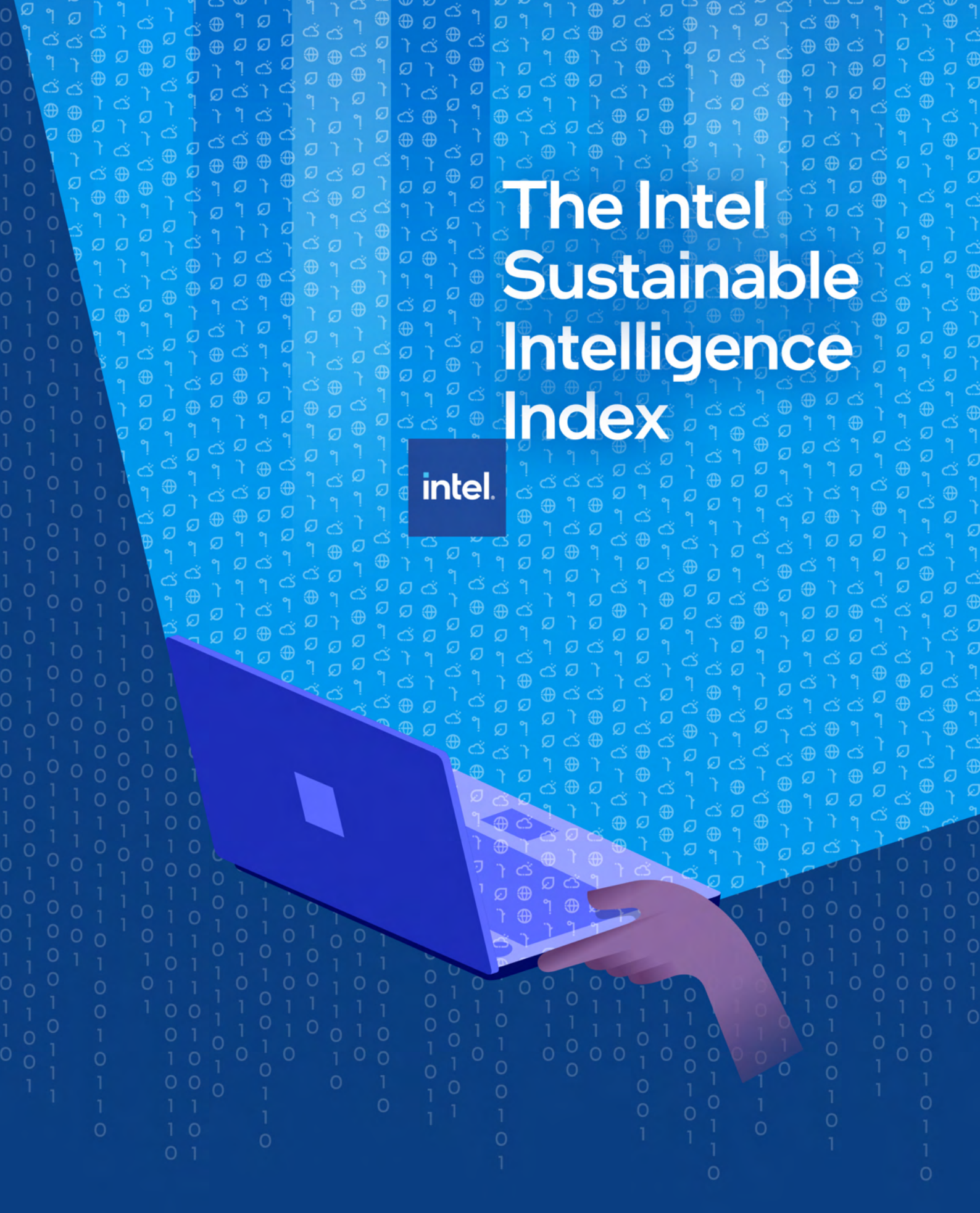
The Intel Sustainable Intelligence Index



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Foreword

AI is everywhere, reshaping the way we live and work. The recent emergence of Generative AI has supercharged this transformation; soon every company will be leveraging AI to enhance efficiency and innovation. And with this comes a new set of challenges.

Our previous research study, *The Sustainable CTO*, highlighted the need for digital and sustainability strategies to merge – and we see AI as the catalyst for this integration. As the demand for AI continues to soar, so does the requirement for computing power, inevitably leading to an increase in emissions.

At Intel, we believe AI implementation needs to be secure, responsible, and sustainable. Neglecting these factors will only intensify the environmental challenges we're currently facing. When embracing AI, business leaders must extend their focus beyond energy-efficient tech and explore how technologies can contribute to broader ESG objectives, for example, enabling more sustainable procurement, resource allocation, or upcycling practices. However, according to our latest study, too few are making this choice. While 72% of C-suite leaders believe sustainability-related AI solutions could have a great impact on their business, only 37% report that these solutions are currently being deployed in their organization.

In the race to achieve business value, organizations are currently overlooking the extent to which digital strategies can help – or hurt – sustainability strategies. We don't have to choose between AI advancement and sustainable progress; rather we must embed sustainability into our technology strategy, and vice versa.

We've found that when AI strategies are developed with sustainability as a guiding principle, organizations can win on two fronts:

Tech zero_

Using AI to reduce the carbon footprint of their IT function.

Tech positive_

Using AI as a lever for the whole organization to reach its net-zero goals and to have a positive overall impact, driving business growth and accelerating innovation.

The Sustainable CTO uncovered a Tech Trilemma: knowledge, investment, and innovation. These three areas need board-level attention for organizations to fully leverage technologies to drive sustainable progress. Our *Sustainable Intelligence Index* will help organizations identify where to focus by measuring and tracking sector progress across these pillars.

There's a lot to be learned from the 'Visionaries' in our study: the organizations effectively bridging AI and sustainability. At Intel, we recognize the journey ahead and the strides we have yet to take. As CIO, I am collaborating with our Chief Sustainability Officers to drive change across the organization, from streamlining maintenance time in our manufacturing processes to working with product teams to enhance energy efficiency. We believe it's also important to engage with other organizations to foster knowledge-sharing and help establish clearer benchmarking standards to drive industry-wide progress.

The journey to a tech-positive future is ongoing, but we are committed to sharing our learnings to help others carve out a path to more sustainable technology practices and a more sustainable future.

Motti Finkelstein
Corporate Vice President and
Chief Information Officer, Intel

About the study

The Intel Sustainable Intelligence Index measures the use of AI to drive sustainability across 11 key sectors. Organizations are scored on their responses across the three pillars of the Tech Trilemma (identified in *The Sustainable CTO* as the areas that need board-level attention for organizations to fully leverage technologies to drive sustainable progress): knowledge, investment, and innovation.

In 2024, Intel, in partnership with Man Bites Dog, ran an independent opinion research study, examining the views of 2,000 C-suite leaders in organizations with a minimum company turnover of $500 million. Job titles included Chief Executive Officer, Chief Sustainability Officer, Chief Technology Officer, Chief Information Officer, and Chief AI Officer.

Respondents were from the following sectors: education; engineering, energy, and infrastructure; financial services; government/public sector; healthcare and life sciences; manufacturing; professional services; retail; technology, media and telecommunications (TMT); transportation and automotive; and travel and hospitality. Respondents were from 22 markets across the Americas, EMEA, APAC, and China.

Key terms

Tech zero_

Using AI to reduce the carbon footprint of their IT function.

Tech positive_

Using AI as a lever for the whole organization to reach its net-zero goals and to have a positive overall impact, driving business growth and accelerating innovation.

Assessing sectors' 'Sustainable Intelligence'

The opinion research data was run through a bespoke scoring system to assess organizational performance across three key pillars: 'Knowledge', 'Investment, and 'Innovation'. An overall score was calculated by taking an average of all three pillars.

Based on these scores, organizations were divided into three groups:

Visionaries_
Those in the top third of the scoring range (i.e. industry leaders).

Advancers_
Those in the middle third of the scoring range.

Followers_
Those in the bottom third of the scoring range.

See the detailed methodology (p44) for further information.

Executive summary

The Intel Sustainable Intelligence Index ranks 11 key sectors on their use of AI to drive progress towards net-zero goals and have a positive impact. Organizations are scored across three key pillars: Knowledge, Investment, and Innovation.

Top 3 sectors overall

1. TMT
2. Financial services
3. Manufacturing

The intention-action gap

The Index reveals a missed opportunity for organizations to leverage AI for sustainable progress: while 72% of C-suite leaders in our study believe sustainability-related AI solutions could have a great impact on their business, only 37% report that these solutions are currently being deployed in their organization.

Tech zero_

62%

of leaders say their organization is utilizing AI to reduce the carbon footprint of the IT function.

Only **20%**

are currently performing as a 'Visionary' organization for tech-zero indicators (i.e. ranking in the top-third of the scoring range).

Tech positive_

66%

of leaders say their organization is using AI as a lever for the whole organization to reach its net-zero goals and to have a positive impact.

Only **17%**

are currently performing as a 'Visionary' organization for tech-positive indicators (i.e. ranking in the top-third of the scoring range).

