AI and sustainability: How Twin Transformations can succeed

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Use cases, success factors, and how to start

The world is at a crossroads: digitalization, AI, and sustainability are no longer optional – they are imperative. At Roland Berger, we have found that organizations that act on AI and sustainability transformations simultaneously can generate strong synergies and thereby endeavor on a Twin Transformation. The Fraunhofer Society defines Twin Transformation as a dynamic synergy between digital and sustainable transformations within companies. According to Fraunhofer, digitalization, including the integration of AI, acts as a powerful catalyst for sustainability initiatives, while sustainability provides a meaningful framework to guide and shape digital advancements. Put simply, we need to give AI better problems to solve - sustainability is one of them.

The connection between AI and sustainability goes beyond theory – it is a practical and strategic opportunity. On the environmental side of ESG (Environmental, Social, Governance), AI offers powerful tools to optimize resource use, mitigate environmental risks, and scale sustainable practices. On the social side, it enables earlier diagnostics in healthcare and can detect fake news. For governance, AI enables more effective reporting and fraud protection.

Methodology

Our research and industry experience have informed our definition of the success factors for Twin Transformation. This report offers insights into the synergies between AI and sustainability, conceptual drivers and practical examples of success, and guidance for businesses seeking to lead in this space.

As an additional methodology, we have analyzed social media and news sentiment, supported by Meltwater, on the topics of AI and the different elements of ESG in 2024. This has uncovered surprising insights that can inform how companies prioritize internal communication and design change management towards AI and sustainability. We also assessed Google Trends data across the relevant topics to substantiate our analysis.

By examining conversations across social media platforms, online journals, corporate publications, and thought leadership content, our analysis captures diverse perspectives, including both positive and negative sentiments, on the role of AI in sustainability.

The social listening and Google trends analysis covered the period from January to October 2024, and analyzed content in German, English, and French, with inclusion criteria ensuring a minimum level of engagement for social media posts. Raw data was processed using a custom-built linguistic algorithm to classify sentiments and refine results by removing irrelevant content. Approximately 3,000 posts per language with the highest reach were manually reviewed for accuracy, with particularly positive or negative topics subjected to deeper analysis. Finally, the research identified patterns across ESG dimensions, categorized by language to capture regional nuances.

Our research highlights the shared success drivers that underpin both AI and sustainability initiatives or transformations, as well as inspiring examples of companies integrating the two within ESG dimensions.

To provide a balanced view, we also examine the complexities that arise from using AI to advance sustainability.

Twin Transformation: AI and sustainability in sync

Drivers for change: Stakeholder expectations

Businesses today face growing pressure to transform, driven by a convergence of external forces that simultaneously impact the fields of AI, sustainability, and many more. These forces, stemming from customers, investors, governments, and employees, are reshaping expectations and compelling organizations to innovate at the intersection of technology and environmental responsibility.

Many factors are driving sustainability and AI development

Consumer expectations

Consumers demand impact-driven brands:

- 72 % prioritize eco-friendly products
- 64 % worry about climate change
- 73 % expect AI to drive positive change

Investors

Investors prioritize sustainability and tech for productivity:

- Over 50 % plan to boost sustainable investments in the next year
- Generative AI may enhance skilled worker performance by up to 40 %

Regulation

Governments push for sustainability and ethical AI:

- The EU AI Act enforces ethical, transparent AI use
- Global regulations like CSRD and California Environmental Quality Act drive corporate sustainability

Employees

Employees demand corporate sustainability and AI adoption

- 70 % value sustainability programs in employers
- 44 % say integrating AI and automation should be a top priority

Source Potloc, World Economic Forum, Carbon Credits, S&P Global, Morgan Stanley, MIT Sloan, Mercer, Roland Berger

Roland Berger

Consumers are increasingly influencing the adoption of AI and sustainability as they prioritize impact-driven brands.

Investors are increasingly focusing on sustainability and technological advancements as key drivers of productivity and growth.

Governments around the world are further amplifying this pressure through stricter regulations targeting both sustainability and the ethical use of AI.

Employees increasingly value the adoption of AI and sustainability in the workplace.

