



Master in Business Administration

Postgraduate Dissertation

“Sustainability and Ethical Sales Practices in the Chemical Industry: a focus on BASF - exploring the integration of sustainability and ethical considerations into BASF’s sales practices and their impact on brand reputation and sales performance. ”

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Abstract

This thesis explores the intersection of sustainability and ethical sales practices in the chemical industry, with a focus on the case of BASF. The study analyzes how BASF can balance profitability with social and environmental responsibility. By examining case studies, regulatory frameworks, and industry best practices, the thesis aims to highlight strategies for integrating sustainability into ethical sales models. The goal is to pave the way for a more responsible and future-ready chemical industry. The research delves into the evolving role of sustainability from a compliance-driven necessity to a strategic opportunity, emphasizing the importance of innovation and sustainable solutions. It also discusses the impact of regulatory pressures, technological advancements, and changing market dynamics on the chemical industry. The thesis underscores the significance of ethical sales practices in fostering trust, cultivating long-term relationships, and enhancing customer satisfaction. It highlights the challenges and opportunities faced by BASF in its sustainability journey, including the need for substantial investments in new technologies and processes. The study concludes that integrating sustainability into core business strategies can enhance brand reputation, secure long-term profitability, and strengthen relationships with customers and stakeholders.

Keywords

Sustainability, Environmental Responsibility, Customer loyalty, Brand Reputation

Βιωσιμότητα και ηθικές πρακτικές πωλήσεων στη χημική βιομηχανία: διερεύνηση της ενσωμάτωσης της βιωσιμότητας και των ηθικών κριτηρίων στις πρακτικές πωλήσεων και ο αντίκτυπός τους στη φήμη της επωνυμίας και στην απόδοση των πωλήσεων.

Γεωργαντάς Κωνσταντίνος

Περίληψη

Η παρούσα διπλωματική εργασία εξετάζει τη διασταύρωση της βιωσιμότητας και των ηθικών πρακτικών πωλήσεων στη χημική βιομηχανία, με έμφαση στην περίπτωση της BASF. Η μελέτη αναλύει πώς η BASF μπορεί να ισορροπήσει την κερδοφορία με την κοινωνική και περιβαλλοντική ευθύνη. Εξετάζοντας μελέτες περιπτώσεων, κανονιστικά πλαίσια και βέλτιστες πρακτικές της βιομηχανίας, η εργασία στοχεύει να αναδείξει στρατηγικές για την ενσωμάτωση της βιωσιμότητας σε ηθικά μοντέλα πωλήσεων. Ο στόχος είναι να ανοίξει ο δρόμος για μια πιο υπεύθυνη και έτοιμη για το μέλλον χημική βιομηχανία. Η έρευνα εξετάζει τον εξελισσόμενο ρόλο της βιωσιμότητας από μια αναγκαιότητα συμμόρφωσης σε μια στρατηγική ευκαιρία, τονίζοντας τη σημασία της καινοτομίας και των βιώσιμων λύσεων. Συζητά επίσης τον αντίκτυπο των κανονιστικών πιέσεων, των τεχνολογικών εξελίξεων και των μεταβαλλόμενων δυναμικών της αγοράς στη χημική βιομηχανία. Η εργασία υπογραμμίζει τη σημασία των ηθικών πρακτικών πωλήσεων στην ενίσχυση της εμπιστοσύνης, την καλλιέργεια μακροχρόνιων σχέσεων και την αύξηση της ικανοποίησης των πελατών. Αναδεικνύει τις προκλήσεις και τις ευκαιρίες που αντιμετωπίζει η BASF στο ταξίδι της προς τη βιωσιμότητα, συμπεριλαμβανομένης της ανάγκης για σημαντικές επενδύσεις σε νέες τεχνολογίες και διαδικασίες. Η μελέτη καταλήγει στο συμπέρασμα ότι η ενσωμάτωση της βιωσιμότητας στις βασικές επιχειρηματικές στρατηγικές μπορεί να ενισχύσει τη φήμη της μάρκας, να εξασφαλίσει μακροχρόνια κερδοφορία και να ενισχύσει τις σχέσεις με τους πελάτες και τους ενδιαφερόμενους φορείς.

Λέξεις – Κλειδιά

Βιωσιμότητα, Περιβαλλοντική Ευθύνη, Αφοσίωση Πελατών, Φήμη Μάρκας

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Chapter 1. Introduction

A popular definition of sustainability is "meeting the needs of the present without compromising the ability of future generations to meet their own needs" [1]. In this concept environmental health, social equity, and economic viability to create booming and resilient communities are taken into account [2]. At its core, sustainability involves maintaining conditions in which humans and nature can coexist in harmony, ensuring long-term well-being for future generations [3].

Sustainability has become a critical focus for industries worldwide, and the chemical industry is no exception. With huge importance in global manufacturing, the chemical industry is a key player in addressing major societal challenges such as climate change, resource scarcity, and waste management. Companies operating in this sector have long been subject to stringent regulations regarding safety, risk management, and environmental impact. Over the years, this has led to the adoption of sustainable practices like for example The Responsible Care® initiative, introduced in 1985 as an early step in coming up with official sustainability measures with emphasis on the importance of health, safety, and environmental stewardship [4].

However, in recent years, sustainability has evolved from a compliance-driven necessity to a strategic opportunity. Chemical companies are now expected not only to minimize their environmental footprint but also to drive innovation and promote sustainable solutions across industries. A lot of pioneering work in fields like the renewable energy technologies, biodegradable materials, and circular economy initiatives are heavily reliant on innovations within the chemical industry. This shift requires has made it mandatory for chemical companies to move beyond traditional risk management approaches and actively invest in new materials, processes, and business models that contribute to sustainable development [4].

There are three main factors contributing to the evolvement of the chemical industry: regulatory pressure, rapid technological advancements and changing market dynamics. One examples of a regulation driving change is the EU's restrictions on single-use plastics and hazardous substances which is forcing companies to produce alternative materials. At the same time, breakthroughs in biotechnology, green chemistry, and recycling technologies are creating new possibilities for sustainable manufacturing. Additionally, new players are emerging in the chemical production scene including recyclers and specialized suppliers, reshaping traditional value chains and demanding established companies to rethink their strategies [4]

Given these shifts, sustainability in the chemical industry can be regarded as source of competitive advantage and not just an operational requirement. Companies that proactively integrate sustainability into their core business strategies can enhance their brand reputation, secure long-term profitability, and strengthen their relationships with customers and stakeholders. Ethical sales

practices play a crucial role in this transition, ensuring that sustainability commitments translate into real value for both businesses and consumers [4].

In light of the above, BASF, one of the biggest chemical companies in the world, is deeply committed to sustainability, integrating it into their corporate strategy and operations. Their new strategy, "Winning Ways," focuses on accelerating value generation and simplifying their organization to support green transformation [5]. BASF aims to achieve net-zero CO₂ emissions by 2050 and reduce greenhouse gas emissions by 25% by 2030 compared to 2018 levels. This ambitious approach underscores their dedication to a sustainable future [6].

BASF SE, headquartered in Ludwigshafen, Germany, is the world's largest chemical producer. Founded in 1865, BASF has grown into a global powerhouse with a presence in over 92 countries and a diverse portfolio that spans multiple industries. The company's mission is encapsulated in its corporate purpose: "We create chemistry for a sustainable future." This commitment to sustainability is reflected in BASF's strategic initiatives, product innovations, and operational practices.

In the 2024 fiscal year, BASF generated sales of €65.3 billion, a slight decrease from the previous year's €68.9 billion. Despite the challenging market conditions, BASF achieved an EBITDA before special items of €7.86 billion, up from €7.67 billion in 2023. This financial performance underscores BASF's resilience and ability to adapt to market dynamics while maintaining a strong focus on sustainability [42].

BASF operates through six main segments:

1. **Chemicals:** This segment includes petrochemicals and intermediates, supplying basic chemicals to various industries such as plastics, construction, and automotive.
2. **Materials:** Focused on high-performance plastics and their precursors, this segment serves industries like automotive, construction, and consumer goods.
3. **Industrial Solutions:** This segment provides dispersions, resins, and performance chemicals for industries including coatings, adhesives, and electronics.
4. **Surface Technologies:** Encompassing catalysts, battery materials, and coatings, this segment supports the automotive and electronics industries.
5. **Nutrition & Care:** This segment offers products for the food, feed, pharmaceutical, and personal care industries.
6. **Agricultural Solutions:** Providing crop protection products, seeds, and digital farming solutions, this segment supports sustainable agriculture [43].



Figure 1. BASF's Operating Divisions

At the same time, sustainability should be applied with ethical sales practices as a guiding principle. Ethical sales practices encompass methods employed by sales professionals that prioritize values such as honesty and fairness. Instead of concentrating solely on making quick sales, these approaches aim to foster trust, cultivate long-term relationships, and enhance customer satisfaction. They consider the needs of the buyer and involve sharing truthful information about products or services, even when this might result in not closing a sale [7].

It is clear that, like in every other industry, ethical selling is of immense importance for the chemical industry as well: it ensures a company's reputation; in the era of social media and internet, consumers can share brand experience in the blink of an eye to a huge audience and unethical sales practices can therefore negatively impact a company's brand name, damaging its customer base. Additionally, trusting and feeling comfortable with a brand can increase the chances of a customer coming back for more business or even referring to other potential customers. Employees can become more productive and motivated when they feel they are working for an organization that employs ethical sales practices [7].

This thesis explores the intersection of sustainability and ethical sales practices in the chemical industry, with a focus on the case of BASF, analyzing how the company can balance profitability with social and environmental responsibility. By examining case studies, regulatory frameworks, and industry best practices, this thesis aims to highlight strategies for integrating sustainability into

ethical sales models, ultimately paving the way for a more responsible and future-ready chemical industry.

The chemical industry experienced moderate progress in 2024, with year-over-year production increasing compared to 2023. As the destocking cycle diminishes and demand for various products rises, production levels are expected to continue growing. To further bolster revenue growth, chemical companies have implemented cost-reduction plans and increased margins while continuing to invest in decarbonization and innovation. In 2025, the industry is anticipated to maintain its recovery, adapting to new market drivers and balancing short- and long-term objectives.

