Deloitte.

# Cloud Migration
# A Catalyst for ESG

**July 2024**

# Introduction

This article showcases the opportunities that a **cloud migration** offers to facilitate the achievement of organization's **environmental, social and governance (ESG)** targets. It has been consolidated based on our research, our observations, and our vast experience in supporting over 500 cloud migration and cloud transformation projects in the past three years across multiple sectors in Germany.

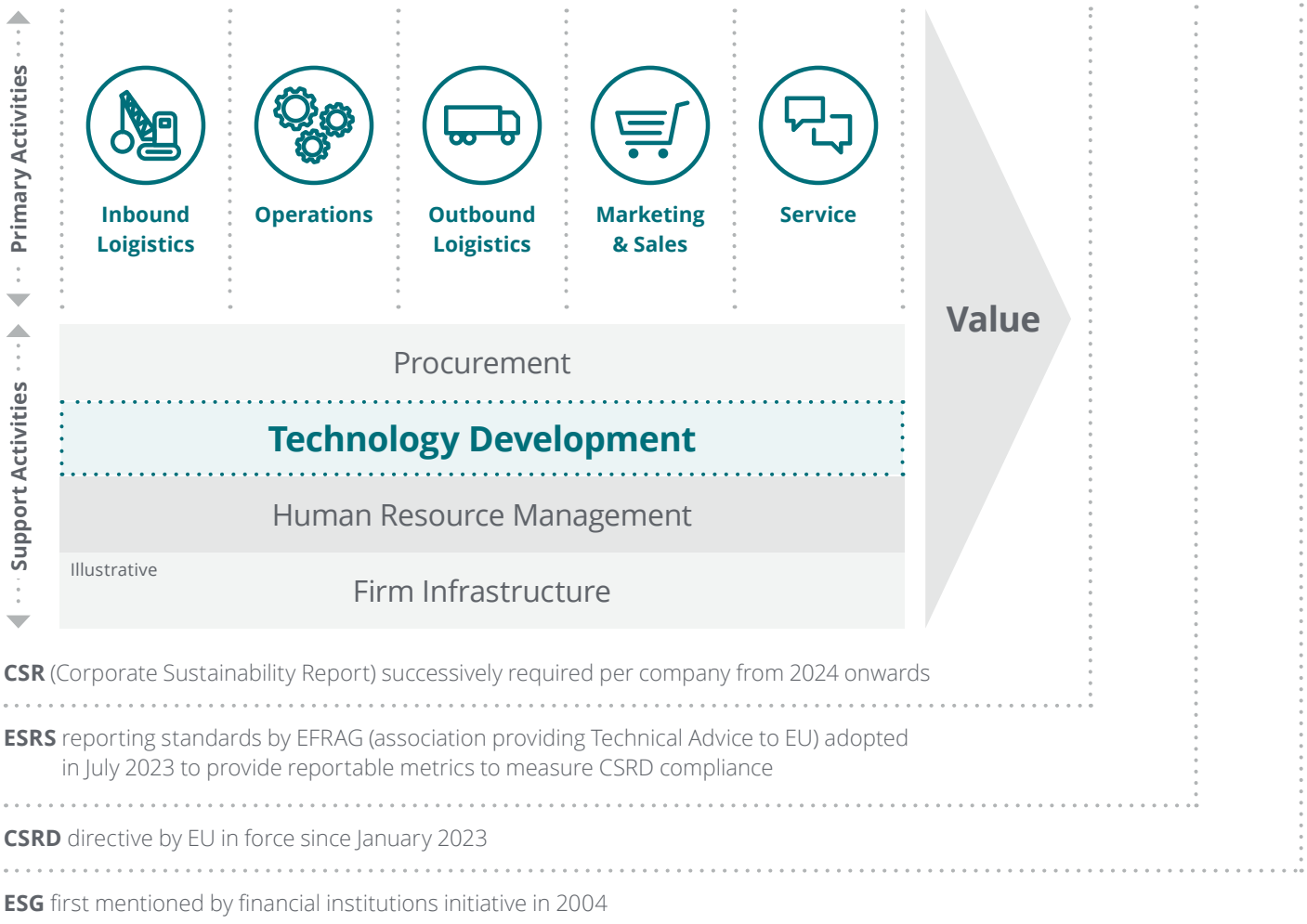
Becoming sustainable is challenging, requires dedicated investment, time, effort, and should be based on a clear strategy and roadmap. The reality is that very few organizations around the world and across industries have incorporated sustainability, although many are striving to do so. This is not least due to the EU´s **Corporate Sustainability Reporting Directive (CSRD)**.

One lever for achieving ambitious sustainability goals is the migration of on-premise data centers to the cloud. In addition, a cloud data strategy offers monetary and performance-related benefits and is therefore a must for companies.

**In our Point of View, we will outline the potential of cloud migration for organizations to meet its ESG standards required by the CSRD from FY 2024 onwards.**

Figure 1 shows the interdependence of value creation and ESG. As well as how technological development, here cloud services, can be part of it. Also, it depicts the various levels of sustainability influencing the value chain.

