FUJITSU

The zero-carbon commitment

Navigating the path to carbon neutrality in manufacturing

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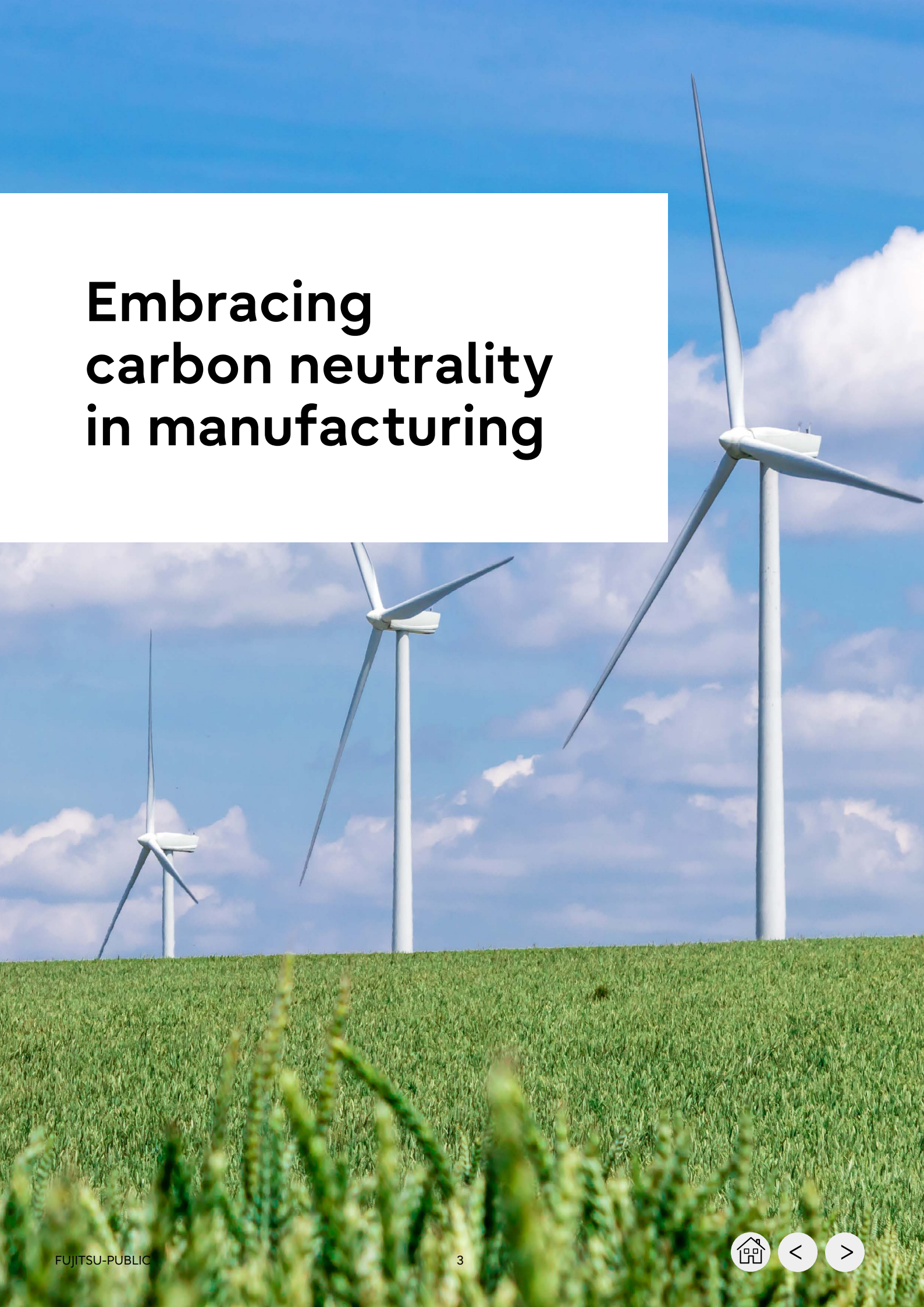
Embracing carbon neutrality in manufacturing



Addressing the environmental imperative with a holistic lens

As the world faces an escalating environmental crisis, the role of manufacturing in spearheading sustainability efforts, including but not limited to achieving carbon neutrality, becomes increasingly important. The manufacturing sector, with its vast network of operations, is at a critical juncture in the transition towards a net-zero industry. This paper explores the multifaceted challenges and opportunities on this path, emphasizing the sector's significant potential to influence a wide array of sustainability goals beyond merely reducing carbon emissions.