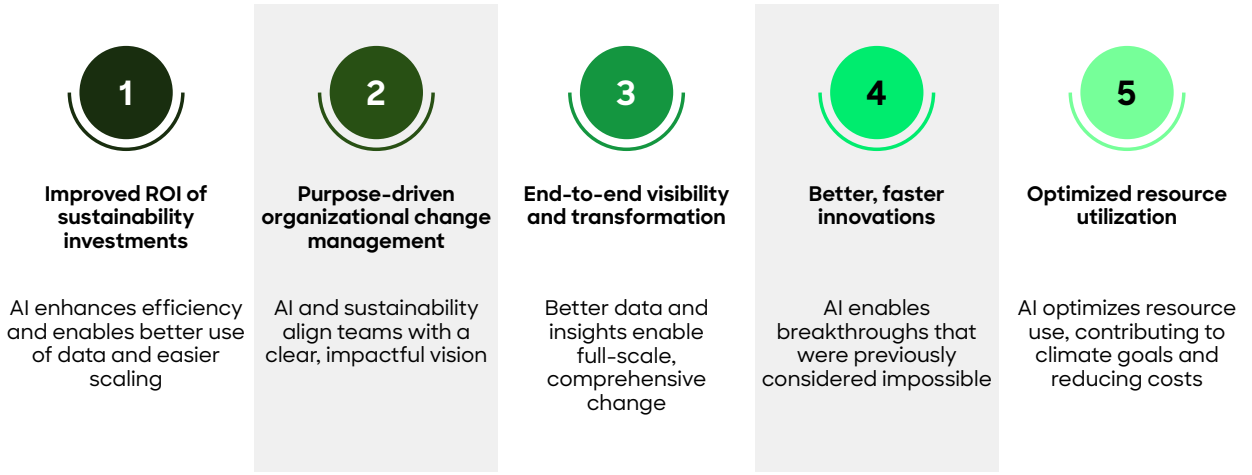
Potential for success: The vast benefits of Twin Transformations

Twin Transformations can help organizations effectively address the mounting external and internal pressures as well as provide a broad range of benefits. Here are the top five outcomes of AI and sustainability integration based on existing cases:

BEATE ROSENTHAL
Partner

"Twin Transformation offers immense potential for competitive advantage and positive sustainability impact."

Top five outcomes of AI and sustainability integration



Source Roland Berger

Roland Berger

While Twin Transformation remains a novel concept, we have already seen a range of cases that demonstrate its effectiveness across ESG dimensions, as shown below.

Environmental: A major retailer and restaurant chain has partnered with an AI vision company to tackle the issue of food waste in its kitchens. Through this collaboration, AI vision was deployed to monitor, track, and analyze food usage patterns. The insights gained enabled the company to make informed decisions on inventory and production, leading to a significant reduction in waste: since the pilot program began in 2015, this initiative has scaled to over 30 countries and 400 stores, achieving an impressive reduction in food waste of more than 50%.

Social: To empower individuals with impaired vision, a multinational software corporation teamed up with a startup to develop an AI-powered application to enhance accessibility. This app provides users with tools to navigate their surroundings, interpret text, and identify objects, fostering greater independence and confidence. The app's availability in over 150 countries ensures that its benefits reach a diverse and widespread audience. Additionally, the data collected through user interactions is being utilized to train AI models to be more inclusive and responsive to varied needs.

Governance: A global pharmaceutical company has taken a forward-thinking approach to governance by embedding AI ethics into its top-level strategic framework. This framework has enhanced accountability practices and fostered transparency in operations, providing stakeholders with greater confidence in the company's activities. Moreover, the adoption of AI-powered risk management tools has resulted in better and faster insights, allowing the company to navigate challenges more effectively while upholding high standards of corporate governance.

- ## Synergies unveiled: Shared success criteria in Twin Transformations

During separate assessments of the success factors for transformations in AI, digital, and sustainability, we discovered a surprising convergence.

The keys to success in digital and sustainable transformations

Source Roland Berger

Roland Berger

Based on this, we have defined six shared success factors of AI and sustainability transformations:

1. **Commitment to change:** Based on our assessment and industry expertise, we tend to see successful transformations in companies that demonstrate a genuine commitment to change

2. **Leadership buy-In:** Successful transformations often depend on the active support and involvement of leadership teams - for example, “transformation champions” from the leadership team to spearhead the change

3. **Robust governance:** Effective governance structures are essential to guide and monitor AI and sustainability projects. This would include strong oversight from dedicated management boards, supported by codified behavioral and ethical frameworks

4. **Data readiness:** Comprehensive, integrated data lakes are a critical enabler of synced AI and sustainability transformations

5. **Employee engagement and culture:** Transformations are more likely to succeed when employees experience both bottom-up and top-down engagement and

transformation is accompanied by effective change management. The organizational culture must support innovation

6. **Balancing efficiency and innovation:** Finding the right balance between operational efficiency and innovative practices is a hallmark of successful transformations

