

Practical Sustainability

Going beyond buzzwords to effect
real change in your organization



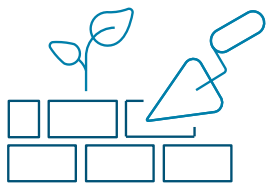
Sustainability is a business imperative. Gone are the days when sustainability appeared as a checklist buzzword in annual reports or corporate social responsibility landing pages. Today business leaders understand that their organizations can't succeed when ecologies are failing or societies are degrading; that in order for business to thrive, so too must the planet.

"The most burning and sometimes drowning problem facing humanity is sustainability," said Tom Soderstrom, Executive Enterprise Strategist at AWS, and Former IT Chief Technology and Innovation Officer at NASA's Jet Propulsion Laboratory (JPL). "Amazon is all about putting customers first. Well, in the context of sustainability, we now have 8 billion customers — the entire population — at stake."

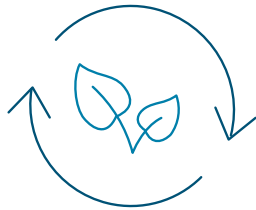
Business success is inextricably tied to sustainable practices. Even so, moving from talk to action can be difficult. Becoming a sustainable business doesn't happen overnight.



The path forward must be realistically achievable and impactful. Throughout this ebook we aim to provide practical ways you can implement sustainability depending on where your organization is in its journey. We'll explore how you can:



- 1 Create an efficient foundation for business success:** Initial steps organizations can take towards sustainable operations.



- 2 Adopt a more holistic approach to sustainability:** How organizations can embrace a comprehensive approach to sustainability that incorporates systems design and the circular economy.



- 3 Go global to have greater impact:** How organizations can look beyond their own organizational boundaries to help contribute to global sustainability efforts.

Green Glossary

The Circular Economy

A model focused on reducing waste and maximizing resource efficiency by extending the lifecycle of products through reuse, repair, recycling, and sustainable design.

Systems Design

An approach to sustainability that considers the repercussions of decisions made in relation to energy, water, waste, pollution, and greenhouse gas emissions, considering the second and third-order effects.



Create an efficient foundation for business success

Environmental and social governance directly affects business performance. In fact, companies on the S&P 500 ESG index [suffered fewer losses and were more resilient](#) than the S&P 500 during the global pandemic and research indicates that these companies are also [2.5x more likely to outperform their peers](#). So if being sustainable is good for business, where should we start focusing? Here are five practical steps for how companies can create an efficient foundation that lasts.

1. Begin with efficiency

Across the organization, start by taking incremental steps to become more efficient, focused on reducing energy and resource usage. This includes measures such as transitioning to using renewable energy and recycled materials whenever possible. Efficiencies can be found practically everywhere. For instance, [Amazon has ordered](#) 100,000 Rivian electric delivery vehicles as part of [its commitment to achieve net-zero carbon by 2040](#).

2. Benefit and take credit from using the cloud

When performing the same task in the AWS cloud vs. in an on-premises data center, companies can realize an up to [88% carbon footprint reduction](#). AWS data centers recycle water and aim to be water positive by 2030 and AWS is the [largest purchaser of renewable energy](#). In fact, 19 regions are already powered by renewable [energy](#), with the goal of all operations being completely powered by renewable energy by 2025. AWS is also addressing a broad category

of indirect emissions, including those associated with the construction of data centers. For example, AWS design standards now require concrete with a 20% reduction in embodied carbon, and AWS is working to source steel from low-emission suppliers that use Electric Arc Furnaces to produce steel with high levels of recycled content (up to 100%). Just by moving to the cloud companies can realize substantial environmental impacts and improve their sustainability scorecards in the process.

3. Go beyond the letter of compliance and regulation

Once an organization has met its environmental obligations, it's easy to stop, but as noted above, you'd likely be throwing away even better business performance and environmental impacts. Through the latest technologies such as AI, ML, IoT, high-performance computing, and more recently, generative AI, organizations now have powerful tools at their disposal to optimize their operations. For instance, IoT sensors can track assets and guide decisions; blockchains can increase traceability and validate provenance for secondary markets of recycled rare metals; and AI and ML models can enable predictive maintenance that extends the lifespan of hardware resources. Finding improvements that save energy or increase efficiency by even fractions of a percent can have tremendous financial and environmental benefits in any organization of significant size.

4. Implement intelligent offsetting

Carbon credit offsets have become a valuable tool for businesses looking to meet their environment targets, but those offsets shouldn't come at the cost of making an impact. Offsetting should be done intelligently, not just through purchased offsets but by contributing to social organizations or by investing in projects that provide both environmental benefits and create jobs. Look around corners and think about the different ways you can have an impact and not just because you're offsetting or doing something that's right in front of you.