The ROI of AI

Organizations investing in sustainability-related AI solutions see average annual savings of **$11.7 million** due to efficiencies, with the greatest reported annual savings in our research being **$53 million.**

Knowledge_

Top 3 sectors for this pillar

1. TMT
2. Financial services
3. Engineering, energy, & infrastructure

Knowledge is the strongest performing pillar for most sectors, with two-fifths of organizations in the Visionaries group (i.e., ranking in the top-third of the scoring range). However, there is still scope to build expertise around tech zero and tech positive.

Visionary organizations

- Demonstrate a strong level of knowledge and understanding around the use of AI for sustainable outcomes and are actively applying this knowledge to reach sustainability targets and deliver positive impact.
- Provide regular training on sustainable AI, both for the IT function and the wider workforce, run by internal and external experts.
- Currently have, or are recruiting for, roles with a focus on AI within both the IT function and across the wider organization.

Investment_

Top 3 sectors for this pillar

1. Financial services
2. Transportation & automotive
3. TMT

Investment is the greatest barrier to embracing sustainability-related AI, with a fifth of organizations (21%) in the 'Followers' group (i.e., ranking in the bottom-third of the scoring range).

- While 70% of C-suite leaders expect general AI investment to triple in the next 12 months, budgets for sustainability-related AI are only predicted to rise by an average of 7%.
- 71% of leaders say their organization's investment in sustainability-related AI is heavily weighted towards the IT function.

Visionary organizations

- Allocate a substantial proportion of their annual IT budget and total revenue to sustainable AI R&D and solutions.
- Deploy a range of sustainable AI use cases, both within the IT function and across the wider organization.

Innovation_

Top 3 sectors for this pillar

1. TMT
2. Financial services
3. Manufacturing

While less than a quarter of C-suite leaders (23%) believe AI is making a significant contribution towards their organization reaching its sustainability goals, 72% have a roadmap or specific goals for further deploying AI technologies to enhance environmental sustainability.

- IT decision-makers have a pivotal role to play in driving this transition: 71% of C-suite leaders say their IT function is the most innovative within the whole organization.

Visionary organizations

- Have filed successful patents for sustainable AI tools or solutions, both within the IT function and across the wider organization.
- Encourage collaboration among internal teams and with a range of stakeholder and external partners to advance knowledge and innovation around the use of AI for sustainability.

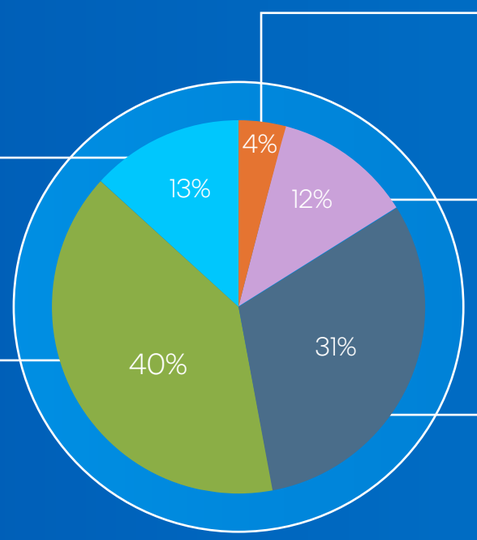
Introduction

Businesses are under increasing pressure to adopt AI technologies, and many are only just beginning to integrate AI into their operations.

Four in 10 leaders in our study (40%) report that, when it comes to AI maturity, their organization is at the implementation stage. A significant proportion are currently innovating – pioneering new and advanced AI applications to gain a competitive edge. Just 4% of C-suite leaders currently see their organization as a leader in this space, establishing industry standards and setting the pace for cutting-edge AI advancements.

It will be crucial for organizations to evaluate how AI solutions fit into their strategic vision from the exploratory stage to ensure investment is directed toward initiatives that align with overarching goals. Sustainability should be a pivotal component of this evaluation process.

General AI maturity:



Leading
Establishing industry standards and setting the pace for cutting-edge AI advancements.

Optimizing
Continuously refining and maximizing the efficiency of AI implementations.

Innovating
Pioneering new and advanced AI applications to gain a competitive edge.

Exploring
Beginning to explore AI applications and possibilities.

Implementing
Actively integrating AI solutions into specific processes or functions.

Exposing the intention-action gap

Advanced technologies, such as AI, play a paradoxical role in the net-zero transition agenda. With the widespread adoption of these tools comes the demand for increased computing power, which significantly contributes to carbon emissions and e-waste. At the same time, these disruptive technologies also hold the key to the solution, helping to optimize processes and drive sustainable decision-making.

AI tools can help reduce the carbon footprint of the IT function – both in terms of hardware and software effectiveness – by enhancing energy efficiency, resource allocation, and green coding. AI also has the power to transform entire organizations and business models to deliver a cleaner, greener, nature-positive future; 73% of C-suite leaders believe integrating AI into their operations can lead to more data-driven decisions, positively impacting sustainability efforts.

Two-thirds of leaders (67%) say their organization's current AI strategy is aligned with its broader net-zero objectives. However, our research reveals a misalignment between organizations' intentions when it comes to using AI to power sustainability strategies and the action that is being taken.

The ROI of AI

C-suite leaders in our study identified cost and ROI concerns as the most common barrier to deploying AI technologies for sustainability. And two-thirds of leaders say their organization has **clear expectations** regarding the return on investment from its AI initiatives.

Our research shows that organizations investing in sustainability-related AI solutions are seeing improved efficiencies across their operations, from optimized resource allocation and supply chain management to improved carbon footprint tracking and renewable energy integration.

These efficiencies are leading to **average annual savings of $11.7 million** for the organizations in our study, with the greatest reported annual savings being **$53 million**. And our research indicates that there are even greater savings on the horizon as AI maturity and embeddedness increase.

The benefits stretch beyond efficiencies, with 65% of leaders reporting that AI has increased innovation within their organization and resulted in net new materials, products, and/or processes that help them remain competitive in a low-carbon economy.

While **72%** of C-suite leaders in our study believe sustainability-related AI solutions could have a great impact on their business, only 37% report that these solutions are currently being deployed in their organization.

The top five sustainability efficiencies organizations are currently seeing as a result of implementing AI tools/solutions:

1. Greater energy efficiency
2. Improved carbon footprint tracking
3. Optimized resource allocation
4. Optimized supply chain management
5. Improved renewable energy integration

Reported cost savings:

$11.7m

Average annual cost savings per company

$53m[1]

Maximum annual savings per company

[1] Cost saving figures were calculated using respondents' reported savings due to the implementation of AI solutions in the following areas: energy efficiency, water usage, resource allocation, supply chain management, waste management, renewable energy integration, carbon footprint tracking, circular economy implementation.

The percentage of organizations seeing efficiencies as a result of implementing AI solutions, by region:

Total Americas

- 47% Greater energy efficiency
- 40% Improved carbon footprint tracking
- 29% Optimized supply chain management
- 23% Optimized water usage
- 23% Reduced waste

Total EMEA

- 34% Optimized resource allocation
- 26% Improved circular economy implementation
- 24% Improved renewable energy integration

Total China

- 50% Greater energy efficiency
- 45% Optimized resource allocation
- 40% Improved carbon footprint tracking
- 33% Improved renewable energy integration
- 29% Optimized supply chain management
- 25% Improved circular economy implementation
- 20% Reduced waste
- 23% Optimized water usage

Total APAC

- 46% Greater energy efficiency
- 44% Optimized resource allocation
- 41% Improved carbon footprint tracking
- 35% Improved renewable energy integration
- 33% Optimized supply chain management
- 30% Improved circular economy implementation
- 27% Optimized water usage
- 22% Reduced waste
- 32% Improved carbon footprint tracking
- 31% Optimized resource allocation
- 26% Improved renewable energy integration
- 25% Optimized supply chain management
- 23% Improved circular economy implementation
- 21% Optimized water usage
- 41% Greater energy efficiency

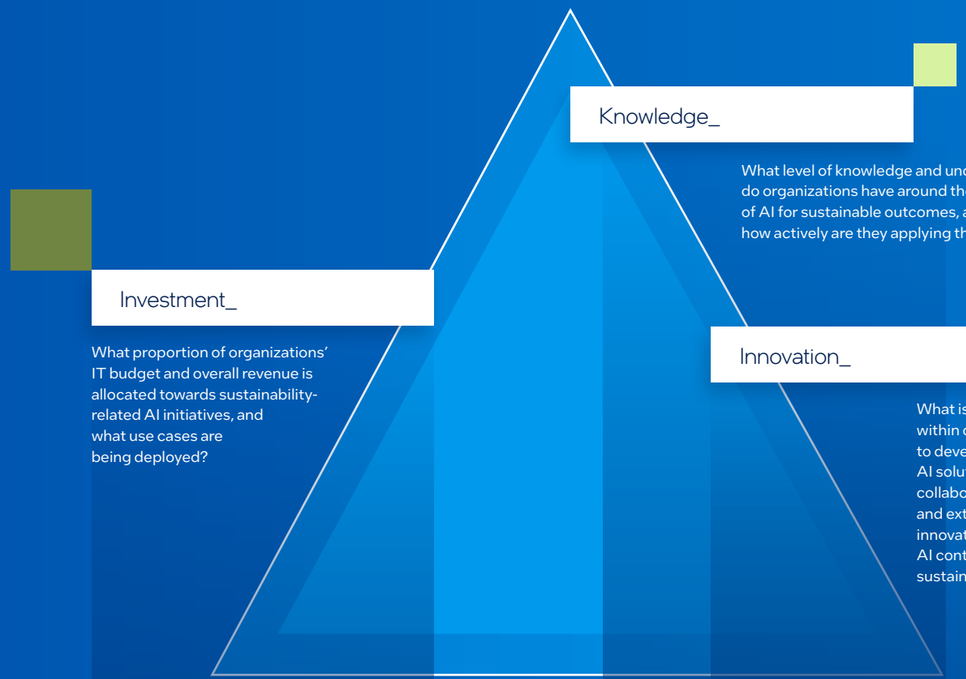
"As we rush towards AI adoption it's important not to overlook the impact of this technology on the planet. Unchecked, energy consumption and associated emissions could soar. On the flip side, the technology holds tremendous potential to help solve some of the world's most pressing sustainability challenges. Strategic sustainability thinking and deployment is paramount.

