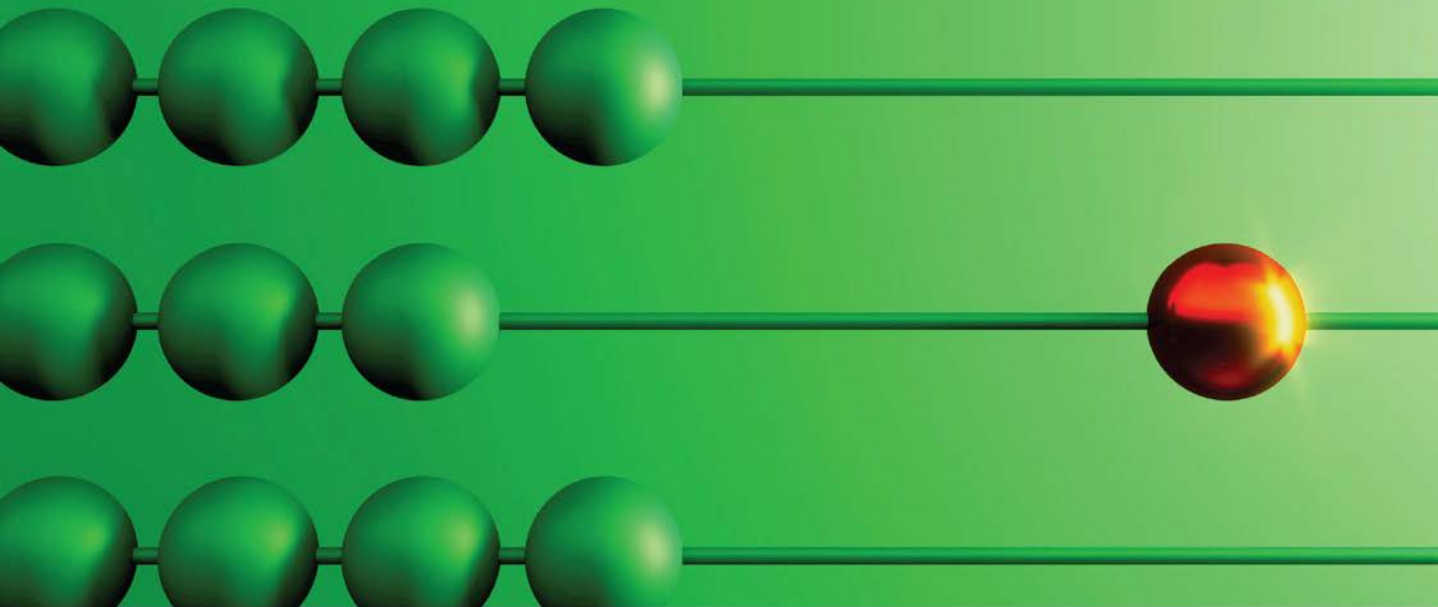


Sustainable IT Playbook for Technology Leaders

Design and implement sustainable IT practices and
unlock sustainable business opportunities



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BIRMINGHAM—MUMBAI

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Rise of Sustainable IT

Education is the most powerful weapon you can use to change the world.

– Nelson Mandela

In this chapter, you will learn about the main drivers of a sustainable IT plan and its importance in implementing sustainable IT into the overall corporate sustainability agenda. Secondly, we will dig into three concepts: *sustainable IT*, *sustainability in IT*, and *IT for society*. Finally, we will examine IT's **environmental, social, and governance (ESG)** considerations.

The main objectives of this chapter are to introduce you to sustainable IT in depth, understand how it interlinks with the overall corporate sustainability agenda, and what critical ESG considerations exist for IT. Learning about the sustainable IT maturity model© will enable you to assess your starting point, define your target state, identify gaps, and define your direction of travel toward a more sustainable IT practice.

In this chapter, we will cover the following topics:

- Main drivers toward a sustainable IT agenda
- Embedding sustainable IT into the overall corporate sustainability agenda
- Sustainability in IT, sustainability by IT, and IT for society
- ESG considerations for IT

By the end of this chapter, you will have learned about the main drivers of a sustainable IT agenda. You will understand the difference between the three key concepts. Sustainability in IT, sustainability by IT, and IT for society. Finally, you will gain more in-depth knowledge of what ESG considerations exist for IT.

What is sustainable IT?

The climate crisis, in combination with current social crises across multiple regions, such as emigration and racially and ethnically driven conflicts, is humanity's most significant challenge to overcome. As discussed in *Chapter 1, Our Most Significant Challenge Ahead*, we need to halve our greenhouse gas emissions by 2030 to stay in the 1.5°C-degree safe zone, and we need to peel back the consumption of Earth's natural resources drastically. We are currently running at a pace of consuming 1.75 of Earth's resources, which means it takes the Earth almost 1.8 months to regenerate what has been taken out. We have a finite number of resources on Earth and we must look after them.

As ESG has become a mainstream business issue, the pressure on technology leaders to assume environmental responsibility is mounting. Not only does a CEO expect a CIO to be the primary catalyst in executing business strategy in the coming 3 to 5 years (PWC 2020) but the ask is also to embed sustainable IT practices into the fabric across the whole organization.