Since the onset of the COVID-19 pandemic in 2020, the chemical industry has faced turbulent market conditions. The pandemic resulted in weak demand, reduced production, and lower revenues in 2020. However, from 2021 to 2022, the industry saw a strong rebound in production and revenues as demand increased and concerns over supply chain disruptions led to higher inventory stocking. By late 2022, supply chain issues began to ease, key end markets started destocking, and demand for chemicals declined. By the end of 2023, revenues had decreased by 8% year-on-year, operating margins fell to their lowest levels since the Great Recession (2007-2009), and returns on capital reverted to pre-pandemic levels. These dynamics underscored the need for greater resilience, prompting cost-reduction programs. As these programs continue to be implemented, margins began to rise in the first half of 2024.

Looking ahead, moderate growth is expected to persist in the chemical industry in 2025. The American Chemistry Council (ACC) projects global chemical production to increase by 3.4% in 2024 and 3.5% in 2025, following a modest 0.3% rise in 2023. Despite improvements in production and margins returning to average levels, the industry still faces challenges and uncertainties. In the coming year, chemical companies will need to navigate evolving macroeconomic conditions, shifts in policy and regulations across regions, changing customer preferences, and technological advancements. To enhance their positions amidst these uncertainties, chemical companies should consider adopting strategies that enable them to weather challenges while positioning themselves competitively in a low-carbon, high-tech future.

To plan effectively for the future, companies should assess their current standing, providing a foundation for examining emerging trends that may shape the industry's trajectory in the coming years. The 2025 Chemical Industry Outlook explores these trends and highlights key indicators that leaders should consider when developing strategies.

Over the past decade, there has been a growing consensus that traditional economic models need to be reformed to address pressing issues such as climate change, biodiversity loss, and water

scarcity, while simultaneously tackling key social and economic challenges. The global financial crisis of 2008–2009 intensified this debate, leading to the vision of a 'green economy.' In 2015, countries worldwide adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). These goals emphasize that ending world poverty must be accompanied by strategies that foster economic growth and address various social needs, including education, health, social protection, and job creation, while also combating environmental pollution and climate change. The SDGs establish a vital link between ecological and economic systems, reinforcing the necessity for a transition to a green economy, which involves fundamentally transforming production and consumption patterns to be more sustainable.

This article focuses on a crucial aspect of this transition: the development of sustainable technological change, which entails production and consumption patterns that significantly reduce negative impacts on the natural environment, including the global climate. Specifically, the article addresses key challenges in supporting and overcoming barriers to sustainable technological change, aiming to communicate important lessons from academic research to policymakers, professionals, and the general public.

Addressing climate and environmental challenges requires scientific knowledge and engineering expertise to develop technical solutions that mitigate negative impacts, such as carbon-free energy technologies. However, pursuing sustainable technological change is also a societal, organizational, political, and economic endeavor involving several non-technical challenges. The transitions literature recognizes that sectors like energy generation and water supply can be conceptualized as socio-technical systems and innovation systems. These systems consist of networks of actors (individuals, private firms, research institutes, government authorities, etc.), their knowledge, and relevant institutions (legal rules, codes of conduct, etc.). Developing new carbon-free technologies often requires establishing new value chains with actors who may not have interacted previously, necessitating a lengthy process that can alter society in various ways, including legal amendments, changed consumer behavior, distributional effects, infrastructure development, and novel business models.

Beyond technological progress, economic and societal adjustments are necessary to achieve sustainable technological change. History provides examples illustrating the need to address organizational and institutional challenges associated with technological change and innovation. For instance, the societal impacts of electricity on productivity gains were tremendous during the twentieth century. However, while electrical energy was discovered in the late 1870s, less than 5% of mechanical power in American factories was supplied by electric motors by 1900, and it took another 20 years for productivity to soar. The slow diffusion of electric power was due to the need for existing factories to change their entire systems of operation, including production processes, architecture, logistics, and worker recruitment, training, and payment. Similarly, the impact of

computers on productivity during the second half of the twentieth century required systemic changes for companies to take advantage of the new technology, such as decentralizing, outsourcing, streamlining supply chains, and offering more choices to consumers.

The adoption of new technology must be accompanied by systemic changes at both the company and societal levels. Novel solutions must consider the complexity of interdependencies between different types of actors with various backgrounds, overall market dynamics, and the need for knowledge development and institutional reforms. This is particularly relevant for green technologies, such as zero-carbon processes in energy-intensive industries.

The issue of promoting sustainable technological change has received increasing attention in policy and academic research. This article discusses significant societal challenges in pursuing such change and outlines key insights for policymakers and future research avenues. The article centers on five overall challenges:

1. Dealing with diffuse – and ever more global – environmental risks
2. Achieving radical – and not just incremental – sustainable technological change
3. The advent of green capitalism: the uncertain business-as-usual scenario
4. The role of the state: designing appropriate policy mixes
5. Dealing with distributional concerns and impacts

The first two challenges address structural tasks required to pursue sustainable technological change and barriers to overcome. The remaining points concern the role and responsibility of different key actors in the transition process, including private firms and government authorities. Each challenge involves specific issues, and the article provides hints on how to address and manage them, with solutions likely differing depending on national or regional contexts. The paper concludes by outlining key avenues for future research, emphasizing research that can assist a green socio-technical transition.

Dealing with Diffuse – and Ever More Global – Environmental Risks

Modern environmental policy began in the 1960s with stringent regulations on emissions into air and water, focusing primarily on stationary pollution sources like industrial plants, which were relatively easy to monitor and regulate. Early environmental policy emphasized local impacts, such as emissions into nearby river basins affecting other industries and households in the same community.

Over time, environmental challenges have increasingly targeted diffuse emissions from scattered sources like road transport, shipping, aviation, and agriculture. Pollution from diffuse sources

occurs over large areas and, individually, may not be of concern, but collectively, they can cause serious overall impacts. The growing importance of global environmental challenges like climate change, combined with globalization and increased international trade in consumer products, adds to this challenge. Managing these issues often requires international negotiations and burden-sharing, which have proven difficult, as illustrated by the challenges in reaching a stringent global climate agreement.

Diffuse emissions are typically difficult to monitor and regulate. For example, environmental authorities may wish to penalize improper disposal of waste products to reduce chemical risks, but such behavior is often clandestine and hard to detect. Plastic waste, stemming from millions of consumer products, is carried around the world by currents and winds, accumulating microplastics, particularly in the sea. Many dangerous substances, including chemicals like solvents and phthalates, are embedded in consumer products, many of which are imported. Monitoring the potential spread of these substances to humans and the natural environment remains challenging. Technological innovation that enables better tracing and tracking of materials should be a priority.

To address diffuse environmental impacts, society must find alternative, indirect ways of monitoring and regulating them. This could involve closing material cycles and promoting a circular economy, where the value of products, materials, and resources is maintained as long as possible. In practice, this means focusing on reduction, recycling, and re-use of virgin materials, material and energy efficiency, and sharing resources through digital platforms like Uber and Airbnb. Rather than regulating emissions as close to the damage done as possible, authorities may support specific activities (e.g., material recycling) and technologies (e.g., low-carbon production processes) that correlate with reduced environmental load.

Addressing diffuse emissions indirectly is not straightforward. National waste management strategies in several countries adhere to the waste hierarchy, which prioritizes waste prevention, followed by re-use, material recycling, recovery, and landfill. Although research has shown that this hierarchy is a reasonable rule of thumb from an environmental perspective, deviations can be justified in certain cases.

Encouraging recycling and reuse of products can be supported by product designs that factor in reparability and reusability. Improved recyclability can benefit from a modular product structure. However, challenges arise when companies manufacture products in ways that increase recycling costs for downstream processors, with no means for waste recovery facilities to incentivize manufacturers to change product designs. For example, multi-layer plastics for food packaging are often incompatible with mechanical recycling.

Promoting material and energy efficiency measures can address diffuse environmental impacts but may also lead to a rebound effect. Efficiency gains free resources, which can be used to increase production and consumption of other goods, partially canceling out the benefits. For instance, consumers who buy fuel-efficient cars may travel more or spend money saved on other products, leading to increased resource exploitation and emissions.

Focusing on circular economy solutions requires increased interdependency between different sectors of the economy, necessitating new collaborative models among companies and novel business models. However, achieving this can be challenging. For example, using excess heat from process industries for residential heating or greenhouses involves relation-specific investments, with returns dependent on the continuation of relationships. Companies may be too heterogeneous in terms of goals, business practices, and planning horizons, making long-term commitment difficult. Additionally, excess heat is a byproduct, meaning its supply is constrained by the production of the main product.

In summary, addressing diffuse emissions requires indirect pollution abatement strategies, which involve challenges such as product design barriers and rebound effects. Technological and organizational innovations are needed to improve tracing and tracking of hazardous substances and materials and provide stronger incentives for product design.

Achieving Radical – and Not Just Incremental – Sustainable Technological Change

Incremental innovations, such as increased material and energy efficiency in existing production processes, are essential for transitioning to a green economy. However, profound and radical technological innovation is also necessary. For example, replacing fossil fuels in the transport sector and iron and steel production requires fundamental technological shifts, not just incremental efficiency improvements.

Several factors make radical innovation inherently difficult. One obstacle is the risk facing firms that invest in technological development, combined with the limited ability of the capital market to handle long-term risk-taking. Capital markets may fail to provide risk management instruments for immature technology due to a lack of historical data to assess risks. Additionally, the deregulation of global financial markets has led private financial investors to take a more short-term view. Research suggests that agency problems within private firms may bias decision-making towards short-term payoffs, resulting in myopic behavior even in the presence of fully efficient capital markets.

Chapter 2. BASF's commitment to sustainability

BASF, a global leader in the chemical industry, is deeply committed to sustainability, integrating it into their corporate purpose, strategy, and operations. The company focuses on three pillars: the economy, environment, and society, aiming to contribute to a better world with enhanced quality of life for everyone. BASF's innovative solutions, such as renewable and chemically recycled raw materials, energy-efficient housing products, and sustainable battery materials, demonstrate their dedication to reducing environmental impact and promoting sustainable development. By 2030, BASF aims to have more than 50% of its sales attributable to Sustainable-Future Solutions, reflecting their strategic approach to creating value for customers, the environment, and society.

