Technology Sustainability Survey Report 2022-23

Technology playing a key role in environmental sustainability

Baringa

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Introduction

Introduction

Our Technology sustainability survey provides insights for organisations in the UK and across the globe to support their journey towards greater technology sustainability.

Most organisations have published plans to move towards net zero carbon emission to reduce their impact on the climate. Their commitment to deliver on these plans is coming under greater scrutiny from regulators, shareholders and consumers. Net zero requires achieving a balance between the carbon emitted into the atmosphere, and the carbon removed from it. To achieve net zero or carbon reduction, organisations face the challenge of reducing emissions across all business functions.

Many sectors have a significant technology footprint to support the delivery of its operations, services and products. This technology footprint can contribute a large portion of the organisation's energy consumption and emissions, whether it is from user devices, applications or infrastructure.

We conducted this survey to provide insight to organisations to support them on their journey to technology sustainability. Given that this is an emerging topic for many organisations, we focused this year’s survey on governance, technology choices and suppliers.

We combined the survey results with over 20 years of experience advising across all industry sectors, including governments, the energy industry, retail and the largest cloud service providers on climate strategy.

Survey Approach

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Survey Overview:

Launched in Q4 of 2022
Organisations across different industries invited to participate, providing a holistic picture.

Global inputs
Survey rolled out to organisations across the globe.

Respondents from a range of sectors and roles
Technology, sustainability and business leaders (CXOs, Directors and Heads of function) surveyed to gain insight.

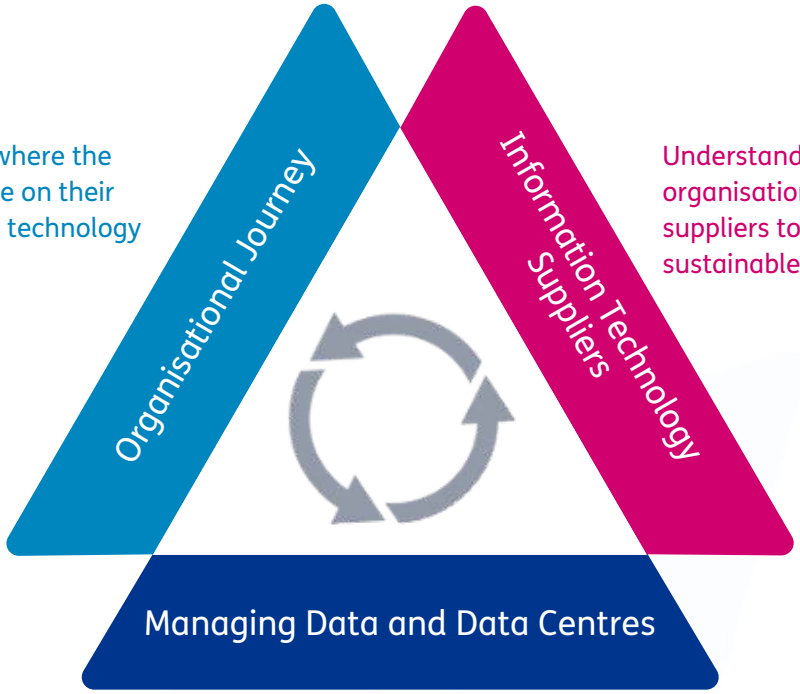
30+ questions
Survey consisted of more than 30 questions covering different aspects of sustainability in technology

Valuable insights
Based on the responses received, various insights have been driven which will help each organisation's journey towards achieving technology sustainability.

Survey Components:

The three survey components were designed to provide a holistic picture of the organisational journey towards delivering environmental sustainability in technology.

Understanding where the organisations are on their journey towards technology sustainability



Understanding how organisations work with IT suppliers to deliver sustainable technology

Understanding how organisations manage their data and data centres to support sustainability

The Technology sustainability survey consisted of more than 30 questions, across the following sections: Organisational Journey, IT Suppliers and Managing Data and Data Centres. This enabled the survey responses to be analysed to gather insights on specific activity across each of these areas as well as to provide a holistic view of key themes across organisations and sectors.

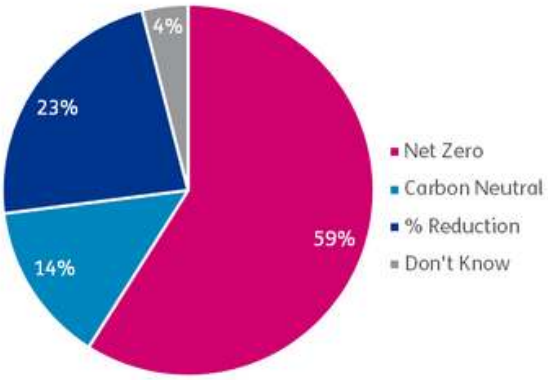
Key Findings

Key Findings

1. Goals and targets

The majority of organisations (81%) have committed to an overall carbon reduction target without understanding or defining the role that technology will need to play to achieve it.

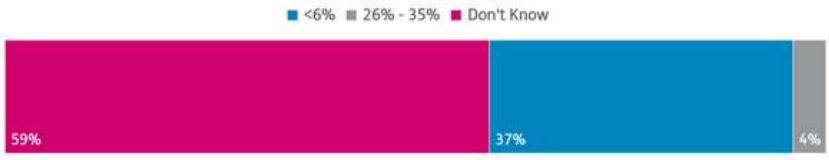
Type of carbon reduction target



- 59% of respondents have committed to a Net Zero target. Whereas 23% and 14% have committed to a Percentage Reduction and Carbon Neutral target, respectively.
- Out of respondents who selected Net Zero or Carbon Neutral, 80% have externally published while 10% have internally published targets.
- 72% of organisations don't have a published set of targets for technology sustainability.

Technology or IT contribution to overall enterprise carbon footprint

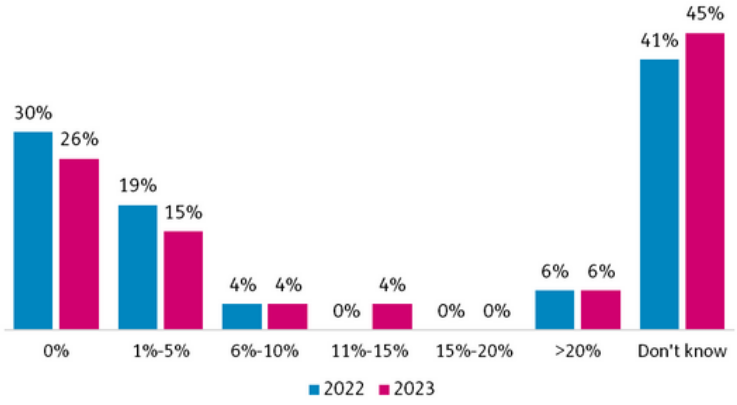
- 59% of respondents were not aware of their technology estate's contribution compared to the overall footprint.



