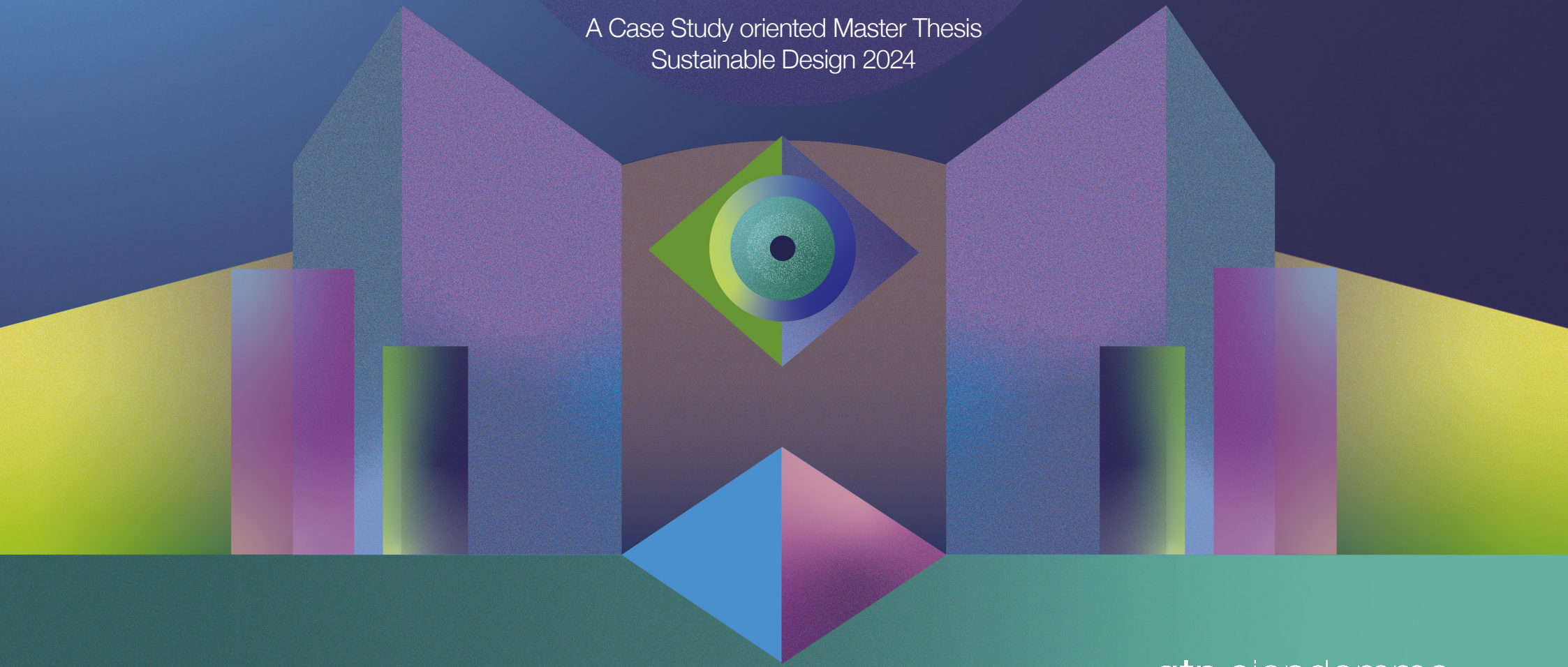
From Insight to Impact

Navigating Sensemaking and Sustainability Perceptions at ATP Ejendomme A/S

A Case Study oriented Master Thesis
Sustainable Design 2024



BREAKING NEW GROUND
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Foreword

Embarking on a journey of exploration, this master's thesis unfolds as a testament to the collaborative efforts and support that have shaped our endeavors. We are profoundly grateful for the invaluable guidance and support we have received from our supervisor, Jens Dorland, Tenure Track Assistant Professor at Aalborg University Copenhagen. His expertise, encouragement, and commitment have been instrumental in shaping the research. We extend our deepest gratitude to ATP Ejendomme A/S for graciously opening their doors and providing us with the opportunity to conduct our master thesis within their organization. This collaboration has allowed us to delve into real-world contexts and enrich our academic exploration. A heartfelt thank you goes out to all the employees inside ATP Ejendomme A/S who generously participated in interviews over the past four months. Your willingness to share insights and experiences has been invaluable, contributing significantly to the depth and richness of our research. Lastly, we want to acknowledge the support received from our family and closest friends. This past four months is truly something we will take on with us, embarking on our official new roles as Sustainable Design Engineers.

Abstract

Framed to investigate the influence of employees' beliefs and perceptions on sustainability initiatives, the case study aims to surface the potential of a shift from compliance-oriented to self-driven sustainability behaviors in ATP Ejendomme A/S. Employing Sensemaking (SM) and Actor-Network Theory (ANT) theory, the case study delved into the dynamics shaping employees' perceptions of sustainability, revealing the impact of values. The case study highlights five key findings: 1) Employees' perceptions of sustainability are influenced and shaped by their tasks and personal values. 2) Roles undertaken by employees shape the level of engagement in sensemaking. 3) Actors such as tenants have higher agency than sustainability. 4) Assessing the sustainability of current initiatives through the R-hierarchy revealed areas of strength, but also scalability concerns. 5) Utilizing the Design for Sustainability (DfS) framework showed that sustainability manifests at materiality level. Lastly, the study ends by suggesting how employees could be moved towards self-driven behaviors through a design suggestion centered on storytelling.

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1. Dictionary

AM: Asset manager. An asset manager is working closely together with the customers inside ATPE's buildings. Asset managers are the link between ATPE and the customers.

ATP: The pension fund.

ATPE: ATP Ejendomme (the subsidiary of ATP).

DS: Design suggestion.

ESG: Name of department inside ATPE responsible for implementing sustainability in strategies and daily tasks.

KEM: Key enactment moments.

PM: Project manager. A project manager is responsible for small, medium and large building projects such as renovations and construction of new buildings etc.

RQ: Research question.

SDE's: Sustainable Design Engineers.

Use case: Set of steps designed to address a specific user need.

2. Introduction

2.1 The Field of Study - ATP Ejendomme A/S

This case study was conducted in the Danish real-estate organization ATP Ejendomme A/S (ATPE), a subsidiary of the pension fund ATP (which stands for 'Arbejdsmarkedets Tillægspension') (ATP, n.d). As a pension fund, ATP allocates capital from Danish individuals into diverse assets like bonds, stocks, and properties to generate the highest possible return on investment, which ensures funds are available to pay pensions to individuals when they retire. ATP's guiding principle is the ATP-law (Beskæftigelsesministeriet, 2024), which indicates that ATP must only invest in low-risk strategies that promise long-term returns to ensure economic safety for Danish citizens.ATPE, as a subsidiary of ATP, does this by investing and managing properties. For context, we have utilized ATPE's 2023 annual report (ATP Ejendomme A/S, 2023) to give a sense of ATPE's extent (see fig 1).

Employees

124

Departments

15

Location

Copenhagen

Total Properties*

84

Total

606.368 m2

Total electricity

24.108.554 kWh

Total heating

36.928.858 kWh

Total emissions**

4.082 CO2e

*Only buildings in Denmark that are fully operational (not under construction)

**Scope 3 emissions

Fig 1: ATPE overview. Self-made illustration.

In 2019, ATPE management established an ESG department responsible for implementing sustainability in daily operations. With upcoming regulations such as the Corporate Sustainability Reporting Directive (CSRD) and EU Taxonomy, the ESG department is responsible for ATPE activities to comply with these standards. Since 2022, Laura, one of the case study's authors, has worked in ATPE's ESG department. Despite initiatives to engage employees in sustainability strategies, she observed their passivity in implementation, often deprioritizing sustainability in favor of other aspects. We have termed this passive behavior "compliance-oriented." We wonder if this compliance behavior is related to the ESG team's struggle to integrate sustainability initiatives into employees' daily routines. At the same time, Laura observed curiosity among some employees who had approached the ESG department and sought guidance to prioritize sustainability. We have coined these phenomena as self-driven behaviors. Highlighting these phenomena to the head of ESG in ATPE, we got the opportunity to explore employees compliance-oriented behaviors further (see fig 2). To contextualize our case study, we have explored literature highlighting the urgency of sustainability studies, such as ours.

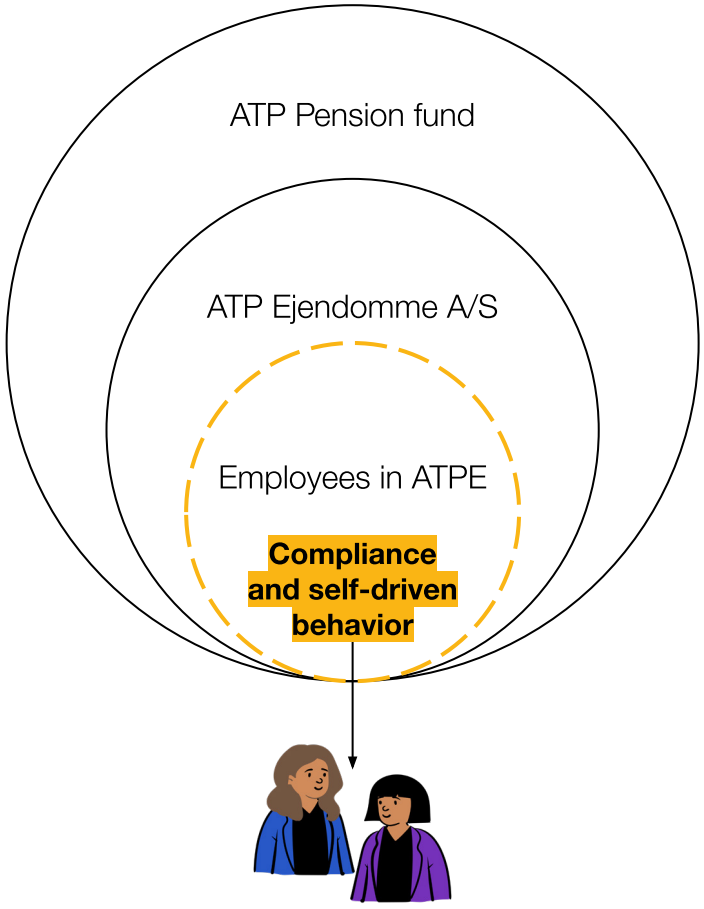


Fig 2: Field of study. Self-made illustration.

2.2 Urgency of Studies in Sustainability

The concept of sustainability emerged in forestry and was used for the first time in 1713 in Germany (Kuhlman & Farrington, 2010; Ademi & Klungseth, 2023), but only after the Brundtland Report in 1987 sustainability was given widespread recognition to become part of the international debate. The report initially highlighted two primary concerns: development and the environment (Kuhlman & Farrington, 2010; Strand et al., 2015). However, current discourse on sustainability often revolves around three dimensions: social, economic, and environmental. The United Nations emphasized these dimensions in their framework of the 17 Sustainable Development Goals (SDG's) (UN, n.d.).

In 2015, at the signing of the Paris Climate Agreement (UNCC, n.d.), the Earth's atmosphere contained 410 ppm of carbon dioxide. After a two-year slowdown due to COVID-19, this number rose to 420 ppm (Shrivastava et al., 2023), underscoring the urgency for change. Another facet of evidence is research pointing out that we have entered the Anthropocene era, in which the stability on Earth that characterized the previous Holocene era, a period spanning almost 10.000 years, is under threat (Rockström et al., 2009). The 'planetary boundaries' framework stresses that six out of nine boundaries have been exceeded (Richardson et al., 2023). The research above joins 50 years of scientific evidence highlighting the urgency of addressing climate change, as humans have collectively been too slow in implementing the necessary solutions (Shrivastava et al., 2023). As climate change intensifies, weather conditions worsen, poverty rates increase, and the sixth extinction persists (UN, 2024), highlighting the relevance of our case study on compliance-oriented behavior.

2.3 Rooted Sustainability Problems

The previous insights provided a global perspective but are too far from the behaviors we have observed. These behaviors hinder the ESG department from integrating sustainability strategies into employees' daily tasks, acting as a barrier. We wonder if this barrier is unique to ATPE, hence why we have appealed to literature that explores barriers to implementing sustainability. Research suggests that "ambiguous terminology and definitions" (Gudmundsdottir & Sigurjonsson, 2024, p. 2) are barriers that hinder sustainability, which is reflected in how organizations set their sustainability targets by customizing them at the corporate level to fit known frameworks like the SDG's (Gudmundsdottir & Sigurjonsson, 2024). We ponder whether this ambiguity is also why ATPE employees do not prioritize sustainability in their projects, even though strategies aimed to guide them already exist.

While Corporate Social Reporting (CSR) standards potentially mitigate generic language by dictating the content and format of disclosures, their effectiveness hinges on specificity, such as precise metrics. Even then, such metrics might not align with all organizations. Establishing CSR criteria at the industry level may enhance specificity but could sacrifice industry comparability (Christensen et al., 2021). A different angle points towards the increasing economic inequality and concentration of wealth, which have resulted in much of the economic decision-making power being held by few. Less than 1% of the world's population owns over 50% of the world's wealth (Shrivastava et al., 2023; Ahmed, 2022), but resistance to change is not exclusive to the wealthy; even middle and low-income groups show reluctance. The barriers exposed in the research emphasize the multifaceted challenges that organizations such as ATPE may face.

2.4 Connecting Sustainability and People

To fully confirm the relevance of our study on human behavior (compliance-oriented/self-driven), we have explored literature on the connection between human behavior and sustainability.

Claiming that humans are in "the planetary driver's seat" (Rockström, 2015, p. 3), is why studies that focus on human behavior are crucial to determining the future of Earth. Pertinent to compliance-driven behaviors, the literature suggests that psychological aspects of decision-making and the fear of climate change prompt defensive reactions. While these reactions may seem irrational, they manifest as action paralysis (Shrivastava et al., 2023). In the case of organizations, research suggests that engaging employees cultivate a sense of purpose, dedication, and accountability, leading to their active involvement in sustainability initiatives (Gudmundsdottir & Sigurjonsson, 2024). However, our observations at ATPE suggest that employees play a critical role in shaping sustainability initiatives as "organizations are shaped by what people believe in and how they act" (Luís & Silva, 2022, p. 372). Based on this knowledge, our case study of compliance-oriented behavior is not only pertinent for advancing sustainability studies but also critical, knowing that the building and construction sector accounts for 37% of global emissions (UN, 2023).

Having established the context for the case study and its relevance at multiple levels, we, two master's students from Sustainable Design at Aalborg University Copenhagen, explored ATPE employees' compliance-oriented behavior to investigate whether understanding these behaviors could lead to more self-driven behavior in the future. To do so, we drew from Karl E. Weick's concept of sensemaking, guided by the following research question:

> How do individual beliefs and perceptions of sustainability among employees in an organization shape their current sustainability initiatives, and can this understanding initiate a transition from *compliance-oriented* behavior to *self-driven* sustainability behaviors?

Weick (1988) explains the mechanism that leads to ***compliance-oriented behavior*** as ***safe inaction***, which is understood as situations where individuals choose not to respond to a problem or challenge because they perceive the potential risks or consequences of action to be greater than the benefits. Weick (1988) also provides a contrary concept: ***dangerous action*** which aligns with ***self-driven behavior***. Weick (1988) explains dangerous action as situations where individuals take action in response to a problem or challenge despite the perceived risks or uncertainties associated with that action.

To guide our case study, we propose the following subquestions that, when combined, answer the research question:

1. How is the sensemaking between employees about sustainability?
2. What is the level of sustainability in employees' current initiatives?
3. What could it take to engage employees further in sustainability initiatives?

2.5 Recap of case study

Our case study at ATPE examined employee compliance behaviors and their perceptions of sustainability, aiming to investigate the possibility of transitioning employees towards self-driven sustainability behaviors.

Using sensemaking theory, we discovered that employees' sustainability perceptions are shaped by their tasks and personal values and that roles undertaken by employees significantly influence sensemaking dynamics and engagement levels. Key enactment moments highlighted that some actors often have more agency than sustainability, although sustainability has the power to trigger employees' emotional responses. Design dynamics can shape, validate, and expand employees' sustainability values towards accepted ones.

The R-strategy evaluation showed that while ATPE's sustainability initiatives surpass standard practices, the lack of initiatives' scalability risks veering into greenwashing. The Design for Sustainability (DfS) framework revealed that sustainability manifests at a materiality level, but ATPE contains motivated employees willing to integrate sustainability values with work tasks.

Based on our findings and the literature review, we developed a design suggestion that, upon testing, confirmed the importance of actors addressing emotional sustainability responses. Non-human actors must address these responses effectively to integrate sustainability into ATPE's organizational structures.

This report's chronological structure does not necessarily reflect how the case study was carried out, as we employed the abductive method, hence why the upcoming section will unfold how we have navigated the relationship between empirical data and theories.

3. Research Design

The research design navigates the relationship between qualitative empirical data and theories that have informed our methodological choices throughout the case study following the abductive method. Fig 3 shows how we structured the case study to address the research subquestions.

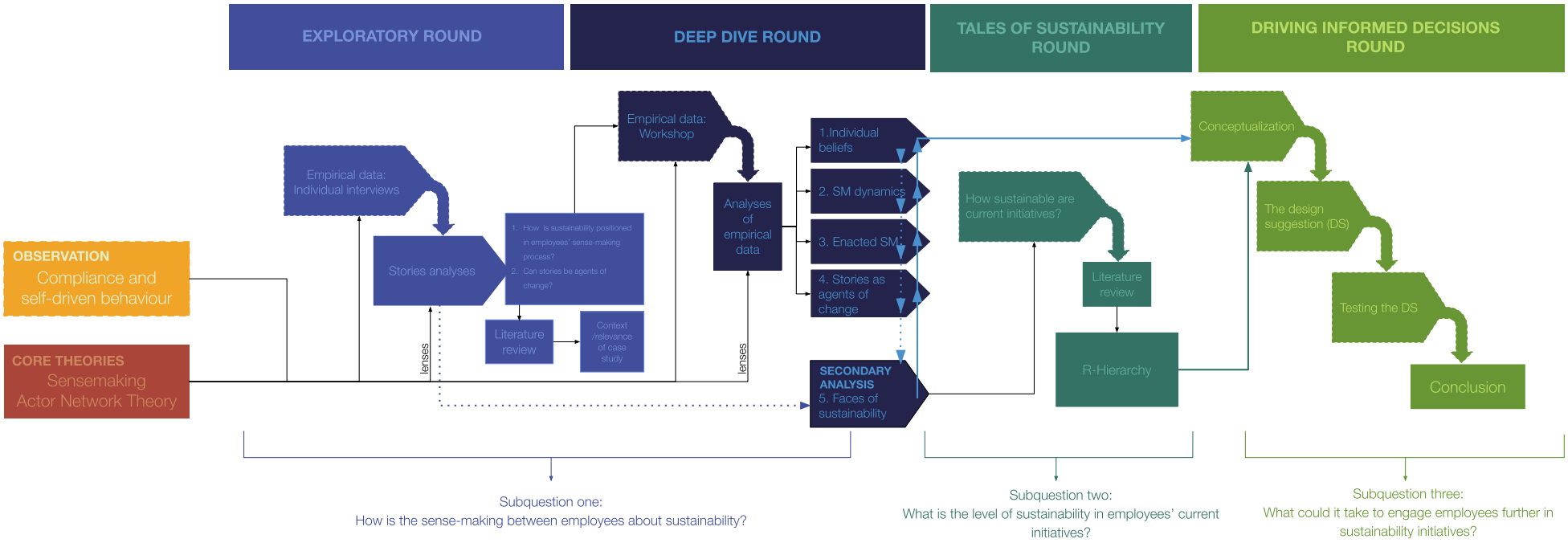


Fig 3: Project overview.

3.1 Exploratory Round

When we started visiting ATPE offices to conduct the case study, some employees approached us seeking more information (see appendix 1), laying the foundation for the first sample size to gather data as we wanted to understand this behavior. We determined that sensemaking (SM) and Actor-Network theory (ANT) could be used as core theories (see section 4.2 and 4.3). The empirical data was analyzed using the theories, which led us in five directions. By selecting two of them: how sustainability is positioned in employees' sensemaking process and the idea of stories as agents of change, we conducted a literature review (see section 6.3) and laid the basis for the next round.

