

GUIDE

Sustainable IT Impact Assessment

The starting point for making IT more sustainable
and using IT for a sustainable organization



Coalitie
Duurzame
Digitalisering

GUIDE

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and using IT for a sustainable organization

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Preface

During the roundtable discussion on sustainability and digitalization in the Dutch House of Representatives on March 14, 2024, Wiebren van der Zee (ABN AMRO) on behalf of the NCDD, made a case for the introduction of a so-called “Sustainable IT Impact Assessment” (SIIA).

The **primary goal** of a SIIA is to determine whether an IT change (such as a modification to an IT application, IT asset, or IT service) aligns with the organization's sustainability objectives.

A **secondary goal** is to use IT to help make other parts of business operations and/or supply chains more sustainable. This requires that organizations gain insight into the sustainability impact of IT and formulate, identify, and undertake actions to positively influence or apply it.

This plea led to the formation of a working group within the Nationale Coalitie Duurzame Digitalisering (NCDD), with the ambition to develop and make this Sustainable IT Impact Assessment available to organizations in the Netherlands. This ambition proved to be no small feat; sustainable IT is a multifaceted and complex topic that cannot easily be captured in a concise booklet.

And yet, you are now reading the first version of the SIIA. As the working group sees it, this is intended as inspiration for all organizations in the Netherlands that want to get started with sustainable digitalization. It offers a structure for approaching this ambition in a systematic and top-down manner, as well as practical tools for individuals or organizations who wish to begin with a specific component.



In addition to this publication, you can find more information on the NCDD website:

- Visit coalitieduurzamedigitalisering.nl/sustainable-it-impact-assessment-siia for practical information, the latest digital version of this publication, and an overview of initiatives;
- At radar.coalitieduurzamedigitalisering.nl you'll find the Radar, which helps organizations keep track of their sustainability initiatives, and at github.com/ncdd-siia/siia-radar the Radar for your own use (technical knowledge required!);
- Visit wiki.coalitieduurzamedigitalisering.nl/index.php/Main_Page for more knowledge, best practices, explanations, and good examples, including the work of various working groups and/or NCDD participants.

With this version of the SIIA, the working group has taken an important step in promoting and supporting organizations in developing and implementing sustainable digitalization. At the same time, this document serves as both a starting point and an invitation for a follow-up process, in which we will work together with all coalition participants to develop version 2.0 and further elaborate it within the online environment.

We thank the members of the working group for their valuable contributions and invite you to use the SIIA as a starting point for further development of the online (Wiki) environment.

Moreover, we warmly invite you to become part of the National Coalition for Sustainable Digitalization. Together, we can advance the twin transition in the Netherlands.



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Preface to the English Edition

This English-language version of the Sustainable IT Impact Assessment (SIIA) has been prepared as a translation of the original Dutch publication. Its purpose is to make the SIIA accessible to Dutch organizations that operate in an international environment and/or have adopted English as their primary working language.

By offering this translation, we aim to support these organizations in integrating sustainable digital practices into their operations, regardless of linguistic boundaries. The SIIA framework and tools are intended to inspire and guide organizations in making IT choices that align with their sustainability goals and in using IT as a lever to improve the sustainability of broader business activities.

While this translation mirrors the Dutch version as closely as possible, we have prioritized clarity and readability—choosing smooth, natural phrasing where necessary to ensure the message is easily understood by an international audience. Our goal has been to preserve the original tone and substance, while making the text accessible and practical for English-speaking readers.

This English version was made possible thanks to the dedication and careful work of the translation team at Ab Ovo, who not only translated the text but also ensured the concepts were communicated clearly and consistently across contexts. We also wish to acknowledge NetApp for their valuable contribution to the design and layout of this English version of the SIIA. We are grateful for their contributions in helping to broaden the reach and impact of this initiative.



In addition to this publication, the working group is also actively working on English translations of the accompanying online tools: the SIIA Radar and the NCDD Wiki. These resources provide organizations with practical guidance, examples, and insights to help implement sustainable IT practices in a structured and transparent way. Making these tools available in English will further support international teams and Dutch organizations with English as their working language in navigating and applying the SIIA framework effectively.

Together, we hope to further the mission of sustainable digitalization, within the Netherlands and beyond.



SIIA – Reading guide and roadmap

Read the detailed Reading guide on page 22.

The Reading guide outlines four distinct tracks:

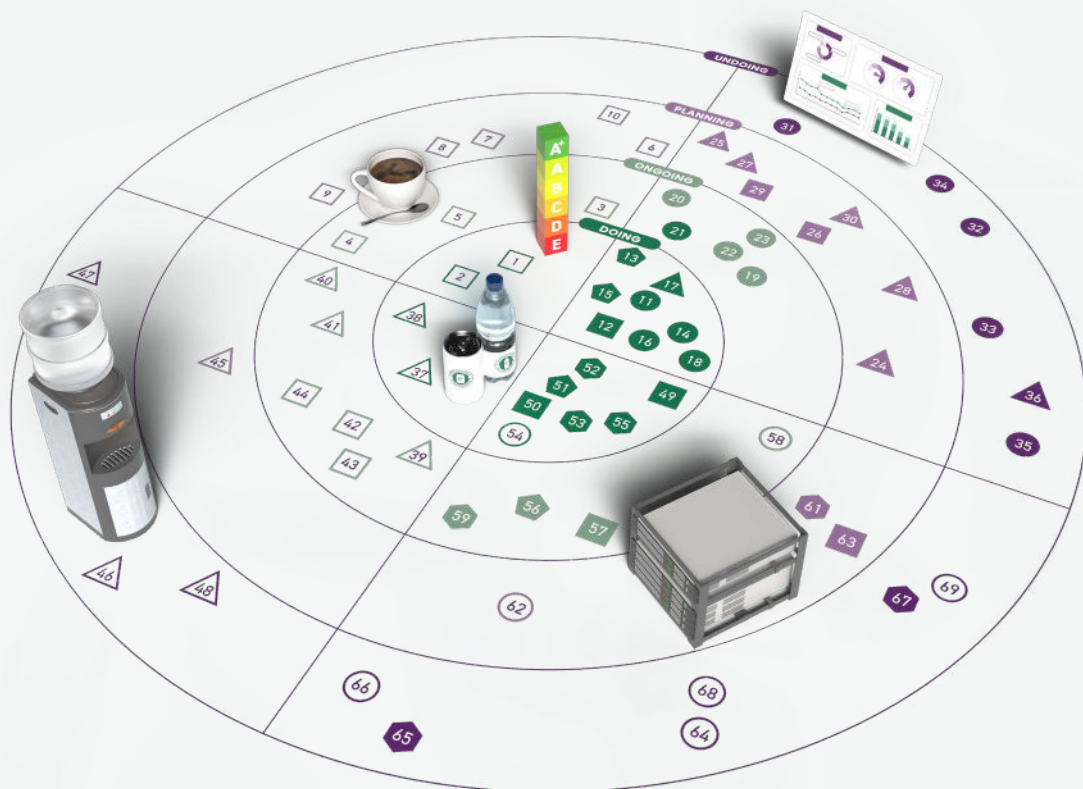
- For the **IT professional or employee** with a good idea to make IT more sustainable or to use IT to support the organization's sustainability efforts ► **chapter 4: Act**
- For the **IT lead** (such as a CIO or CISO) responsible for designing IT systems that are sustainable and capable of supporting a sustainability-focused organization ► **chapter 3: Organize**
- For the **executive** (board member, director, owner) who must take accountability for sustainability efforts and the role of IT in those efforts ► **chapter 2: Think**
- For the **auditor or legal advisor** who must investigate or advise on compliance, and on the design, existence, and effectiveness of sustainability measures ► **chapter 5: Measure**

About the structure of this publication:



A step-by-step plan for sustainability: the SIIA Radar

The SIIA Radar provides an overview of activities and their progress in making IT more sustainable within an organization that is itself striving for sustainability.



About the SIIA Radar

- You can read more about the Sustainable IT Impact Assessment (SIIA) and access the latest version at: coalitieduurzamedigitalisering.nl/sustainable-it-impact-assessment-siia
- An example of the Radar (inspired by the sustainability journey of Wigo4it) is available at: radar.coalitieduurzamedigitalisering.nl
- The software repository to create your own Radar can be found on GitHub: github.com/ncdd-siia/siia-radar
- A knowledge base with background information, best practices, and overviews is available at: wiki.coalitieduurzamedigitalisering.nl/index.php/Main_Page (working document).





Sustainable IT Impact Assessment Duurzaamheidsradar



Doing

- 1 EnergielabelA+
- 2 Bank

Planning

- 6 Certification
- 7 1% of budget
- 8 5% of time
- 9 CSRD Reporting
- 10 Productvision

Ongoing

- 3 Responsibility
- 4 Planet as a Stakeholder
- 5 Agile Sustainability Manifesto

Undoing

- -

Doing

- 11 Containerization
- 12 Scaling
- 13 Self-service
- 14 Terracost
- 15 Guide
- 16 Public Cloud
- 17 Batches
- 18 Cattle

Planning

- 24 Always On
- 25 Carbon Aware Computing
- 26 Energy Proportionality
- 27 Carbon Aware SDK
- 28 Green Builds
- 29 ARM Architecture
- 30 Electricity Maps

Ongoing

- 19 Right Size Provisioning
- 20 On-Demand Resources
- 21 Purchasing Policy
- 22 Tender
- 23 Hardware

Undoing

- 31 Dashboards
- 32 Infrastructure as Code
- 33 Infrastructure as a Service
- 34 Twin Datacenters
- 35 Pets
- 36 CO2 Monitoring

Filters

- 1 Less Hardware
- ▲ 2 Carbonaware
- 3 Less Energy
- ◆ 4 Sustainable Use
- ◆ 5 Software
- 6 Data
- △ 7 Employee
- 8 Organization





Sustainable Work

Doing

37 Deposit System
38 STOMP

Planning

45 Search Engine

Ongoing

39 CleanupFest
40 Digital CleanupDay
41 DualSimTelefoon
42 Cleaning
43 Coffee and tea
44 Lunch

Undoing

46 Videocall
47 Water(bottles)
48 E-Mail

IT for Sustainability

Doing

49 Green Coding
50 Green Software
Patterns
51 Reservations
52 Webbased
53 SLA conform building
54 Archive Law
55 Digital Signing

Planning

60 Messagebox
61 Algorithm
62 Data Collection Rules
63 Reduce idle time

Undoing

64 Full Data Sets
65 Python
66 Archive
67 Client server
68 Backups
69 Dark Data

Ongoing

56 Workbooks
57 Event-Driven
Architecture
58 Removal Strategy
59 APIs



Filters

- 1 Less Hardware
- ▲ 2 Carbonaware
- 3 Less Energy
- ◆ 4 Sustainable Use
- ⬢ 5 Software
- 6 Data
- △ 7 Employee
- 8 Organization





STEP

1. Create a list of activities needed to achieve sustainability and place them in the SIIA Radar

Using IT to make the business model more sustainable

Quadrant 1
Sustainable Organization



Making IT itself more sustainable

Quadrant 2
Sustainable IT



Making IT-supported processes more sustainable

Quadrant 3
IT for Sustainability



Making the workplace more sustainable

Quadrant 4
Sustainable Work





STEP

2.

For each activity, consider the following:

How does this activity contribute to sustainability?

Where are we now? **(Measure!)**

Where do we want to go?
(Measure!)

What is needed for this in terms of:

1. Technology
2. Organization
3. Skills and motivation of people
4. Ethics

Use categorization to map how the activity relates to other activities (see the filters in the **SIIA Radar**)

► Chapter 2: Think

► 2.5: Think: develop a plan for sustainable IT within a sustainable organization

1. ► 3.2 The role of IT: making IT more sustainable, IT management

2. ► 3.3 Organizational setup: digital innovation

3. ► 3.4: People: awareness and cultural change

4. ► 3.5: Desirability: ethics and compliance

► Chapter 4: Act



STEP 3. Plan the activity

Place the activity in the appropriate circular segment on the **SIIA Radar**

- Undoing (stopping),
- Planning (researching),
- Ongoing (implementing),
- Doing (executing)

Add a timeline

STEP 4. Measure and document progress and update the Radar

Check: Are the plans working **(Measure!)**, and are adjustments needed?

► Chapter 5: Measure

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CHAPTER 1

Introduction and reading guide: structure and products of the SIIA



In this chapter

1.1. What is the SIIA?

1.2. Reading guide

1.3. Structure: think, organize, act, measure

1.4. The SIIA and European Sustainability Legislation

1.5. SIIA products

1.6. The National Coalition for Sustainable Digitalization



1.1. What is the SIIA?

The Sustainable IT Impact Assessment (SIIA) is a starting point for leveraging IT in the process of making an organization more sustainable. It serves as a guide for employees, managers, and executives who have responsibilities or tasks related to sustainability and IT, helping them explore two key questions:

1. The role of IT in the transition to a sustainable organization (sustainability by IT).
2. The impact of IT itself on sustainability (sustainability of IT). This includes the consumption of raw materials, energy, land, and water by IT, as well as electronic waste (e-waste), the strain on scarce sustainable energy resources, and the burden on the overloaded power grid.