Sustainability in IT, sustainability by IT, and IT for society

As ESG has become a mainstream business issue, corporations are being pushed by mounting regulations and stakeholder pressure to present transparent ESG reporting, assume responsibility for climate change, and deal with it holistically across the entire company. IT is no exception. Technology leaders are tasked with shining a light on the environmental and social impact of IT and taking tangible steps toward a sustainable IT practice. On top of running your environment securely and stably, the ask is to embed sustainability into the fabric of the whole IT organization. As we saw in *Chapter 1*, IT's impact is not insignificant. Three leading examples of IT's impact on the environment are illustrated in *Figure 2.1*:

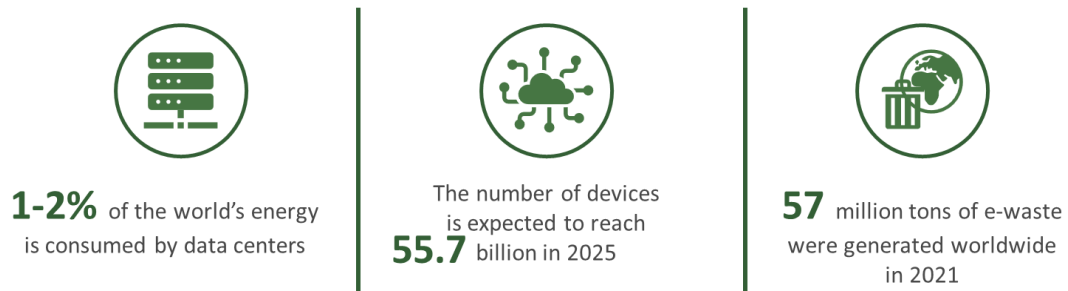


Figure 2.1 – Leading examples of IT's impact on the environment

Let's explore these leading examples of IT's impact on the environment:

- Data centers consume 1 to 2% of the world's energy and this is rising rapidly (IEA 2019)
- The number of devices is expected to reach 55.7 billion in 2025, producing 80% of carbon dioxide during manufacturing (IDC 2020)

- 57 million tons of electronic **waste (e-waste)** was generated worldwide in 2021 and rose by 21 percent in 5 years between 2015 and 2020 (*Global E-waste Surging: Up 21 Percent in 5 years 2020*)

IT is a significant enabler of long-term sustainability efforts and business success. 88% of a company's sustainability-related strategy decisions are influenced by IT (Letemple and Craven 2021). Sustainable IT or green IT has many different meanings depending on whether you are a manufacturer, manager, or user of technology. In the simplest definition, sustainable IT is the manufacture, management, use, and disposal of IT to meet our present needs without compromising the ability of future generations to meet their own needs.

Before we get into the how-to section of the book in *Chapter 10, Get Started Today*, and start defining our carbon emission baseline, it is essential to make clear distinctions. We need to differentiate sustainability in IT from sustainable by IT and IT for society.



Figure 2.2 – Sustainability in IT, sustainability by IT, and IT for society

Let us look at the definitions:

- **Sustainability in IT:** Sourcing IT products, components, and services that utilize recyclables and restorative or regenerative design (Méndez-Villamil 2021). Directly impacts your CO₂ emission reduction – your “footprint.”
- **Sustainability by IT:** Using innovation for sustainable business models, use cases, and applications (Méndez-Villamil 2021). An indirect CO₂ emission impact since it is embedded into a process or business function – your “handprint.”
- **IT for society:** Your altruistic side where you positively impact your people, community, and society – your “heartprint.”

Sustainability in IT simply pertains to anything you use internally to run your enterprise, such as owning data centers, managing cloud providers, developing software, managing the life cycle of your hardware, optimizing your energy consumption, or managing your e-waste. A few examples of sustainable IT are illustrated in *Figure 2.3*:



Figure 2.3 – Sustainability in IT examples (direct CO₂ emission reduction)

Sustainability by IT is what you develop for internal use and commercial use by your customers, providing a product or solution that targets a specific sustainability need. Sustainable solutions enabled by IT can be applied within various industries. Here the use cases are endless, but in *Figure 2.4*, we have outlined ten key areas: *carbon emission reporting, ESG risk management sustainable sourcing and manufacturing, eco-friendly transportation, energy-efficient buildings, energy resource management, hybrid-work, eco-friendly travel, development of e-services, and product as a service*:



Figure 2.4 – Sustainable by IT (indirect CO₂ emission reduction)

We will return to these key areas in *Chapter 9, Sustainability by IT*, where we have devoted a whole chapter to exploring them in much greater detail. It is also worth mentioning that the EU has created a **Recovery and Resilience Facility** that identifies a set of given areas (or pillars) for its allocation of Covid recovery funds related to environmental sustainability and digitalization. This instrument was created to assist the EU in overcoming the Covid-19 crisis and to emerge more robust and resilient post-pandemic.

IT for society is the altruistic side, where you positively impact your people, community, and society. There are different ways to positively impact society using IT by donating IT equipment, donating employee time, monetary funding, and running specific initiatives to improve **diversity, equity, and inclusion (DEI)**. Just as with sustainable by IT, the use cases are endless, but in *Figure 2.5*, we have

outlined a few key areas: organizational enablement, social responsibility programs, women in tech, and sustainability hackathons:



Figure 2.5 – Examples of key focus areas in IT for society

Now that we have a better understanding of what sustainable IT, sustainable by IT, and IT for society are and we have looked at some examples for each, we need to explore and understand the **greenhouse gas (GHG)** emission taxonomy and how it translates into a sustainable IT taxonomy.