3.2 Deep Dive Round

We designed a workshop to surface insights related to the two findings from the exploratory round. Fig 3 shows that, by design, the theories fed both the workshop's design and the analyses of gathered empirical data. We structured the empirical data in four analyses. A secondary analysis was conducted to gather the insights from the before-mentioned analyses. The insights of this round inform both of the following rounds.

3.3 Tales of Sustainability in ATPE Round

Faces of sustainability encapsulated the manifestations of sustainability in ATPE, which, on one side, exposed ATPE employees' focus on materials and on the other, called for a holistic reflection. This prompted us to conduct a literature review (see section 8.2), which helped us select a suitable method for assessing sustainability in two recent initiatives. The assessment was carried out in two sections. First, we used the R-hierarchy to assess the initiative's sustainability degree. Second, an assessment of the five faces of sustainability with the DfS framework to paint a picture of how sustainability manifests in ATPE's.

3.4 Driving Inform Decisions Round

This round was designed to activate the insights from the previous rounds by conceptualizing a design suggestion. It also entailed workshops to test whether the design suggestion engages employees toward self-driven behaviors. Lastly, we present our results together with possible future directions.

4. Theoretical Framework

The following sections elaborate on the theoretical framework and how it has supported our case study.

4.1 Organizations Through the Eyes of Karl E. Weick

Karl E. Weick departs from the classical views of organizations by proposing that they are sensemaking machines or social forms in constant sensemaking processes (Czarniawska, 2005). Weick's organizational theory focuses on organizing ongoing interdependent actions into coherent sequences (Czarniawska, 2005). His impact on the organizational field stems from his embrace of ambiguity, ambivalence, equivocality, and plausibility, and he acknowledges that organizing involves a complex and inherently ambiguous sensemaking process rather than attempting to impose the rules of rationality on a disorderly world (Czarniawska, 2005). While we operate inside an organization, our primary focus is on the individuals inside. We do acknowledge that organizational structures affect the sensemaking processes of employees. Still, our goal is not to focus on the organizational structures, but rather understand employees' sensemaking processes to foster self-driven sustainability behaviors. Therefore, we will explain and relate the sensemaking theory to our case study.

4.2 Sensemaking (SM)

Developed by Karl E. Weick, the concept of sensemaking (SM) emphasizes the internal cognitive processes and social interactions through which individuals construct their understanding of the world, particularly in unclear situations: "Where there is no frame or at least no obvious connection presents itself, one has to be created – and this is sensemaking." (Czarniawska, 2005, p. 271). SM focuses on how individuals and groups interpret and give meaning to their experiences, highlighting the significance of their subjective perspectives.

The concept of SM supports us in answering the research question in two ways: first, by offering a perspective to grasp the impact of employees' perception of sustainability in organizational practices, and second, by facilitating an examination of beliefs and values where elements that might

encourage employees to become more engaged in sustainability initiatives surface. Our research question aligns with Weick's (1988) concepts of dangerous action and safe inaction as we use these mechanisms to explain compliance-oriented and self-driven behaviors (see section 2.4).

Non-interpretivism may view case studies with a subjective focus as less valid. Still, following Czarniawska (2005) and Weick (1995), the notion about what makes SM valuable is plausibility rather than correctness:

> The answer is, something that preserves plausibility and coherence, something that is reasonable and memorable, something that embodies past experience and expectations, something which resonates with other people, something that can be constructed retrospectively but also can be used prospectively, something that captures both feeling and thought, something that allows for embellishment to fit current oddities, something that is fun to contrast. In short, what is necessary in sensemaking is a good story. (Czarniawska, 2005, p. 272).

Weick (1995) proposes seven properties of sensemaking, which we have summarized in fig 4. They do not have a linear order, and the presence of all properties' or degree of presence is not a prerequisite for SM processes. For us, these properties serve as a guide to analyze our empirical data.

4.2.1 Limitations of Sensemaking

Sensemaking theory heavily relies on subjective interpretations. This urges us to emphasize formal structures and their relevance. In its descriptive nature, it offers limited guidance for proactive organizational management, but we accept this, as our research question does not focus on organizational management. As sensemaking theory flourished from Weick's background as a psychologist, it emphasizes individuals and social processes, which downplays other vital factors that shape organizational behaviors towards sustainability, such as financial and regulatory factors. To fill out these gaps and gain a more holistic theoretical foundation, we have combined SM with another theory: Actor-Network theory (ANT). The combination of theories addresses the potential weakness of solely relying on one theory.

Fig 4: Seven properties of SM. Self-made illustration.

4.3 Actor-Network Theory (ANT)

ANT is brought into play to introduce a material-semiotic approach that acknowledges the interconnectedness of material and symbolic dimensions (Czarniawska & Hernes, 2005). Stating that entities are what they are in relation to other entities (Jensen, 2003), ANT allows us to explore a more comprehensive understanding of how various entities contribute to the dynamic of a network and how material-semiotic networks could enable or constrain sustainability practices in organizations. Specifically, the aim is to utilize the concept of "translation" between actors, which is described as: "A way of describing movements of different forms - of knowledge and cultural practices, but also of technology and artifacts" (Czarniawska & Hernes, 2005, p. 9). As the research question indicates, we seek to uncover and analyze how movements, such as individual beliefs and perfections, are transformed into ATPE. In doing so, we aim to explore how movements could be transformed differently into the organization and how this reshaping could enable self-driven sustainability behaviors among employees.

4.3.1 Limitations of ANT

Critics note that ANT tends to diminish the role of human agency by assuming both human and non-human actors as equals, potentially ignoring unique aspects of human decision-making processes. This assumption oversimplifies the complexities of power differentials and social interactions. ANT may lack the normative guidance to allow us to evaluate networks' desirability or ethical implications, but we do not see this as problematic, as our research question has a different aim.

4.4 Sustainability

This section explores two theories: Circular Economy (CE) and Design for Sustainability's evolutionary framework (DfS).

4.4.1 Circular Economy (CE) - The R-hierarchy

Following Reike et al. (2018), Circular Economy's (CE) transformative potential lies in the "nuanced material hierarchies as operationalization principle of CE, sometimes called R-hierarchies or imperatives" (Reike et al., 2018, p. 247). CE accepts the 3R-imperatives 'reduce', 'reuse' and 'recycle', but also emphasizes imperatives with shorter loops, such as 'refurbishing' or 'repurposing', with the objective of retaining the highest possible value over a product's multiple life cycles (Reike et al., 2018).

We have chosen to use the R-hierarchy (see fig 5) to assess sustainability in ATPE due to their focus on property investment and the consequential emphasis on material flow to maintain their buildings. Due to this, our assessment data primarily revolves around material quantities and we hypothesize that the R-hierarchy provides a framework that resonates with ATPE employees.

Fig 5 shows the R-hierarchy based on the work of Reike et al. (2018). For a detailed explanation of each R-strategy, visit appendix 2.

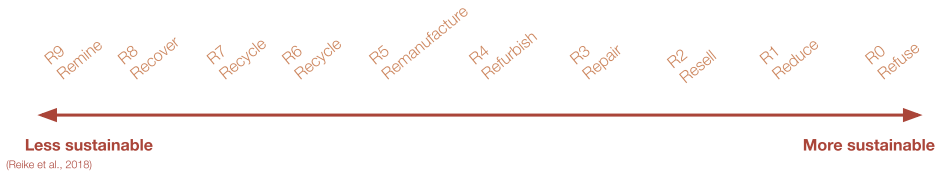


Fig 5: R-hierarchy. Self-made illustration.

4.4.1.a Limitations of R-hierarchy

While we acknowledge that the R-hierarchy is useful, it still has some limitations. The hierarchy implies a linear progression from remining to refusing, but in practice, sustainability challenges are often more complex and interconnected. To address these limitations, we have combined our sustainability assessment with a more holistic approach to sustainability.

4.4.2 Design for Sustainability (DfS) Evolutionary Framework

To assess sustainability in a more holistic approach, we have chosen to use the socio-technical system (STS) framework: Design for Sustainability (DfS) by Ceschin & Gaziulusoy (2016). The framework explores the evolution of DfS across four innovation levels (see fig 6), and our objective is to assess the findings gathered from our case study using these four innovation levels as a benchmark.

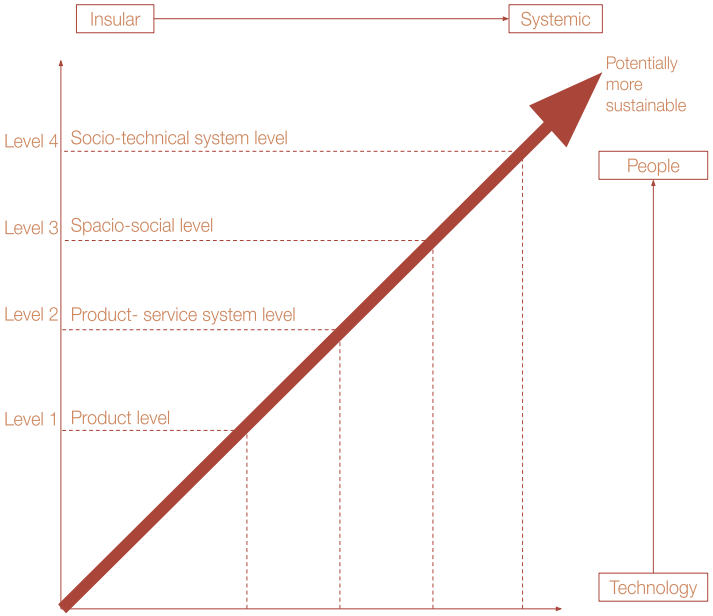


Fig 6: DfS evolutionary framework (Ceschin & Gaziulusoy, 2016, p. 143).

The four levels of innovation are:

1. Product level, which focuses on improving existing or developing new products.
2. Product-service system level, aiming to integrate products and services.
3. Spatio-Social level, which explores spatial-social conditions of human settlements
4. Socio-technical system level explores radical changes in societal needs and focuses on the transition to new sociotechnical systems.

Cheschin & Gaziulusoy (2016) proposes two dimensions (see fig 6). The first is people and technology, which aligns with sensemaking theory as it focuses on “evolution from a technically focused and incremental view of innovation towards innovations in which sustainability is seen as a socio-technical challenge where user practices and behaviors play a fundamental role.” (Ceschin & Gaziulusoy, 2016, p. 141). Second, insular and systemic systems provide a scope from internal range to broader socio-economic systems.

5. Method

5.1 A Case Study About Employees

Before highlighting the specific methods during each round, we have gathered the rationale behind our overall methodological approach and our case study's foundational philosophical assumptions (see table 1).

Element	Description
Research design	Qualitative case study with a focus on employees inside ATPE. Referenced scholars: Flyvbjerg (2006) and Yin (2003).
Methodological approach	Abductive method following the combination of theoretical frameworks with empirical data. Referenced scholars: (Alvesson & Sköldbjerg, 2018).
Foundational philosophical assumptions	Sensemaking is compatible with the abductive method, as both prioritize subjective interpretations and meanings. Both are consistent with the interpretivist paradigm by Burell & Morgan (1979), which recognizes the importance of subjective interpretations and meanings in understanding social phenomena. In contrast, this case study diverges from more rigid structuralist approaches that aim to establish universal truths about social phenomena, as it is largely independent of individual subjective experiences.
Ethical considerations	We anonymized all employees' identities to reduce social desirability bias and improve data authenticity. When referring to employees, we utilized the first letter of their names. This decision applies throughout the whole case study.

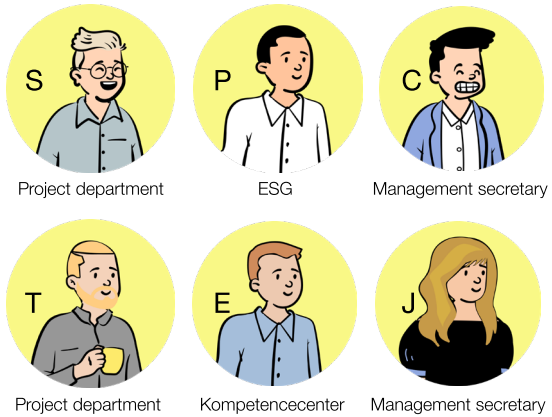
Rounds	How it aids the research question	Contributes to which subquestion:
Exploratory round	Six single interviews to understand individuals' perspectives of sustainability.	How is the sensemaking between employees about sustainability?
Deep dive round	One workshop with four employees to explore sensemaking dynamics among employees and validate findings from the exploratory round.	
Tales of sustainability	Analyze data to assess the sustainability degree of current initiatives	What is the level of sustainability in employees' current initiatives?
Driving informed decisions	Transform insights of previous rounds into a concept.	What could it take to engage employees further in sustainability initiatives?

Table 1: Our case study's foundational philosophical assumptions.

Reflecting on our methods, combining abductive reasoning with a qualitative case study has helped us achieve an understanding of how employees in ATPE make sense of sustainability individually and in groups. Our interpretivist perspective focuses on understanding these experiences from the employees' view, making our analysis more relevant to the real-life context of ATPE employees.

5.2 Exploratory Round

Table 2 provides an overview of the methods for this round, intending to collect data to address the subquestion: How is the sensemaking between employees about sustainability?

Element	Description
Sample	Six ATPE employees from diverse backgrounds (see fig 7) were selected, representing the employees who actively approached us (appendix 1). The sample does not represent all the teams in ATPE.  Fig 7: Sample composition.
Interview method	Semi-structured individual interviews based on the sensemaking theory by Weick (1995) (see appendix 3). As described by Torres (2021), it utilized storytelling to elicit rich and contextual data from the employees.
Data management	Audio recordings and partial transcriptions of interviews, with data structured into six snapshots (see appendix 4), aiming to facilitate analysis of the data. Combining visuals and writing to enrich details and communication McCloud (1993). For more information about data management, see appendix 5.

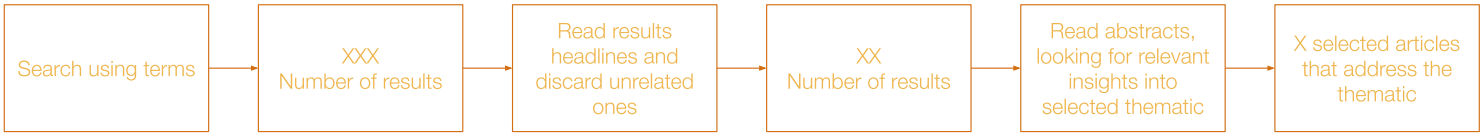
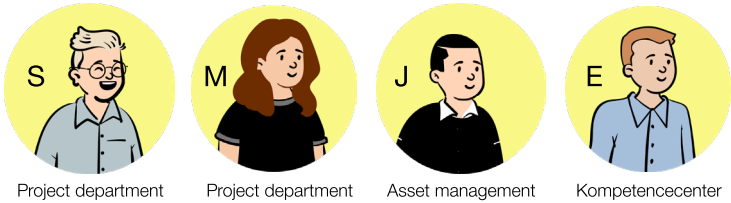
Collected data overview	Audio: 278 minutes. Transcript: 11.086 words.
Analysis technique	The analysis involved first creating an overview of stories about sustainability, followed by an examination of these stories using the seven properties of sensemaking (Weick, 1995). Concurrently, the analysis identified actors based on ANT theory (Czarniawska & Hernes, 2005; Jensen, 2003).
Scope of analysis	Analysis was carried out for three of 11 stories, due to their extensive details and the fact that they address sustainability in ATPE. The remaining stories were disregarded in this round, but saved in an overview (appendix 6) and later revisited two of them in "tales of sustainability round".
Literature review	A literature review using eight articles was carried out to explore the two findings from the analysis further: Stories as agents of change and the positioning of sustainability in people's sensemaking. The flow below explains the method for selecting relevant literature (see fig 8). See appendix 7 for a full overview of the search specifics, such as boolean types and results.  Fig 8: Literature review flow. Self-made illustration.
Limitations	Since the data comes from past experiences, we recognize that the stories may not be entirely accurate. Additionally, our identification of human and non-human actors relies on employees' memories, not our own observations, so any changes in actors are not accounted for.
Potential bias	Interviews may carry biases due to one of us working in ATPE as a student helper, potentially affecting data interpretation. To mitigate the risk we have had the one with least experience within ATPE lead most interviews.

Table 2: Exploratory round - methods.

The exploratory round methodology, based on sensemaking theory and utilizing semi-structured interviews, allowed us to start investigating the complex perceptions of sustainability among ATPE employees.

5.3 Deep Dive Round

Table 3 provides an overview of the methods for this round, intending to collect data to further address the subquestion: How is the sensemaking between employees about sustainability?

Element	Description
Sample	Four ATPE employees from diverse backgrounds were selected (see fig 9). The sample does not represent all the teams in ATPE.  Fig 9: Sample composition.
Interview method	A semi-structured workshop with 4 exercises (see appendix 8) inspired by sensemaking theory primarily focusing on exploring the two findings from the exploratory round. Utilizing exercises to make employees generate data to expose their perception of sustainability before and after sensemaking dynamics.
Data management	Audio, video recordings and partial transcriptions of the workshop, with data structured into four snapshots (see appendix 9), aiming to facilitate analysis of the data. For more information about data management see appendix 10.
Collected data overview	Audio: 86 minutes. Video: 90 minutes. Transcript: 4544 words.

Analysis technique	The analysis included several techniques. One was an analysis of beliefs and perceptions based on employees inputs in exercise one (crazy eight). Second, utilizing the seven properties of sensemaking to analyze sensemaking dynamics (Weick, 1995). Third, a comparison between the data from exercise one and exercise three (crazier eight) to validate enacted values. Fourth, an analysis of the transcript to explore stories as agents of change. Fifth, gathering the four above-mentioned analyses to surface the “five faces” of sustainability in ATPE
Limitations	Our analyses are limited due to their reliance on a 1.5-hour workshop involving four employees from three departments. As such, we accepted a tradeoff on depth rather than width.

Table 3: Deep dive round - methods.

5.4 Tales of Sustainability Round

Table 4 provides an overview of the methods for this round, with the intention of collecting data to address the following subquestion further: What is the level of sustainability in employees' current initiatives?

Element	Description
Data management	Finalize the list of stories that surfaced during the case study (see appendix 6). The selection of two stories due to their high level of detail and prevalence during previous rounds. We used the five faces of sustainability to assess sustainability holistically. See appendix 11 for more information on data management.
Collected data overview	One email to gather additional information about one of the stories. Revisited complete list of all stories, transcripts from exploratory round and deep dive round to finalize needed data.
Analysis technique	The analysis included two techniques. First, a sustainability assessment of the two chosen stories, using calculations and the R-hierarchy (Reike et al., 2018). Second, a holistic sustainability assessment utilizing the five faces of sustainability combined with the DfS framework by Cheschin & Gaziulusoy (2016).
Scope of analysis	The analysis carried out for two out of 32 stories had a concrete metric-driven scope to assess sustainability compared to current practices. In contrast, the five faces had a qualitatively driven scope to paint a partial glimpse of ATPE sustainability manifestation.

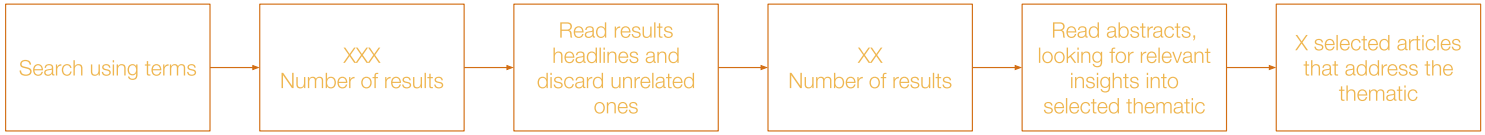
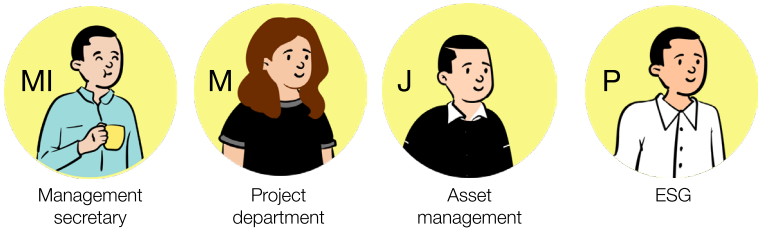
Literature review	A literature review using 11 articles was carried out to explore current methods to assess sustainability. The flow below explains the method for selecting relevant literature (see fig 10).  Fig 8: Literature review flow. Self-made illustration.
Limitations	Our sustainability assessment has limitations as it relies on only two stories, which may not fully capture the complete picture of sustainability at ATPE. Nevertheless, when combined with the sustainability assessment of the five faces of sustainability, we suggest our assessment as valuable, due to the insights into how current initiatives at ATPE address sustainability.