Sustainability is applied along the whole value chain that BASF is involved in, from sourcing the raw materials to respecting their employees and respecting the societies it operates in [8].



Figure 2. Sustainability at BASF (source: [Sustainability | BASF Turf Solutions Australia](#))

2.1 Sustainable Procurement

When procuring raw materials for its production, BASF is committed to being responsible, with 90% of the company's relevant spend undergoing sustainability evaluations by 2025. At the same time, BASF aims to leverage their buying power to improve the sustainability performance of up to 80% of its supplier base.

BASF's responsible procurement practices are integral to their commitment to sustainability, ensuring that their supply chain operations align with their environmental, social, and economic goals. The company emphasizes the importance of sustainable development by strengthening their suppliers' awareness of BASF's standards and expectations. This is achieved through initiatives

such as the Supplier Code of Conduct and the "Together for Sustainability" (TfS) initiative, which promotes sustainable practices across the chemical industry [9].

One of BASF's key strategies in responsible procurement is the sourcing of renewable raw materials. The company aims to continuously increase the share of renewable resources in their value chains, using materials like biomethane and bio-naphtha as alternatives to fossil resources. This approach not only reduces the carbon footprint but also supports the circular economy by integrating ecological and social principles into their sourcing practices. Additionally, BASF is committed to responsible sourcing of mineral raw materials, ensuring that their procurement processes prevent the financing of violence and human rights abuses, particularly in conflict-affected and high-risk areas [9].

BASF's Supplier CO₂ Management Program invites suppliers to join their efforts in reducing greenhouse gas emissions, contributing to BASF's ambitious targets of achieving net zero carbon emissions by 2050. By fostering partnerships based on mutual value creation and sustainability, BASF ensures a reliable supply of raw materials, technical goods, and services at competitive prices, while also promoting ethical and sustainable practices throughout their supply chain [9].

2.2 People and Sustainability

BASF places a strong emphasis on sustainability with regards to their people, integrating this focus into various aspects of employee engagement, development, diversity, inclusion, health, safety, and societal engagement. This comprehensive approach ensures that BASF not only meets its sustainability goals but also fosters a supportive and inclusive work environment.

Employee Engagement and Development

BASF recognizes the importance of employee engagement as a key factor for success. The company conducts regular global employee surveys and pulse checks to actively involve employees in shaping their work environment. The most recent survey revealed an engagement index of 82%, with a goal to maintain this score above 80%. Leaders are supported with follow-up measures to address specific needs and strengthen engagement, such as inclusion and flexible working arrangements during the pandemic.

Leadership development is also a priority at BASF. The company promotes high-quality leadership, expecting leaders to serve as role models and positively influence employee engagement. The CORE Leadership Values guide leadership behavior, aligning with BASF's strategic goals. Various learning and development opportunities are offered, including the CORE Leadership Upskilling program and regular feedback tools. Lifelong learning and individual

development are key at BASF, with a range of learning activities available, including digital formats, self-directed learning, and design thinking workshops.

Diversity and Inclusion

Diversity and inclusion are integral to BASF's strategy. The company values diversity and aims to reflect the global character of their markets among employees. Diverse teams boost performance, innovation, and creativity. BASF promotes diversity across all levels and expects inclusive conduct from all employees and leaders. Initiatives like the German Diversity Charter and the United Nations Global LGBTI Standards of Conduct for Business support this commitment [9].

BASF has set a global target to increase the proportion of women in leadership positions to 30% by 2030. As of 2021, the proportion of female leaders was 25.6%. Various initiatives support the advancement of women, including the United Nations' Women's Empowerment Principles (WEPs) and other external programs. Employee Resource Groups and activities raise awareness of diversity within the organization, fostering a working environment based on mutual respect, trust, and appreciation [9].

BASF Group employees by region

(Total: 111,047, of which 26.1% women, as of December 31, 2021)

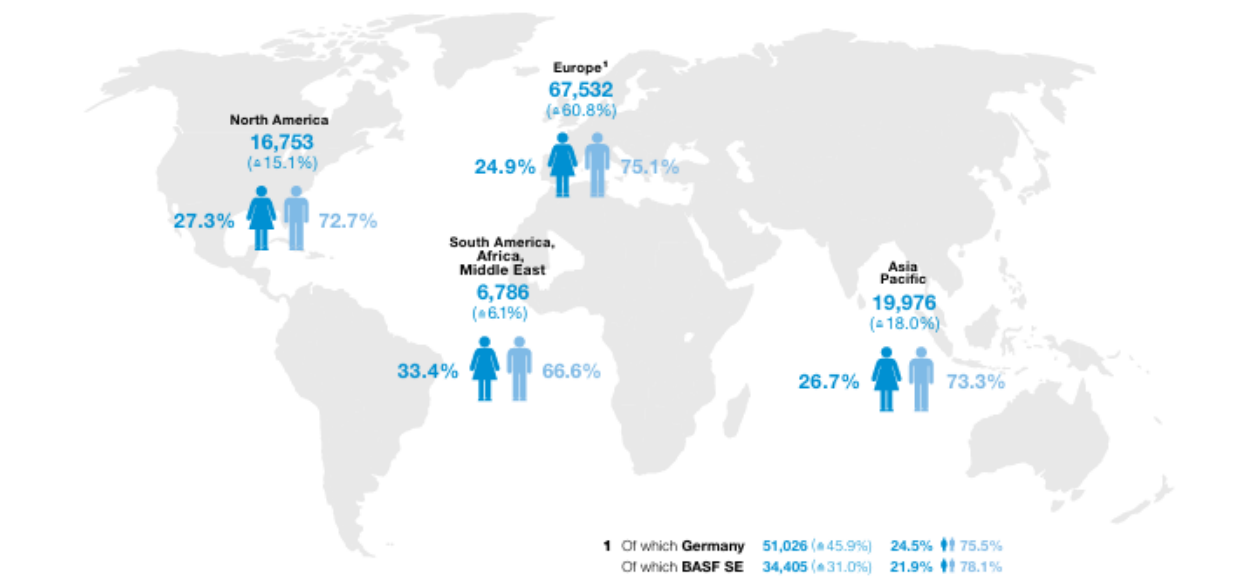


Figure 3. BASF Group employees by region (source: [Responsible Procurement - BASF Report 2021](#))

Health and Safety

Health and safety are top priorities for BASF. The company has a comprehensive health management system and conducts regular health checks, with a Health Performance Index (HPI) of 0.96 for 2021. Extensive measures were implemented during the COVID-19 pandemic, including a vaccination center at the Ludwigshafen site, where more than 22,000 primary vaccinations and over 21,000 secondary vaccinations were administered [9].

BASF supports work-life balance with flexible working hours, part-time employment, remote working, and time-off options. These offerings help employees manage work and personal life challenges, and regional initiatives address local needs, such as flexible co-working spaces and employee assistance programs [9].

Compensation and Benefits

BASF aims to attract and retain engaged employees with a total offer package that includes market-oriented compensation, development opportunities, and a good working environment. Compensation comprises fixed and variable components, with benefits often exceeding legal requirements. The company regularly reviews compensation systems to ensure competitiveness.

Most BASF employees participate in variable compensation components, linking their compensation to the company's economic success and individual performance. The BASF Group's return on capital employed (ROCE) is used to measure economic success for variable compensation purposes. The "plus" share program ensures employees' long-term participation in the company's success through incentive shares, with around 23,600 employees participating in 2021 [9].

Societal Engagement

BASF engages in societal activities to address community needs and help achieve the Sustainable Development Goals (SDGs). Their societal engagement strategy focuses on health, skills, and resources. Initiatives include the New Nets project to combat malaria and the Zero Hunger Private Sector Pledge to invest in food security and smallholder projects [9].

The company also provides support during natural disasters and crises. In 2021, BASF donated €1 million to flood relief in Germany and \$500,000 to disaster relief following Hurricane Ida in Louisiana, supporting employees affected by these disasters [9].

2.3 Sustainability in Production and product offerings

ChemCycling™

BASF's ChemCycling™ project is a pioneering initiative aimed at creating a circular economy for plastics through chemical recycling. This process involves converting plastic waste into pyrolysis oil, which can then be used as a secondary raw material in BASF's production processes. The pyrolysis oil is fed into BASF's Verbund production at the beginning of the value chain, thereby saving fossil resources and reducing greenhouse gas emissions [10].



Figure 4. ChemCycling Process (source: <https://renewable-carbon.eu/news/basf-quantafuel-and-remondis-want-to-cooperate-on-chemical-recycling-of-plastic-waste/>)

The ChemCycling™ project focuses on plastic waste that is not suitable for mechanical recycling due to technological, economic, or ecological reasons. This includes plastics with residues, mixed plastic waste fractions, and end-of-life tires. By using a third-party audited mass balance approach, the share of recycled feedstock is attributed to products manufactured in the Verbund. These mass-balanced Cycled™ products are independently certified and have the same properties as conventional products, allowing them to be used in demanding applications such as food packaging, medical, textile, and automotive industries. BASF has established partnerships with

companies like Quantafuel, ARCUS, Pyrum, and New Energy, which specialize in the pyrolysis of mixed plastic waste and end-of-life tires. These partnerships are crucial for establishing a broad supply base for pyrolysis oil and offering customers certified products from chemical recycling on a commercial scale [10].

Overall, ChemCycling™ represents a significant step towards a more sustainable and circular economy for plastics, addressing the global challenge of plastic waste and contributing to the reduction of fossil resource consumption and greenhouse gas emissions [10].

The Biomass Balance (BMB) approach

The Biomass Balance (BMB) approach employed by BASF is an innovative method that integrates renewable raw materials into the chemical production process. This approach allows BASF to replace fossil resources with renewable feedstocks, such as bio-naphtha or biogas derived from organic waste, at the very beginning of the production chain. The renewable feedstocks are then allocated to specific products using a third-party audited mass balance method, ensuring that the share of renewable resources is accurately accounted for throughout the production process [11].

Biomass Balance Approach - How does it work?