2. Investment Levels

The majority of respondents (79%) either made no, or did not know if investments were made, to enable technology sustainability during 2022. Investing in technology sustainability need not be in isolation, as many enablers improve sustainability (cloud, decommissioning) also deliver a simplified, standardised, lower cost IT and data estate.

Overall IT transformation spend invested in improving technology sustainability

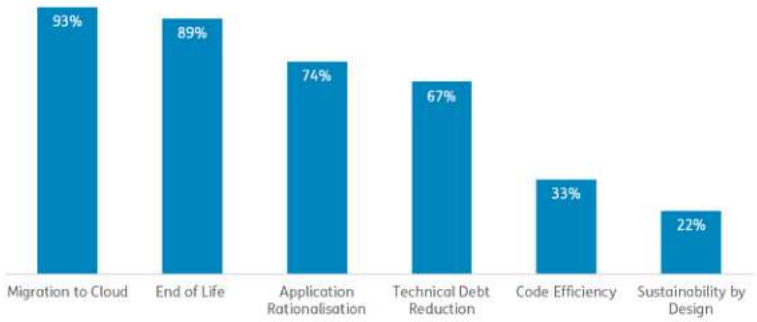


- Only 30% of respondents had any spend in 2022 toward improving technology sustainability.
- We saw one respondent increase spending in 2023 as opposed to 2022.
- 45% of respondents do not have any visibility of spend in this area for 2023.

3. Technology Enablers

There are a range of techniques available to organisations to reduce their carbon footprint. The most popular techniques were cloud migration (92%) and rationalising the number of applications (73%); the least popular was improving code efficiency (31%).

% Respondents who have invested in initiatives that will improve their technology sustainability

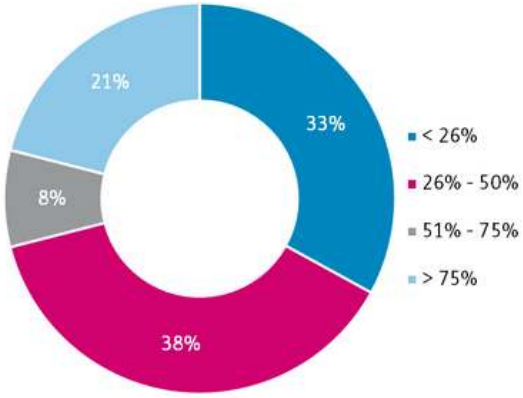


- 93% of respondents have Migration to Cloud Infrastructure to reduce emissions, 89% have End of Life Initiatives, while 74% have Application Rationalisation policies.
- End of Life and Technical Debt Reduction initiatives need to be appropriately funded and linked to broader business, IT and sustainability objectives to successfully realise the benefits.

4. Data Centre Efficiency

96% of respondents didn't know the Power Usage Efficiency (PuE) of their data centres, be those self- or supplier-managed. Data centres are a major source of energy and water consumption. Another quick win is switching to renewable energy for power - 21% still use fossil fuels.

% Respondents with applications and infrastructure in organisation dedicated data centres



- 67% of respondents indicated that 26% or more of their organisation's applications and infrastructure remain in organisation owned data centres (DCs).
- Power Usage Efficiency (PuE): Organisations looking to improve technology sustainability should start with measuring their data centre power usage effectiveness as 96% of respondents were not aware of their organisations or supplier's PuE.

Renewable energy usage to power data centres

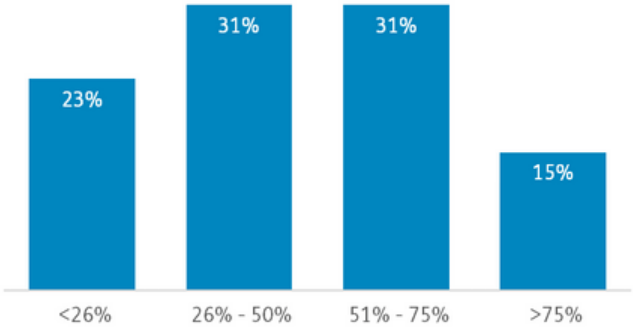
- At least 23% of organisations use non-renewable fuels to power their data centres.
- 52% of respondents were not aware if their operations or IT suppliers use water efficiency metrics to monitor water consumption.
- 48% of respondents were not aware if their organisation or suppliers incorporate passive cooling/heat recovery systems in their data centres.

Our research indicates that up to 80% more water efficient data centres can be produced through recycling water, optimising operational set points, and relocating data centres so that ambient air can cool servers. Additionally, energy management systems can attain up to 45% reduction in energy consumption and up to 20% reduction in energy bills through better understanding of energy use.

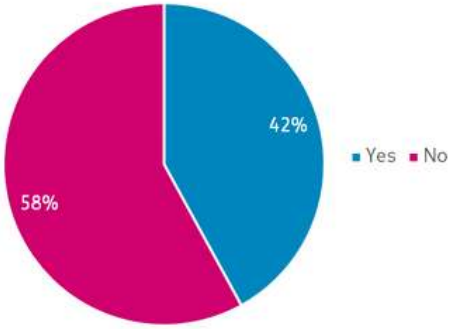
5. IT Supplier Contribution

61% of respondents do not require their IT suppliers to report their carbon emissions for their contracts and only 40% had a sustainable procurement policy in place. As around a third of enterprise IT spend is delivered by third parties, it is critical that organisations track and work with IT suppliers to reduce their contribution as well as their own.

% of technology budget delivered by IT suppliers



Sustainable procurement policy covering IT



- For 77% of respondents, 26% or more of their IT budget is delivered by IT Suppliers.
- 58% of organisation don't have a Sustainable procurement policy that covers IT.
- Additionally, 61% of respondents never require IT suppliers to report their carbon emissions for each of their contracts.

Many IT organisations depend on a multi supplier ecosystem to provide products and services. It is important that the environmental policy is interpreted and actioned by IT, especially in the way that it procures products/services. Also, many organisations use cloud to demonstrate a reduction in scope 2 emissions without being conscious of the indirect impact of their workload on a given cloud could be. Therefore it is important to understand your carbon impact even when operating in the cloud.

