

AIS in Focus

How to provide relevant and reliable
accounting information

Appendix: chapter 6 Sustainability and Management Information Systems

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Contents appendix

6. SUSTAINABILITY AND MANAGEMENT INFORMATION SYSTEMS	4
6.1 DOUBLE MATERIALITY: IMPACT, RISK, AND OPPORTUNITY	4
6.2 INTEGRATIVE THINKING AND THE VALUE CHAIN.....	6
6.3 DOUBLE MATERIALITY ANALYSIS	9
6.4 IMPLICATIONS FOR INTERNAL CONTROL.....	14
6.5 EUROPEAN REGULATIONS ON SUSTAINABILITY.....	20
6.6 CORPORATE SUSTAINABILITY DUE DILIGENCE DIRECTIVE (CS3D)	21
6.7 CRITERIA FOR SUSTAINABILITY: THE EU TAXONOMY	23
6.8 SUSTAINABILITY REPORTING: CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD) AND ESRS	24
6.9 GUIDANCE FOR SMES: VSME	26
SUMMARY	27

Sustainability and Management Information Systems

6.1 Double Materiality: Impact, Risk, and Opportunity
6.2 Integrative Thinking and the Value Chain
6.3 Materiality Analysis
6.4 Implications for Internal Control
6.5 European Rules on Sustainability
6.6 Principles for Sustainable Governance: CSDDD
6.7 Criteria for Sustainability: EU Taxonomy
6.8 Reporting on Sustainability: Corporate Sustainability Reporting Directive (CSRD) and ESRS
6.9 Guidance for SMEs: VSME

This chapter discusses the relations between sustainability and accounting information systems.

Organizations are expected to act sustainably more and more and to account for their actions as such. In the summer of 2023, the European Commission introduced new rules for reporting over sustainability. The Corporate Sustainability Reporting Directive (CSRD) led to the **European Sustainability Reporting Standards (ESRS)**. Later on in 2025 the impact of the original legislation was reduced by the Omnibus legislation. The Omnibus legislation reduces the number of companies that need to comply and aims to simplify these reporting standards in the future. Nevertheless, the original CSRD and the related ESRS can still be seen as the gold standard for sustainability reporting. Acting sustainably means maintaining a balance between the social, environmental, and economic aspects of doing business. This is reflected in the so-called **three Ps: People, Planet, and Profit**. Companies are expected to pay attention to all three dimensions. To operate sustainably, a cultural shift is needed — from organizations that are primarily profit-driven to those that also define clear objectives related to people and the environment. This shift creates new information needs for executives, managers, and supervisors, such as:

- What was our greenhouse gas emission level compared to the standard?
- What percentage of our energy use comes from renewable sources?
- What is the pay gap between female and male employees?
- Have there been any reported cases of bribery?
- Have there been any incidents of inappropriate or unacceptable behavior in the workplace?

To meet these information needs, organizations must record data on sustainability in order to produce information about their achievements. Moreover, it will be necessary to determine whether this information is indeed *relevant* and *trustworthy*.

6.1 Double Materiality: Impact, Risk, and Opportunity

The concept of materiality is closely linked to relevance of information. Information is considered material if omitting it or presenting it incorrectly could influence the decisions

made by users of that information. Within the field of management information systems, it has traditionally been common to regard as material only that information which relates to a company's risks and opportunities. For example, if an airport causes significant disturbance to nearby residents, this could result in restrictions on the number of flights and, consequently, a loss of revenue. From this perspective, the residents' complaints are considered material only because they represent a risk to the airport's financial results.

However, new European legislation now requires companies to also gather information about their material impacts on people and the environment. In this case, the airport must assess the severity of the noise pollution's effects on the surrounding community, for instance by engaging in dialogue with local residents. Double materiality is a key concept in the Corporate Sustainability Reporting Directive (CSRD). When conducting a double materiality analysis (DMA), the importance of a sustainability-related issue is determined in two ways:

1. By estimating the consequences of that issue for the company — in terms of financial risks and opportunities. This is comparable to a traditional risk analysis.
2. By estimating the positive and negative impacts of the company's activities on people and the environment.

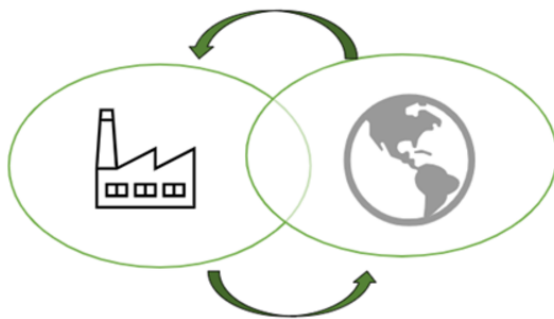


FIGURE 6.1 – DOUBLE MATERIALITY (SOURCE: SER – WHAT IS “DOUBLE MATERIALITY”?)

In the context of double materiality, the terms impact, risk, and opportunity are central. But what do these mean for an organization's management information, and how are they interconnected? A company's activities can have both positive and negative impacts on its environment and stakeholders. For example, a steel manufacturer may provide jobs for people in the region, yet at the same time make a significant contribution to local air pollution. This represents the company's impact on stakeholders — an “inside-out” effect. As a result of this impact, the government may decide to impose stricter emission requirements, leading to higher costs and possibly even the closure of the factory if production becomes unprofitable. In this case, the negative impact on the environment has created a risk for the company. At the same time, the government may encourage the use of hydrogen by offering subsidies to the steel company. This could enable the company to become one of the first in its industry to produce sustainable steel in a truly sustainable way. Customers might then be willing to pay more for this product — creating an opportunity.

Thus, impact, risk, and opportunity are often closely connected.

FIGURE 6.2 CONNECTION BETWEEN IMPACT, RISK, AND OPPORTUNITY

<i>Event</i>	<i>Impact on stakeholders</i>	<i>Risk for the company</i>	<i>Opportunity for the company</i>
Outsourcing production to regions with lower wages	<ul style="list-style-type: none"> • Loss of employment for workers in the home country • Job creation for workers in developing countries 	<ul style="list-style-type: none"> • Possible quality issues • Production delays in case of a pandemic • Reputational damage among customers 	<ul style="list-style-type: none"> • Access to new markets due to lower production costs
Building a new residential area	<ul style="list-style-type: none"> • Provides housing for people in need • Nitrogen emissions • Disruption of local flora and fauna 	<ul style="list-style-type: none"> • Construction halts • Customer claims 	<ul style="list-style-type: none"> • Development of new building techniques • Compensation or restoration projects

Traditionally, accounting information systems provide information to managers about financial risks and opportunities. Reporting on their impacts on stakeholders, however, is relatively new. Meeting these new information needs is more complex than it may seem. Most of the necessary data are not found in internal information systems but must be gathered from external sources. This makes it more challenging to assess the reliability of the information. By conducting a double materiality analysis (see section 6.3), organizations can determine which sustainability topics are so significant for both the company and its stakeholders that they must be given due attention in policy and decision-making.