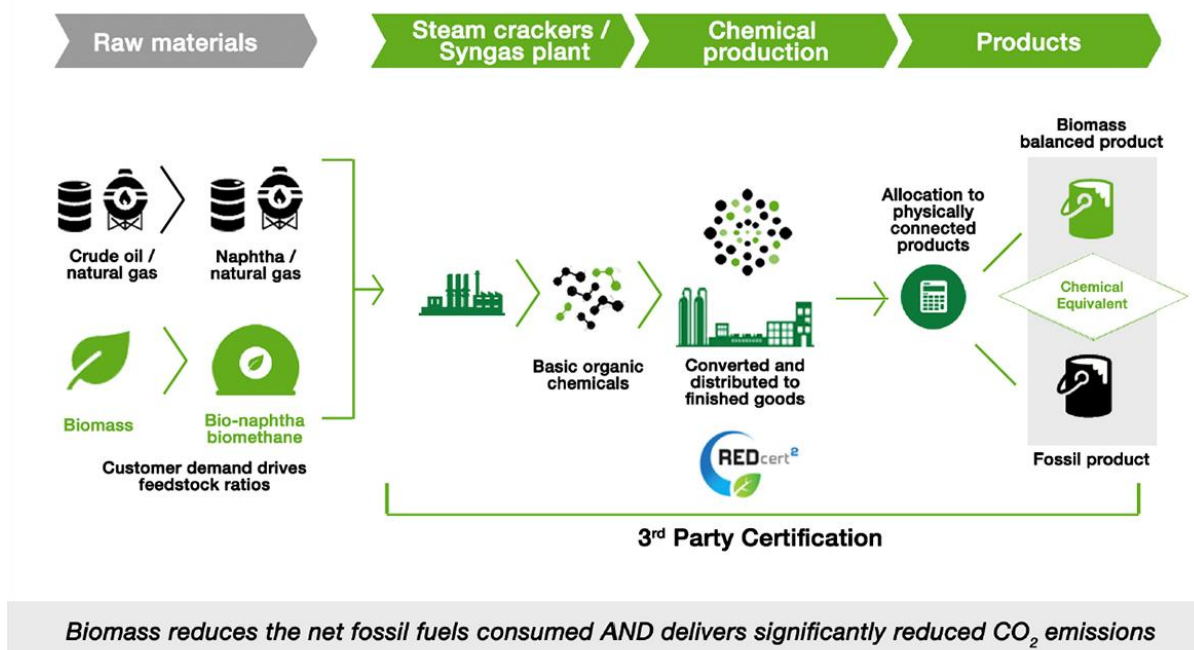


Figure 5. BMB approach (source: <https://www.pcimag.com/articles/112429-biomass-balance>)

The BMB approach offers several significant benefits. Firstly, it helps to reduce CO₂ emissions by substituting fossil resources with renewable raw materials. This substitution leads to a lower carbon footprint for the final products without compromising their quality or performance. Secondly, the BMB approach supports the conservation of fossil resources, contributing to a more sustainable and circular economy. By using renewable feedstocks, BASF can produce high-quality products that meet the same standards as those made from conventional fossil resources [11].

BASF's biomass-balanced products are certified according to recognized standards such as the International Sustainability and Carbon Certification (ISCC Plus) or REDcert. This certification ensures transparency and traceability of the renewable content in the products, providing customers with confidence in the sustainability of their purchases. These products offer the same properties and performance as their conventional counterparts but with a significantly lower carbon footprint [11].

The BMB approach is part of BASF's broader strategy to promote sustainability and reduce the environmental impact of its products and production processes. By integrating renewable raw

materials into its production system, BASF is taking significant steps towards achieving its sustainability goals and supporting the transition to a more sustainable and circular economy [11].

Biobased Products

In addition to recycled or mass balanced products, BASF offers biobased solutions as well for many industries. A few examples follow below:

- **Bio-EA:** Ethyl Acrylate (EA) is an acrylic monomer used in a wide variety of polymer dispersions, which are the basis for coatings and adhesives production. As of late 2024, BASF has switched to bio-based EA, completely substituting its fossil equivalent. To produce bio-EA, BASF uses bio ethanol sourced predominantly from Europe. The raw material comes from residues of starch production, lower quality grains or molasses, feedstocks which are not competitive to food or feed. The products guarantee 40% of 14C-traceable content and a 30% Product Carbon Footprint Reduction compared to fossil-based EA [12].
- **ecovio®:** this is a pioneering bioblastic which combines compostability and biobased content. It consists of the biodegradable polymer ecoflex® and polylactic acid which is derived from corn starch or other renewable sources, thereby reducing carbon emissions [13]. ecovio® finds applications in organic waste bags, agricultural films and other fields [14].
- **2 Octyl Acrylate:** an acrylic monomer produced from 2-octanol. This is a bio-alcohol derived from castor oil, which is a non-edible raw material. This renewable feedstock replaces fossil-based octanol, resulting in reduced product carbon footprint and a 73% of 14C-traceable biobased content.

Chapter 3. Effect of Sustainability on Brand and Customers

In recent years, sustainability has emerged as a critical factor influencing brand reputation and customer loyalty. Companies that integrate environmental, social, and governance (ESG) factors into their operations not only enhance their corporate image but also build stronger relationships with their customers. This analysis explores the impact of sustainability on brand reputation and customer loyalty, drawing insights from various sources.

3.1 Effect of Sustainability on Brand and Customers

Sustainability management significantly enhances a brand's reputation by aligning corporate practices with the growing environmental and social consciousness of consumers. According to Sigma Earth, integrating sustainability into business operations can lead to increased consumer trust and loyalty, particularly among millennials and Generation Z [15]. These demographics are more likely to support brands that demonstrate a genuine commitment to sustainable practices, thereby enhancing the brand's reputation.

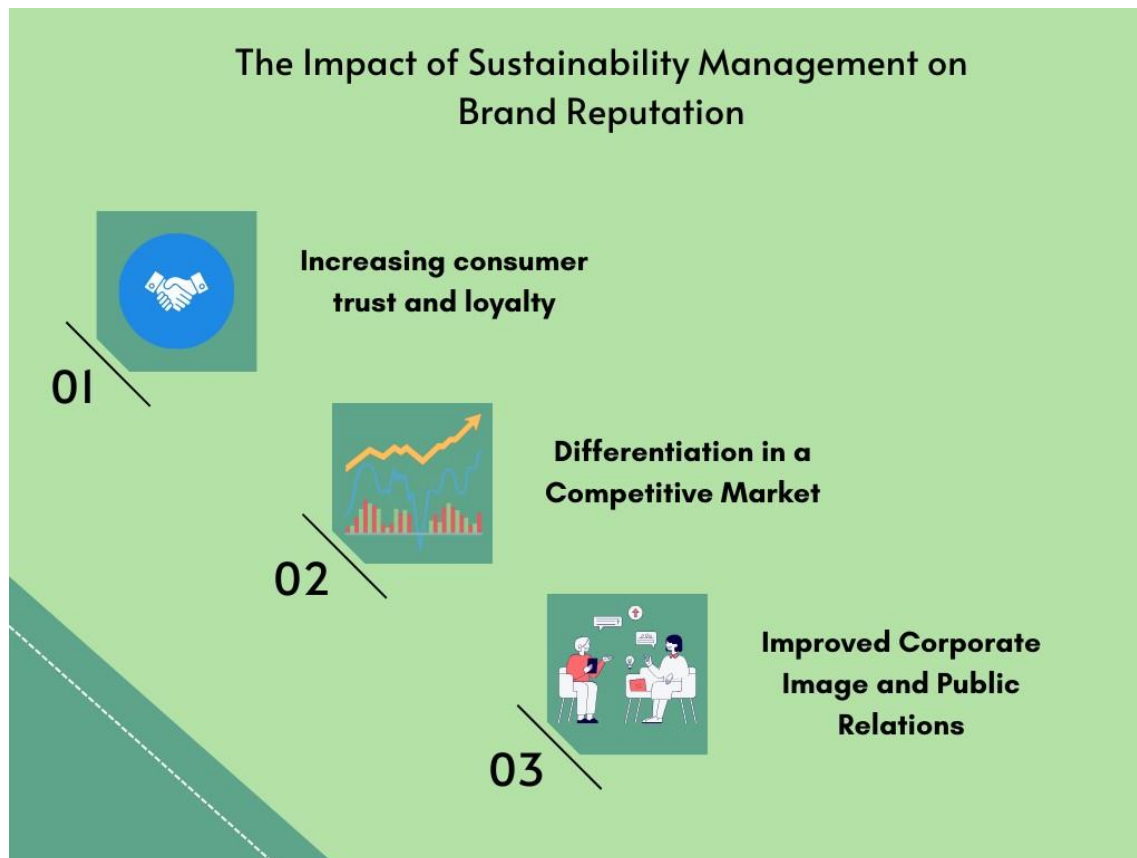


Figure 6. The Impact Of Sustainability Management On Brand Reputation [15].

Moreover, sustainability serves as a critical differentiator in competitive markets. Brands that adopt sustainable practices can stand out from their competitors, attracting positive media attention and public endorsements. This improved corporate image not only helps in gaining new customers but also in retaining existing ones [15].

Research from Harvard Business Review highlights a significant shift in consumer behavior, where sustainability is becoming a baseline requirement for purchase decisions [15].

Consumers, especially younger generations, are increasingly prioritizing brands that make good on their promises to people and the planet. This shift is driven by three main factors: trust, the promotion of sustainability, and the purchasing power of younger generations. Brands that fail to meet these rising demands risk losing their competitive edge [15].

The emphasis on sustainability also promotes trust among consumers. Trust is a crucial driver of consumer behavior and business outcomes. Companies that invest in sustainable practices are more likely to build and maintain trust with their customers, leading to enhanced brand loyalty [15].

Customer satisfaction and retention are closely linked to a company's sustainability efforts. As noted by Global Banking and Finance, businesses that prioritize customer satisfaction through sustainable practices can significantly impact their long-term success. Satisfied customers are more likely to make repeat purchases, advocate for the brand, and contribute to positive word-of-mouth marketing [16].

Furthermore, sustainability-driven customer satisfaction reduces churn rates and marketing costs. Companies that focus on meeting and exceeding customer expectations through sustainable practices can foster deeper emotional connections with their customers. These emotional connections are vital for building long-term loyalty and ensuring sustained growth [16].