Participant Data 2022-23

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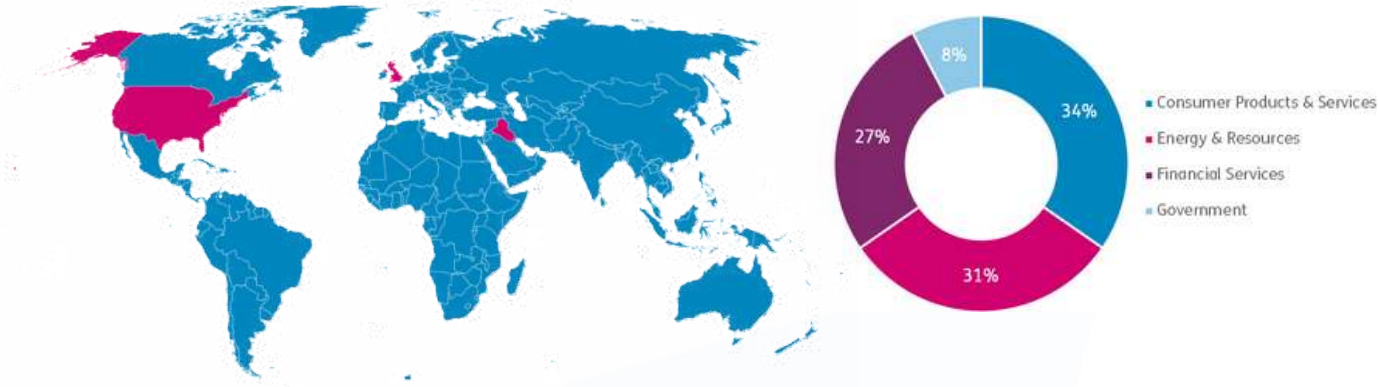
We received responses from different industries across different geographies. The responses were received from technology and sustainability leaders representing a broad range of sectors which provides a holistic picture of the current technology sustainability landscape.



Key geographies	Most of the responses were received from the United Kingdom (85.2%). The other countries are United States (7.4%) and the Middle East (7.4%).
Industry / sector	Survey participants spanned across several industries: Consumer Products & Services (34.6%), Energy & Resources (30.8%), Financial Services (26.9%) and Government (7.7%).
Organisation size	Responses were received from Super Large (>40K employees) comprising 16%, Large/Medium (1K-40K) comprising 48% and Small firms (<1K employees) comprising 36%.
Respondents	The survey was rolled out to C-suite, including CEOs, CIOs, CISOs, IT Directors, Head of IT/IM, Heads of Sustainability.

Observations, Insights and Recommendations

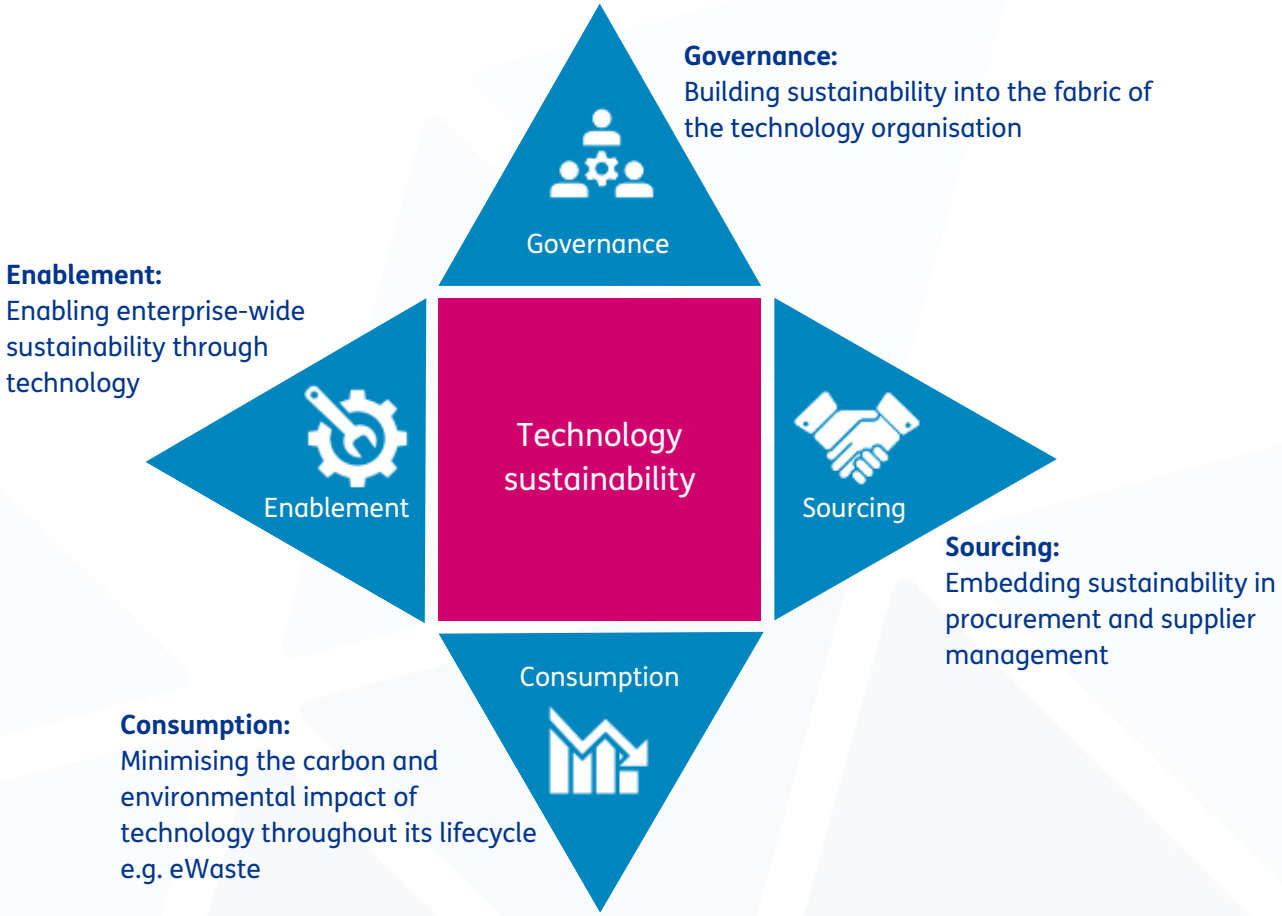
Observations, Insights and Recommendations

The survey consisted of 34 questions across three key components (Organisational Journey, IT Supplier Information and Data and Data Centre Management).