**Figure 1: Sustainability & Cloud**



# Insight pathway

# Glossary

| | |
|---|---|
| **Cloud (Migration)** | The *cloud* refers to servers accessible over the Internet used for the storage, management, and processing of data, whereas cloud migration is the process of moving these operations, data, applications, or other elements from on-premise or legacy infrastructure to a cloud-based infrastructure. |
| **CSRD** | The Corporate Sustainability Reporting Directive (CSRD) is an initiative by the European Union that mandates companies to disclose relevant and detailed information about their social and environmental impact, as well as their governance structure. |
| **ESG** | Environmental, Social, and Governance (ESG) refers to the three key factors that measure the sustainability and ethical impact of a company, playing a pivotal role in the CSRD. |
| **ESRS** | The European Sustainability Reporting Standards (ESRS) are a set of rules issued by the European Financial Reporting Advisory Group (EFRAG) designed to standardize the disclosure of sustainability or ESG-related information by corporations, in line with the European Union's Corporate Sustainability Reporting Directive (CSRD). |
| **EFRAG** | European Financial Reporting Advisory Group, *refer to ESRS* |
| **GHG** | Greenhouse Gas (GHG) refers to atmospheric gases such as carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$) that trap solar heat, resulting in the warming of the planet's overall climate, a process commonly known as global warming.<br><br>Scopes 1, 2 and 3 are ways of classifying climate-warming greenhouse gas emissions.<br><br>*Scope 1* = direct emissions from owned/controlled sources<br><br>*Scope 2* = indirect emissions from generation of purchased electricity, steam, heating, and cooling consumed by a company<br><br>*Scope 3* = other indirect emissions that occur in a company's value chain, including both upstream and downstream emissions |

# What is Sustainability?

## It is more than $CO_2$ emissions

**Essentially, sustainability strives to create a balance where our current civilizational needs are met without compromising the ability of future generations to meet their own needs or the health of our planet.[1]**

The most tangible sustainability aspects for many organizations are CO2 emissions. Simply due to the fact that one can observe and measure them. But sustainability goes far beyond that.

However, now with new regulations this approach seems to be changing. Organizations realize the necessity to be active in more than one component of sustainability. It's an interplay of countless aspects which can be divided into the three main themes of sustainability – Environment (E), Society (S) and Governance (G).

**Figure 2: Definition ESG**


Based on United Nations (2004) Who cares wins

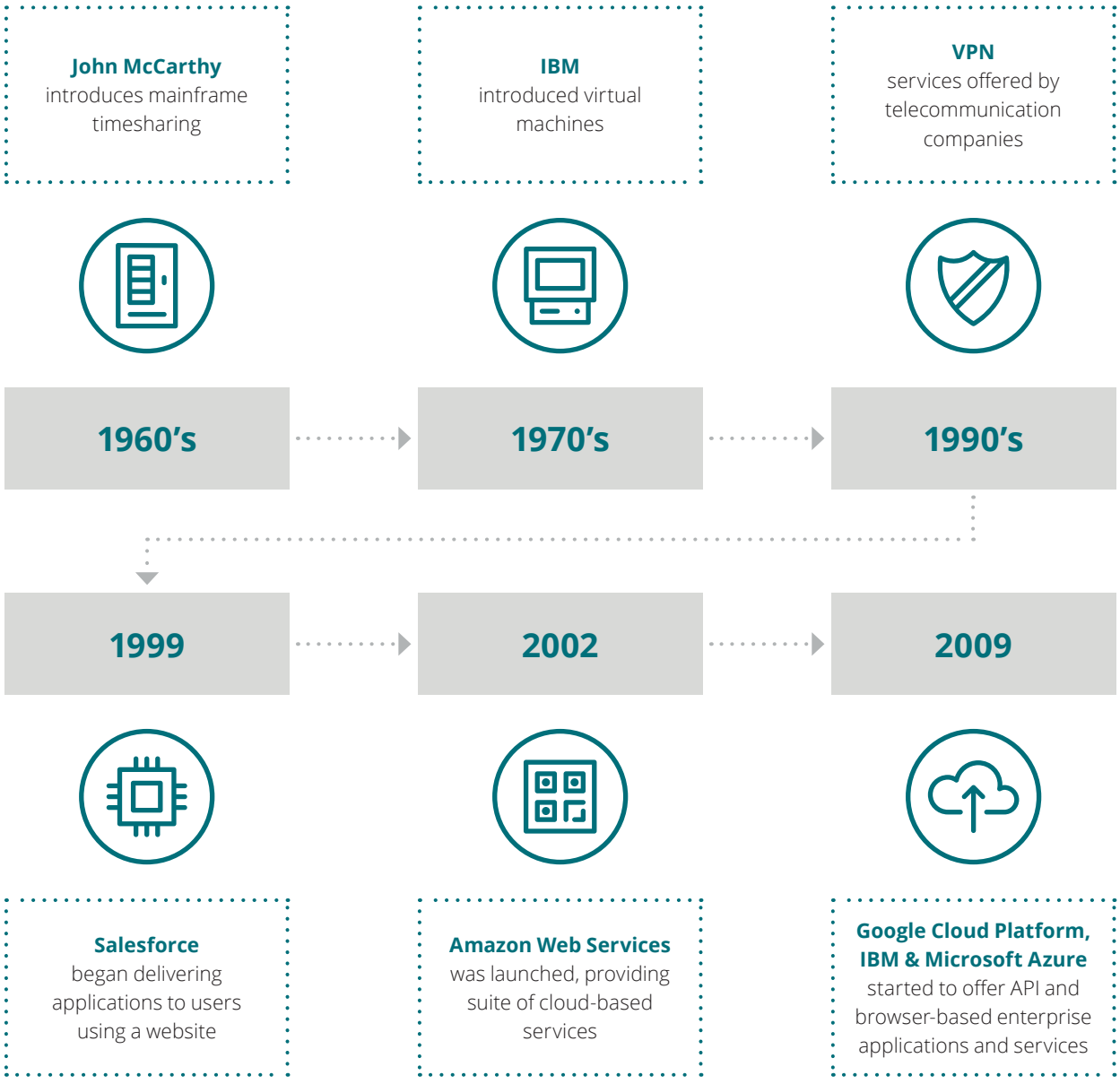
# What is Sustainability?