Table 4: Tales of sustainability round - methods.

5.5 Driving Informed Decisions Round

Table 5 provides an overview of the methods we use this round. It intends to collect data to address the following subquestion: What could it take to engage employees further in sustainability initiatives?

Element	Description
Sample	Four ATPE employees from diverse backgrounds (see fig 11) were selected, representing the target group of our design suggestion, a lawyer and the ESG department. The sample does not represent all the teams in ATPE.  Fig 11: Sample composition.
Interview method	A semi-structured approach utilizing storytelling Torres (2021) to test the two assumptions through our design suggestion.
Data management	Audio recordings and partial transcriptions of interviews, with data structured into two groups. One with data aiming to validate or falsify our assumptions. One with feedback to the actual design of our design suggestion (DS). For more information about data management see appendix 12.
Collected data overview	Audio: 121 minutes. Video: 63 minutes Transcript: 2735 words.

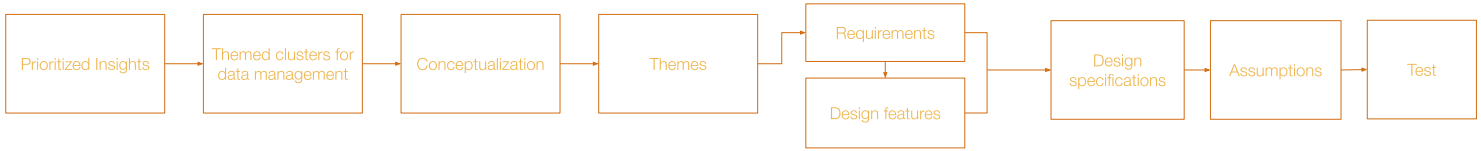
Literature review	The creation involved several steps (see fig 12) based on findings from the deep dive and tales of sustainability round. First, conversion of findings to themes. Second, the themes are converted into requirements, and third, requirements are converted into design features, which are combined design specifications. The design suggestion (DS) was created based on the design specifications. Embracing an iterative design approach, through two iteration rounds, we created the DS in Figma. We then tested, through two assumptions, if our DS could meet the two most critical design specifications to answer sub-question three.  Fig 12: Creation of the DS. Self-made illustration.
Limitations	Three employees tested the design suggestion, which limited the feedback. However, the test still gave us enough data to address the two assumptions, making it successful.
Potential bias	Our research and background as sustainable design engineers brought us to create the DS, a non-human actor, which we suggest is consistent with the findings throughout the case study and validated through testing. However, we wonder if, due to our background, we overlooked alternative approaches with an equal valuable impact.

Table 5: Driving informed decisions round - methods.

Having outlined our methodologies, we now turn to the insights gained through their application, demonstrating our findings' depth and relevance.

6. Exploratory Round

This analysis aims to explore subquestion one: How is the sensemaking between employees about sustainability? In initial interviews, employees encapsulated ideas of sustainability through stories, depicting their version of previous events. Table 6 summarizes three stories we chose to analyze due to their extensive details and the fact that they address sustainability in ATPE.

Story 1: The floors	**Story 2: Refurbishment of lamps**	**Story 3: Geothermal failure**
Wood floors from one of ATPE's buildings were treated and reused in ATPE's new office.	Leftover outdoor lamps were given to an external stakeholder for refurbishment and thereby given a second life.	Geothermal project, with potential of large energy-reduction failed.
Interview with C, transcript in appendix 13.	Interview with S, transcript in appendix 14.	Interview with E, transcript in appendix 15.

Table 6: Summary.

We will now utilize sensemaking theory and actor-network theory to analyze story 1, the floor story. The analysis of the remaining two stories are in appendix 16. Core insights from both stories (lamps and geothermal) were used in section 6.2, to triangulate all three stories' insights, show the patterns we identified and how those aided us in moving forward with the case study.

6.1 The Floor Story

C, the story's author, stated in the interview that his interest in approaching us was to collect more information regarding our master's thesis project. One thing we noticed was that he needed to clarify that he does not, in his opinion, work with sustainability although he almost immediately started telling us about the story of the floors. C did not just tell the story once. Throughout the interview, we noticed it was retold and refined, with more details emerging with each iteration. Initially, C used the story to convey how he learned about specific sustainability approaches while also clarifying his role in the story: "It was eye-opening for me to see how M (senior project manager) talked about sustainability because he talked about floors. Some of the floors here (at ATPE's office) are reused" (C, interview, 21.02.2024). Upon inquiring, C clarified that he had coordinated the movement of ATPE's office for a whole year when the floors were reused. Almost immediately, C formulated how he related to the initiative and he thought it was a good story: "It was not cheaper - but it was a good story so it happened. The executive management bought into it, and they also wanted to be able to tell the story when we have visitors" (C, interview, 21.02.2024). To us, the excerpt implies that he intended to use it as a strategic advantage rather than out of awareness of the story's sustainable impact. As C had emphasized the financial implications of reusing the floor, we prompted him to tell us more about why he thought the story succeeded, which he believed was mostly about fortuitous timing: "The flooring was a matter of luck, the timing was right, J (senior project leader) was here, brought it up. The floor was more or less 1:1. Time was great for the floor." (C, interview, 21.02.2024).

6.1.1 A Sensemaking Perspective on the Story

To gain a deeper clarity of the elements in the story and how C perceives sustainability in ATPE, we will now utilize the seven properties of sensemaking by Weick (1995) to analyze the story.

The connector of dots: C sees himself as a person whose role is "connecting the dots" between management and the rest of the organization: "I do because what I do is connect the dots" (C, interview, 21.02.2024). His identity as the dot connector clarifies why he states that he does not work directly with sustainability as his role implies that he is not responsible nor in charge of carrying out sustainability initiatives. As a dot connector, he gathered the actors and gave the story the needed agency to make the story succeed. We are left with the impression that C reflected his identity in how he supported the initiative, which he did because it was a strategically good story.

Continuously looking back: Weick's (1995) concept of retrospective invited us to consider how C's past experiences shaped his current understanding of sustainability. During the interview, we asked if he had been a part of something similar to the floors beforehand, which he had not. This confirms his previous notion of the idea coming from J (project manager).

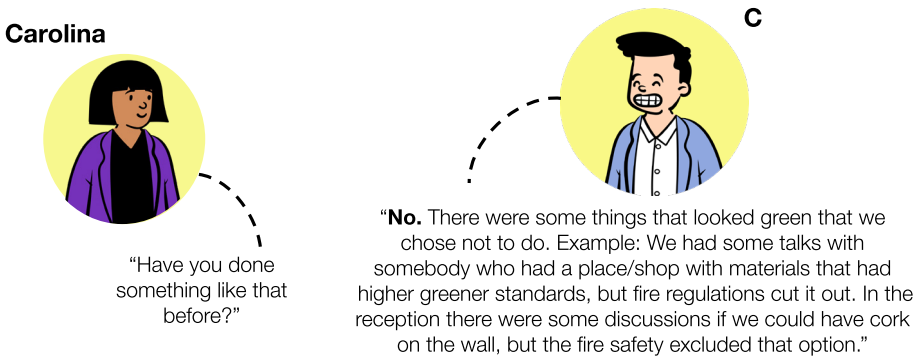


Fig 13: Interview quotes. Self-made illustration.

As the excerpt shows (fig 13), C explains that they (ATPE) did consider other initiatives during the project. Most relevant to the idea of retrospective, when prompted to discuss more sustainability initiatives, C revealed his concerns regarding certain ATPE's practices (see fig 14).

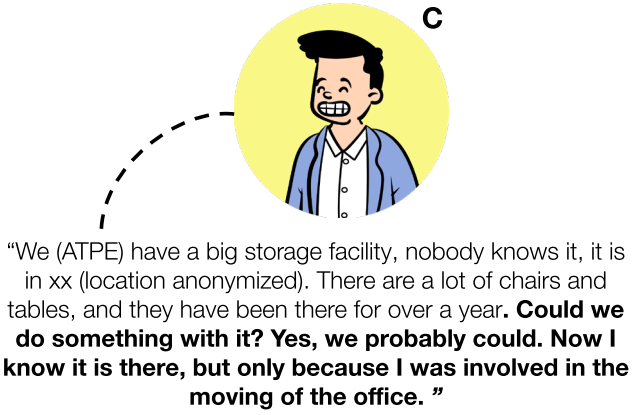


Fig 14: Interview quotes. Self-made illustration.

This suggests that the experience of the floors has influenced C's perspectives regarding sustainability and that the idea of being able to reuse something has become part of his thought process. However, as the empirical data shows no sign of action regarding this concern, we find that he stays within compliance-oriented behavior.

Producing own environment: The dynamic between J (project manager) and C moves from considering reusing the floors to creating a concept that the executive management would later approve. C hears the idea from J, who has access to the old floors and in return, following the ATPE process, C collects the data and actors he finds critical to sell the idea successfully to executive management. Ultimately, M (project manager) carried out the project thanks to J's knowledge and C's facilitation. This tells us that C, through actions such as collecting entrepreneur prices, comparing them to brand new prices, and presenting them, successfully sold the idea to executive management, who gave the green light. The empirical data clearly shows how C succeeded in conveying the spirit of "the good story" to executive management due to his ability of gathering relevant actors: "The executive management bought into it, and they also wanted to be able to tell the story when we have visitors." (C, interview, 21.02.2024).

Human thinking and social functioning: Accepting that "sensemaking is never solitary because what a person does internally is contingent on others" (Weick, 1995, p. 40) allows us to explore

C's sensemaking of sustainability through concrete examples. For instance, it shows us how he prepared the story for management, according to C's depiction in the previous section. His depiction implies that he presumes executive management as an audience. Then, the information regarding the initiative and the idea of sustainability manifests through elements that management will react to, such as the financial implications of the initiative, while highlighting the story's strategic value.

Always ongoing: The story of the floors shows us the durability of such actors in employees' sensemaking process of sustainability; as of today, it still reaches new employees and external actors. This observation was one of the first we made; the story is used by C in the interview and outside by others. For example, the floor information was shared when we first toured the office. During the interview with C, it was evident that C saw the story as a strategy (good story). Still, during the office tour, it was presented to us as ATPE's commitment to sustainability. This emphasizes how fluidly sustainability can be re-framed according to the context.

Focus on extracted cues: The conversation with C brought to our attention some aspects of the story, such as the relevance of understanding the financial implications, strategic value and the circumstances that allowed it to occur. In particular, the financial implications and strategic advantages are the values, from C's perspective, that sustainability must comply with in order to succeed. This makes us consider whether or not all initiatives must comply with the cues that C highlights or whether there are other values sustainability must encompass in ATPE.

Driven by plausibility: By definition, addressing individual perceptions of sustainability implies that our insights flourish from what is sensed by the author (C). This perspective, brought by sensemaking theory, shows how the story is founded on C's beliefs that reusing the floors is sustainable, even though a structured assessment was not carried out. In contrast, what C needed to know and what he found valuable to share with us was the cost implications of the story. This indicates that initiatives in ATPE are being evaluated through parameters that do not give sustainability agency, but vouches for well-established classic values.

As indicated in the theoretical approach, section 4.3, ANT is used in this analysis to explore a more comprehensive understanding of how movements, such as how C's individual beliefs, are negotiated and transformed in the story with the help of actors.

6.1.2 Actor-network negotiations

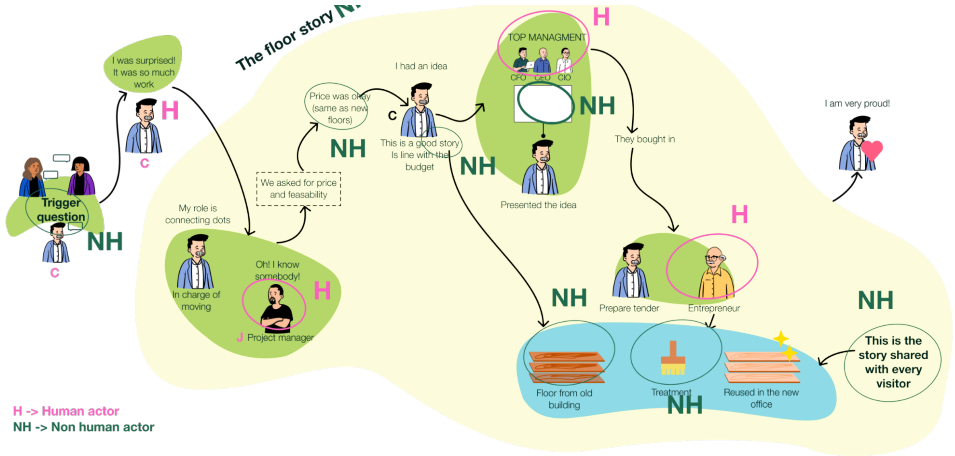


Fig 15: Overview of the actors. Self-made illustration.

Fig 15 shows non-human actors such as budget, presentation, floors, the story, time, and human actors such as C, J, top management (executive management), the entrepreneur, and us.

Stories as a non-human actor: The floor story is used, at a company level, to narrate ATPE's engagement with sustainability and appears as a quick linear process (see the blue in fig 15). However, in C's depiction, the story has more details. It shows us how the story, as an actor, helps him talk about sustainability, but does not enable him to develop further initiatives.

Actors that facilitate the story's success: Several non-human actors, such as budget, price calculations, and tenders tell us about the dominant values in ATPE, but the idea of the story as 'a good story' as a non-human actor comes together with the aforementioned dynamics of negotiations with executive management. This shows us how it is not one unique value that guides the decision process but a set of values, which, according to the empirical data, are aligned with ATPE's low-risk, profit-driven business model.

These observations clearly show us how actors facilitate sensemaking dynamics and how they shape the context in which the sensemaking is taking place. Knowing this underscores the relevance of studying individual experiences. Still, if we intend to move employees from compliance-oriented to self-driven behavior, we should consider their role in building and perpetuating structures that foster these behaviors.

6.2 Findings

The analyses of the three stories provided us with a set of insights regarding employees' sensemaking of sustainability. Table 7 shows an overview of the insights from all three stories.

	Story 1: The floors	Story 2: Refurbishment of lamps	Story 3: Geothermal failure
1	C was heavily involved in getting the initiative approved, as he prepared the initiative accordingly to the needs he knew executive management had.	S drove the initiative and took charge of the whole process.	E, delegated the task to external consultants and presented the insights to ATPE employees.
2	C as a connector of dots, connects human and non human actors.	S is constantly questioning current practices.	E, sees himself as an internal consultant which is reflected in his engagement with initiatives.
3	Sustainability is related to practices such as reusing materials with the intention of the having **a good story.** The floor story changed his view on sustainability, making him consider if ATPE could do more.	S sees low hanging fruit initiatives as important to address as sustainability is **the right thing to do.**	Technology is used to address specific sustainability issues, such as energy consumption. It is expensive but E sees it as **the right thing to do.**
4	Actors are critical in shaping SM dynamics and its context.	Actors are critical in shaping SM dynamics and successfulness of stories.	He is disconnected from the network as his role lacks agency.
5	Story was a powerful actor for easy documentation and knowledge sharing.	Story got attention due to non-human actors and was easy to carry out.	The story is a reminder of the failure of his project, but enables E to make sense of why the project failed.

Table 7: Findings from the three stories. Self-made illustration.

As table 7 shows, we grouped the insights from all three stories into five patterns, which we elevated to five questions (see fig 16).

We then selected two questions that offered us a focused yet broad enough lens to explore the integrations of sustainability in organizational practices and how employees use sustainability in their sensemaking process. The two questions were:

How is sustainability positioned in people's sensemaking? And how is it used in group dynamics? Can we investigate both how sustainability is used individually and in group dynamics? Can we explore in depth the values behind sustainability initiatives?

What makes a good story? Can stories be agents of change or empower employees? Exploring whether stores can be agents of change in ATPE could give us insights into approaches to moving employees towards self-driven behaviors.

The two questions were used to design the next round of data collection, aiming to explore aforementioned findings further.

Furthermore, the two questions also provided a scope for the literature review. Corresponding to the two questions in fig 16, we reviewed literature addressing the position of sustainability in people's sensemaking and stories as agents of change to contextualize our case study, identify gaps, and build on existing knowledge.

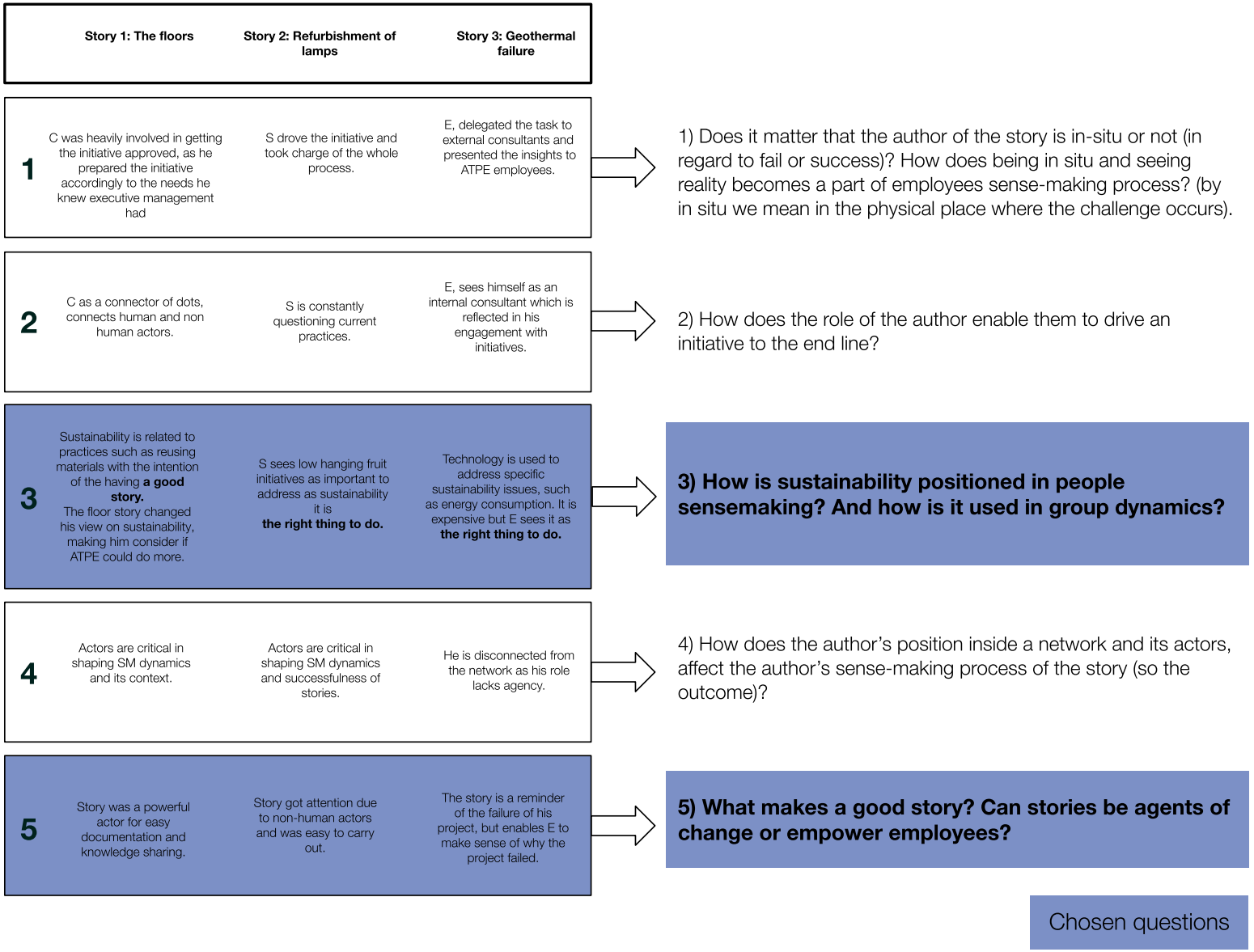


Fig 16: From insights to questions. Self-made illustration

6.3 Agents of Change and Sensemaking in Organizational Contexts

Exploring current literature on the position of sustainability in people's sensemaking process and stories as agents of change was critical to enriching the case study and providing a sense of the value of our research's contribution.