6.2 Integrative Thinking and the Value Chain

From “Cash is King” to “Integrative Thinking”

One of the most important concepts in management information systems is undoubtedly the value cycle, described in Chapter 3. A key principle of the value cycle is that the relationships between inventories and processes are best measured financially. This idea is also reflected in Starreveld’s reliability typology, which assumes that organizations operating in a market economy aim for profit and must ensure efficiency in their associated costs. From this perspective, customers are viewed as sources of revenue, while employees and suppliers are seen as cost factors. The objective is to maximize the profit that remains for the shareholders or owners. Advocates of sustainability, however, have embraced a new mindset known as integrative thinking. This approach views issues from multiple stakeholder perspectives and seeks to creatively reconcile potential conflicts of interest.

Many organizations have started addressing sustainability challenges by applying this principle of integrative thinking, and regulators are increasingly encouraging this as well.

Figure 6.3 illustrates how the dairy cooperative FrieslandCampina applies the concept of integrative thinking. Inputs and outputs are measured not only from a financial perspective but also from intellectual, natural, human, and product perspectives. To make these measurements possible, FrieslandCampina’s management information system must collect, record, and process data across all these perspectives into reliable and relevant information.

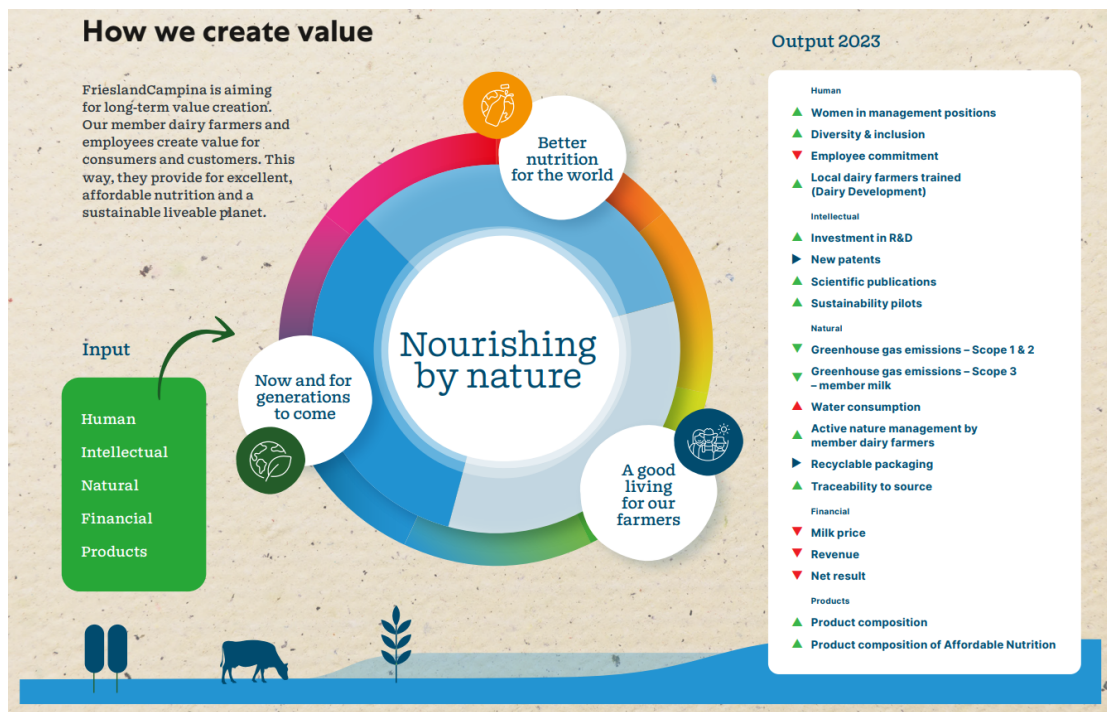


FIGURE 6.3 – INTEGRATIVE THINKING AT FRIESLANDCAMPINA (SOURCE: ANNUAL REPORT 2023)

From the Value Cycle to the Value Chain

When an organization decides to outsource part of its production process to another company, it may effectively shift certain sustainability issues outside its own boundaries.

For example, consider a car manufacturer that sources batteries for its electric vehicles from China. Producing these batteries is a polluting activity that, due to environmental regulations, cannot take place in the manufacturer’s home country. Nevertheless, the car manufacturer remains indirectly responsible for the pollution generated during the battery production process.

Similarly, the company is also indirectly responsible for the pollution caused using its vehicles and for the recyclability of their components at the end of their life cycle.

For this reason, there is a growing recognition that an organization’s responsibility does not end at its own operational boundaries (the value cycle) but extends further to the entire value chain.

The value chain can be seen as the value cycle plus the impact of suppliers (so-called “upstream” activities) and customers (the “downstream” activities).



FIGURE 6.4 – VALUE CHAIN OF FRIESLANDCAMPINA (SOURCE: ANNUAL REPORT 2023)

Scope 1, 2, and 3

In relation to greenhouse gas emissions along the value chain, the terms Scope 1, 2, and 3 are commonly used.

Figure 6.5 shows that the greenhouse gas emissions caused by an organization are not limited to emissions from its own facilities (Scope 1) but also include those from its suppliers and customers (Scopes 2 and 3).

Greenhouse gases act like a blanket around the earth, trapping heat and causing global warming. The main greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (CFCs, HCFCs, HFCs, PFCs, SF₆). It has been agreed that all gases will be converted into CO₂ equivalents, so it is not necessary to report on each gas separately.