Sustainable IT GHG emission taxonomy

The previous chapter dove into the GHG standard protocol and looked at the three different forms of emissions – scopes 1, 2, and 3. As Scope 4 is not yet officially part of the GHG protocol it has been omitted in the taxonomy for now. As you may recall, the GHG protocol defines how to count carbon and represents the so-called outlining of what you can trust. The definitions for a respective scope may be ambiguous within IT and technology. Therefore, we present a Sustainable IT Greenhouse Gas Emission Taxonomy© (Sundberg, Sustainable IT Greenhouse Gas Emission Taxonomy 2021) to make it easier to relate to and digest:

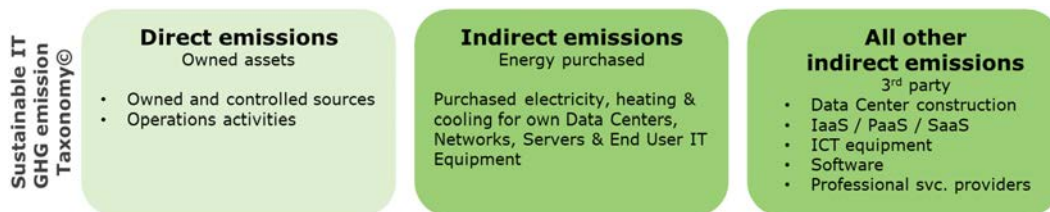


Figure 2.6 – The Sustainable IT Greenhouse Gas Emission Taxonomy© (Sundberg, Sustainable IT Greenhouse Gas Emission Taxonomy 2021)

The taxonomy follows the same principles as the overall GHG Protocol Standard, but we have related each scope category to IT and technology instead of giving more general definitions:

- **Scope 1** is your direct emissions from owned and controlled sources such as data centers (local and global), enterprise networks, and operations activities.
- **Scope 2** includes indirect emissions that other companies have generated to supply the reporting company with energy, such as electricity, heating, and cooling for their data centers, networks, servers, and end user IT equipment.

- **Scope 3** focuses on indirect emissions along the entire value chain of a company. It goes far beyond the emissions recorded by Scopes 1 and 2. They occur outside the organization, such as cloud consumption with **Infrastructure as a Service (IaaS)**, **Platform as a Service (PaaS)**, and **Software as a Service (SaaS)**, ICT equipment such as user devices (computers, smartphones, and tablets), printers, access networks, data centers, enterprise networks, and operator activities. On-premises software you use is developed and licensed to you by a third party. Professional services providers provide services to build, operate, and run your IT environment. If they sit offsite and not onsite in your locations (for example, in India), everyone has a local emission footprint that should be accounted for.

As we saw in *Chapter 1*, Scope 3 emissions are 11.4 times higher than a company's operational emissions (Scope 1 and Scope 2) on average, and IT and technology are no exception. Whether you are an old company with a long IT legacy or a start-up company with no legacy, you need to understand your starting point and where you are going.

If you are an old company and the general trend is to move your own data centers to cloud hyperscalers and have a professional network provider running your worldwide enterprise network, this is a significant shift from Scope 1 and 2 to Scope 3.

If you are a start-up company, you will probably not start building up your own data center estate and enterprise networks unless it is your core business. Therefore, most of your GHG emissions will land in Scope 3 from the start.

Regardless of whether your GHG emissions reside in Scope 1, 2, or 3, your responsibility is to minimize your overall emission impact. Just because you are offloading your own Scope 1 and 2 emissions to someone else does not mean that you are still not responsible for it. Emerging legislation, such as the EU taxonomy and **Corporate Sustainability Reporting Directive (CSRD)** that comes into effect in January 2024, also requires you to report your entire scope.

As we move further into the book, you will discover that different levers can be used depending on which scenario and scope you are trying to address. For example, suppose most of your emissions reside in Scope 3. In that case, vendor management and IT procurement are essential for putting pressure on your vendors to disclose honest and transparent environmental reporting, following your sustainable IT policies, vendor code of conduct, and circular economy principles. In *Chapter 8, Leveraging Your Buying Power*, we have dedicated a chapter to further detailing these core concepts.

In the next section, we will look closely at the importance of connecting sustainable IT to your overall corporate sustainability strategy in this rapidly changing business environment.

Corporate sustainability and sustainable IT

As we saw in *Chapter 1, Our Most Significant Challenge Ahead*, company longevity on the S&P 500 is rapidly declining. Companies that cannot adapt to rapid changes in macro trends such as electrification, and sustainability will likely be relegated to the graveyard of corporate failures. Sustainability has become a recurring boardroom topic and 24% of global CEOs are “extremely concerned” about environmental damage and climate change (PWC 2020).

As the demand for companies has shifted toward fulfilling the needs of a broader spectrum of stakeholders such as employees, customers, partners, ecosystems, and communities, and not only the shareholder needs, ESG has become a mainstream business issue. Due to the increasing pressures of investors, governments, and organizations in terms of emissions reporting, the requirements for companies to provide transparent reports are continually growing.