Expanding the scope of environmental responsibility

The urgency of today's environmental challenges demands a comprehensive response from manufacturers, one that transcends the focus on carbon emissions to embrace a broader spectrum of sustainability objectives. This includes mitigating impacts on biodiversity, promoting waste reduction, enhancing community well-being, and upholding high standards of business ethics. By examining the interconnectedness of these issues with carbon neutrality, this discussion underscores the manufacturing sector's crucial role in fostering a sustainable future that considers the full environmental and social landscape.

The wider benefits of pursuing sustainability

Pursuing carbon neutrality within manufacturing processes offers profound benefits that extend across the environmental, social, and economic dimensions. Sustainable manufacturing practices yield significant ecological conservation, bolster community health, and unlock economic advantages, demonstrating the interconnected nature of sustainability efforts. These comprehensive benefits highlight the necessity for the manufacturing industry to adopt an integrated approach to sustainability, one that goes beyond carbon to encompass a holistic impact on the planet and its inhabitants.

Embracing comprehensive sustainability compliance

The increasing emphasis on carbon regulation compliance underscores the need for manufacturers to integrate sustainability deeply into their operational ethos. However, true sustainability transcends regulatory adherence, encompassing a broad array of impacts from emissions and waste to community engagement and ethical business practices. Achieving carbon-neutral manufacturing thus represents a critical step within a larger journey towards comprehensive environmental stewardship.

This approach necessitates a shift towards more inclusive and multifaceted sustainability strategies, reflecting a commitment to not only align with global sustainability efforts but to lead by example in fostering a more responsible and sustainable manufacturing landscape.

Weighing the environmental and financial impact of carbon-intensive operations

The essential role of carbon neutrality in driving business sustainability

Carbon neutrality has become a foundational element for businesses pursuing long-term sustainability, yet it's essential to differentiate between carbon neutrality and CO_2e (carbon dioxide equivalent) neutrality. While carbon neutrality refers to achieving a balance between emitting carbon and absorbing carbon from the atmosphere, CO_2e neutrality broadens this scope by considering all greenhouse gases (GHGs), not just carbon dioxide. This includes gases like methane and nitrous oxide, which have a higher global warming potential than CO_2.

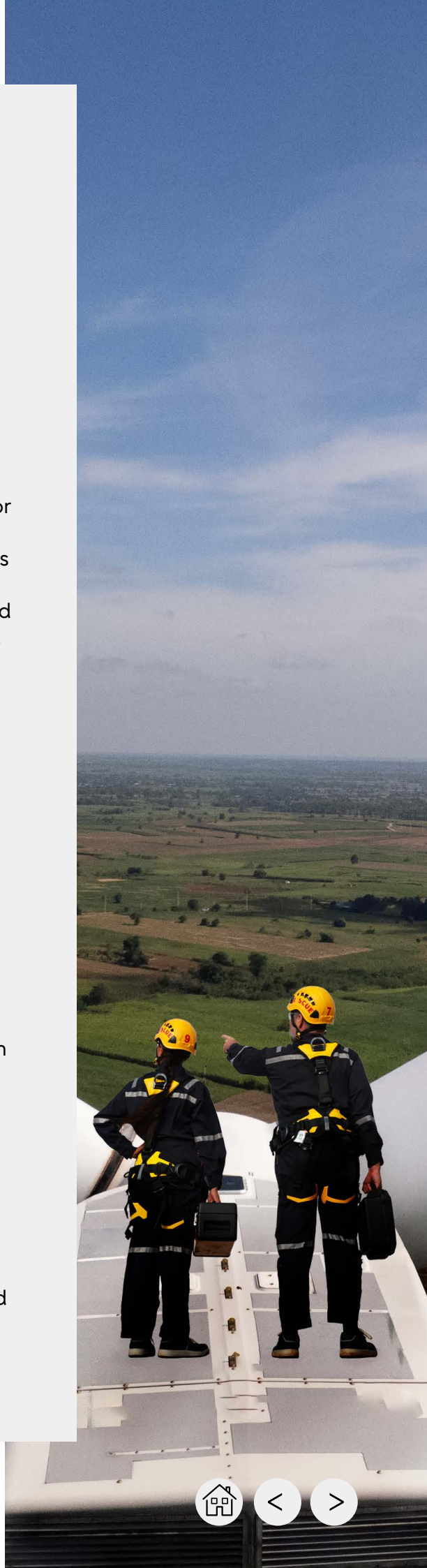
Achieving CO_2e neutrality requires businesses to account for and neutralize the broader spectrum of their GHG emissions. This comprehensive approach enables companies to address their environmental impact more fully, encompassing all relevant GHGs within their operational and supply chain activities. In doing so, organizations can unlock financial benefits through enhanced operational efficiencies, tax incentives, and by contributing to global environmental conservation efforts. The commitment to CO_2e neutrality signifies a deeper engagement with sustainability, reflecting the organization's dedication to mitigating its overall climate impact.