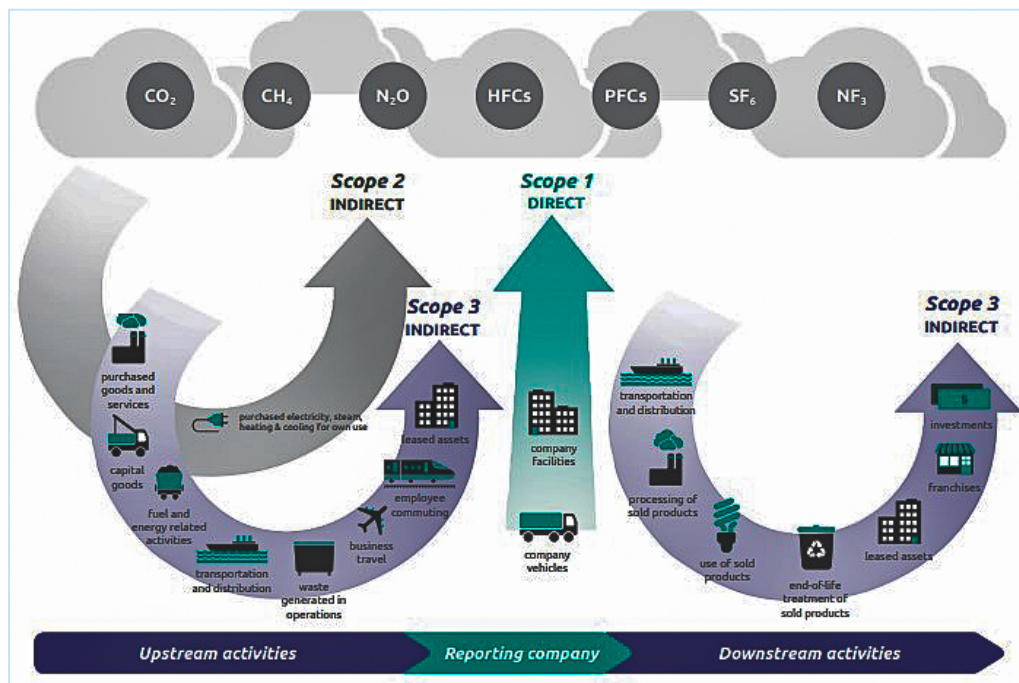


FIGURE 6.5 – VALUE CHAIN, UPSTREAM AND DOWNSTREAM

Scope 1 refers to the direct emissions produced by the organization itself, such as those resulting from burning natural gas for heating and ovens, or diesel in company vehicles.

Scope 2 covers the indirect emissions associated with the generation of electricity, steam, heat, or cooling purchased and consumed by the organization.

Scope 3 includes all other indirect emissions that occur across the value chain — both upstream (from suppliers and production inputs) and downstream (from customers and product use).

Examples of upstream Scope 3 emission sources include:

- Purchased goods and services
- Investments
- Upstream transport and distribution
- Examples of downstream Scope 3 emission sources include:
 - Transport and distribution of goods to customers
 - Processing of intermediate products by customers
 - Use of sold goods and services by end users

By expanding the concept of the value cycle into the value chain, new information needs arise: How sustainable are the upstream and downstream activities? How can these be measured and reported? In the context of sustainability, relevance of information may sometimes be more important than reliability. However, the data required for such reporting is often not available within the organization, since they are recorded by external parties. This makes it even more difficult to assess the reliability of such external information. As a result, companies frequently must rely on estimates based on average values within their sector.

6.3 Double Materiality Analysis

In section 6.1, the relationship between impact, opportunities, and risks was explained — and how these lead to new information needs.

To act sustainably, it is important for an organization to clearly understand the significant impacts it has on people and the environment, and how these may translate into risks and opportunities.

The central question is essentially:

What are the key common sustainability topics that are most relevant both to the organization and its stakeholders?

The process used to identify these topics is known as a *Double Materiality Analysis (DMA)*. Understanding these topics helps improve strategy and ensures that resources are allocated as effectively as possible. A double materiality analysis can be performed in several ways. Here we describe a practical, four-step approach commonly used in organizations:

- Step 1: Explore the value creation model and stakeholders
- Step 2: Collect data
- Step 3: Analyze the collected data
- Step 4: Develop a materiality matrix

Step 1. Exploring the Value Creation Model and Stakeholders

Before conducting the double materiality analysis, it is essential to have a clear understanding of the organization’s value creation model and its stakeholders. A value creation model is not only about understanding the organization’s internal strategy and processes, but also about recognizing its position within the entire value chain. For example, a textile manufacturer aiming to grow by becoming the cheapest producer might consider moving production to a country where child labor is still permitted — resulting in a *negative impact* on a vulnerable group of stakeholders.

SECTOR INFLUENCE ON SUSTAINABILITY-RELATED TOPICS

In addition, the sector in which an organization operates often has certain characteristic sustainability topics.

Figure 6.6 provides examples of such topics that may affect stakeholders and lead to risks or opportunities for organizations.

FIGURE 6.6 – EXAMPLES OF KEY SUSTAINABILITY TOPICS BY SECTOR (SOURCE: SASB)

Sector	Key Sustainability Topics
E-commerce	<ul style="list-style-type: none"> • Energy consumption • Customer privacy • Data security • Employee engagement, diversity, and inclusion • Product design and lifespan
Construction and Furniture	<ul style="list-style-type: none"> • Energy consumption • Product quality and safety • Product design and lifespan • Supplier relationships, sustainable material sourcing
Alcoholic Beverage Producers	<ul style="list-style-type: none"> • Energy consumption • Water and wastewater management • Product design and packaging lifecycle • Supplier relationships, sustainable material sourcing • Efficient use of ingredients
Hotels	<ul style="list-style-type: none"> • Energy consumption • Water and wastewater management • Ecological impact on the surrounding environment • Working conditions • Physical impact of climate change
Transport Organizations	<ul style="list-style-type: none"> • Greenhouse gas emissions • Air quality • Employee health and safety • Overall safety

IDENTIFYING RELEVANT STAKEHOLDERS

Understanding who the organization’s stakeholders and their interests are, is crucial for defining an effective sustainability strategy.

A successful strategy benefits all stakeholders, not just a single group (such as shareholders). By identifying stakeholder interests, an organization can better manage relationships and balance different needs when formulating its strategy.

While it may seem straightforward to identify stakeholders — such as customers, employees, suppliers, investors, and government agencies — in practice, there are many

more, and within each group, further subcategories can be distinguished. Each subgroup of stakeholders can experience the organization's impact differently and to varying degrees. When mapping out stakeholders, organizations typically distinguish between three stakeholder groups:

1. Circle of Control & Ownership – These are the most direct stakeholders, such as employees, management, and executives.
2. Circle of Influence – This group includes suppliers and customers.
3. Circle of Concern & Interest – This group consists of local communities, the general public, and advocacy groups.

It is also useful to look at different steps in the value chain and departments within the organization. For example, employees in a production department working with hazardous materials experience different impacts than sales staff who are responsible for meeting revenue targets. The Royal Netherlands Institute of Chartered Accountants (NBA) distinguishes the following stakeholder groups in its guidance for conducting a materiality analysis (NBA, 2023, *Double Materiality Analysis: Step-by-Step Plan, Background, and Longlist of Sustainability Topics for CSRD Implementation*):

1. Primary users of sustainability information, such as investors and lenders
2. Affected stakeholders, such as employees and customers who experience either positive or negative impacts from the organization
3. Silent stakeholders, such as ecosystems and endangered species

Step 2. Collecting Data

To identify which sustainability topics are most important for both stakeholders and the organization itself, data can be collected through surveys (for example, using an application like SurveyMonkey) or through interviews with stakeholders and executives. In practice, these methods are often combined to obtain a more complete picture.

CONDUCTING A WRITTEN SURVEY AMONG STAKEHOLDERS

The main tool for gathering information about the potential impact of the organization on its stakeholders is a written survey. It is important that data are collected from all relevant stakeholders, including those with whom the organization has less direct interaction (the so-called circle of concern & interest).