According to a recent study, *The C-Suite Sustainability Imperative 2021*, conducted by **IDC** and **ServiceNow**, the report highlights that 72% of enterprises worldwide consider sustainability a key business priority (IDC 2021). Furthermore, as illustrated in *Figure 2.7*, the report outlines four main drivers for enterprises to invest in sustainability – cost savings, brand and image, product innovation, and stakeholder demand:



Figure 2.7 – The top four main business drivers for sustainable investments

As more and more companies commit to the **Science-Based Targets initiative (SBTi)** Net-Zero Standard and set a net-zero target in line with the **1.5°C future**, companies are making a critical contribution to limiting the worst impacts of climate change. The business plan is not all about setting a net-zero agenda but a broader strategy that includes a set of adaptive actions, including mitigating business risk and ensuring long-term business success.

There are several ESG considerations for developing a corporate sustainability plan. *Figure 2.8* lists eight key drivers for a corporate sustainability plan – legislation; investor, social and political pressure; customer requirements; responsible business ecosystems; new market opportunities; supply chain challenges; cost reduction; and trust and reputation:

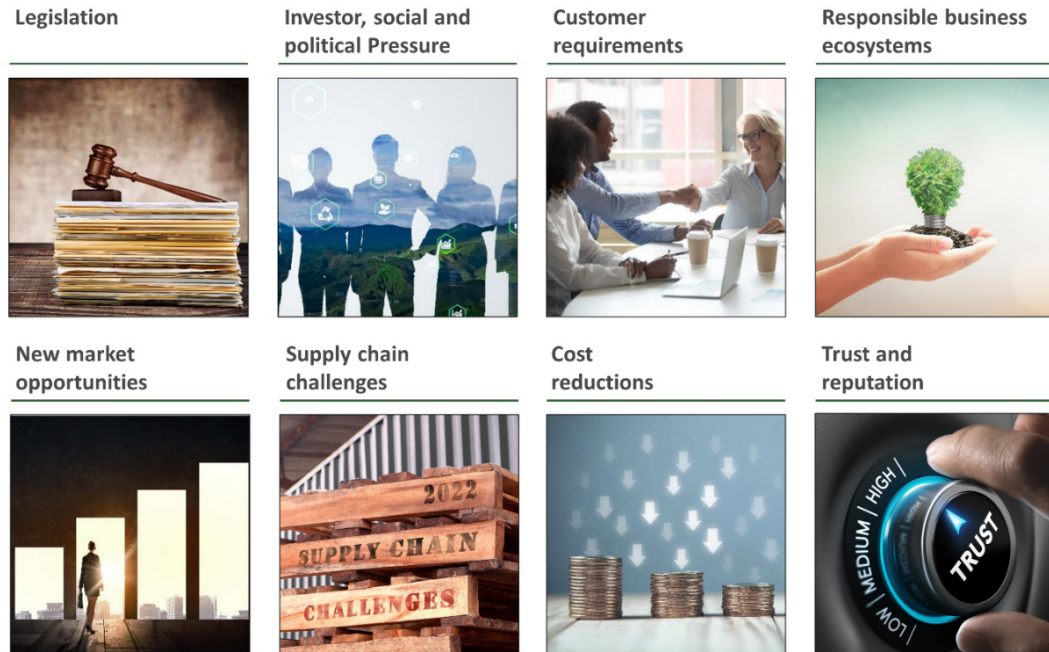


Figure 2.8 – The drivers for a corporate sustainability plan

Let us look at each in brief:

- **Legislation:**
 - Increased pressure through new and emerging international sustainability legislation. Forces companies to provide accurate and transparent reporting and disclose climate risk to the public.
 - Examples: The **European Green Deal**, **EU taxonomy**, the **Paris Agreement**, the **Clean Air Act**, the **Montreal Protocol**, and the **German Supply Chain Act (GSCA)**.
- **Investor, social, and political pressure:**
 - Increased pressure from key stakeholders to act and improve transparency, detailed sustainability reporting, and disclosure
 - Examples: The **SBTi**, the **Carbon Disclosure Project (CDP)**, the **Value Reporting Foundation**, the **CSRD**, and the **Task Force on Climate-Related Financial Disclosure (TCFD)**

-
- **Customer requirements:**
 - Both B2B and B2C dynamics are raising the bar for corporations to conduct sustainable, ethical, and social business.
 - Examples: B2B customers are increasingly asking suppliers to comply with one of the 200+ ESG rating agencies such as **Ecovadis**, **NQC qualifications**, **Sustainalytics**, **S&P**, and **Bloomberg**. Also, having your supplier adhere to your own Supplier Code of Conduct policies sends a powerful message that you are serious about ESG policies. **Microsoft** and **Salesforce** are two good examples where these companies have set high requirements on their suppliers to comply with environmental protection and compliance. Beyond the technology industry, both **IKEA** and **Unilever** adhere to strong codes of conduct for suppliers.

 - **Responsible business ecosystems:**
 - Expectations to build responsible business ecosystems through sustainable investments and circular economy practices that drive improvements across the entire value chain (Scopes 1 to 3)
 - Examples: Apply circular design principles, lower energy consumption, switch to renewable energy sources, lower water intensity, focus on supply chain working conditions and human rights, remove conflict minerals, reduce hazardous materials, and keep e-waste to a minimum

 - **New market opportunities:**
 - Develop new sustainable B2C and B2B products and service models such as “as a service” to drive new revenue streams and top-line growth
 - Examples: Sustainable building construction and management, electrification of the transport sector, development of renewable energy sources and storage, reduce water intensity in agriculture, invest in plant-based foods, and move from selling a product as a service, as in bicycles, computers, home appliances, heavy industrial equipment, or airline jet engines