Based on the responses received across these components, the analysis, observations and insights were generated aligned to Baringa's four technology sustainability lenses i.e., Governance, Sourcing, Consumption and Enablement.

The subsequent sections of this report highlight the insights generated across these lenses which would help organisations achieve their goal to technology sustainability.

The technology sustainability lenses



1. Governance

To be effective, sustainability should be embedded into all aspects of an organisation's technology strategy and operations.

Just as organisational change needs a clear path with defined objectives, a sustainability journey is no different. To help ensure objectives are achieved, all stakeholders need to know the steps to be taken to reach that point. The governance lens covers a number of aspects that help organisation reduce and maintain a reduction in carbon emission, and support the wider ESG (Environmental, Social and Governance) agenda, by building it into the fabric of the technology organisation.

Technology sustainability as a cultural change

At its heart, technology sustainability is a "cultural" change and organisations need a governance framework to achieve this.

The organisation must take steps to break down the silos between different business units to achieve a common vision of sustainability, including technology sustainability.

Collaboration is the hallmark of technology sustainability. Teams must work together for continuous improvement and better decision making. The journey needs to be started with understanding the role of technology in sustainability, creating best practices to be followed, disseminating these via training and embedding sustainability within the culture.

What can organisations do?

Define the Vision

Define technology sustainability outcomes aligned to the organisation's sustainability goals. Gartner expects that by 2025, 50% of CIOs will have performance metrics linked to the sustainability of the IT organisation (Gartner Report: 'Are You Thinking Too Small About Sustainable Technology?').

Plan and Design

Develop the approach and roadmap, with measurable milestones, supported by:

- Policies: create policies and a governance structure (along with roles and responsibilities) that will help to influence behaviour and guide decisions leading to the desired outcomes (e.g., sourcing and supplier management policies).
- Principles: design principles that will lay the foundation for a sustainable technology architecture (e.g., coding and testing principles).
- Metrics: define metrics to track progress against sustainability goals.

Communicate and Collaborate

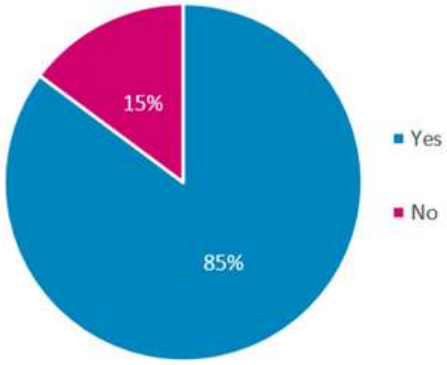
The journey towards sustainability practices in technology needs to be supported by effective communication, training and collaboration across the organisation. It is important that there is buy-in from sponsors and stakeholders as well as the teams that will deliver the change.

Embed in Culture

Embedding sustainability as a strategic driver for innovation and transformation will help achieve the short- and long-term organisational sustainability goals. There is an opportunity for technology, data and digital functions to build capability in sustainability to help the wider organisation leverage existing and emerging technologies, e.g., cloud, blockchain, optimisation tools and automation.

Governance insights from the survey and recommendations

Does your organisation have an environmental policy in place?

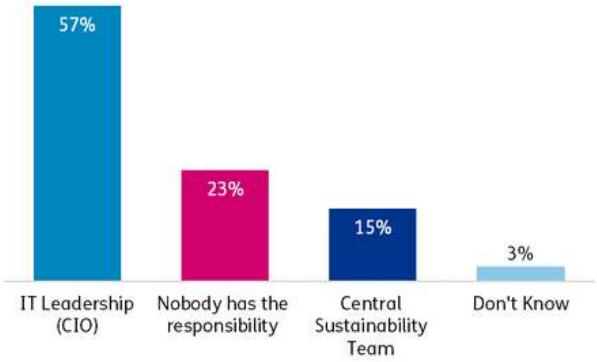


- Most surveyed organisations have set targets already, with 85% of respondents having an environmental policy within the organisation.
- 87% of UK based respondents' organisations have an environmental policy already.

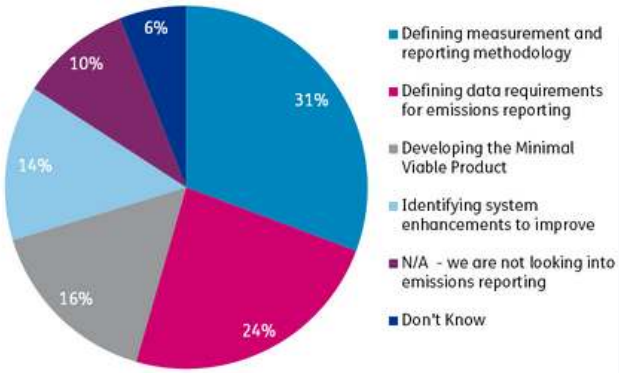
Most organisations have an environmental policy, an important first step towards achieving sustainability.

Who is responsible for the ownership and governance of technology sustainability in your organisation?

- IT Leadership (CIO) is responsible for ownership of technology sustainability in 57% of survey responses.
- 23% of respondents indicated that nobody has this responsibility.



What is your organisation doing to make it easier to report its emissions?



- 31% of respondents have defined measurement and reporting methodologies to make it easy to report on emissions.
- This was followed by 24% of organisations that have defined data requirements for emissions reporting.
- 10% of respondents are not looking into emissions reporting yet.

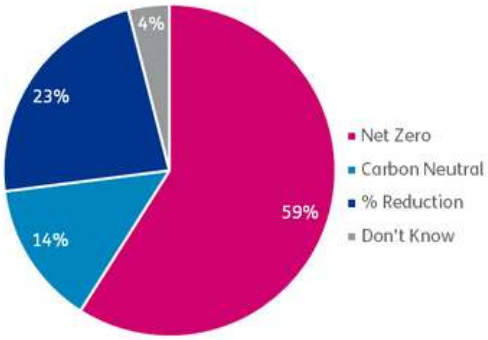
Whilst most organisations are investing in emissions reporting, they tend to be in the earlier stages of implementation.

Does your organisation have a committed target to reduce its carbon footprint?