The hidden cost of carbon in carbon-intensive goods

A study by PWC focusing on G20 countries revealed that the hidden cost of carbon in the production of carbon-intensive goods such as steel, cement, and chemicals can exceed 1.5% of the production value, and even soar to 10% for electricity. These costs, often overlooked, highlight the financial burden that carbon-intensive operations impose on businesses.

Financial risks associated with carbon costs

The same study also sheds light on the financial risks linked to carbon costs. For instance, the steel produced in the Republic of Korea carries a hidden carbon cost of about 0.54% of its selling price. However, with projected carbon prices for 2030, in alignment with the International Energy Agency's net-zero emissions scenario, this hidden cost could escalate to 12.85% of the steel's current selling prices – a staggering 23-fold increase over the current cost.



Understanding and managing supply chain emissions: The role of Scope 1, 2, and 3 emissions

A crucial aspect of addressing supply chain emissions involves understanding the concept of Scope 1, 2, and 3 emissions. This classification helps companies identify and manage their direct and indirect carbon footprints.

- **Scope 1 emissions:** These are direct emissions owned or controlled by the company, such as fuel combustion in company vehicles.
- **Scope 2 emissions:** These emissions are indirectly caused by the energy purchased and used by the company, like the electricity or gas powering its buildings.
- **Scope 3 emissions:** Representing a significant portion of a company's overall carbon footprint, Scope 3 emissions encompass all indirect emissions in a company's value chain, including those from suppliers.

Recent research, including insights from the Fujitsu C-suite research in partnership with FT Longitude, a Financial Times Company[1] , highlights a critical challenge in achieving carbon neutrality: the "invisibility" of emissions throughout the supply chain, particularly Scope 3 emissions. This invisibility stems from the complexity of data utilization and sharing across the various stages of the supply chain. Addressing this challenge requires a collaborative approach to data management, ensuring transparency and accountability from all parties involved.

A key insight from the aforementioned PWC research is that a significant portion of a company's emissions, often up to 80%, can originate from a small fraction of its purchases. This statistic underscores the importance of targeted data collection and analysis. By focusing on the most significant sources of emissions, companies can develop more effective strategies to reduce their carbon footprint. This targeted approach is crucial for managing Scope 3 emissions, which often represent the largest, yet most challenging, part of a company's carbon emissions to control and reduce.

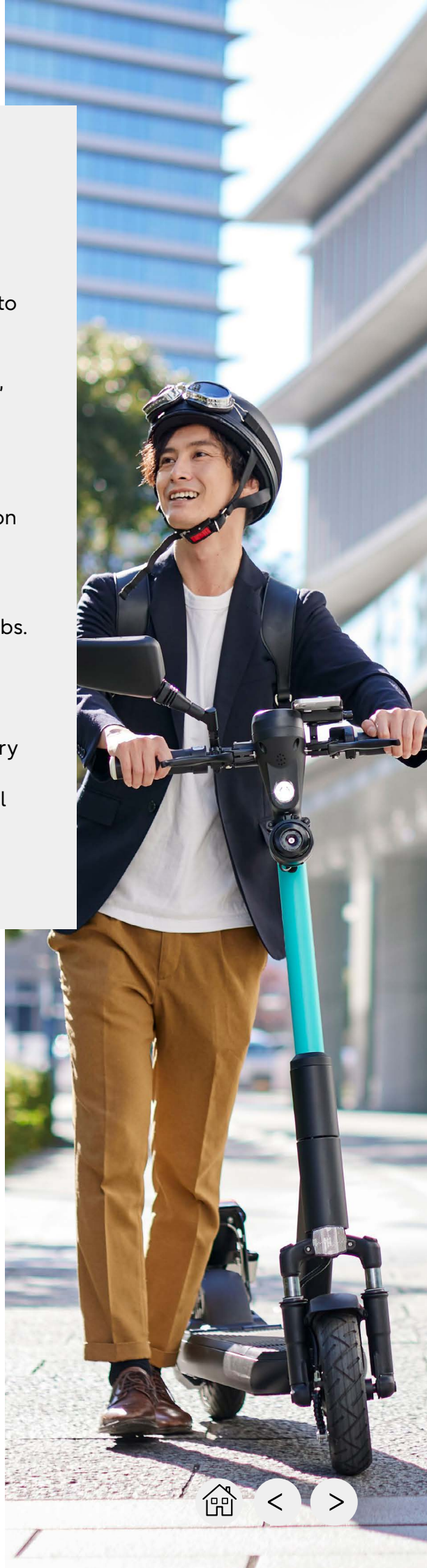
[1]Fujitsu conducted a survey of 600 C-suite executives in 15 countries on their attitudes toward sustainability management. The responses were captured in November and December 2023, full results to be published in April 2024.