 - **Supply chain challenges:**
 - Supply chain challenges are another factor that is strongly related to sustainability from sourcing
 - Examples: Finding local suppliers, diversifying suppliers, sourcing sustainable raw materials, and enabling circularity in the supply chain to minimize risks of material shortages due to geopolitical tensions

- **Cost reductions:**
 - Focus on driving efficiency, reducing complexity, and improving quality and speed to reduce cost
 - Examples: Drive efficiency through intelligent automation, reduce complexity by rationalizing applications and infrastructure, design and execute on quality metrics, and adopt an agile mindset across the entire organization
- **Trust and reputation:**
 - Enabling trust and reputation is essential. Scandals related to poor ESG practices have been costly for companies and senior executives, and in recent times, several large companies are coming under the spotlight.
 - Examples: **Boohoo** has been accused of violating minimum wage requirements in Leicester (Bland 2020). **Rio Tinto's** CEO and two senior executives resigned after backlash over the destruction of an Aboriginal site in Western Australia (Hume and Smyth 2020). In *Chapter 12, From Strategy to Execution – Lead With Purpose and Deliver Progress Quickly*, we look at three additional examples from the French energy company TotalEnergy, the Dutch subsidiary of **Air France**, **KLM**, and Swedish fast-fashion giant **H&M**.

Now that we have taken a closer look at eight key drivers for a corporate sustainability plan, let us shift our focus to IT and what drivers for a sustainable IT agenda exist.

Drivers for a sustainable IT agenda

Although technology solutions can help solve environmental issues, the IT industry contributes significantly to the world's **carbon footprint** and e-waste. Tech is a huge electricity consumer and most of the industry does not have a strategy for making its use sustainable. When running on non-renewable energy sources, electricity becomes a proxy for direct carbon emission. Equally important, we also need to ensure that the products and services we procure are produced under fair market conditions and that we use responsible materials.

For example, **Bitcoin** mining consumes roughly 0.5% of the world's energy consumption, approximately 91 terawatt-hours annually. This astronomical consumption is more than Finland, a country of 5.5 million people, and seven times more than **Google's** total usage (Kim 2021). In just 5 years, we have seen exponential growth by a factor of 10. Until the middle of last year, China was home to a significant chunk of Bitcoin mining factories, but in July 2021, the regime banned all forms of Bitcoin mining. Leading Bitcoin miners seek alternative ways to mine in neighboring countries such as Kazakhstan, Malaysia, and Russia, with limited access to renewable energy sources. According to the Cambridge Bitcoin Electricity Consumption Index, Bitcoin mining in the United States has jumped from roughly 10% of the total share of global Bitcoin mining in January 2021 to a staggering 35.4% in August 2021,

in less than a year (Bitcoin Mining Map n.d.). Due to this shift away from China and Bitcoin's growth in popularity, the environmental impact is expected to worsen. Bitcoin is only one example of how technology is being misused to exacerbate the situation.

The picture is clear. IT is far from sustainable. With the expected growth in energy consumption from 2% to 8% in the next decade due to the rise in exponential technologies such as AI, ML, and robotics, it is essential to find new ways to deliver sustainable IT and be an enabler of sustainability.

A recent global survey (*No Turning Back: How the Pandemic has Reshaped Digital Business Agendas*. Google Cloud. 2020) by IDG surveyed 2,000 IT decision-makers on how the pandemic has reshaped the digital business plan. The survey found that IT leaders are pursuing four key areas to accelerate their digital transformation:

- Adoption of multicloud and hybrid cloud solutions
- Data analysis and intelligence
- Sustainable IT
- Security and risk management

Sustainable IT or green IT is not a new concept, but with an increased focus on sustainability, these concepts have become front of mind for many technology leaders. Driven by three macro-trends in digitalization, electrification and sustainability, technology leaders can no longer shy away from addressing a sustainable IT agenda. Although digitalization and the **4IR** seem like positive outcomes for the environment, they also translate into the need for new data centers, computer power, storage, network equipment, and end user IT equipment such as computers, tablets, and smartphones.

IT departments play a huge role in sustainability efforts. 88% of a company's sustainability-related strategy decisions are influenced by IT (Letemple and Craven 2021). So, there are many opportunities to make a long-lasting impact on the sustainability agenda.

A recent study conducted by the Capgemini Research Institute on sustainable IT (*Sustainable IT – Why it's time for a green revolution for your organization's IT 2021*) reveals some disturbing facts:

- Maybe not surprisingly, only 43% of executives claim they know their organization's IT footprint
- 50% of firms say they have an enterprise-wide sustainability strategy, but only 18% have a comprehensive sustainable IT strategy with well-defined goals and target timelines
- 53% say they do not have the required expertise for sustainable IT implementation

Although we see a significant increase in carbon emissions from IT, the issue has not come to a tipping point where sustainable IT is viewed as a priority. In the next section, we will look closely at some ESG considerations for IT.

ESG considerations for IT

Earlier, we looked at six drivers for a sustainable corporate agenda; let us look at some ESG considerations for IT. The five key areas – financial value, non-financial value, risks (physical and transition risks), employee engagement, and readiness – are illustrated in *Figure 2.9*:



Figure 2.9 – ESG considerations for IT

When assessing these five areas and assessing your own sustainable IT plan, there are several key questions that you should consider.