While many success factors overlap between AI and sustainability transformations, some are unique to each domain. For AI transformations, two critical factors stand out:

- **Technical expertise and infrastructure:** AI transformations require specialized technical knowledge, robust infrastructure, and partnerships to develop, deploy, and maintain AI systems

- **AI adaptability and scalability:** Successful AI transformations depend on adaptability and scalability, enabling systems to evolve with changing needs and technologies

For **sustainability transformations**, distinct success factors include:

- **Regulatory alignment:** Sustainability initiatives often require continuous adherence to evolving environmental regulations and standards

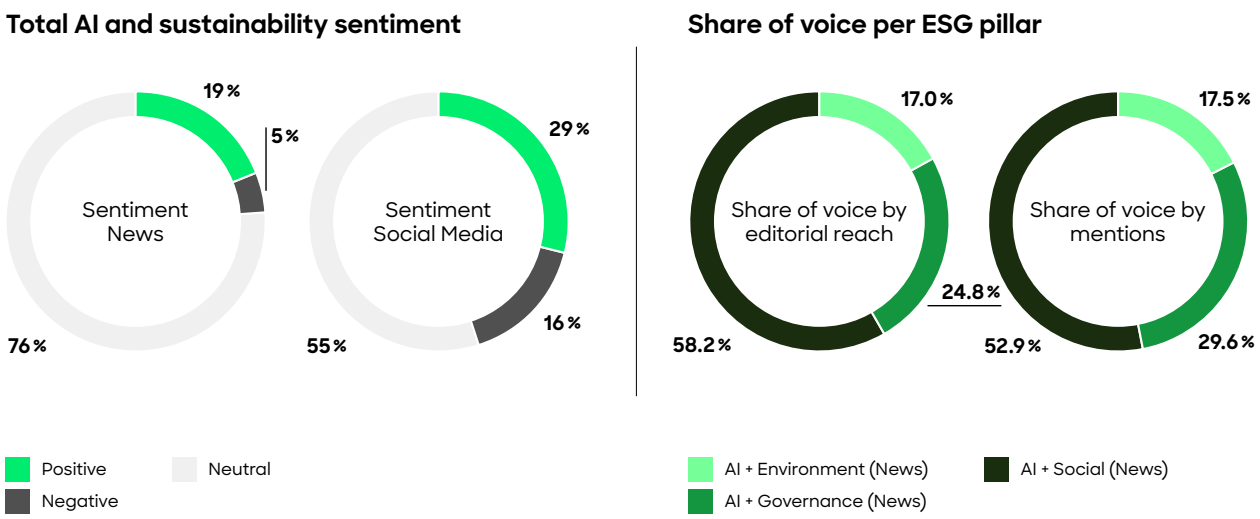
- **Stakeholder collaboration:** Engaging with diverse stakeholders, including governments, NGOs, and communities, can be vital for sustainability efforts

Understanding public perception of AI and sustainability

Our public sentiment analysis reveals a strong foundation for companies embracing Twin Transformation. However, to fully capitalize on this potential, organizations must approach communication around these topics with care, avoiding pitfalls like green-hushing – under-communicating their sustainability efforts – and greenwashing, which can damage credibility. Equally crucial is the need for businesses to measure the tangible impact of AI applications, ensuring they align with and enhance current decarbonization models. Finally, maintaining a focus on innovation while staying attuned to evolving regulatory frameworks will be key to navigating this complex landscape and driving meaningful, compliant progress.

Overall, sentiment for AI and sustainability is largely neutral or positive, with most buzz coming from the social dimension. The environmental aspect has increasingly featured since October 2024, when publications on investment in nuclear power plants to cover AI-related energy needs began to appear.

Examining public sentiment of AI and ESG topics



Source Roland Berger and Meltwater sentiment analysis (01.01.2024 – 31.10.2024)

Roland Berger

Across all languages, social media consistently fosters a more favorable sentiment on ESG topics compared to traditional news outlets, emphasizing its role as a key platform for shaping public opinion.

