

Practitioner's Section

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Sustainable industrial area management: Using the materiality analysis at a multi-stakeholder industrial park to align activities

This case study is intended to show how multi-stakeholder industrial sites can form a first common framework for sustainable development. The paper presents the application of the materiality analysis approach to a multi-stakeholder industrial park in Germany. The challenge of a multi-stakeholder industrial area is to align activities of different companies within the park and to respond to the expectations of heterogenous external stakeholders. The case study will answer the following questions: 1) How do I identify the key sustainability issues from the internal perspective of the companies involved? 2) How do I find a common denominator for the different companies in the industrial park as a whole? 3) How do I derive the relevant SDG-related aspects for joint stakeholder communication? Benefits and challenges of the method are described and recommendations for the application of the concept are shared.

1 The context and challenge: Sustainable development at multi-stakeholder industrial areas

Founded in 1863, Industriepark Höchst in Frankfurt am Main nowadays is home to some 90 chemical and pharmaceutical companies that conduct research, development and production on site. It is one of the largest industrial parks in Europe, and new companies continue to settle here. It is further developed by the individual companies year after year with investments in the millions. The total investment since 2000 has been around 8.0 billion euros. More than 120 production plants are operated here (Infraserv GmbH & Co. Höchst KG, 2023). In 2023, the headquarters of most companies are abroad, namely France (company [Sanofi](#)), USA (company [Celanese](#)), Japan (company [Kuraray](#)) or Switzerland (company [Clariant](#)). The site is managed by Infraserv GmbH & Co. Höchst KG (company [InfraservHöchst](#))

Infraserv Höchst also has a wholly-owned subsidiary private education provider (company Provadis with its private university of applied sciences, [Provadis Hochschule](#)).

All companies on site have their individual climate strategy – but most of these company climate strategies are global in nature and not specific to the industrial site Frankfurt. At the same time, the municipality of Frankfurt has acclaimed the goal of being climate neutral by 2035. A goal that can't be reached without close collaboration among the different players in the region.

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Transforming a site and dealing with sustainability today:



Perspective of one company

Until the end of the 1990s, it was the headquarters and main plant of the former globally active Hoechst AG group. At that time, all the activities of this integrated site were in one entrepreneurial hand. Due to its clear identity, the environment naturally perceived this site as a cohesive unit.



Perspective of individual companies

At the turn of the 2000s, this site became Industriepark Höchst and developed into a multi-stakeholder site in the hands of 3 international owners, who continue to use this site for their own entrepreneurial activities today: Celanese, Clariant and Sanofi. The site, which continues to have the technological character of a Verbund site, has been operated by Infraser Höchst since 1998 and serves as a place of activity for about 90 companies with a total of about 22,000 employees. The environment observed this development, which is relevant to it, with great attention and at the same time it was a great challenge for it, because now many more companies, which have taken on responsibilities at this site in different roles, had to be taken into account.



Majority coordinated perspective

The growing importance of sustainability has been met by the many companies in Industriepark Höchst in their own corporate responsibility. With the Process4Sustainability cluster initiated in the early 2020s, the site's stakeholders wanted to take the next step in a holistic and coordinated manner to further develop this site into a location for a climate-neutral process industry. The character of a cluster site provides many options for this. This article has shown how a site can identify the key sustainability issues for itself and deal with them in the next steps (internal communication) and how it can prepare them for the environment and make them traceable (external communication). The work done so far represents

- 100 % of the owner companies
- 100 % of the site operator
- > 50 % of the 22,000 employees of Industriepark Höchst.

Figure 1 Transformation pathway of the site (own representation).

Against this backdrop, a structure for regional collaboration among a variety of stakeholders was initiated in 2019, the cluster process4sustainability.eu. It is a cluster for climate neutral process industries in Hesse and is co-funded by the different industrial companies, the state of Hesse, and the European Union alike. The following text describes the mission and vision of the cluster:

"Europe wants to become CO₂ neutral - as early as possible, but by 2050 at the latest. This goal requires a fundamental transformation of the economy and society. The process industry and its partnerships are central to the success of this transformation: together, we can develop new markets through innovative solutions, save energy and raw materials, replace fossil CO₂ sources, and increasingly also use CO₂ as a resource.

The Process4Sustainability cluster - a network of companies in the process industry, research institutions, and social innovation partnerships - wants to proactively shape this transformation process. We translate the major goal of CO₂ neutrality concretely for individual companies and the specific local conditions.

We want the transformation to succeed.

Based at Industriepark Höchst, we offer companies practical knowledge about the levers of CO₂ neutrality, new markets, and innovative business models. We create future markets by connecting solution providers with the relevant demanders.