In most cases, the organization provides a list of sustainability topics to stakeholders and asks them to indicate how important they consider each topic. This can be done by asking respondents to assign a score, for example on a scale from 1 to 7, or to rank the topics in order of importance. Based on these results, the relative importance of each topic to a specific stakeholder group can be calculated.

Example: Bicyclet – A Materiality Analysis

Bicyclet, a large bicycle manufacturer based in Lelystad, conducted a materiality analysis. They identified three main stakeholder groups:

- Employees
- Bicycle dealers
- Suppliers

Among these stakeholder groups, a survey (see Table 6.7) was distributed asking respondents to rate the importance of various sustainability topics on a scale from 1 to 7, where 7 means “most important” and 1 means “least important.”

FIGURE 6.7 – STAKEHOLDER SURVEY FOR BICYCLET

Sustainability Topic	Relation to UN Sustainable Development Goals (SDGs)	To be completed by respondent (1–7)
Economic performance	8, 13	
Procurement policy	11, 12	
Energy consumption and emissions	7, 12, 13	
Water consumption	6, 12	
Biodiversity	12, 16	
Employment	8	
Workplace safety and health	2, 3	
Education and training	4, 8, 10, 16	
Diversity and equal opportunities	6, 10, 16	
Non-discrimination	10, 16	
Freedom of association (union membership)	8, 10, 16	
Human rights in the value chain	10, 16	
Rights of local residents	8, 6, 10, 11	
Customer safety	3, 11, 12	
Customer privacy	11, 12	
Recycling	6	

Interviews

Interviews allow for a deeper exploration of the results from the written survey or can be used beforehand to ask a few stakeholder representatives which topics they consider most important — and then adjust the survey accordingly.

Interviews are also useful for obtaining insights from stakeholders who are less likely to respond to a written survey, for example because they fall outside the organization’s direct sphere of influence.

Collecting Data on the Importance of Topics for the Organization Itself

It is equally important to determine the relative importance of the sustainability topics for the organization itself. To assess this, interviews or surveys are conducted with managers and executives, allowing the organization to compare how different stakeholder groups and internal leadership view the significance of each topic.

Step 3. Analyzing the Collected Data

CALCULATING THE AVERAGE SCORES PER TOPIC

For each stakeholder group, the average score assigned to each sustainability topic is calculated. At the same time, the relative importance (weight) of each stakeholder group must be determined.

These results are then multiplied to determine the relative importance of each topic.

Formula:

Impact of topic y on stakeholders

$$= \sum (\text{Relative importance of stakeholder group } i \times \text{Average score of stakeholder group } i \text{ for topic } y)$$

Importance of sustainability topic y for the organization

$$= \text{Average score for topic } y \text{ among managers and executives}$$

At Bicyclet, employees are considered the most important stakeholder group and are assigned a weight of 50%.

Next come the bicycle dealers with 30%, followed by the suppliers with 20%.

The average score among stakeholders for the topic *Employment* was 6.6, while the management survey showed an average score of 2 for the same topic.

Using this approach, Bicyclet determined the average score for each topic, both from the perspective of stakeholders and from that of the organization itself.

- The average stakeholder score can be seen as an estimate of the organization’s impact on its stakeholders.
- The average organizational score represents an estimate of the risk or opportunity associated with that topic.

FIGURE 6.8 – SCORES FOR SUSTAINABILITY TOPICS AT BICYCLET

Sustainability Topic	Average Score (Organization – Bicyclet)	Average Score (Stakeholders)
Procurement policy	5.0	3.0
Energy consumption and emissions	5.0	5.5
Water consumption	2.0	2.0
Biodiversity	1.0	1.0
Employment	2.0	7.0
Workplace safety and health	4.5	4.3
Education and training	4.0	4.0
Diversity and equal opportunities	2.0	6.0
Non-discrimination	–	–
Freedom of association (union membership)	2.0	2.4
Human rights in the value chain	2.0	5.0
Rights of local residents	2.0	3.0
Customer safety	5.0	5.0
Customer privacy	1.5	1.5
Recycling	6.0	6.5

Step 4. Developing a Materiality Matrix

MEANING OF THE X- AND Y-AXES

Once the scores for each topic have been determined — both for the stakeholders and for the organization itself — a materiality matrix can be created.

The materiality matrix has two axes:

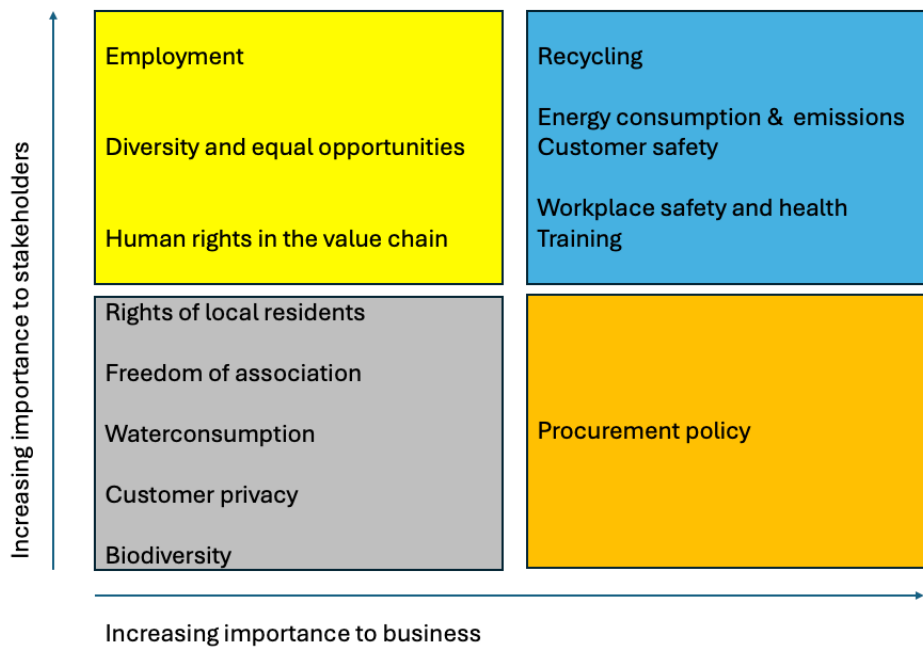
- The x-axis represents the importance of the topic for the organization itself.
- The y-axis represents the impact of the topic on stakeholders.

In some cases, these axes are reversed; however, this does not change the underlying concept. Figure 6.9 illustrates an example of Bicyclet’s materiality matrix.

DIFFERENT AREAS WITHIN THE MATERIALITY MATRIX

Organizations often divide the materiality matrix into different areas or quadrants. In the upper-right quadrant are the topics that should receive top priority in the coming period. These are the issues that are highly important to stakeholders, and at the same time, the organization believes it can make a meaningful contribution in these areas.