World Bank's simulation on sector policies and benefits

The World Bank conducted simulations across three case studies to analyze the effects of key sector policies. In the United States, these policies focused on stimulating a shift to clean transport, enhancing industrial energy efficiency, and promoting energy-efficient buildings and appliances. The projected benefits of these policies by 2030 are substantial, including:

- An estimated GDP growth of between $1.8 trillion and $2.6 trillion.
- The prevention of around 8.5 billion metric tons of carbon dioxide equivalent emissions.
- Almost 16 billion kilowatt-hours of energy saved.
- The creation of approximately 195,000 to 261,000 new jobs.

These studies illustrate the significant environmental and financial implications of carbon-intensive operations. They highlight the necessity for businesses to adopt carbon-neutral practices not only as a response to regulatory pressures but also as a strategic move to optimize costs, reduce financial risks, and contribute positively to the global fight against climate change.



Adapting to evolving sustainability reporting requirements

Recent regulatory changes are setting a new precedent for environmental accountability in global manufacturing, guiding industries towards a future of enhanced sustainability. As we progress towards carbon neutrality and net-zero emissions, manufacturers face the imperative to adapt to an expanding array of regulatory frameworks, not only for compliance but as an essential part of their business strategy. By exploring these regulatory shifts, we can gain insight into the immediate challenges and opportunities these changes present, particularly focusing on sustainability reporting requirements that are driving investments and operational enhancements within the manufacturing sector.

Global and regional regulatory developments

A significant development in this arena is the introduction of comprehensive sustainability reporting mandates such as the Corporate Sustainability Reporting Directive (CSRD) in the European Union, the Carbon Border Adjustment Mechanism (CBAM), and specific state-level legislations in the United States, including California's SB 261 and SB 253. These regulations require organizations to provide detailed accounts of their environmental impact, compelling them to seek efficient methods for data collection, management, and reporting.

The immediate challenge of compliance

Manufacturers are now tasked with integrating their operational systems, such as ERP platforms, with carbon accounting and management solutions to meet these reporting obligations. The urgency is underscored by deadlines for CSRD reporting for the fiscal year 2024, necessitating immediate action for compliance preparation. This reality prompts a critical evaluation of technology partners who can navigate the intricacies of these requirements, offering proven solutions for streamlined data handling and reporting.