We see ourselves as a partner for business, science, politics, and society on the road to climate neutrality and are supported by the Hessian state government and the European Regional Development Fund." (Provadis Hochschule, 2023)

The cluster is managed by Provadis Hochschule, through the Center for Industry and Sustainability. This cluster office ensures fruitful collaboration by defining, planning, and implementing the work packages. A steering committee as a decision-making body finds and decides on the activities proposed by the office.

The cluster pursues two major goals, (a) the identification and implementation of an economically viable transformation pathway for the industrial park and the process industries in Hesse, and (b) the definition of a collaboration pattern between the industrial park and the key external stakeholders from the fields of business, academia, society, and politics.

The following text will focus on the second topic and describe the activities of a working group focusing on "Identifying and dealing with the key sustainability issues of the Industriepark Höchst".

2 Finding common ground: Sustainability materiality analysis

2.1 The concepts: Materiality analysis and SDGs

The core challenge of the cluster at the multi-stakeholder industrial park (Unido et al., 2021) was to create a shared understanding of the sustainability-related challenges of the industrial site (Accenture and EPRI, 2023; Cefic, 2023). The industrial site consists of the regional entities of large global corporations with their respective sustainability strategies; at the same time, these regional entities are perceived by neighbours and regulators as a joint entity. This perception of the industrial park is presumably still shaped by its history as the headquarters and main plant of one global company (Hoechst AG).

A variety of concepts can be used to identify sustainability-related topics for an organizational entity. One widely used concept is the materiality analysis (Sailer, 2020; Jenker et al., 2020; Nill and Severtih, 2018; Bertelsmann Stiftung, 2016; Stierl and Lüth, 2015), typically used by an individual company: "The company discloses which aspects of its own business activities have a material impact on aspects of sustainability and what material impact the aspects of sustainability have on its business activities. It analyzes the positive and negative impacts and indicates how these findings are incorporated into its own processes." (RNE, 2023). The core idea of this concept is to identify the expectations of the external environment towards the organizational entity (outside in analysis) and to contrast these expectations with the impact and requirements of the own organizational entity towards the external environment (inside out analysis).

Selecting this concept was the result of a joint decision process of a variety of parties: The selected concept needed to (1) be easy to handle, (2) be compatible with existing company-specific concepts, (3) be easily understood by external stakeholders and (4) allow the integration of existing external information.

The participating companies expected answers to the following questions:

- Inside out: What do the companies jointly demand from society and policy makers? Where do the companies have common interests? Which interests are company-specific? Who might take the lead on a specific topic?
- Outside in: What are the expectations of external stakeholders towards the site in its entirety (in contrast to expectations towards an individual company)? Who are core external stakeholders and how should we work with them?

For communication reasons, it was decided to apply the Sustainable Development Goals (SDG) (GRI et al., 2015; Nill et al., 2017; Kaminski-Nissen and Bongwald, 2022; United Nations, 2023; VCI, 2020) for framing the sustainability-related challenges and expectations. This global initiative of the United Nations (UN) is widely used by a variety of regional stakeholders and provides the necessary legitimacy and connectivity for the industrial park's messages. Other sustainability issues that did not align with the concept of the SDGs were not considered in this project in the first instance. These two core concepts, the materiality analysis, and the SDGs, are used by many local companies, which in turn are part of globally active corporations: They apply the materiality analysis in their corporate reports and the SDGs in connection with their sustainability communications via their headquarters. This approach thus immediately found the necessary support from the cluster members. As part of the materiality, these internal stakeholders (international companies) were integrated with their corporate requirements in a way that is appropriate for the site, thus preparing the ground for an exchange with external stakeholders.

The aim of the project is not to develop a reportable materiality analysis for the industrial park, but to use the work described above to identify the key sustainability issues for our industrial park and prepare them for external communication with our stakeholders.

2.2 A multi-step process with feedback loops

A materiality analysis generally refers to a company. It focuses on the sustainability impact of the corporate strategy and at the same time involves the various stakeholders of the company, who in turn exert an influence on the company. Basically, this approach can also be applied to a site, even if it does not have a uniform corporate strategy for all the companies located there. A site with all the companies located there will cause sustainability impacts in its entirety and at the same time be considered by various stakeholders.

So how did we specifically go about adapting the approach of a materiality analysis to a multi-stakeholder industrial site with around 90 companies?

Relevant goals of this work package were to create a shared picture of the relevant sustainability issues for the Industriepark Höchst and to link these to the SDGs.