## What is the connection with cloud computing?

Cloud computing is more than just a temporary trend for tech organizations. It's an enabler, supporter, and optimizer. Its invention has an economic driven background but its use spreads into all three areas of sustainability.

Cloud computing has its roots in the drive to reduce costs and improve efficiency. Today, the positive sustainability spin-offs of engaging in cloud services are increasingly coming to the fore. Figure 3 shows inventions leading to cloud computing.

**Figure 3: Developments leading to Cloud Computing**



# Why is ESG reporting important?

## It's a must have to secure viability now and in the future.

Many organizations understood the necessity of transforming their operations towards more sustainable ones. However, many of them lack knowledge about the wide-ranging benefits of this transition. The following figure 4 marks important reasons for ESG reporting with related examples from real-life.

**Figure 4: Reasons for ESG reporting**

### Risk Management

ESG factors can help identify potential risks within a company. For instance, poor governance or unethical practices can pose a significant risk. Similarly, the environmental impact of a company's operations can lead to regulatory penalties or reputation damage.

### Capital Market Attraction

More and more investors are considering ESG factors in their investment decisions. They prefer companies that are responsible and sustainable reducing their exposure to ESG risks and potentially improving returns in the long run.

### Customer & Employee Attraction

Today's consumers and employees are more socially and environmentally conscious. They want to be associated with companies that uphold strong ESG values. This can boost a company's reputation, customer loyalty, and employee morale and retention.

### Compliance

Many jurisdictions are now requiring companies to adhere to certain ESG standards. Having these guidelines not only ensures compliance but can also anticipate future regulatory changes.

### Long-term Prosperity

ESG guidelines help a company focus on long-term sustainability over short-term profits. Companies that prioritize ESG are often more innovative and resilient, contributing to long-term success.

# Deep Dive CSRD: Reporting Obligation

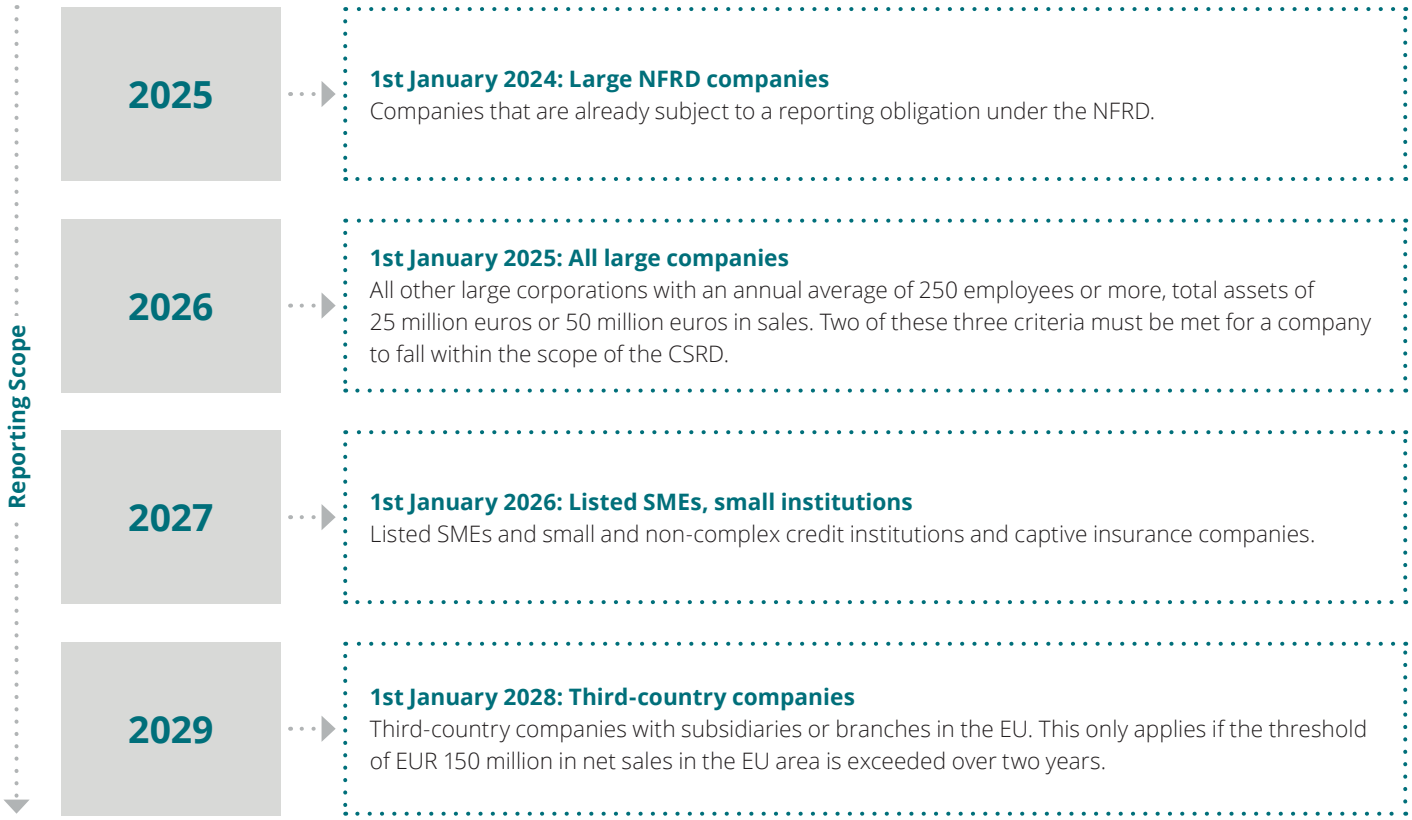
The Corporate Sustainability Reporting Directive, or CSRD for short, is the new EU directive on sustainability reporting by companies. This directive substantially extends the Non-Financial Reporting Directive (NFRD) from 2014. The extension leads to almost five times more affected organizations. The reporting requirements will be successively expanded from beginning of 2024 onwards. With the CSRD exists for the first-time binding reporting standards in the EU.