Strategic response to sustainability reporting

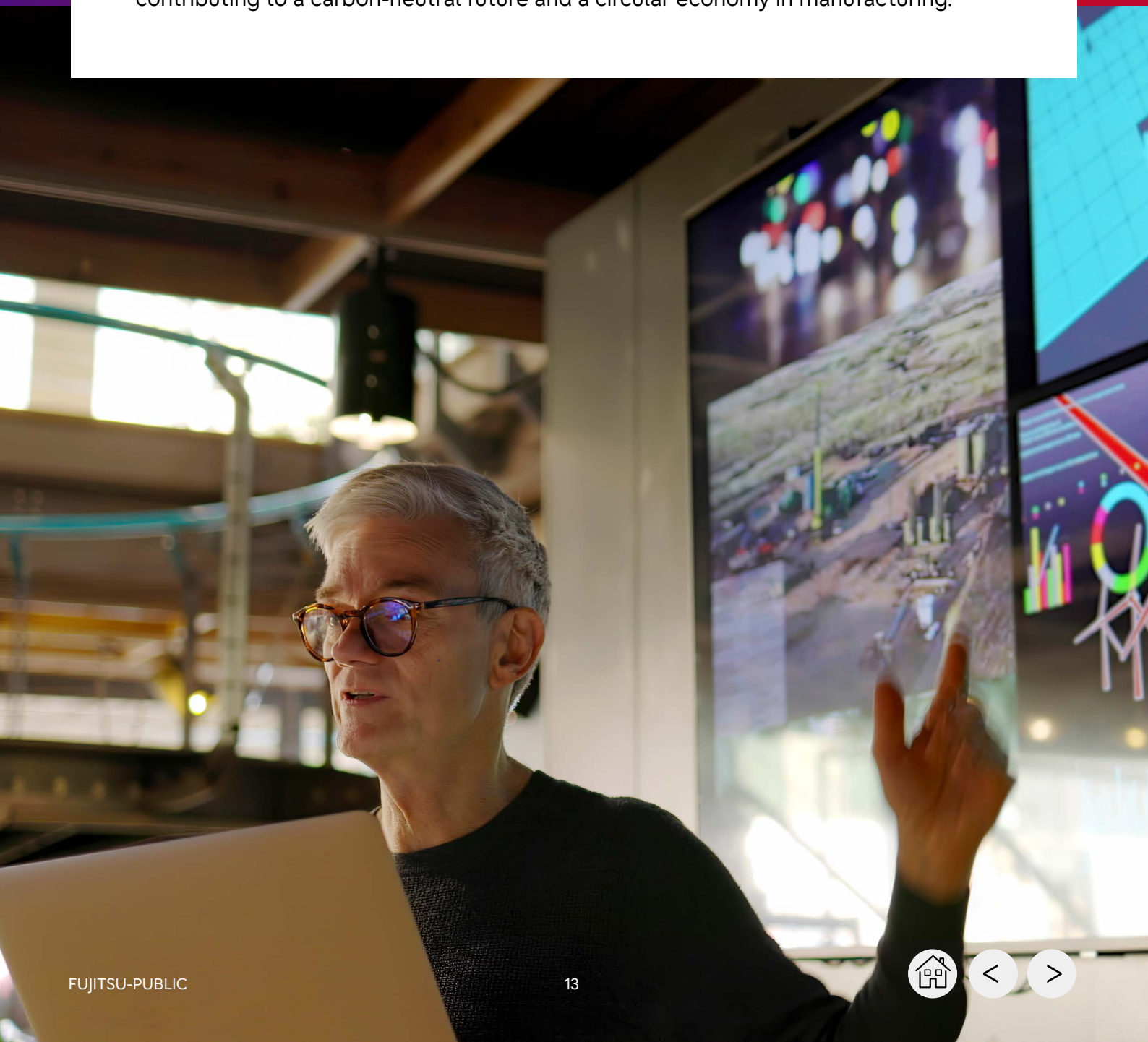
In response to these regulatory demands, the manufacturing sector must expand its focus to include both short-term targets and adapt to legislation from various regions. This approach not only addresses immediate compliance needs but also aligns with broader sustainability goals, offering a clear direction for future investments in technology and processes. By prioritizing the development of robust systems for sustainability reporting, manufacturers can ensure not only adherence to current regulations but also readiness for future mandates, reinforcing their commitment to environmental stewardship.

These regulatory shifts, emphasizing sustainability reporting and environmental impact, highlight the growing importance of strategic adaptability in the manufacturing sector. As organizations navigate these new rules and requirements, their ability to innovate and comply will be pivotal in contributing to the global effort towards a more sustainable and accountable manufacturing landscape.

Case studies

Teijin partners with Fujitsu for blockchain-enhanced sustainable material management

Teijin and Fujitsu collaboratively launched a blockchain platform to elevate the environmental value and traceability of recycled materials for manufacturers. This platform promises transparent, reliable data on the environmental impact and origin of materials, promoting sustainable, environmentally conscious designs, and contributing to a carbon-neutral future and a circular economy in manufacturing.



Fujitsu pledge and solutions: championing carbon neutrality in manufacturing

Optimizing data for environmental sustainability

A critical aspect of the Fujitsu strategy in championing carbon neutrality involves the integration of technology to meet sustainability goals, with a particular emphasis on the quality, collection, and governance of data. Understanding the pivotal role data plays in environmental sustainability, we deliver solutions that enhance the accuracy and accessibility of data across manufacturing operations, thereby enabling more informed decision-making and strategic planning towards sustainability objectives.