6.3.1 The position of Sustainability in People's Sensemaking Process

Claiming that "organizations are shaped by what people believe in and how they act" (Luís & Silva, 2022, p. 372), underscores why there is a need to "humanize sustainability." Additional literature supports this: "Workers play a crucial role in making organizational change happen and drive alongside organizational leaders the implementation of ecological practices" (Zappalà et al., 2023, p. 2). This underscores the importance of understanding individual perceptions and behaviors regarding a topic, highlighting a shift in measurement procedures. Merely measuring greenhouse gas (GHG) emissions and implementing greener technology based on these figs is insufficient, as it fails to provide insights into employees' views on such initiatives. Employees who perceive their organization as environmentally supportive tend to engage more in voluntary sustainability actions (Luís & Silva, 2022). Comprehending employees' perspectives and knowledge utilization could enhance organizational sustainability efforts, but it is noteworthy that studies have found that employees working in larger organizations often view their workplace as more sustainable than employees in smaller organizations. This could be due to the amount of resources that organizations have, with larger ones typically having more at their disposal and smaller ones having less (Moilanen & Toikka, 2023). Contrary to this assertion, other studies (Balasubramanian & Balaj, 2021) have indicated that the size of organizations may not be the sole determinant influencing employees' perceptions of sustainability as "the perception about sustainable development and organisational sustainability differs for different types of organisation." (Balasubramanian & Balaj, 2021, p. 249). If organizations want to influence how the employees perceive their sustainability positively, they must foster robust environmental management practices, care about employee-related sustainability, and support public-related sustainability (Balasubramanian & Balaj, 2021). In addition, "the purpose employees perceive in their companies is a key driver of their sustainability behaviors at work" (Bhattacharya et al., 2023, p. 977). Crucially, evidence suggests that employees who express more significant concern about climate change are already taking action within their work environments to promote sustainability and are generating innovative ideas on how to do so (Moilanen & Toikka, 2023).

6.3.2 Stories as Agents of Change

Story-telling, an “intrinsic human characteristic and evolutionary skill that has been refined over thousands of years” (Veeckman et al., 2023, p. 3), has been studied to address participation inequality in citizen science (CS). Researchers found that stories can enhance the level of engagement in CS and that stories are great at generating knowledge between groups (Veeckman et al., 2023). Supporting this claim, Moniz et al. (2023) argue that co-production between groups is a pivotal process and that one of the most important mechanisms of a co-production process is establishing a safe and open space for people to contribute. However, this is not the only advantage of using stories as knowledge-sharing tools. Letting people generate stories based on previous experiences makes them feel empowered to create change, as stories capture emotional resonance (Moniz et al., 2023), and literature even suggests that story-telling techniques could facilitate self-helping tools for larger groups (Petrovic et al., 2022).

The literature review indicates that the direction of our case study is highly relevant. The different authors emphasize that organizations are deeply influenced by the beliefs and actions of individuals within them, providing evidence that there is a growing need to “humanize sustainability” by understanding individual perceptions and behaviors. This directly connects with the subquestion: How is the sensemaking between employees about sustainability? The literature additionally validates our initial observations regarding the potential of stories as actors, which inspires us to explore the role of stories as agents of change in the deep dive round.

7. Deep Dive Round

The deep dive round was designed to gather empirical data to address the two questions we highlighted in the exploratory round (see fig 17). Together, they offer a comprehensive understanding of the sensemaking process, which is essential to answer subquestion one: How is the sensemaking between employees about sustainability? The empirical data used in this chapter comes from the workshop conducted in March 2024 with four employees. The workshop structure and transcript are in appendix 8 and appendix 17.

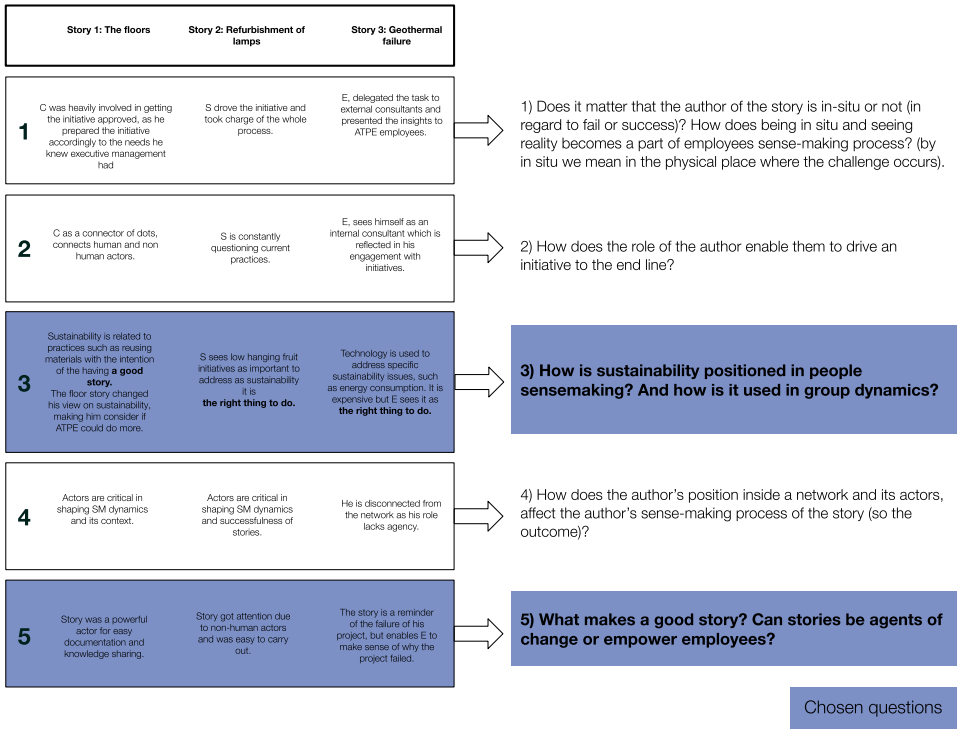


Fig 17: Questions from exploratory round. Self-made illustration.

To address: How is sustainability positioned in people's sensemaking? And how is it used in group dynamics? We have divided the workshop analysis into three sections, as shown in fig 18.

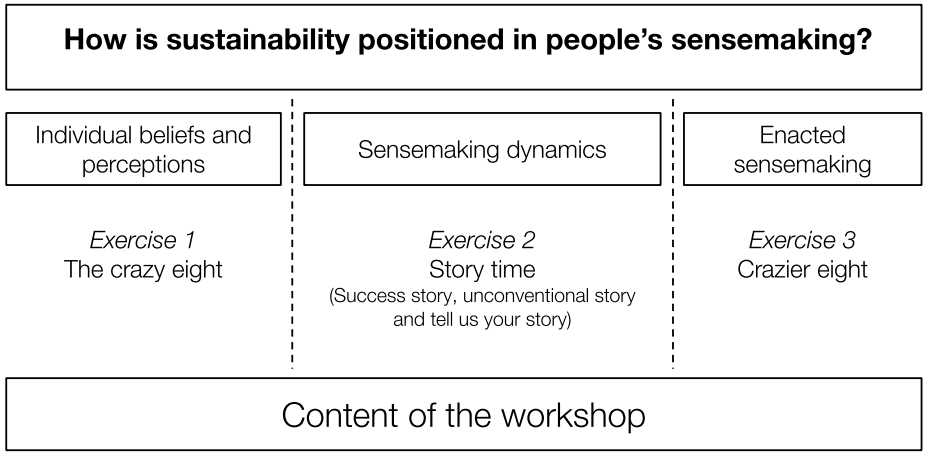


Fig 18: Workshop. Self-made illustration.

7.1 Exploring Individual Beliefs Through the Crazy 8

This analysis focuses on employees' individual beliefs and perceptions of sustainability by analyzing the words generated in exercise one (crazy eight). The instructions for this exercise were: "Write, draw, etc. whatever comes to your mind in regards to sustainability. You have 8 seconds per section".

Employee	Exercise 1: Crazy eight	Exercise 3: Crazier eight
M 	Recycling Emissions Food Muh (cow) Choice for materials	Material selections Heating Energy Reuse Biodiversity Time Carefully taking things down Material bank
E 	CO2 Biodiversity People energy UN Holistic equal rights Animals	Circular economy Environment Equal rights Biodiversity Life cycle Waste Regulation
J 	How much we use how much we produce Temperature Biodiversity	Reuse of material Biodiversity Money CO2 Business case
S 	World overshoot day Environment Green Reuse	Material Reuse more Money talks Conflict of interest

Fig 19: Words generated in exercise 1 (the crazy eight). Self-made illustration

7.1.1 M

M expressed a total of 5 words (see fig 19). ***Recycling, emissions,*** and ***choice of materials*** are terms that convey a connection between sustainability and resources management; we are left with the impression that these are terms and values she encounters as part of her role as project manager. In contrast, ***Muh (cow)*** and ***food*** indicate her awareness of the environmental impact of animal agriculture. These terms are distant to her work tasks in ATPE, which shows us that, as an individual, M also connects sustainability with experiences external to her work, indicating a broader sense of sustainability than a work-related one.

7.1.2 E

E expressed eight terms, as shown in fig 19. One thing we noticed was the broad range of directions they cover. For instance, ***CO2*** and ***energy*** indicate E's sense of duty towards energy use, which are topics he works with as part of his job in ATPE. Terms such as ***animals*** and ***biodiversity*** convey his concerns for preserving life. Lastly, words such as ***people, equal rights, UN,*** and ***holistic*** leave us with the impression that E connects sustainability with social justice and equality issues while suggesting an integrated approach to sustainability. It appears that E was very aware of our background. Grounded in sensemaking theory, we suggest his broad range of terms responds to the audience he was trying to enact.

7.1.3 J

J was the only employee who drew something instead of writing a word; he ***drew a tree*** and wrote ***biodiversity*** (see fig 19), which exposes concerns for preserving life. Expressions such as ***how much we use, how much we produce*** indicate an awareness of resource consumption and production patterns. Such expression is connected to ideas of waste and resource management. The mention of ***temperature*** suggests an awareness of climate change.

7.1.4 S

Based on the five words provided by S (see fig 19), we identified two patterns; first, S employed the term ***reuse***, which connects sustainability to waste and resource management. This connection is noteworthy as S tasks in ATPE are related to such practices. The mention of ***world overshoot day***, suggests an awareness of global resource depletion and the ecological footprint of human activities. ***Environment*** and ***green*** are terms that reflect S's climate change concerns.

Fig 20 shows the connection between the employee's terms expressed in exercise 1, the crazy eight, and the underlying values they believe are essential to mention in social interactions such as the workshop. Noticeably, three out of four employees expressed values directly related to their work tasks in particular materiality, highlighted in green in fig 20. The remaining terms used by all the employees express non-work-related ideas of sustainability.

Employee	Term expressed	Values
	*Recycling, emissions, choice of materials.*	Waste management & resources management
	Cow, food	Awareness of the Environmental impact of agriculture
	*CO2, energy*	Sense of duty toward energy reduction
	Animals and biodiversity	Preservation of life
	people, equal rights, UN, holistic	Social equity
	*Drawing of tree biodiversity*	Preservation of life
	How much do we use and how much do we produce	Waste management & resources management
	Temperature	Climate change concerns
	*Overworld shooting day, environment, and green*	Climate change concerns
	Reuse	Waste management & resources management

Fig 20: Key takeaways. Self-made illustration.

The previous section shows the insights we collected in the workshop. We recognize that although sensemaking was already taking place, it was through exercise two (story time) that we, in a designed manner, surfaced empirical data that more deeply exposed sensemaking dynamics with a focus on sustainability.

7.2 Sensemaking Dynamics

We used the seven properties from Weick (1995) to analyze the dynamics. Instead of using them individually, as we did in the exploratory round, we grouped them into two patterns we observed in the workshop. Roles and key enactment moments. We will use the sensemaking properties to analyze these two patterns, allowing us to see how dynamics shape sustainability in people's sensemaking process.

7.2.1 Roles

In exercise two, we saw how some employees took two specific roles: the truthseeker and the critic; we will use three of the sensemaking properties proposed by (Weick, 1995) to expose different aspects of the roles. 'Identity' surfaces employees' self-perceptions and how they align with the roles observed in the workshop. 'Extracted cues' emphasize how employees interpret and respond to their environment, and 'social' allows us to uncover how relationships and interactions influence the roles, ultimately shaping the overall group dynamics.

7.2.1.a The truthseeker

The 'truthseeker' role in the workshop drove the conversation towards deeper inquiries. M took this role and was most evident when she persistently questioned one participant while he was sharing a story (see fig 21). This behavior conveys that such a role facilitates a constructive sensemaking process. By that, we mean that we observed how, during the dynamic, the conversation pivoted towards revisiting and better understanding past events, surfacing more details from a story from two years ago.

The truthseeker's role aligns closely with the employees identity: "Two months after moving in they say that all the walls should be torn down. We did not tear it down, some of us wanted to *looks at J and laughs*, some didn't." (M, workshop, 20.03.2024). In a sense, the truthseeker manifests as an individual with inquisitive behaviors. This behavior is connected to the 'extracted cues', where M, for instance, becomes more attentive to subtleties in her environment. M did not "accept" J's story; she inquired in more detail, which brought nuances for the group (see fig 21). Moreover, this role impacts social dynamics. Fig 21 also shows how M's role fostered some employees to answer questions while others had a listening role. Our takeaway is that the truthseeker explores her interests and fundamentally shapes the overall group dynamics, making interactions more meaningful as all the employees now have access to the insights the truthseeker surfaced. At the same time, by engaging in deeper conversation with one of the employees, the truthseeker shaped the engagement level during the sensemaking dynamics.

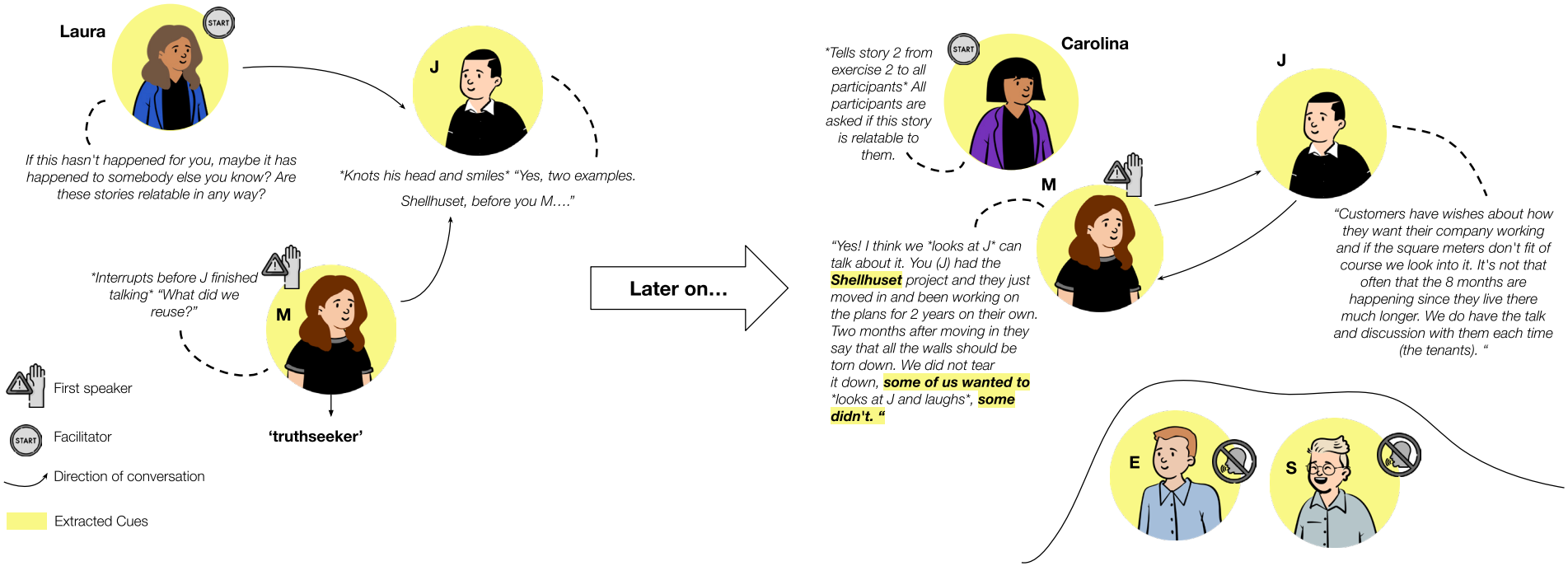


Fig 21: Workshop conversation. Self-made illustration.

7.2.1.b The critic

The other role we observed was the 'critic' who questioned the relevance of current practices, such as throwing everything in the trash containers in front of the construction site instead of selling leftover materials from projects (see fig 22).

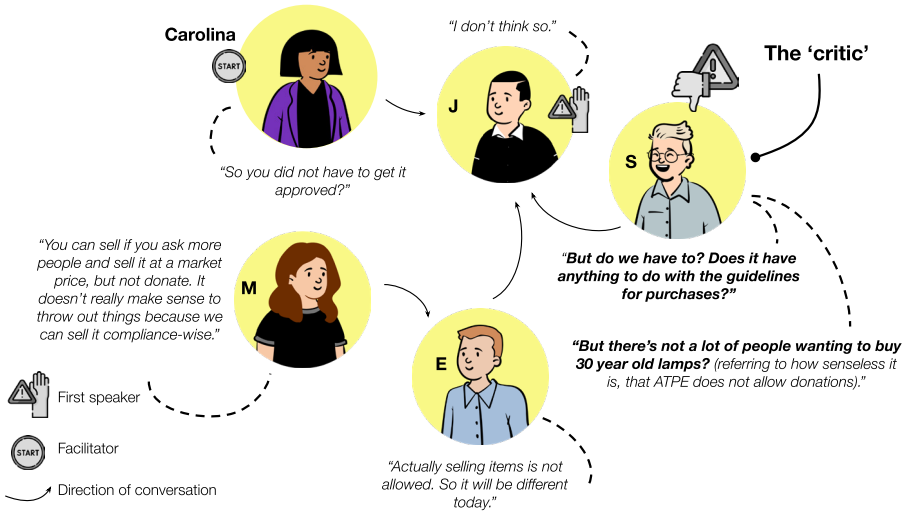


Fig 22: Workshop conversation. Self-made illustration.

The critic's questions not only shifted the group's sensemaking dynamics from a relaxed to a heated discussion about the ATP law but also prompted a deeper engagement with complex issues. The employees were so engaged in the discussion that, due to time constraints, we had to end the conversation after ten minutes. The critic's self-perceptions misalign with their tasks: "But there's not a lot of people wanting to buy 30 year old lamps?" (S, workshop, 20.03.2024). This excerpt explains how his identity influences his discussions; as he mentions how challenging it is to adhere to a law that does not fit his observations. The critic's extracted cues are evidence of how his role and actions trigger more profound and, in this case, more confrontational interactions among employees. The critic's relationships with other employees affect how they perceive and react to the critic's input. For instance, we observed that one of the employees who works in the same team was particularly more engaged and commented on the ATP law, while the two remaining ones were more partial in comparison to the critic's point of view, as shown in fig 22.

The truthseeker and the critic play essential roles in shaping the workshop's dynamics. The truthseeker enriches the conversation by bringing depth through deep inquisition, helping the group explore and understand past issues more thoroughly. However, the discussion did not evolve into actionable insights for future issues. In contrast, the critic introduces critical challenges to existing practices, sparking a debate on the ATP law that left us with the impression that this topic needs clarification. It appears that both the roles not only shaped the topics and tone of the dynamics but also had the power to engage the employees, as evidenced by the critic being able to engage all employees to a certain degree. In contrast, the true seeker did not, so the employees were passive listeners.

7.2.2 Key Enactment Moments (KEM)

The second pattern we identified was key enactment moments (KEM). To surface nuances, we used the remaining four sensemaking properties: 'enactment,' 'ongoing,' 'plausibility,' and 'retrospection' (Weick, 1995). In particular, it provides insights into how, in dynamics, sustainability is positioned in people's sensemaking. We used the four properties as they interact dynamically with each other (Weick, 1995).