In this context, the word “assessment” refers to an analysis that compares the desired situation (a sustainable organization where processes are supported in a sustainable way by sustainable IT) with the current situation, and outlines what is needed to achieve the desired state.

The SIIA consists of a static and a dynamic part. This publication represents the static part. On the NCDD website (coalitieduurzamedigitalisering.nl/sustainable-it-impact-assessment-siia/), best practices and additional background information can be found. This is the dynamic part, which is regularly updated with new input.



1.2. Reading guide

Several chapters include clearly marked breakout boxes with case descriptions from two working group members: Wigo4it and ABN AMRO. These cases help illustrate the often abstract subject matter and use the same terminology explained in the respective chapters.

The SIIA is based on a broad definition of sustainability ► **2.1: A broad approach to sustainability and IT**. This aligns with European legislation and also helps prevent issues or imbalances, such as an organization that is environmentally friendly but treats its employees poorly, or one that harms the environment but uses sustainable IT.

The SIIA briefly outlines several different starting points:

- **Starting point 1:** Starting with an idea to make IT more sustainable.
- **Starting point 2:** Aiming to make the organization more sustainable.
- **Starting point 3:** Seeking to make the organization's IT landscape more sustainable.
- **Starting point 4:** Wanting to comply with European sustainability legislation.

1.2.1. Starting point 1: start with an idea to make IT more sustainable

Sustainability often begins with a simple idea, such as: "Let's consider sustainability when purchasing new equipment." The SIIA can support such an idea in the following ways:

1. The ► **chapter 4: Act** outlines an approach to making equipment procurement more sustainable. This approach poses several questions, for example, whether the new device is actually necessary (since the greatest environmental impact of IT occurs during the production phase: raw materials and components).
2. That question leads you to the ► **chapter 3: Organize**: The section on IT management helps answer it and explores how IT can remain reliable, secure, and flexible. Suppose IT management wants to make the entire IT landscape more sustainable by moving to the cloud, then new equipment might not be needed at all. But IT is also essential for enabling colleagues to work in the short term. Consider what postponing the purchase would mean for work processes. And what does the purchase mean for your colleagues' ability to do their jobs? For example, does



postponement mean a colleague has to keep using a device that frequently crashes? Finally, there's the question of desirability: How desirable is it to purchase this new device, considering the environmental impact, the effect of postponement on colleagues, and the broader goal of making the IT landscape more sustainable?

3. The question of whether equipment is needed cannot be answered by IT management based solely on the current state of the organization. It also involves the organization's future. The organization may itself become more sustainable and shift its activities. Will that device still be necessary? What kind of IT will be needed for that? What capabilities will people in the organization need? That brings you to the ► **chapter 2: Think**, which focuses on goals and strategy.

1.2.2. Starting point 2: making the organization more sustainable

Sustainability efforts can begin with individuals who feel responsible, or are responsible, for the organization: how can we become more sustainable? They can start with the ► **chapter 2: Think**, which focuses on making the organization more sustainable and specifically on the contribution IT can make. This chapter discusses the steps needed to develop a sustainability plan and the research required to support it (due diligence, materiality analysis). It also addresses how this leads to new plans and the importance of assessing the risks involved in implementing them.

The risk analysis is further developed in the ► **chapter 3: Organize**. This chapter covers the constraints and opportunities for achieving sustainability goals in terms of IT, organizational structure, knowledge and skills, and the daily work of employees. It also emphasizes the perspective of desirability (including the views of customers and suppliers).

Once the goals are clear and the risks are understood, the focus shifts to planning and prioritization. To ensure accountability and maintain control over the sustainability process, a decision-making framework must be created: what will we do, when will we do it, what are the dependencies, and what uncertainties exist? The ► **chapters 4: Act** and ► **chapters 5: Measure** delve into the detailed development of plans and what is needed to report on them.



1.2.3. Starting point 3: making IT and IT-supported processes more sustainable

Sustainability can also begin from a management perspective: How can IT gradually become more sustainable, and how can we make the processes that IT supports more sustainable?

The ► **chapter 3: Organize** provides an overview of relevant topics. This includes analyzing the sustainability of IT and identifying opportunities for improvement. It also considers requirements from the perspective of IT innovation, reliability and security, flexibility, continuity, and outsourcing.

The question of making IT more sustainable cannot be answered without also considering the sustainability of the organization as a whole. That topic is central in the ► **chapter 2: Think**. The ► **chapter 4: Act** offers practical guidance on issues such as making the application landscape more sustainable, reducing energy consumption, and lowering environmental impact through better procurement and usage practices.

1.2.4. Starting point 4: accountability and compliance

European CSRD legislation requires organizations to report on how they are becoming more sustainable and what role they see for themselves in a transitioning economy.

► **Chapter 3: Organize** is structured to address the key questions involved in sustainability reporting. It also covers risk reporting. A crucial aspect of these reports is verifying whether the plans are realistic and desirable. This is done by actively engaging stakeholders (employees, customers, suppliers, regulators, etc.). Stakeholder engagement is discussed in the sections on ethics within this chapter. The ► **chapter 5: Measure** explains the structure of sustainability reporting standards and how the SIIA can serve as input for such reports.





1.3. Structure: think, organize, act, measure

The SIIA distinguishes four types of activities aimed at increasing the sustainability of the organization, insofar as IT can influence it¹:

Think

The SIIA provides guidance for setting sustainability goals to make IT more sustainable and to use IT to realize a sustainable business model. It supports formulating objectives and strategy, and managing the risks and opportunities on the path to sustainability. This also includes making adjustments based on experience ► **chapter 5: Measure** and new insights ► **chapter 2: Think**.

Organize

The SIIA offers guidance for structuring IT and the organization to achieve sustainability goals. For IT, this involves analyzing the opportunities and risks IT presents for achieving goals, executing strategy, and managing risks. Similar analyses apply to organizational design (e.g., innovation, GreenOps), employee knowledge, skills and motivation, and stakeholder engagement from a desirability (ethical) perspective. ► **Chapter 3: Organize**.

¹ The structure Think, Organize, Act, and Measure at times runs parallel to the so-called PDCA cycle: Plan, Do, Check, Act. However, they are more perspectives than phases in an action cycle.



Act

The SIIA provides practical guidance for making specific aspects of IT more sustainable.

► **Chapter 4: Act.**

Measure

Each chapter of the SIIA includes guidance on setting goals and measuring and monitoring progress in the organization's sustainability transition. Examples include measuring circularity (procurement), sustainable usage, and reducing energy consumption and emissions. ► **Chapter 5: Measure.**



Illustration of SIIA Content: Case study Wigo4it: 'Carbon-aware computing',

The SIIA Radar highlights around 80 activities that Wigo4it is undertaking to become more sustainable. One of these is carbon-aware computing.

The goal of carbon-aware computing is to run IT processes independently of time and location, at moments when green energy is available on the power grid.

Think: Goals and Strategy

The key question is whether this activity contributes or could contribute to the organization's service delivery goals and whether it aligns with the company's strategy.

One of Wigo4it's organizational goals is sustainability. Carbon-aware computing can support this goal, but it also affects the availability of Wigo4it's services, and thus touches on the company's core objectives. Relevant questions include: In emergencies, can a process be started quickly even if green energy isn't available? Should all workloads be carbon-aware, or only non-production workloads? How much does carbon-aware computing contribute to the sustainability goal, and should it be prioritized? Regardless, it contributes to a GreenOps mindset.





Organize

1. IT Management:

Does this activity align with the IT management approach to keeping IT sustainable, reliable, agile, affordable, and secure?

The answer is yes. The control mechanisms required for carbon-aware computing largely overlap with those needed to achieve two key IT management goals: flexibility and reliability of IT operations.

Carbon-aware computing also depends on the transparency of cloud providers regarding how green their energy is and the real-time load on the power grid. Similarly, it depends on energy suppliers being transparent about how energy is generated at any given moment.

2. Organization

This section raises the question of what is needed to transition to carbon-aware computing. The impact on work scheduling could be significant if done manually. However, if automated with potential fallback scenarios, it becomes an easily achievable goal with minimal organizational impact. What does this mean for contracts with cloud providers? And with municipalities?

3. Skills and motivation

What do colleagues need to know or learn to apply carbon-aware computing? Wigo4it operates on the principle of aligned autonomy, high individual responsibility. Will carbon-aware computing infringe on that autonomy? How can teams learn from each other's experiences and make consistent decisions? This also applies to municipal officials: What do they need to know and be able to do? What information do they need to work in a carbon-aware way?

4. Ethics

How does carbon-aware computing change the nature of work? Does it add pressure or stress? Does it reduce or enhance employee autonomy? Does it affect working hours or employee availability?



Act

This perspective focuses on the practical side of carbon-aware computing: What is needed to implement it? How can its impact on GHG emissions be measured? The chapter explores various sustainability topics. In the case of carbon-aware computing, a key focus is measuring and reducing GHG emissions.

Carbon-aware computing directly contributes to reducing GHG emissions. The SIIA delves into how to measure emissions from the power grid and cloud providers in real time.

In Wigo4it's specific example, non-production workloads are automatically scheduled to run when green electricity is available, using the ElectricityMaps API. Think of batch jobs or specific calculations. This can all be automated, whether in the Netherlands using wind power or in Sweden using hydropower. This rationale is also reflected on the SIIA Radar.

Accountability: The question here is: What is needed to report on the status of carbon-aware computing? Where does Wigo4it want to go in terms of sustainability, and what is required to get there? Another question is how much priority carbon-aware computing should be given. The answers to earlier questions help inform this.

Accountability involves three key questions: Is everything in place in theory to steer toward carbon-aware computing (**design**)? Is it actually being implemented as intended, and are decisions being made and documented accordingly (**existence**)? Is it achieving the intended outcome, namely a real reduction in emissions (**effectiveness**)?

At Wigo4it, which works with autonomous teams, a relevant question might be: Are development teams considering carbon-aware computing when building new features? Are teams working to structure processes in a way that enables carbon-aware computing? Is Wigo4it engaging with cloud providers to gain more insight? Once implemented, accountability also means evaluating whether carbon-aware decisions are practically feasible and most importantly, whether they lead to the intended reduction in GHG emissions.



1.4. The SIIA and European Sustainability Legislation

The sustainability topics explored by the SIIA are structured around the ESRS standards (European Sustainability Reporting Standards).

Best practice: The structure used by the ESRS standards is considered best practice and is based on the Global Reporting Initiative (GRI) (www.globalreporting.org). Since its founding in 1997, the GRI has provided organizations worldwide with a framework to voluntarily, or at the request of stakeholders, report on their journey toward sustainability².

By adopting the structure of ESRS and GRI, the results of the SIIA can be used to report to stakeholders on sustainability and progress in meeting legal obligations. Because the ESRS is based on the GRI, an initiative by organizations that voluntarily report on their sustainability efforts, the GRI is also suitable for voluntary reporting. Both ESRS and GRI are applicable to public sector organizations and private entities.

² The additions and changes made in the ESRS compared to the GRI are described in the interoperability index (www.globalreporting.org/media/z2vmxbks/gri-standards-and-esrs-draft-interoperability-index_20231130-final.pdf)



There are three types of ESRS standards:

1. Cross-cutting standards: ESRS 1 and ESRS 2

These apply to all companies, regardless of sector or size. They include basic information about the organization, governance structures related to sustainability, and an overview of general risks and opportunities concerning sustainability. ESRS 1 and 2 are reflected in:

- ► **Chapter 2: Think** – The Role of IT in Sustainability
- ► **Chapter 3: Organize** – Structuring IT and the Organization