3.2 Effect of Greenwashing

Greenwashing refers to the practice of companies making misleading claims about the environmental benefits of their products or practices. This can range from overstating the sustainability of a product to outright falsehoods about a company's environmental impact. According to Harvard Business Review, research in Europe found that 42% of green claims were exaggerated, false, or deceptive, highlighting the prevalence of greenwashing on an industrial scale. This deceptive practice can lead to significant reputational damage as consumers become more aware and skeptical of corporate sustainability claims [18].

As consumers become more environmentally conscious, their expectations for corporate sustainability have increased. However, this heightened awareness also brings greater scrutiny. The Journal of Business Ethics notes that perceived greenwashing can lead to lower customer satisfaction because it is often viewed as corporate hypocrisy. When companies fail to deliver on their promised socially responsible actions, they risk damaging their relationships with customers. This skepticism is further fueled by the proliferation of information intermediaries that rate companies on their ESG performance, making it easier for consumers to identify and call out greenwashing [19].

Greenwashing can have a devastating impact on a company's brand reputation. When consumers feel cheated or misled by false environmental claims, their trust in the brand erodes. Askel

Sustainability Solutions highlights that being outed for greenwashing can lead to a decline in sales and customer loyalty. This loss of trust can be particularly damaging in competitive markets where brand reputation is a key differentiator. Companies that engage in greenwashing not only risk losing their existing customer base but also face challenges in attracting new customers who are increasingly prioritizing genuine sustainability efforts [20].

The chemical industry, with its significant environmental footprint, is particularly vulnerable to accusations of greenwashing. A study published in the International Journal of Financial Management and Research (IJFMR) discusses the ethical considerations of greenwashing in the chemical sector and its impact on corporate reputation. The study emphasizes that greenwashing can lead to long-term consequences such as legal liabilities, reputational damage, and financial instability. For example, companies that falsely claim to use environmentally friendly processes or materials may face backlash from both consumers and regulatory bodies, leading to a loss of credibility and trust.

Media plays a crucial role in shaping public perception of corporate sustainability efforts. Positive media coverage can enhance a company's reputation, while negative coverage can amplify the impact of greenwashing scandals. According to Harvard Business Review, companies that overcommit and fail to deliver on their sustainability promises often face intense media scrutiny, which can further damage their reputation. This negative publicity can have a ripple effect, influencing not only consumer perceptions but also investor confidence and employee morale [18].

Trust is a fundamental driver of customer loyalty, and greenwashing can severely undermine this trust. Research from the Journal of Business Ethics indicates that customers perceive greenwashing as a form of corporate hypocrisy, which can lead to lower satisfaction and loyalty. When customers feel that a company is not being honest about its environmental efforts, they are less likely to remain loyal and may even switch to competitors who are perceived as more transparent and genuine in their sustainability initiatives [19].

The financial implications of greenwashing extend beyond immediate sales losses. Companies that engage in greenwashing may face long-term financial instability due to legal liabilities, regulatory fines, and increased scrutiny from investors. The IJFMR study highlights that greenwashing can lead to a loss of investor confidence, which can impact a company's stock price and overall financial performance. Additionally, companies may incur significant costs in rebranding and rebuilding their reputation after a greenwashing scandal.

To avoid the pitfalls of greenwashing, companies must adopt genuine and transparent sustainability practices. This includes setting realistic and achievable sustainability goals, regularly reporting on progress, and being honest about challenges and setbacks. According to Askel Sustainability Solutions, companies should focus on building a culture of sustainability that

permeates all aspects of their operations. This approach not only helps in avoiding greenwashing but also enhances overall corporate reputation and customer loyalty [20].

In conclusion, greenwashing poses significant risks to brand reputation and customer loyalty. As consumers become more environmentally conscious, they are also more vigilant in scrutinizing corporate sustainability claims. Companies that engage in greenwashing risk losing consumer trust, facing legal and financial repercussions, and damaging their long-term reputation. To build and maintain trust, companies must prioritize genuine sustainability efforts and transparent communication. By doing so, they can enhance their brand reputation, foster customer loyalty, and achieve sustainable growth.

Chapter 4. Overview of global regulations affecting BASF's sustainability efforts.

Chapter 4.1. Environmental Regulations

The Paris Agreement

The Paris Agreement, adopted in December 2015 during the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC), is a landmark international treaty aimed at addressing climate change. The agreement's primary goal is to limit global warming to well below 2°C above pre-industrial levels, with efforts to limit the temperature increase to 1.5°C. This ambitious target is crucial for mitigating the severe impacts of climate change, such as more frequent and intense droughts, heatwaves, and extreme weather events [21].

PARIS CLIMATE AGREEMENT



Figure 7. Paris Climate Agreement (source: <https://sustainability.yale.edu/explainers/yale-experts-explain-paris-climate-agreement>)

Key Objectives and Mechanisms

The Paris Agreement establishes a framework for countries to set and communicate their climate action plans, known as Nationally Determined Contributions (NDCs). These NDCs outline the actions each country will take to reduce greenhouse gas emissions and adapt to the impacts of climate change. Countries are required to submit updated NDCs every five years, with each successive submission reflecting increased ambition and commitment to climate action. The agreement also encourages countries to develop long-term low greenhouse gas emission development strategies (LT-LEDS) to provide a vision for sustainable development and align national policies with global climate goals [21].

Support for Developing Countries

Recognizing the varying capabilities and responsibilities of countries, the Paris Agreement provides a framework for financial, technical, and capacity-building support to help developing countries implement their climate action plans. Developed countries are encouraged to provide financial resources to assist developing countries in their mitigation and adaptation efforts. This support is essential for ensuring that all countries can contribute to global climate goals and build resilience to the impacts of climate change [21].

Global Stocktake and Transparency

The Paris Agreement includes a robust transparency framework to ensure accountability and track progress towards achieving its goals. Every five years, a global stocktake assesses collective progress and informs the updating and enhancement of NDCs. This process encourages countries to continuously improve their climate actions and provides a mechanism for international cooperation and support. The transparency framework also includes provisions for reporting and review, enabling countries to share information on their climate actions and track their progress [21].

As a global leader in the chemical industry, BASF is significantly impacted by the Paris Agreement. The company has aligned its sustainability strategy with the agreement's goals, committing to ambitious targets for reducing greenhouse gas emissions. BASF aims to achieve net-zero emissions by 2050 and has set interim targets to reduce emissions by 25% by 2030 compared to 2018 levels. These targets are part of BASF's broader commitment to climate protection and sustainable development [22].

BASF's efforts to reduce emissions include investing in renewable energy, developing innovative low-carbon technologies, and enhancing energy efficiency in its production processes. For example, BASF is exploring the use of electric resistance heating for steam cracker furnaces, which could significantly reduce process-related emissions. The company is also investing in renewable energy projects, such as the Hollandse Kust Zuid offshore wind farm, to power its production sites with green electricity [22].

In addition to reducing its own emissions, BASF is actively involved in initiatives that promote global climate action. The company is a member of the Alliance of CEO Climate Leaders, a coalition of CEOs committed to advancing corporate climate action in line with the Paris Agreement. BASF also participates in the Business 20 (B20) task force on Energy, Climate & Resource Efficiency, advocating for ambitious global climate policies and supporting the implementation of the Paris Agreement [23].

The European Green Deal

The European Green Deal, announced by the European Commission in December 2019, aims to make the EU climate-neutral by 2050. This ambitious plan has significantly impacted BASF's sustainability efforts. BASF supports the objectives of the Green Deal and Europe's ambition to achieve climate neutrality. The Green Deal's focus on sustainability and climate protection aligns with BASF's commitment to reducing its environmental footprint and promoting sustainable practices. One of the key areas where the Green Deal has influenced BASF is in the transition to a clean, circular economy. BASF has been actively working on innovations that contribute to climate protection, such as insulation materials for energy-efficient housing and battery materials for electromobility. These innovations are essential for enhancing climate protection efforts and

are in line with the Green Deal's goals [24]. BASF's Sustainable Solution Steering program continuously assesses and improves the sustainability of its product portfolio, ensuring that its products meet the stringent requirements of the Green Deal [25].



Figure 8. European Green Deal (source: [GREEN GROWTH AND THE ENVIRONMENT - EU-ASEAN](#))

The Green Deal also emphasizes the importance of reducing greenhouse gas emissions. BASF has established its Carbon Management Program to develop new technologies aimed at reducing carbon emissions from chemical production. This includes using renewable electricity and completely new processes, such as producing clean hydrogen. These efforts are crucial for achieving the deep transformation required to meet the Green Deal's targets. Since 1990, BASF has already halved its greenhouse gas emissions in absolute terms while doubling its production, demonstrating its commitment to sustainability [25].

Furthermore, the Green Deal's focus on sustainable industry has prompted BASF to invest in low-carbon process innovations and CO₂ abatement technologies. The company is working on developing new technologies that will enable it to switch to low-emission production. However, the technological challenges are enormous, and BASF expects to have these new technologies ready for implementation from around 2030 onwards. The availability and competitive pricing of

renewable energy are critical factors for the success of these technologies, and BASF is advocating for the removal of additional levies and surcharges on renewable electricity [25]

In addition to technological advancements, the Green Deal has also influenced BASF's approach to recycling. The company supports recycling approaches that are complementary and technology-neutral, incentivizing high-quality mechanical, organic, and chemical recycling. This aligns with the Green Deal's goal of promoting a circular economy and reducing waste. BASF's commitment to life cycle thinking and its existing portfolio sustainability assessment schemes further support the Green Deal's objectives [24].

Overall, the European Green Deal has had a profound impact on BASF's sustainability efforts. By aligning its strategies with the Green Deal's goals, BASF is not only ensuring compliance with regulatory requirements but also driving innovation and contributing to a sustainable future. The company's proactive approach to sustainability and its continuous efforts to develop and implement new technologies demonstrate its commitment to achieving the ambitious targets set by the European Green Deal [24],[25].

The European Union (EU) is often described as a "regulatory superpower," capable of influencing the behavior of public officials and private-sector actors far beyond its own borders. European regulations shape the regulatory practices of other governments, and firms serving multiple export markets frequently adopt European standards to minimize compliance burdens. This regulatory norm-shaping power, known as the "Brussels effect," reflects not only the size of the EU market—one of the largest globally in terms of economic value—but also the ambition of European regulators and their tendency to set standards that outpace those of other leading economies across various policy domains.

