca-Cola/Unilever, Sompo Japan



Case studies

Each of the 10 case studies featured in this guide demonstrate a particular aspect of the step-by-step approach to creating a sustainable value chain. They exemplify how companies have grappled with specific issues, and have either improved, or are in the process of improving, the sustainability of their value chains. Although each case is relevant on its own, the combination of these cases, and the overall perspective they provide on the different aspects of the value chain, are particularly significant when presented together. Finally, it's important to recognize that each of these case studies, although presented by a single, or in some cases multiple companies, have involved substantial collaboration among partners-serving as tangible examples of the importance of working together, in order to achieve maximum benefits.

- **Solvay** – Managing a sustainable portfolio of businesses
- **Umicore** – Making the case for hybrid electric vehicles
- **AkzoNobel** – Developing future-proof supply chains
- **Philips** – Selling sustainable lighting
- **Henkel** – Improving the triple bottom line profile of product portfolios
- **Procter & Gamble** – Cold water laundry
- **TNT** – Collaborating with customers to develop innovative city logistics solutions
- **The Coca-Cola Company and Unilever** – Working together to reduce the environmental impact of refrigerants
- **Sompo Japan Insurance** – Disseminating green procurement practices through the value chain
- **SABIC** – Environmental innovation in plastics upcycling

Managing a sustainable portfolio of businesses

Summary:

This case study illustrates how sustainable portfolios can be managed through a strategic tool, focusing on both environmental footprint of manufacturing and market alignment of products and applications to sustainable megatrends, providing a holistic assessment.

In order to anticipate and prepare for the transformations needed to achieve a more sustainable growth and a greener economy, Solvay has developed a Sustainable Portfolio Management mapping tool, which aims to assess risks and opportunities associated with sustainability issues, not only the impact of the manufacturing activities, but also the extent to which Solvay's products are part of the solutions consumers are seeking to address their own sustainability concerns. The tool takes a holistic approach, combining both product vulnerability and market alignment.

The vulnerability of Solvay's products is measured through Life Cycle Assessments, performed from cradle to gate and in conformity with standards from the International Organization for Standardization (ISO). All parameters in product ecoprofiles are monetized to assess the potential financial risk associated with a product, and to prioritize resource allocation to resolve any potential problems. This value is then expressed as a share of the sales price. The higher the ratio, the more exposed and vulnerable the product is to sustainability issues.

Market alignment is measured through a set of closed questions,

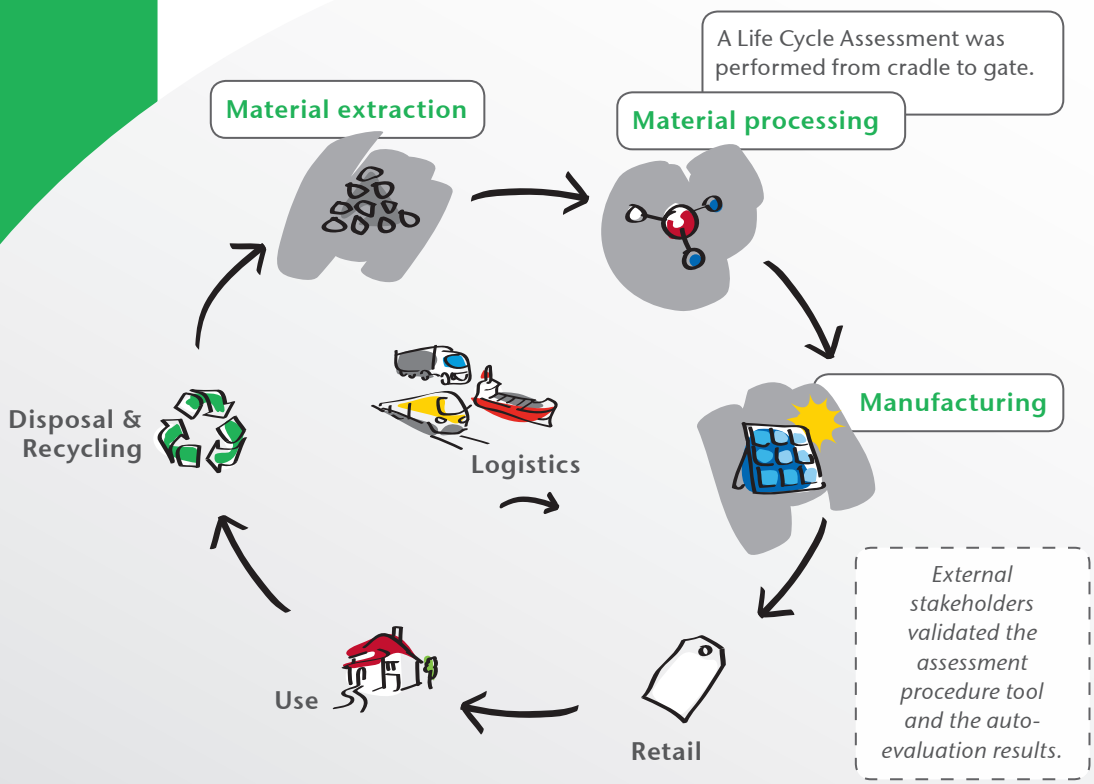


Figure: The SVC phases involved

to which answers have to be based on facts and supported by external and reliable evidence. The objective is to:

1. Assess the benefits end consumers may ultimately find by buying a particular solution.
2. Check whether Solvay is among the leaders in providing products that are part of this solution.
3. Check if obstacles exist that may significantly decrease the attractiveness of these products.

In order to increase the reliability of data generated by Business Unit auto-evaluations, Solvay has asked two external consultancies for a second opinion; TNO revises the environmental footprint of operations, and Arthur D. Little verifies the alignment to the megatrends.

The rollout of the Sustainable Portfolio Management tool has been successful. 275 product-application combinations have been assessed, accounting for more than 80 percent of company revenue. More than 100 research and development projects also have been assessed to an extent of almost 70 percent corporate research and development budget.

The Sustainable Portfolio Management tool has delivered its objective; to visualize what sustainable development means for Solvay in strategic terms, so that awareness of sustainability issues is firmly embedded. At Solvay, sustainable development and resource efficiency are now among the leading criteria for decision taking.

Risks, opportunities, challenges and key success factors

Opportunities

- Establish a clear understanding of what sustainability means for the company, in business terms.
- Monetization of sustainability aspects.
- Creation of a powerful management tool for resource efficiency.

Challenges

- Share the same understanding of sustainable development.
- Conciliate agendas and opinions.
- Transcend generally accepted ideas about sustainability.

Risks

- Failure in attempts to tackle sustainable development from a business-driven point of view.

Key success factors

- Identify and understand the instruments that may affect the supply-demand balance, and translate these into clear, precise questions.
- Focus on external, authoritative, sources of information.
- Be consistent, rigorous, systematic, and learn through action.
- Top-down approach, with full support and endorsement of top management.

Lessons learned

- **It is crucial to identify objectives and keep a long-term view, while at the same time being flexible enough to address unexpected issues.**
- **Be honest, and recognize that not all businesses will necessarily emerge as front-runners in solutions consumers seek to solve/ address their sustainability issues.**

Link

www.solvay.com/EN/Sustainability1/OurAmbition/Productportfolio.aspx

"Solvay's Sustainable Portfolio Management approach received a "Highly Recommended" award in EFQM's Sustainability Good Practice Competition. The Jury recognized that this tool represents a paradigm shift in the way organizations consider sustainability as part of their strategic planning process and the potential for this tool to be adapted and applied in other organizations and sectors."

Matt Fisher, COO, EFQM

Making the case for hybrid electric vehicles

Summary:

This case study shows how a Life Cycle Assessment, commissioned by Umicore and Toyota, has clarified the environmental benefits of the hybrid electric Toyota Prius and its batteries, promoted Life Cycle thinking, and further advanced sustainability.

Government incentives and high oil prices during the 2008 economic crisis significantly increased public interest in hybrid electric vehicles. So did misunderstandings and inaccurate information about the environmental impact of hybrid electric vehicles and their batteries. As a result, Umicore, together with Toyota, the Oeko-Institute, and the Nickel Institute embarked on performing a Life Cycle Assessment, to provide the market with clear and proven information about this issue.

The Life Cycle Assessment, conducted by Oeko-Institute, was twofold. Firstly, the assessment compared the environmental impact of combustion vehicles with that of hybrid electric vehicles, using the Toyota Prius and a conventional car of the same size as benchmarks. Secondly, the assessment compared the environmental impact of recycled batteries with that of non-recycled ones; in particular using Nickel Metal Hybrid batteries, used in Toyota's Prius II. The Life Cycle Assessment included the production, use, and end-of-life phases.