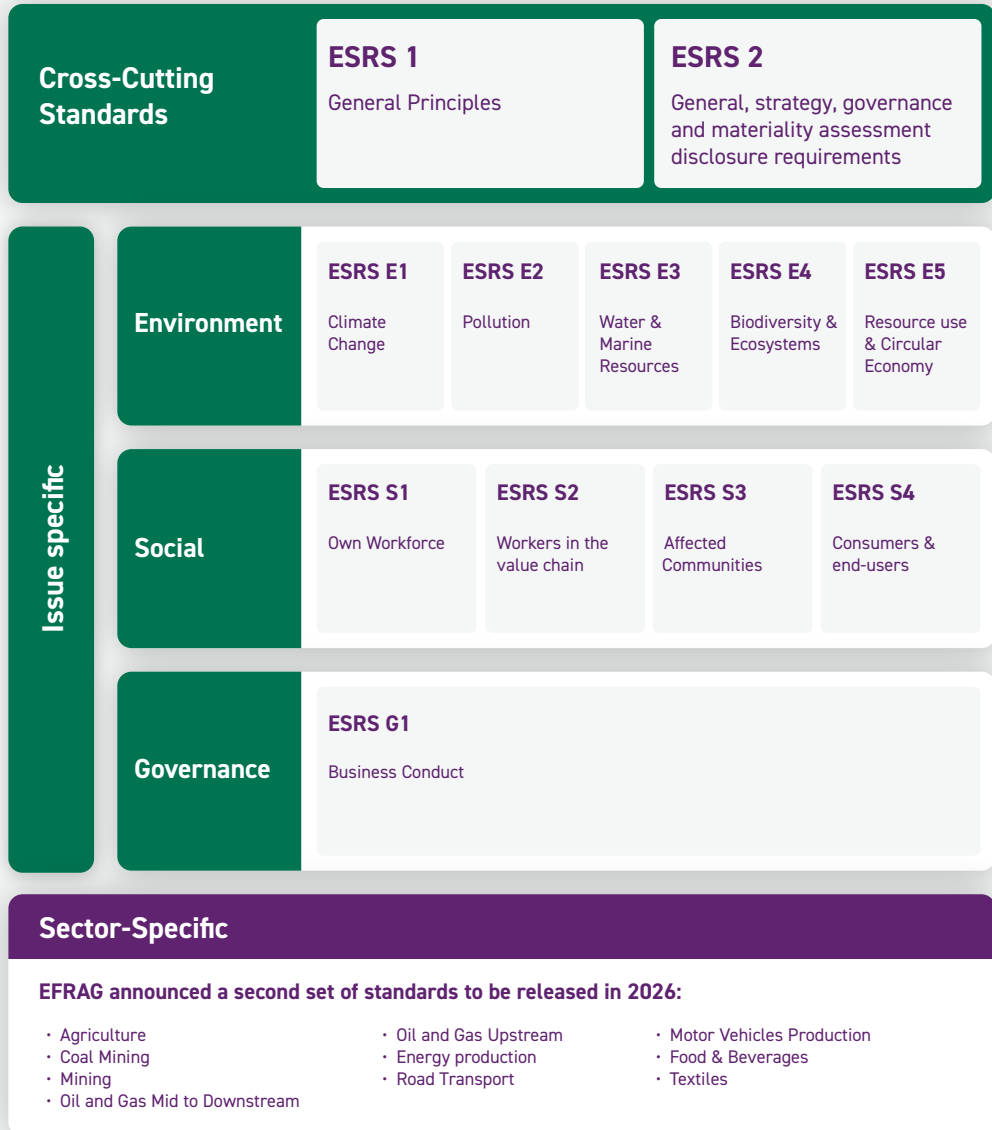
2. Issue specific standards: ESRS E[x], S[x] and G[x] standards

ESG stands for Environment, Social, and Governance. These standards address specific themes relevant to an organization's sustainability impact, such as climate change, water usage, biodiversity, and social issues. They are designed to help organizations provide more detailed information on specific impact areas.

- ► **Chapter 4: Act**

3. Sector specific standards

These focus on the unique sustainability challenges and requirements of specific sectors, such as energy, transportation, or agriculture. By considering sector-specific contexts, these standards guide companies in reporting on the benefits and risks that are specific to their operations and markets.



At the time of the SIIA's publication, insufficient information is available regarding the sector-specific standards. See the SIIA Wiki for the most up-to-date information about general, specific, and sector-specific standards: wiki.coalitieduurzamedigitalisering.nl/index.php/ESRS



1.5. SIIA products

The analyses from the SIIA can be clearly presented using the SIIA tools: Radar, Canvas, Roadmap, and Dashboard.

1.5.1. SIIA Radar

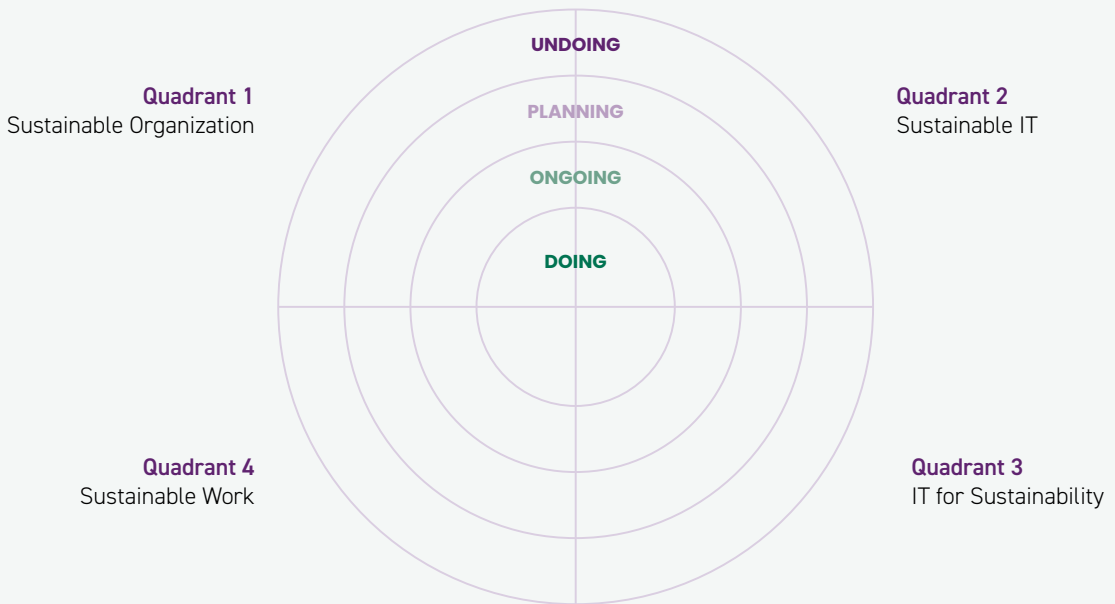
The **SIIA Radar** is an interactive tool available via the NCDD website on GitHub. It provides a visual overview of the activities that need to take place to achieve sustainability.

Activities are categorized into four quadrants:





- **Quadrant 1 – Sustainable Organization:** Actions focused on implementing goals, strategy, and preconditions. Indicators show whether the organization is on track to achieve its goals and realize its strategy.
- **Quadrant 2 – Sustainable IT:** Actions aimed at making IT more sustainable.
- **Quadrant 3 – IT for Sustainability:** Actions to enhance the sustainability of organizational processes. Indicators reflect progress.
- **Quadrant 4 – Sustainable Work:** Actions focused on sustainable choices and work processes involving colleagues, customers, suppliers, and employees.



Each activity is assigned to an implementation phase: **DOING** (implemented – innermost ring), **ONGOING** (being implemented – second ring), **PLANNING** (implementation being prepared – third ring), **UNDOING** (being phased out – outermost ring).



The purpose of the Radar is to help organizations align their choices and priorities, and to visualize interconnections by mapping them on the SIIA Radar. The workload (activities in the implementation phase) should remain manageable.

The **SIIA Radar** is an interactive tool available on the NCDD website. The software can be found on the NCDD GitHub.

1.5.2. SIIA Canvas

The activities that need to take place are described in detail in the SIIA Canvas. This is an Excel file from which the SIIA Radar pulls its information. For each activity, the Canvas addresses the following topics:

- **Name of the activity**
- **Quadrant and status**
- **What is it?** (Description; how does the activity contribute to sustainability?)
- **Where do we want to go?** (What is the goal? Is it measurable?)
- **Where are we now?** (How far along is the organization? Is it measurable?)
- **How do we get there?** (What is needed to reach the goal? How are risks mitigated?)

Dependencies:

- » Organizational
- » Technical
- » People: colleagues, client-side employees – facilities, tools, skills, motivation/capabilities
- » Ethical/legal: stakeholders, employees, customers and their customers, other relevant parties such as financiers and suppliers
- **Roadmap** (Timeline for when the action will be executed and completed)
- **Accountability and evaluation indicators** (Design, existence, and effectiveness of measures; indicators of effectiveness; decision-making framework)



1.5.3. SIIA Roadmap

The timelines of the various activities listed in the SIIA Canvas are plotted in a roadmap. The roadmap is a spreadsheet that maps the progress of the actions from the Canvas over time.

1.5.4. SIIA Dashboard

The SIIA Dashboard is a graphical overview of the status of the indicators mentioned in the SIIA Canvas. It is updated as needed (real-time dashboards continuously retrieve data). Think of metrics such as the organization's CO2 emissions, profit and revenue, and scores on various performance indicators (such as the percentage of circular inflow and outflow of raw materials, the lifespan of equipment, the percentage of renewable energy, and so on).



1.6. The National Coalition for Sustainable Digitalization

The SIIA is the result of a joint effort. It was developed by a working group of the National Coalition for Sustainable Digitalization (NCDD) and reviewed by a broad group of contributors. In addition, the search engine on the website, the NCDD Wiki, which is linked to the SIIA, is continuously updated by NCDD coalition partners.

The NCDD provides a platform where various stakeholders can share their visions, opinions, and facts. We place great importance on fostering constructive dialogue and highlighting different perspectives. Some of the goals of the NCDD include:

- Promoting sustainable digital innovation;
- Reducing the ecological footprint of digital technology;
- Inspiring and supporting organizations in implementing sustainable digital solutions;
- Raising awareness about the impact of digitalization on people, society, and the environment.

Through collaboration, knowledge sharing, and concrete projects, the NCDD contributes to a sustainable and responsible digital future in the Netherlands.



CHAPTER 2

Think: Sustainability and IT – a broad approach



In this chapter

2.1. A broad approach to sustainability and IT

2.2. Why pursue sustainability

2.3. Introduction

2.4. Case study

2.5. Developing a sustainability plan

2.6. Best practices



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2.1. A broad approach to sustainability and IT

The SIIA is based on a broad approach to sustainability; an approach also adopted by European legislators.

The primary goal of making IT more sustainable is to eliminate its negative environmental impact. This includes using green energy, minimizing energy consumption, reducing the purchase of equipment, ensuring that equipment is sustainably produced with responsible raw materials, and disposing of it sustainably after use (e-waste).

This broad approach also considers the types of processes IT supports. Is IT being used to make the organization's business model or activities more sustainable (because the organization aims to contribute to prosperity, the economy, and society)? Or is it used to make internal processes, necessary for delivering a product or service as sustainable as possible? This also involves considering the impact of IT and organization on people. What does working with IT mean for those involved? If IT dehumanizes work or renders work addictive, it cannot be considered sustainable.

The broad definition of sustainability does not describe a final state, but rather a process, it is more about the act of becoming sustainable than sustainability as a fixed characteristic.

The definition used by the SIIA is:

Sustainability is the pursuit of development (prosperity, economy, society) in which the interests of a healthy environment, a just society, and good governance are balanced.

This broad definition is based on the report '*Duurzaam durven denken*' by the Social and Economic Council (SER, 2023) and aligns with the sustainability approach of the Corporate Sustainability Reporting Directive (CSRD).



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2.2. Why pursue sustainability

The SIIA targets both businesses and government entities. While the motivations for pursuing sustainability may differ, the approach and accountability are largely the same.

In the following sections, we identify four key drivers for making organizations and IT more sustainable:

- Moral drivers;
- Legal and societal drivers;
- Continuity and sustainable value creation;
- Cost considerations.

2.2.1. Moral drivers

While some organizations have long been intrinsically motivated to operate sustainably, the external pressure to do so has increased significantly in recent years.

This pressure has a strong **moral** dimension. Globally, it is recognized that to keep the planet livable, the harmful effects of industrialization on the climate and environment must be curbed. This has led to a gradual global movement to reverse the trend and make both the economy and society more sustainable.

Many employees, executives, and investors prefer to be associated with organizations that contribute positively to livability and well-being.



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2.2.2. Legal and societal drivers

In Europe, the pressure to become more sustainable has resulted in numerous **laws** that will reshape the economy and society in the coming years. The Corporate Sustainability Reporting Directive (CSRD)³ is one such law that affects many large companies.

This legislation primarily targets large organizations and their financiers. However, companies must not only examine their own operations but also their supply chains and customers. This means that large companies increasingly seek insight into the sustainability performance of their suppliers and clients. Therefore, it is crucial for smaller organizations to pursue sustainability, as they will be asked about their practices when working with larger firms.

Government organizations also face legal pressure to become more sustainable, through instruments such as the Dutch Climate Act, the Paris Climate Agreement, the Green Deal, and specific national, provincial, and municipal legislation. The Environmental Planning Act (*Omgevingswet*) also sets sustainability requirements.

This does not change the fact that many organizations, their clients, and suppliers will want to pursue sustainability for moral and business reasons. When it comes to financing, the risks associated with non-sustainable activities will be taken into account.

³ With the <https://finance.ec.europa.eu/publications/commission-simplifies-rules-sustainability-and-eu-investments-delivering-over-eu6-billion> and "Simplification Omnibus Package" (26.02.2025) the European Commission aims to reduce the administrative burden of sustainability legislation. Only larger companies will remain subject to reporting requirements, and the investigation into the sustainability of chain partners (suppliers, customers) will be limited. The introduction of certain legislation will be postponed until 2027. ESRS measurement points will also be reduced. A VSME standard (Voluntary Small and Medium Enterprises) will be introduced regarding the reporting format.



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2.2.3. Continuity and value creation

A key reason to pursue sustainability is **continuity**: organizations must redefine their roles and adapt their business models to remain viable in a society and economy that are becoming more sustainable. Sustainability is increasingly becoming a critical success factor in long-term strategic planning.