The Brussels effect is particularly evident in climate and sustainability policy, where the EU has long been a global leader in ambition. The European Green Deal (EGD), a comprehensive regulatory and investment package aiming to make Europe a net-zero emitter by 2050, has positioned the continent as a global standard-setter in areas such as fuel and energy efficiency, building construction, agricultural and forestry practices, and heating and cooling systems. The EGD builds on existing high standards in these areas and the decarbonization incentives provided by the EU Emissions Trading System, the world's oldest greenhouse gas emissions trading scheme.

The EU's climate ambition has led to a growing emphasis on emissions reduction in European trade policy, extending the Brussels effect to the emerging field of "green trade." Trade policy has traditionally reinforced EU regulatory practices both domestically and internationally by setting conditions for accessing the European market, typically through import restrictions and the inclusion of baseline environmental, labor, safety, and privacy standards in free trade agreements (FTAs). As the European Commission noted in a recent communication, "Thanks to the common commercial policy, the EU speaks with one voice on the global scene. This is a unique lever."

In conjunction with the EGD, European policymakers have repurposed trade tools to support European decarbonization efforts and encourage climate action among trading partners, most

notably through the adoption of the world's first carbon tariff, the EU Carbon Border Adjustment Mechanism. These initiatives have garnered both praise and criticism from governments, civil society groups, and private-sector actors worldwide. They have also sparked discussions about the best ways to align trade and climate policies among leading economies and multilateral forums such as the World Trade Organization (WTO) and the United Nations Framework Convention on Climate Change (UNFCCC), which govern and facilitate policy cooperation in these areas.

Europe's pioneering role in green trade means that the success of its policies, both in terms of reducing the continent's carbon footprint and persuading trading partners to adopt similar measures, has significant implications for the future of the global trade system and a coordinated international approach to the green transition.

Europe's assertive approach to climate-aligned trade is advancing during a period of upheaval and tension on both sides of the Atlantic. President Donald Trump's return to the White House has brought pledges to reverse climate action, roll back investments in the energy transition domestically and internationally, and impose broad tariffs and trade restrictions on both adversaries and allies, including the EU. This shift in U.S. climate policy and the antagonism in U.S. trade policy will likely erode U.S. diplomatic influence and prompt spurned trade partners to seek new markets and supply chain relationships.

In this context, Europe's significant influence and commitment to an open global trading order present both opportunities and risks. If successful, the EU's approach could serve as a model for integrating climate goals into trade policies, encouraging other major economies to adopt similar or harmonized measures that drive global momentum toward decarbonization. However, poorly designed, uncoordinated approaches could exacerbate trade tensions, fragment markets, and disproportionately burden emerging markets and developing economies with compliance costs. As Brussels navigates this complex landscape, it will need to carefully balance climate ambition with its trade relationships. This paper examines these policies, the motivations behind them, and the opportunities and risks they present for European industry and consumers amid an uncertain international economic outlook.

Chapter 4.2. Social Regulations

BASF's sustainability initiatives are significantly shaped by various social regulations. These regulations ensure that the company not only meets environmental standards but also contributes positively to society. In several countries, companies are required to allocate a portion of their profits to social and environmental projects. For instance, India mandates that companies spend at least 2% of their average net profits on CSR activities. This drives BASF to invest in community development, education, and health initiatives [26]. In regions like the EU, while CSR spending

isn't mandatory, companies are encouraged to report their CSR activities. This transparency builds trust and showcases BASF's commitment to societal well-being [27].

Regulations ensure that BASF maintains high standards for worker health and safety. This includes providing safe working conditions, regular health check-ups, and training programs. Laws against child labor, forced labor, and discrimination require BASF to uphold ethical labor practices. This fosters a positive work environment and enhances employee satisfaction and productivity [28]. Regulations often encourage companies to engage with local communities. BASF's societal engagement includes initiatives like educational programs, health campaigns, and environmental conservation projects [26]. Social regulations promote collaboration with NGOs, local governments, and other stakeholders. BASF partners with various organizations to address societal challenges and contribute to sustainable development [27].

In the EU, companies are required to disclose non-financial information, including social and environmental impacts. BASF's comprehensive sustainability reports highlight its efforts in areas like community engagement, labor practices, and CSR activities [27]. BASF adheres to GRI standards, ensuring that its sustainability reporting is transparent, consistent, and comparable. Global anti-corruption regulations mandate that BASF conducts business ethically and transparently. This includes implementing anti-corruption policies, conducting regular audits, and training employees on ethical practices [28].

Historically, climate considerations have not been central to trade policy or the global trade system. None of the 60 legal agreements that form the WTO system mention climate, and most FTAs are similarly silent on the issue. Although environmental standards that do not specifically reference climate have become more common in FTAs over the past two decades, there is still no established expectation that trade policy should address environmental impacts. As WTO Deputy Director General and former French WTO Ambassador Jean Marie Paugam noted in 2024, “For a long time, the environment was treated with a form of benign neglect by trade negotiators: environmental losses were often considered unfortunate externalities to be corrected by non-trade measures and policies.”

This omission is notable given trade's significant contributions to—and potential role in mitigating—climate change. According to the WTO, trade accounts for approximately 20%-30% of global emissions, primarily due to the direct and indirect emissions associated with the manufacturing of widely-traded industrial goods like steel and aluminum and the fuels used in their transportation across borders. Economic integration through WTO accession and FTAs has been found to increase emissions among trading partners by stimulating demand for carbon-intensive primary commodities and downstream products such as automobiles and aircraft. Reduced trade barriers, combined with greater capital mobility, heighten the risk of manufacturing migrating to jurisdictions with weaker climate regulations, a phenomenon known as “carbon leakage.”

This situation is largely a result of timing. The modern global trade system emerged before most governments recognized and took seriously the threat of climate change. Since then, institutional inertia and a lack of consensus on the role of climate in trade policy have hindered the reform of trade rules to create policy space for climate ambition. The WTO has not concluded a significant agreement in two decades, and even today, some members argue that the organization's mandate does not include addressing climate change. Members of other multilateral forums like the UNFCCC and G20 have attempted to address the climate-trade nexus, but these efforts are still in their early stages and have produced few tangible results.

The trade system's indifference to climate change represents a missed opportunity for Europe, perhaps more so than for any other major economy, given its "regulatory superpower" status. For decades, European leaders have sought to elevate global climate ambition through stringent regulation, diplomatic engagement, and foreign assistance and lending. Aligning EU trade policy with climate action is a logical extension of these efforts for several reasons:

Europe's greenhouse gas footprint extends beyond its borders. The continent is deeply integrated into transnational value chains, and European consumer and industrial demand drives commercial and agricultural activity worldwide. The EU, with its carbon market and strong environmental regulations, faces a significant risk of carbon leakage, exacerbating concerns over deindustrialization amid high energy prices. By leveraging its substantial market power, Europe can encourage greener production elsewhere, disrupting an unsustainable race to the bottom and ensuring that carbon-intensive production methods do not provide a competitive advantage for imports into the European market. Trade policy is a relatively underutilized climate tool. At a time when conventional approaches to reducing emissions, such as diplomacy and finance, are yielding diminishing returns internationally, trade policy offers new tools and incentives to catalyze climate ambition. Europe, like virtually every other region, cannot source the goods and services needed to power a decarbonized economy solely from domestic suppliers. FTAs and other trade arrangements can contribute to robust and cost-effective clean energy supply chains. Trade can alleviate consumer burdens associated with the green transition. New circularity and energy efficiency requirements may have inflationary impacts in sectors like construction, agriculture, and electronics. Trade policy can potentially mitigate these impacts by reducing tariffs and fostering greater competition along clean energy supply chains. Why Brussels (finally) embraced green trade: Climate, competitiveness, and cost The European Commission acknowledged the separation of trade from climate and other environmental concerns in a 2021 Trade Policy Review, which stated that "the EU needs a new trade policy strategy – one that will support achieving its domestic and external policy objectives and promote greater sustainability." Under the leadership of President Ursula von der Leyen, the commission has responded by designing and adopting a range of climate-aligned trade policies, such as the Carbon Border Adjustment Mechanism, new environmental standards and due diligence requirements for goods imported into the European market, and binding climate commitments in FTAs.

This shift reflects Europe's broader policy reorientation towards rapid decarbonization under the EGD, which aims to make sustainability a core feature of the European economic model and mainstream climate ambition across numerous policy areas to meet 2050 targets under the Paris Agreement. It is not surprising that European trade policy, Brussels' "unique lever," has been affected by this recalibration.

However, climate leadership is not the only reason for Europe's embrace of green trade. Trade policy is also seen as a means of addressing growing concerns about European competitiveness amid waning support for the EGD. From the outset, European leaders have presented the EGD not just as an emissions reduction strategy, but also as a framework for economic recovery and growth following the COVID-19 pandemic and eurozone sovereign debt crisis. The hope in Brussels is that burgeoning clean energy industries and the eventual cost reductions from the transition to renewable power and energy-efficient goods and materials will lead to economic expansion. As the European Commission stated, "The European Green Deal will transform the EU into a modern, resource-efficient and competitive economy."

Recent European politics have questioned this vision for climate-aligned growth. In the last EU-wide elections, EGD supporters, including the European Greens, suffered significant electoral losses, and the European People's Party, von der Leyen's political home, has increasingly criticized climate and clean energy goals—and the EGD itself. Critics argue that the regulatory burdens and costs associated with the transition to net zero have put European firms at a competitive disadvantage compared to foreign competition. These concerns are particularly acute for hard-to-abate industrial sectors, which will face increased exposure under the EU Emissions Trading System. Given these concerns, it is not surprising that Brussels sees value in trade policies that neutralize the cost advantage enjoyed by exporters from countries with low environmental standards and enhance access to critical minerals and other key commodities.

It is notable that Brussels has maintained its climate ambition despite concerns about industrial competitiveness. In February, the European Commission announced its "Clean Industrial Deal," a comprehensive strategy aimed at reversing the continent's declining industrial manufacturing sector. European energy costs have remained high since the Russian full-scale invasion of Ukraine, after which Moscow halted nearly all flows of piped gas. These higher costs have made European industrial production less globally competitive and prompted Brussels to focus on reducing them. The plan seeks to address these concerns without significantly departing from European climate goals. Von der Leyen still views decarbonization as a means to bolster European manufacturing, though Europe is neither on track to meet its 2030 climate goals nor achieve zero emissions by 2050.