The Life Cycle Assessment concluded that in the use phase, the environmental impact of the Prius is significantly less than that of the conventional car; mainly

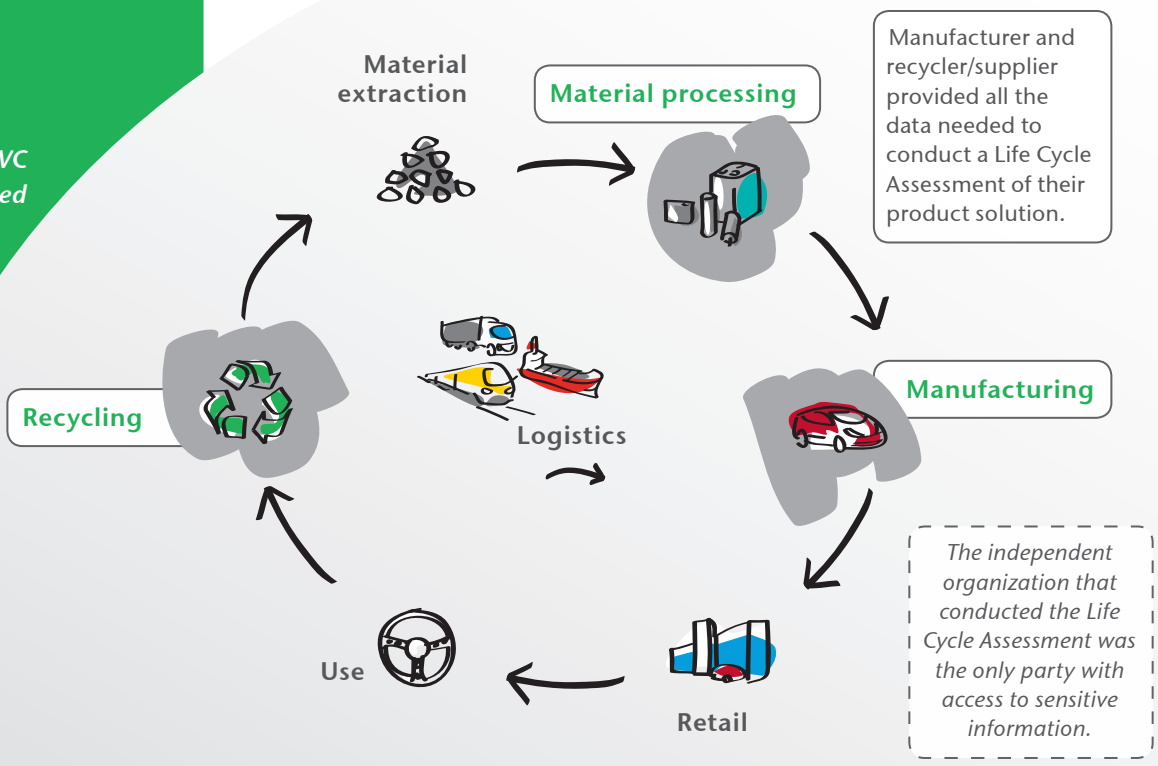


Figure: The SVC phases involved

due to the Prius' lower energy requirements, and related lower global warming contribution. The difference in the environmental impact between the use of a recycled battery and the use of a non-recycled one was found to be immaterial when compared with the overall positive, environmental impact of the use of the vehicle.

In the end-of-life phase, a recycled battery has less environmental impact than a non-recycled one. The recycling of batteries does not significantly reduce the impact in terms of Global Warming Potential (GWP measures the ability of a greenhouse gas to trap heat in the atmosphere), but it does in terms of acidification potential and eutrophication, resulting from the nickel beneficiation and primary extraction. There is also less depletion of scarce resources, such as nickel and cobalt.

The study contributed to the acceptance of electric vehicles, showing the benefits of hybrid driving, and the added benefits of the environmentally sound recycling of Nickel Metal Hydride (Ni-MH) batteries. The results have not only strengthened Umicore's position as a battery recycler among battery collection schemes and the automotive industry, but has also promoted Life Cycle thinking and sustainability at the company. Toyota shared the results of the study with its customers during the promotion of the new Prius, and reinforced its position in the market.

Opportunities, risks, challenges and key success factors

Opportunities

- For all partners, opportunities included promoting the inclusion of nickel in batteries, the use of rechargeable batteries, recycling of batteries and hybrid driving.
- For Umicore, opportunities included gaining credibility and trust as a recycler from business customers, especially those interested in ensuring that batteries are properly treated and recycled.

Challenges

- Collecting all required data to conduct Life Cycle Assessments.

Risks

- Having reduced availability, consistency and reliability of inventory data to conduct Life Cycle Assessments.
- Potential that the study had concluded that hybrid electric vehicles and the recycling of batteries were not the best environmental option. Involved companies would thus have had to modify their products and services.

Key success factors

- Oeko-Institut was the only party with access to all the sensitive information collected from the companies. Involving Oeko-Institut, and not having direct competitors involved, ensured that companies collaborated, communicated openly, and disclosed all required information.

Lessons learned

- **All partners should understand the scope and boundaries of a study, to ensure consistency in the information provided for the Life Cycle Assessment, and to reduce potential time delays.**
- **Umicore's Life Cycle Assessment in- house expertise was not yet structured. This experience helped convince business units that a central competence center was necessary.**

Link

www.batteryrecycling.umicore.com

> *"The cooperation between Umicore and Toyota demonstrates the sustainable approach both companies are taking to meet the highest environmental and safety standards and social expectations, and to be fully in line with the EU Commission's 'Roadmap to a Resource Efficient Europe.'"*
>
> *Willy Tomboy, Director/Environment Officer, Environmental Affairs & Corporate Citizenship Group, Toyota Motor Europe*

Developing future-proof supply chains

Summary:

This case highlights AkzoNobel's strategic approach toward further improving the environmental profile of its value chains. Achieving economies of scale through strong alliances is a crucial step in making sustainable value chains competitive, compared to conventional production processes.

Reducing the carbon profile of its supply chains is one of AkzoNobel's major challenges. In fact, approximately 45 percent of the company's cradle-to-grave carbon footprint is attributed to emissions generated in its upstream processes, which the company can control only in close cooperation with its suppliers (and, in turn, their suppliers).

Keen to be at the forefront of the move toward a more resource efficient economy, AkzoNobel conceptualized a strategic initiative – the "AkzoNobel approach to supply-chain sustainability." This approach pursues two major goals; introducing sustainable product solutions, and reducing the ecological footprint of the company. It works along two lines in parallel; reduction of carbon footprints in existing chains, and introduction of new chains, with improved eco-footprints.

The key challenge facing AkzoNobel is that new and more environmentally friendly supply chains might not be able to compete with less sustainable ones, unless they achieve

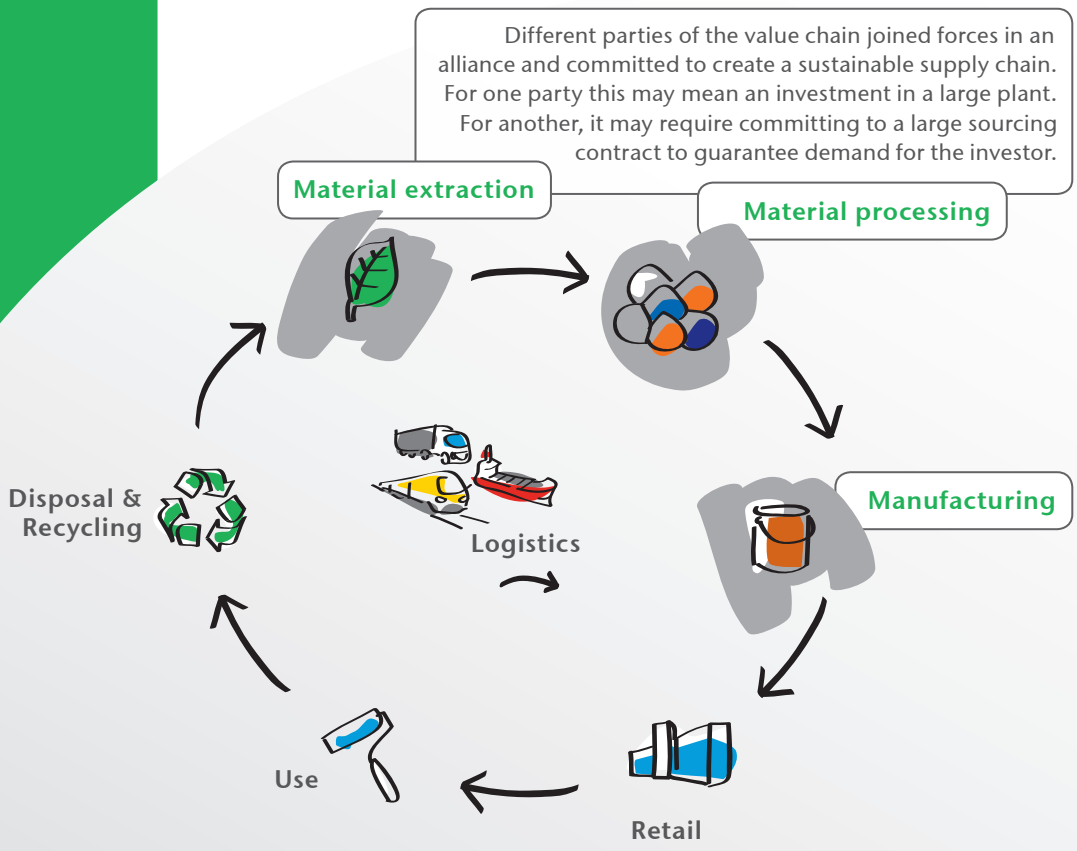


Figure: The SVC phases involved

economies of scale. Offering environmentally friendly features in a product is not enough to reach the customer mass required to achieve a financially viable product. The offer has to be made at reasonable prices, and deliver the same level of quality for the end-consumer.

AkzoNobel is working on several projects to develop new supply chains, most of them focusing on greenhouse gas reduction. Due to the high investment required by these projects, AkzoNobel is building supply chain alliances, involving suppliers and customers who believe in sustainability to create alternative solutions capable of competing in current market conditions.