5. Approach projects with a sustainability-focused mental model

Every project or initiative is weighed by its ability to positively affect the business. However, by adopting a sustainability-focused mental model, leaders can ensure that sustainability isn't an after thought. "A mental model allows companies interested in transitioning to a more sustainable business to make decisions in a way that benefits their business in addition to the environment," said Ilan Gleiser, Principal Specialist of Emerging Technologies at AWS. Gleiser proposes leaders look at projects in four ways:

- The economic benefit of the project
- The digital transformation aspect of the project, reinforcing sustainability
- The data requirements of the project and if the company has the data required to build proofs of concept and use cases
- And the deployability of the project, meaning does the organization actually have the capability to deploy the workloads in production

Scoring initiatives based on these four factors can help leaders prioritize those with the greatest impact, both to the business and the environment.

By taking these initial steps, companies can begin to operate more efficiently and grow comfortable with regularly weighing environmental and sustainability factors alongside more traditional criteria in the day-to-day business decisions they make.

Adopt a more holistic approach to sustainability

As an organization's comfort with operating sustainably increases, there's an opportunity scale up. The organization can now adopt a more holistic approach based on system design that evaluates every aspect of the organization and its impacts to help identify ways to make it more sustainable at-scale over time. Just as importantly, taking this holistic

approach can also enable organizations to shift away from wasteful linear economy models to adopt a circular economy where business growth is gradually decoupled from resource consumption. Here are four practical recommendations.

How AWS applies circular economy principles to our data center designs

In support of meeting net-zero carbon by 2040, AWS embraces three circular economy principles in architecting our data center server racks

1 Design reusable and lower-carbon rack systems

AWS eliminates excess materials such as steel or plastic, increase recycled and biobased content, and plan for repair, reuse, and recycling from the start.

2 Keep equipment operating efficiently

AWS uses its equipment for as long as operationally efficient to reduce the associated carbon footprint. In 2022, AWS extended the life of servers from four years to five and networking equipment from five years to six.

3 Recover value from securely decommissioned equipment through reuse, repair, and recycling

When it's time to decommission equipment, AWS employs its Reverse Logistics hubs which test, repair, and recirculate non-media storage equipment back to data centers or to be sold for reuse by third parties. AWS does this on a global scale, funneling all retired rack systems through its dedicated Reverse Logistics network.

1. Harness data to create an organizational baseline

It's impossible to know what "better" looks like without a baseline, and doing so requires data. By building a data-driven framework such as a sustainability data lake or a circular economy data lake, organizations can understand how green their business is. The sustainability of an organization is primarily dependent on the product design process. AWS applies a proven methodology that breaks down the product development lifecycle into various pillars including the product design, the inputs that go into producing your product, your operations, the product use, and end of use. "For each one of those pillars, we help customers gather data so they can understand the status quo of where they are now, and decide where to go next," said Gleiser. Ultimately organizations are left with a baseline or dashboard for where they are today, measuring metrics and KPIs for their renewable energy use, recycled water use, recycled waste, and waste production as it applies to their production process.

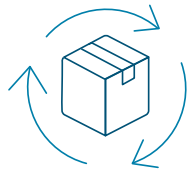
2. Set data-driven goals

With a baseline in hand, organizations can see which parts of their operations are more or less sustainable and which areas can most benefit from being optimized for sustainability. They're able to use data to set commitments and then work towards those commitments. By creating granular digital representations of the business, organizations can simulate different aspects to see how changes will affect sustainability and business outcomes. Amazon did just that, producing an [agent-based model simulation of the entire Amazon supply chain](#) — the largest supply chain in the world. The model allows Amazon to change particular variables and simulate their effects, using that information to come up with recommendations on how to further decarbonize the supply chain.

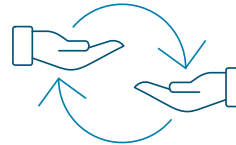


3. Adopt circular business models

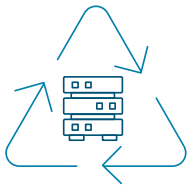
Where possible, businesses should align their efforts with the five business models for the circular economy in order to reduce environmental impact. Those models are:



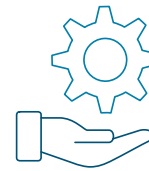
Circular Supplies Model: This involves the provision of renewable energy, bio-based or fully recyclable materials which can minimize waste, creating an eco-friendly loop.



Sharing Platform Model: This model leverages technology to share products or services among multiple users, thereby optimizing usage and reducing waste and resource consumption.