The Dutch Corporate Governance Code applies to executives of publicly listed companies and serves as a best practice for others. It emphasizes that executives must take accountability for how their organizations can thrive in a sustainable society and economy, and in an environment where major disruptions due to climate and geopolitical changes may occur.

2.2.4. Cost considerations

Finally, **costs** are an important factor in pursuing sustainability.

First, fluctuations in the price of IT equipment and services due to geopolitical shifts (scarcity of raw materials, availability of components and services) make it attractive to reduce dependence on suppliers and service providers. This can be achieved by using IT longer, repairing and upgrading equipment, and ensuring reuse of devices and components when they are no longer in use. Ultimately, organizations can also recover raw materials through the manufacturer or work with a certified ITAD provider (ITAD stands for IT Asset Disposal).

Additionally, energy will increasingly become an unpredictable cost item. The supply of wind and solar energy naturally fluctuates, affecting prices. These fluctuations are intensified by geopolitical tensions (e.g., in gas and oil markets) and congestion in the energy infrastructure, stemming from the electrification of the economy and society. Reducing energy consumption and better planning energy usage (e.g., consuming energy when green, affordable energy is available and the grid has capacity) can lead to significant cost savings. The same applies to flexibility (being able to quickly scale processes up or down). **Think: a plan for sustainable IT within a sustainable organization.**



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2.3. Introduction

This chapter outlines a plan for making IT more sustainable and for leveraging IT to reduce the organization's impact on the environment and society.

A key principle in developing this sustainability plan is that legislators treat sustainability in the same way as a company's financial health. Executives must be able to sign off not only on financial accountability, but soon also on sustainability accountability.

Sustainability aspects, like financial aspects, will become part of the responsibilities of nearly every employee, supervisor, or manager. In finance, risks such as the loss or unnecessary spending of money must be identified and managed. The same applies to sustainability: the negative environmental impact must be identified and controlled.

Sustainability, like a company's financial health, is not an absolute criterion. Risks are taken, and new (costly) initiatives are tested that may initially incur expenses or reduce short-term profit or sustainability. New markets may be explored to develop sustainable activities, and the organization may be restructured to operate more sustainably.

The following sections describe the process of developing a sustainability plan.

The steps are: due diligence investigation, materiality analysis, goals and strategy, risks, accountability, and reporting.





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2.4. Case study

The following breakout section discusses these concepts using the example of Wigo4it.

Breakout - Wigo4it sustainability plan

The SIIA Radar highlights the activities Wigo4it is undertaking to become more sustainable. The organization is currently preparing to draft a CSRD report. This breakout box illustrates the various elements of the CSRD report using the activities shown in the SIIA Radar.

1. Due diligence investigation

This involves examining the impact of running the organization, and the services and products Wigo4it provides, on the environment and society.

The due diligence investigation might report:

- That the (now closed) data center had the greatest sustainability impact, and that Wigo4it is working toward delivering services as efficiently as possible.
- That the intended impact of its services on clients (the municipalities) and their clients (benefit recipients, applicants) is to save time, public funds, and effort, reduce errors, and enable more tasks and obligations to be fulfilled. The investigation could examine qualitative and quantitative indicators to assess whether these goals are being met and identify areas for improvement.
- The extent of the organization's impact on its own employees. Wigo4it emphasizes personal responsibility, engagement, and autonomy among staff, based on the belief that this is essential for satisfied colleagues who can fully commit to the organization, contributing to its problems, solving capacity and service quality. The investigation could seek indicators that confirm how well Wigo4it is achieving this.



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- The impact on suppliers; with the servers and data center phased out, only office equipment suppliers remain part of the due diligence investigation.

Thanks to extensive automation, the IT infrastructure is designed to allow easy migration to other (cloud) providers if they operate more sustainably and offer acceptable costs. A continuing concern is whether any forms of vendor lock-in have emerged that could hinder such transitions. Wigo4it could request sustainability reports from its service providers and examine:

- » Guarantees regarding labor conditions, such as equal opportunity (gender balance), compensation, etc.
- » The sustainability of the cloud provider from which it procures services. Wigo4it could engage in dialogue with cloud providers to gain more insight into the emissions associated with the workloads running there.
- » Energy consumption: Cloud services still run in data centers and consume energy. What are the actual emissions of these workloads? Is it possible to run certain loads near hydropower plants? Further details can be found on our SIIA wiki (wiki.coalitieduurzamedigitalisering.nl/index.php/Carbon_aware_computing).
- » Discussions on long-term improvements.

2. Materiality analysis

The materiality analysis assesses the significance of various topics from two perspectives: the importance from the perspective of sustainability impact, and the importance from the perspective of the business case, namely, the organization's financial health, activities, objectives, and ways of working. The analysis identifies which topics must be addressed in the plan due to their significant influence on either the environment and society or the organization itself.

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3. Goals and strategy

Wigo4it's analysis might conclude that making IT more sustainable is the most impactful way to contribute to sustainability (impact materiality). The financial materiality analysis shows that sustainability enhances the scalability and flexibility of services, reduces the risk of vendor lock-in, and can lower costs, indicating that the financial materiality of sustainability is also high. Moreover, the transition to the public cloud enables municipalities to further improve the sustainability of their own processes, as customer sustainability is also of high material significance.

The second major theme for Wigo4it is employee autonomy and engagement. This autonomy underpins the organization's reliability, cost-efficiency, and flexibility. The shift toward sustainability will undoubtedly affect the nature of work and require new knowledge and skills. Some skills (e.g., server and infrastructure management) will become less relevant. The move to the cloud introduces new tasks, dependencies, and a different mindset such as carbon-aware computing and rightsizing. The materiality analysis may reveal that sustainability has both an impact dimension (on employees' work) and a financial dimension (on service reliability and quality) for Wigo4it.

Risk Analysis

This section of the plan addresses the risks involved. What is needed to realize the plans? The ► **chapter 3: Organize** analyzes the technical, organizational, and human requirements. The case is also examined from an ethical perspective, and the necessary actions to achieve the goals are mapped out.

One risk for Wigo4it is that its autonomous teams may make decisions that are not aligned. Another risk is that decisions may place undue pressure on employees, who are autonomous but also highly interdependent, and may lack the ability to plan effectively due to sustainability measures.





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Examples of how Wigo4it manages these risks:

- The Sustainability Radar aligns decisions around sustainability. It describes around 80 activities, including their rationale, current status, future goals, and other essential background information.
- Product owners are provided with all relevant information to align team activities and report in backlogs on how teams incorporate this information into their decisions.
- Within teams, specialists maintain close contact and exchange knowledge on their areas of expertise.
- Type 1 and Type 2 decisions: Teams may make decisions independently if they can be reversed within one sprint and/or cost less than €10,000 per month.

Accountability

Finally, the organization must assess whether it is on the right track, whether the trade-offs made are justified and effective, and whether the risk analysis and mitigation measures are working as intended.

To do this, data must be collected and decisions documented. The necessary data and information must be identified in advance.

The Radar includes Objective Key Results (OKRs): these define the organization's goals and the indicators that reflect progress toward them.

In ► **chapter 5: Measure** these topics are addressed.



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2.5. Developing a sustainability plan

The following steps are inspired by the reporting requirements of the ESRS (E1 and E2) and the GRI (Global Reporting Initiative, see page 83 and onwards).

2.5.1. Research: sustainable due diligence and materiality analysis: the organization examines its own impact on sustainability

The foundation of the sustainability plan is an analysis of the organization's impact on the environment and society: from the **processes** used to produce **services and products**, to the impact of those services and products on customers and **downstream value chains**, and the impact of supply chains behind those services and products. This forms the sustainable due diligence investigation.

A key aspect of this due diligence is the future viability of the organization: Will there still be demand for its products or services in a more sustainable economy and society? Will the business model remain viable as services, products, and supply and demand chains become more sustainable? Are there new opportunities? Where do the risks lie?

This is the sustainable due diligence that organizations are required to conduct under the CSRD.

The SIIA adds an **IT perspective** to this due diligence investigation:

- What role does IT play in the environmental and societal impact of the processes used to produce services and products?
- What role does IT play in the impact of these processes within supply and demand chains?





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2.5.2. Defining the scope of due diligence: the double materiality analysis

The scope of due diligence can potentially be very broad. Our economy and society are full of interdependencies.

The materiality analysis helps narrow the focus and prioritize sustainability efforts. It assesses the significance and impact of a topic on the organization's viability.

This requires evaluating each topic along two dimensions:

- To what extent does the topic significantly influence the organization's impact on the environment and society (impact materiality)?
- To what extent does the topic significantly influence the organization's viability, business model, and operations (financial materiality)?

The due diligence investigation should inform this double materiality analysis, and in turn, the materiality analysis determines which topics are investigated. It is important to explain how the scope of the due diligence was defined and how both dimensions of materiality were considered.

2.5.3. Set goals and strategy: risk management, opportunity utilization, and measurement

The sustainable due diligence and double materiality analysis form the basis for the organization's goals and strategy. The organization must explain how the outcomes of these analyses were considered in developing its business model and strategy. This includes addressing material impacts, risks, and opportunities. The organization must also clearly communicate the indicators and targets used to measure progress (measure).

2.5.4. Risks: engage stakeholders, suppliers, business partners, customers, and employees

An essential part of the investigation is engaging stakeholders: those affected by the organization's activities and changes. These may include employees, suppliers, investors, customers, and regulators. Stakeholders also include those who actively shape society, such as political leaders, public administrators, civil society organizations, and academics.



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Here too, a materiality assessment applies: How important are the motivations, capabilities, and perceptions of these stakeholders to the success of the sustainability initiative, particularly in achieving goals and ensuring the strategy's effectiveness?

2.5.5. Transparency and accountability

The double materiality and due diligence analyses provide insight into the tensions between business and sustainability requirements. These are further complicated by uncertainties such as market developments around sustainable products and services.

Legislation requires companies to make their sustainability trade-offs transparent. How are conflicting interests managed? How does the organization account for uncertainties? Which activities are planned for the short term, and which for the long term? How are decisions validated, and are they adjusted over time?

2.5.5.1. Reporting

A key component of legally required sustainability reporting is defining the purpose and target audience(s) of the report, and identifying their information needs. How can the report provide them with assurance? Stakeholders may include customers, business partners, internal and external regulators, suppliers, financiers, and the broader public (politicians, administrators, citizens, and local communities). Employees are also essential stakeholders. A service, sector, or organization may also have specific audiences it needs to inform.

The report must provide identified stakeholders with reliable information they need. This enables them to compare organizations on environmental, social, and financial aspects and assess their own risks.

The report must also substantiate the credibility of the information, for example, by clarifying the status and sources of estimates, exceptions, and special circumstances that may affect interpretation. Additionally, risks and uncertainties related to economic and technological developments must be clearly communicated.

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2.6. Best practices

2.6.1. Best practice: making the business model more sustainable

On the NCDD website (wiki.coalitieduurzamedigitalisering.nl/index.php?title=Verduurzaam_het_businessmodel#Inleiding), readers can find examples of best practices submitted to support the sustainability of business models:

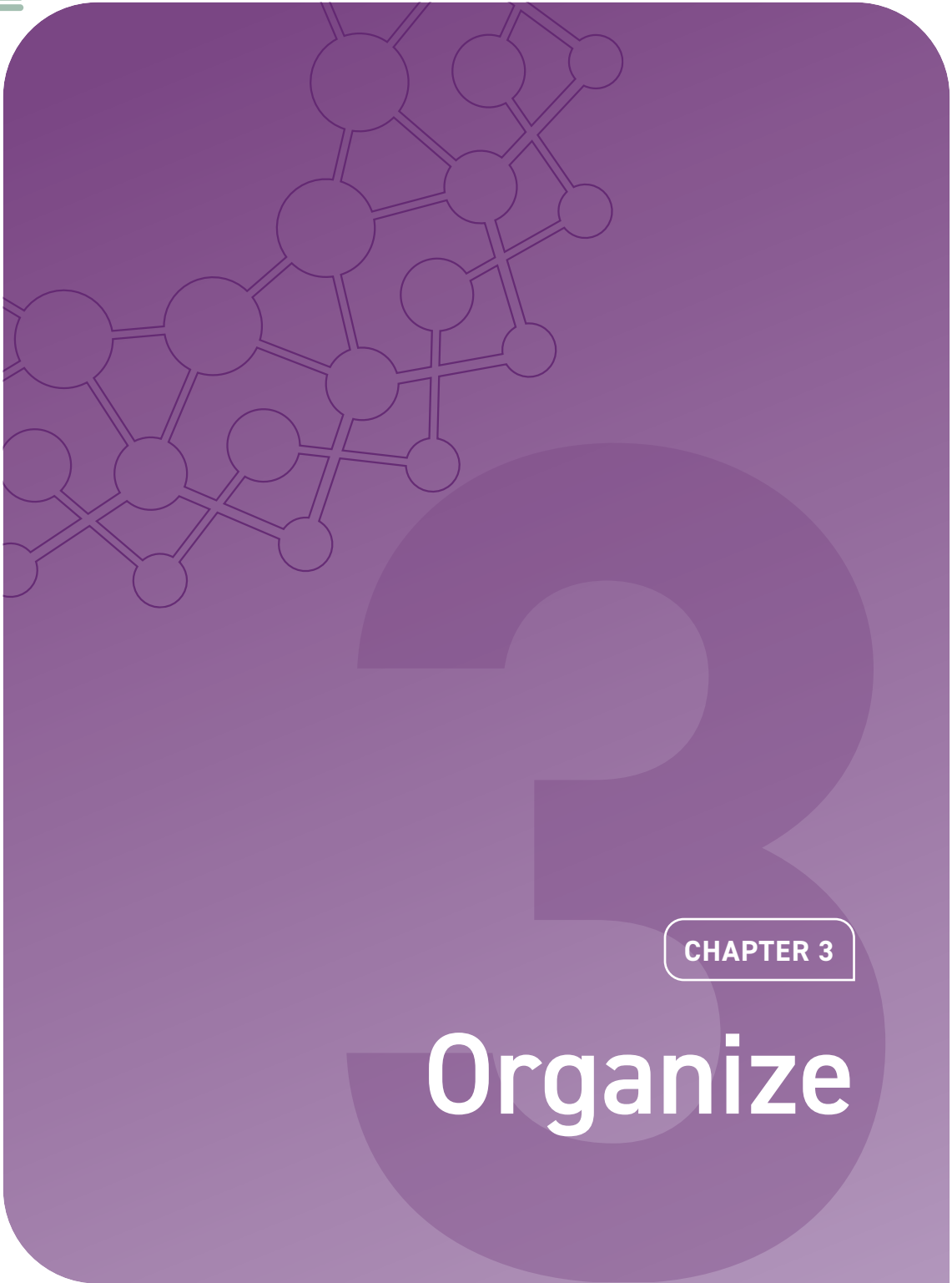
- Triple Layered Business Model Canvas (Joyce, 2015)
- Sustainable Development Goals as a framework for aligning goals and strategy with sustainability (sdgs.un.org/goals).

2.6.2. Best practice: using IT to support organizational sustainability

On the NCDD website, readers can also find best practices related to the use of IT in sustainability efforts: (wiki.coalitieduurzamedigitalisering.nl/index.php?title=Verduurzaam_het_businessmodel#Inleiding)

1. Sustainable IT Playbook, Sundberg (2002)
2. Sustainable TWO Model by Conclusion
3. Twin Transition Playbook by PA Consulting
4. A Strategic Framework for Overcoming Barriers to Accelerate Green and Digital Transitions, by Lisette van Rijn (2023)
5. Net Carbon Impact Assessment Methodology for ICT Solutions - European Green Digital Coalition (www.greendigitalcoalition.eu/net-carbon-impact-assessment-methodology-for-ict-solutions/)





CHAPTER 3

Organize



In this chapter

3.1. Introduction

3.2. The role of IT: greening of IT and IT management

3.3. Organizational design: digital innovation

3.4. People: awareness and cultural change

3.5. Desirability: ethics and compliance

This chapter supports the analyses required to address the general topics (ESRS 1 and ESRS 2), as well as those related to Environment (E1), Pollution (E2–E4), Circularity (E5), Social (S1–S4), and Governance (G1).

Sources for this chapter include: xbrl.lefrag.org/e-esrs/esrs-set1-2023.html#d1e5302-3-1 and for the accountability of IT management: the International Digital Reporting Standard (2025) <https://onlinetrustcoalitie.nl/nieuws/internationale-digitaal-rapportage-standaard/>. This standard follows the ESRS and GRI methodology and provides an overview, endorsed by a broad range of stakeholders and tested in practice, of the many topics addressed by the often highly specific standards for aspects of IT management.



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3.1. Introduction

This chapter analyzes what is needed to achieve sustainability objectives within an organization, considering its IT landscape, organizational processes, stakeholders, and whether the changes are ethically desirable for those involved (ethics).

The previous chapter addressed how an organization can remain viable in a transitioning economy and society, and how it must adapt to become more sustainable.

This chapter explores how IT can influence the realization of sustainability goals and strategy. It also addresses the challenges of organizing and managing innovation and change processes, and of incorporating the interests and perspectives of stakeholders (employees, customers, suppliers, management, financial stakeholders, auditors, and regulators) in sustainability plans. Finally, it includes an ethical/legal analysis: how desirable are the proposed changes?





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3.2. The role of IT: greening of IT and IT management

This section examines the limitations and opportunities IT presents in the sustainability process. Two perspectives are key: the impact of IT on sustainability, and how IT management requirements affect the achievement of sustainability goals.

3.2.1. Sustainability of IT

To use IT sustainably and responsibly, the organization must first assess its IT sustainability performance. This includes:

- An assessment of IT sustainability within the organization, including opportunities for improvement;
- The environmental (Environment) and social (Social) impact of IT and its use
- Developing an approach to reduce this impact: setting goals and strategy

The outcome of this analysis is an overview of the organization's IT impact on the environment and society, along with relevant indicators.

The next step is to define goals to make IT more sustainable (e.g., circularity and emissions) and describe how these will be achieved. The pace and method of achieving these goals depend on the organization's sustainability objectives, strategy, IT management, and risk management.

A key part of organizing is formulating goals and defining indicators for these goals. Another is establishing feedback loops to show how performance on these indicators leads to adjustments in the organization, its goals, and its strategy.



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3.2.2. Rational and optimal use of IT within the organization

The central question in this section is: What is needed to ensure that IT is used effectively, efficiently, and optimally to support the organization?

Sustainability goals and strategy are often constrained by the capabilities of IT within the organization. This section focuses on building a shared and realistic understanding across departments of what IT can contribute to the sustainability journey, both in the short and long term. It also addresses aligning organizational goals related to sustainability.

3.2.3. IT risk management

The goal of IT risk management is to structure IT in a way that protects and enables value creation, improves organizational performance, facilitates innovation and change, and optimally supports the achievement of goals.

The IT impact assessment includes an analysis of IT's contribution to the organization, the risks IT poses, and the risks arising from changes in the organization and its IT.

IT risk management must be included in accountability and reporting if it affects organizational continuity and/or the transition to sustainability.

This analysis may lead to requirements to delay or accelerate certain changes.

3.2.4. Data-governance and ethics

Another potentially material topic is data governance and ethics. This includes examining how the organization's data strategy and data management either support or hinder sustainability efforts. One key topic here is the security of data assets.

If sustainability efforts lead to different uses of decision-making systems and AI, ethical issues may arise. Sustainability must not come at the expense of protecting sensitive data. In the context of legal transparency obligations (as outlined in the Corporate Sustainability Reporting Directive – CSRD), this is a highly relevant issue.



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Case study Wigo4it

Storing and using large datasets has a significant environmental impact. This is due to the media required for data storage and access, the processing and querying of large datasets during operations, and the networks and equipment needed to use the data.

Wigo4it is systematically working toward more sustainable and robust data management by focusing on:

- 1. Data management policy:** Store as little as possible. Critically assess archival laws and implement policies that cover data collection, retention, deletion, and security.
- 2. Improved efficiency and greater sustainability:** Through better deletion, archiving, and minimization, Wigo4it aims for more efficient data usage and more sustainable storage methods.
- 3. Compliance and risk management:** At the same time, Wigo4it must meet legal requirements and manage risks by limiting unnecessary data retention.

This results in several concrete activities to achieve these goals:

- **No full data sets:** For testing and analysis, Wigo4it can often work with a minimal dataset. A full (anonymized) copy of production data is not always necessary.
- **Data collection rules:** Establishing clear rules for data collection should lead to compliance, data minimization, and efficient processing.
- **Archiving:** Processes for storing older data ensure regulatory compliance and optimize storage.
- **Deletion strategy:** Standardizing data deletion helps reduce risks such as data breaches and unnecessary storage.
- **Backups:** Only actual production data is backed up. Non-production data or server-related data (e.g., the status of IT processes, configurations, and server activity at a given time) is embedded in code. This code can regenerate the status of processes and servers at any time, eliminating the need for backups.



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- **No real-time dashboards:** Real-time processing is not sustainable. A refresh button is sufficient. Real-time data should only be used when absolutely necessary, rather than continuously.

Goals and accountability: It is important to gain insight into whether the concrete activities are sufficient to support sustainability and whether they provide adequate direction for teams to align on shared priorities and decisions, not only for accountability purposes, but also for Wigo4it's internal management.

Sustainability: to report on the outcomes of this approach, Wigo4it could collect data on the amount of data that will be stored per client in the future, the amount of data currently being stored, an estimate of the resulting savings in energy consumption, storage costs, and storage capacity requirements.

To comply with **legal requirements** under the Dutch Archives Act and the standards for **reliable** data management (such as the Baseline Information Security for Government and the GDPR), Wigo4it could ask its internal auditors to work closely with teams to thoroughly assess how robust the new policy is.

For reporting purposes, Wigo4it could explore which further optimizations are possible and whether there are any conflicts between sustainability goals and legal or reliability requirements. In its accountability reporting, Wigo4it can outline the specific actions it plans to take in the coming years to achieve its concrete goals, and how it intends to remove any barriers.



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3.2.5. Cybersecurity

This part of the IT assessment addresses whether and how sustainability efforts and changes in IT usage impact cybersecurity. It examines the extent to which changes in processes and resource usage introduce cybersecurity threats, and how these affect the organization's goals, strategy, and associated risks.

For example, if the organization collaborates closely with business partners to advance sustainability, this may influence its ability to protect against cybersecurity threats.

3.2.6. Outsourcing

Outsourcing often plays a key role in sustainability by promoting better, longer, and more efficient use of sustainable equipment and improving energy efficiency.

This section explores the opportunities and limitations that outsourcing presents for the organization's sustainability efforts, especially given that many organizations are heavily dependent on external service providers for their operations.

Over time, this dependency may have evolved to the point where business processes are no longer separable from the setup and characteristics of the service provider's environment. This poses a significant risk during transitions, either because new functionality cannot be leveraged (due to vendor lock-in, pricing structures, or lack of innovation from new entrants), or because the internal knowledge required to manage processes independently has been lost.

Operational risk management, defining what the organization can do if something goes wrong with the service provider, has often received little attention. While legal clauses may exist regarding performance and uptime, there is often no verification of whether the provider can actually meet those commitments in practice. Moreover, there is frequently no contingency plan in place.

Another aspect of outsourcing is the sustainability performance of the service provider, including energy consumption, equipment sustainability, and waste management practices.

When considering continuity risks posed by service providers, it is important to ask whether sufficient assurances exist regarding their performance. How effectively do they respond to incidents, and what measures are in place to prevent recurrence?



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3.2.7. Continuity management

Sustainability efforts often involve new partnerships, which introduce different risks and opportunities for continuity management. For example, an organization may choose to work with IT vendors that are more sustainable but less mature in their operations. Practices such as *rightsizing* (optimizing operations, resources, and structures to promote both economic efficiency and sustainable practices) and *carbon-aware computing* (reducing the CO₂ emissions associated with computing activities) may result in limited redundancy in infrastructure and equipment. This can make it more difficult to absorb disruptions, posing a threat to continuity. Sustainable data management may also involve sourcing data directly from its origin. When multiple sources are involved, each one becomes a potential point of failure or error.

Legal aspects also play a role here. For instance, what happens if a critical IT service provider goes bankrupt? Will services continue to run during bankruptcy proceedings? Is it possible to switch to another provider without major disruption? Are fallback options available in the event of a major incident?

The key question addressed here is: How material is continuity management to achieving the organization's sustainability goals, strategy, and risk management?





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Case study Wigo4it

This section explores the IT requirements for sustainability processes from the perspective of continuity management and outsourcing.

Wigo4it leverages the opportunities offered by DevOps, cloud, and containerization to manage risks related to continuity and outsourcing, achieving gains in both sustainability and operational resilience.

- 1. DevOps Approach:** By working in a DevOps model, Wigo4it automates everything through code. Multiple changes are deployed from development to production daily in short, iterative cycles. If a misconfiguration occurs, it can be immediately rolled back.
- 2. Cloud:** Adopting a **multi-cloud or hybrid cloud strategy** reduces dependency on a single provider and allows for workload optimization and easier migration in case of issues. Wigo4it uses both Microsoft Azure and Oracle Cloud, thereby complying with the **data exit strategy** requirements outlined in the Dutch Government information security baseline (in Dutch: *Baseline informatiebeveiliging Overheid* or BIO).
- 3. Containerization:** This approach offers flexibility, as containers are platform-independent and can run anywhere. It is important to use open-source software, as reliance on proprietary containerization services may limit the ability to switch providers.

Conclusion: By using open standards and open-source software, and by reducing dependency on specific cloud providers through automation, the organization can effectively migrate to other cloud providers if needed.





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Reporting / accountability / measurement

Wigo4it has made significant progress in sustainability by moving from its own data centers to the public cloud, using open-source cloud software (containerization), and adopting a multi-cloud strategy. This transition also strongly supports its business objectives: scalability, cost reduction, reliability, and flexibility.