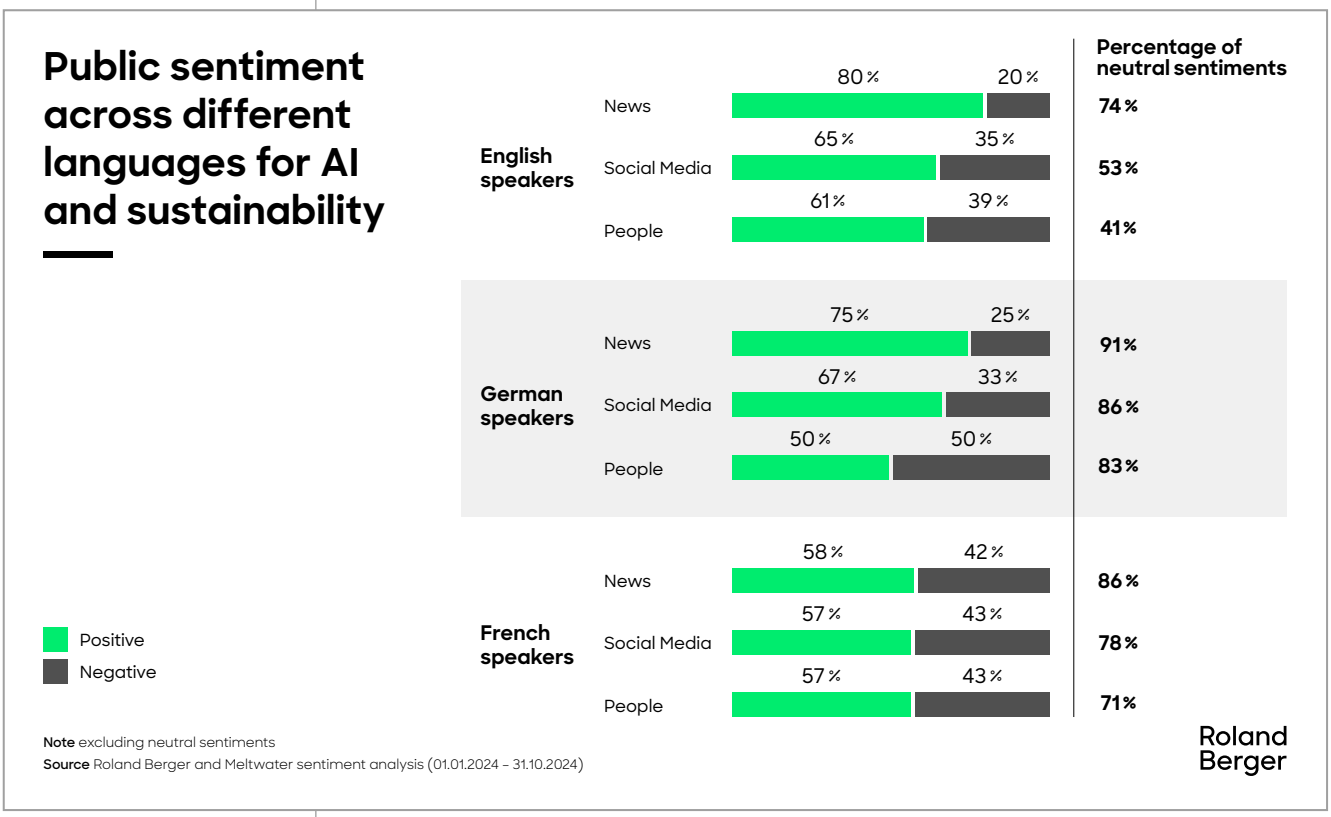
In terms of broader trends, AI and social topics have dominated discourse, while interest in environmental issues has grown significantly, especially in the context of sustainable data center practices and nuclear energy debates. Regulatory discussions are a central theme across all languages, often generating both positive sentiment (e.g., enhanced safety and data management) and negative sentiment (e.g., perceived innovation constraints).

English-language content, particularly in news, demonstrates the most positive sentiment and comparatively fewer neutral statements. Social media in English is a clear driver of positive sentiment (65% of all non-neutral statements), propelled by discussions around AI's transformative potential in sustainability, healthcare innovation, and ethical governance.

German-language content in news and social media follows a similar trend to English, but discussions by people show a more even split of positive and negative sentiment. The negative discussions are largely focused on environmental concerns such as energy consumption, nuclear energy, and the ecological impact of data centers. Regulatory hurdles are also a key source of negativity, with AI-related regulation such as the EU AI Act perceived as barriers to innovation.

French-language discussions stand out for their thematic diversity and greater overall balance between positive and negative sentiment, bolstered by company-driven news. They highlight advancements in climate prediction, agriculture, and AI applications in safety and recruitment. However, challenges around cybersecurity,

data privacy, and the political misuse of AI continue to raise concerns. This sentiment landscape highlights the critical need for tailored strategies that address regional sensitivities, leverage positive narratives, and mitigate regulatory concerns to maximize the impact of AI and sustainability initiatives.