During the workshop, we witnessed KEM's, summarized in fig 23. The following section analyzes the ATP law KEM. To see the analysis of the second KEM, "tenants and sustainability," see appendix 18.

The ATP Law	Tenants and sustainability
The conversation revolves around the ATP law and its implications for donating or selling leftover items. J mentions that according to the ATP law, if a public tender makes the leftover items available for everyone, then selling materials is allowed. M brings up instances where donating items was possible in her previous job but feels restricted in her current job within ATPE due to the law. S and E discuss the specifics of the ATP law and its implications for donating or selling items.	The conversation discusses employees' previous experiences where tenant renovation requests are denied to prioritize sustainability or due to financial reasons. M shares a specific instance where a renovation request was declined, while J provides examples of finding alternative solutions to avoid costly renovations. The discussion highlights the dynamics between landlords and tenants regarding renovation decisions, focusing on financial implications and balancing tenant needs with sustainability goals.

Fig 23: Key enactment moments overview.

7.2.2.a The ATP law

The topic of the ATP law surfaced when J shared a previous experience in which he could sell materials instead of discarding them. We prompted him to share any story he had experienced regarding sustainability, and he shared this story. The conversation quickly turned around the ATP law, as shown in fig 24.

Fig 24: Conversation about ATP law. Self-made illustration.

During the dynamic, we observed that the employees talked about the law and enacted it in ways that affected their perceptions and actions. For instance, M tries to explain how the law would allow them to sell materials instead of throwing them out, while E, mentions that

the law does not allow sales. They construct the reality of how the law impacts them and influences their behavior, in which we are left with the impression that M will likely try to sell items while E will not.
We also observed how the sensemaking process was constantly ongoing. As the conversation unfolded, new input and ideas were continuously added, from the critic's initial questioning of the current practices to each employee exposing their understanding of the law. This shows us how the dynamics are fluid and confirms that sensemaking is never over but constantly evolving.

Throughout the dynamics, we saw how the employees relied on plausible information in the story at the moment to explain the law, even though they had contradicting views, as shown in fig 24. This conveys the idea that the conversation was not about understanding the law, but about them explaining how it affects their work and how sustainability takes a backseat in the decision process as a consequence of the law.

The information used in the dynamic to explain the law was based on their previous experience, which they used to navigate their frustrations and confusion. We are left with the impression that the discussion did not touch on how relevant sustainability is as a practice or a principle. The conversation focuses more on the employees' barriers when trying to do things differently, which starts shedding light on a facet of compliance-driven behaviors.

We use table 8 to gather the previous insights from the ATP law and the tenant discussion.

	ATP law	**Tenants and sustainability**
Enactment	Law is used to rationalize	Tenant needs and the revenue they bring are used to rationalize unnecessary renovations
Ongoing	Sense-making process is constantly fed by inputs	Sense-making is informed by the lease agreement and relationship with tenants
Plausibility	Discussion is not about the facts on the law is about the information necessary in the moment to explain how the law affects them	Some employees had direct experiences with tenants, while one employee relied on plausible information to be a part of the conversation, shaping the inclusivity of the dynamics
Retro	Their experiences are used to navigate frustration and confusion	Financial implications are also used to justify why they sometimes refuse unnecessary renovations

Table 8: Key enactment moments overview.

Upon reflecting on the insights of both KEM analyses, we first learned that using stories to talk about sustainability surfaced actors such as the ATP law and tenants that are predominant in informing employees perceptions and, therefore, how they carry out projects. These phenomena left us with the impression that sustainability does not carry the same agency in decisions as the actors such as the ATP law

and the tenants. Second, the KEM's surfaced sentiments of frustration, confusion, and shame. These are opportunities and places to start, as we wonder if these sentiments may hide the willingness to transition from compliance-oriented to self-driven behaviors.

So far, we have explored individual beliefs and perceptions of sustainability and sensemaking dynamics. The following section will examine how everything that happened during the workshop affected the employees' beliefs and perceptions about sustainability.

7.3 Enacted Sensemaking

As part of answering subquestion one, we will now analyze the potential of employees influencing each other's sensemaking processes in the workshop by comparing and discussing the words generated in exercises one (the crazy eight) and three (the crazier eight) (see fig 25).

Employee	Exercise 1: Crazy eight	Exercise 3: Crazier eight
M	Recycling Emissions Food Muh (cow) Choice for materials	Material selections Heating Energy Reuse Biodiversity Time Carefully taking things down Material bank
E	CO2 Biodiversity People energy UN Holistic equal rights Animals	Circular economy Environment Equal rights Biodiversity Life cycle Waste Regulation
J	How much we use how much we produce Temperature Biodiversity	Reuse of material Biodiversity Money CO2 Business case
S	World overshoot day Environment Green Reuse	Material Reuse more Money talks Conflict of interest

Fig 25: Overview of exercises 1 and 3. Self-made illustration.

As part of answering subquestion one, we will now analyze the potential of employees influencing each other's sensemaking processes in the workshop by comparing and discussing the words generated in exercises one (the crazy eight) and three (the crazier eight) (see fig 25).

7.3.1 M

M's terms continue to reflect sustainability concerns that align with waste and resource management values but with a shift towards more specific topics like ***material selections, heating, energy, reuse,*** and ***carefully taking things down***. In a sense, the dynamics validated the values she works with as part of her task but also expanded on them; in other words, the dynamic provided her with more accepted terms to discuss sustainability. Simultaneously, we saw how two employees enacted their values from exercise one, resulting in M changing her answers. From ***cow*** and ***food*** to ***biodiversity*** and ***time*** which conveys that the dynamics change the values she sees as relevant for the room.

7.3.2 E

In E's case, we observed how the dynamic made him abandon the values he works with in ATPE. As the dynamics changed the previous values (energy use), he chose to use terms such as ***circular economy, environment, life cycle*** and ***waste*** which aligns with the thematic of the workshop and with values of waste and resources management. Some of E's values are genuinely embedded, and the dynamics did not change them. Exemplified by terms like ***biodiversity*** and ***equal rights***, which stayed in both exercises one and three, these values are accepted values in the dynamic.

7.3.3 J

J maintained values such as preservation of life in terms of ***biodiversity***, as the dynamics validated them. In exercise one, J was the only employee who did not provide terms that reflected his role in ATPE. Still, in exercise three, we can see how, in particular, the key enacted moments around the ATP lay and the tenant discussion validated values that align with his role, reflected in terms such as ***money*** and ***business case***, implying that the dynamics legitimized values around the financial implication of sustainability. Additionally, the dynamics expanded the previous values, and he found the terminology to express his original value to better fit the context, with changes from ***how much do we use and how much do we produce*** to ***reuse of material*** or ***temperature*** to ***CO2***.

7.3.4 S

S's initial values connected to his job tasks were validated and expanded as he used terms such as ***materias*** and ***reuse more***. Simultaneously, the dynamics changed some of the previous values. The new values enacted are connected to what happened in the Key enacted moments; S then chooses accepted terms such as ***money***

talks and ***conflicting interests*** which overthrow previous terms such as ***world overshoot day***.

The changes or maintenance of values from exercise one to exercise three suggests that the stories provided in exercise two and the dynamics among the employees are evidence of the power of enactment. Fig 26 contains an overview of the initial and new terms and their corresponding values. We are left with the impression that the dynamics in exercise two affected the employees' beliefs and perceptions and the place sustainability takes in their rationalization process. In particular, we observed three ways the dynamics affected the employees' values.

1. The dynamic expanded and validated existing values.
2. The dynamics change the previous values, resulting in employees discarding initial values and using accepted ones.
3. Some values are genuinely embedded, and the dynamics do not affect them.

Employee	Initial terms	Values	New terms	Enacted values
	*Recycling, emissions, choice of materials.*	Waste management & resources management	*Material selections* *Heating* *Energy* *Reuse* *Carefully taking things down* *Material bank* *Time*	Waste management & resources management
	Cow, food	Awareness of the Environmental impact of agriculture	*Biodiversity*	Preservation of life
	*CO2, energy*	Sense of duty toward energy reduction	*Circular economy* *Environment* *Life cycle* *Waste*	Waste management & resources management
			Regulation	ATP organizational structures
	Animals and biodiversity	Preservation of life	*Biodiversity*	Preservation of life
	People, equal rights, UN, holistic	Social equity	*Equal rights*	Social equity
		Preservation of life	*Biodiversity*	Preservation of life
			Money *Business case*	Financial implications
	How much do we use and how much do we produce	Waste management & resources management	*Reuse of material*	Waste management & resources management
	Temperature	Climate change concerns	*CO2*	Climate change concerns
	*Overworld shooting day, environment, and green*	Climate change concerns	*Money talks* *Conflict of interest*	Financial implications
	Reuse	Waste management & resources management	*Material* *Reuse more*	Waste management & resources management

Fig 26: Overview. Self-made illustration.

This section has explored how sustainability is positioned in employees' sensemaking processes and highlighted sustainability's transformative journey in sensemaking dynamics. Initially, we surfaced how employees enter the dynamics with values that reflect work and not work-related themes. These values are transformed through various mechanisms, such as roles and KEM. The roles set the tone and influence the level of engagement among employees, guiding how much they engage with sustainability during the conversations. KEM revealed that actors such as the ATP law and the tenants shape the employees' perceptions and, therefore, their approach and management of sustainability in their projects. Second, the KEM highlighted how emotional responses such as frustration, shame, and confusion can serve as opportunities to benchmark employees' readiness to transition to self-driven behaviors. The analysis shows that guided dynamics enact some sustainability values among employees by expanding or changing existing values towards accepted ones. This observation captured the complexity and nuance of sustainability, highlighting how it is constructed, understood, and acted upon in a constantly evolving context.

7.4 Stories as Agents of Change

To address the second question from the exploratory round: What makes a good story? Can stories be agents of change or empower employees? We utilized the transcript (see appendix 17), to identify how stories are used and explore their characteristics. We have grouped our findings into five claims.

7.4.1 Stories Alone are not Agents of Change

In the exploratory round, we saw indications that stories could be agents of change. Yet, one particular dynamic in fig 27 shows that some stories lack acceptance from all employees.

Fig 27: Conversation. Self-made illustration.

M expresses her discontent with the story, surfacing that it is hot air. The story carries no meaning for M as it lacks replicability and is so niche that she sees no value in it. That is why we proposed that stories alone cannot be considered agents of change. Nevertheless, as actors, stories have negotiation power in movements of knowledge. We wonder if stories can be loaded with meaning, in this case, guidelines, to provide direction for implementing change and making abstract sustainability concepts more tangible and applicable for employees in their tasks.

7.4.2 Stories are powerful knowledge-sharing tools

As previously noted, stories carry power in movements of knowledge. During the workshop, it became evident how, as actors, stories foster discussions. Fig 28 shows how J recounted an experience of selling materials at a low price instead of discarding them, triggering a conversation among all employees about this initiative and the ATP law. This discussion evolved into exploring the law's framework, flaring up emotional responses such as frustration and confusion (see fig 28). In this case, a story can engage the employees to surface their challenges when integrating sustainability practices into their tasks.

Fig 28: Conversation. Self-made illustration.

7.4.3 Navigating the challenges of story dissemination

While stories can be used to share knowledge, the empirical data indicates that not all employees are familiar with all stories. This lack of awareness could diminish stories' potential power. Fig 29 shows an instance in which E shares an initiative with the potential of transitioning ATPE to use geothermal storage. S's comments that he endorsed the idea back when it took place. At the same time, M, when asked if she knew about it, mentioned that she did not. We then established that not all initiatives reach complete dissemination, and if

more employees, such as M, had been aware of it, the story may have gained support. We previously established that M took a truthseeker role in section 7.2.1.a. We speculate if she could have helped address the challenges E claimed to have led to the project's failure, but this is purely speculative as the story never reached M.

Fig 29: Conversation. Self-made illustration.

7.4.4 Complexity hinders dissemination

The empirical data revealed stories have different degrees of complexity, for instance, the floor story is so simple and concrete that it is used constantly in the ATPE office. Nevertheless, in the workshop, we observed stories with higher complexity. For instance, E explains in great detail, in 2:50 minutes, a story about a project on geothermal storage. As shown in fig 29, the other employees almost immediately dismissed it. None of them added follow-up questions. On the other hand, another conversation lasted 11:43 minutes, during which three employees engaged in a detailed discussion about tenants and sustainability. We are reminded of the importance of understanding the intentions behind using stories, whether as communication tools that prioritize relatability over complexity or as negotiation tools where complexity is maintained among employees performing similar tasks.

7.4.5 Homeless stories

We have touched upon the challenges of story dissemination in section 7.4.3. Related to that, during the workshop, we learned that stories currently reside mostly in employees' memories, except in certain instances, we could trace some of the stories back to LinkedIn posts (see fig 30 and appendix 19).

Fig 30: Conversation. Self-made illustration.

This phenomenon is encapsulated in employees expressing how valuable it would be to have a designated space for these stories to live, as mentioned by M in the fig above. This excerpt reveals current challenges in effectively sharing stories in ATPE. The issue with stories living only in employees' memory is the challenge that this poses for dissemination across the organization but also makes stories vulnerable to gaps and turnover.

The findings above present an opportunity; establishing a centralized story repository emerges as a promising approach to elevating stories' potential as agents of change. The insights summary in fig 31 was carried into the driving informed decisions round.

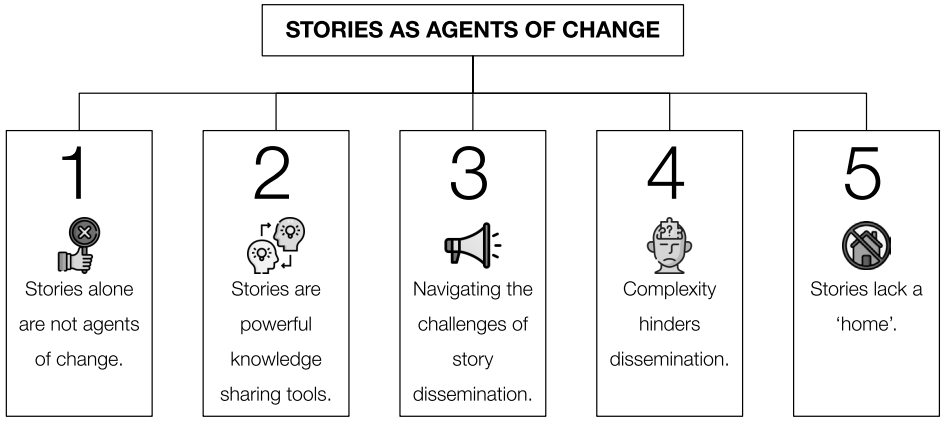


Fig 31: Stories as agents of change findings. Self-made illustration.

This section has explored the idea of stories being agents of change, which emerged from the exploratory round. Our observations indicate that, indeed, stories have the potential to be agents of change; to do so, they need mechanisms to make them stronger. For instance, the analysis indicates that stories need to carry meaning through information that allows employees to act on the story to activate the knowledge encapsulated in it. Depending on how a story will be used, a story may need to balance simplicity and relatability to engage a broader audience and be spread easily through ATPE or complexity, to address a specific niche and surface specific challenges relevant to them and empower certain employees. Still, we cannot expect the same story to empower all employees. Lastly, ATPE stories live in employees' memories, which poses a danger as knowledge is lost during turnover and relies only on spoken dissemination, which is unreliable because information may be lost, compromising sustainability's agency.

To wrap up the exploratory and deep dive round, we have reflected on the insights collected in both rounds. We have termed these insights as the faces of sustainability (see fig 32) as they are the picture of how sustainability manifests in ATPE.

7.5 Faces of Sustainability

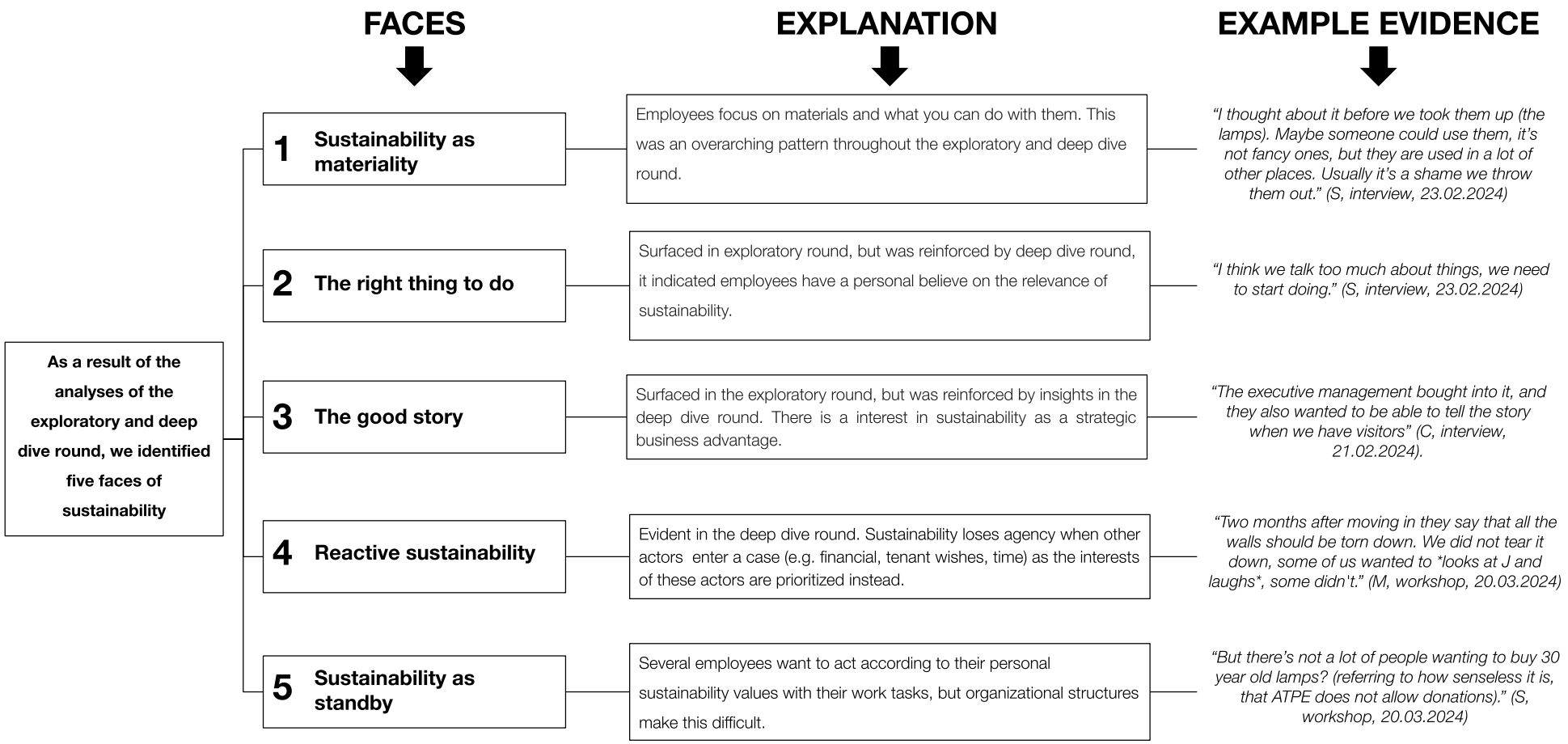


Fig 32: The five faces of sustainability. Self-made illustration.

The faces provide a baseline to assess the initiatives to explore subquestion two: What is the level of sustainability in employees' current initiatives? In the tales of sustainability in ATPE round. Additionally, they are part of the foundation for our conceptualization (in the driving informed decisions round), guided by the third subquestion: What could it take to engage employees further in sustainability initiatives? Together with the insights from the exploratory and deep dive round, we will explore if a design suggestion could transition the employees from compliance-oriented to self-driven behavior.

8. Tales of Sustainability Round

Up to this point, we have used stories to investigate how sustainability manifests in ATPE. However, we recognize the necessity of employing established sustainability assessment methods to determine the degree of sustainability of these stories. Our assessment addresses subquestion three: What is the level of sustainability in the current initiatives? First, we will assess the sustainability performance of two stories at a more concrete scale. Second, as highlighted in our theory section 4.4.2, use the insights from our analyses of the five faces of sustainability (see section 7.5) to assess sustainability more holistically.