AkzoNobel has set specific goals for its supply chain initiative. By 2015, a 10 percent reduction of cradle-to-gate carbon intensity, and a 30 percent share increase of eco-premium products have to be realized. By 2020, AkzoNobel plans to achieve an additional 20-25 percent reduction in carbon intensity (all figures with base year 2009). If successful, AkzoNobel will not only achieve significant improvement in its corporate environmental profile, but also take a competitive advantage by offering efficient, sustainable products at reasonable prices.

AkzoNobel also expects that all stakeholders involved will gain from this initiative, turning it into a "win-win" solution. By securing AkzoNobel purchasing, suppliers will be able to make important facility investments, and reach the necessary scale to compete within the current market. AkzoNobel's customers will be able to develop and offer competitive new products with improved environmental profiles due to better efficiency and/or green labels. Society and environment will benefit from a decrease in carbon intensity along the value chain.

Opportunities, risks, challenges and key success factors

Opportunities

- Competitive advantages.
- Stronger relations with business partners.

Challenges

- Realizing economies of scale - scaling up sustainable production / sustainable value chains, in order to be cheap and efficient enough to successfully compete with conventional value chains.
- Find the right partners, and align their perspectives while outcome of the initiative is unclear, and trade regulations have to be observed.

Risks

- Compliance with codes of competition has to be maintained.
- Financial risks due to initial investments in sustainable processes and research and development.
- Technical feasibility of solutions.
- Insufficient internal support / support of partners.

Key success factors

- Find the right people within partner companies, willing to support the initiative.
- Operational feasibility of the strategic approach.

Lessons learned

- **Involve the right people at the right level in the partner companies.**

Link

www.akzonobel.com/sustainability

"The 'Invisible Hand' will take (too) long to overcome ingrained practices in our supply chains – we may need to actively guide it."

Peter Nieuwenhuizen, Director, Future Proof Supply Chains, AkzoNobel

PHILIPS
sense and simplicity

Selling sustainable lighting

Summary:

This case study shows how lighting can be made more sustainable through the offer of a service-based approach instead of a product-level one, making it a ”win-win” situation for both provider and customer.

In 2010, the Dutch architect Thomas Rau approached Philips with the idea of engaging a full-service provider of sustainable lighting for his new office building.

Together with Thomas Rau, Philips created a new business model, the “Pay per Lux” approach in which the company provides state of the art lighting installations, including LED and dynamic lighting to enhance the well-being and productivity of RAU Architects’ employees. Philips retains ownership of the lighting systems and all additional lighting services including replacement and recycling of old light fixtures. Energy data is collected by energy meters, allowing for optimization of energy consumption.

For Philips, the project is an example of an innovative business model that further fosters sustainability. Thanks to its knowledge of lighting, particularly its physiological and psychological effects, Philips is able to make workplaces more comfortable. As a full-service provider, Philips intensifies its relation with the customer, thus receiving quicker and comprehensive feedback, to identify and deliver improvement to the customer and to enable

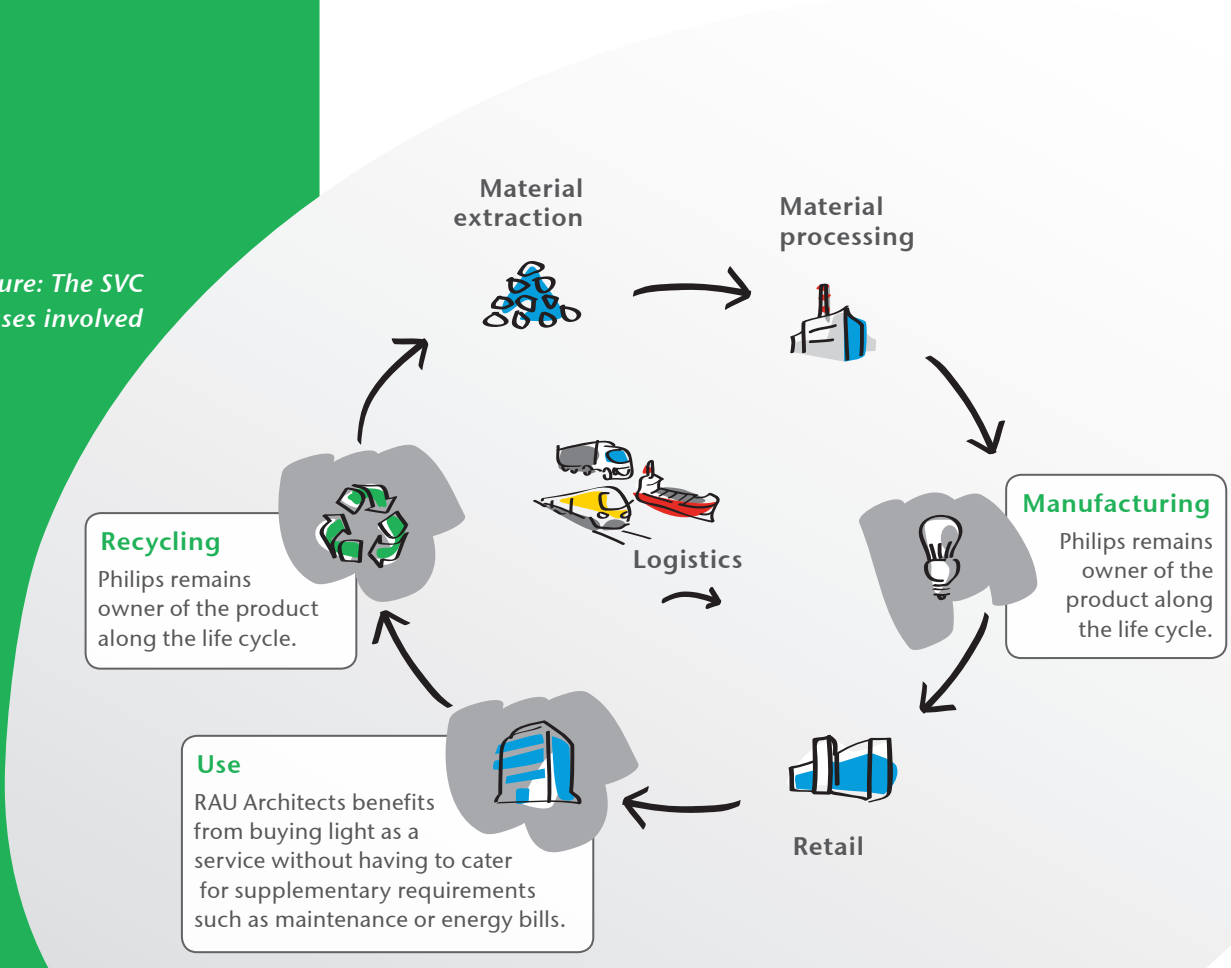


Figure: The SVC phases involved

faster overall innovation processes. By offering highly efficient LED-lighting systems, substantial energy savings can be realized. And finally, in closing the material loop by retaining ownership of the products in use, Philips develops integrated strategies for material disposal or recycling.

The "Pay per Lux" approach is currently in its trial phase. So far, it has proved to be a "win-win" situation for both RAU Architects and Philips. RAU Architects deals now with one partner providing lighting performance, instead of multiple service providers who cannot address its lighting needs as a whole. Thanks to Philips' know-how, RAU Architects was able to implement a lighting concept perfectly adapted to its office building, while ensuring employee well-being and satisfaction with their work environment.

By using sustainable innovation as a driver for lighting provision, Philips was able to explore a new type of service that met RAU Architects' needs and broaden Philips' knowledge of potential business models for lighting. This new model is also well aligned with Philips' commitment to its EcoVision5 and associated sustainability leadership key performance indicators: bringing care to people, improving energy efficiency of products and closing the materials loop. In particular, the focus on the end of the life cycle has helped Philips to further understand sustainability as a holistic challenge, and contribute to the identification of economically viable solutions.

Opportunities, risks, challenges and key success factors

Opportunities

- Develop deep customer relationships.
- New service model with continuous stream of income instead of one-time payment.

Challenges

- Develop new business structures to support the new service model.
- Address legal issues (e.g., ownership of light bulbs).
- Close the material loop by developing new business opportunities for the disposed products.

Risks

- Change of business model – from selling products to selling services – requiring new expertise (e.g., legal requirements).

Key success factors

- RAU Architects shared Philips' vision of people, social and environmental responsibility.
- Long-term commitment by both parties.
- Trust and close relationship with RAU Architects.

Lessons learned

- **Trust is important – a certain amount of transparency is necessary.**
- **A certain degree of diversity is needed to be able to work together without putting competitiveness at risk.**
- **Enlarge the pie before you cut it – first identify the sources of value creation, then undertake discussions on margins split.**

Link

www.lighting.philips.com

> *"At RAU we are interested in adequate lighting in the office, not in actual possession of the lighting products themselves. With the 'Pay per Lux' concept developed with Philips, the speed of innovation is greater and could make the use of environment-friendly products considerably cheaper. This concept is a very new, sustainable way to think about lighting solutions and use of light."*
>
> *Thomas Rau, Architect*

Improving the triple bottom line profile of product portfolios

Summary:

This case describes how Henkel's "Sustainability#Master" tool helps to assess the sustainability profile of product and process innovations across the entire value chain, covering the environmental, social and economic dimensions.