Description of our process:

(1) Identifying

The Industriepark Höchst is one of the major "industrial agglomerations" in FrankfurtRhineMain and faces a wide range of expectations from different stakeholder groups (e.g. the city of Frankfurt, the state of Hesse, citizens' initiatives). The first objectives were to survey the expectations of these stakeholders and to assess the potential influence of the stakeholders on the business. The definition of the field was done based on an in-depth desk research (1) on potential methods, approaches, and/or regulations and (2) on procedures of other locations and companies in the region and (3) on the actions of companies located at

Industriepark Höchst. On the one hand, the cluster evaluated sustainability reports of the international and reporting companies. On the other hand, in the case of the non-reporting companies, benchmark comparisons were carried out and corresponding proposals were derived. Furthermore, the results were discussed both bilaterally and multilaterally with the companies and subsequently approved. In addition, extensive desk research was conducted. With the help of expert interviews with national and European chemical association institutions (Chemie³, cefic), industry standards and activities of other large chemical sites (e.g. BASF, Currenta and Chemelot) were analysed. In addition, companies and institutions from the region (e.g. Fraport, Mainova, City of Frankfurt) were observed. As a result, a long list of 132 sustainability topics was compiled. The result was a comprehensive picture of the most important sustainability topics of the companies involved, which had been derived by reviewing sustainability reports or other sources, materiality analyses and SDG communications.

(2) Prioritising

In the next step, in the "prioritising" phase, all the essential topics of the individual companies were brought together and clustered into common overarching topics that were prioritised to obtain a comprehensive picture of the essential topics of the industrial park. This extensive material enabled the development of a first draft of a materiality analysis for the Industriepark Höchst. The outcome of this phase was the prioritisation of the essential topics of the industrial park based on the individual companies. Related to this, a list of 101 topics resulted; redundant aspects were eliminated and the availability of the operationalisation of the aspects was checked.

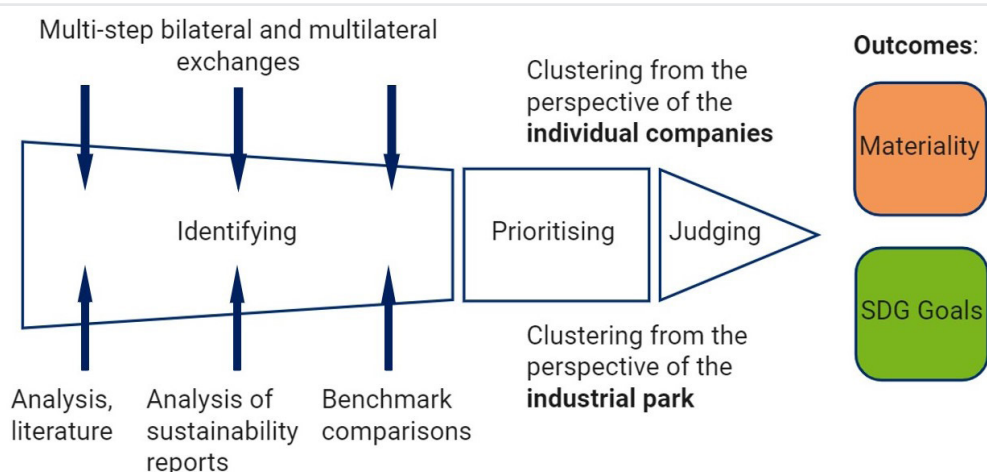


Figure 2 Process and steps towards the outcomes (own representation), 2023.

(3) Judging


The findings of the “prioritising” phase were discussed in a series of cluster workshops with multiple sustainability experts from different cluster companies. In various exchange formats with the companies involved in the cluster, the specific material sustainability issues for Industriepark Höchst were identified. The objective of this phase was to decide on the central sustainability topics of the industrial park which should be communicated externally. These will be expressed by the corresponding SDGs, which are to be reinforced by tangible projects of the individual companies in the industrial park. The summarized topics were to (1) be relevant to the different external or internal stakeholders and (2) to be potentially influenced by the respective stakeholder groups. As a result, 22 topics were identified and summarized in a coherent catalogue of topics for the materiality analysis.

(4) Outcomes

The next step was to link the identified sustainability issues with the corresponding sustainable development goals. The goal here was to group the issues in a way that matched existing definitions and criteria – in order to structure the cluster’s internal and external communication activities. The results of our work were presented and discussed first in smaller and then in increasingly larger circles of companies at Industriepark Höchst.

As a result, SDG-related communication activities were achieved. The developed framework was shared with the various companies at the site. It was possible to publicly present the SDGs and suitable sustainability projects that pursue these SDGs with concrete corporate activities on Industriepark Höchst’s sitewide web portal for the first time Sustainability | Industriepark Höchst (<https://www.industriepark-hoechst.com/>).