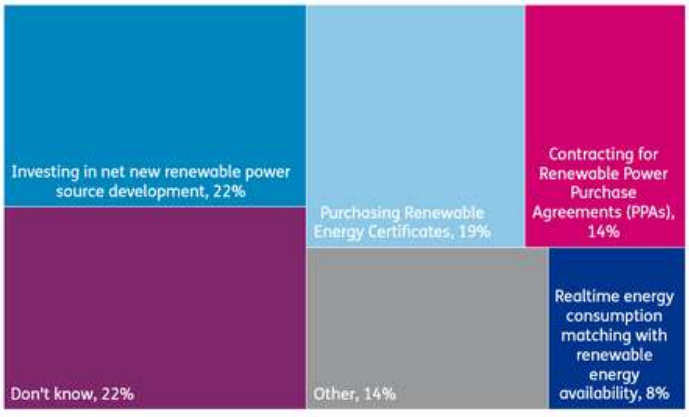
- 73% of respondents are externally publishing their committed target for carbon footprint reduction, whereas 8% are internally publishing it.
- All E&R sector responses are publishing their committed targets, with 75% publishing externally and 25% publishing internally.

What type of target has your organisation committed to?

- 59% of respondents have committed to a Net Zero target.
- In contrast, 23% and 14% are committed to a Percentage Reduction and Carbon Neutral target, respectively.
- All respondents from E&R sector indicated they had committed to either Net Zero or Percentage Reduction targets.



How does your organisation meet this target?



- The most popular approach to meeting targets is through investment into renewable power source development.
- Our survey also indicates that although targets have been set 22% of respondents do not know how these will be met.

2. Consumption

Minimising the carbon and environmental impact of technology

Technology has become an integral part of every organisation, and it plays a key role in the day-to-day operations. However, organisations need to recognise that technology has a significant environmental impact, and it is critical to consume technology sustainably to reduce the overall environmental impact.

What can organisations do?

This section highlights 4 key areas that can enable organisations to consume technology more sustainably.

- **Baselining, monitoring, auditing, and reporting**

These are key steps to enable organisations to spot inefficiencies and areas of improvement by tracking and reporting - internally and externally - on the environmental impact, through frequent assessments. This data can then be used to develop targeted net-zero, carbon neutral or percentage reduction plans, based on current performance and identified areas of improvement.

- **Infrastructure efficiency**

The energy required to run data centres and IT equipment has a considerable impact on the carbon footprint of an organisation. By using cloud computing, an organisation can reduce energy consumption, while also improving on flexibility, scalability, and accessibility. Our research indicates that cloud infrastructure powered by renewables can lead to 92-98% fewer emissions compared to an on-premises data centre. In addition, an organisation can utilise advanced cooling and heat recovery systems in data centres, thereby improving airflow management and increasing infrastructure efficiency. Other breakthrough technologies include energy management systems that can result in reduced energy consumption of IT estate, leading to lower energy bills and lower maintenance costs, as any faults are remotely diagnosed and rapidly resolved.

- **Application optimisation**

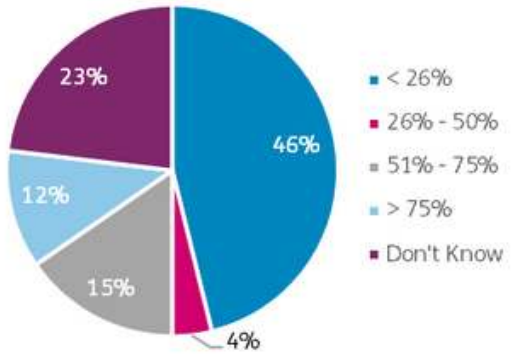
An organisation can greatly reduce its environmental impact by optimising software and applications to use less data and resources, lowering energy use, and increasing efficiency. An organisation can pursue application rationalisation initiatives, which involves analysing existing application infrastructure, optimising the performance of applications, and retiring redundant applications; utilise code efficiency methods that allow software code to perform intended functions with minimal resource use; and technical debt reduction, by systematically identifying and replacing poorly designed systems, outdated technology, and accumulation of technical debt due to lack of upgrades and/or maintenance.

- **eWaste reduction**

Electronic waste is a growing environmental concern as the use of technology continues to increase. Purchasing assets that are produced with sustainable design incorporate longer lifespans, upgradeable components, and repairable designs, can reduce the need for frequent replacement. Moreover, organisations can minimise the amount of eWaste through various initiatives targeted at extending the life of existing IT assets, reusing components, purchasing refurbished components, and properly disposing equipment at the end of life.

Consumption insights from the survey and recommendations

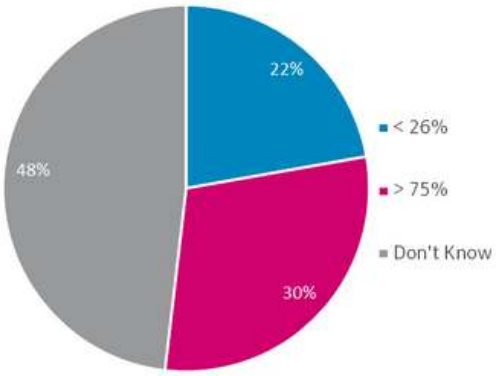
What percentage of your organisation's data is stored in the public cloud?



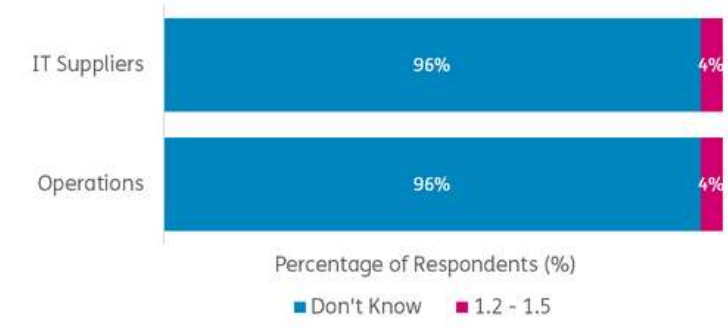
- Organisations are yet to take full advantage of cloud to host their data sustainably as 46% of respondents have <26% of their organisation's data stored on the cloud.
- Baringa's research indicates that it can be over 70% more energy efficient than traditional on-premises provision.

What percentage of your organisation's energy is from renewable sources?

- 48% of respondents were not aware whether their organisation's energy is powered through renewables. 22% responded with >75% powered by renewables.
- If an organisation is looking to improve sustainability of its estate, the first thing to check is if it is powered by renewable energy.
- Research indicates utilising cloud powered by renewables can lead to up to 92-98% fewer emissions than a traditional on-premise data centre not powered by renewables.