Financial value

Ensuring long-term value creation is critical to ensuring a corporation's financial value. There are financial value opportunities in working with the top line, your revenue, and the bottom line from a cost perspective. As an example, **Unilever**, the British multinational consumer goods company, has proven through their **Unilever Sustainable Living Plan (USLP)** that they can be better socially and environmentally but at the same time perform well as a business, ensuring long-term value creation (Unilever 2020). Let us look at a few key areas.

Circularity

The overall trend is moving from a linear to a circular process. Infinite growth on a finite planet is simply not possible. Profits should come from solving the world's problems, not creating them. Therefore, you should consider your circular maturity.

Key questions:

- What are the critical circular industry trends shaping the future agenda?
- What is your level of circularity today?
- What product offerings can be transitioned into service offerings (i.e., as a service)?
- What is the percentage of your total top line today and where should it be in the future?
- How can IT unlock opportunities to switch from a linear to a circular economy?

Return on Sustainable Investment

Return on Sustainable Investment (ROSI) is a method to assess the environmental, societal, and economic impacts of investment. It is a significant shift from viewing sustainability as a cost instead of a source of value. The 2020 *Sustainable Market Share Index™*, a report released by the NYU Stern Center for Sustainable Business, found that although sustainability-marketed products only make up 16.1% of the market, they attributed to 54.7% of the growth in **consumer packaged goods (CPG)** from 2015 to 2019 (Kronthal-Sacco and Whelan 2021).

Key questions:

- Do you have a framework in place to assess sustainable investments?
- What measures and KPIs are taken to bridge the gaps between sustainability strategies and financial performance?
- How can sustainable investments be made within IT to drive the sustainability agenda forward, grow the top line, and improve the bottom line?

IT cost and value optimization

Technology leaders are constantly under pressure to unlock the value of IT at an increasingly lower cost. There are typically three ways to drive down IT costs – cost-cutting, cost optimization, and value optimization. IT cost-cutting is reactionary, considering short-term gains and immediate reductions. Cost optimization consists of more structured improvements over time, focusing on improving efficiency, increasing productivity, and shifting IT spending. Value optimization is about delivering business outcomes and unlocking value. Typically, value optimization focuses on growing top-line growth rather than improving the bottom line.

Fortunately, there is no contradiction between driving a sustainable IT plan and IT cost and value optimization.

Key questions:

- Where can we improve efficiency?
- Where can we improve productivity?
- Where can we shift spending?

Hardware longevity

ICT equipment significantly impacts scope 2 when used in energy, heating, and cooling, and scope 3 in manufacturing, transportation, and recycling. The management of ICT equipment tends to be linear, but it is paramount to switch to circular management of ICT equipment. According to a recent study by the Capgemini Research Institute, 89% of organizations recycle less than 10% of their ICT equipment (Sustainable IT - Why it's time for a Green revolution for your organization's IT 2021). This is a massive opportunity for improvement. If you are a global company with thousands of employees, changing your approach to managing your IT hardware can significantly impact your carbon reduction plan year after year.

Key questions:

- How long is your typical hardware refresh cycle for computers, servers, monitors, and network equipment?
- What is your current process for managing the life cycle of your ICT equipment?
- Do you have a process in place to prolong the longevity of the ICT equipment, such as replacing laptop batteries or replacing cracked smartphone screens?
- Do you have a safe and well-proven methodology to remove data?
- What circularity can your **IT Asset Disposition (ITAD)** vendor achieve?
- Do you receive any carbon credits from your **ITAD** vendor?
- Is there an opportunity to buy refurbished equipment from the start to reduce your carbon emissions significantly?

Energy reduction

As cited forecasts suggest, the energy for ICT equipment will continue to accelerate in the next decade. As 41% of total global emissions come from burning fossil fuels, it is paramount to switch to renewable energy sources such as geothermal, wind, water, and solar. The opportunity to reduce power use within IT spans four main categories: ICT production, data centers, network equipment, and end-user equipment.

Key questions:

- What is our total energy consumption today?
- What share of renewable energy is utilized from total energy consumption?
- What is our data center's **power usage effectiveness (PUE)**?
- What savings can be derived from reduced water usage and e-waste generation?

-
- What is the energy consumption of our end user equipment?
 - What percentage of end user equipment is turned off at night?

Lean operations

Technology leaders should ask themselves what their future IT operations should look like. What adaptations are needed to mitigate changing conditions due to the climate?

Key questions:

- What changes do I need to make to my operating model to reduce risk?
- How can I most effectively decarbonize my operations?
- Which key areas need to be focused on to decarbonize efficiently and effectively?
- Where does decarbonization raise the cost and where does it lower it?
- Which vendors should I effectively use that can enable us to decarbonize?

Non-financial value

Ensuring long-term value creation is critical to ensuring a corporation's financial value. Especially when it comes to sustainability, there are several opportunities to unlock significant non-financial value. Let us look at a few key areas.

Improved brand perception

As we saw earlier in the chapter, according to IDC improved brand perception is a top-three driver for enterprises to invest in sustainability (IDC 2021). Companies with a robust and purposeful mission and vision tend to have strong brand perceptions. It enables product and brand differentiation, strengthens employer branding, and gives access to capital such as green bonds.

One of the north star companies is Unilever, the giant multinational consumer CPG company. Under the leadership of CEO Paul Polman for over a decade, sustainability was a core mission. At the same time, they outpaced their fierce competitor Heinz on the stock market tremendously.