As Chief Sustainability Officers, we need to work closely with CTOs to create tools and mechanisms to assess AI implementation using a sustainability lens in order to maximize its potential while minimizing its environmental impact."

Todd Brady
Vice President, Global Public Affairs & Chief Sustainability Officer, Intel

The Intel Sustainable Intelligence Index

The Intel Sustainable Intelligence Index ranks key sectors on their **use of AI to drive sustainability**. Sector performance is scored across the three pillars of the Tech Trilemma:



Knowledge_

What level of knowledge and understanding do organizations have around the use of AI for sustainable outcomes, and how actively are they applying this?

Investment_

What proportion of organizations' IT budget and overall revenue is allocated towards sustainability-related AI initiatives, and what use cases are being deployed?

Innovation_

What is the level of innovation within organizations when it comes to developing and implementing AI solutions? Are organizations collaborating with internal teams and external partners to drive innovation? And to what degree is AI contributing toward achieving sustainability objectives?

Organizations are divided into three groups based on their scores:

Visionaries_

The companies blazing a trail in sustainability-related AI. (i.e. in the top third of the scoring range).

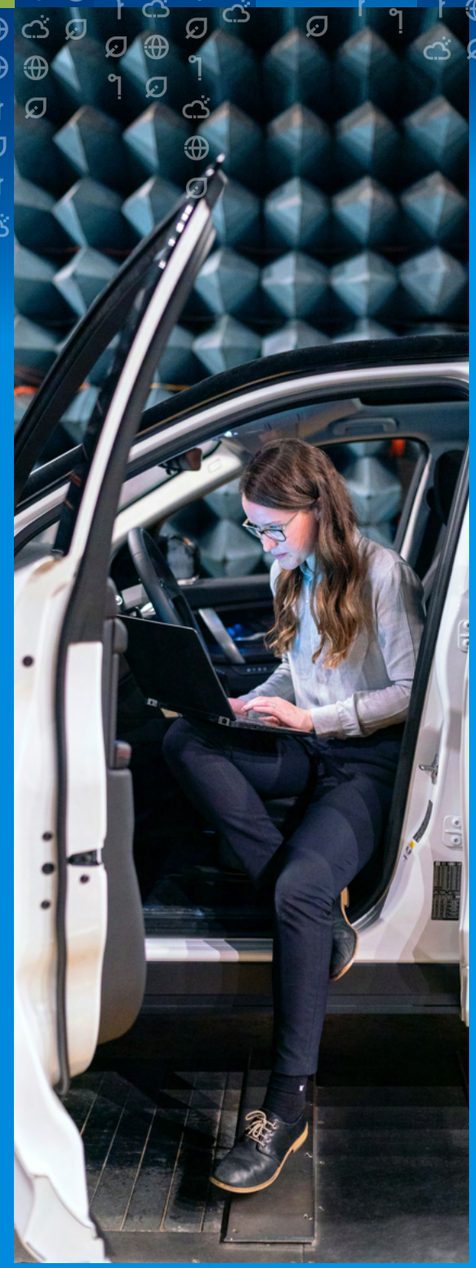
Advancers_

The companies making headway in this space (i.e. in the middle third of the scoring range).

Followers_

The companies at risk of falling behind the curve. (i.e. in the bottom third of the scoring range).

Visionary organizations – those developing expertise, allocating investment, and pushing for innovation – are setting the agenda when it comes to the use of AI for sustainability. Organizations in the Advancers and Followers groups should be looking to these trailblazers for guidance and best practices to bridge knowledge, investment, and innovation gaps.