Many products and solutions are linked to singular environmental or social benefits, without clear quantification or consideration of potentially harmful side effects or trade-offs. Sustainability strengths and weaknesses often are not assessed systematically, because of lack of expertise, limited data, or complexity of existing tools.

As a response to this challenge, Henkel developed the Sustainability#Master – an assessment tool based on information generated through life cycle assessments. The tool evaluates products and processes in three dimensions; environmental protection, social progress, and economical success. It quantifies the impacts of a proposed product or process along the value chain, presents a holistic picture of its sustainability strengths and weaknesses, and helps to assess whether the proposed product or process is overall more or less sustainable than its predecessor. The tool aims to answer a simple question; will the new product or process lead to more sustainable consumption?

The Sustainability#Master has already been used for several products, including Henkel's MiraFoil, an effect lacquer for packaging, labeling, and other

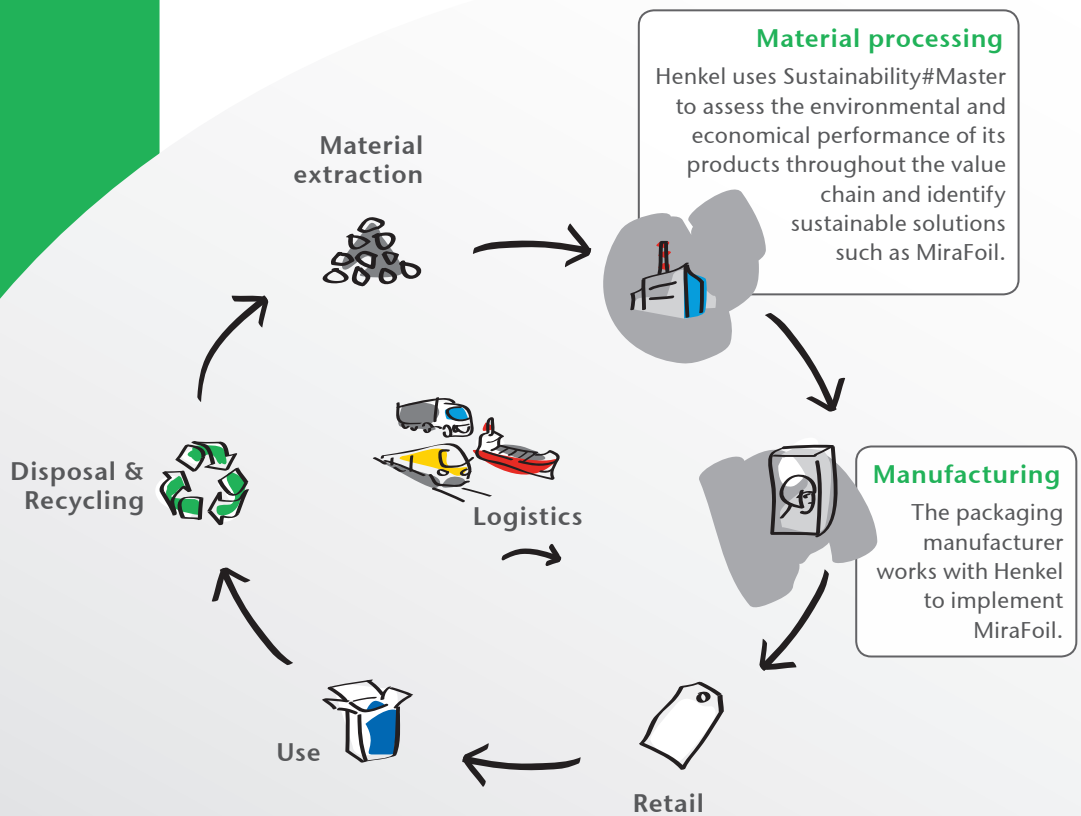


Figure: The SVC phases involved

graphics applications. It creates a metallic gloss on product surfaces, and is an alternative to existing solutions such as hot foil stamping, aluminum pre-treated board and cold foil. Henkel carried out Life Cycle Assessments for MiraFoil and used the Sustainability#Master to analyze the results. The tool demonstrated MiraFoil's overall superior performance, with benefits in all three dimensions of sustainability. Social benefits were achieved, due to easier production coordination and improved quality. Economic improvements were realized due to shorter lead times, and lower production costs. The environmental dimension had the greatest positive impact. MiraFoil can be applied to more precise areas, reducing the use of raw materials (e.g., 95 percent less aluminum), and waste. Mira Foil's process also allows for efficiency in supply chain transportation and a 65 percent improvement in global warming potential ,due to a shift from a 3-step to a 1-step production process.

Following its launch in 2009, the Sustainability#Master was continuously refined through its application to new solutions, different business questions, and dialogue with stakeholders. The tool helps to structure discussions and argumentation. Internally, insights generated through it use provide guidance for business choices, and are fed back into the further development of products and processes. Externally, it has helped to develop and implement more sustainable solutions that require the collaboration of different actors.

Lessons learned

- **A pragmatic approach, designed to provide input to concrete business questions, ensured the acceptance of the Sustainability#Master both within Henkel and with its partners.**
- **Concrete applications helped facilitate its refinement as the tool continued to evolve.**
- **A structured, semi quantified approach can overcome some of the challenges associated with sustainability measurement and provide directionally reliable results.**

Opportunities, risks, challenges and key success factors

Opportunities

- Base business decisions on reliable and clear information and promote sustainable solutions.
- Quantify progress toward more sustainable value chains and consumption.

Challenges

- Visualize sustainability benefits and trade-offs.
- Reduce complexity avoiding over-simplification.
- Get all necessary actors on board to implement sustainable solutions.

Risks

- Being driven by a multitude of potentially conflicting assumptions and expectations that might not be based on sound science.

Key success factors

- Top management support.
- Interdisciplinary team willing to find solutions to long-standing challenges.
- Having data and a tool to demonstrate benefits versus existing technologies in a transparent and easy-to-understand fashion.

Link

www.naturallyhenkel.com/mirafoil.htm

"LCA data are often too complex to communicate the benefits of more sustainable solutions to our customers. The Sustainability#Master has helped me to present a balanced and holistic argument - driving the implementation of more sustainable solutions in our value chains."

Marcel Hübenthal, Project & Strategic Account Manager, Paper Converting Europe

Cold water laundry

Summary:

This case study shows how Procter & Gamble reduced the energy consumption of washing by offering new eco-efficient detergents without compromising efficient cleaning results.

Since the 1990s, Procter & Gamble (P&G) and other detergent manufacturers, have conducted Life Cycle Assessments to analyze the environmental impacts of washing products. The assessments revealed that up to 85 percent of the energy consumed in the detergent's life cycle was the result of the use of hot water by end-consumers during the washing phase.

Building on these findings, P&G developed Ariel Cool Clean, a low temperature, highly-efficient washing detergent, which allowed for a significant reduction of energy use and greenhouse gas emissions per wash. P&G collaborated with its suppliers to develop a new concentrated formulation that used less-sourced ingredients, and to produce compacted packaging that generated less waste and emissions. P&G also partnered with manufacturers of washing machines to ensure the widespread availability of low temperature washing functions.