FIGURE 6.9 – BICYCLET’S MATERIALITY MATRIX



6.4 Implications for Internal Control

Using the results of the materiality analysis, the organization identifies the sustainability topics it aims to focus on in the coming period. Establishing these topics forms the starting point for internal control.

On a general level the objectives for the internal control system regarding sustainability are:

- To minimize the organization’s negative impact on people and the environment, and to maximize its potential positive impact.
- To reduce risks for the organization itself that are associated with these topics, while making full use of the related opportunities.

The COSO Internal Control Framework can be applied to achieve these goals. The application of this framework is illustrated by using the example of a furniture manufacturer “Classic Oak”.

Example: Furniture Manufacturer “Classic Oak”

“Classic Oak” is located in Oisterwijk and produces shelving units and storage systems from sustainably sourced wood, based on a patented wooden dowel connection. The company targets highly educated consumers who consciously choose a sustainable lifestyle.

The furniture is more expensive than similar items from large retail chains, but many of the designs have been produced in almost unchanged form since the 1660s.

There continues to be strong demand for second-hand “Classic Oak” furniture, reflecting its quality and timeless design.

A key sustainability topic for both the organization and its stakeholders is the sustainability of purchased materials.

CONTROL ENVIRONMENT

1. The organization demonstrates a commitment to integrity and ethical values.

When it comes to sustainability, the attitude of senior management is of particular importance. The key question is: *Is management genuinely motivated by a desire to make the organization more sustainable?*

At “Classic Oak”, the management actively supports sustainable production and sets a positive example. The company’s Code of Conduct includes the following rules:

- Wood must be purchased only from suppliers certified by the FSC label.
- Suppliers must recognize and respect workers’ rights to organize and join trade unions.
- Suppliers must pay their employees no less than the legal minimum wage, or, if there is none, a living wage that meets basic human needs.
- Suppliers must demonstrate commitment and continuous improvement in environmental protection by saving energy, reducing CO₂ and other greenhouse gas emissions, properly managing waste and recycling, and contributing to environmental restoration efforts.

2. The board of directors demonstrates independence from management and exercises oversight of the development and performance of internal control.

This refers to the supervisory role of the Board of Commissioners (or Supervisory Board). Key indicators for the quality of supervision include expertise, independence from management, and availability of time and attention. The Supervisory Board includes Professor Aniek Schreuder, a part-time professor of Forestry Management and Forest Economics at Wageningen University.

In her role as commissioner, she visits several forestry organizations each year that supply the pine wood used by “Classic Oak.”

3. *Management establishes, with board oversight, structures, reporting lines, and appropriate authorities and responsibilities in the pursuit of objectives.*

The organization's structure must support its sustainability objectives. At "Classic Oak", a dedicated Quality Assurance Department operates alongside the Purchasing Department. This department verifies that the wood purchased is indeed sourced from certified sustainable forestry operations.

4. *The organization demonstrates a commitment to attract, develop, and retain competent individuals in alignment with objectives.*

To achieve sustainability goals, an organization must have motivated and qualified staff and be able to retain them.

At "Classic Oak", attention is paid during recruitment to candidates' attitudes toward sustainability. Purchasing staff receive regular training to stay up to date on the latest developments in sustainable forestry. When evaluating purchasing staff performance, the findings of the Quality Assurance Department are considered — not only the achieved purchase prices.

5. *The organization holds individuals accountable for their internal control responsibilities in the pursuit of objectives.*

Employees who fail to comply with sustainability-related policies and directives must be held accountable. This helps ensure that behavior contrary to sustainability objectives is not tolerated. For example, one of the purchasers, Klaas Bos, received a reprimand from the director after it was discovered during a quality inspection that a batch of wood he purchased carried a tampered FSC certification.

RISK ASSESSMENT

The materiality analysis results in a set of topics that are relevant both to the stakeholders and to the organization itself.

6. *The organization specifies objectives with sufficient clarity to enable the identification and assessment of risks relating to objectives.*

To effectively identify the risks that could threaten the achievement of sustainability goals, the organization must first define clear and measurable objectives. The clearer the objectives are, the easier it becomes to identify the associated risks.

Especially in the field of sustainability, language can sometimes be vague or ambiguous, as sustainability covers many dimensions.

When the management of *Classic Oak* developed its strategy for the coming years, it became clear that one of its key differentiators in the furniture market would be sustainability.

Translating this valid ambition into concrete, measurable goals required considerable time and discussion among department heads.

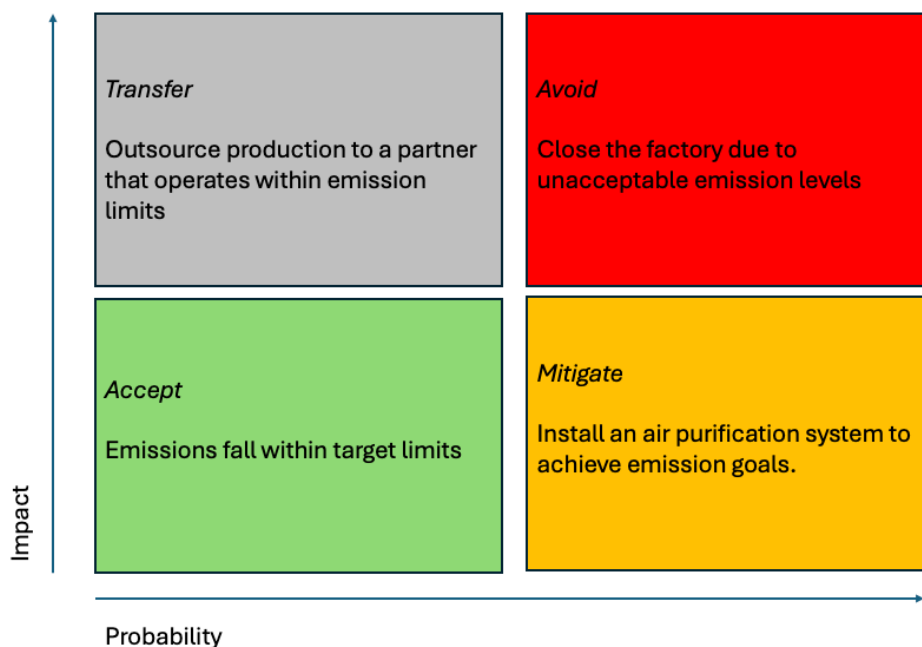
Ultimately, the organization defined the following objectives:

- 100% of all purchased wood must be certified with the FSC label.
- 26% of all purchased metal components must be sourced from recycled materials.

7. The organization identifies risks to the achievement of its objectives across the entity and analyzes risks as a basis for determining how the risks should be managed.