In terms of continuity and outsourcing, Wigo4it has also made major strides. However, there is a risk that new dependencies may unintentionally emerge, whether due to necessity or oversight. For example, dependencies may arise in areas such as performance monitoring, energy tracking, or process scheduling. It is important to identify whether and to what extent these dependencies exist and whether they pose a threat to continuity and outsourcing.

As part of accountability and internal operations, it is essential to conduct exercises and evaluations. These may include migrating processes to other cloud providers, maintaining team skills, and minimizing the risk of disruptions. Such exercises also test how long it would take to switch providers in the event of a major outage.

Now that municipalities have more control over scaling services up or down or turning them on or off entirely (both of which positively impact environmental and cost performance), idle environments are far less common. This shift also encourages municipalities to become more cost-conscious as service consumers.

Even though Wigo4it is not directly responsible for municipal operations, sustainability reporting requires organizations to consider the impact of such changes on their clients. It is therefore especially important to systematically gather feedback from municipalities and collaborate on continuity planning.





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3.2.8. Privacy

Privacy-related issues deserve careful attention during sustainability transitions. The handling of personal data may impose limitations on how innovation is pursued, and this area may require separate research into what is feasible. For example, it must be determined whether procedures are needed to properly inform individuals and obtain their consent.

3.3. Organizational design: digital innovation

The central question here is whether and how the digital innovation required for the organization's sustainability goals can be realized within its current structure.

Changing both IT and the organization itself presents a major challenge. Innovation processes often spiral out of control; they may not deliver what is needed, or costs may exceed projections. The exchange of information required to integrate the experiences and interests of developers, operational staff, and management is complex. As such, transforming both IT and the organization poses a serious risk to sustainability efforts.

Wigo4it has adopted an agile organizational approach, where small teams from operations, IT, management, and customer service work closely together. This structure is designed to support rapid feedback loops, enabling the organization to respond quickly when things do not go as planned. In the face of challenges, teams collaborate intensively, pooling knowledge and experience.

The breakout box on the next page elaborates on these processes. For further details, visit wiki.coalitieduurzamedigitalisering.nl/index.php/Innovatie_en_cultuur.





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Breakout Box: Structuring IT innovation processes

Changing IT is a challenge: IT projects often spiral out of control.

Examples of challenges organizations face during such transitions include:

1. How can I ensure that IT changes in my organization adequately respond to sustainability requirements and the (evolving) demands of the external environment? And how can I ensure these changes align with operational needs and that the organization fully leverages IT to achieve its goals?
2. Out-of-the-box: How can I ensure that innovations and changes in IT are evaluated and integrated, even when they conflict with existing policies and strategies, if they solve a critical problem, contribute to sustainability, or significantly support organizational objectives?
3. How can I ensure that my IT systems and processes can respond quickly to unexpected developments, which are inherent to the major transformations in the economy and society driven by sustainability?

The way these processes are structured depends heavily on the size and maturity of the organization. A small company with fewer employees using IT primarily for office applications and knowledge work will approach this differently than a large online service provider. The structure also depends on the level of uncertainty in a project.

Several factors that may influence how innovation projects are structured:

- Are employees and the organization entering **new territory**, where gaining hands-on experience will lead to better and different insights? What is the added value?
- What are the **uncertainties surrounding technology**, its complexity, and its effectiveness?
- How confident are we that the **problem analysis and scope** are accurate and stable?
- How certain are we that the **conditions for the solution are correct and complete**?



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- Is it clear what the **most effective and widely accepted solution** is?
- What is the **level of knowledge and experience among staff** in innovation, IT, and operations?
- **How critical is the process** being changed to the organization's operations?

These are important questions for managing the risks associated with IT and organizational innovation. An organization must assess whether these risks are material to its sustainability goals or operational continuity. Additionally, organizations should report how they assess these risks and what measures are being taken to manage them.

Innovation Practices

Under the umbrella of **DevOps**, many innovation practices have been developed that account for the uncertainties inherent in innovation. A key principle of DevOps innovation practices is: The greater the uncertainty, the closer the collaboration between innovation/IT and operations staff. The greater the uncertainty, the more important short development cycles become, allowing for rapid evaluation and adjustment. The more critical and impactful the project, and the more uncertain the right solution (requiring creativity), the more stakeholders and management should be involved.

In **SecDevOps**, specific adaptations have been made to DevOps to make it suitable for high-risk environments (such as financial institutions, healthcare, or critical infrastructure). There is a strong emphasis on short development cycles, rapid testing and deployment, as well as transparency and accountability. An example of a SecDevOps framework is the Secure Software Framework developed by the Secure Software Alliance, which has been tested at two major financial service providers (*see: www.securesoftwarealliance.org*).

FinOps is an approach that closely integrates the financial impact of (design) decisions into the design and implementation process.



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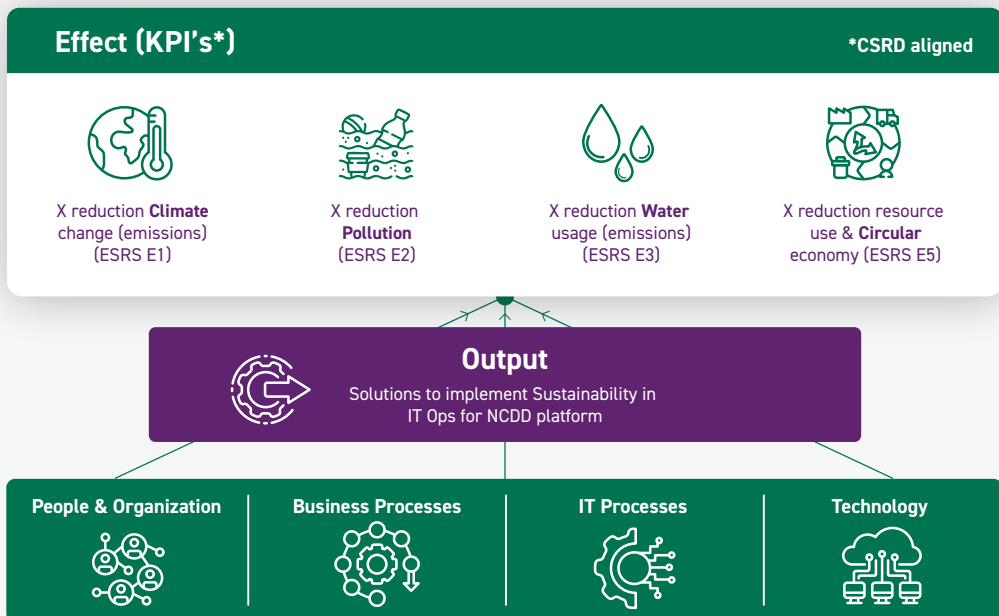
GreenOps focuses on the sustainability aspects of innovation and operations.

The NCDD has a working group dedicated to developing the principles of GreenOps. These principles and guidelines are discussed in the SIIA Wiki:

wiki.coalitieduurzamedigitalisering.nl/index.php/GreenOps

The key question is how, for each project, responsiveness (the ability to respond quickly and effectively to changes, risks, and incidents) can be increased, the quality and creativity of solutions can be improved (making optimal use of technology), while keeping IT costs and management under control. You can find more information on topics related to this subject through our search engine, the SIIA Wiki.

GreenOps Framework





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3.4. People: awareness and cultural change

The implementation of change often stalls or progresses more slowly than expected. One reason may be that employees lack the means or opportunities to work differently. It is therefore important to analyze the drivers and barriers that influence behavioral change.

Employees face various obstacles to change, ranging from motivation to skills. Often, the ability to change behavior is limited when that behavior depends on customers, suppliers, colleagues, or management. The incentives to stick with familiar routines are often much stronger than the motivation to change.

This chapter focuses on analyzing the drivers and potential barriers among employees, their supervisors, management, and executives when it comes to making decisions that support sustainability objectives aligned with the organization's strategy. The goal of this analysis is to remove barriers and strengthen drivers.

The SIIA Wiki on the NCDD website presents the COM-B model as a best practice for driving cultural change around sustainability within organizations.

See wiki.coalitieduurzamedigitalisering.nl/index.php/Gedrag_en_cultuur.





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3.5. Desirability: ethics and compliance

3.5.1. Social impact, engage stakeholders

The European Sustainability Reporting Standards (ESRS) require organizations to assess the impact of organizational changes on employees, individuals, and communities within both the supply and value chains and to evaluate the desirability of that impact. A key component of sustainability reporting is also to explore opportunities to improve that impact.

The SIIA Wiki provides further guidance on how organizations can engage stakeholders to map out the social impact of changes made in the pursuit of sustainability, go to wiki.coalitieduurzamedigitalisering.nl/index.php/Aanpak_Begeleidingsethiek.



CHAPTER 4

Act: guidelines



In this chapter

4.1. Introduction

4.2. Greening of IT equipment: procurement and use

4.3. Greening of IT

This chapter elaborates on various topics such as an approach to circularity (procurement, extended use, repair, and IT Asset Disposal (ITAD)), reduction and accountability of energy consumption, reduction and accountability of GHG emissions, and carbon-aware computing.

[Think](#)[Organize](#)[Act](#)[Measure](#)

4.1. Introduction

This chapter addresses specific sustainability topics in the field of IT:

- Making IT equipment itself more sustainable (procurement, sustainable use);
- Reducing energy consumption and GHG emissions from IT;
- The role of virtualization/cloud, applications, and software in making IT more sustainable.

4.2. Greening of IT equipment: procurement and use

4.2.1. Less equipment

- Circularity and waste management are key topics, as **reducing the purchase of IT equipment** has the greatest impact on environmental and social aspects. Approximately 80% of the environmental impact of IT equipment is related to the extraction and processing of raw materials, the production of components, logistics, and waste. Only 20% is related to emissions from IT usage.
- There are also **strategic reasons** to opt for using less equipment, extending the lifespan of devices, and prioritizing the purchase of used or circularly produced equipment. The extraction of scarce raw materials is subject to geopolitical tensions, leading to fluctuations in availability and price. Currently, the European Union sources 100% of its heavy rare earth metals from China, 98% of the element boron (a key mineral used in batteries, among other things) from Turkey, and 71% of its platinum from South Africa. (Source: www.consilium.europa.eu/nl/infographics/critical-raw-materials/)
- There are also **legal reasons**. In 2024, the European Critical Raw Materials Act was adopted, requiring equipment manufacturers to take measures to make raw material recovery more sustainable. The law also mandates the reuse of components and reduces geopolitical dependency.



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4.2.2. Less and better use of equipment

- **Cloud:** Where possible, opt for cloud solutions instead of on-premises equipment. Cloud environments can optimize the use of available hardware by sharing resources and leveraging advanced virtualization.
- **Carbon-aware, sufficiency en rightsizing:** Use software and equipment primarily when sufficient energy from renewable sources is available and the network has adequate capacity. Analyze which infrastructure, computing, and storage capacity is sufficient to perform operations. Often, capacity is calculated based on peak loads. These peaks may be avoidable, or capacity can sometimes be temporarily scaled up. Read more on the SIIA-Wiki (wiki.coalitie-duurzamedigitalisering.nl/index.php/Carbon_aware_computing).
- **Behavioral change:** Support employees, customers, and suppliers in critically assessing the necessity of using your equipment or services and in reducing energy and resource consumption.

4.2.3. Procurement of better and used equipment

- When proceeding with procurement, it is essential to first assess whether **used or refurbished equipment** is suitable.
- **Circularity:** When purchasing new equipment, circularity must be a procurement criterion. What percentage of the materials in the device is recycled? And can the materials in the device be reused?
- **Influence the market:** Leverage market power to encourage suppliers to adopt sustainable practices. Request that suppliers report on sustainability aspects and set requirements for their sustainability performance. Participate in partnerships that coordinate and consolidate demand for sustainable equipment and services.
- **Socially responsible procurement:** Request information about the sourcing of raw materials, the production and logistics of equipment, and waste management. Also, set requirements regarding the social impact of these processes.
- The **expected lifespan of the equipment and the possibilities for extending** that lifespan should be key procurement criteria. For example, choose devices with durable casings that can withstand wear and tear and are **repairable**. Also, opt for equipment with robust components that are long-lasting and can be repaired, replaced, or **upgraded**.



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- Another important criterion is whether there is a market for **reusing** the purchased equipment and whether the manufacturer has a system in place for collecting devices and reusing components.
- Choose **equipment with low energy consumption and minimal heat generation**.
- Opt for devices that are designed to be **off by default** (rather than on standby or always on). Also, choose equipment that can be easily activated when needed.

Extending the lifespan of equipment

- Another way to reduce the environmental and social impact of equipment is by extending its lifespan. This includes using IT equipment for **longer periods** and **focusing on repair and upgrades**. A laptop or phone does not necessarily need to be replaced every three years.