Key questions:

- Does your company have a robust and purposeful mission and vision?
- Is sustainability at the heart of your mission?
- How strong is your employer branding today?
- What do you need to do to set yourself apart?

Attracting like-minded customers

As we saw previously, within CPG, sustainability-marketed products are attributed to 54.7% of the growth over 4 years from 2015 to 2019. There is strong customer demand for sustainable products. Being at the forefront of delivering sustainable products and solutions is crucial for attracting like-minded customers. As more and more products are becoming connected and the **Internet of Things (IoT)** is enabled, IT will have an increasingly significant footprint on the products and solutions delivered to customers and end users. Ensuring that your physical and digital products and solutions are provided and managed sustainably will be paramount to any company's long-term competitiveness and ongoing success.

Key questions:

- What is your share of your sustainable products and solutions today?
- Do you know what your emissions are from your physical and digital products?
- Do you have a process to certify your products and solutions as sustainable?

Attracting and retaining talent

Globally, we are at a skill shortage in several functions or sectors. As the war on talent is heating up, companies must find new ways to attract and retain talent. Access to IT skills remains a top priority for technology leaders year after year. According to the World Economic Forum's Future of Jobs Reports 2020, jobs within IT will be in especially high demand, such as data analysts and scientists, AI and ML, process automation specialists, and information security analysts, to name a few (The Future of Jobs Report).

Different generations also have other demands. Today, millennials make up roughly 50% of the workforce in the United States. Millennials come with varying requirements than previous generations. They seek out purpose-led companies with strong **corporate social responsibility (CSR)** where they can be a contributing factor. According to the 2016 Cone Communications Millennial Employee Engagement Study, 64% of millennials will not work for a company that lacks strong CSR values (2016 Cone Communications Millennial Employee Engagement Study 2016).

Employee activism is becoming more widespread. A clear example was when 1,000 **McKinsey and Company** consultants asked the firm to disclose how much their clients emit and called for them to discontinue doing business with the world's greatest polluters in an open letter (Beals 2021). This is nothing unique for McKinsey and Company, and employers should expect employees to speak out against them when they are not living up to set forth ESG standards and public commitments (Jan 2019).

You should ask yourself what you need to do to set yourself apart and attract and retain the stars of tomorrow.

Key questions:

- What is your attractiveness in the job market? What is your share of millennials?
- Are you falling short on your CSR values, resulting in the inability to attract and retain talent?
- Are you able to close your internal skills gap or are you forced to rely on partners?
- Do you have an internal program to upskill employees?

Positive impact on society

Companies are increasingly expected to have a positive impact on society. Within IT, this is more commonly referred to as *IT for society* or *Tech4Good*. Moving from a shareholder supremacy business model to a multi-stakeholder business model is imminent. Companies can no longer compete and stay in business solely by being profitable and only serving shareholder needs. The scope has increasingly become wider, forcing companies to become socially, environmentally, and ethically responsible and help many stakeholders such as employees, customers, partners, the communities in which they operate, and society. As an example, at the inauguration of **Salesforce.com**, founder **Marc Benioff** introduced the **1-1-1 model**, which commits 1% of Salesforce equity, technology, and employee time to improving education, equality, and the environment for everyone. Since then, many companies have followed suit and introduced similar programs.

Key questions:

- What positive impact does your company play within society?
- Do you have an internal program for employees to regularly donate their time to a specific cause?
- Do you have a program to leverage suppliers in less endowed countries or areas?
- Do you have a mechanism to donate old IT equipment to charities, schools, or individuals?

Reducing IT complexity

IT complexity is synonymous with high IT costs, a slow pace of innovation, and compliance challenges. IT complexity is an inhibitor to operational excellence to drive efficiency and effectiveness. Large global companies are complex, with multiple geographic locations, different divisions, business units, and diverse business processes, so it should be no surprise that they also have a complex IT landscape. According to LeanIX's Enterprise Architecture Insights Report 2019, 36% of billion-dollar enterprises typically have more than 1,000 applications in their portfolio (LeanIX 2019). Reducing the number of applications in your application portfolio is an efficient, cost-saving venture. It is also a significant contributing factor to reducing your GHG emissions in terms of reduced energy consumption, reduced hardware, and storage. We will examine the topic of application rationalization further in *Chapter 5, Application and Data*.

Key questions:

- Do you have a high IT complexity within your enterprise?
- How many applications do you have within your enterprise?
- Do you actively work with **Application Portfolio Management (APM)** and application rationalization?

Risks

As highlighted in *Chapter 1, Our Most Significant Challenge Ahead*, the World Economic Forum highlights in the 2022 Global Risks Report that *climate action failure* is the most significant risk that currently faces humanity, followed by “extreme weather” and “biodiversity” loss (Global Risks Report 2022). Transitioning to net zero is the most potent mitigating factor to levitate these risks. Companies are increasingly exposed to ESG risks that can translate into economic loss, stranded assets, and inaccurate valuation. The risk areas are divided into physical and transition risk categories. Physical risks are acute or chronic, as in more frequent and severe adverse natural events such as droughts, floods, heatwaves, and wildfires. Transition risks are the changes in response to climate change issues such as climate policy shifts, consumer preferences, and emerging new technology. Both categories need to be managed to make an orderly net-zero transition to a new sustainable state and set up companies for long-term business success.