The organization must identify the risks that could hinder the achievement of its sustainability objectives. It should also determine for each whether the risk should be accepted, mitigated, transferred, or avoided.

FIGURE 6.10 – RISK-IMPACT MATRIX



The risk-impact matrix is composed of:

- an x-axis representing the likelihood of occurrence, and
- a y-axis representing the impact of the risk.

It is important to note that impacts are not only financial — they may also involve environmental impacts (e.g., CO₂ emissions or pollutant discharge) or social impacts, such as the effect of stress on employees.

This creates new challenges for the design and operation of accounting information systems.

While measuring CO₂ or pollutant emissions is relatively straightforward, measuring the human impact of stress in the workplace is far more complex.

In addition to identifying risks (negative events), organizations should also identify opportunities (positive events).

For each opportunity, the potential positive impact (net benefit) must be assessed.

Example: Risk Identification at “Classic Oak”

For the objective “100% of purchased wood must have an FSC certification”, the following risks were identified:

- Collusion between the purchaser and the supplier.
- False supplier claims regarding FSC certification.
- Limited availability of FSC-certified wood.
- Excessive prices for FSC-certified wood, making profitable production no longer feasible.

8. The organization considers the potential for fraud in assessing risks to the achievement of objectives.

Organizations and employees are often under pressure to demonstrate strong sustainability performance, yet the criteria for what counts as “sustainable” are not always clear.

It is also difficult to verify whether suppliers are performing as sustainably as they claim. When organizations portray themselves as more sustainable than they actually are, this practice is known as greenwashing.

Classic Oak takes this into account when selecting suppliers, paying particular attention to whether FSC certifications are legitimate.

9. The organization identifies and assesses changes that could significantly impact the system of internal control.

Societal and governmental attention to sustainability is expected to continue evolving rapidly. Organizations must monitor these developments and adjust their internal control systems as necessary to remain compliant and effective.

CONTROL ACTIVITIES

10. The organization selects and develops control activities that contribute to the mitigation of risks to the achievement of objectives to acceptable levels.

Classic Oak, the furniture manufacturer, has implemented the following control measures to ensure compliance with its goal that all purchased wood must carry the FSC certification:

- Collusion between purchaser and supplier:
Separation of duties between the Purchasing Department and the Quality Assurance Department. The Quality Assurance Department verifies the existence and authenticity of the FSC label on the wood.
- False supplier claims about FSC certification:
The Quality Assurance Department confirms that the supplier is listed in the official FSC database.
- Insufficient availability of FSC-certified wood:
The Purchasing Department establishes long-term contracts with suppliers of certified wood, aligned with planned production. The administration monitors the status of each contract.

- Excessive price of FSC-certified wood making profitable production impossible: In addition to long-term contracts, the organization considers alternative wood types or materials, the use of recycled wood, or design adjustments.

11. The organization selects and develops general control activities over technology to support the achievement of objectives.

To monitor progress toward sustainability goals, organizations often need to record data in automated information systems specifically developed for that purpose.

To ensure the reliability of such systems, IT controls—as described in Chapter 3—must be applied.

Classic Oak has purchased optical scanning equipment to simplify verification of FSC certifications. This enables the Quality Assurance Department to confirm whether an FSC label is legitimate and whether the supplier is listed in the FSC database.

These checks are automatically recorded in the purchasing system, which cannot be modified by the Purchasing Department.

12. The organization deploys control activities through policies that establish what is expected and procedures that put policies into action.

It is essential that sustainability-related control activities are anchored within the organization’s structure.

This means that responsibilities, tasks, and authorities are clearly defined and documented in procedures and job descriptions.

INFORMATION AND COMMUNICATION

An integral part of managing sustainability-related risks and opportunities is the availability of relevant and reliable information showing whether the organization is meeting its objectives.

The European Sustainability Reporting Standards (ESRS) (see Section 6.6) require organizations to include performance indicators on material sustainability topics in their sustainability reports — such as greenhouse gas emissions, workforce composition, and other key measures.

13. The organization obtains or generates and uses relevant, quality information to support the functioning of internal control.

To determine which information is relevant, given the organization’s strategy and goals, the Toll Model described in Chapter 2 can be used.

The reliability of information is ensured primarily through a well-functioning internal reliability system, as discussed in Chapter 3.

The management of *Classic Oak* receives the following information to assess whether the objectives regarding sustainable procurement are being met:

- Percentage of purchased metal components made from recycled materials
- List of suppliers incorrectly displaying the FSC certification
- Percentage of purchase orders without valid FSC certification

14. *The organization internally communicates information, including objectives and responsibilities for internal control, necessary to support the functioning of internal control.*

The COSO framework emphasizes the importance of effective internal communication regarding internal control — including the importance of sustainability controls, and the responsibilities of management and employees in executing control activities.

It also highlights the significance of whistleblower mechanisms.

The management of *Classic Oak* held a meeting with the heads of the Purchasing, Quality Assurance, and Controlling departments to explain the goals, responsibilities, and actions required to achieve sustainable procurement.

15. *The organization communicates with external parties regarding matters affecting the functioning of internal control.*

Communication with external parties is often essential to achieving sustainability goals.

This includes communication with customers, suppliers, and industry associations.

Classic Oak provides the industry association for sustainable living with an annual report demonstrating that its furniture is manufactured sustainably.

MONITORING ACTIVITIES

16. *The organization selects, develops, and performs ongoing and/or separate evaluations to ascertain whether the components of internal control are present and operating.*

The internal control system of *Classic Oak* is audited once a year by an independent audit firm. This firm checks if the internal control system is indeed present and operating as claimed.

6.5 European Regulations on Sustainability

European sustainability legislation requires organizations to include information in their annual reports that demonstrates how sustainable they truly are. These obligations initially apply to large organizations, but they may also affect smaller companies that are part of the value chains of larger entities. This section provides a brief overview of the most important European laws and regulations relating to sustainability.