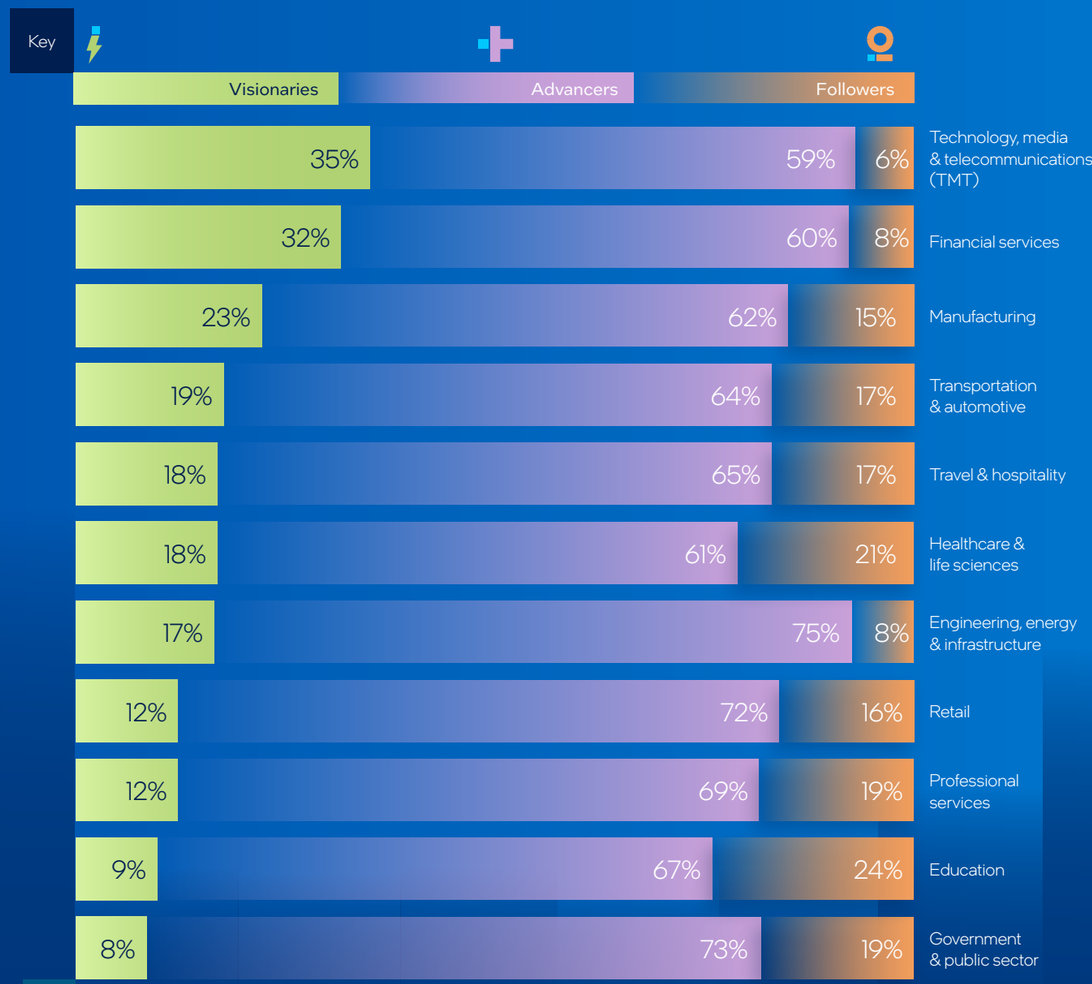


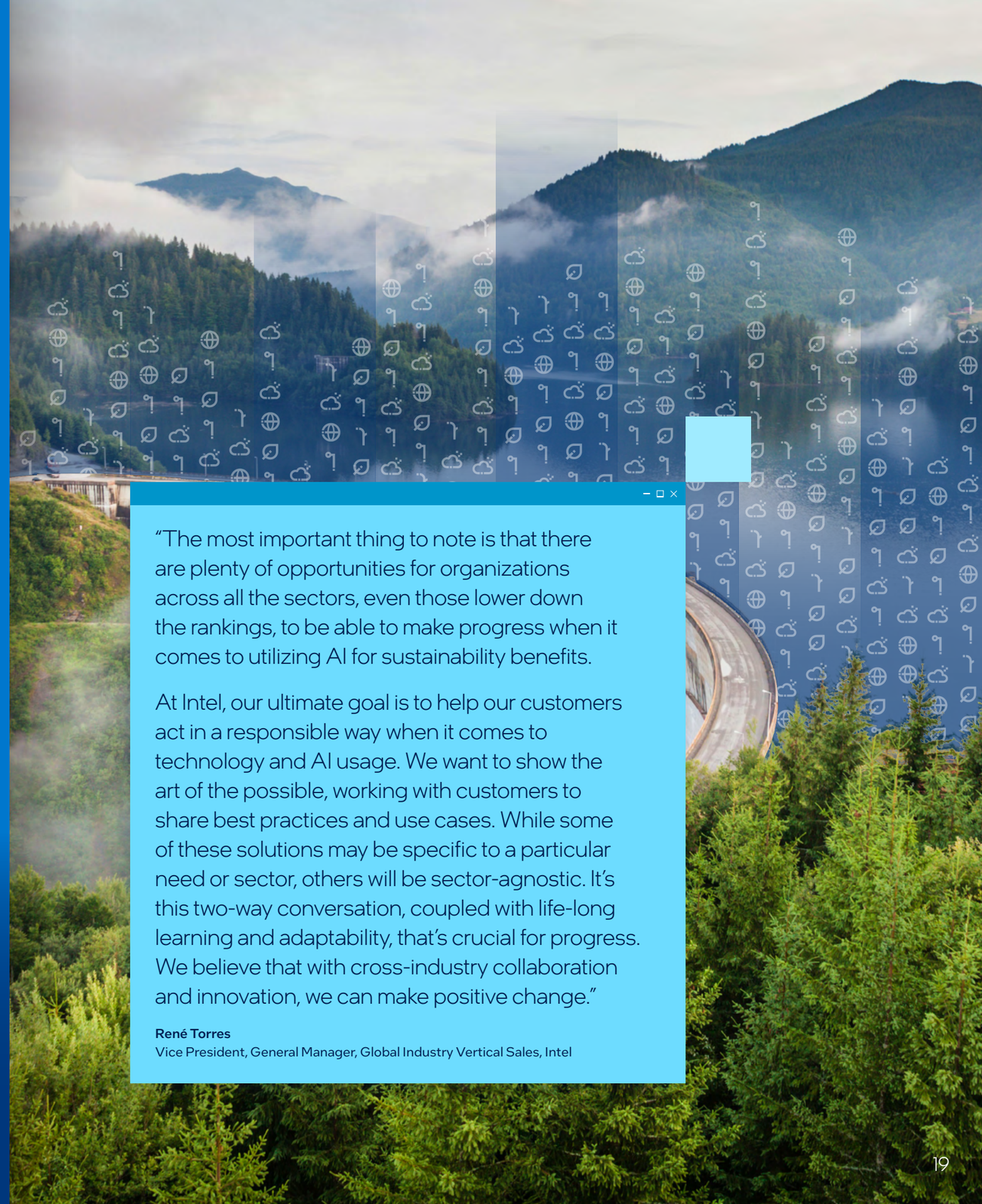
Overall sector performance

The technology, media, and telecommunications (TMT) sector tops the Index overall, leading the way when it comes to leveraging AI for sustainability. Over a third of TMT organizations in our study (35%) fall within the Visionaries category. Financial services and manufacturing follow closely behind, with 32% of organizations classed as Visionaries, and manufacturing is in third place with 23% of organizations classed as Visionaries.

Organizations in the education sector and government and public sector are falling behind, with fewer than one in 10 in the Visionaries category (9% and 8% respectively).

Overall sector rankings across all pillars:





"The most important thing to note is that there are plenty of opportunities for organizations across all the sectors, even those lower down the rankings, to be able to make progress when it comes to utilizing AI for sustainability benefits.

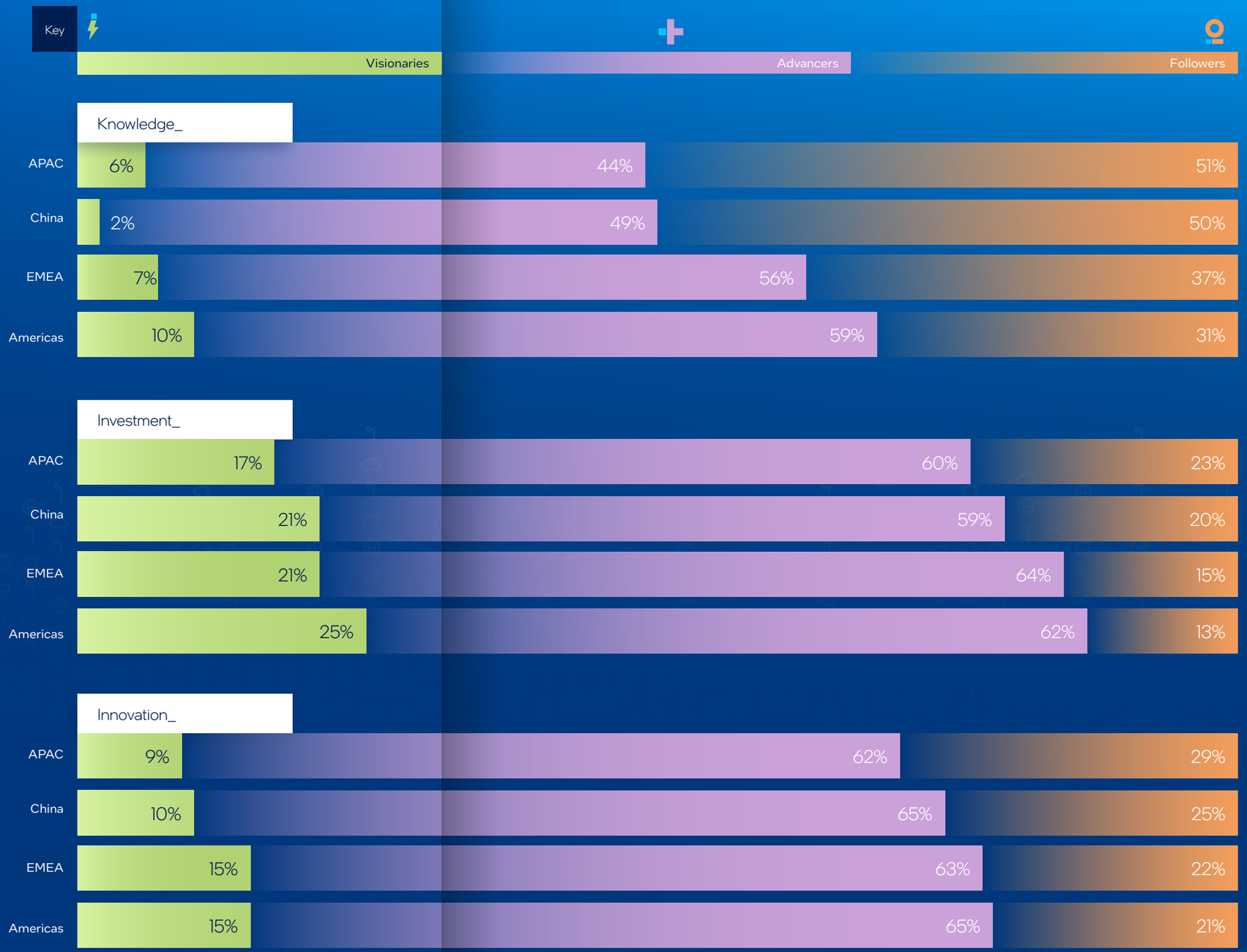
At Intel, our ultimate goal is to help our customers act in a responsible way when it comes to technology and AI usage. We want to show the art of the possible, working with customers to share best practices and use cases. While some of these solutions may be specific to a particular need or sector, others will be sector-agnostic. It's this two-way conversation, coupled with life-long learning and adaptability, that's crucial for progress. We believe that with cross-industry collaboration and innovation, we can make positive change."

René Torres
Vice President, General Manager, Global Industry Vertical Sales, Intel

Regional spotlight

Organizations in APAC and China lead the way across all three pillars, with 51% of organizations classed as Visionaries in the Knowledge pillar. Meanwhile, organizations in the Americas score low, with 25% of organizations falling behind when it comes to Investment.

Regional performance across the three pillars:



Tech zero vs tech positive

The Index also examines sector performance through the lenses of tech zero and tech positive, i.e. **AI for sustainable IT and AI for sustainable organizations**.

The majority of leaders report strong progress across tech zero and tech positive. However, our research reveals a misalignment between organizations' *intentions* when it comes to using AI to power sustainability strategies and the *action* that is being taken.

Tech zero_

62%

of leaders say their organization is utilizing AI to reduce the carbon footprint of the IT function.

Only 20%

are currently performing as a Visionary organization for tech-zero indicators (i.e. falling in the top-third of the scoring range).