Responsible e-waste processing: WEEELabex

- When disposing of equipment, explore options for giving devices a second life (**reuse**).
- If reuse is not possible, the equipment must be destroyed in accordance with **WEEELabex** standards (WEEE stands for Waste Electrical and Electronic Equipment; Labex stands for Label of Excellence). **WEEE** is established in the WEEE Directive of the European Union (Directive 2012/19/EU) and sets requirements for organizations disposing of equipment and for the certification of IT Asset Disposal service provider **ITAD**. For more information: www.weeelabex.org.

Note: Different types of waste materials require separate certifications. A certificate indicates that a service provider has the expertise and equipment to contribute to the recovery of specific categories of raw materials for reuse and to ensure responsible disposal of any e-waste.



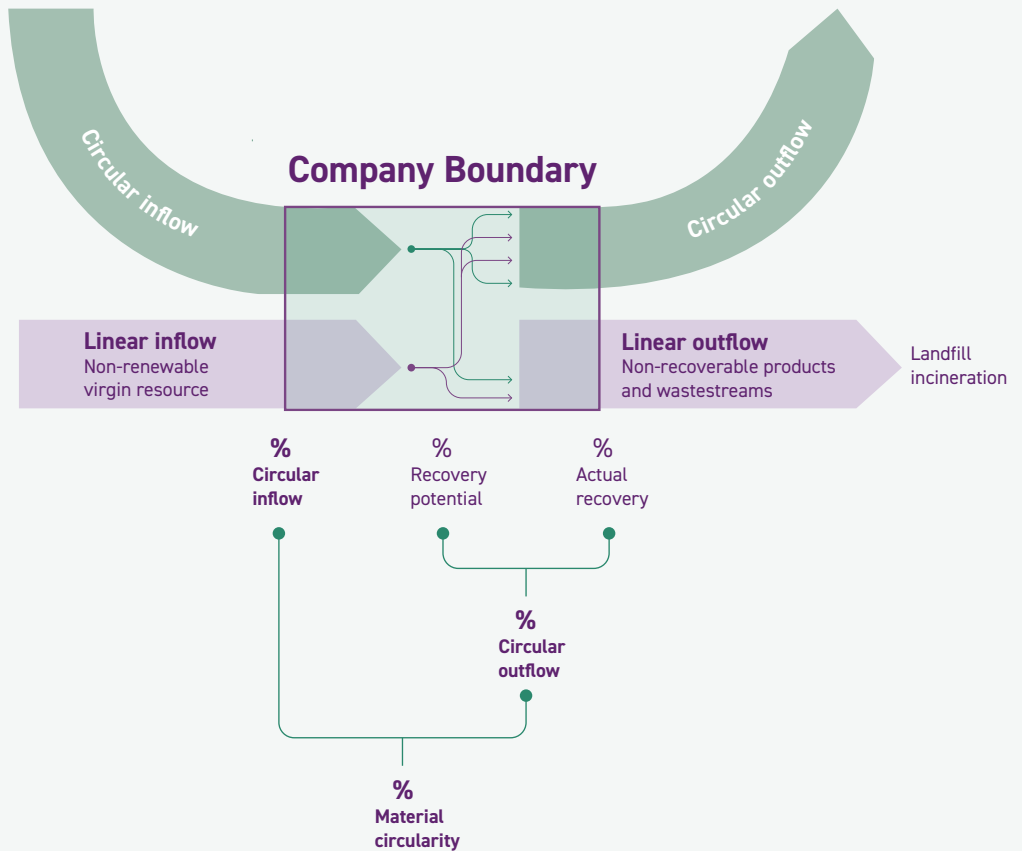
Think

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4.2.4. Best practice: measuring and increasing circularity



The World Business Council for Sustainable Development developed a model for circularity in 2023. This can be found on our SIIA Wiki: (wiki.coalitieduurzamedigitalisering.nl/index.php?title=Circulariteit_meten).



Think

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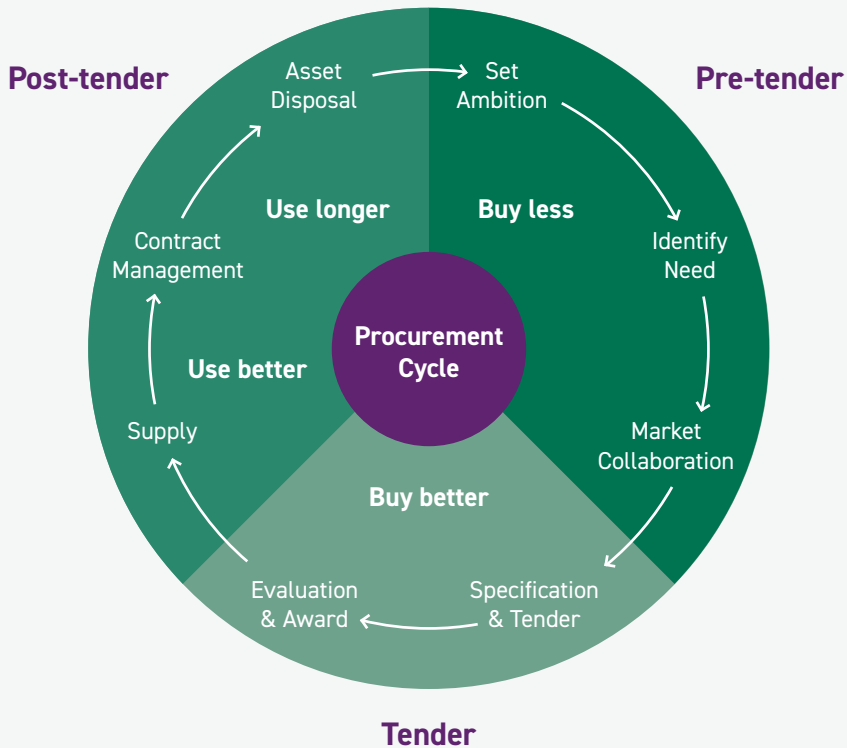
Act

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4.2.5. Best practice: sustainable procurement

See: wiki.coalitieduurzamedigitalisering.nl/index.php?title=Inkoop_en_aanbesteding

The PACT for Circular and Fair ICT (CFIT) has developed a framework to make IT procurement and usage more sustainable. The topics addressed by CFIT relate to both emissions (ESRS E1) and circularity (ESRS E5).



(CFIT Framework, n.d.; PACT for Circular and Fair ICT (CFIT), 2022)

The Municipality of Amsterdam has developed the *Handelingskader Duurzaam opdrachtgeven en Inkopen van ICT* as a framework for sustainable IT procurement and contracting (www.openresearch.amsterdam/nl/page/111226/handelingskader-duurzame-ict).





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4.2.6. Best practice: IT Asset Disposal (ITAD)

There is significant fragmentation in the world of IT Asset Disposal (ITAD). When selecting a service provider for the secure and responsible disposal or reuse of IT equipment and assets at the end of their lifecycle, proper certification is essential. Choosing companies with the appropriate certifications incentivizes ITAD providers to invest in these standards.

For different types of e-waste, there are specific WEEE Labex certifications (WEEE stands for Waste Electrical and Electronic Equipment). Examples include SHA (Small Household Appliances), LHA (Large Household Appliances), and FPD (Flat Panel Displays), for small and large household appliances and flat screens, respectively. Certification ensures that ITAD companies operate in compliance with laws and regulations and maintain accurate records of raw materials. At the EU level, oversight ensures that raw materials remain within the European Union.

For more information: weee-labex.org.

4.3. Greening of IT

4.3.1. Virtualization

Place equipment in sustainable data centers and cloud environments, or use cloud services that operate in such facilities. These centers often achieve high efficiency through advanced cooling systems, heat reuse, and the use of renewable energy sources.

To ensure continuity, backup generators, batteries, and parts of the infrastructure are often duplicated. Additionally, there is ongoing innovation to optimize the use of redundant components in data centers, further reducing environmental impact.



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4.3.2. Cloud providers

Cloud providers are increasingly able to report on the energy, water, and land use of their services. Major tech companies like Microsoft, Google, and AWS support their customers with dashboards and (real-time) data. While this provides insight, it is not yet comprehensive. Joint efforts and collaboration are needed to improve the quality and usability of this data. This starts with a dialogue with your company's cloud provider(s). These questions are also relevant for *on-premise* software and data centers.

Examples of discussion topics with cloud providers:

- What are the energy performance metrics of the cloud provider? How are they calculated?
- To what extent does the provider use renewable energy or Carbon-Free Energy (CFE)? What are the details of the energy sources?
- What are the energy performance metrics of the services your company uses? How are they calculated?
- How does the provider manage energy and cooling efficiency, including heat and water recovery?
- What steps does the provider take to optimize energy performance? For example, through improved hardware utilization via virtualization, serverless computing, and Function as a Service (FaaS)?
- What advice can the provider offer to customers and end users? Significant gains can be made through optimized computing and sustainable software engineering.
- To what extent does the provider use *cloud-native* application architecture?
- To what extent does the provider apply circular hardware design and management, and what happens at the end of the hardware's lifecycle? Can a report be provided?
- Another important question concerns *rightsizing*. What machine capacity is truly needed to run the software? Often, machines are over-provisioned to handle peak performance moments. Is it possible to scale capacity only when needed?
- Many devices are always on by default, allowing computing power to be accessed in milliseconds. The question is whether it's possible to have devices turned off by default and whether additional measures can be taken to enable quick startup. This could include reserving capacity (*see the description of the S-model on the SIIA wiki: wiki.coalitieduurzamedigitalisering.nl/index.php?title=S3-model*).



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The rise of AI has increased attention on the energy consumption of software. In a model with thousands of parallel nodes, an unnecessary operation can significantly impact performance, cost, and environmental footprint. This analysis is also valuable for other widely used applications.

- To measure software energy consumption, tools and methodologies have been developed by the Green Software Foundation: [Green-Software-Foundation/carbon-aware-sdk: Carbon-Aware SDK \(github.com\)](https://github.com/Green-Software-Foundation/carbon-aware-sdk).
- Tools for building carbon-aware software that can respond in real time to the availability of renewable energy can be found at: github.com/Green-Software-Foundation/awesome-green-software.

4.3.3. Software energy consumption

Developing, testing, and using software consumes energy and, unless that energy is fully renewable, results in greenhouse gas emissions.

- More rational use of software and hardware can help reduce emissions. This requires a thorough analysis.
- That analysis should also include emissions from the data center hosting the software and the devices on which the software runs. If more green energy is available elsewhere, consider relocating your IT operations accordingly.
- A key element is *rightsizing*: What machine capacity is truly needed to run the software? Often, machines are overdimensioned to handle peak performance. Is it possible to scale capacity only when needed?
- Many devices are always on by default, allowing computing power to be accessed in milliseconds. The question is whether it's possible to have devices turned off by default and to implement additional measures that allow for quick startup. This could include reserving capacity (see the S-model).
- To measure software energy consumption, tools and methodologies have been developed by the Green Software Foundation: [Green-Software-Foundation/carbon-aware-sdk: Carbon-Aware SDK \(github.com\)](https://github.com/Green-Software-Foundation/carbon-aware-sdk).
- Tools for building carbon-aware software that can respond in real time to the availability of renewable energy can be found at: github.com/Green-Software-Foundation/awesome-green-software.





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4.3.4. Responsible use of AI

The proper use of IT enables transformation, simplifies societal challenges, and can even help solve them. The potential of new technologies is vast, and examples of smart applications are countless.

In this era of transformation, Artificial Intelligence (AI) plays a crucial role in shaping our society. AI is deeply embedded in numerous industries and sectors, including finance, healthcare, security, and agriculture.

AI drives innovation and efficiency. According to the European Parliament, AI also plays a key role in combating climate change and supports the achievement of sustainability goals. While AI offers undeniable benefits, it also presents challenges, particularly in terms of ethical responsibility and environmental sustainability.

That's why embedding the responsible use of AI into governance frameworks is essential.

4.3.5. Sustainable remote work, green offices, and limited travel

Also reduce the environmental impact of the environments in which equipment is used. This can be achieved by constructing sustainable office buildings and reducing the need for office space through serious implementation of remote and hybrid work models.

However, remote work does not automatically lead to greater sustainability, as research shows. Equipment and office furnishings often need to be purchased twice, and both home and office workspaces require heating and lighting. Organizations can help by promoting the reuse of home office furnishings.

Moreover, remote work does not necessarily reduce travel. Employees working from home often seek social interaction outside of work hours and still travel. They may also make additional trips for sports or leisure, and many have caregiving responsibilities. These trips were previously often combined with commuting.

Finally, organizations can promote the use of sustainable transportation. Focus on reducing air travel and increasing the use of public transport and bicycles. Encourage car sharing and the reuse of (leased) cars.



CHAPTER 5

Measure: evaluate and report



In this chapter

5.1. ESRS 1 and 2: a plan for sustainability

5.2. Environment (ESRS E1-E5)

5.3. Social (S1-S4)

5.4. Governance (G1)

An essential aspect of sustainability is making the necessary steps and progress transparent.

The previous chapters addressed various subtopics. This chapter focuses on accountability, both internally within the organization and externally to stakeholders.



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5.1. ESRS 1 and 2: a plan for sustainability

A sustainability report begins with a sustainability plan in accordance with the European Sustainability Reporting Standards (ESRS).