Beyond the EGD, two external factors have also encouraged the adoption of climate-aligned trade policies. The first is the Russian invasion of Ukraine and the resulting volatility in European energy costs, which has added urgency to building a diversified and resilient European energy base and improving economy-wide energy efficiency. The second is the United States' shift towards industrial policy under the Biden administration, particularly the Inflation Reduction Act, which

has increased demand for critical minerals and other inputs for renewable power generation and zero-emissions transportation. Both developments have pressured European governments and firms to preserve and enhance economic competitiveness, especially in energy-intensive industries; maintain and expand relationships with exporters of raw materials and clean energy products; and neutralize the cost advantage foreign firms may gain from cheap and abundant power.

Chapter 4.3. Governance Regulations

Governance regulations play a crucial role in shaping BASF's sustainability efforts. These regulations ensure that the company operates transparently, ethically, and responsibly, fostering trust among stakeholders and driving sustainable growth. BASF adheres to the German Corporate Governance Code (GCGC), which sets standards for responsible corporate governance. This includes transparent management practices, effective supervision, and the integration of sustainability into corporate strategies. BASF's two-tier governance system, comprising the Board of Executive Directors and the Supervisory Board, ensures a clear separation of management and oversight functions. This structure promotes accountability and strategic decision-making aligned with sustainability goals [29].

In the EU, companies are required to disclose non-financial information, including environmental, social, and governance (ESG) impacts. BASF's sustainability reports provide detailed insights into its ESG performance, enhancing transparency and stakeholder trust. BASF follows GRI standards for sustainability reporting, ensuring comprehensive and comparable disclosures [28]. BASF's Code of Conduct outlines ethical business practices and compliance with legal regulations. This code is mandatory for all employees and helps prevent compliance violations through regular training and audits. Governance regulations require BASF to implement robust anti-corruption policies. This includes conducting regular audits, training employees on ethical practices, and maintaining a zero-tolerance approach to corruption [31].

BASF is committed to respecting human rights across its operations and supply chains. Governance regulations mandate due diligence processes to identify, prevent, and mitigate human rights risks. BASF adheres to the core labor standards of the International Labor Organization (ILO) and other international guidelines, ensuring fair labor practices and promoting worker welfare [28]. Governance regulations ensure that shareholders have rights to co-administration and supervision at the Annual Shareholders' Meeting. This promotes transparency and accountability in BASF's decision-making processes. BASF engages with various stakeholders, including investors, customers, employees, and communities, to address sustainability challenges and drive collective action [31].

Chapter 5. Challenges and Opportunities

As BASF continues to implement its sustainability strategy, the company faces a dynamic landscape filled with both challenges and opportunities. The pursuit of sustainability is not only a response to regulatory pressures but also a strategic decision that can drive innovation, enhance brand reputation, and create long-term value. This chapter explores the key challenges BASF encounters in its efforts to integrate sustainability into its operations and business practices. It also highlights the opportunities that arise from these efforts, demonstrating how sustainability can serve as a catalyst for growth and competitive advantage.

5.1 Challenges

Implementing a comprehensive sustainability strategy is a complex endeavor for BASF, given the multifaceted nature of the chemical industry and the stringent regulatory environment.

One of the most significant challenges for BASF is navigating the complex landscape of environmental regulations. The European Green Deal, REACH, and the EU Emissions Trading System (ETS) impose stringent requirements on emissions, waste management, and resource efficiency. Compliance with these regulations requires substantial investments in new technologies and processes. For instance, the Green Deal's ambitious targets for reducing greenhouse gas emissions compel BASF to innovate continuously and adopt cleaner technologies. This regulatory pressure drives BASF to set its own ambitious targets, such as achieving net-zero CO₂ emissions by 2050 and reducing greenhouse gas emissions by 25% by 2030 compared to 2018 levels [8].

Developing and implementing sustainable technologies is inherently costly. BASF's commitment to sustainability involves significant financial investments in research and development (R&D) to create innovative solutions that meet regulatory standards and market demands. Projects like ChemCycling™, which focuses on chemical recycling of plastic waste, require substantial funding to develop and scale. Additionally, transitioning to renewable energy sources and developing new processes to reduce carbon emissions are capital-intensive endeavors. Balancing these investments with maintaining profitability is a constant challenge for BASF [32].

One great example of investment towards sustainability is the battery recycling factory in Schwarzheide, Germany. A state-of-the-art facility that co-locates battery material production and recycling. This plant focuses on producing high-performance cathode active materials and recycling end-of-life batteries to produce black mass, which contains valuable metals like lithium, nickel, cobalt, and manganese. The cost of this project is estimated to be around €100 million [33].

In addition to its battery recycling efforts, BASF has invested heavily in green energy projects. One notable example is the Hollandse Kust Zuid offshore wind farm in the Dutch North Sea, where

BASF holds a 49.5% stake. This wind farm, operational since 2023, is the world's first subsidy-free offshore wind farm and has a total capacity of 1.5 gigawatts. BASF's investment in this project amounts to approximately €1.6 billion. BASF also secured a long-term Power Purchase Agreement (PPA) with Ørsted for renewable power from the Borkum Riffgrund 3 wind farm in the German North Sea, expected to be fully operational by 2026 [34]. Additionally, BASF has commissioned a 54-megawatt water electrolyzer at its Ludwigshafen site, producing zero-carbon hydrogen and reducing greenhouse gas emissions by up to 72,000 metric tons per year. The cost of the water electrolyzer project is around €25 million [35].

Ensuring sustainability across the entire supply chain is another critical challenge for BASF. The company must work closely with suppliers to improve their sustainability performance and ensure compliance with sustainability standards. This involves assessing and managing the environmental and social impacts of suppliers' operations, which can be complex and resource-intensive. BASF's Supplier Code of Conduct and initiatives like "Together for Sustainability" (TfS) aim to promote sustainable practices across the chemical industry, but achieving widespread compliance and improvement remains a challenging task [9].














Sustainability pathway	Companies	Examples
1 LC hydrogen and ammonia	    	<ul style="list-style-type: none"> ExxonMobil is planning 1 bcfd blue hydrogen production at their Baytown, TX facility Yara is planning a 1.4 million tpa blue ammonia project in Ingleside, TX Sinopec will produce 30,000 tpa of green hydrogen in Inner Mongolia Air Products has multiple large-scale green and blue hydrogen/ammonia projects in development Lotte Chemical has a blue and green ammonia project that combined will produce 10 million tpa of clean ammonia in Corpus Christi, TX
2 Plastics recycling	  	<ul style="list-style-type: none"> Reliance Industries is designing a commercial-scale catalytic pyrolysis plant for plastics recycling Eastman Chemical has invested \$2 billion in PET recycling plants Asahi Kasei is developing a recycling process for nylon 6,6
3 Renewable energy	 	<ul style="list-style-type: none"> Dow is adding a modular nuclear reactor to their Seadrift, TX complex. Many projects are using renewable electricity to produce green hydrogen/ammonia. Sasol will be buying electricity from a new wind project in South Africa
4 Biobased processes and materials	  	<ul style="list-style-type: none"> Toray Industries has developed the first biobased process for adipic acid Mitsui chemicals is developing biomass-derived bisphenol A and polycarbonate OCI is producing biomethanol from decomposing waste

Figure 9. Sustainability efforts by Chemical Companies (source: [Top chemical companies transitioning toward sustainability - ADI Analytics](#))

As sustainability becomes a key differentiator in the chemical industry, BASF faces intense competition from other companies that are also investing in sustainable practices. Staying ahead in this competitive landscape requires continuous innovation and adaptation. BASF must develop unique and effective solutions that not only comply with regulations but also meet the evolving demands of consumers and stakeholders. This competitive pressure drives BASF to invest heavily in R&D and sustainability initiatives to maintain its market leadership.

Many of BASF's competitors, such as Dow, LyondellBasell, and Shell, are heavily investing in sustainability to stay competitive in the chemical industry. Dow aims for carbon neutrality by 2050 and focuses on recyclable packaging and renewable energy projects. LyondellBasell's strategy includes producing recycled and renewable-based polymers and developing advanced recycling technologies. Shell's "Powering Progress" strategy targets net-zero emissions by 2050, with investments in renewable energy sources and carbon capture technologies [33], [34], [35].

5.2 Opportunities

The sustainability efforts of BASF and other chemical companies present numerous opportunities that can drive growth and competitive advantage. The demand for sustainable products is rapidly increasing, driven by a shift in consumer preferences towards environmentally friendly and socially responsible goods. This trend presents significant opportunities for chemical companies to innovate and capture new markets.

Consumers are becoming more environmentally conscious and are seeking products that align with their values. This shift in consumer behavior is driving demand for sustainable products, such as bio-based materials, biodegradable plastics, and eco-friendly chemicals. Chemical companies that can innovate and offer these products are well-positioned to capture a significant share of this growing market [39],[16]. At the same time, many consumers are willing to pay a premium for sustainable products. According to a Forbes report, nearly 90% of Gen X consumers stated they would spend an extra 10% or more for sustainable products, compared to just over 34% two years ago. This willingness to pay more reflects the value consumers place on sustainability and their desire to support brands that align with their values [40]. Younger generations, such as Millennials and Gen Z, are driving the demand for sustainable products. These groups are more likely to consider sustainability as a baseline requirement for purchase. As they gain more purchasing power, their preferences are expected to shape the market further, creating opportunities for companies that can meet their sustainability expectations [16].

The sustainable products market is experiencing significant growth, driven by increasing consumer awareness and demand for environmentally friendly and socially responsible goods. The market size was valued at approximately USD 355.3 billion in 2024 and is expected to reach USD 692 billion by 2033, growing at a compound annual growth rate (CAGR) of about 7.7% from 2025 to 2033. This growth is largely attributable to heightened consumer awareness during the COVID-19 pandemic, which led to a surge in demand for sustainability. Consumers have become more conscious of the environmental impacts of their actions and have developed concerns about health and the environment, driving the trend towards sustainable products [41].