Central new developments are:

- an extended, standardized reporting duty
- a new understanding of materiality
- external audits
- sustainability information as part of the management report
- and a standardized electronic reporting format.

As illustrated in figure 5, from fiscal year 2024 in the 2025 annual report companies that are already subject to a reporting obligation under the NFRD have to extend their annual reports according to CSRD. From fiscal year 2025 (2026 annual report) all other large corporations with an annual average of 250 employees or more, total assets of 25 million euros or 50 million euros in sales[1] are added. Then from fiscal year 2026 (2027 annual report) listed SMEs and small and non-complex credit institutions and captive insurance companies have to report. From fiscal year 2028 (2029 annual report) third-country companies with subsidiaries or branches in the EU[2] are affected.

**Figure 5: Reporting Scope CSRD**

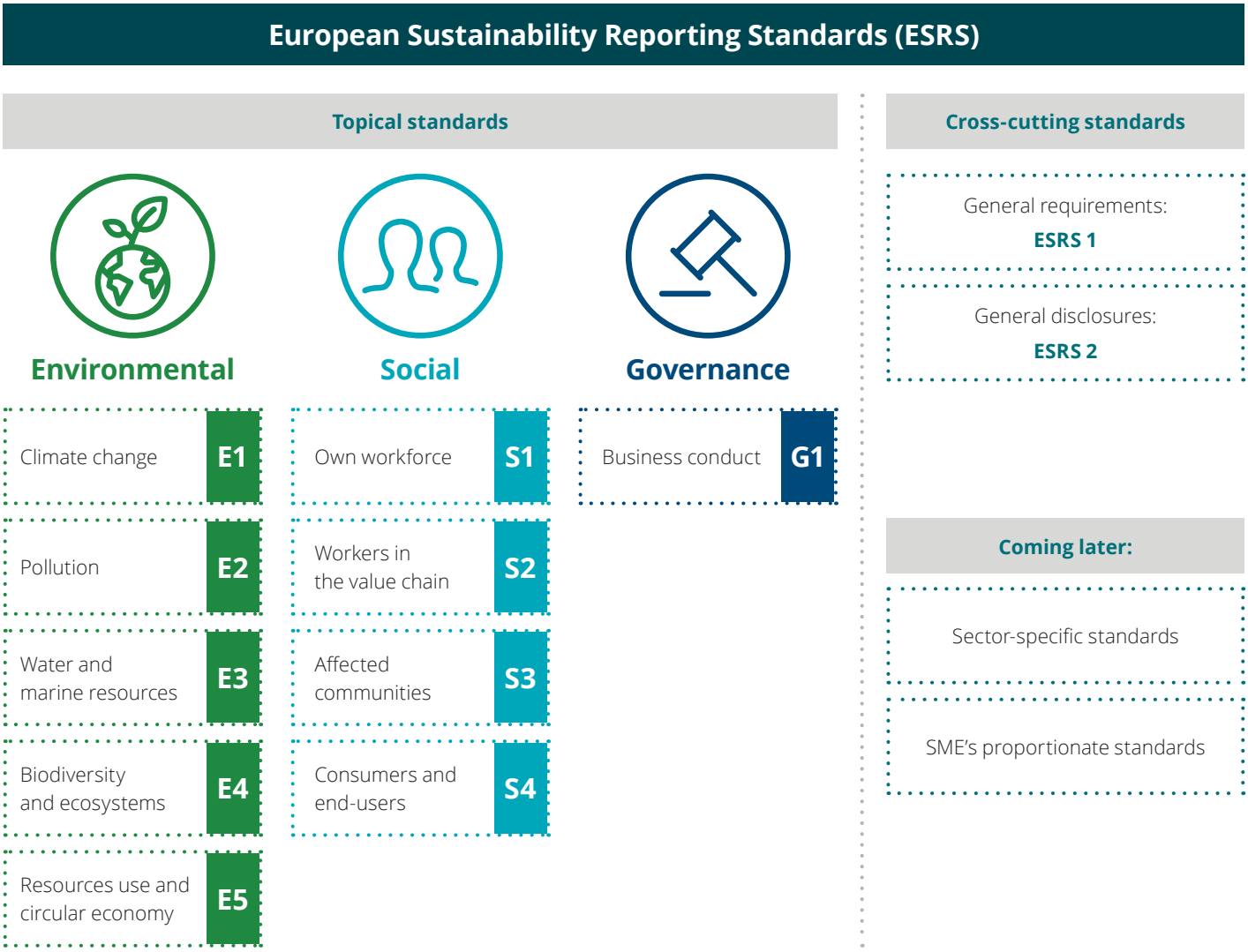



Based on BaFin (2023) Nachhaltigkeitsberichterstattung – CSRD

1. Two of these three criteria must be met for a company to fall within the scope of the CSRD.
2. This only applies if the threshold of EUR 150 million in net sales in the EU area is exceeded over two years.

# Deep Dive CSRD: Reporting Content

**Figure 6: ESRS content**




According to EFRAG (2023)

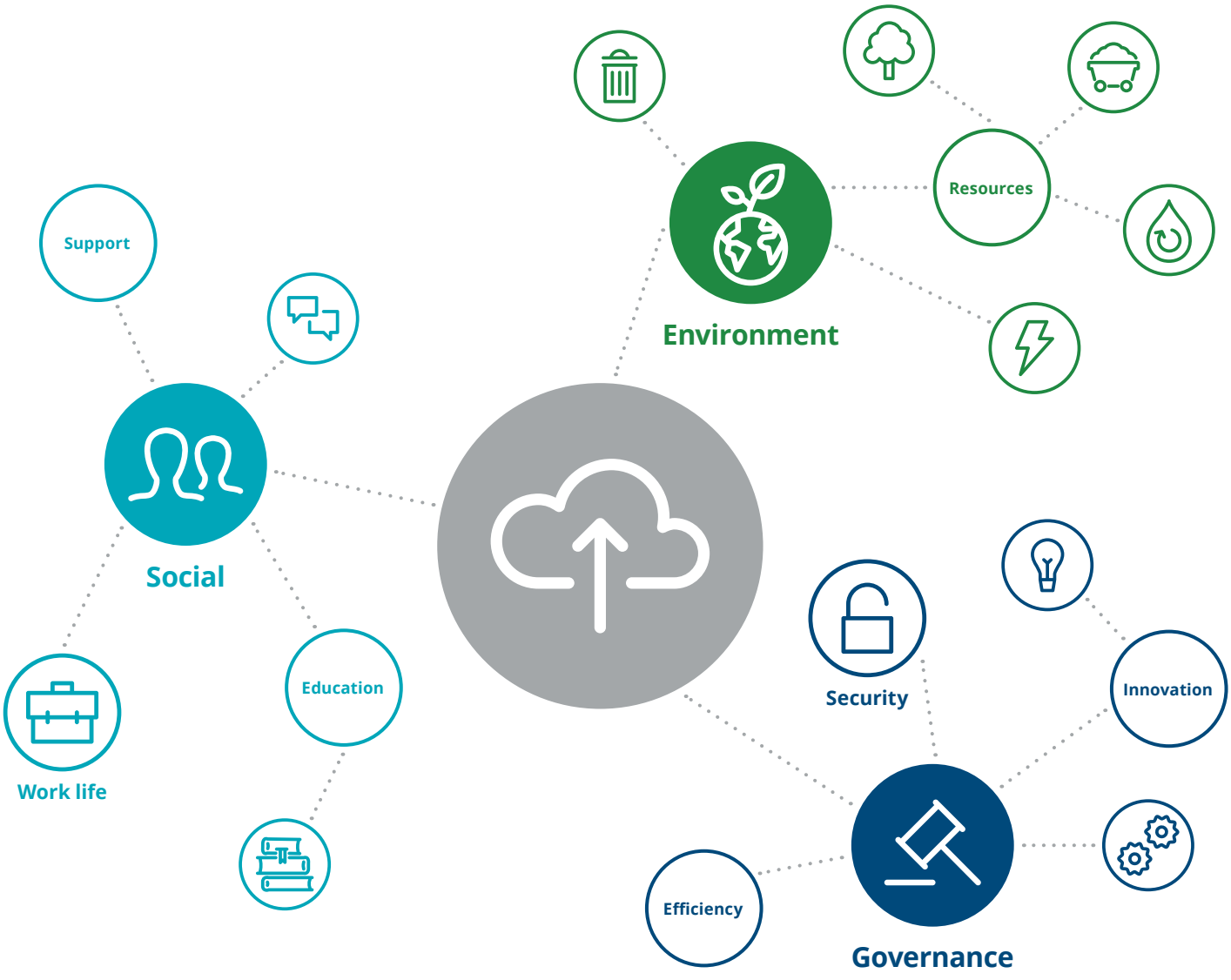
The new reporting obligations are summarized in the European Sustainability Reporting Standards (ESRS) developed by the European Financial Reporting Advisory Group (EFRAG). The ESRS are following the guidelines laid down in the CSRD and consist of two cross-cutting standards and ten topical standards. The topical standards are divided into the three areas of ESG. Each topical standard consists out of different disclosure requirements (DR) and associated paragraphs. In total 1178 datapoints are required. These can be divided into three areas: mandatory data points, voluntary datapoints and data points with phased introduction. Double materiality serves as an essential foundation for the ESRS. It refers to the idea that sustainability information is materially 'double-sided'. On the one hand, it includes how sustainability issues can affect a company's financial position, performance and development (financial materiality); on the other hand, it illustrates how a company's activities can affect society and the environment (social and environmental materiality). Put simply, it's about measuring both how sustainability issues affect your business and how your business affects sustainability issues. The CSRD uses this approach to help companies better understand and manage their full range of risks and opportunities, and to present a more accurate picture of their sustainability performance to investors and stakeholders.