8.1 Assessment of Two Stories

Throughout the case study, we encountered numerous stories told by employees that varied in length, detail, and popularity. These stories organically surfaced as a method of knowledge exchange, and while not all stories are included in our report, we believe it holds value to exhibit the number of encountered stories to emphasize just how much they are used in ATPE (see table 9). To get a more detailed overview, see appendix 6.

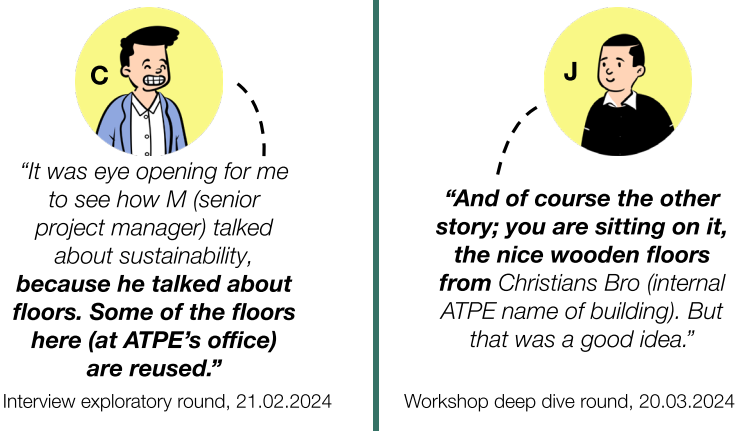
Round name	Number of collected stories
The exploratory round	11
The deep dive round	21
Total	32

Table 9: Overview of collected stories.

Our assessment will be based on two selected stories: ‘The floors story’ because our collective experience in ATPE has proven it to be the most widely recognized story and ‘the lamps story’ due to the amount of details we have on this story.

8.1.1 The floors story

The widely-known floor story has become a statement of ATPE’s commitment to sustainability. This became evident to us after observing numerous office tours where ATPE employees take external actors on a guide to show them the ATPE office, and was surfaced in both the exploratory and deep dive round (see fig 33):



“It was eye opening for me to see how M (senior project manager) talked about sustainability, ***because he talked about floors. Some of the floors here (at ATPE’s office) are reused.”***

Interview exploratory round, 21.02.2024

“And of course the other story; you are sitting on it, the nice wooden floors from *Christians Bro (internal ATPE name of building). But that was a good idea.”*

Workshop deep dive round, 20.03.2024

Fig 33: Floor story quotes. Self-made illustration.

We found that C did not have all the necessary information for us to assess the sustainability of the floor story. Therefore, we contacted MA through email, who was responsible for the project of re-using the floors in ATPE's new office, making it possible to gather the needed details of the story (see fig 34).

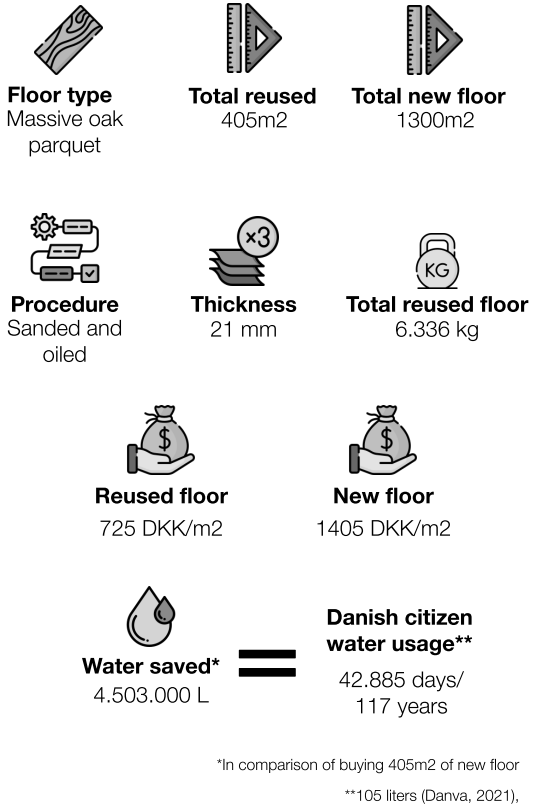


Fig 34: Details of the floor story. Self-made illustration.

We calculated the liters of water saved using an estimated water usage per m3 of oak wood (Jayasundara, 2015). To see the full calculation, see appendix 20.

8.1.2 The lamps story

This story first surfaced during the exploratory round (shared by S, see fig 35) and resurfaced in the deep dive round.

Fig 35: Lamps story quotes. Self-made illustration.

Fischer Lightning had made a life cycle analysis (LCA) of the lamps and with the help of ATPE's LinkedIn post in January 2024 about the story of the lamps (see appendix 19), we have the necessary information to assess the sustainability of the story (see fig 36).

Fig 36: Details of the lamps story. Self-made illustration.

After gathering initial information and performing calculations for the two stories, we aimed to demonstrate their level of sustainability using an established method. To achieve this, we reviewed literature on various methods for assessing sustainability in different contexts.

8.2 Assessment Methods

Demonstrating the level of sustainability achieved by an initiative is crucial, particularly considering the existence of greenwashing, which encompasses actions that deceive by falsely portraying the environmental benefits (Christensen et al., 2021; UN, 2024). To mitigate risks of greenwashing, organizations are pursuing ways to measure the level of sustainability in their initiatives. Yet, measuring sustainability becomes challenging in the absence of conceptual and definitional transparency (Gudmundsdottir & Sigurjonsson, 2024). In recent years, several methodologies have emerged to quantify sustainability, including Sustainability Performance Indicators (SPI's), which are instrumental in measuring, and showcasing corporate sustainability levels (López-Arceiz et al., 2020). However, metrics alone do not encapsulate the entirety of sustainability performance. Some approaches, such as the Fair Trade and ISO 14001 certification, prioritize a holistic perspective, incorporating factors beyond numerical measures, such as management practices (Gudmundsdottir & Sigurjonsson, 2024). Other frameworks, such as the Sustainable Development Goals (SDG), provide an alternative approach for assessing sustainability and is acknowledged for its holistic view of both economic, social and environmental sustainability (Liu, 2024).

Corporate Social Responsibility (CSR) is an additional method for stakeholders to assess an organization's sustainability performance. It entails that organizations must have "considerations for human rights, societal, environmental and climate conditions as well as combatting

corruption in their business strategy and corporate activities" (Ioannou & Serafeim, 2017, p. 8). A newer addition to sustainability reporting is CSRD, which mandates companies to disclose the environmental and social impact of their activities, and necessitates the audit (assurance) of reported data (KPMG, 2024).

The construction sector, which ranks among the top contributors to global carbon emissions, accounting for approximately 40% of total emissions (Lima et al., 2024), has traditionally focused on mitigation strategies aimed at reducing operational energy consumption, including electricity, heat, water, and waste (Prideau et al., 2023). However, recent years discourse has emphasized the need to assess embodied effects of buildings. Life Cycle Assessment (LCA) is particularly useful for this purpose, as it allows for estimation of environmental impacts throughout a building's life cycle (Prideau et al., 2023). However, LCA requires significant resources, as databases are not readily available (Guardigli et al., 2011). A method, which requires less resources is the R-hierarchy, representing a series of strategies utilized in Circular Economy (CE) to maximize a product's value in the end-of-life phase is also one such method (Bakker et al., 2019; Reike et al., 2018).

The literature review revealed that assessing the sustainability of initiatives is crucial to avoid greenwashing. It also taught us that not all assessment methods are holistic; some are more product-oriented, while others also consider management practices, and the methods can be sector-specific. For the construction sector, which includes ATPE, both LCA and the R-hierarchy are suitable, but also being aware of CSR and CSRD is important for ATPE. However, since CSR and CSRD are comprehensive directives that require substantial resources, and LCA also demands significant resources, we chose to assess the two stories; The floors and the lamps, using the R-hierarchy. For more details on why we selected this method, see section 4.4.1.

8.3 Sustainability Assessment

8.3.1 Floors

The floors were sanded and oiled before they could be used in ATPE's new office. Based on Reike et al. (2018), the story is R4-refurbish (see fig 37), making this initiative more sustainable than buying new floors.

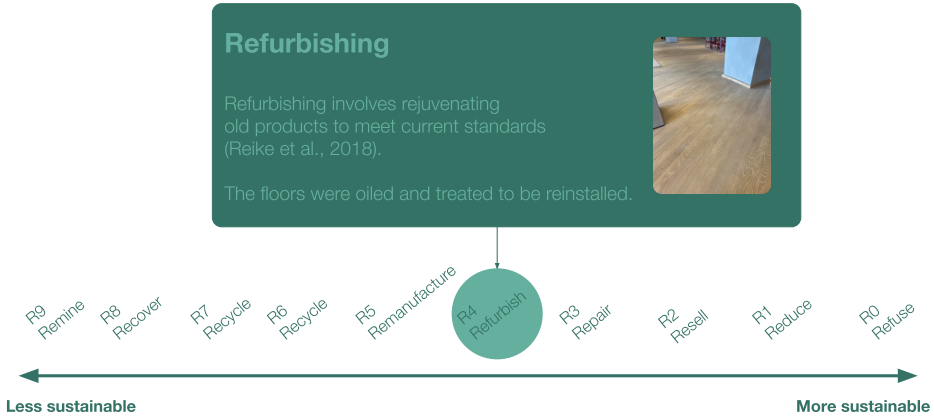


Fig 37: R-hierarchy applied to the floor story. Self-made illustration.

8.3.2 Lamps

The lamps had their technology upgraded and got its shell renovated. Based on Reike et al. (2018) the story is R4-refurbish (see fig 38), making this initiative more sustainable than buying new lamps. Nevertheless, lacking access to the actual LCA, we acknowledge the uncertainty regarding the refurbishment process of the lamps. Therefore, we also propose the possibility of R3-repair.

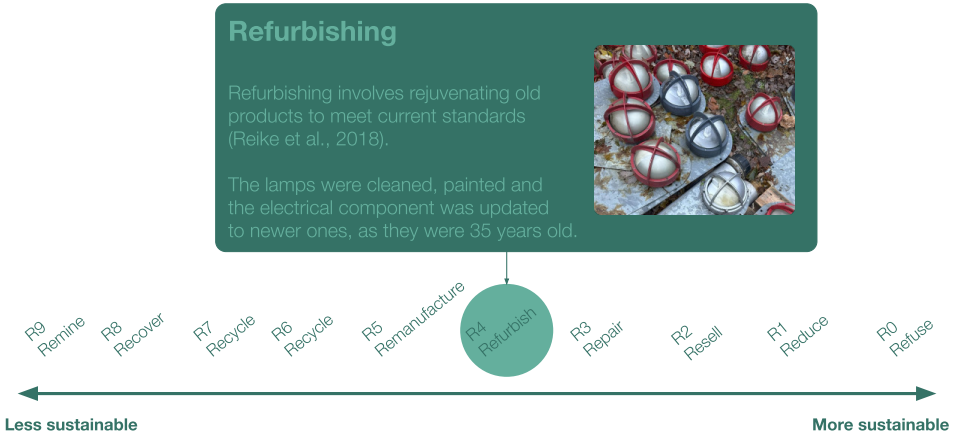


Fig 38: R-hierarchy applied to the lamps story. Self-made illustration.

8.3.3 Putting assessments into perspective

ATPE owns 606.368m² of properties in Denmark (ATP Ejendomme A/S, 2023), with the floor story (405m²) corresponding to 0,067% of its total.

According to T, project manager, buildings require approximately 0.5 lamps per m² to comply with Danish building standards (BR18) (Boligstyrelsen, 2023). We lack data on the total outdoor area in m², but if each building (84) averaged around 15 outdoor lamps, then ATPE would have 1260 lamps. Consequently, the lamps story would represent 9.52% of all lamps.

It is in our understanding that there are no plans to repeat re-using old floors in buildings, suggesting that future renovations will use new

floors instead. However, this is an assumption, as we have not had the opportunity to get insight into all upcoming projects in ATPE. From our experience in ATPE, the lamps story also marks an unique project. We have not been able to confirm the feasibility of similar initiatives, implying that ongoing renovations might miss out on the potential for reusable external lamps, contradicting principles of circularity.

As stated in section 4.4.1.a, we acknowledge the limitations of the R-hierarchy, hence why the upcoming section will unfold an assessment at a holistic level.

8.4 Sustainability Faces put into Perspective

As a result of the analyses of the exploratory and deep dive round, we identified five faces of sustainability (see section 7.5): Sustainability as materiality, the right thing to do, the good story, reactive sustainability, and sustainability as a standby. While we acknowledge that the faces cannot be concluded as absolute truths within ATPE, we still find the five faces useful to provide us with a partial glimpse into how sustainability manifests in ATPE. Therefore, we will utilize the five faces and the framework Design for Sustainability (DfS) by Ceschin & Gaziulusoy (2016) to assess sustainability on a more holistic level in ATPE (see section 4.4.2 for more information on the framework). Fig 39 shows how we have positioned the faces within the aforementioned framework.

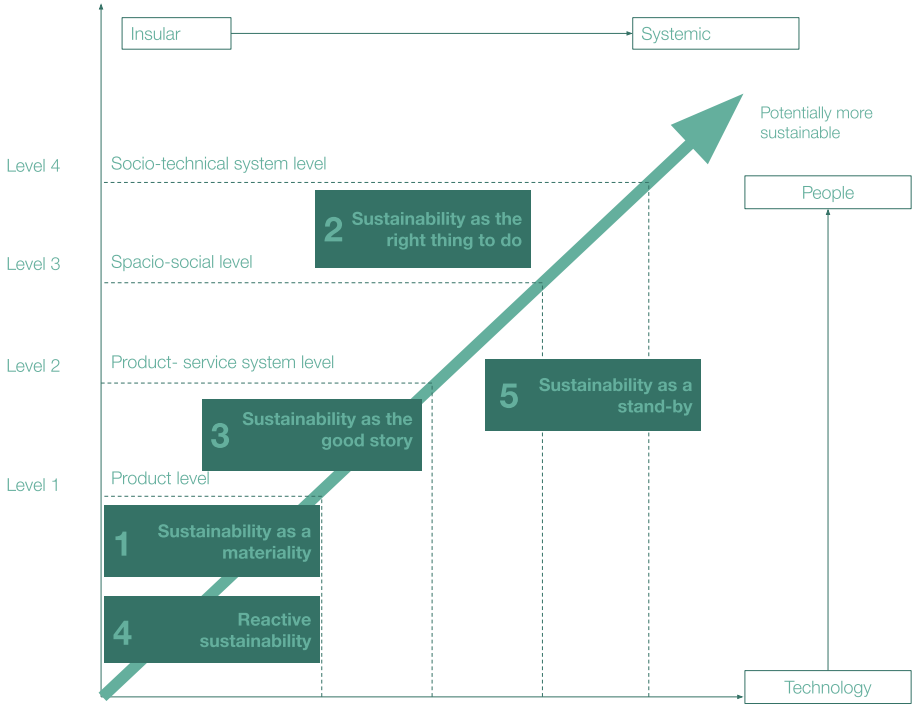


Fig 39: Five faces of sustainability with the DfS framework. Self-made illustration.

8.4.1 Product-level

The face of ***sustainability as materiality*** aligns with the product-level, as our analyses made it evident, that ATPE employees' current sustainability efforts are focused on enhancing the physical attributes

of materials and design strategies for easier re-using. At that same level, we encounter the ***face of reactive sustainability***. This face became evident by observing the key enactment moment "tenants and sustainability" (see section 7.2.2) where sustainability was added reactively rather than proactively.

We suggest that the faces at the product-level imply that there is a correlation between ATPE's focus on materiality, reactive sustainability, and property management. ATPE manages properties, which are tangible objects for project managers.

8.4.2 Product-service system level

The ***face of sustainability as the good story*** reveals how sustainability can be used as a narrative or brand strategy, which is why we see it fitting within the product-service system level.

We have observed how employees with various titles talk about sustainability as the good story, and this is due to the capability of stories to share knowledge in a tangible manner. We suggest that this face could be fostered by the culture in ATPE, as the empirical data shows that this face contains extracted cues in which individuals know the audience and the values relevant for that audience: "It was not cheaper - but it was a good story so it happened. The executive management bought into it, and they also wanted to be able to tell the story when we have visitors" (C, interview, 21.02.2024).

8.4.3 Socio-technical system level

The ***right thing to do*** and ***sustainability as standby*** faces align with the socio-technical system level where supporting transitions are promoted by changing how societal needs are met. The face of "the right thing to do" highlights the relevance of considering sustainability's ethical and social dimensions beyond individual products. We suggest that the face implies that several employees engage in sustainability initiatives, because they truly believe it is the right thing to do. Furthermore, we propose that their need to do things differently stems from personal values. Interestingly, we have chosen to position the face of "sustainability as standby", in the same innovation level as the face reveals organizational structures and regulatory complexities. The face of stand-by was exemplified by the ATP law, showing how employees struggle to comprehend the complexity of the law. The contradiction between the two faces seems to trigger shame, frustration, and confusion which we suggest are all emotional responses contributing to compliance-oriented behavior.

We have demonstrated that the initiatives involving refurbishing floors and lamps are more sustainable than purchasing new ones. However, our analysis indicates that for these initiatives to make a significant

impact in terms of ATPE's overall footprint they must be integrated into renovation practices on a larger scale.

The assessment rooted in the DfS framework offers valuable insights into ATPE's sustainability maturity. For instance, ATPE exhibits multiple faces at the product level, aligning with its revenue generation model of property management. It indicates that starting at the materiality level appears crucial if we aim to shift employees from compliance to self-driven behaviors. Furthermore, the assessment shows multiple faces at the socio-technical level, indicating that several ATPE employees are keen on transitioning towards sustainability-oriented values. These insights will be further discussed in section 10.2. Lastly, our assessment underscores that the value of ATPE's initiatives lies not solely in their immediate sustainable impact, but in their potential to confer strategic advantages, although with a risk of veering into greenwashing territory.

9. Driving Informed Decisions Round

This section of the case study aims to connect the findings from the deep dive and exploratory round to answer subquestion three: What could it take to engage employees further in sustainability initiatives? First, we created an overview of all the findings and related them to the research question and subquestions. Fig 40 shows that some findings contribute directly to the research question (RQ), while others support the subquestions.

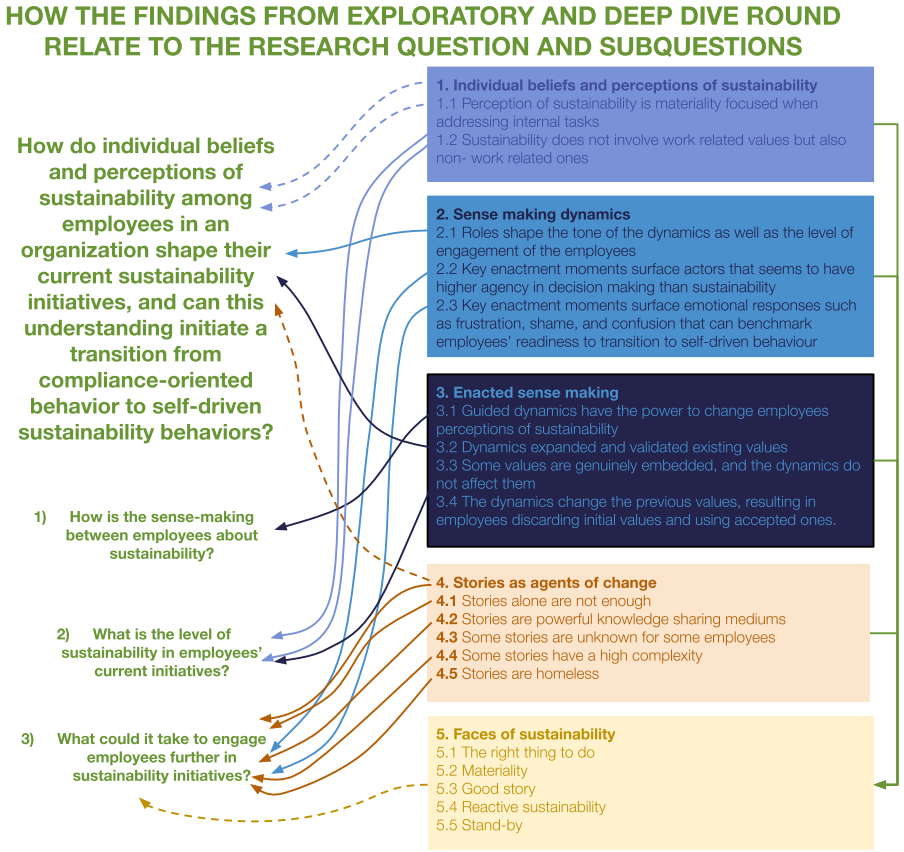


Fig 40: Connection between findings, RQ and subquestions. Self-made illustration.