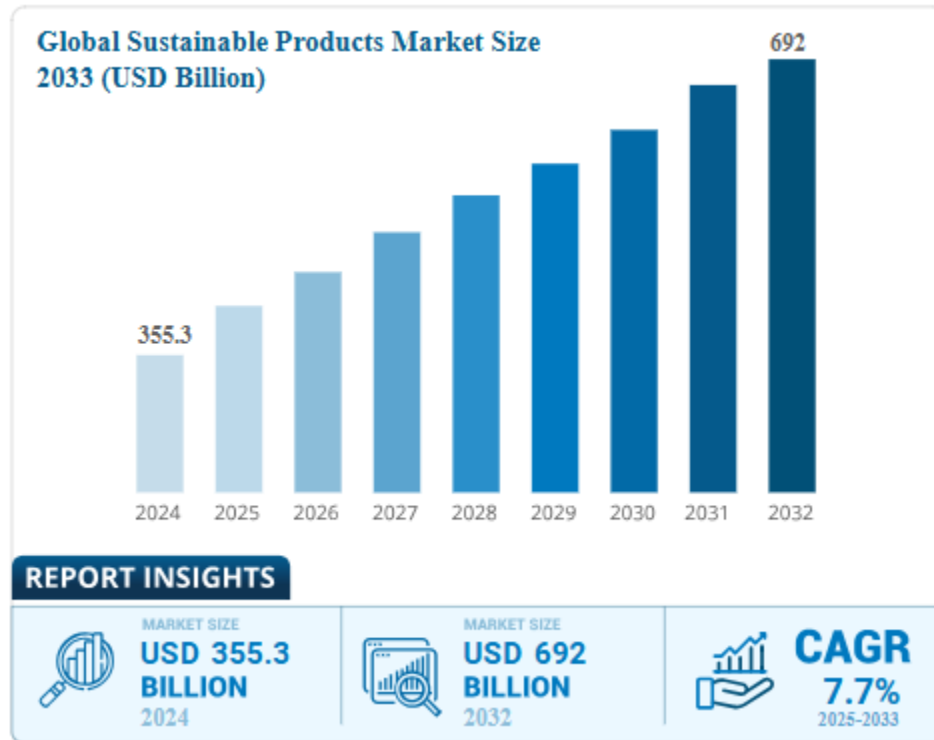


Figure 10. Global Sustainable Products Market Size [41]

In its quest to align trade policy with climate ambitions, Brussels is expanding the scope of its regulatory efforts, setting new boundaries between economic activities and societal and environmental interests. Even by the standards of the Brussels effect, Europe's green trade initiative has been notably successful in shaping global norms, particularly by legitimizing the previously marginal view that the trading system should actively consider climate concerns.

Following the implementation of the EU Carbon Border Adjustment Mechanism (CBAM), the United Kingdom has announced plans to introduce its own CBAM. Australia is contemplating similar measures, and Canada has also explored border carbon adjustments. In the U.S. Congress, there is bipartisan interest in some form of carbon tariff, a significant development given past resistance to domestic carbon pricing. Middle-income countries such as Brazil, India, Colombia, Turkey, and Chile have strengthened or introduced carbon pricing schemes since the CBAM was enacted, according to the World Bank. Additionally, the inclusion of maritime emissions in the EU Emissions Trading System (ETS) has prompted the International Maritime Organization to move towards a global carbon levy on regulated vessels after years of inactivity.

The European Union Deforestation Regulation (EUDR), Corporate Sustainability Reporting Directive (CSRD), and Corporate Sustainability Due Diligence Directive (CSDDD) may also

prove influential over time, although they differ from the CBAM in key ways. Compliance with these policies involves a greater degree of subjectivity than carbon pricing, and effective enforcement will require monitoring complex supply chains across multiple jurisdictions with varying capabilities and governance structures. Given these challenges, it is unsurprising that Brussels has delayed the implementation of the EUDR and CSDDD to allow affected firms and governments more time to prepare and provide additional feedback.

Brussels' pioneering role in green trade is not without its drawbacks. While greening trade can reward the EU industry's carbon advantage and drive deep decarbonization in hard-to-abate sectors, reinforcing the bloc's leadership in climate policy, it can also cause economic disruption, particularly for industries facing higher costs under stricter carbon regulations as free allowances are phased out. Without export rebates or parallel carbon border adjustment mechanisms in key markets, EU industries may struggle to compete globally, risking carbon leakage and undermining the broader effectiveness of the EU's green trade strategy. Addressing competitiveness concerns has become a primary policy focus in Brussels and various European capitals.

Moreover, the EU must balance these trade policies with its broader strategy towards China, which is both a major export market for European manufacturers and a growing threat to European national security and industrial competitiveness. Brussels has imposed measured tariffs on Chinese electric vehicles (EVs) to encourage Chinese automakers to manufacture and source locally within the European market. Similar trade barriers may be necessary for other Chinese clean technologies to build competitive domestic industries, achieve manufacturing targets outlined in the Net-Zero Industry Act, and avoid excessive dependence on foreign supply chains. These efforts are supported by the Foreign Subsidies Regulation, a novel trade enforcement tool addressing market-distorting subsidies provided by foreign governments to firms operating in the European market.

The unilateral nature of Europe's key green trade measures—the CBAM and EUDR—has provoked criticism from other governments, particularly in the Global South. Unlike more strictly domestic policy areas, trade policy has traditionally been viewed as a cooperative endeavor between governments. Brussels' use of border measures and import restrictions has led to accusations of “regulatory imperialism.” Critics have labeled these policies as “green protectionism,” arguing that they infringe on the sovereign right to regulate and violate the Paris Agreement's principle that countries can decarbonize on their own terms.

The EU's green trade measures are likely to strain its already tense trade relations with the United States. U.S. Commerce Secretary Howard Lutnick has stated that the Trump administration would consider using all available trade tools, including tariffs, to counter EU environmental regulations affecting American companies. In this context, EU leadership on climate and trade is even more crucial given the U.S. retreat from the global trading system and the principle of neutral, rules-based international governance. European officials may find themselves in a delicate position:

granting exemptions to the United States to avoid retaliatory measures could offend other trading partners who would demand similar concessions. At the same time, punitive tariffs threatened by Trump could harm an already sluggish European economy. Ultimately, Brussels cannot afford to pursue a trade agenda that alienates the United States, China, and the Global South simultaneously.

Nevertheless, Europe can take steps to address other countries' concerns and mitigate accusations of inflexibility and imperialism. For example, Brussels could clearly define the requirements for regulatory equivalency, allowing products and firms under CBAM, EUDR, and other schemes to be exempt. This approach, though controversial, would require the EU to offer flexibility to countries without domestic carbon pricing schemes. Additionally, increasing assistance to countries facing new regulatory requirements may reduce opposition.

Europe, through its "Clean Trade and Investment Partnerships," could develop novel trade arrangements addressing issues like carbon leakage and the relocation of manufacturing to countries with weaker climate regulations; improving access to minerals and transition minerals; and aligning markets on carbon tariffs and other trade tools. Importantly, these efforts could be less unilateral than the EU CBAM and various EU regulations that have faced criticism for heavy-handedness and sovereignty encroachment from the Global South. Given the U.S. withdrawal from climate policy and international leadership, Europe should seize the opportunity to lead with an innovative trade tool that embodies the agenda-setting Brussels effect rather than Europe's recent reputation for indecisiveness and economic malaise.

It is increasingly important for Brussels to succeed in this balance as the United States deprioritizes climate both domestically and internationally and shifts from strategically applied trade measures to threats of wholesale tariffs against allies and adversaries alike. As the only major economy still committed to open and fair trade in principle and practice, Europe is uniquely positioned to cultivate favorable trading relationships that strengthen clean supply chains and build support for the proposition that the global trade system can and should do more to address the existential threat of climate change.

Conclusion

In recent years, the concept of sustainability has emerged as a crucial element in business strategy, affecting various aspects of corporate operations and consumer perception. As global challenges such as climate change and resource depletion continue to intensify, businesses are increasingly recognizing the importance of integrating sustainable practices into their operations. This review will examine the key points of the thesis and draw conclusions on how sustainability influences brand image, customer loyalty, and sales performance.

The thesis discusses several significant aspects of sustainability and its impact on business operations and consumer behavior. Here, we summarize the main points:

The implementation of regulatory measures such as the EU Carbon Border Adjustment Mechanism (CBAM), the European Union Deforestation Regulation (EUDR), and the Corporate Sustainability Reporting Directive (CSRD) has driven businesses to adopt sustainable practices. Compliance with these policies requires monitoring complex supply chains, which can be challenging but ultimately contributes to better environmental stewardship.

While greening trade can reinforce the EU industry's carbon advantage and drive deep decarbonization, it can also cause economic disruption for industries facing higher costs under stricter carbon regulations. Addressing competitiveness concerns has become a primary policy focus to avoid carbon leakage and maintain global market position.

The unilateral nature of Europe's green trade measures has provoked criticism, particularly from the Global South, leading to accusations of "green protectionism." Balancing trade policies with broader strategies towards major economies such as China and the United States is crucial to avoid alienating key trading partners.

Europe has the opportunity to lead with innovative trade tools that address issues like carbon leakage and the relocation of manufacturing. Developing "Clean Trade and Investment Partnerships" can help cultivate favorable trading relationships that strengthen clean supply chains.

Based on the main points of the thesis, we can draw several key conclusions regarding the impact of sustainability on brand image, customer loyalty, and sales performance:

Adopting sustainable practices enhances a company's brand image by demonstrating a commitment to environmental and social responsibility. Consumers increasingly prefer brands that align with their values, and sustainability can differentiate a brand in a competitive market.

Sustainability contributes to increased customer loyalty by building trust and long-term relationships. Consumers are more likely to support brands that prioritize sustainability, leading to repeat purchases and positive word-of-mouth recommendations.

Integrating sustainability into business operations can lead to improved sales performance. Sustainable practices can attract environmentally conscious consumers, expand market reach, and enhance product appeal. Additionally, compliance with regulatory measures can open new market opportunities and reduce risks associated with non-compliance.

The integration of sustainability into business strategy is not only a response to regulatory measures but also a means to enhance brand image, customer loyalty, and sales performance. As global challenges continue to evolve, businesses must prioritize sustainable practices to remain competitive and build strong relationships with consumers. By embracing sustainability, companies can drive positive change and contribute to a more sustainable future while achieving business success.

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