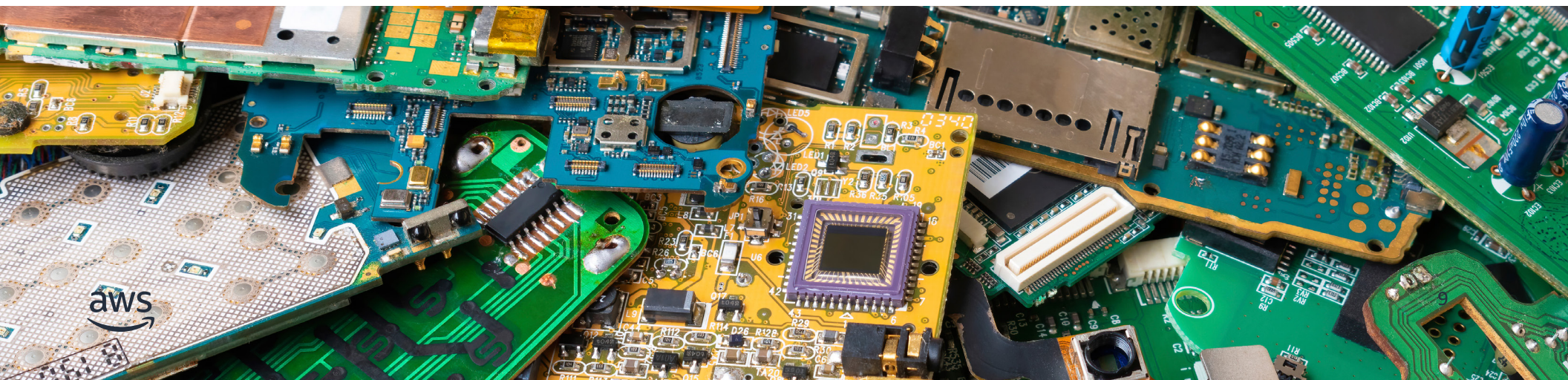
Resource Recovery Model: This ensures waste is not actually waste but a useful resource, extracting useful substances from disposed items, ensuring nothing goes to landfill and contributing to a circular economy.



Product as a Service Model: Rather than selling products, businesses offer the service a product provides. This creates a system where products are reused, shared, and often manufacturers retain product ownership, which incentivizes them to create long-lasting products.



Product Life Extension Model: This is about repairing, upgrading and reselling products, thus extending their life and thereby preventing or reducing waste, making good use of resources.





4. Take a systems design approach

An approach to sustainability centered on systems design requires an awareness of the repercussions of decisions made in relation to energy, water, waste, pollution, and greenhouse gas emissions, considering the second and third-order effects. This methodology aligns with the principles of the circular economy. The choices that a business makes can have significant consequences, extending beyond environmental impact and reaching local economies, as well as the health and welfare of communities. Because of these far-reaching implications, it is crucial for corporate executives and city planners to weigh the benefits and drawbacks of various approaches while also exploring opportunities to incorporate “bridging technologies” into their operations. Although not perfect, these solutions are superior to current options and can serve as a useful stopgap until more ideal alternatives emerge.

Amazon has taken a similar approach in steadily improving its environmental impact. AWS recently [increased the recycled content](#) of its plastic film bags from 25% to 50% and that of its plastic padded bags from 15% to over 40%. It also deployed algorithms to optimize the number and size of boxes used around the world, helping to eliminate over 1.5 million tons of packaging. Any step in the right direction is a positive one, and organizations shouldn't let “perfect” be the enemy of “good” if it means steady progress can be made.

By implementing these approaches, businesses can adopt a comprehensive sustainability strategy that involves analyzing data to identify areas of improvement and monitor progress.

Go global to have greater impact

Being sustainable doesn't need to stop when you walk out of the boardroom. Today's supply chains are global and interconnected, and as we've seen over the global pandemic and certainly through various environmental crises, what happens around the world can have unforeseen impacts on your business at home. As you steadily improve the sustainability of your own business, there's an opportunity to look beyond your organization to help contribute to global sustainability efforts. Here are some practical steps you can take, starting today.

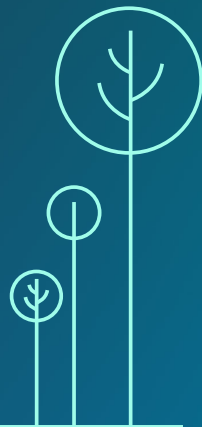
1. Contribute to the public good

Every enterprise has a Corporate Social Responsibility arm that explores different ways that the organization can give back to the community, whether that be through donations or volunteering. In our digital age,

data is a valuable commodity that serves an equally important role. The Amazon Sustainability Data Initiative makes large sustainability datasets publicly available to anyone in an effort to accelerate sustainability research and innovation and minimize the cost and time required to acquire and analyze data. More than 180 datasets have been contributed from organizations around the world. The [Amazon Sustainability Data Initiative](#) also provides cloud grants to those interested in exploring the use of AWS's technology and scalable infrastructure to solve big, long-term sustainability challenges. In a similar vein, the London National History Museum is working to digitize the entire collection of species, including plants, insects, reptiles, amphibians into a complex model to understand the linkages between species over time. The goal is to develop a biodiversity impact index that can then be used to better assess sustainability and conversation efforts.