# How can cloud migration support compliance with ESG standards?

## Through positive impacts in all three areas of sustainability

Cloud migration can have a positive impact on all three ESG areas. The **environmental** aspect is addressed by reduced energy and resource consumption due to the shared nature of the hardware. At the same time, both aspects are addressed by the improved technology of the cloud provider, which is described in detail in the following chapter. The same applies to waste management. In addition, cloud providers have far-reaching **social** goals that are indirectly supported by migrating. Last but not least, the **governance** aspect is addressed by the innovative technologies used by the providers and the higher security standards through full-stack security. The use of a cloud increases efficiency, which has a positive impact on all three ESG areas in terms of costs, energy consumption and the working lives of an organization's employees.

**Figure 7: Context ESG & Cloud**



The following tables 8-10 illustrate explicit potential sustainability issues that are part of the CSRD that can be positively impacted by cloud migration and highlights the reasons why. The development symbol shows the change of the corresponding disclosure requirement (DR) after a cloud migration: the plus (+) means increasing and minus (–) indicates decreasing.

**Figure 8: Environmental benefits of a cloud migration**

| ESRS | DR | § | Topic | Development | Factors |
|---|---|---|---|---|---|
| **E1** | | | **Climate Change** | | |
| | E1-3 | 29(b) | GHG emission reductions | + | • Low relative energy consumption by higher energy efficiency<br>• More energy from renewable resources<br>• Less buildings needed<br>• Less waste generation through shared property, less servers, reuse & recycle<br>• Enhanced tracking & reporting<br>• Real-time data & analytics |
| | E1-4 | 32 | Tracking of Targets | + | • Cloud platforms provide robust tools for tracking & assessing effectiveness of policies & actions |
| | E1-5 | 37 | Energy consumption | – | • Shared resources not only in terms of compute and storage, but also with regard to networking etc. |
| | E1-5 | 37(c) | Renewable energy | + | • Provider's energy comes mainly/entirely from renewable resources |
| | E1-6 | 44 | Total GHG emissions | – | • Less GHG emissions due to reductions in energy consumption and waste generation; increase of hardware lifespan; efficiency |
| **E2** | | | **Pollution** | | |
| | E2-4 | 28(a) | Pollution to air, water, soil | – | • Research on better technologies by cloud providers<br>• Tracking & reporting of pollutions |
| **E3** | | | **Water & marine resources** | | |
| | E3-4 | 28(a) | Water consumption | – | • Better technology with higher efficiency<br>• Projects for water positivity to compensate high water usage of hardware<br>• Real-time data on water usage ensuring efficiency |
| | E3-4 | 28(c) | Water recycled & reused | + | • Innovative technology at-scale used by cloud providers |
| | E3-4 | 29 | Water intensity ratio | – | • Tools for calculating & monitoring intensity ratios<br>• Ensuring water use is optimized |
| **E4** | | | **Biodiversity & ecosystems** | | |
| | E4-5 | AR34(a) | Use of land area | – | • Less land used because of shared property and no own land needed for IT (bottom line more servers per m²) |
| **E5** | | | **Resource use & circular economy** | | |
| | E5-4 | 31a | Material use | – | • Tracking & reporting of material use<br>• Ensuring resources are managed efficiently (often longer than the maintenance time enterprises would get) |

| ESRS | DR | § | Topic | Development | Factors |
|---|---|---|---|---|---|
| | E5-4 | 31(c) | Reused/recycled products | + | • Higher rate thanks to innovative programs & technological knowledge<br>• Partnerships for source of components |
| | E5-4 | 37(a) | Waste | – | • Lower amount due to a circular economy focus |