In order to reach the mass market with these new products, and

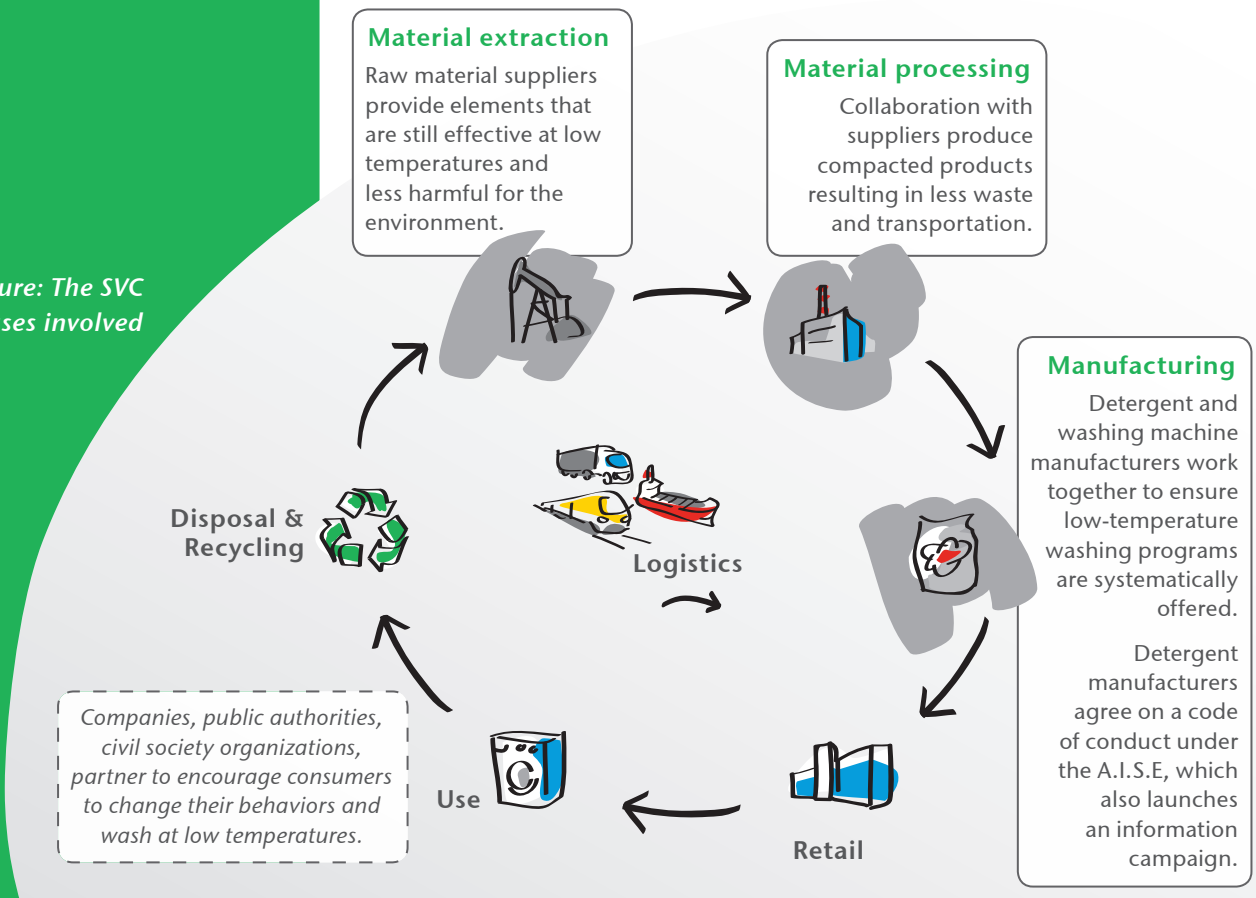


Figure: The SVC phases involved

to change consumer behavior on a substantial scale, a joint movement of leading companies in the industry was necessary. In Western Europe, the industry association A.I.S.E. (International Association for Soaps, Detergents and Maintenance Products), coordinated measures across companies with the introduction of the Code of Good Environmental Practice (1997), and the Charter of Sustainable Cleaning (2005). The A.I.S.E. also launched the Washright campaign, giving simple advice on how to wash more sustainably, including avoiding under-filling, dosing appropriately, washing at low temperatures, and saving packaging by recycling or refilling.

In each country where Ariel Cool Clean was introduced, P&G launched information and awareness campaigns in partnership with civil society organizations. In the UK, the company partnered with the Energy Saving Trust to launch the "Turn to 30" campaign, which consisted of TV and print advertizing, direct marketing, internet campaigns, in-store events and promotional activities.

The initiative proved to be a "win-win" situation. Ariel Cool Clean, and subsequently Ariel Excel Gel, proved to be better products for consumers, helping them to save energy and money by washing at lower temperatures and using lower doses of detergent, without compromising washing quality. These new products also helped to reduce the overall environmental footprint of the company. The "Turn to 30" also became an economic and environmental success for P&G. It contributed to the growth of Ariel's market share, and served as a brand-building measure.

Opportunities, risks, challenges and key success factors

Opportunities

- Exploration of new market segments.
- Substantial improvement of corporate environmental footprint.

Risks

- Failure to change people's habits.
- Working with competitors might be perceived as anti-competitive behavior.

Challenges

- Influence customers' habits to wash more energy-efficiently and eco-friendly.
- Overcome the "bigger is better" thinking of customers by conveying benefits of compacted products.

Key success factors

- Engagement of consumers.
- Success in research and development.
- Joint operations beyond company borders.

Lessons learned

- **Know where your impacts are, and make them visible.**
- **Develop an efficient strategy to address hot-spots in the value chain, instead of proceeding on a general basis with an overall life cycle optimization.**
- **Sustainable products must simultaneously meet consumer needs, give performance, add value, and be sustainable – otherwise they are only appealing to the green niche.**

Link

www.washright.com

"Ariel Excel Gel is a classic "no trade-offs" where the consumer gets a better product and good value, and where you can see many benefits for the environment."

Peter White, Director, Global Sustainability, Procter & Gamble

Collaborating with customers to develop innovative city logistics solutions

Summary:

This case study shows how a combination of smart supply chain solutions, new technologies, supporting regulations and most importantly, collaboration with key partners can provide clean and cost-effective logistics solutions to city centers.

The environmental impact of transport in supply chains is becoming increasingly important. As well as understanding their environmental impact, a growing number of companies seek concrete and specific solutions to reducing greenhouse gas emissions in their supply chains.

TNT responds to that demand by offering its customers a portfolio of solutions that enable them to reduce emissions from air, road and building operations. One of these solutions is City Logistics, which provides a zero-emission alternative for the last-mile delivery. It also enables partnerships with cities that have an increasing focus on reducing air pollution, congestion and noise. The City Logistics concept delivers benefits through smart bundling, and the use of innovative last-mile solutions, such as an Integrated Transport System and Electric Vehicles.

TNT is developing a series of pilots under the City Logistics project. One of them took place in Milan, with the High-Street Solution. A fact-based analysis of vehicles' movements related to the transport of goods in Via Montenapoleone was performed, in collaboration with a recognized

Figure: The SVC phases involved

local university. Based on the facts and figures on street level and scenario modeling, TNT was able to show to the city authorities and its customers how the number of vehicles and emissions could be reduced by more than 50 percent, by optimizing the transport capacity on this particular street.

TNT joined forces with the luxury brand Gucci to implement this solution as a pilot. All Gucci shipments to the targeted street were delivered into the city center using electric vehicles provided by a leading electric vehicles manufacturer. The real breakthrough of this approach was the combination of innovative logistics management, technologies, and collaboration with customers, as well as other city stakeholders.

First conclusions were very positive from all parties involved. The solution proved to significantly reduce CO_2 and other emissions for Gucci, TNT and the City of Milan. It also differentiated TNT services from its competitors, and, based on the current technologies, confirmed electric vehicles as the preferred option for the last-mile delivery.

The pilot has been turned into a business proposition, and will be offered to TNT customers in other cities around the world as part of a broader portfolio to reduce supply chain emissions.

More generally, the pilot reinforced the idea that replacing the existing diesel or petrol vehicles with electric ones does not solve all the problems of a city, because congestion and other problems still exist. The key is to take out as many transportation movements as possible (mileage and vehicles) through capacity optimization, and to use environmentally friendly transportation for the remaining vehicles. This includes a full range of transport means, such as trucks, walkers, tricycles and bicycles.

Opportunities, risks, challenges and key success factors

Opportunities

- Build a stronger and more durable relationship with customers.
- Secure TNT's future license to operate in inner cities.
- Enhance TNT's competitiveness.

Challenges

- Obtain proactive support from cities.
- Bundling at street level, and sourcing the relevant technology to support the chosen solution.

Risks

- Ensure TNT releases a positive business case, and that electric vehicle technology is reliable in the long term.

Key success factors

- Fact-based approach is key; trial and error process does not work.
- Understand changes in end-consumer behaviors to customize service offering.
- Customers must be keen to achieve new sustainable solutions.

Lessons learned

- **No single solution fits all customer and city requirements. Tailor the solution to the type of city, specific political environment, type of customer and network.**
- **Working closely with City authorities might be challenging, as working styles differ from that of the business sector, and from city to city.**
- **For informal settlements or slums, completely different solutions are required (reference Technology Enablers Initiative).**

Link

www.tnt.com/corporate/en/site/home/about_us/corporate_responsibility

> *Gucci launched a worldwide eco-friendly program designed to reduce the company's impact on the environment. The project with TNT goes in the same direction and we are sure that our customers will appreciate our efforts and commitment in terms of reduction of CO_2 emissions.*
>
> *Gucci*

Working together to reduce the environmental impact of refrigerants

Summary:

This case study outlines how a group of companies, a campaigning organization and an international organization worked together to create Refrigerants, Naturally!, a global initiative to combat climate change and ozone layer depletion.

Fluorinated gases have a negative impact on the environment, and are widely used in commercial refrigeration applications, such as vending machines, coolers and freezers. Initiated with the Montreal Protocol in 1978, the focus on embracing environmentally friendly refrigeration alternatives has been accelerated through influential civil society campaigns, government action, and the commitment of visionary companies.

As a response to this challenge, The Coca-Cola Company, Unilever and McDonald's, with the support of Greenpeace and the United Nations Environment Programme (UNEP), launched "Refrigerants, Naturally!", a global not-for-profit initiative committed to promote a shift away from harmful fluorinated gases toward natural refrigerants, with a focus on their point-of-sale cooling applications. Natural refrigerants are naturally occurring substances, such as hydrocarbons (HC), carbon dioxide (CO_2), water and air; when used as refrigerants, these substances do not harm the ozone layer, and have zero or negligible climate impact.

Both The Coca-Cola Company and Unilever rely on refrigeration throughout the value chain.