Data quality and governance

Our approach emphasizes the importance of high-quality data and robust governance frameworks to ensure that sustainability efforts are based on reliable and accurate information. This approach facilitates precise tracking of emissions, resource usage, and other environmental impacts, enabling companies to identify areas for improvement and comply with reporting requirements effectively.

Advanced data collection technologies

Our solutions leverage advanced technologies for comprehensive data collection across the entirety of a company's operations, including hard-to-reach areas of the supply chain. This ensures a complete overview of environmental impacts, from direct operational emissions to broader, scope 3 emissions related to the value chain.

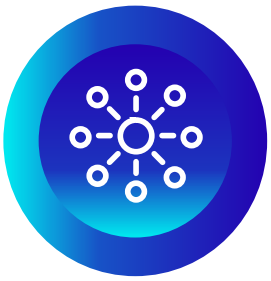
Sustainability through technology integration

Our suite of technologies, from AI and blockchain to digital twins and eco-friendly robotics, is designed not only for operational efficiency but also for significant contributions to sustainability efforts. These technologies aid in reducing emissions, optimizing resource use, and achieving greater supply chain sustainability.

Technological innovations for Sustainable Manufacturing

AI-driven analysis for comprehensive emission reduction

Our AI solutions and algorithms play a crucial role in analyzing and managing emissions across all scopes - Scope 1, 2, and 3. These advanced AI tools are adept at processing vast datasets, enabling businesses to efficiently identify areas of inefficiency and potential improvement in their direct and indirect emissions. By applying AI to Scope 1 emissions, companies can optimize their direct operational activities. For Scope 2 emissions, AI can enhance energy efficiency in purchased energy use. Most importantly, AI becomes pivotal in managing the complexities of Scope 3 emissions, which involve indirect emissions in a company's wider value chain.



Blockchain for sustainable sourcing

Our blockchain technology, including Track and Trust, plays a crucial role in ensuring the sustainable sourcing of materials. It also tracks green initiatives and validates carbon credits, ensuring transparency and accountability in environmental efforts.

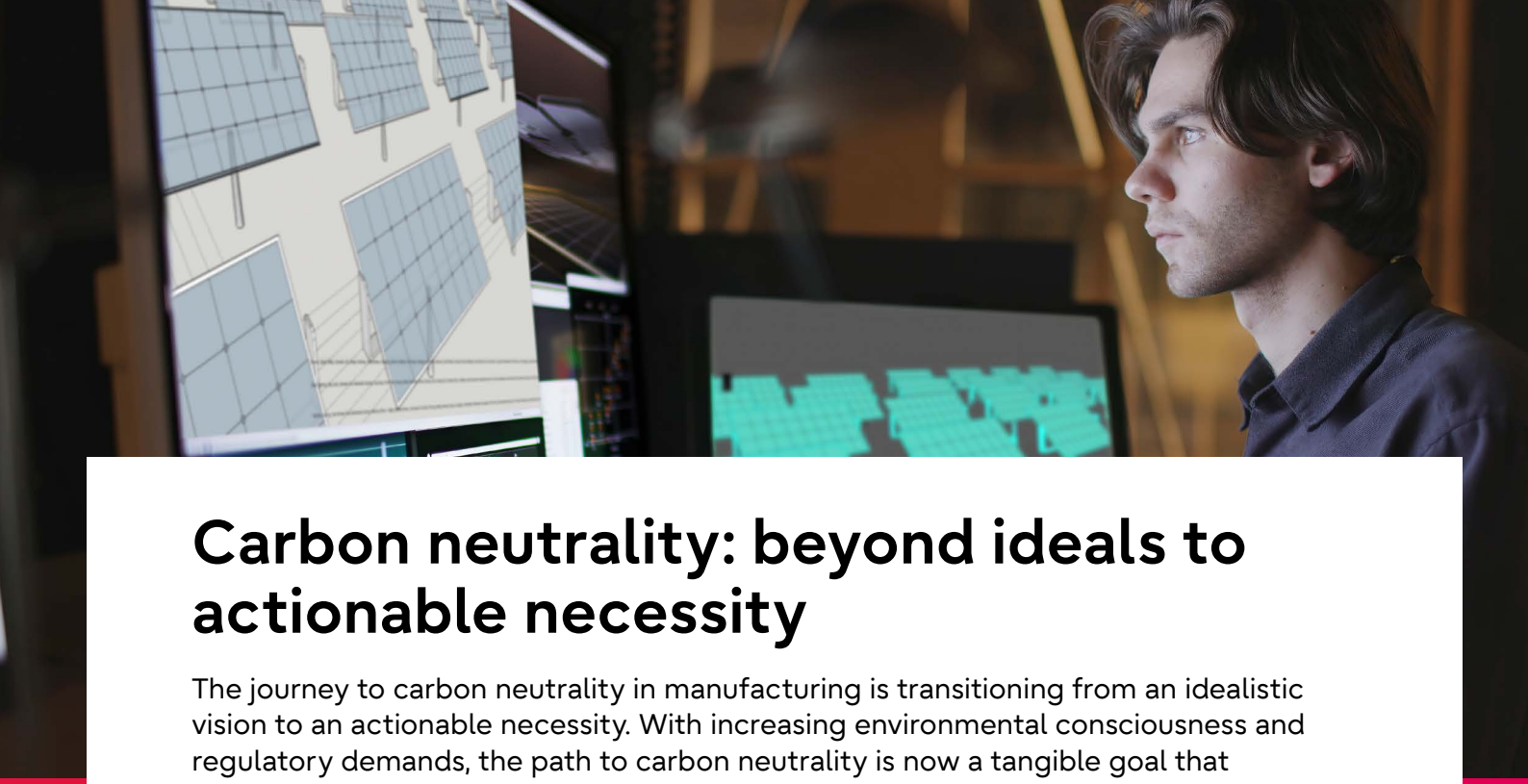
Digital Twin (DT), Virtual Reality (VR), and Augmented Reality (AR)