**Figure 9: Social benefits of a cloud migration**

| ESRS | DR | § | Topic | Development | Factors |
|---|---|---|---|---|---|
| **S1** | | | **Own workforce** | | |
| | S1-6 | 50(a) | Number of employees | – | • Less employees needed for IT infrastructure, maintenance etc. |
| | S1-6 | 50(c) | Employee turnover | – | • Lower turnover thanks to higher loyalty by adopting to modern business technology |
| | S1-13 | 83(b) | Trainings | + | • More trainings needed to be capable of understanding and using cloud services (typically provided by cloud providers free of charge)<br>• Positive in terms of employee development |
| | S1-17 | 103(a) | Discrimination | – | • Higher automation leaves reduced space for discrimination and increased transparency |
| | S1-17 | 103(b) | Complaints | – | • Improving workforce satisfaction & trust (due to stable IT infrastructure) |
| **S2** | | | **Workers in the value chain** | | |
| | S2-5 | 41 | Management of targets | + | • Improvement of data collection & analysis (in IT space)<br>• Enablement of better tracking & management of targets |
| **S3** | | | **Affected communities** | | |
| | S3-2 | 21 | Engagement with communities | + | • Easier and better engagement due to use of tools |
| | S3-4 | 32, 33, 34, 35 | Actions in communities & mitigation of negative impacts | + | • Cloud provider projects in affected communities that are directly supported and can be further developed by contributing ideas to the projects<br>• Cloud platforms provide robust tools for tracking & assessing effectiveness of initiatives<br>• Ensuring that positive outcomes for affected communities are achieved & documented |
| **S4** | | | **Consumers & end-users** | | |
| | S4-4 | 31(c) | Actions to prevent negative impacts on consumers | + | • More and easier sustainable decisions with a positive impact for consumers by migrating to the cloud<br>• Due to scalability improved experience in IT-adjacent areas<br>• Improved setting, tracking & management of targets |

**Figure 10: Governance benefits of a cloud migration**

| ESRS | DR | § | Topic | Development | Factors |
|---|---|---|---|---|---|
| **G1** | | | **Business conduct** | | |
| | G1-2 | 15 | Selection & relationship suppliers | + | • Tools for better selection of suppliers, taking into account their sustainability performance<br>• Marketplace of provider as intermediate |
| | G1-6 | 33(a) | Invoice payments | – | • Reduced potential for late payments due to robust tools for tracking & reporting payment practices offered in the cloud (e.g. automation)<br>• Ensuring invoices are paid promptly & in accordance with contractual terms |

**Environmental**

**E**

- Enhanced tracking & reporting
- Increased efficiency/efficient use: water, resources
- More environmentally sustainable practices thanks to ambitions of cloud providers: less GHG emissions, recycling & reuse

**Social**

**S**

- Improved data management
- Better documentation & transparency
- Scalability & flexibility

**Governance**

**G**

- Improved supplier selection process
- Tracking, reporting and management of impacts, risks and opportunities: e.g. reduced potential for late payments

# Who are the cloud service providers?

## Key players with great sustainability impact

**Figure 11: Cloud providers & their ESG impact**

| | Amazon Web Services | Microsoft Azure | Google Cloud Platform |
|---|---|---|---|
| **Carbon emissions** | 80-96% smaller carbon footprint | Up to 98% emissions savings<br>Carbon negative by 2030 | 65-90% reduction of carbon emissions |
| **Circular economy** | Maintenance & repair<br>Secondary market<br>Recycling<br>End-of-life management<br>Reverse logistics hubs | Circular Centers | 4 strategies: maintain, refurbish, reuse, recycle |
| **Data Analysis** | Amazon Sustainability Data Initiative | Azure Synapse Analytics | Geospatial data analysis |
| **Energy efficiency** | 5x more efficient than typical European data centers | 22-93% more efficient | 68-87% energy savings |
| **Measuring & AI Tools** | AWS Customer Carbon Footprint Tool | Microsoft Sustainability Manager<br>Emissions Impact Dashboard<br>Azure IoT | Carbon Footprint<br>Active Assist Recommender<br>Region Picker |
| **Renewable energy** | 100% by 2025 | 100% by 2025 | 100% since 2017 |
| **Water responsibility** | Water positive by 2030 | Water positive by 2030 | Replenish 120% of consumed water |

Based on information from the cloud providers

The main three cloud providers and many others not listed here are aware of their potential for enhancing sustainability of their clients' operations. They have ambitious and ever evolving goals for the next years. Central reasons for their potential are:

- Data centers and hardware with continuously improvement in scale-, performance-, cooling- and power-efficiency
- Use of renewable energy
- Increase of servers' lifespan
- Power (financial position, brand awareness) & Knowledge
- Sustainable Innovations
- Partnerships
- High performance tools to support sustainability reporting and Big Data analytics

Most important is that regardless of which provider an organization chooses, all providers offer more sustainable operation options for companies than typical on-premise data centers. The extent of this improvement needs to be examined in an individual sustainability study.