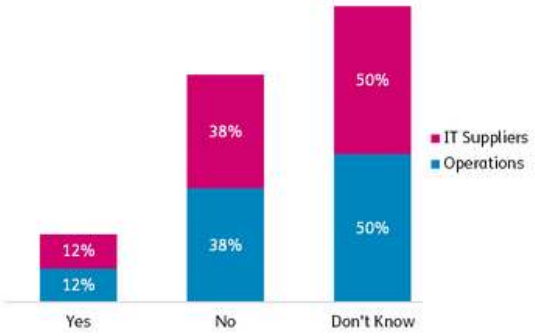


What is your average data centre power usage effectiveness (PUE)?



- Organisations looking to improve Technology Sustainability should start with measuring their data centre power usage effectiveness as 96% of respondents were not aware of their organisation's or supplier's PUE.

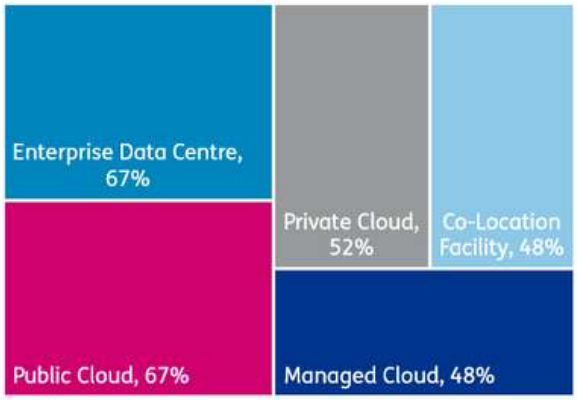
Does your organisation's internal operations/IT suppliers use water efficiency metrics to monitor data centre water consumption?



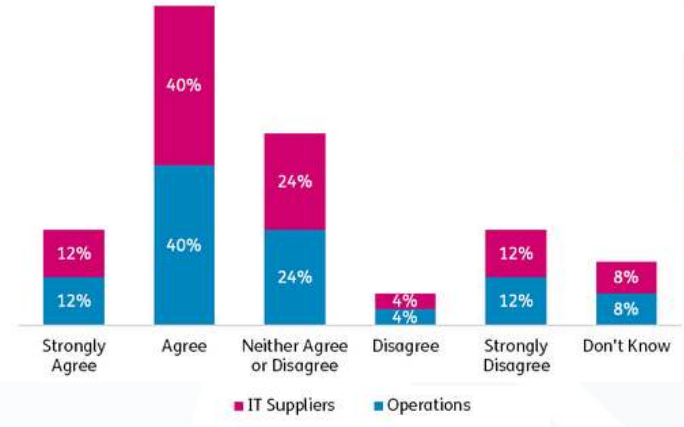
- 50% of respondents were not aware if their operations or IT suppliers use water efficiency metrics to monitor water consumption.
- Our research indicates that up to 80% more water efficient data centres can be produced through recycling water, optimising operational set points, and relocating data centres so that ambient air can cool servers.

How do you store data?

- All organisations that have responded to the survey use a combination of an on-premise data centres and use of cloud to store data.
- Enterprise data centre and Public Cloud were the most common responses, with 67% of respondents using the technology, followed by 52%, using the Private Cloud.



Your organisation/ IT suppliers effectively optimise data centre service performance to reduce resource consumption i.e. server capacity management.



- 52% of respondents either strongly agree or agree that they optimise data centre and suppliers' service performance to reduce resource consumption. Whereas 16% either disagree or strongly disagree.
- 63% of UK respondents strongly agreed or agreed with the statement.
- All respondents indicated the same response for both their organisation and IT suppliers.

3. Sourcing

Sourcing plays a significant role in your sustainability ambitions and procurement decisions made today can have a lasting impact.

The sustainability performance of your organisation is highly dependent on the sustainability performance of your service providers and suppliers. Due to this dependency, it is important that you work with the right suppliers that can help enable and drive your own ambitions.

Organisations need to consider and account for scope 3 emissions when working towards their sustainability ambitions. Your procurement practices heavily influence your scope 3 emissions. The multi-year length of most procurement agreements presents a great opportunity to work with your suppliers towards becoming a more sustainable organisation over the life of your relationship and service contracts. However, it also means that it is important to embed sustainability requirements and monitoring in procurement agreements now in order to meet future targets.

What organisations can do?

Demand review
Buy less

- Ensure there is a genuine business need for purchases
- Forecast accurately, ensure the correct care is taken in forecasting volume
- Right-size, only buy what is needed
- Consider
  - Multi-functional solutions
  - Durable, repairable and upgradable
  - Pool, share or hire
  - Product as a service
  - Virtualisation and cloud (for IT)

Early sustainability input is key to success.

Pre-qualification
Set minimum supplier standards

- Ensure your suppliers have the following guidelines in place:
  - Sustainability policies
  - Environmental management systems
  - Labour audits
  - Prosecution free
- Commitments to Science Based Targets

Reference standards in Terms & Conditions.

Specifications

Raise the bar

- Push for energy efficiency and renewable energy from suppliers
- Recycled content and recyclability should be key
- "Free from.." specific plastics or hazardous substances should be required
- Certified and ecolabel led products
- Product take back and responsible disposal.

Engage suppliers and market test cost and availability before RFP.

Evaluation

Reward going "above and beyond" specifications

- Confirm all bids are compliant and meet specifications
- Reward performance exceeding specifications
- Evaluate whole life costs, consider the whole lifecycle of a product
- Request and evaluate bidders' carbon and waste reduction plans

Avoid relying on evaluation alone.

Contract management

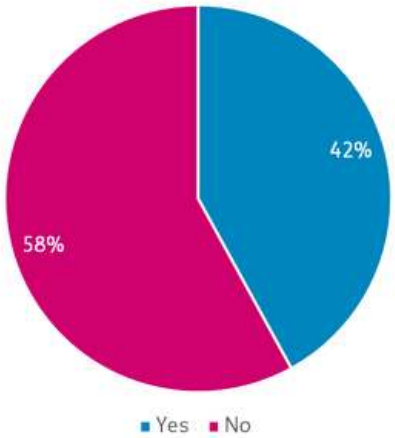
Hold suppliers to their commitments

- Compliance with specifications
- Ongoing product and service improvements
- Packaging reduction
- Securing certification
- Completing labour audits
- Delivering supply chain carbon, water, chemical and waste reductions
- Corporate and contract level sustainability data and reporting

Use balanced scorecards with targets and incentives.