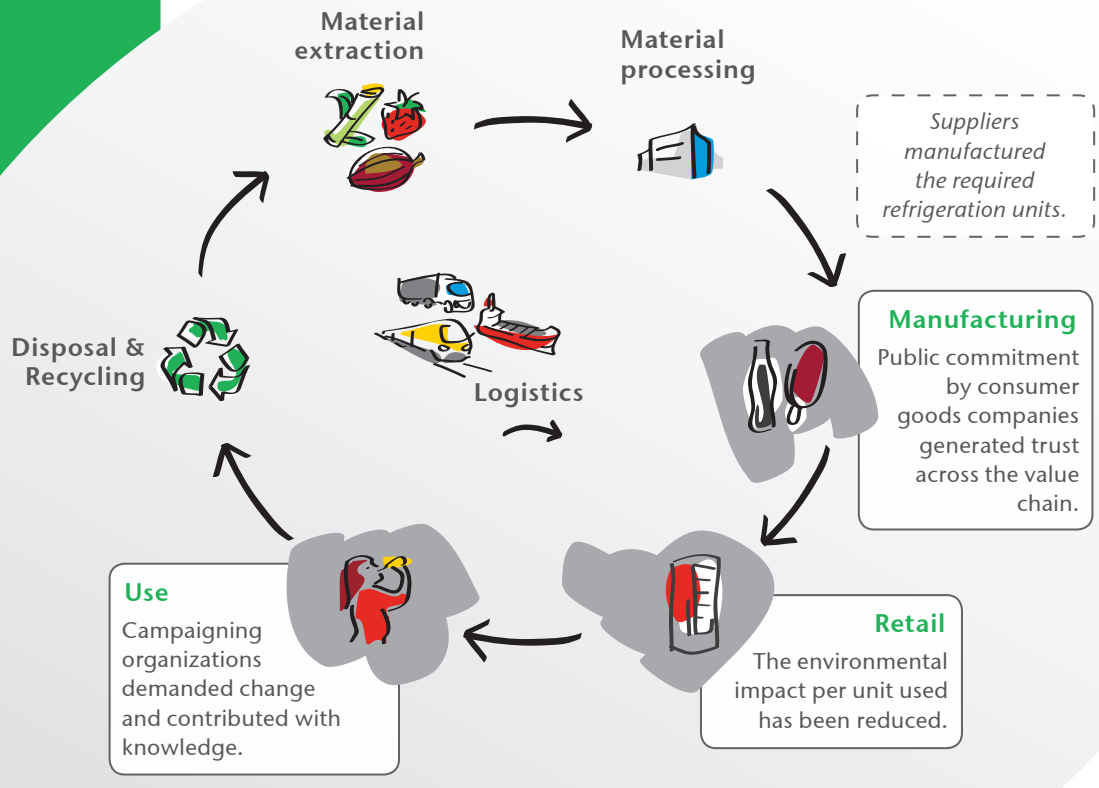


Figure: The SVC phases involved

At The Coca-Cola Company, refrigeration is the greatest contributor to its climate footprint. Coca-Cola beverages are kept cold in over 10 million coolers and vending machines around the world. The Coca-Cola Company has invested more than USD 60 million over the past decade in research and development to advance the use of Hydrofluorocarbon (HFC)-free cooling technologies. The company has 380,000 HFC-free units in use around the world, and also is phasing out HFCs in all new cold drink equipment, as of 2015.

At Unilever, refrigeration is less significant in connection with the company's overall environmental profile, but still relevant in absolute values. As the largest producer of ice cream, it keeps its products in over 2 million freezer cabinets at the point of sale. Having proved the HC technology, Unilever began replacing cabinets in 2004. By 2011, Unilever had replaced around 900,000 and is currently accelerating this rollout globally, with the objective of purchasing a further 400,000 by 2015.

In 2010, the members of The Consumer Goods Forum, a global industry network gathering consumer goods companies, committed to phase out HFC refrigerants as of 2015, and replace them with natural refrigerants.

Despite the initial challenges of developing financially and technologically viable solutions, through vision, commitment and collaboration, this initiative has generated several benefits. It has contributed to environmental protection, fostered new technologies, brought different value chain actors closer together, and demonstrated that by working together, solutions to difficult problems can be found.

Opportunities, risks, challenges and key success factors

Opportunities

- Be proactively part of driving innovative solutions to global climate change.
- Build relationships with consumers, civil society organizations and other stakeholders.

Challenges

- High cost of new technology requiring economies of scale to become financially viable.
- Regulations not aligned across markets and scant incentives to adopt climate-friendly solutions.
- Low interest from suppliers.

Risks

- Climate change and its potential impact on business.
- Activism by influential campaigning organizations.
- New regulations that could have costly impacts on legacy equipment.

Key success factors

- Public commitments that send signals to suppliers and other businesses.
- Cross-sector and cross-industry collaboration.
- Solutions that can work in multiple applications.

Lessons learned

- **A shared vision may not lead to an immediate solution. Some initiatives require a long-term commitment to engagement and collaboration.**
- **Solutions cannot be driven by business alone. Collaboration between business, civil society organizations and government often yield the most viable solutions to global issues.**
- **Collaboration with companies is a delicate matter. Due to competition regulations, any kind of coalition must be based on the commitment of companies to contribute to specific issues on an individual basis to avoid cartel accusation.**

Link

www.refrigerantsnaturally.com

> *Greenpeace increasingly works with businesses to make fundamental manufacturing and sourcing changes by connecting regulation, economies of scale and supply chain security. Coca-Cola and Unilever's commitment today runs ahead of regulation and takes some fear out of rapid change.*
>
> *Amy Larkin, Director of Greenpeace Solutions*

SOMPO JAPAN

Disseminating green procurement practices through the value chain

Summary:

This case study explains how a service company created and spread a green procurement online system through its value chain. The new system is not only reducing the insurance sector's environmental impact and promoting its stakeholders' environmental consciousness, but also helping Sompo Japan differentiate itself in the market due to its sustainability initiatives.

Green procurement has been prevailing among large companies in Japan, but as yet, not among medium- and small-sized companies, especially in local areas. Sompo Japan, which had been tackling green procurement since 1997, decided to disseminate it amongst insurance agencies, which are a core part of its value chain, and indirectly to 5.9 million corporate and individual customers across the country.

With the help of the Green Purchasing Network (an extra-governmental organization with members of more than 2,900 corporations and local governments in Japan), and the cooperation of its office supplies service provider, Sompo Japan developed an online and centralized green purchasing system, offering eco-friendly stationery products for its nationwide agency organizations, the AIR. This consisted mainly of automobile repair shops, and the J-SA, an organization of professional insurance agencies.

A communication campaign was launched, not only to disseminate knowledge of the system and provide agencies with sensitization messages