Tech positive_

66%

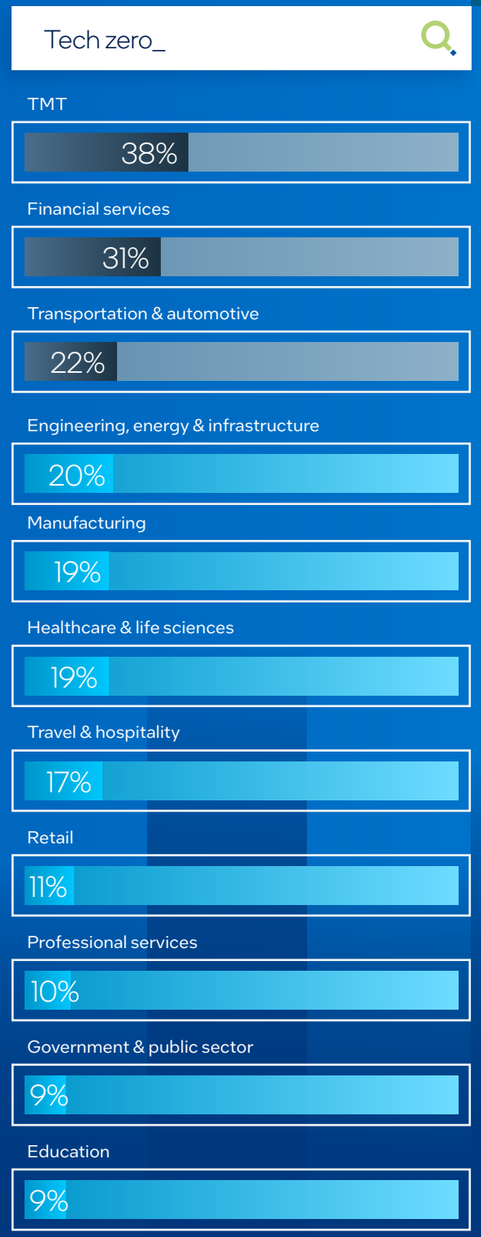
of leaders say their organization is using AI as a lever for the whole organization to reach its net-zero goals and to have a positive impact.

Only 17%

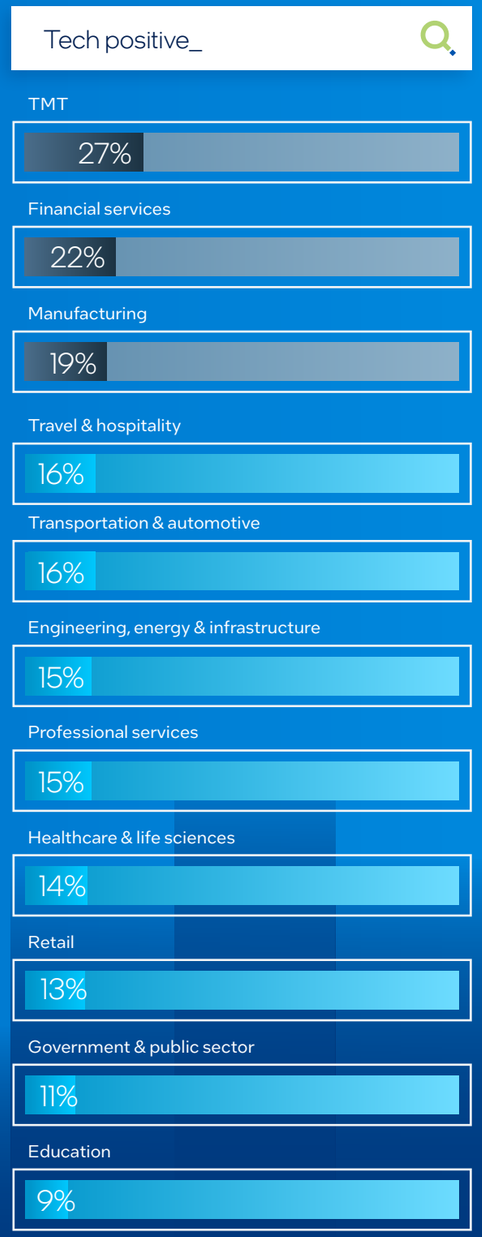
are currently performing as a Visionary organization for tech positive indicators (i.e. falling in the top-third of the scoring range).

Visionary rankings:

Tech zero_



Tech positive_



In the leading sector, TMT, we see 38% of organizations in the Visionaries group (i.e. organizations that are leading the way) for **tech-zero indicators** across the Index – and just 27% for **tech-positive indicators**. The education sector falls to the bottom of the rankings for tech zero and tech positive, with just 9% of organizations in the Visionaries group across both.

Notably, the top three performing sectors for tech-positive indicators mirror the overall rankings, while the transportation and automotive sector makes its way to third place for tech zero. Looking between the two lenses, we see the most movement in the middle of the rankings. The travel and hospitality sector, for example, jumps from seventh place in the tech-zero rankings to fourth place for tech positive.

These scores illustrate that tech-zero performance is currently stronger than tech-positive performance for the majority of sectors. This indicates that the IT function is leading the way when it comes to using AI to drive positive change (as demonstrated in *The Sustainable CTO*), but now it's time for the whole organization to take up this mantle.

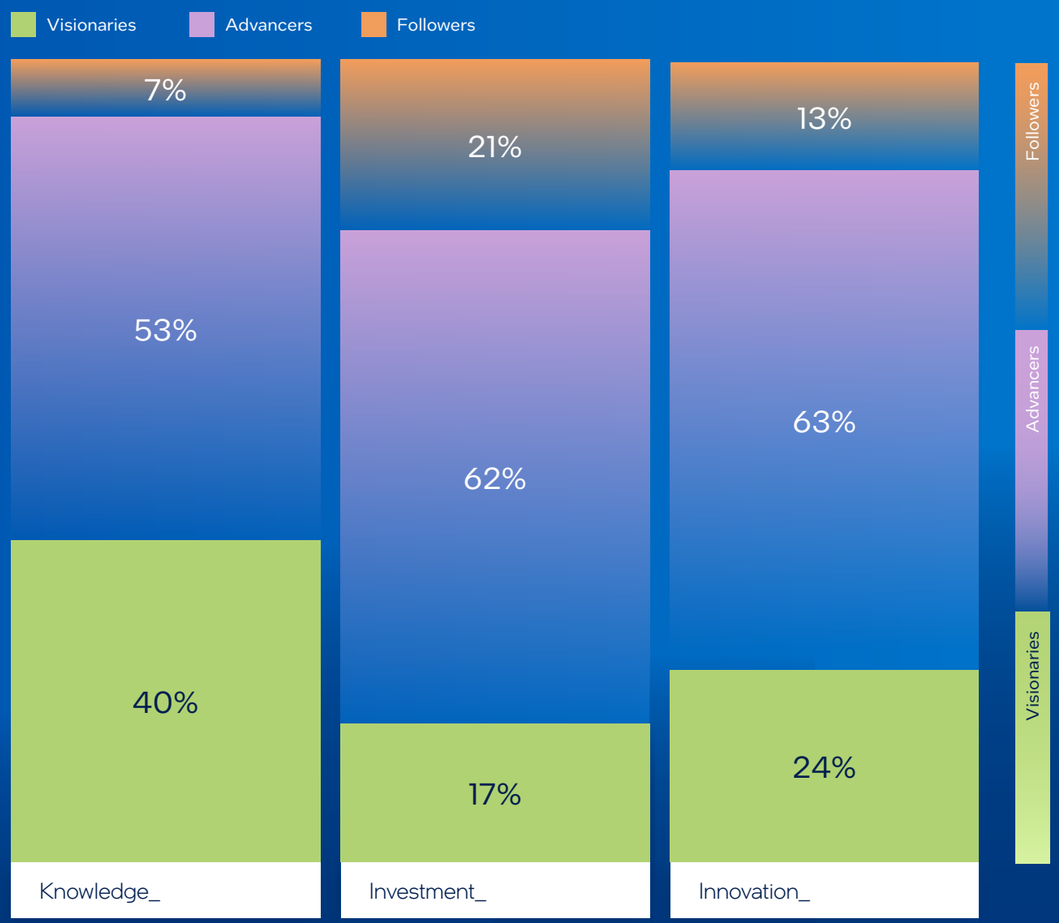
Overall pillar performance

Knowledge is the strongest performing pillar in the Index, with two-fifths (40%) of organizations sitting in the Visionaries category. The majority of organizations (53%) fall within the Advancers category, demonstrating a moderate awareness and understanding of AI for sustainability, and just 7% of organizations are classed as Followers. This shows a strong grasp and potential application of AI towards sustainability goals across the organizations in our study.

The Innovation pillar sees the majority of organizations (63%) sitting in the Advancers group, while a quarter of organizations (24%) sit in the Visionaries group, championing innovation in the sustainable AI space.