The SDGs at Industriepark Höchst and in Process4Sustainability










SDG	Definition	Examples	SDG	Definition	Examples
	Ensure a healthy life for all people of all ages and promote their well-being	<ul style="list-style-type: none"> Insulin from Sanofi Covid-19 vaccine Other products of the site companies 		Build resilient infrastructure, promote broad-based and sustainable industrialization, and support innovation	<ul style="list-style-type: none"> Industrial park at the cutting edge of technology Industrial Park as Innovation Campus Cluster: Exchange formats
	Ensure access to affordable, reliable, sustainable and timely energy for all	<ul style="list-style-type: none"> Key task of Infraserb Coal phase-out H2 filling station Cluster: Examination of the possibilities of renewable energy 		Ensure sustainable consumption and production patterns	<ul style="list-style-type: none"> Industrial park as the epitome of the circular economy Hydrogen trains; phosphorus recycling Cluster: Chemical recycling
	Promote lasting, broad-based and sustainable economic growth, full and productive employment and decent work for all	<ul style="list-style-type: none"> 22,000 well-paid jobs Large trade tax payer in Hesse 		Take immediate action to combat climate change and its effects	<ul style="list-style-type: none"> Commitment to CO₂ neutrality 2045 Cluster: Collaboration for transformation path
				Strengthen means of implementation; global partnership for sustainable development.	<ul style="list-style-type: none"> Cluster: Close cooperation with regional players International exchange of experience

Figure 3 Defined SDGs for the Industriepark Höchst, Provdias Hochschule, 2022.

This first overview can be understood as a first-generation SDG concept for the industrial park. In the future, this picture will be updated by integrating the perspective of further cluster partners, further external stakeholders' views and in the light of technological, societal and environmental developments. Furthermore, in a new generation, in addition to the activities, concrete common goals, that the industrial park wants to achieve, could also be defined. Consequently, a status and/or progress report would fit in.

3 Conclusion

The adapted materiality analysis for multi-stakeholder industrial sites can be used to identify and deal with the essential sustainability issues in an aggregated and coordinated way; the described process has helped the companies based at the Industriepark Höchst in different ways:

- Better understanding among peers: Through the described process, companies know more about each other and can thus learn from each other and identify or work on joint sustainability projects - projects that would possibly demand a greater effort for each individual company. Particularly in the last few years, there have been numerous challenges (including shortage of skilled workers, COVID-19 virus, fragile supply chains, Russian war in Ukraine, energy crisis) combined with increased regulatory demands (EU Taxonomy) the collaboration can be of great benefit, especially for SMEs (joint learning, joint testing, more substantial and faster implementation in the community and in the own company). This improved mutual understanding may also promote constructive dialog when it comes to larger new investments or new settlements onsite.
- Joint external communication: A common understanding of the cluster companies enables coordinated joint external communication - be it with the neighbours or with the relevant public bodies (community, city, state) leading to an improved societal acceptance and support.
- Preparation for reporting (EU Taxonomy): Cluster companies can access a wide variety of methods and regulations in order to select a specifically suitable common approach for the development of the key sustainability topics. By taking stock of the relevant methods and regulations, the cluster work can support the company's internal preparation for the upcoming reporting duties.

At the same time the following limitations need to be taken into account:

- Sustainability issues change over time: These issues will be subject to change as a result of internal developments at individual companies - new ones will be added, existing ones will undergo modifications, and others will disappear, as they will have become less important or will have been replaced by solutions through new decisions or will no longer be allowed as a corporate activity due to external requirements and regulations.
- Sustainability communication needs to change over time: As developed here, external sustainability communication can be framed in relation to the Sustainable Development Goals. Here, too, changing requirements of internal and external stakeholders will either necessitate adjustments in breadth (additional SDGs) and/or in depth (more comprehensive reporting on the projects addressed), or new reporting options will lead to new concepts in communicating with stakeholders.
- Industrial site's activities complement company specific activities: Site-related activities do not replace the efforts of each individual company to formulate its own sustainability strategy and thus achieve the set corporate goals and meet regulatory requirements. The added value in the additional cooperation of different companies within an agglomeration has been the focus of this article.

For our concerns at Industriepark Höchst, the described approach has proven to be effective. Every other entrepreneurial agglomeration (business park, industrial region or similar) must define a context-specific approach. Developing this context-specific approach for this industrial park requires the close collaboration of all relevant stakeholders, the discussion of their interests and goals in order to create a site-specific sustainability roadmap that complements the individual company strategies.

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