Utilizing DT, VR, and AR technologies in areas such as virtual prototyping and training significantly reduces the need for physical materials and travel, thereby lessening the environmental impact.

Fujitsu commitment to carbon neutrality

Our commitment goes beyond simply providing solutions; it embodies a corporate ethos of environmental responsibility. Recognizing the urgency of global commitments to carbon neutrality, we have accelerated our pledge to achieve "zero CO_2 emissions within the Group by FY2050" to FY2030. Furthermore, we have set an ambitious target of reaching net-zero greenhouse gas emissions across its value chain by 2040. This commitment reflects our dedication to playing a pivotal role in the global effort to reduce carbon usage and underscores our company's leadership in sustainable business practices.

Embracing carbon neutrality as a manufacturing imperative



Carbon neutrality: beyond ideals to actionable necessity

The journey to carbon neutrality in manufacturing is transitioning from an idealistic vision to an actionable necessity. With increasing environmental consciousness and regulatory demands, the path to carbon neutrality is now a tangible goal that manufacturers must actively pursue.

Opportunities in the carbon-neutral transition

The transition to a carbon-neutral future presents not just challenges but also substantial opportunities for the manufacturing sector. This shift is an opening for businesses to redefine their operations, innovate sustainably, and create enduring value. By leveraging this transition, manufacturers can position themselves at the forefront of a sustainable industrial revolution, contributing positively to both the environment and the economy.