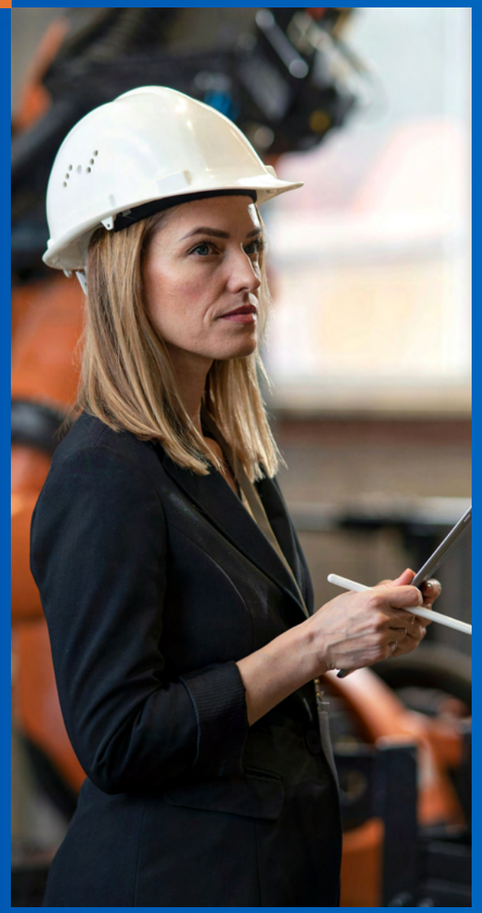
Our research reveals that Investment is the biggest hurdle to sustainability-related AI, with a fifth of organizations (21%) falling behind in this area. A small group of Visionaries for this pillar (17%) indicates a minority of organizations are making robust investments in this area.

Overall pillar performance across all sectors:



Pillar 1

Knowledge



Knowledge is the strongest performing pillar across all sectors, apart from retail.

Our research shows that organizations are putting time into upskilling their workforce around AI technologies in general; 72% of C-suite leaders report that their organization is dedicated to ensuring employees are not only skilled in current AI technologies but prepared for future advancements in the field.

However, when it comes to the degree of understanding around using AI to drive *sustainability*, and the extent to which this knowledge is being implemented, the TMT; financial services; and engineering, energy, and infrastructure sectors are leading the way.

What does Visionary look like?

Visionary organizations are defined as those that:

- Have a strong level of knowledge and understanding around the use of AI for sustainable outcomes and are actively applying this knowledge to reach sustainability targets and deliver positive impact.
- Carry out regular team training, both for the IT function and the wider workforce, which incorporates internal and external expertise.
- Currently have, or are recruiting for, roles with a focus on AI within both the IT function and across the wider organization.

The organizations in our study generally perform better for tech-positive indicators in the Knowledge pillar, suggesting that knowledge-building around the use of AI for sustainability is not only reserved for the IT function. Almost seven in 10 leaders (69%) say their organization is actively incorporating AI expertise to drive sustainability initiatives.

However, there is still scope to develop a broader understanding of tech zero and tech positive across organizations. Just half of leaders (51%) report high levels of knowledge in their organization around the use of AI to reduce the carbon footprint of the IT function. And 53% report high levels of knowledge in their organization when it comes to using AI as a lever for reaching sustainability targets and delivering a positive impact – although this rises to 68% among TMT leaders.

> "We are entering the AI PC era: a breakthrough in personal computers with dedicated AI acceleration capability spread across the central processing unit, graphics processing unit and neural processing unit architectures. With AI and ML tasks processed at our fingertips rather than in the cloud, the landscape of collaboration and productivity will be reshaped. Reducing reliance on cloud computing will also minimize environmental impact and promote more sustainable computing practices."
>
> **Michelle Johnston Holthaus,**
> Executive Vice President, General Manager, Client Computing Group, Intel

AI expertise in the TMT sector

TMT organizations have a wide range of AI expertise to draw from:

48%

have a Chief AI officer in position within their organization.

Within the IT function:

56%

of TMT organizations currently have an AI/ML engineer in position (compared to just 30% in the professional services sector).

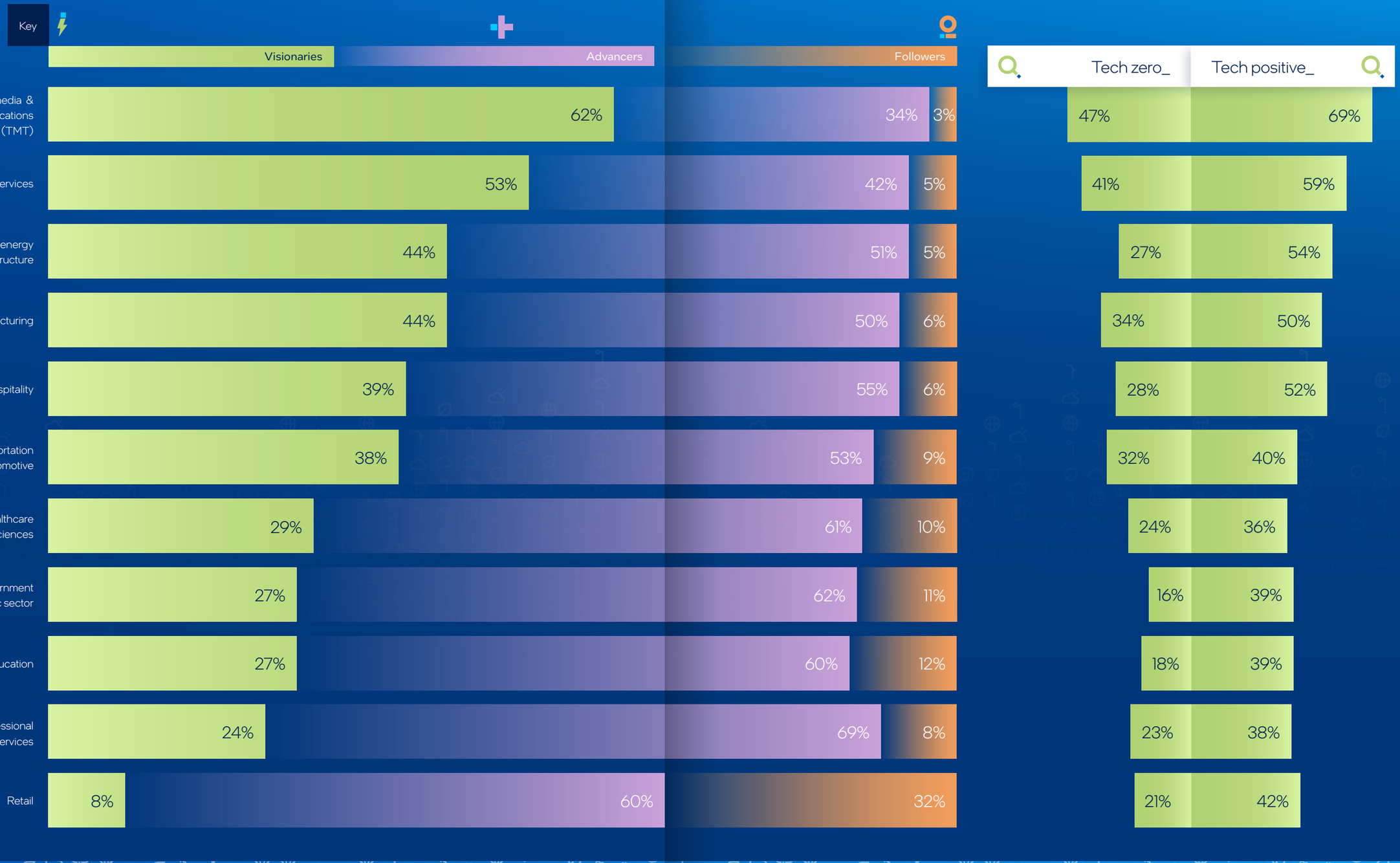
38%

have an AI research scientist (compared to 16% of government and public sector organizations).

40%

have an AI trainer (compared to 24% in the healthcare sector).

Knowledge pillar rankings:



AI for tech zero

What does AI for tech zero *look like*? AI technologies can be deployed in a variety of ways to reduce the carbon footprint of the IT function while improving operational efficiency and sustainability.

Greener software development

AI tools can assist in developing energy-efficient software by identifying code optimizations, reducing the computing power needed to run applications.

Greener data storage

Organizations must have a clear data strategy, with ever-increasing data requirements, data storage plans are essential. AI algorithms can optimize data storage and transmission by compressing and deduplicating data, reducing storage requirements and minimizing network traffic.

Greener resource allocation

AI-driven resource allocation algorithms can optimize the utilization of computing resources such as servers, storage, and networking equipment, reducing the need for additional hardware.

Greener virtualization and cloud environments

AI tools can enhance virtualization and cloud computing platforms by optimizing resource allocation, workload placement, and scaling strategies, leading to more efficient use of hardware resources and reduced energy usage.

Greener data centers

AI algorithms can optimize data center operations by dynamically adjusting cooling systems, server utilization, and power distribution based on real-time data.

Pillar 2

Investment

Our research reveals that while general AI investment is set to surge, sustainability-related AI budgets are at risk of stalling.

While 70% of C-suite leaders say their organization's general investment in AI is set to triple in the next 12 months, budgets for sustainability-related AI – both within the IT function and for the organization as a whole – are predicted to increase by an average of just 7%. This reveals a huge, missed opportunity.

Organizations in the financial services; transport and automotive; and TMT sectors are leading the charge on investment in sustainability-related AI.

What does Visionary look like?

Visionary organizations are defined as those that:

- Are allocating a substantial proportion of their annual IT budget and total revenue to sustainability-related AI R&D and solutions.
- Have a range of AI use cases currently being deployed/in development, both within the IT function and across the organization as a whole.

The majority of leaders (71%) say their organization's investment in sustainability-related AI is heavily weighted towards the IT function. This is evident in the financial services sector, where there are almost twice as many Visionaries for tech-zero Investment indicators (33%) than for tech-positive Investment indicators (17%).