A key component of this plan is the due diligence process, as described in

► **chapter 2: Think.** This involves assessing the organization's impact on the environment and society. The next step is a materiality analysis: Which topics are most important? This analysis must consider two perspectives: the organization's impact on the environment and society, and vice versa, how sustainability developments affect the organization's activities, business model, and value creation. The outcome of this analysis forms the sustainability plan.

Next, the risks that could prevent the achievement of sustainability goals are addressed. For this risk analysis, ► **chapter 3: Organize** is relevant. The risks, and the corresponding measures in terms of technology (IT), organization (e.g., innovation processes), and people (skills, capabilities, motivation), must be reported. The organization must also assess the desirability of changes for stakeholders (ethics).

Finally, a timeline and prioritization are established, along with an accountability framework that explains how priorities were determined and how progress will be monitored.

The topics for which progress must be tracked are defined in the topic-specific standards. For additional information, see wiki.coalitieduurzamedigitalisering.nl/index.php/ESRS.





Think

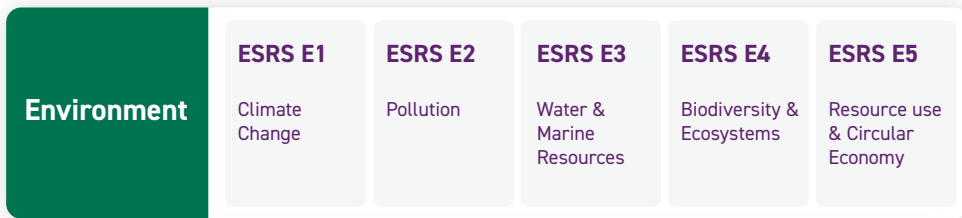
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5.2. Environment (ESRS E1-E5)

This chapter addresses the organization's environmental impact. One subtopic is the environmental impact of IT.



Topical ESRS: ESRS E1

Topic	Sub-topic	Sub-Sub-Topic
Climate change	• Climate change adaptation • Climate change mitigation • Energy	

5.2.1. Climate change (ESRS E1)

ESRS E1 includes several components, such as a climate transition plan, a resilience analysis, and reporting on greenhouse gas (GHG) emissions. It also covers the organization's energy consumption and various carbon-related topics such as offsetting and internal carbon pricing policies.

IT solutions can support the achievement of climate goals. This can be intentional, using technology to address climate-related challenges or to provide insights and decision-making tools for climate objectives. Often, however, this happens unintentionally; IT solutions contribute to climate goals by improving efficiency. For example, more efficient route planning in logistics can reduce fossil fuel consumption.



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5.2.1.1. GHG emissions

A key foundation of ESRS E1 reporting is the disclosure of the company's scope 1, scope 2, and scope 3 greenhouse gas emissions.

- IT is a component of the overall GHG analysis. In IT-intensive companies, IT may account for a significant portion of the total GHG footprint. This makes a specific analysis of the company's IT footprint worthwhile.

There is currently no universally accepted methodology for calculating an IT footprint. However, using general frameworks such as the GHG Protocol and the Defra conversion factors (emission factors developed by the UK Department for Environment, Food and Rural Affairs), companies can follow these steps:

- » Define the pillars of the footprint (What is included? What is broken down?);
 - » Define the scope (e.g., cradle-to-grave, cradle-to-gate, and include the usage phase);
 - » Identify the value chain steps for each pillar;
 - » Determine the data used for each value chain step.
 - » Examples include Conclusion's sustainability report 2024 (www.datocms-assets.com/33413/1746004140-sustainability-statement-2024.pdf) and ABN AMRO's sustainability report (www.abnamro.com/en/about-abn-amro/information/download-centre?selectedTab=Integrated+Annual+Report+2024).
- IT solutions can support the collection of data, calculation, and presentation of the overall GHG footprint. Most ERP systems (such as SAP, Oracle, AFAS, and Microsoft Dynamics 365) offer modules for this purpose. Additionally, many commercial providers offer tools that simplify the GHG reporting process beyond Excel.



Think

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5.2.1.2. Best practices: GHG emissions

On our search platform, the SIIA Wiki, the following best practices are listed:

- GHG Protocol: ICT Sector Guidance based on the GHG Protocol Product Life Cycle Accounting and Reporting Standard (2017) ghgprotocol.org/sites/default/files/ghgp/GHGP-ICTSG%20-%20ALL%20Chapters.pdf (2017).
- Defra Conversion Factors (2023): www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 (2023).
- ITU L.1410: Methodology for environmental life cycle assessments of information and communication technology goods, networks and services: www.itu.int/rec/T-REC-L.1410-201412-I/en (2014).
- ISO/IEC 21031: 2024 Information technology – Software Carbon Intensity (SCI) specification (2024): www.iso.org/standard/86612.html (2024).
- Blue Angel – The German Ecolabel, Data Centers DE-UZ 228 (2023): www.blauer-engel.de/en/productworld/data-centers

5.2.1.3. Energy consumption and energy mix

ESRS E1 not only addresses greenhouse gas emissions but also the energy consumption and energy mix of companies and the sectors in which they operate.

Mapping and systematically reducing the energy consumption of cloud services, IT hardware, and software is a complex process. Better data can be obtained through monitoring. Numerous IT solutions are available to monitor and even regulate the energy performance of IT. Several of these solutions are explored in more detail within the dynamic SIIA environment.



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5.2.2. Pollution (ESRS E2)

ePollution and the Product Passport (ESPR – Ecodesign for Sustainable Products Regulation).

Topical ESRS: ESRS E2

Topic	Sub-topic	Sub-Sub-Topic
Pollution	• Pollution of air • Pollution of water • Pollution of soil • Pollution of living organisms and food resources • Substances of concern • Substances of very high concern • Microplastics	

In the area of pollution and IT, there are still many concerns regarding the sustainability of data and the quality and reliability of sustainability data from suppliers.

Manufacturer websites often provide limited information. With the introduction of the ESPR (Ecodesign for Sustainable Products Regulation) in 2024, more information will become available about the sustainability of production and waste chains. This will be a multi-year process, as agreements will be made per product category.

ICT equipment is one of the first product groups for which such agreements are being developed. More information: commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en.



Think

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Internationally, extensive work has already been done on the digital product passport, which collects and shares information about the supply chain. More details about the passport and the ESPR can be found at: www.gs1.nl/themas/duurzaamheid/digital-product-passport/. Topics addressed include pollution from raw material extraction, data center cooling, and the environmental impact of electronic waste. The ESPR is expected to significantly boost the availability of information on these issues.

5.2.3. Water and marine resources (ESRS E3)

Topical ESRS: ESRS E3

Topic	Sub-topic	Sub-Sub-Topic
Water and marine resources	• Water • Marine resources	• Water consumption • Water withdrawals • Water discharges • Water discharges in the oceans • Extraction and use of marine resources

Current IT-related topics include water usage for data center cooling and understanding how much water is needed for specific applications. It is also important to assess the local environmental impact of water withdrawals and the discharge of heated water from data centers. The role of IT in identifying opportunities and achieving sustainability goals in this area should be further explored.



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5.2.4. Biodiversity and ecosystems (ESRS E4)

Topical ESRS: ESRS E4

Topic	Sub-topic	Sub-Sub-Topic
Biodiversity and ecosystems	• Direct impact drivers of biodiversity loss	• Climate Change • Land-use change, fresh water-use change and sea-use change • Direct exploitation • Invasive alien species • Pollution • Others
	• Impacts on the state of species	<i>Examples:</i> • Species population size • Species global extinction risk
	• Impacts on the extent and condition of ecosystems	<i>Examples:</i> • Land degradation • Desertification • Soil sealing
	• Impacts and dependencies on ecosystem services	

Topics Related to Biodiversity and Ecosystems:

- The impact of the digital sector on biodiversity loss (see the recent ABN AMRO report "Hoe sneakers, bankstellen en mobiele telefoons de biodiversiteit schaden" (*How sneakers, sofas, and mobile phones harm biodiversity*): www.abnamro.nl/nl/zakelijk/insights/sectoren-en-trends/retail/sneakers-bankstellen-en-mobieltjes-schaden-biodiversiteit.html. It also highlights the crucial role of data and IT solutions in protecting ecosystems and reducing biodiversity loss.



Think

Organize

Act

Measure

5.2.5. Circular economy (ESRS E5)

Topical ESRS: ESRS E5

Topic	Sub-topic	Sub-Sub-Topic
Circular economy	• Resources inflows, including resource use • Resource outflows related to products and services • Waste	

In the digital world, the transportation and electronic waste (e-waste) of IT hardware have the greatest environmental impact. By systematically extending the lifespan of hardware, organizations can make a significant difference. This begins with policies aimed at increasing the standard usage period of equipment. Additionally, reusing returned but not yet depreciated equipment, repairing devices, and the method of disposing of end-of-life equipment all play a role.

A sustainable policy for IT hardware also includes a sustainable procurement strategy. This includes, for example, choosing modular hardware, which extends the lifespan and usability of devices. It is also beneficial if the relevant energy performance can be scaled remotely as much as possible.



Think

Organize

Act

Measure

5.3. Social (S1-S4)

In these four sections of the European Sustainability Reporting Standards (ESRS), the organization's impact on social aspects is addressed. There are four "S" sections: own employees, workers in the supply chains, communities surrounding the supply chains, and customers.



Key topics include: inclusion, education and training, privacy, recruitment and selection, freedom of expression, the right to organize and bargain collectively, working conditions, remuneration, work-life balance, health, and safety.

For customers and consumers, additional topics include access to services, freedom of expression, privacy and protection of fundamental rights, customer safety and health, and business practices (quality, claims, expectations, and warranties).

The ESRS requires organizations to report on these aspects if they are material from the perspective of the organization's impact on people and communities. In addition, social requirements may pose risks to the organization.

SIIA-Wiki: wiki.coalitie-duurzamedigitalisering.nl/index.php?title=CSRD_-_Social



**Think****Organize****Act****Measure**

5.3.1. Own workforce (S1)

Topical ESRS: ESRS S1

Topic	Sub-topic	Sub-Sub-Topic
Own workforce	• Working conditions • Equal treatment and opportunities for all • Other work-related rights	• Secure employment • Working time • Adequate wages • Social dialogue • Freedom of association, the existence of works councils and the information, consultation and participation rights of workers • Collective bargaining, including rate of workers covered by collective agreements • Work-life balance • Health and safety • Gender equality and equal pay for work of equal value • Training and skills development • Employment and inclusion of persons with disabilities • Measures against violence and harassment in the workplace • Diversity • Child labour • Forced labour • Adequate housing • Privacy

In this section of the report, which concerns the organization's impact on its own employees, several themes emerge that may not be directly associated with sustainability and IT, such as employee development, housing, freedom of assembly, work-life balance, safety, and health.



Think

Organize

Act

Measure

5.3.2. Workers in the value chain (S2)

Topical ESRS: ESRS S2

Topic	Sub-topic	Sub-Sub-Topic
Workers in the value chain	• Working conditions • Equal treatment and opportunities for all • Other work-related rights	• Secure employment • Working time • Adequate wages • Social dialogue • Freedom of association, including the existence of work councils • Collective bargaining • Work-life balance • Health and safety • Gender equality and equal pay for work of equal value • Training and skills development • The employment and inclusion of persons with disabilities • Measures against violence and harassment in the workplace • Diversity • Child labour • Forced labour • Adequate housing • Water and sanitation • Privacy

**Think****Organize****Act****Measure**

5.3.3. Affected communities (S3)

Topical ESRS: ESRS S3

Topic	Sub-topic	Sub-Sub-Topic
Affected communities	• Communities' economic, social and cultural rights • Communities' civil and political rights • Rights of indigenous peoples	• Adequate housing • Adequate food • Water and sanitation • Land-related impacts • Security-related impacts • Freedom of expression • Freedom of assembly • Impacts on human rights defenders • Free, prior and informed consent • Self-determination • Cultural rights

5.3.4. Consumers and end-users (S4)

Topical ESRS: ESRS S4

Topic	Sub-topic	Sub-Sub-Topic
Consumers and end- users	• Information-related impacts for consumers and/or end-users • Personal safety of consumers and/or end-users • Social inclusion of consumers and/or end-users	• Privacy • Freedom of expression • Access to (quality) information • Health and safety • Security of a person • Protection of children • Non-discrimination • Access to products and services • Responsible marketing practices



Think

Organize

Act

Measure

5.4. Governance (G1)

In the area of governance, topics include bribery, (the safety of) organizational culture, whistleblower protection, animal welfare, influence on political decision-making and lobbying, payment practices, and relationships with suppliers.

Governance

ESRS G1

Business Conduct

Topical ESRS: ESRS G1

Topic	Sub-topic	Sub-Sub-Topic
Business conduct	• Corporate culture • Protection of whistle-blowers • Animal welfare • Political engagement and lobbying activities • Management of relationships with suppliers including payment practices • Corruption and bribery	• Prevention and detection including training • Incidents



CHAPTER 6

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