Setting targets and phased approaches

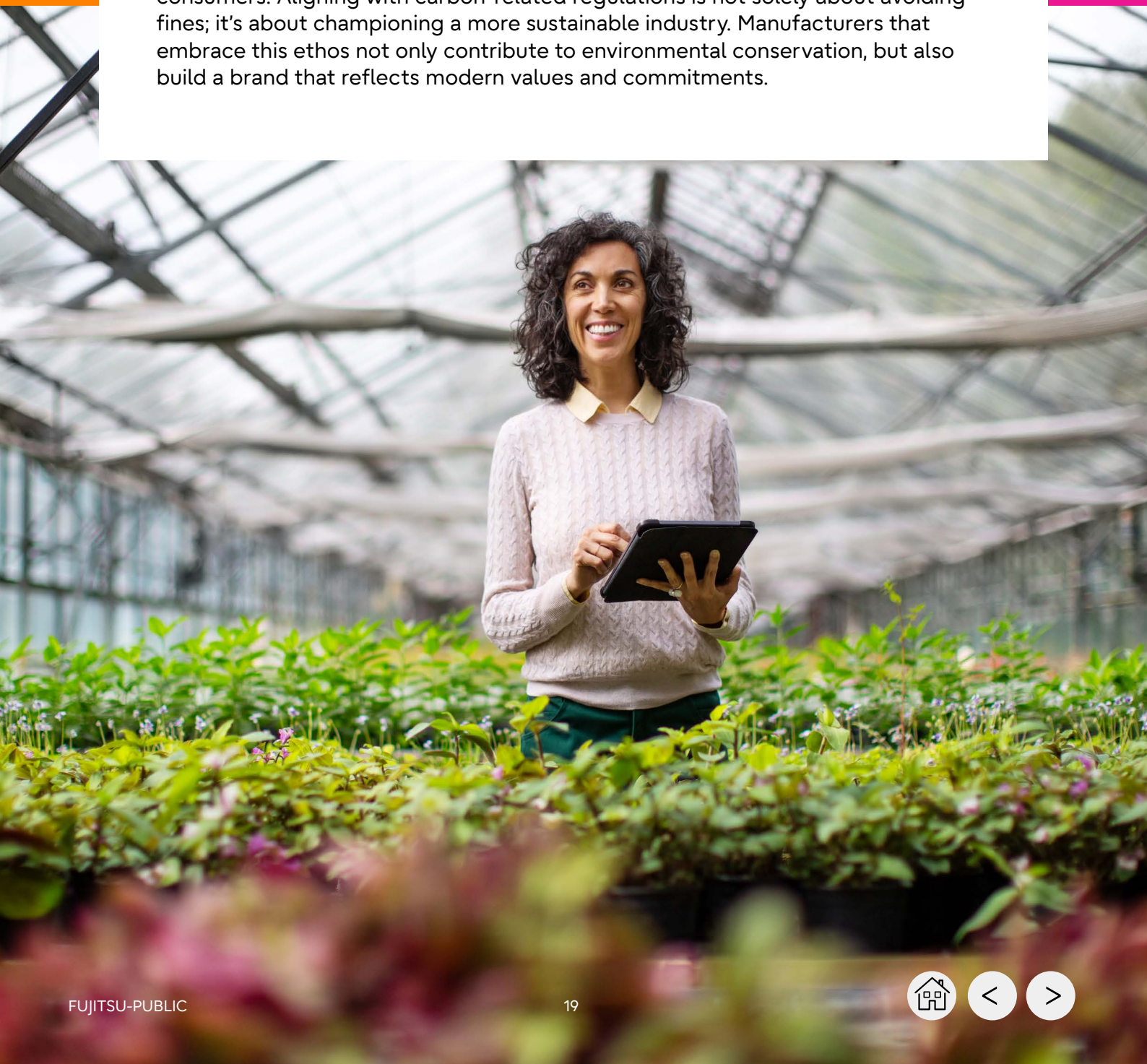
Achieving carbon neutrality requires a strategic and phased approach. By setting clear, achievable targets, manufacturers can chart a course toward meaningful change. This phased approach allows for gradual integration of sustainable practices, ensuring that the transition is both manageable and effective. For manufacturers, it's about taking incremental but significant steps, constantly measuring progress against set benchmarks.

Flexibility and adaptability in strategy

Adopting an ethos of ongoing evolution is crucial. Strategies aimed at achieving carbon neutrality must be flexible and adaptable, capable of responding to emerging challenges and harnessing new opportunities. This adaptability ensures that manufacturers can remain agile and responsive in a rapidly evolving environmental landscape.

Building a sustainable brand

Carbon neutrality transcends environmental responsibility; it's about building a brand that resonates with a growing demographic of environmentally conscious consumers. Aligning with carbon-related regulations is not solely about avoiding fines; it's about championing a more sustainable industry. Manufacturers that embrace this ethos not only contribute to environmental conservation, but also build a brand that reflects modern values and commitments.



Work with us

The path to carbon neutrality in manufacturing involves a journey that encompasses challenges, opportunities, strategic planning, and a commitment to continuous evolution. It's a journey that demands not just compliance but leadership and innovation. As manufacturers take this path, they do so not just to meet regulatory requirements or avoid penalties, but to play a pivotal role in shaping a sustainable future for the industry and the planet.

In this journey, Fujitsu is an invaluable partner offering expertise and innovative solutions that can help manufacturers navigate the complexities of achieving carbon neutrality.

With our support, manufacturers can leverage cutting-edge technologies and tailored strategies to optimize their operations for sustainability.
Our commitment to innovation and sustainability supports manufacturers seeking to transform their processes and contribute positively to a greener future.

By partnering with us, manufacturers can access the tools and insights needed to turn the challenges of carbon neutrality into opportunities for growth and leadership paving the way for a more sustainable, resilient, and profitable manufacturing operations.

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Contact Fujitsu to find out more about our services and products for manufacturers.

Contact Fujitsu: Fujitsu Global