Our research reveals the top areas where organizations are currently deploying AI technologies to drive tech-zero and tech-positive progress.

Top five AI use cases being deployed to reduce the carbon footprint of the IT function (tech zero):

1. Resource management
2. Algorithm and data efficiency
3. Computer Vision for improved quality or reduced waste
4. Energy consumption optimization
5. Regulatory compliance

Top five AI use cases being deployed across the wider organization to reach net-zero goals (tech positive):

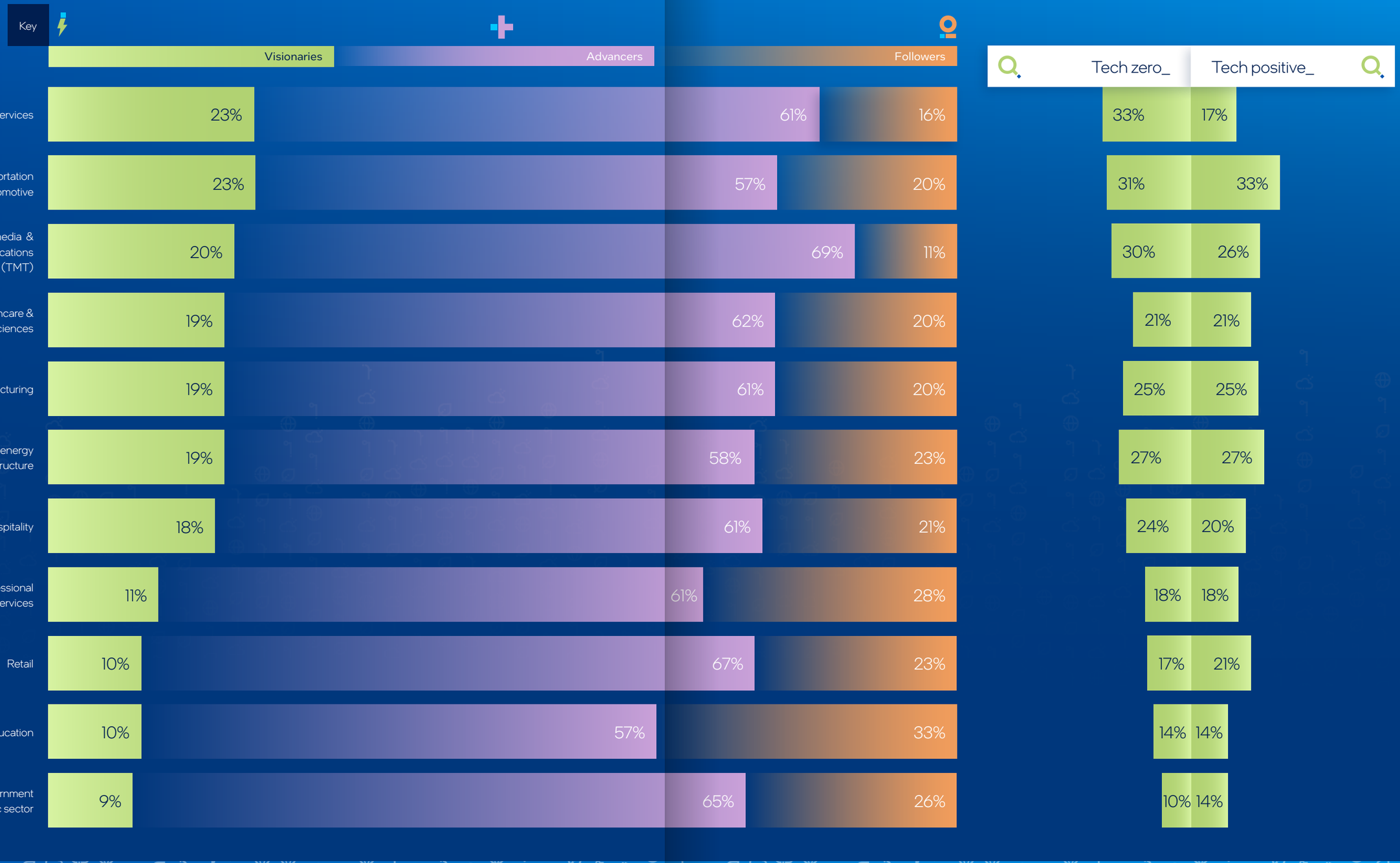
1. Energy consumption optimization
2. Resource management
3. Predictive analytics
4. Carbon footprint tracking
5. Environmental monitoring and compliance

"The most impactful AI innovations are happening at the edge where the convergence of AI and edge computing is unlocking groundbreaking opportunities. By processing data and executing AI algorithms right where the data is generated, edge computing decreases costs, reduces latency, and conserves energy.

Delivering AI at the edge not only enhances efficiency but also fosters the development of transformative solutions that contribute to environmental sustainability. By leveraging the power of edge AI, organizations can address pressing challenges with agility, paving the way for a greener future."

Sachin Katti,
Senior Vice President, General Manager,
Network and Edge Group, Intel

Investment pillar rankings:



Pillar 3

Innovation

Less than a quarter of C-suite leaders (23%) believe AI is making a significant contribution towards their organization reaching its sustainability goals. However, innovation is on the rise, with companies making headway in both tech-zero and tech-positive indicators; 59% of leaders say their organization is either fairly or extremely innovative in terms of using AI as a lever for the whole organization to reach its net-zero goals and have a positive impact.

The TMT; financial services; and manufacturing sectors lead the way when it comes to the level of innovation within their IT teams and across the organization in terms of using AI to drive sustainability.

What does Visionary look like?

Visionary organizations are defined as those that:

- Have filed successful patents for sustainability-related AI tools or solutions in the last 12 months, both within the IT function and across the wider organization.
- Encourage collaboration among internal teams and with a range of stakeholder and external partners to advance knowledge and innovation around the use of AI for sustainability.
- Are seeing AI solutions contributing towards reaching their sustainability goals.

More than seven in 10 leaders (72%) say their organization has a roadmap or specific goals for further deploying AI technologies to enhance environmental sustainability, and 69% of organizations have an AI innovation center or lab. Crucially, 71% of leaders say their IT function is the most innovative within the whole organization. This supports the findings from *The Sustainable CTO* that IT decision-makers have a pivotal role to play in driving a successful transition.

Collaborating with internal teams and external partners will be crucial to advancing supercharging innovation. Over half of leaders (51%) say their organization currently collaborates with research institutions to advance knowledge and innovation around AI to drive sustainability. However, just 25% report collaboration with other business functions. Encouraging organization-wide buy-in will be pivotal to driving a tech-positive future.

Internal teams and external partners that organizations currently collaborate with to advance knowledge and innovation around AI to drive sustainability (tech positive):