9.1 Evaluation of Findings

We evaluated each finding's relevance to the problem that our research question focuses on, the compliance-oriented behavior, with the help of a matrix (see fig 41). We will now explain how the findings are rated in the matrix. To do so we have clustered the findings.

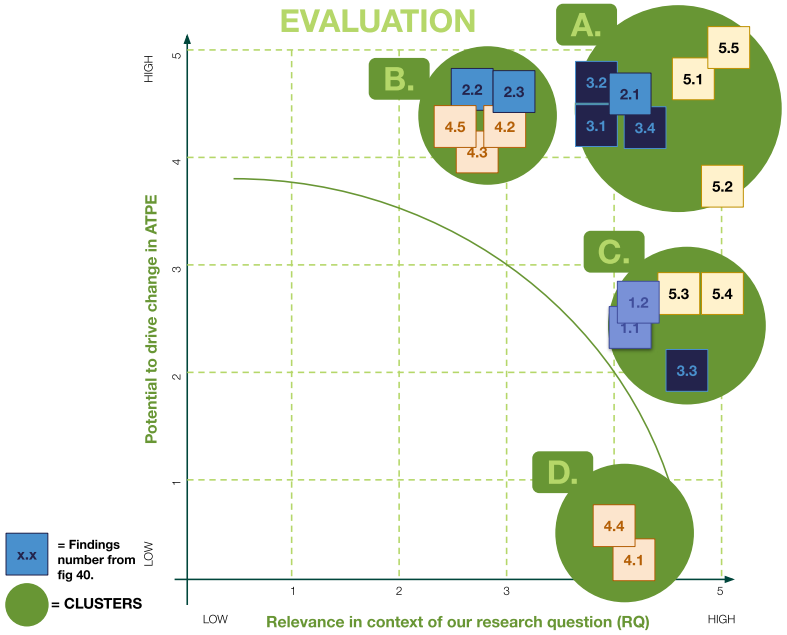


Fig 41: Findings and their ratings. Self-made illustration.

Cluster A (high relevance for RQ/high potential for driving change): Guided dynamics have the power to change individual beliefs (3.1), the dynamic expanded and validated existing values (3.2), the dynamics change the previous values, resulting in employees discarding initial values and using accepted ones (3.4), roles shape the tone of the dynamics as well as the level of engagement of the employees (2.1). The insights regarding the faces of sustainability (5.1, 5.2, 5.5) inform us of how sustainability manifests among employees in ATPE. All findings also showed us how to initiate self-driven behavior among employees and what we should be critically aware of while moving forward.

Cluster B (medium relevance for RQ/high potential for driving change): The findings provided additional information on factors that could contribute to employees' self-drivenness. Such finding was that key enactment moments surfaced actors (ATP law and tenants) proving that sustainability does not carry the same agency in decisions (2.2). Key enactment moments surfaced emotional responses such as frustration, shame, and confusion that can serve to benchmark employees' readiness to transition to self-driven behavior (2.3), the power of stories (4.2), as well as specific barriers for sensemaking processes such as knowledge gaps or unknown stories (4.3). Lastly, a need for more documentation structure (4.5). These findings have a high potential to drive change within ATPE as they inform us from different perspectives on initiating self-driven behavior. However, they do not surface as critical insights as the previous cluster regarding medium relevance for our RQ.

Cluster C (high relevance for RQ/medium potential for driving change): Findings 5.3, 5.4, 1.2, 1.1, and 3.3 relate to the faces of sustainability and personal beliefs and perceptions and, therefore, also how sustainability manifests in ATPE. However, as they provide less information on how to drive change, but rather about specific barriers we should be aware of, we rated the cluster to have medium potential for driving change.

Cluster D (low relevance for RQ/high potential to drive change): While findings 4.1 and 4.4 do not directly support us in answering the RQ as they focus on stories, we still consider them interesting regarding initiating self-driven behaviors. This is because the cluster focuses on how stories could become agents of change.

9.1.1 Prioritizing clusters

Based on the ranking in fig 41, we chose to focus on the clusters rated as most relevant to address the research question and their potential to initiate self-driven behaviors among employees (see fig 42).

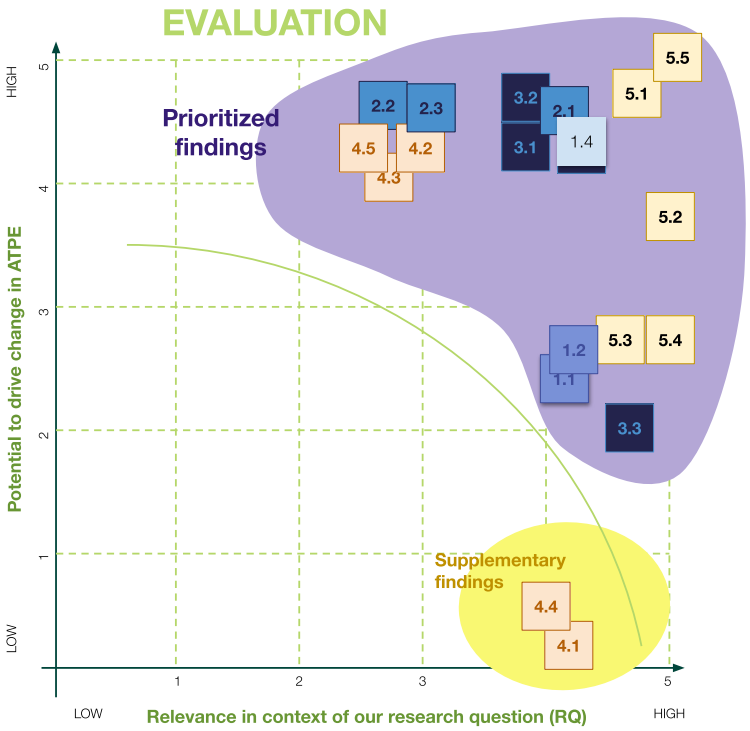


Fig 42: Prioritization. Self-made illustration.

To manage the clusters, we assigned themes representative of the findings inside each cluster (see fig 43). The themes were: ‘Staging’, ‘stories and their lack of agency’, ‘power of sensemaking’, ‘hope and opportunity’, ‘current manifestation of sustainability. A place to start’ and ‘sustainability as a nice to have but not critical’.

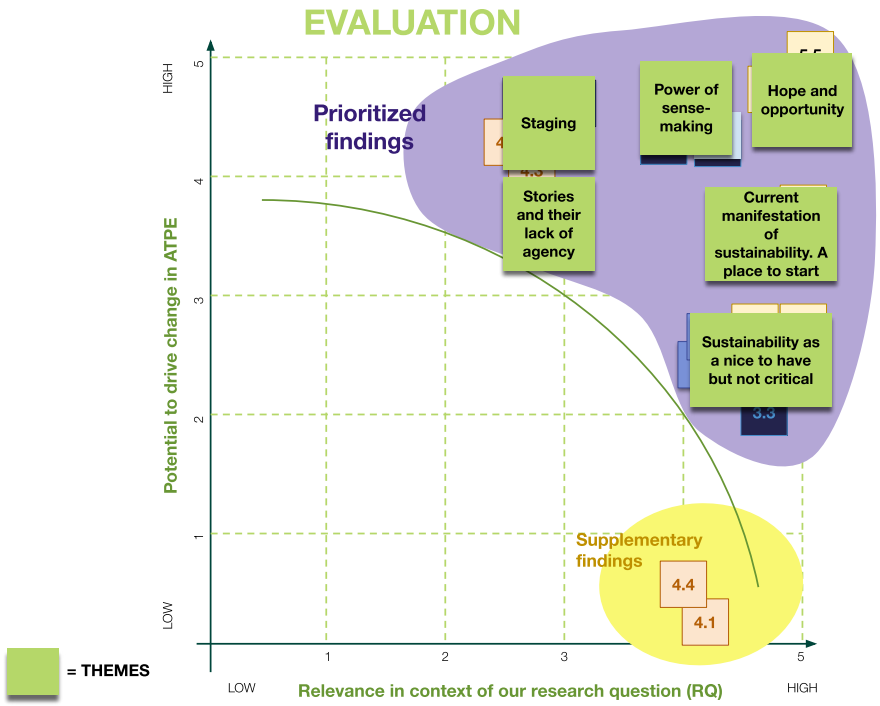


Fig 43: Cluster themes. Self-made illustration.

9.2 Conceptualization

Converting the themes into tangible design specifications was necessary to create a design suggestion (DS) that could initiate a transition from compliance-oriented to self-driven behavior. To do so, we first translated the themes into requirements (what the design must meet or achieve) and then into design features (specific implementations that allow the design to meet the requirements) (see fig 44). For clarity, the design specifications will be referred to as the names of the themes. We will now unfold the design specifications.

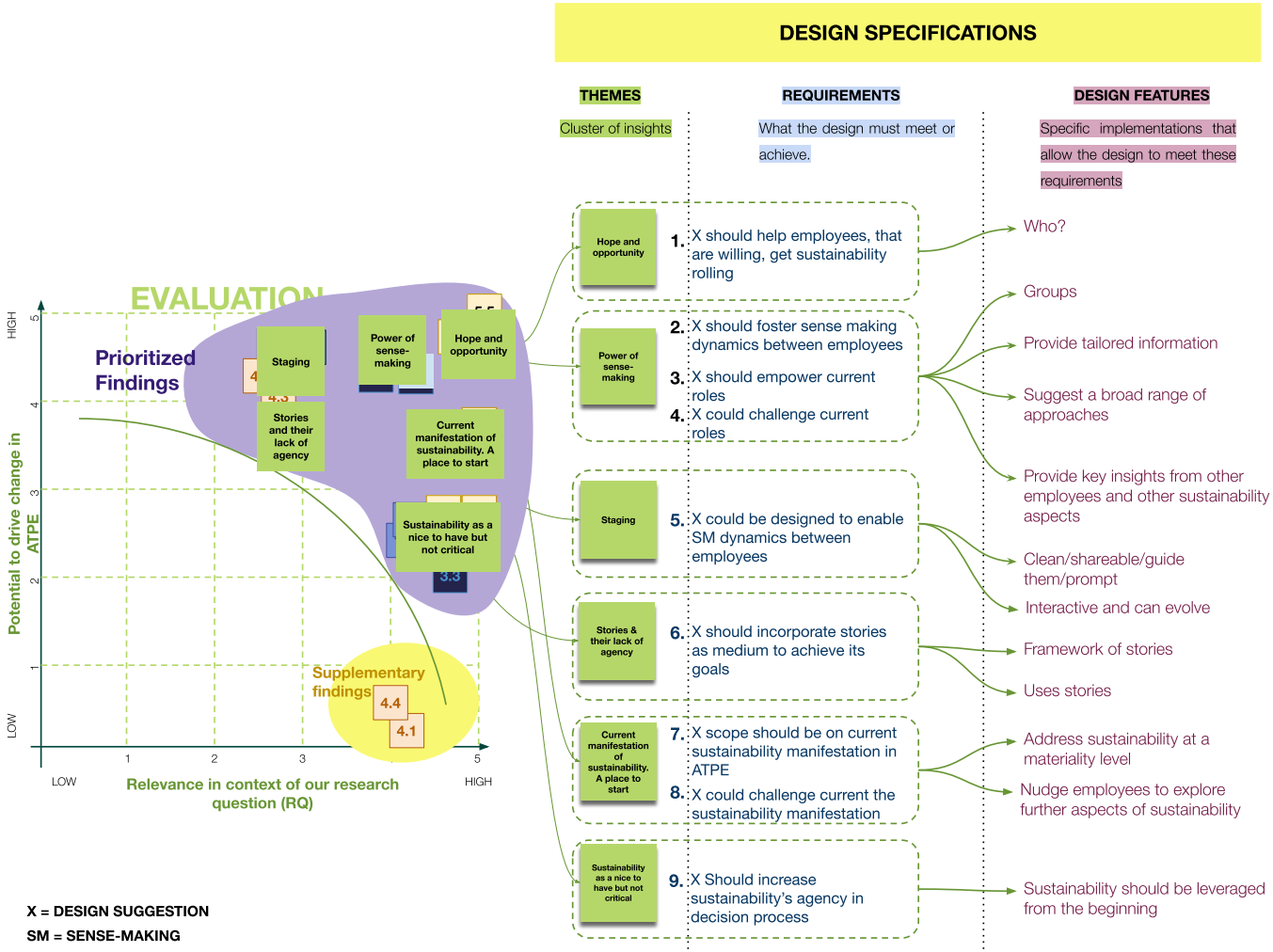


Fig 44: Overview of the steps from themes to requirements to design features. Self-made illustration

9.2.1 Design Specifications

9.2.1.a Hope and opportunity

Our design suggestion (DS) should help employees willing to engage further in sustainability initiatives. However, as we know that achieving this depends on which tasks employees have, it is relevant to consider who the target audience of our DS is. Based on our experience across departments, the DS targets project managers and asset managers, who have expressed a strong interest and emotional responses to change their current practices in ATPE.

9.2.1.b Power of sensemaking

The DS should foster sensemaking dynamics between employees, which is why the DS should be able to be used in groups. Empowering the already motivated target audience could be done by tailoring the DS to their current roles and tasks. However, we also see an opportunity to challenge their current roles and the scope of their sustainability initiatives, which is why the DS could nudge employees to explore further sustainability aspects.

9.2.1.c Staging

This theme directs our focus toward the specific form of our DS. Given the necessity of promoting sensemaking dynamics, we find it crucial to create the DS in a manner that enables sharing and interactivity.

9.2.1.d Stories and their lack of agency

While we have proven that stories alone are not agents of change, we still know that they are powerful mediums, which is why the DS should utilize the format of stories as a medium to share knowledge.

9.2.1.e Current manifestation of sustainability. A place to start

We have proven that current sustainability initiatives are focused on materiality. While we acknowledge the inadequacy of this approach in the long run, we also recognize the significance of starting with a level of sustainability that resonates with employees. However, although not a requirement, we still aspire for our DS to challenge the current perception of sustainability.

9.2.1.f Sustainability is nice to have but not critical

Currently, sustainability is seen as desirable (e.g. Sustainability as the right thing to do), yet it requires more agency to enact substantial impact and drive change in projects. In response, we aim to craft the DS in a way that utilizes sustainability from the beginning, ensuring active engagement of employees with sustainability principles.

9.3. Design Suggestion (DS)

We went through two iteration rounds before ending up with a design suggestion (DS) we could test. Embracing an iterative design approach, which focuses on an initial design based on the design specifications, then iterated, tested, and built upon employee feedback, differs from a parallel design approach. An iterative design approach also aligns with the abductive methodology of our case study, which is a design approach that adapts to emerging information and changes.

9.3.1 Iterative Design Process

The first sketch resulted from a brainstorming session in which we tried to integrate all the design specifications we defined in the conceptualization (fig 44). The sketch was drawn on A3 paper, as shown in fig 45. In particular, the first sketch failed to include the design specifications regarding sustainability ('current manifestation of sustainability. A place to start', and 'sustainability is nice to have but not critical').

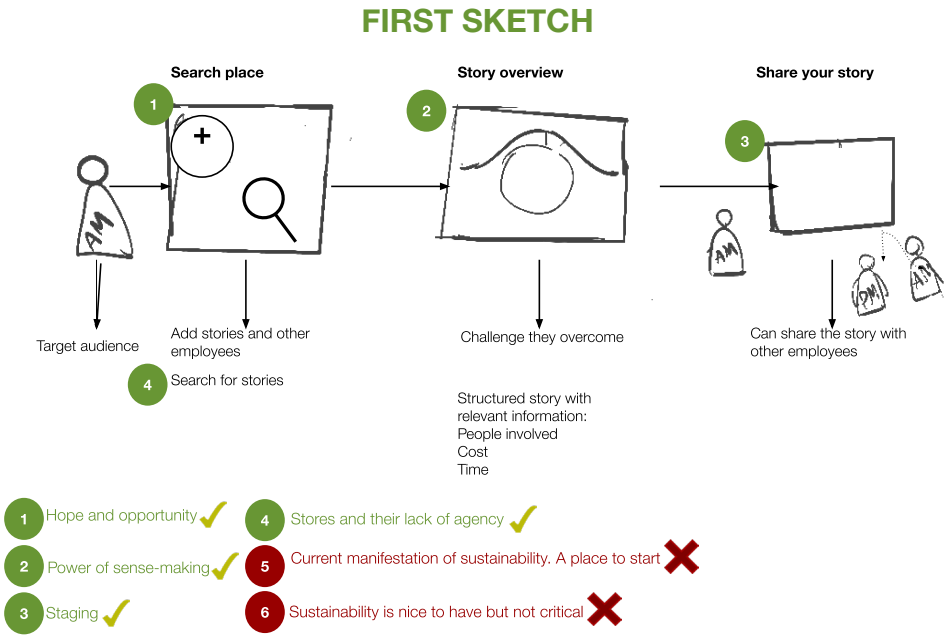


Fig 45: Sketch. Self-made illustration.

The second sketch (see fig 46) was an iteration of the previous one, which was iterated to address the missing design specifications regarding sustainability before testing.

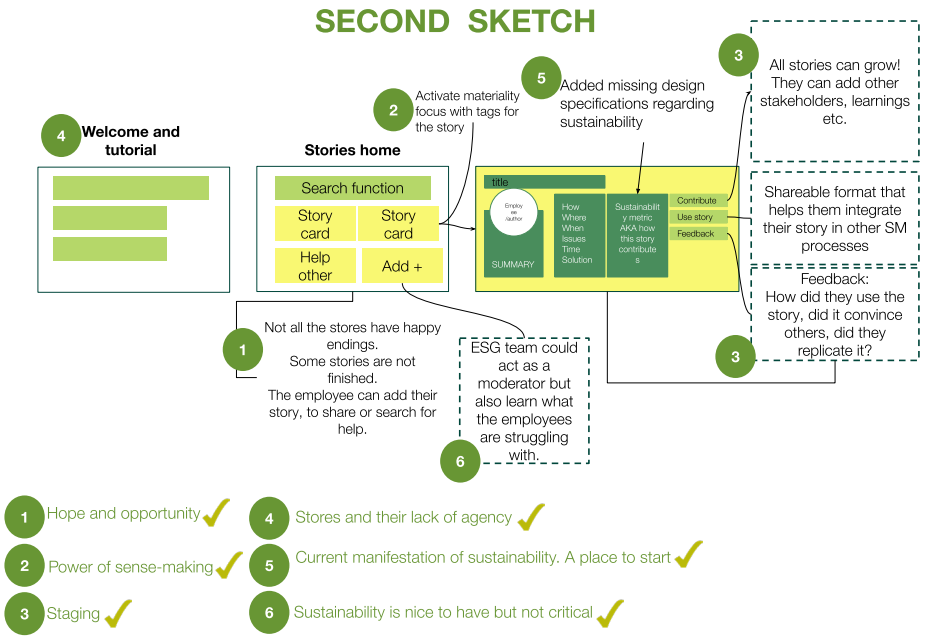
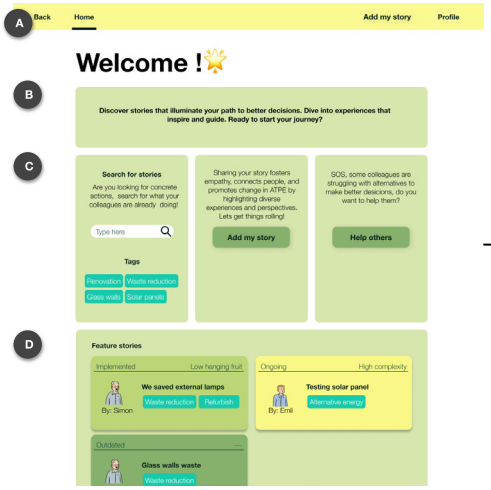


Fig 46: Second sketch. Self-made illustration.

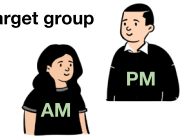
The following section explains the DS prototype, which was created based on the second sketch.