# What are the benefits of a migration with Deloitte?

## We amplify transformations putting the capabilities of the cloud providers to use for your organization

**Figure 12: Benefits of a cloud migration with Deloitte**

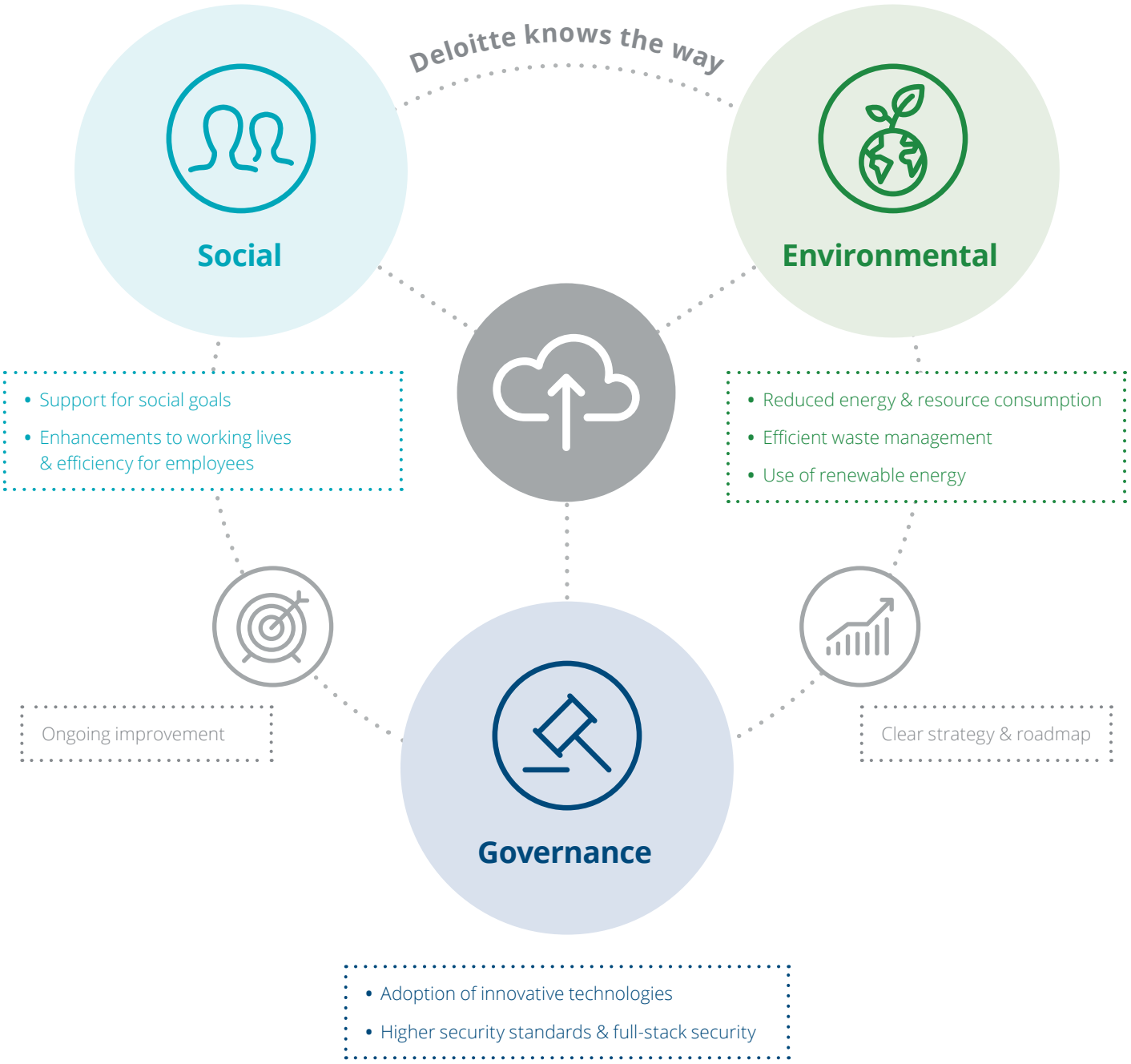
| | |
|---|---|
| **Speed & Quality with Sustainability** | Sustainability is about long-term value creation, and Deloitte's value-oriented approach to migration ensures exceptional quality while emphasizing fast, efficient processes that reduce energy consumption. By reducing the physical infrastructure requirements, we channel businesses towards a lower carbon footprint and more eco-friendly operations. |
| **Smart Cost Reduction & Simplified Maintenance** | Cloud migration not only promotes cost savings by reducing physical data center usage but it also minimizes resource waste and energy usage. Deloitte's application onboarding & enablement strategy reinforces a more sustainable and efficient use of resources, thus advocating eco-efficiency. |
| **Balance of Planning with Agile Implementation** | Agile methods adopted by Deloitte allow businesses to rapidly react and adapt to changing environments. Improved decision-making, mitigating environmental risks and integrating sustainability initiatives into the agile methodology support a more resilient, flexible, and ultimately more sustainable business model. |
| **Transformation towards a Sustainable Future** | At Deloitte, we help clients not only to move to the cloud but to utilize it sensibly. This includes transforming the organization to align with sustainable operations. Developing sustainable cloud practices aligns businesses with larger global sustainability targets and underlines the transformational nature of our approach. |
| **Flexible Support for Sustainable Operations** | Our range of support services ensures the migration journey is as green as possible. The end-to-end migration support and Cloud Migration Control Tower place sustainability at the forefront by coordinating greener processes and educating all application owners to adopt more sustainable practices. |
| **Embracing Sustainable Pricing Models** | Our pricing models are adaptable and incentivize sustainable practices. The 'Skin in the game' approach promotes shared responsibilities and rewards for sustainable outcomes, aligning interests with ethical and environmental standards. |
| **Agile, Throughput Driven Migration** | Our agile and throughput-driven approach to migration allows us to adapt swiftly and efficiently to advances in sustainable technology and practices. By doing away with manual, energy-intensive processes, we save resources and reduce environmental impacts. |

Cloud migration presents an excellent opportunity for businesses to integrate sustainability goals into their operations. Deloitte's mission towards sustainable cloud migration integrates three main values: environmental responsibility, social justice, and economic efficiency.

Embracing sustainability in cloud migration is no longer a preference, but a necessity. Deloitte's approach ensures that this part of the business transformation journey leads towards a more sustainable digital future.

# Key takeaways – Merging ESG & Cloud

**Figure 13: Key takeaways**



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