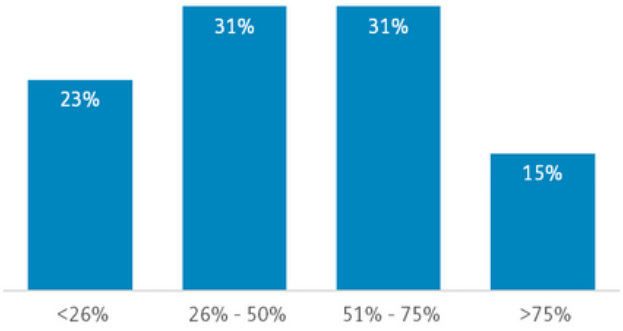
Sourcing insights from the survey and recommendations

Do you have a sustainable procurement policy which covers IT?



- 58% of organisation don't have a Sustainable procurement policy that covers IT
- Policies help and guide businesses when to acquire goods and services and select the products based on their social and environmental impact
- It is important that the environmental policy is interpreted and actioned by IT especially in the way that it procures products/ services

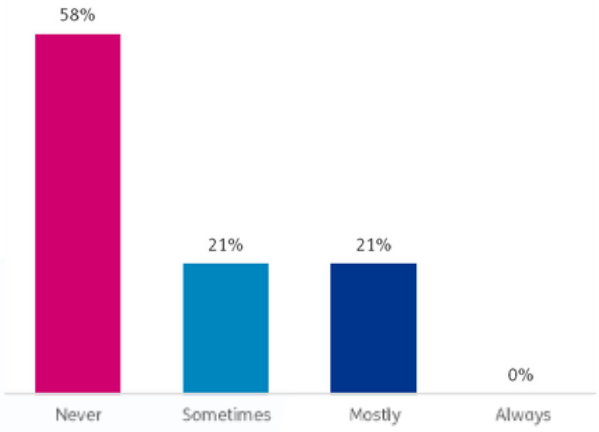
What % of your technology budget is delivered by technology suppliers?



- For 77% of respondents, 26% or more of their IT budget is delivered by IT suppliers. This highlights the dependency that exists on suppliers.
- Many IT organisations depend on a multi supplier ecosystem to provide products and services.
- Emissions from a third party would be considered under scope 3.

Do you require IT suppliers to report their carbon emissions for each of your contracts?

- 58% of respondents never require IT suppliers to report their carbon emissions for each of their contracts.
- It is important to ask your suppliers about their carbon emissions so that you can procure products and services in a responsible way.
- Many organisations will use cloud to demonstrate a reduction in scope 2 emissions, without being conscious of the indirect impact of their workload on a given cloud could be. Therefore, it is important to understand your carbon impact even when operating in the cloud.



4. Enablement

Technology can be a key enabler in helping the organisations meet their sustainability objectives.

Whether it through end-user-computing, asset management or supply chain, there is an opportunity for technology to be an enabler for the wider organisation in reducing its carbon footprint and supporting wider ESG objectives. Per Gartner (Are You Thinking Too Small About Sustainable Technology 2022), choosing the right technology investments will drive sustainability in enterprise and customer operations. IT functions should equip themselves with a robust portfolio of technologies to support the wider organisation to become sustainable (e.g., tools for employees enabling the reduction of the carbon footprint through remote working and collaboration, the use of technologies, analytics and software to enable efficiency workforce, asset, energy and software management etc).

What Organisations can do?

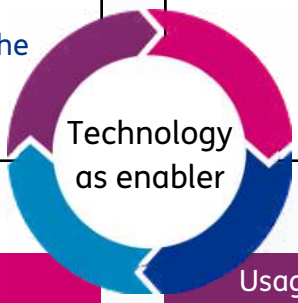
Organisations need to be aware of the different types of technologies available to utilise to support them in achieving their sustainability goals. This needs to be an iterative process which would involve the following steps:

Tracking using metrics

Organisations should define automated mechanisms, metrics and processes to track and report on emissions against targets. This will enable areas of opportunity to be identified to reduce carbon emission across the organisation.

Collaboration tools

Implement tools for employees, enabling the reduction of the carbon footprint through remote working and collaboration, reducing the need to travel.



Continuous improvement

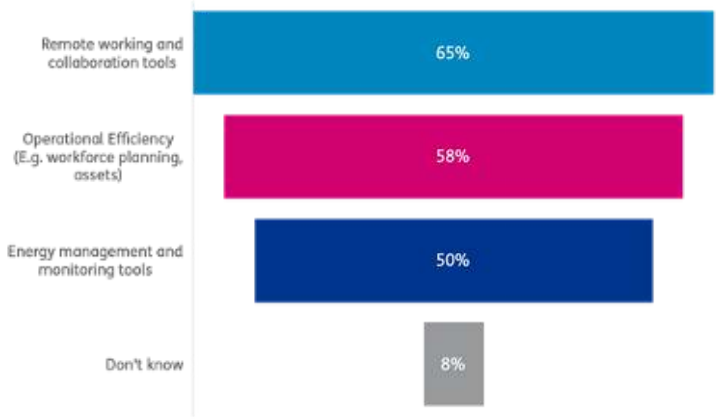
The organisations need to be updated with the fast-changing technology landscape and continuously improve on the set of tools, techniques and processes followed.

Usage of technology and analytics

Use technologies, analytics and software to enable efficiency in an organisation, for example workforce, asset, energy and software management. Machine learning and decision science can be used to simulate scenarios and forecasting around future target emissions to aid business sustainable decision making.

Enablement insights from the survey and recommendations

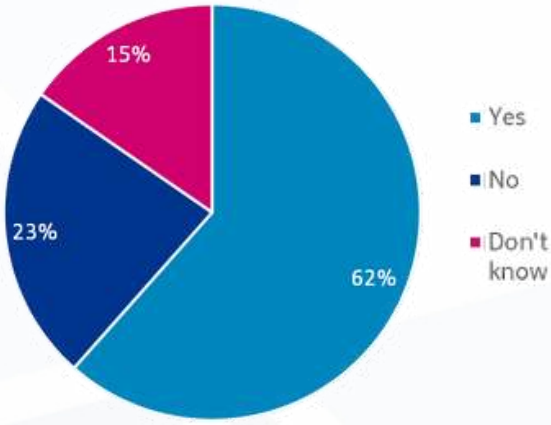
What activities is technology contributing to?