Amazon
Sustainability
Data Initiative

ASDI



Makes large sustainability datasets publicly available to anyone in an effort to accelerate sustainability research and innovation.

Helps minimize the cost and time required to acquire and analyze data.

Includes more than 180 datasets contributed by organizations from around the world.



2. The space economy can help solve sustainability on Earth

When you talk about zooming out to see a problem, there's no better perspective than space. "There was an argument in the beginning: is there global climate change or not? When we look at it from space, there's no question. You can see it, you can track it, you can monitor it," said Soderstrom. [Today the space economy is booming](#) — it's expected to be a trillion-dollar economy by 2040. The majority of the space-focused startups today are located outside the US, and many of them are focused on the environment, such as measuring habitat loss, mapping climate change, or monitoring emissions. Investing in space can provide valuable new perspectives (and new data) to help inform decisions. "Participating in the growing space economy is one way to get started and there are a lot of startups that you can join, sponsor, or start, that are doing that today. You have a terrific opportunity to participate in this rapidly growing economy," said Soderstrom.

3. Big change doesn't require big budgets

Today, you can have a great effect without breaking the bank. Some of the most impactful ideas are also incredibly cost effective. One example is the [Blue Dot Observatory](#) in Australia which monitors over 7,000 at-risk bodies of water on a continuous basis using satellite data to track changes over time. Its operational costs are roughly a hundred dollars a month, including the satellite images. "It's not only for the big guys with large budgets to take action. Sustainability is something that we can all do something about," said Soderstrom. "It's never been cheaper to have an outsized impact."

Achieving global sustainability will only be possible by expanding beyond individual corporate activities, to broader more inclusive efforts. Embracing diverse approaches — from leveraging the vast potential of space to adopting thoughtful cost-effective initiatives like the Blue Dot Observatory — will be needed to build a sustainable future.

The preservation of our planet is the defining issue of our time, and thankfully it's not at odds with running a successful business. Profitability and sustainability can be mutually reinforcing. No matter where you are in your sustainability journey, the important thing is to act, and to act now. Every step, however small, contributes to a more harmonious future, one where the needs of business and those of our planet can coexist together and thrive. In fact, studies show that sustainable businesses [are more likely to recruit top talent](#), and [are likely to be at least twice as profitable than the rest](#). And that's a future worth striving for.

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About the authors

Tom Soderstrom, Executive Enterprise Strategist, AWS

Since June 2023, Tom Soderstrom serves as an Enterprise Strategist helping and coaching executive customers with their transformation and innovation strategies and actions. From 2020-2023, he created and built the worldwide Chief Technologist team for AWS Public Sector, responsible for identifying emerging technology trends, helping solve complex technical problems at scale, and advising public sector executive CTOs and AWS leaders. Soderstrom served as the IT Chief Technology and Innovation Officer at NASA's Jet Propulsion Laboratory (JPL) from 2006-2020, where he helped define, support, and implement innovative Space missions, emerging IT trends, and mentor the next generation of IT and Space explorers. Prior to JPL, he led teams working on large scale IT technologies, best practices, tools development, and change efforts in small startups, large commercial companies, international venues, and the US Government.

Ilan Gleiser, Principal Specialist of Emerging Technologies, AWS

Ilan Gleiser has over two decades of experience in financial services and cutting-edge technologies such as AI, ML, IoT, High Performance Computing, Blockchain and Robotics. He specializes in areas including financial risk management, quantitative portfolio management and product management. In his current position as a Principal Specialist - Emerging Technologies at AWS, Ilan focuses on architecting scalable infrastructures utilizing technologies with a focus on Circular Economy, Climate Risk and Agent-Based Simulations use cases. Prior to joining AWS, Ilan held prestigious roles and exhibited remarkable prowess in delivering innovative financial solutions and managing risk. As a Chief Risk Officer for both a Bank and a Renewable Energy company, a Product Manager at two fintech companies, and as a Quant Portfolio Manager at Millennium Management, he has brought unprecedented growth and stability to the organizations he served.

About AWS

For over 15 years, Amazon Web Services has been the world's most comprehensive and broadly adopted cloud offering. Today, we serve millions of customers, from the fastest-growing startups to the largest enterprises, across a myriad of industries in practically every corner of the globe. We've had the opportunity to help these customers grow their businesses through digital transformation efforts enabled by the cloud. In doing so, we have worked closely with the C-suite, providing a unique vantage point to see the diverse ways executives approach digital transformation—the distinct thought processes across C-suite roles, their attitudes and priorities, obstacles to progress, and best practices that have resulted in the most success.