- ## Navigating complexities in the Twin Transformation journey

While the potential of combining AI and sustainability efforts is immense, leaders must navigate a range of challenges to realize their full value. This chapter explores four critical complexities that can hinder progress if left unaddressed.

AI's environmental blind spot

Despite its benefits, AI's environmental impact remains largely opaque. Measurement and categorization are nascent but expected to improve. For example, cooling systems in data centers can increase energy use drastically, and rapid innovation in hardware generates significant e-waste, with less than 14% recycled globally. According to the sentiment analysis, this "blind spot" already presents a risk for investors and the public. At the same time, innovation in AI models is underway to improve energy efficiency.

To address this blind spot, accurate emissions classification and tracking is critical. Companies can leverage tools like Scope3's new open-source solution to measure and report the full environmental impact of AI operations. Collaboration with AI solution providers to prioritize energy-efficient systems and green innovation can further mitigate the environmental costs.

Critical need for ethical AI governance

AI's transformative potential must be matched with robust ethical oversight. Without proper governance, AI risks amplifying inequalities, reinforcing biases, and worsening environmental impacts through inefficient or poorly designed systems. As seen in the sentiment analysis, some of the posts with the highest reach were on the topics of ethical AI use, as well as related regulations.

To ensure ethical AI governance, organizations must implement comprehensive frameworks that prioritize transparency, accountability, and fairness. This involves establishing governance structures to oversee the development and deployment of AI systems, ensuring they align with societal values and regulatory standards.

The growing gap between AI advancement and sustainability progress

Globally, AI's rapid growth is outpacing sustainability efforts, creating a critical imbalance. While AI adoption is often driven by efficiency and profitability, sustainability initiatives sometimes lag due to unclear returns. This risks turning AI into an environmental challenge rather than a solution. Integrating AI with sustainability objectives can align technological progress with environmental priorities, unlocking AI's transformative potential for sustainable progress.

In a regular business scenario, sustainability will only scale if it drives profitability or efficiency – AI can help turn sustainability into a profit-driver for organizations worldwide.

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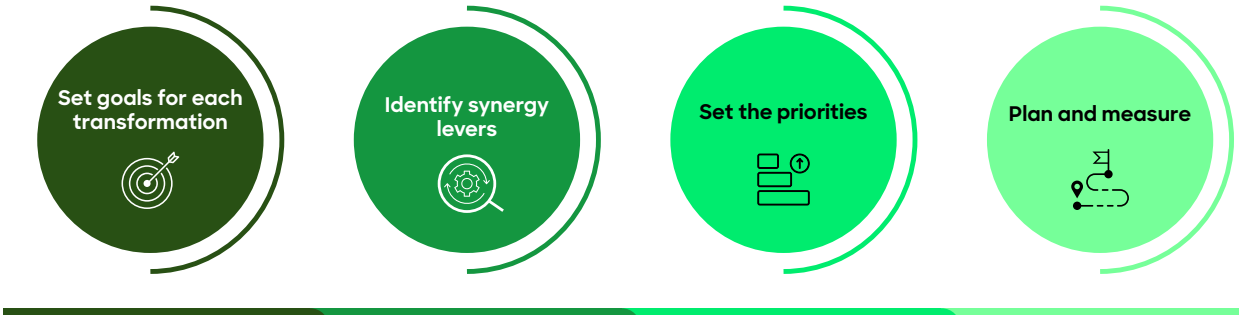
"AI is not just transforming industries; it's redefining sustainability. From optimizing energy consumption to reducing waste, AI is the catalyst for a greener future. The question is no longer if AI can drive sustainability, but how fast we can scale its impact."

Twin Transformation: What's next?

Twin Transformation offers immense potential for organizations to achieve competitive advantage while fostering positive societal and environmental impacts. However, this journey is complex and requires a structured approach, strategic alignment, and a commitment to cultural and operational change. Here's how organizations can begin their Twin Transformation journey:

Four steps toward integrating Twin Transformation



1 — Establish **clear and actionable objectives** for both AI integration and sustainability initiatives

2 — Understand where AI can **optimize your sustainability journey**, and where sustainable frameworks can guide **responsible AI use**

3 — **Rank initiatives** by their potential impact, feasibility, and alignment with long-term strategy, **ensuring full buy-in from stakeholders**

4 — Develop a **roadmap for your transformation** from scratch or integrate your existing AI and green transformations

Source Roland Berger

Roland Berger

Further reading

- ➔ *COMBATING WASTE IN FOOD AND FASHION*
- ➔ *THE GENAI-DRIVEN TRANSFORMATION*
- ➔ *DRIVING VALUE WITH SUSTAINABILITY*

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