51%

Research institutions

43%

Customers/clients

39%

Suppliers

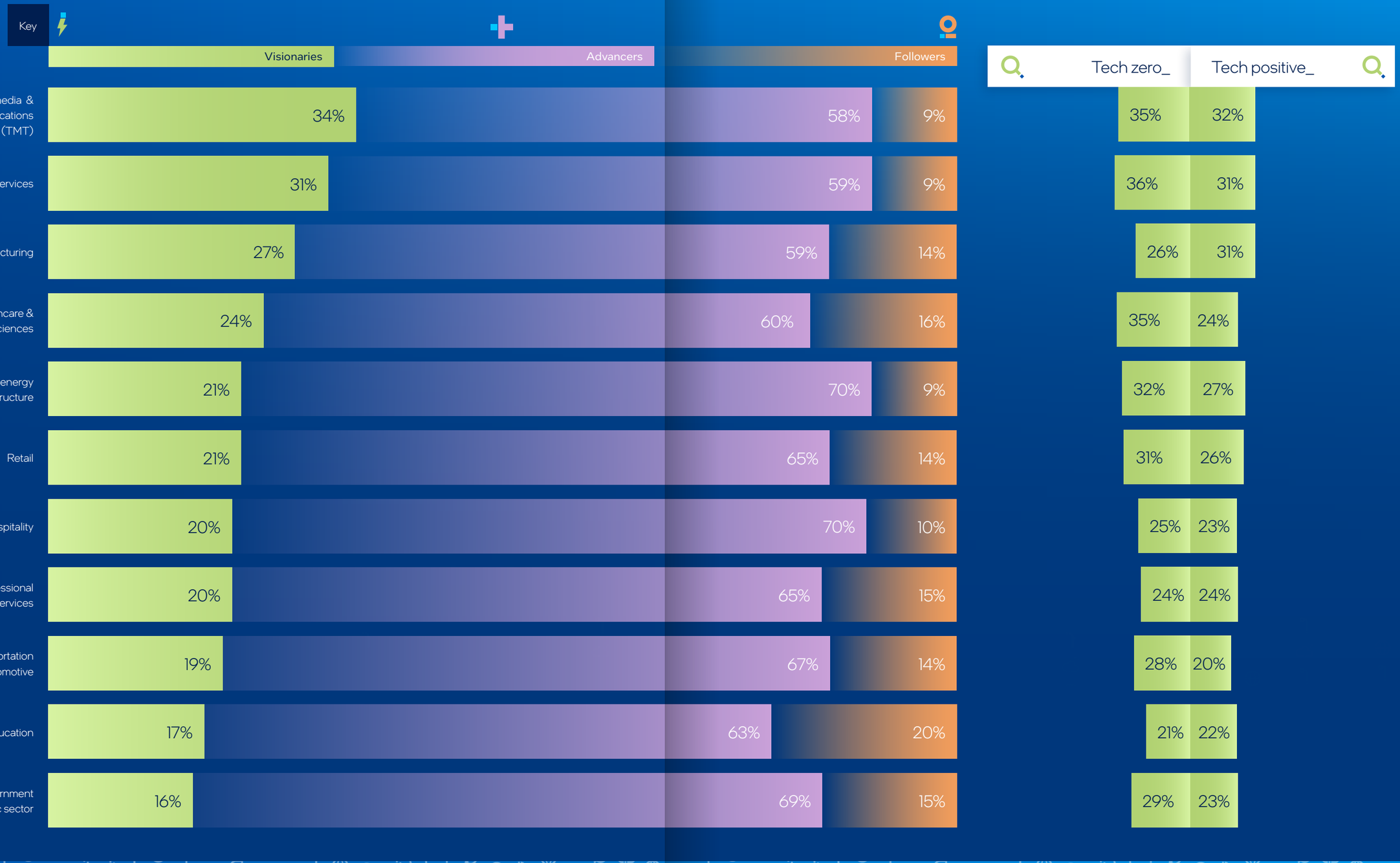
36%

Industry peers

25%

Other functions within the business

Innovation pillar rankings:



AI for tech positive

By bringing AI beyond the confines of the IT function, organizations can unleash the power of their data for sustainable progress – helping to meet organizations' net-zero goals, drive business growth and accelerate innovation.

Optimizing energy efficiency

AI can analyze vast amounts of data to identify opportunities for energy savings across business operations, from manufacturing processes to office facilities. Beyond this, AI tools can optimize energy consumption and distribution in smart grids, facilitating the integration of renewable energy sources and reducing reliance on non-renewable energy.

Streamlined supply chains

AI-powered analytics can help to identify inefficiencies, reduce waste, and minimize environmental impact throughout entire supply chains. In addition to reducing emissions, crucially, this helps to enhance supply chain resilience.

Predictive maintenance and asset management

By integrating AI with IoT devices and sensors, organizations can enable real-time monitoring and control of equipment. Predictive maintenance systems can anticipate equipment failures before they occur, helping to minimize downtime, extend equipment lifespan, and minimize resource waste.

Product lifecycle optimization

Designing products with sustainability in mind is crucial to reducing waste, conserving resources, and meeting evolving consumer demands for eco-friendly solutions. AI-driven insights can help to optimize product design, manufacturing processes, and end-of-life management to minimize environmental impact throughout the product lifecycle.

Innovation and research

Fostering a culture of innovation is imperative in the AI era, and AI tools themselves will play a vital role. Through the analysis of intricate datasets and scenario simulations, AI can free up expert time and identify opportunities for sustainable solutions.

"IDC forecasts a steep climb in data center energy consumption, partially driven by generative AI, anticipating growth from 382TWh in 2022 to 802TWh by 2027.[1] Innovation will be crucial to alleviate this strain.

Organizations can leverage insights generated from AI together with automated solutions to reduce the carbon footprint of their data centers. For example, while the rise in AI is heating up data centers, AI-assisted cooling can monitor temperature and humidity levels in real-time, making dynamic adjustments to main optimal conditions.

We must also work towards the development of AI-focused data centers, specially designed to handle AI-heavy workloads with ability to manage increased network demands effectively."

Justin Hotard
EVP GM, Data Center & AI Business Group, Intel

[1] IDC, July 2023, ID#US51013223 - Generative AI: Implications for the Data Center

Conclusion

Closing the intention-action gap

Now is the time for digital transformation and sustainability strategies to come together. AI is the technology to break these silos and propel organizations into a tech-positive space.

While organizations are making strides in knowledge-building and innovation around AI for sustainability, harnessing their full potential will require responsible planning and substantial investment. This investment goes beyond financial resources – encompassing strategic foresight, talent development, and a commitment to sustainable AI practices.

There is a substantial ROI opportunity for businesses integrating AI into sustainability efforts. By leveraging AI-driven insights, organizations can identify opportunities to reduce waste, minimize energy consumption, and optimize resource allocation, thereby contributing to a more sustainable future. And, beyond cost savings and enhanced operational efficiency, AI can play a pivotal role in advancing environmental stewardship.

However, achieving these outcomes requires collaboration among key decision-makers. Chief Technology Officers (CTOs) and Chief Sustainability Officers need to align their strategies to close the intention-action gap, transform business processes, and meet sustainability goals.

Collaboration with external partners will also be crucial to drive innovation. Governments, businesses, and technology providers must unite to foster an ecosystem that supports the development and deployment of sustainable AI solutions, such as new tools, code, and products; clean energy technology; and grid modernization.

The journey toward harnessing the power of AI for sustainability is one of both challenge and opportunity. It requires bold leadership, strategic vision, and a commitment to collaboration and responsible innovation. By viewing AI and sustainability as complementary forces, rather than adversaries, we can shape a future where technology is the ultimate catalyst for sustainable growth.

Detailed methodology

The Intel Sustainable Intelligence Index is based on an independent opinion research study carried out by Intel in 2024, in partnership with Man Bites Dog and with research completed by Coleman Parkes Research. The research sample consisted of 2,000 C-suite leaders from organizations across 11 sectors and 22 markets.

11 sectors

- Education
- Engineering, energy, & infrastructure
- Financial services
- Government & public sector
- Healthcare & life sciences
- Manufacturing
- Professional services
- Retail
- Technology, media & telecommunications (TMT)
- Transportation & automotive
- Travel & hospitality

2,000 C-suite leaders

Minimum company turnover: $500m

- 1,500 senior IT decision-makers (including the CTO)
- 250 CEOs
- 250 CSOs

22 markets

- **Americas:** US, Canada, Brazil, Mexico
- **EMEA:** UK, France, Germany, Spain, Poland, Belgium, Italy, Switzerland, UAE, South Africa, Nigeria.
- **APAC:** Japan, India, Australia, Singapore, South Korea, Taiwan.
- **China** (PRC)

Sector rankings are based on organizations' **use of AI to drive sustainability**, scoring organizations across three pillars: Knowledge, Investment, and Innovation. These pillars were identified in *The Sustainable CTO* as the Tech Trilemma: the three key areas that need board-level attention for organizations to fully leverage technologies to drive sustainable progress.

Within each pillar, organizations were assessed on their use of AI to reduce the carbon footprint of their **IT function** (tech zero) and as a lever for the **whole organization** to reach its net-zero goals and have an overall positive impact (tech positive).

To assess how organizations are performing in each of these pillars, we ran our opinion research data through a bespoke scoring system (details on the inputs for each pillar below) to produce scores for each pillar and an overall score (an average of all three).

Based on these scores, organizations were divided into three groups:

Visionaries_

Top third of the scoring range (i.e. industry leaders).

Advancers_

Middle third of the scoring range.

Followers_

Bottom third of the scoring range.

Sectors were ranked according to their percentage of 'Visionary' organizations.

By looking at respondents' scores for tech-zero and tech-positive questions independently, we were also able to rank sector performance in these two areas.

Further detail on each pillar

Knowledge_

The **Knowledge** pillar is based on the following opinion research data:

- The level of knowledge within organizations around the use of AI to reduce the carbon footprint of the IT function and as a lever for reaching stated sustainability targets and delivering a positive impact.
- The degree to which this knowledge is being actively implemented.
- Training across the IT function and the wider organization around the use of AI to drive sustainability.
- The range of AI-focused roles in organizations

Investment_

The **Investment** pillar is based on the following opinion research data:

- The proportion of organizations' annual IT budget and total revenue that is invested in sustainability-related AI R&D and solutions.
- The AI use cases that are currently being deployed/in development, both within IT functions and across organizations as a whole.

Innovation_

The **Innovation** pillar is based on the following opinion research data:

- The level of innovation within IT teams and across organizations in terms of using AI to drive sustainability.
- The number of patents organizations have filed for sustainability-related AI tools or solutions in the last 12 months, both within the IT function and across the wider organization.
- The internal teams and external partners that organizations collaborate with to advance knowledge and innovation around the use of AI for sustainability.
- The degree to which AI is contributing towards organizations reaching their sustainability goals.

Disclaimer, authorship, and acknowledgments

The concept development and research design for this report were carried out by Intel and thought leadership consultancy, Man Bites Dog. The opinion research fieldwork was conducted in January and February 2024.

Resources

For more information about Intel's sustainability goals and progress please visit:
www.intel.com/sustainability

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To find out more

For further information please contact:

**Alex Liu, Sustainability Lead,
Sustainability Center of Excellence**

alex.liu@intel.com

For media enquiries, please contact:

**Chelsea Hughes, Senior Corporate
Communications Manager: Global Impact**

chelsea.hughes@intel.com