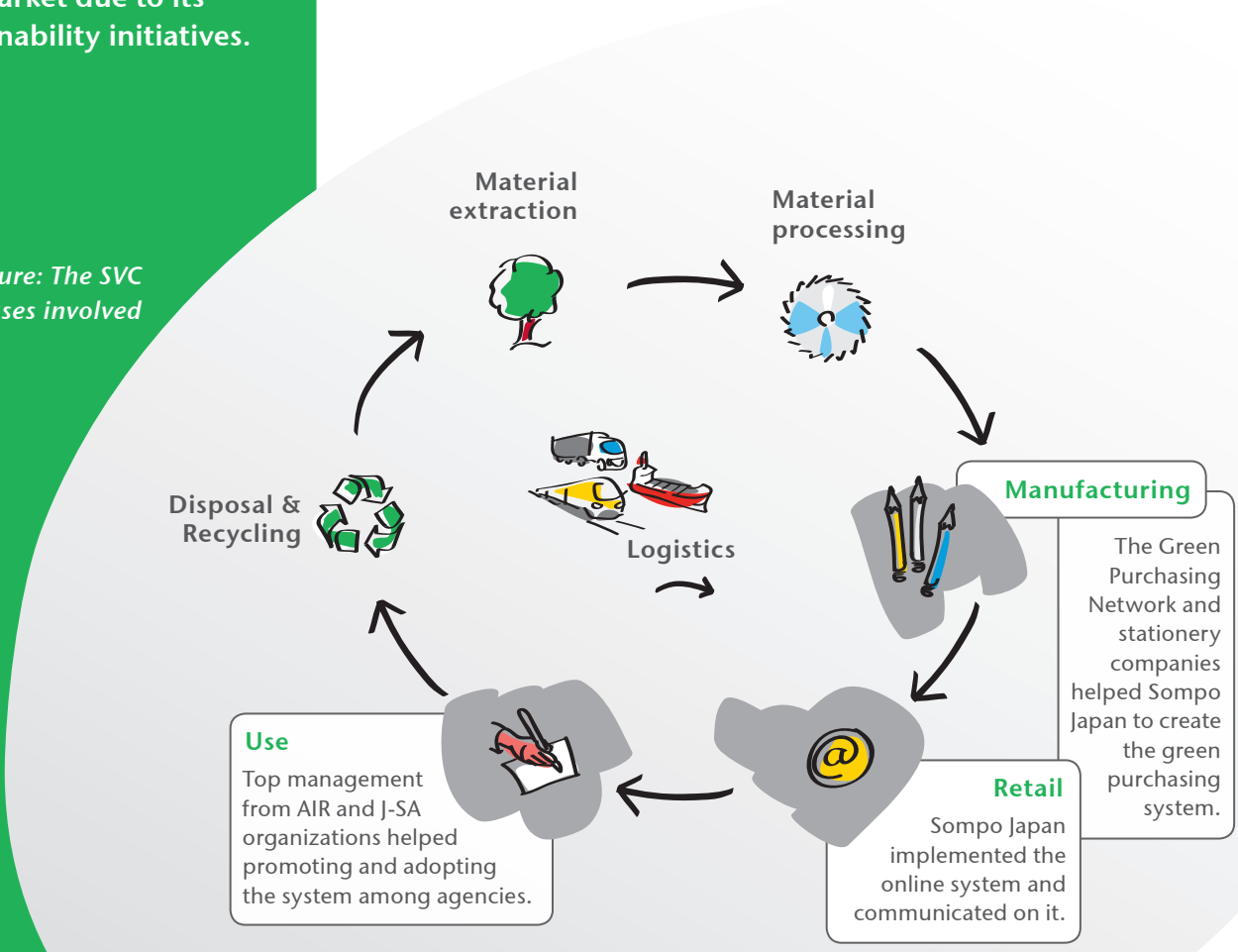


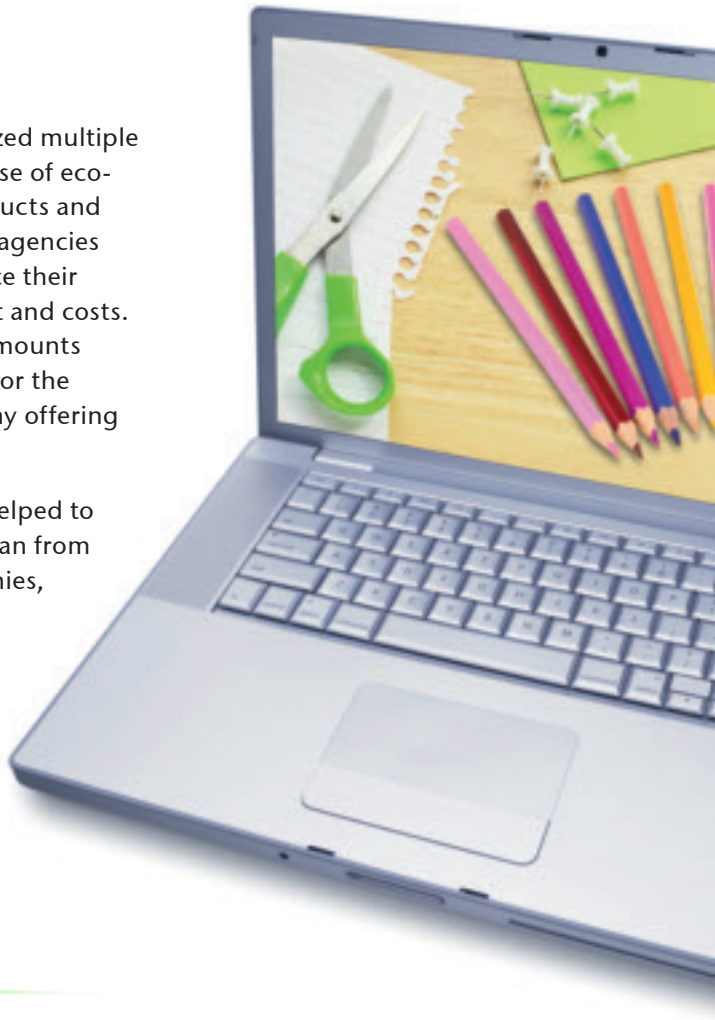
Figure: The SVC phases involved

about purchasing more eco-friendly products, but also to advise on the sustainable use and disposal of these products. Also, Sompo Japan made tools such as comics and posters, to encourage agencies in an easily understood manner.

In less than three years, the voluntary procurement system has been adopted by about 70 percent of AIR and J-SA agencies, an estimated 4,000 entities. Sompo Japan is actively working to increase this number, and to ensure a more frequent use of the platform.

The agencies have realized multiple benefits. Through the use of eco-friendly stationery products and bulk discounts offered, agencies have been able to reduce their environmental footprint and costs. Increased purchasing amounts leads to further profits for the stationery sales company offering eco-friendly products.

This initiative has also helped to differentiate Sompo Japan from other insurance companies, and strengthen the link between the company and its agencies.



Opportunities, risks, challenges and key success factors

Opportunities

- Differentiate the company from competitors.
- Further strengthen existing relationship to agencies.

Challenges

- Promoting green procurement was not easy, especially in remote and small communities.

Risks

- Increased operating costs may lead to loss.

Key success factors

- Leadership commitment was key. Top management from AIR and J-SA were very active in making consensus in their respective organizations.
- AIR was already conscious of the impact of their business on the environment, due to their core business of automobile repair shops.
- Clear messaging about the importance of green purchasing.

Lessons learned

- **The three pillars of such an initiative are: sympathy to the cause from target organizations; cost reduction allowing a faster buy-in; top-level commitment.**

Link

www.sompo-japan.co.jp/english/about/csr/index.html

> *Misachi Firm registered the green procurement system and has been making use of it. In addition, we have been making efforts to spread our customers' environmental consciousness by placing green procurement posters and comics in our showrooms and offices and by providing explanations to customers. We continue to co-work with Sompo Japan, J-SA and AIR and aim to become a leading company within the environment field in the community.*
>
> *Misachi Firm, automobile repair shop agency and a member of AIR*

Environmental innovation in plastics upcycling

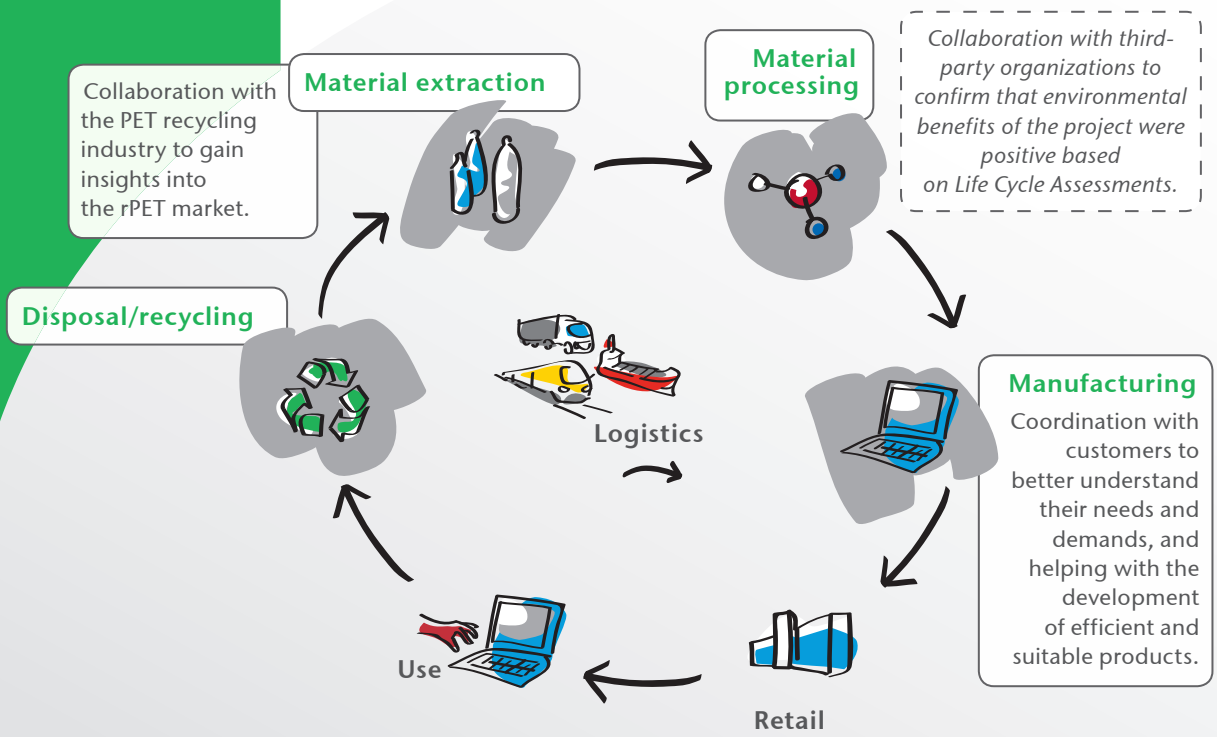
Summary:

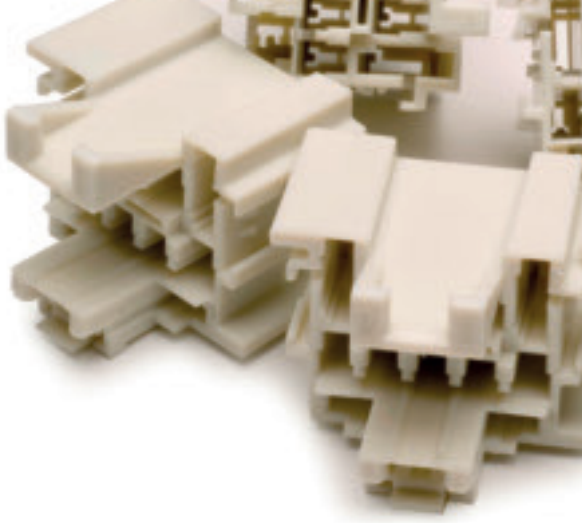
This case study shows how SABIC developed an innovative method to produce recycled-based resin products for the electronic and automotive industries.

In the past decade, the demand for plastics with recycled content has increased significantly. E-waste and end-of-life vehicle regulations, industry standards and other initiatives have encouraged the market expansion of recycled materials. Corporate sustainability programs also have led many of the manufacturing companies to set targets for the use of recycled materials in their products. In addition, consumers have become more aware of sustainability issues, and oil prices have climbed upward due to scarcity concerns – all of which have made recycling technologies more competitive and attractive.

One way that SABIC has addressed these market needs is by the development of Valox iQ* and Xenoy IQ* resins.

Valox iQ* resins are polybutylene terephthalate (PBT)-based resins, produced using up to 60 percent post-consumer polyethylene terephthalate (PET). PET from waste bottles is upcycled into high performance PBT, with better engineering properties than the original bottle-grade PET. Xenoy iQ* resin is obtained through blending PBT with polycarbonate. Up until this time, chemical upcycling of PET had been economically unsustainable, due to the low price of crude oil.