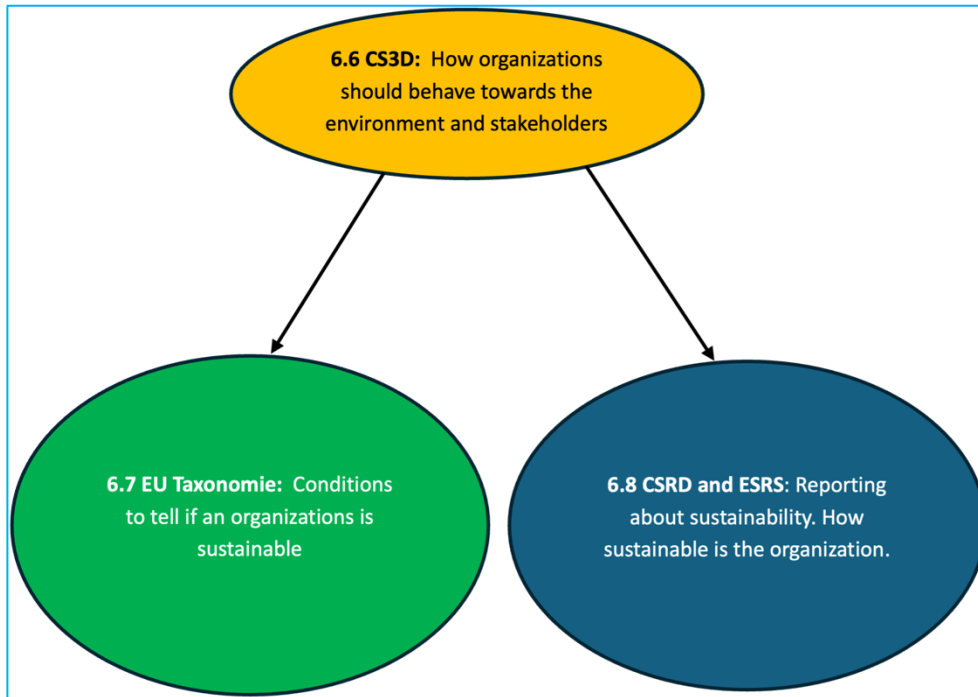
These include:

1. The Corporate Sustainability Due Diligence Directive (CSDDD or CS3D)
2. The EU Taxonomy

3. The Corporate Sustainability Reporting Directive (CSRD) and the resulting European Sustainability Reporting Standards (ESRS)

In addition, there are of course already existing laws in areas such as environmental protection and working conditions, which remain fully in effect. Figure 6.11 illustrates how these European sustainability regulations are interconnected.

FIGURE 6.11 INTERCONNECTED EUROPEAN SUSTAINABILITY REGULATIONS



6.6 Corporate Sustainability due diligence directive (CS3D)

The starting point for responsible corporate behavior should be “due diligence” — meaning that organizations carefully weigh the impact of their actions on people and the environment in relation to the risks and opportunities for the business itself.

In 2022, the European Commission proposed a directive designed to ensure that organizations contribute to sustainable development and the transition toward a sustainable economy by eliminating or minimizing their negative impacts on human rights and the environment.

To achieve this, organizations must implement a six-step due diligence process:

1. Integrate due diligence into policies and management systems.
2. Identify and assess negative impacts on human rights and the environment.
3. Prevent, cease, or minimize actual and potential negative impacts on human rights and the environment.
4. Monitor and evaluate the effectiveness of the measures from steps 1 through 3.
5. Communicate with stakeholders regarding identified impacts and actions taken.
6. Provide remediation or compensation for negative impacts.

The directive focuses on the impact on people and the environment across the organization's value chain. Organizations are only responsible for the negative impacts caused by suppliers and customers if they can exercise influence over those impacts. The CS3D applies to large companies. Directors and executives are responsible for overseeing the implementation of due diligence and for integrating the principles of responsible governance — such as respect for human rights and the climate — into their strategies and decisions.

For companies operating in high-impact sectors, the thresholds are lower.

These sectors include, among others:

- Textiles and leather industries, and wholesale trade in textiles, clothing, and footwear.
- Agriculture, forestry, fisheries (including aquaculture), the food industry, and wholesale trade in agricultural products, livestock, timber, food, and beverages.
- Extractive industries (such as mining), the metal industry, manufacturing of non-metallic mineral products, metal product manufacturing (excluding machinery and equipment), and wholesale trade in extractive products, construction materials, and fuels.

SUSTAINABILITY AND CORPORATE GOVERNANCE IN THE NETHERLANDS

In the 2025 Dutch Corporate Governance Code, it is already stated that the management board is responsible for creating long-term sustainable value, taking into account the impact of the company's activities on people and the environment. When determining strategy and making decisions, long-term sustainability and viability are central considerations, and the interests of stakeholders are carefully weighed (section 1.1.1 Strategy for sustainable long-term value creation. The supervisory board monitors how the management fulfills this responsibility.

GOVERNANCE DISCLOSURE REQUIREMENTS UNDER THE CSRD (ARTICLE 26B)

Under the Corporate Sustainability Reporting Directive (CSRD), organizations are required to provide information about the following governance-related factors:

1. The role of the management board, executives, and supervisory bodies in relation to sustainability matters — including their composition, training, and experience to effectively perform this role.
2. The main characteristics of the company's internal control and risk management systems related to sustainability reporting and decision-making.
3. The company's ethics and culture, including anti-corruption and anti-bribery policies, whistleblower protection, and animal welfare practices.
4. The company's activities and commitments to influence political decision-making, including lobbying activities.
5. The company's relationships with customers, suppliers, and communities affected by its operations — including payment practices, particularly regarding late payments to small and medium-sized enterprises (SMEs).

6.7 Criteria for Sustainability: The EU Taxonomy

The European Union (EU) developed the EU Taxonomy to define when an organization can legitimately be considered sustainable — and when it cannot. This classification is important because being recognized as sustainable can provide financial and reputational advantages.

For example:

- Banks are more willing to offer loans at lower interest rates to sustainable organizations, since they themselves must report on the sustainability of their investments.
- Governments frequently provide subsidies to organizations that meet sustainability criteria.
- Job applicants increasingly consider an employer's sustainability performance when deciding where to apply.

SIX ENVIRONMENTAL OBJECTIVES

The EU Taxonomy currently defines six key environmental objectives (Article 6, EU Taxonomy Regulation):

1. Climate change mitigation
2. Climate change adaptation
3. Pollution prevention and control
4. Sustainable use and protection of water and marine resources
5. Transition to a circular economy
6. Protection and restoration of biodiversity and ecosystems

COMPLIANCE CRITERIA

To comply with the EU Taxonomy, an organization's economic activities must meet the following criteria:

1. Make a substantial contribution to at least one of the six environmental objectives.
2. Do no significant harm (DNSH) to any of the other objectives, in accordance with Article 17 of the taxonomy.
3. Meet minimum social safeguards, such as those defined in:
 - The European Pillar of Social Rights,
 - The Universal Declaration of Human Rights,
 - The OECD Guidelines for Multinational Enterprises, and
 - The International Labour Organization (ILO) conventions.

SECTORS COVERED

The taxonomy rules apply to nine major sectors:

1. Forestry
2. Nature conservation and restoration
3. Industry
4. Energy
5. Water supply, sewerage, and wastewater management
6. Transport
7. Construction
8. Information and communication
9. Professional, scientific, and technical activities

To assess a company's level of sustainability, the EU Taxonomy requires reporting through key performance indicators (KPIs).