If we look closer at business risk, according to the Allianz Risk Barometer 2022, cyber incidents have been ranked as the #1 business risk since 2020 (Allianz Risk Barometer 2022). During the COVID-19 pandemic, cybercrime has increased by 600%; in Feb 2022, national cyber security agencies issued joint statements to strongly advise businesses to strengthen their security resilience after observing increased cybercrime activity again due to the Russian invasion of Ukraine.

Besides the imminent cyber incident risks, several risks are connected to climate change, such as natural catastrophes such as flooding, drought, wildfires, energy shortages, and pandemic outbreaks. Managing your ESG risks as part of your overall enterprise risk management framework is essential.

Key questions:

- What changes do you see from a climate change perspective?
- Is your company engaging in scenario-based planning to model various scenarios?
- Are clients abandoning you due to poor sustainability and sustainable IT practices?
- Do you envision the risk of asset loss or property destruction due to natural catastrophes such as flooding, drought, and wildfires?
- Does energy dependency challenge access to renewable energy sources?
- What is your sensitivity to rising material costs or energy prices?

In *Chapter 9*, we will explore some of these use cases further in terms of Earth insights, wildfire risk analysis, and water availability.

Employee engagement

Climate change is a global problem and it affects us all. Therefore, everyone needs to get involved and contribute in every way. Sustainability is a team sport. It is not enough for a few people, companies, or governments to acknowledge the problem; executive commitment and employee engagement must be firmly established.

It is about developing a culture centered around sustainability, raising awareness, educating, and activating employees. You should assess what future sustainability skill sets you need to add to create a multilayered curriculum.

It would help if you aimed to raise a sustainable culture centered around circularity, a zero-waste hierarchy reinforced by **9Rs** thinking (Kirchherr, Hekkert and Denise 2017): *R0 – Refuse, R1 – Rethink, R2 – Reduce, R3 – Reuse, R4 – Repair, R5 – Refurbish, R6 – Remanufacture, R7 – Repurpose, R8 – Recycle, and R9 Recover*, as illustrated in *Figure 2.10*. We will return to this model later in the book since it is a valuable tool for introducing circular thinking into the fabric of your organization:

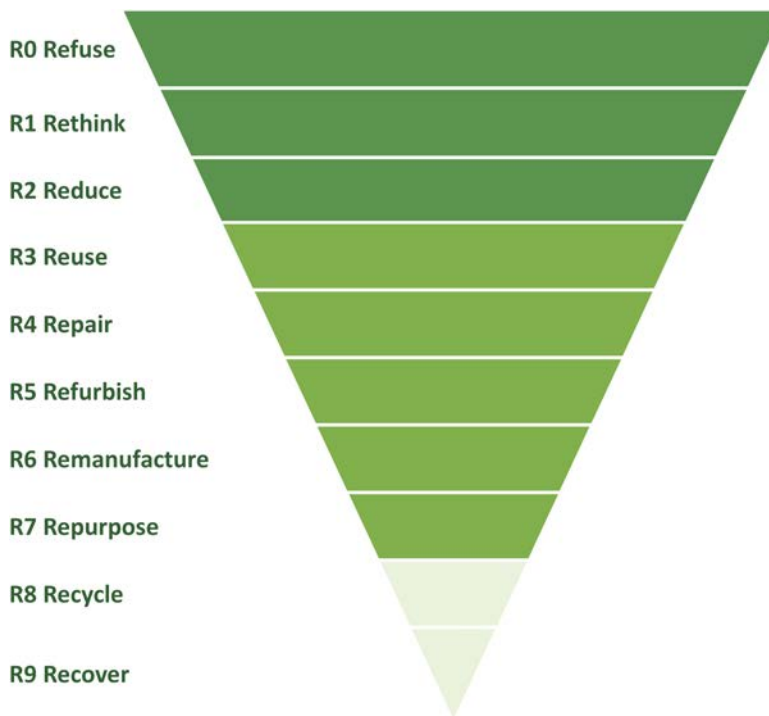


Figure 2.10 – A zero-waste hierarchy

Your company's sustainability and ethics can significantly impact talent retention and attraction. By embedding this thinking into the minds of employees, they will start to make more purposeful decisions that can positively impact your company's IT greenhouse gas emissions and financial impact.

These are six simple things you can ask your employees to do:

- Turn IT equipment off during non-working hours
- Reduce data storage
- Limit paper-based printing and promote e-services
- Prolong ICT equipment longevity
- Ask employees to consider buying refurbished ICT equipment such as smartphones, computers, and network equipment
- Adopt a sustainability-first mindset when creating and innovating new products and services

Readiness

The final ESG consideration for IT is readiness. As companies are coming under increased pressure, as a technology leader, so will you. Assess honestly and earnestly – what is your readiness? Do you have the proper structure, people, processes, and technology capabilities to start? What do you need to be able to establish traceability and an emission baseline reliably? Do you have an emission reduction plan in place? If the answer is no, do not worry. That is what this book intends to do – enable you to take concrete steps toward a more sustainable IT practice.

Summary

You have learned about the main drivers of a sustainable IT agenda. We understood the difference between the three key concepts sustainable IT, sustainable by IT, and IT for society. Finally, we gained more in-depth knowledge of what ESG considerations exist for IT.

In the next chapter, we will enter *Part 2* of this book. It will start with an introductory chapter introducing some critical areas of sustainable IT practice. The following chapters will devote an entire chapter to the data center and cloud, application and data, IT hardware management, energy resource management, vendor management and IT procurement, and sustainability by IT.

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