A series of Life Cycle Assessments concluded that Valox iQ* resin technology can offer real environmental benefits, without the traditional trade-off in performance usually found in mechanical recycling. The properties of Valox iQ* resin are nearly equivalent to those of the virgin Valox* PBT resin used in electrical connectors, electronic devices, fibers, and consumer goods, such as oral care and food utensils. Xenoy iQ* resin has been used in power-tool housings, transportation exteriors, outdoor products, and components requiring high impact and chemical resistance, such as healthcare applications.

Since their introduction, the demand for both product lines has grown, as has the portfolio. Today, there are approximately 20 commercial grades available in SABIC's iQ resin portfolio. SABIC is also exploring alternative ways to increase the sustainability content of the iQ resin product lines.

The success of the Valox iQ* resin product helped SABIC develop the experience, confidence, and Life Cycle Assessment competency required to put additional emphasis on developing new sustainability solutions for the market. Today, developing sustainability solutions for their customers is one of the major themes in their sustainability program. This includes developing a broader range of recycled materials to complement Valox iQ* resin, implementing a sustainability product standard and scorecard to monitor progress, and continuing to practice and expand the role of Life Cycle Assessment in making business decisions and communicating results.

* Trademarks of SABIC Innovative Plastics IP B.V.

Opportunities, risks, challenges and key success factors

Opportunities

- Meet customer needs for high performance, sustainable solutions that deliver in demanding applications.
- Assisting customers in meeting new environmental standards and regulations, which helps to support demand and awareness for products such as Valox iQ* resin.

Challenges

- Find early adopters that value the products' sustainability benefits.
- Eliminate the outdated perception that recycled materials are lower performing.

Risks

- Limited availability and high prices of recycled PET (rPET) due to increasing demand.
- Price volatility of natural gas and oil used as raw materials in the plastic industry that could compete with recycled raw materials.

Key success factors

- Focusing on a proven technology and awaiting the right market conditions for commercialization.
- Keeping customers' requirements in mind when selecting and designing the technology.
- Third-party verification of environmental benefits across the life cycle.
- Setting sustainability goals that help customers to achieve their goals by using SABIC's products.

Lessons learned

- **Introducing sustainability solutions to complex value chains, such as electronics and automotive, requires close collaboration across the entire value chain.**
- **Customers are seeking one supplier with a broad portfolio of sustainable solutions to meet their growing needs, in a variety of demanding applications. Life Cycle Assessment is an important tool in developing a sustainability portfolio.**

Link

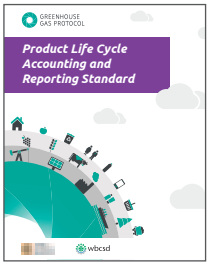
www.sabic-ip.com/gep/Plastics/en/ProductsAndServices/ProductFamily/iq*_valox.html

> *Valox iQ* technology gives us credibility in sustainability discussions in the market, opens up new product development opportunities, and creates dialogue with customers, which may not have happened if we had not launched this product.*
>
> *Robert McKay, Sustainability Leader, Innovative Plastics*

Resources

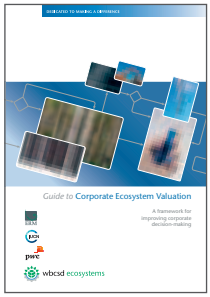
While by no means exhaustive, the list below provides a few useful supporting research papers and guidance documents. These additional resources aim to assist companies in their journey toward a more sustainable value chain.

Companion WBCSD documents



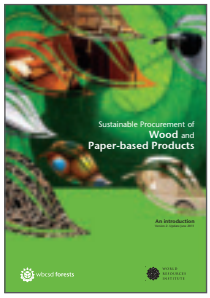
Corporate Value Chain (Scope 3) Accounting and Reporting Standard and Product Life Cycle Accounting and Reporting Standard.
With WRI (2011)

The new GHG Protocol standards provides a standardized method to inventory the emissions associated with individual products across their full life cycles and of corporate value chains, taking into account impacts, both upstream and downstream, of company operations.



Guide to Corporate Ecosystem Valuation
With ERM, IUCN and PwC (2011)

This first-of-its-kind framework enables companies to consider the actual benefits and value of the ecosystem services they depend upon and impact, giving them new information and insight to include in business planning and financial analysis.

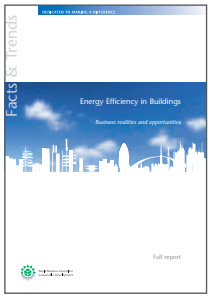


Sustainable Procurement of Wood and Paper-based Products Guide
With WRI (updated in 2011)

This is a toolbox designed to help corporate managers understand and find the best advice on how to purchase products originating from the world's forests.

Global Water Tool
(updated in 2011)

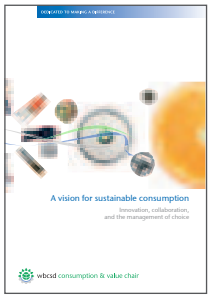
This tool maps a company's water-related risks and provides an inventory for reporting on GRI's water indicators.



Energy Efficiency in Buildings – Facts and Trends

(2008)

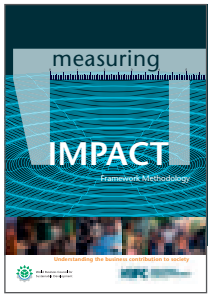
This report is a detailed view of the current state of energy demand in the building sector. It helps to understand the complexity of interactions between stakeholders in the building value chain.



A vision for sustainable consumption

(2011)

This report envisions what sustainable consumption could look like in 2050, and how business could help to establish it in the mainstream. It proposes a new "value net" model in which value is continuously created, preserved and shared.

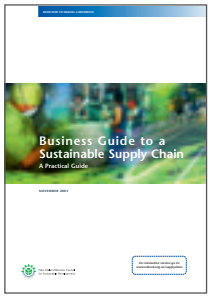


Measuring Impact Framework

(2008)

This tool helps companies understand their contribution to society, inform their operational and long-term investment decisions, and have better-informed conversations with stakeholders.

WBCSD Regional Network



Business Guide to a Sustainable Supply Chain

New Zealand CSD (2003)

The guide provides tools for companies to create their own code of conduct and rating system for suppliers, suggestions on how they can improve their internal logistics toward a more sustainable model, and a strategy for incorporating sustainability into product and service design.

General publications

UN GC, UNEP, SustainAbility (2008). *Unchaining Value – Innovative Approaches to Sustainable Supply*. This report explores how supply chains function, in order to identify new approaches to building sustainability capacity at the local supplier level, as well as identifying initiatives that will encourage and enable consumer demand for more sustainable solutions.

BITC (2009). *How To: Manage your Supply Chains Responsibly*. This How-to Guide outlines why responsible supply chain management is vital to your business; the types of risks and issues commonly found within supply chains; and a practical step-by-step approach to meet these challenges.

BSR and UN GC (2010). *Supply Chain Sustainability: A Practical Guide for Continuous Improvement*. This publication offers practical guidance on how to develop a sustainable supply chain program, based on the values and principles of the Global Compact.

Consumer Goods Forum (2011). *2020 Future Value Chain: Building Strategies for the New Decade*. This report aims to help companies understand how megatrends will impact their businesses, and be prepared to benefit from these transformations.

The Terrace & NL Agency (2011). *Cradle to cradle pays off! Companies of the C2C Learning Community about their experiences and lessons learned*. This report summarizes the learning experiences on cradle to cradle from 17 companies involved in the Cradle-to-Cradle Learning Community.

ICC (2008). *Guide to responsible sourcing – Integrating social and environmental considerations into the supply chain*. The guidance presents basic steps that companies can take to influence and monitor social and environmental performance in their global supply chains.

UNEP, SETAC and LCI (2008). *Life Cycle Management – How business uses it to decrease footprint, create opportunities and make value chains more sustainable*. This publication can be used by company in-house experts and non-specialist managers as well as company suppliers in order to learn how to apply life cycle management practices throughout the value chain.

UNEP, SETAC and LCI (2008). *Life Cycle Management: A business guide to sustainability*. The guidebook covers the topics of life-cycle thinking based on the triple bottom line, Life Cycle Management in practice in the various departments of a company, and implementation, using a step-by-step approach to plan, do, check and act.

Websites

UN GC, *UN Global Compact Supply Chain Resources & Practices*. http://supply-chain.unglobalcompact.org

CSR Europe, *Managing Sustainable Supply Chains*. www.csr-supplychain.org

Government of South Australia, *PIRSA Value Chains, Value Chain Toolkit*. www.pir.sa.gov.au/valuechains/value_chain_toolkit

European Commission- Joint Research Centre, Institute for the Environment and Sustainability, *Life Cycle Thinking and Assessment*. http://lct.jrc.ec.europa.eu

US Environmental Protection Agency, National Risk Management Research Laboratory, *Life-Cycle Assessment*. www.epa.gov/nrmrl/lcaccess

Consumer Goods Forum, *Future Value Chain 2020*. www.futurevaluechain.com

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About the World Business Council for Sustainable Development (WBCSD)

The WBCSD is a CEO-led organization of forward-thinking companies that galvanizes the global business community to create a sustainable future for business, society and the environment. Together with its members, the Council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the Council helps drive debate and policy change in favor of sustainable development solutions.

The WBCSD provides a forum for its 200 member companies - who represent all business sectors, all continents and a combined revenue of more than USD 7 trillion - to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The Council also benefits from a network of 60 national and regional business councils and partner organizations, a majority of which are based in developing countries.

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