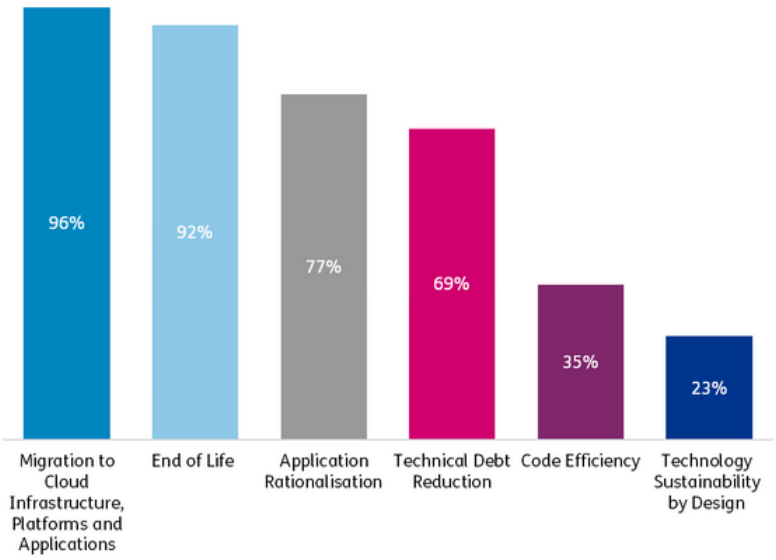
- Survey results indicate that technology can play a bigger role in helping organisations across their sustainability initiatives.
- Investing in monitoring and reporting will help identify efficiency opportunities, demonstrate benefits of initiatives and overall performance against sustainability objectives.
- Improving efficiency of processes, supply chains and assets not only benefits the environment, but typically reduces operational costs in the longer term.
- Public reporting of statistics will demonstrate commitment to sustainability initiatives improving brand reputation.

Does your organisation use technology to improve sustainability?

- 38% of survey respondents indicated that that they either don't use or don't know if technology is used to improve an organisation's sustainability.
- Typically, all organisations are using some form of technology that will enable sustainability e.g. collaboration tools MS Teams, Skype etc.
- However, organisations could achieve more through creating innovation hubs, with appropriate resourcing and funding, to identify and deliver efficiencies across the organisation.

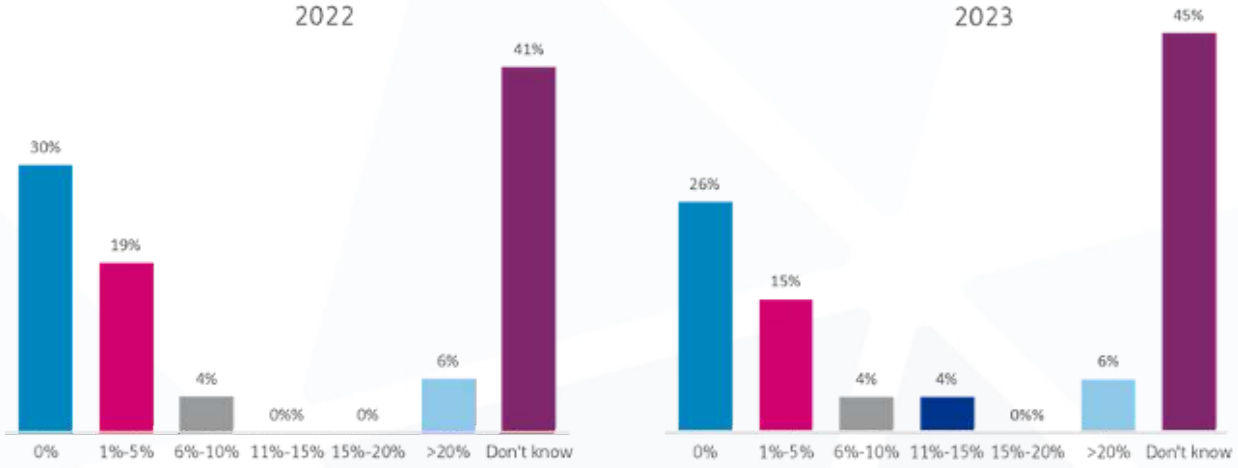


Which of the following technologies does your organisation use?



- Above 90% of survey respondents reported Migration to Cloud as their primary approach to achieving sustainability through technology.
- Organisations should invest in a broader range of techniques to help them achieve the carbon reduction, including code efficiency and sustainable technical design.
- Organisations can do more through a deeper understanding of the Cloud ecosystem, its effectiveness as a green solution, looking beyond the first step of cloud migration, allowing them to achieve sustainability throughout their supply chain.

How much of your organisation's overall 2022 & 2023 IT Transformation spend has it invested in improving technology sustainability?



- Year on Year, the percentage of companies which do not know their technology spend has gone up about 4%. What is encouraging to see is companies which were not spending anything earlier have now increased their spend i.e. the 0% category has decreased.
- 2023 shows a new category where roughly 4% of the respondents plan on spending between 11 and 15% of their budget on achieving sustainability through spending on better and efficient technology.

About Baringa

Baringa's Role in Sustainability

We combine our expertise in IT landscape analysis and subject matter insights with over 20 years' experience advising across all industry sectors, including governments, the energy industry, retail and the largest CSPs on climate strategy.

- **Led the capture, management and analysis of the infrastructure, application and physical asset data as part of a £1.1bn Cloud Migration deal.**
- Undertook application architecture and estate analysis for a major UK insurer.

- **Working with the world's largest financial services firms, governments and large global brands.**
- Developing and embedding climate change risk into their DNA from risk appetite and strategy setting to understanding and managing their climate change risk.

- Working with governments across the world to drive their response to climate change.
- **Supporting the UK Government with overall planning and policy advice for the 2050 Net Zero Program.**
- Supporting the Committee on Climate Change's assessment of transition for different technologies.

- **Working with global leading consumer product, pharma, technology and media brands.**
- At the heart of addressing the key industry challenges – whether accelerating the move to digital and online, driving a step change to their cost bases, improving their ability to accelerate their innovation and win against the competition, or address regulation requirements and changes.

- **At Baringa, climate change is our number one priority and we have made it a key pillar of our purpose-led strategy.**
- It has formed the core of our business for the last 20 years. It will continue to be so for the next 20. From recruitment of our latest interns, to our new office, climate change is embedded in our DNA.

We set out to build the world's most trusted consulting firm – creating lasting impact for clients and pioneering a positive, people-first way of working. We work with everyone from FTSE 100 names to bright new start-ups, in every sector. We have hubs in Europe, the US, Asia and Australia, and we can work all around the world – from a wind farm in Wyoming to a boardroom in Berlin. Find us wherever there's a challenge to be tackled and an impact to be made.

Find out more at baringa.com or on LinkedIn and Twitter.

For more information on the contents of this survey report or how we can support you on your Technology Sustainability journey, please contact:

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