FIGURE 6.12 – KEY PERFORMANCE INDICATORS (KPIs) UNDER THE EU TAXONOMY

Type of Organization	Required KPIs
Non-financial companies (operating in one of the nine sectors: Forestry, Nature Conservation and Restoration, Industry, Energy, Water Supply, Sewerage and Wastewater Management, Transport, Construction, Information and Communication, Professional, Scientific and Technical Activities)	- Percentage of turnover derived from sustainable activities that meet taxonomy requirements. - Percentage of capital expenditures (CapEx) invested in sustainable activities aligned with the taxonomy. - Percentage of operating expenditures (OpEx) associated with taxonomy-aligned activities.
Financial institutions (with investments in one or more of the nine sectors above)	- Green Asset Ratio (GAR): The percentage of total assets that are taxonomy-aligned.

6.8 Sustainability Reporting: Corporate Sustainability Reporting Directive (CSRD) and ESRS

On July 31, 2023, the European Parliament adopted a set of reporting standards for sustainability. Although these reporting standards are mandatory only for large and listed companies, smaller organizations may also be affected, as they are often part of the value chains of these larger companies.

For example, large corporations may request information from smaller suppliers about working conditions or greenhouse gas emissions to meet their own reporting obligations and sustainability strategies.

LEGAL BASIS AND SCOPE

These sustainability reporting standards were developed as part of Article 26 of the Corporate Sustainability Reporting Directive (CSRD), which required the creation of reporting standards covering the following areas:

- a) Environmental factors
- b) Social and human rights factors
- c) Governance (corporate behavior and ethics)

These standards are collectively referred to as the European Sustainability Reporting Standards (ESRS) and are summarized in Figure 6.13 below. The standards ESRS 1 and ESRS 2 are always mandatory, while the other topic-specific standards apply only if the related activities are deemed material.

ESRS 1 and ESRS 2:

- ESRS 1 defines the general requirements for sustainability reporting. It specifies that organizations must apply the concept of double materiality (as described in Section 6.1) and report not only on their own value cycle, but also on their entire value chain (as discussed in Section 6.2).
- ESRS 2 requires organizations to disclose how the materiality analysis (Section 6.3) was conducted and to present the resulting materiality matrix, identifying the material sustainability topics.

FIGURE 6.13 – OVERVIEW OF THE EUROPEAN SUSTAINABILITY REPORTING STANDARDS (ESRS)

Category	Standard Code	Title / Description	Applicability
General Requirements	ESRS 1	General Requirements	Mandatory
	ESRS 2	General Disclosures	Mandatory
Environmental (after materiality assessment)	ESRS E1	Climate Change	Conditional
	ESRS E2	Pollution	Conditional
	ESRS E3	Water and Marine Resources	Conditional
	ESRS E4	Biodiversity and Ecosystems	Conditional
	ESRS E5	Resource Use and Circular Economy	Conditional
Social (after materiality assessment)	ESRS S1	Own Workforce	Conditional
	ESRS S2	Workers in the Value Chain	Conditional
	ESRS S3	Affected Communities	Conditional
	ESRS S4	Consumers and End Users	Conditional
Governance (after materiality assessment)	ESRS G1	Business Conduct	Conditional

STRUCTURE AND REPORTING REQUIREMENTS

Each standard generally requires disclosure of the following information relevant to its topic area:

1. Material impacts, risks, and opportunities related to the topic, and how these are connected to the organization's strategy.
2. Policies, plans, and resources adopted to reduce negative impacts and risks — or to enhance positive impacts and seize opportunities.
3. Objectives and performance indicators (KPIs) associated with the topic.

IMPLICATIONS FOR MANAGEMENT INFORMATION SYSTEMS

Although the ESRS are part of external reporting requirements, organizations must have internal management information systems capable of reliably producing the data required for such reports.

This means that sustainability reporting cannot be separated from effective internal control and information management — the systems must be robust enough to deliver accurate, verifiable, and timely sustainability information.

6.9 Guidance for SMEs: VSME

The Corporate Sustainability Reporting Directive (CSRD) issued by the European Union has become an extensive and complex framework.

Small and medium-sized enterprises (SMEs) are increasingly affected by it because large companies often require their suppliers to provide detailed information about their sustainability performance.

This demand frequently exceeds the knowledge, capacity, and resources of the average SME.

While a simplified version of the CSRD already exists for listed small and medium-sized enterprises, it has still often been considered too burdensome.

Therefore, a voluntary and more limited standard has now been developed for non-listed SMEs: the VSME (Voluntary ESRS for non-listed Small and Medium-sized Entities).

If adopted, this standard is intended to enable SMEs to respond uniformly and efficiently to information requests from larger companies.

The VSME consists of three modules:

1. Basic Module – includes a set of mandatory reporting requirements that all SMEs should meet.
Micro-enterprises can comply solely with this module.
2. Narrative – Policies, Actions, and Targets Module – provides guidance to small and medium-sized enterprises on how to describe their sustainability policies, plans, and goals.
This module also includes the double materiality analysis.
3. Business Partners Module – contains the metrics that stakeholders and business clients may request in addition to the basic module.

Summary

This chapter discussed the impact of sustainability thinking on management information systems.

Where management information systems once focused primarily on internal risks and opportunities, they must now also consider the impacts of the organization's operations on the environment and external stakeholders.

To understand these impacts — as well as the associated risks and opportunities — an organization must perform a double materiality analysis, which consists of four steps:

1. Exploring the value creation model and identifying stakeholders
2. Collecting relevant data
3. Analyzing the collected information
4. Developing a materiality matrix

By conducting this double materiality analysis, organizations can prioritize sustainability topics and focus their internal control efforts on those issues that are most significant to both the organization and its stakeholders.

To achieve sustainability objectives effectively, the COSO Internal Control Framework (ICF) remains a useful model.

The European Union has issued three major sustainability directives:

1. Corporate Sustainability Due Diligence Directive (CS3D)
2. EU Taxonomy
3. Corporate Sustainability Reporting Directive (CSRD) and its accompanying European Sustainability Reporting Standards (ESRS)

The CS3D serves as the foundation for responsible business conduct, requiring companies to establish a six-step process:

1. Integrate due diligence into policies and management systems
2. Identify and assess negative impacts on human rights and the environment
3. Prevent, end, or minimize actual and potential negative impacts
4. Evaluate the effectiveness of these measures
5. Communicate with stakeholders about identified impacts
6. Provide remediation and compensation for negative impacts

The EU Taxonomy primarily aims to define criteria for sustainable economic activities, enabling organizations to access green financing and subsidies more easily.

Currently, these technical criteria cover nine high-impact sectors, but they are expected to expand in the future.

The CSRD is mainly a reporting directive, applying primarily to large, listed companies.

The standards developed by EFRAG on behalf of the European Commission are grouped into environmental, social, and governance categories.

Although already extensive, further sector-specific standards are expected to be introduced.

To ease the administrative burden these complex rules impose on SMEs, the EU has introduced the VSME — a streamlined, voluntary reporting framework that enables small

and medium-sized enterprises to participate in sustainable value chains in a consistent and credible manner.