9.3.2 A Walk-through

Fig 47 shows an overview of the DS and the four use cases employees can experience while using it. The upcoming sections will delve into two of them and use letters to explain how the design specifications materialized in the DS. For details on the remaining two use cases, see appendix 21.



Target group



USE CASE 1: Looking for help?

USE CASE 2: Sharing stories

USE CASE 3: Helping others

USE CASE 4: ESG as moderators

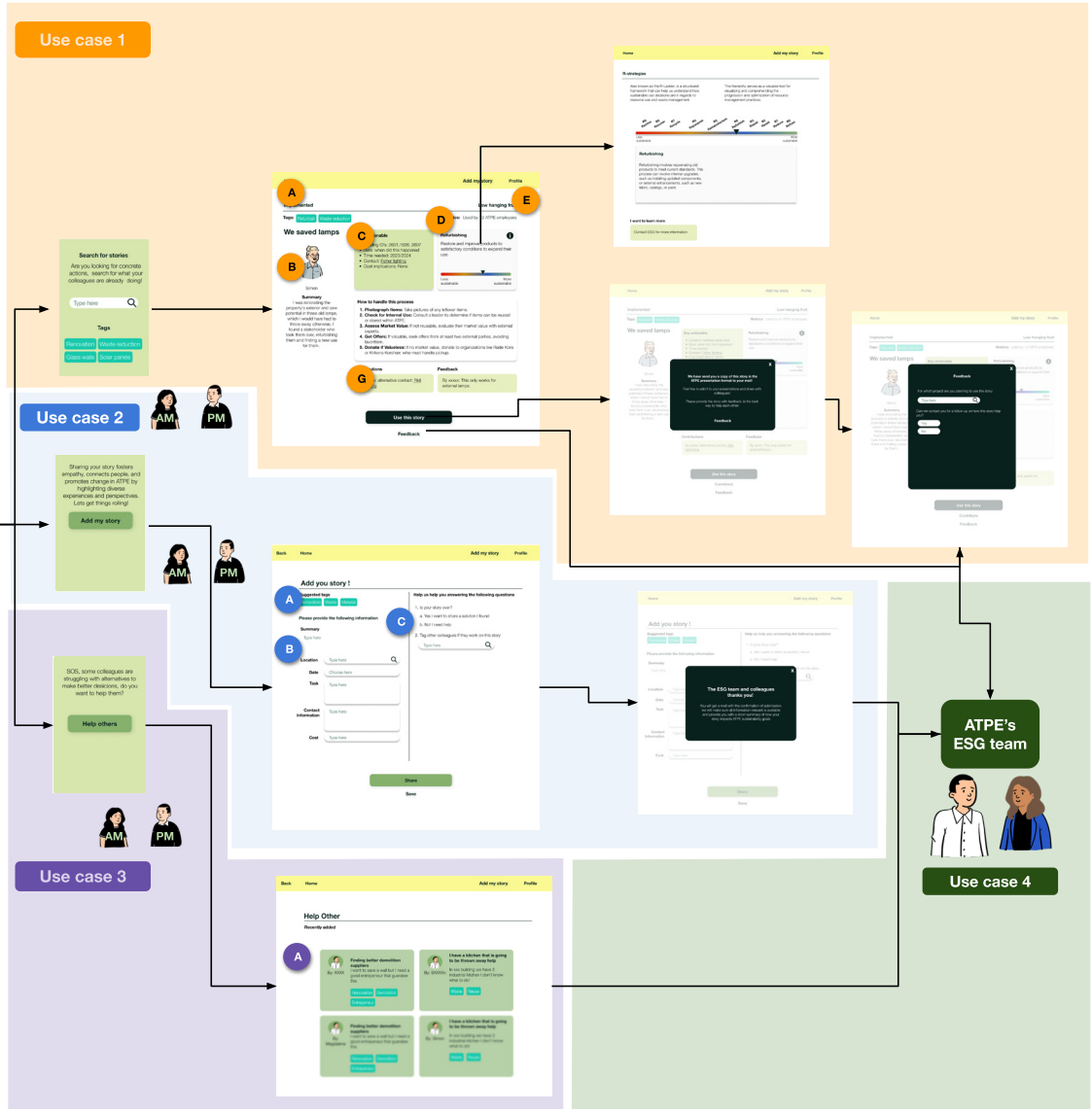


Fig 47: DS overview. Self-made illustration

9.3.2.a The-welcome page

Fig 48 shows the welcome page. **'A'** shows the navigation component that enables the PM's and AM's to use the DS. The overall user interface has been designed to match the look of ATPE's corporate visual identity by maintaining institutional colors. **'B'** gives the employees a brief recap of the DS's aim. **'C'** contains the three cases where the DS can be used. Finally, **'D'** shows how the DS provides a feature to give stories a home.

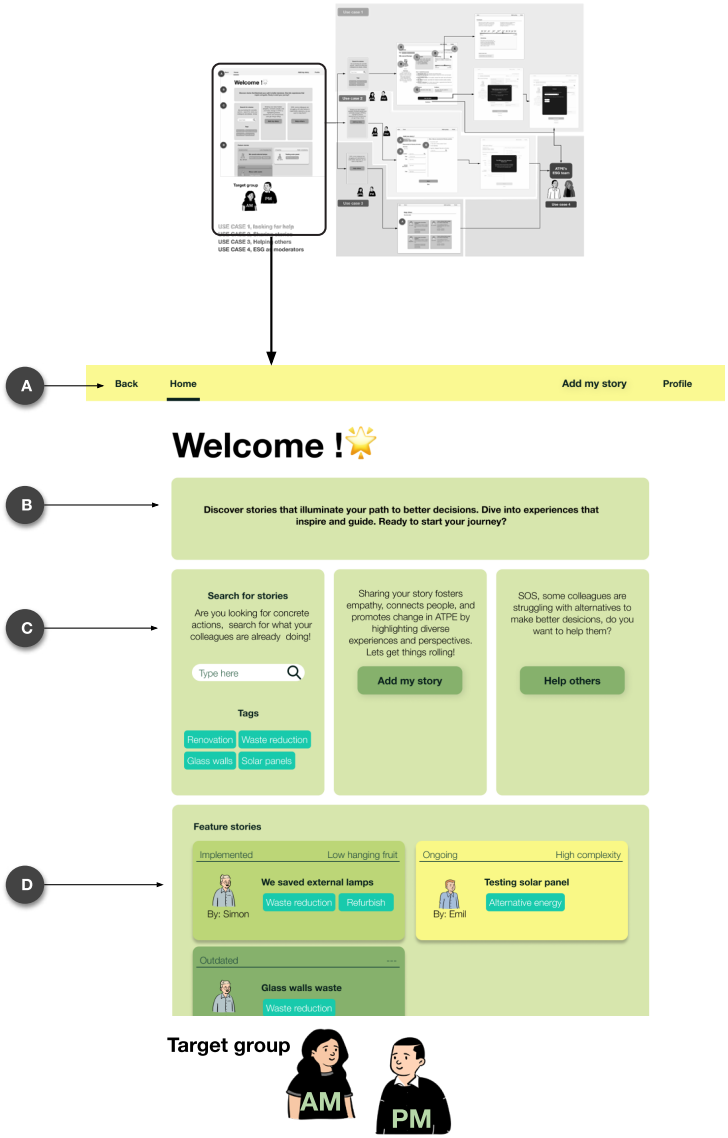


Fig 48: The welcome page.

9.3.2.b Use case one: Looking for help?

Fig 49 shows use case one, which we created to target employees looking for actionable information to aid them in decisions regarding sustainability within their tasks. The search bar allows employees to search or be guided using the tags. After choosing a story, they enter the next section. As indicated in **'A',** they find reference information regarding the story, such as its status (if it is still ongoing or finished). **'B'** shows the information, including the title, author, and story summary. **'C'** shows the story's specifics: Building ID, date, time required, contact details, and cost implications. **'D'** shows the R-hierarchy, which is the sustainability assessment of the story. If they press on R-hierarchy, they will proceed to the following flow (see fig 50) to explore further information on the sustainability assessment. The employee can assess the complexity of the story in **'E'**. The ATP law is addressed in five steps in **'F'**. The source of these five steps stems from an interview with a lawyer inside ATPE (see appendix 22). The employee can provide feedback, as shown in **'G'** and the section allows the employees to add relevant information to the story or provide insights on how it has helped them and why. Finally, if the employee wants to use the story, they can proceed with the primary action at the bottom, **'H'**, which says "use this story". Doing this will lead them to the next part of the flow (see fig 51), where they can share the story and give feedback. The employee will receive the story in an ATPE-friendly format in their mail.

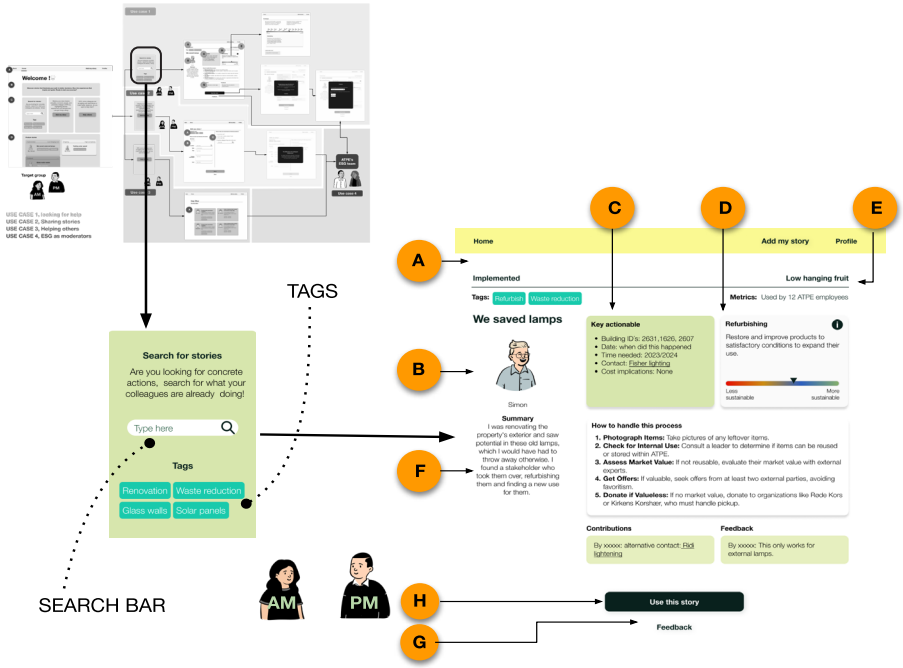


Fig 49: Use case one.

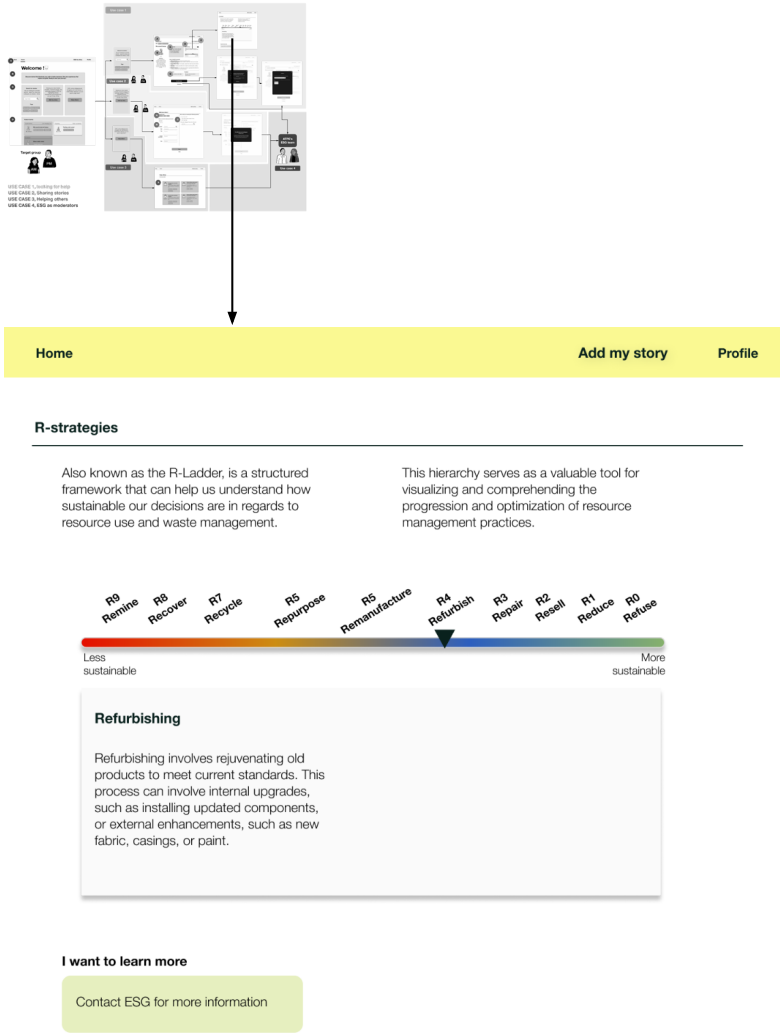


Fig 50: The R-hierarchy.

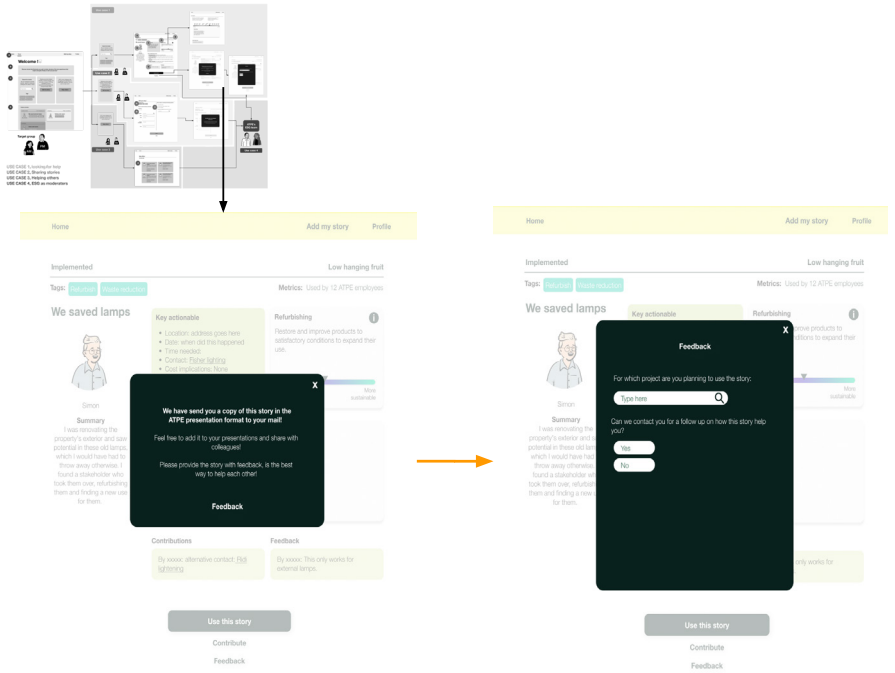


Fig 51: Last part of the use case.

9.3.2.c Use case two: Sharing stories.

This use case allows employees to share their story. The flow allows them to select tags, as shown in **'A'** (see fig 52). They can add information relevant to the story, such as building ID, summary, relevant contacts, etc in **'B'**. Lastly, they can provide the moderators (the ESG department) with crucial information such as status and relevant actors in **'C'**.

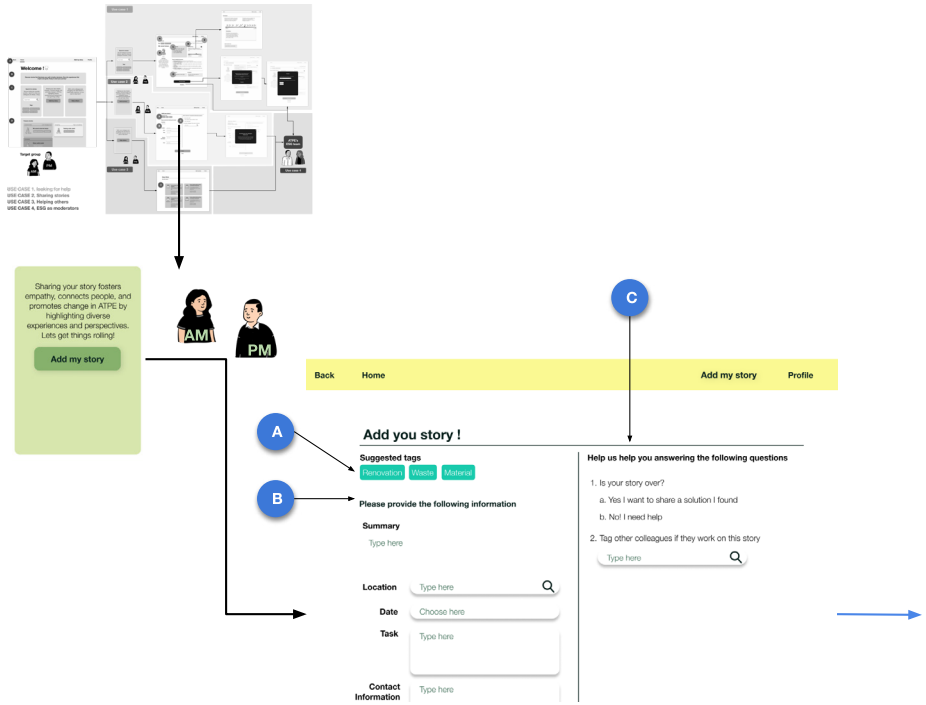


Fig 52: Use case two.

Once the employees submit the story, they will be informed that the ESG team will review their story (see fig 53), which marks the start of the fourth use case (see appendix 21).

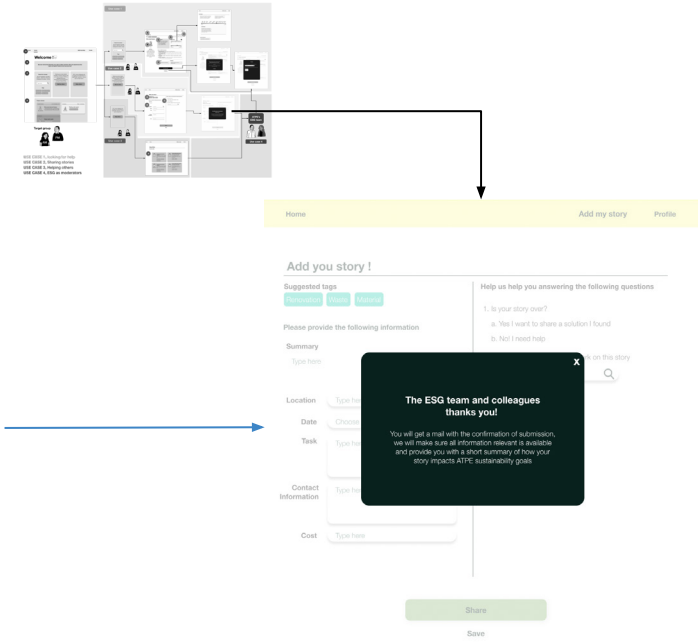


Fig 53: Submitted story.

The DS was necessary to test with employees, as it helped us avoid unnecessary distractions and hypothetical feedback, which could skew the results. With the prototype available, we could test whether or to what degree we can move employees toward self-driven behaviors. We will now unfold how we tested the DS and the results.

9.4. Testing

Recognizing that it is unrealistic to validate or falsify whether the DS meets all design specifications from fig 44 within the duration of the case study, we selected five of them that could help us answer subquestion three: What could it take to engage employees further in sustainability initiatives? To test the design specification, we formulated two assumptions, each representing one theme of the design specification (see fig 54).

1. "The DS fosters group-based dynamics that help employees address 'low hanging fruit' initiatives (initiatives that can be implemented with minimal effort)". Validating this could imply that the DS empowers their current roles, fosters sensemaking dynamics of sustainability between employees, and gives us insights into whether the DS makes previous (and upcoming) initiatives actionable, as it was designed to structure stories to become more than just stories.

2. "The DS effectively informs employees about the relevance and impact of sustainability in their initiatives."
This is crucial for integrating sustainability into decision-making processes, thereby giving sustainability a higher agency. It examines our ability to translate insights from empirical data on how sustainability currently appears in ATPE into understandable information for AM's and PM's.

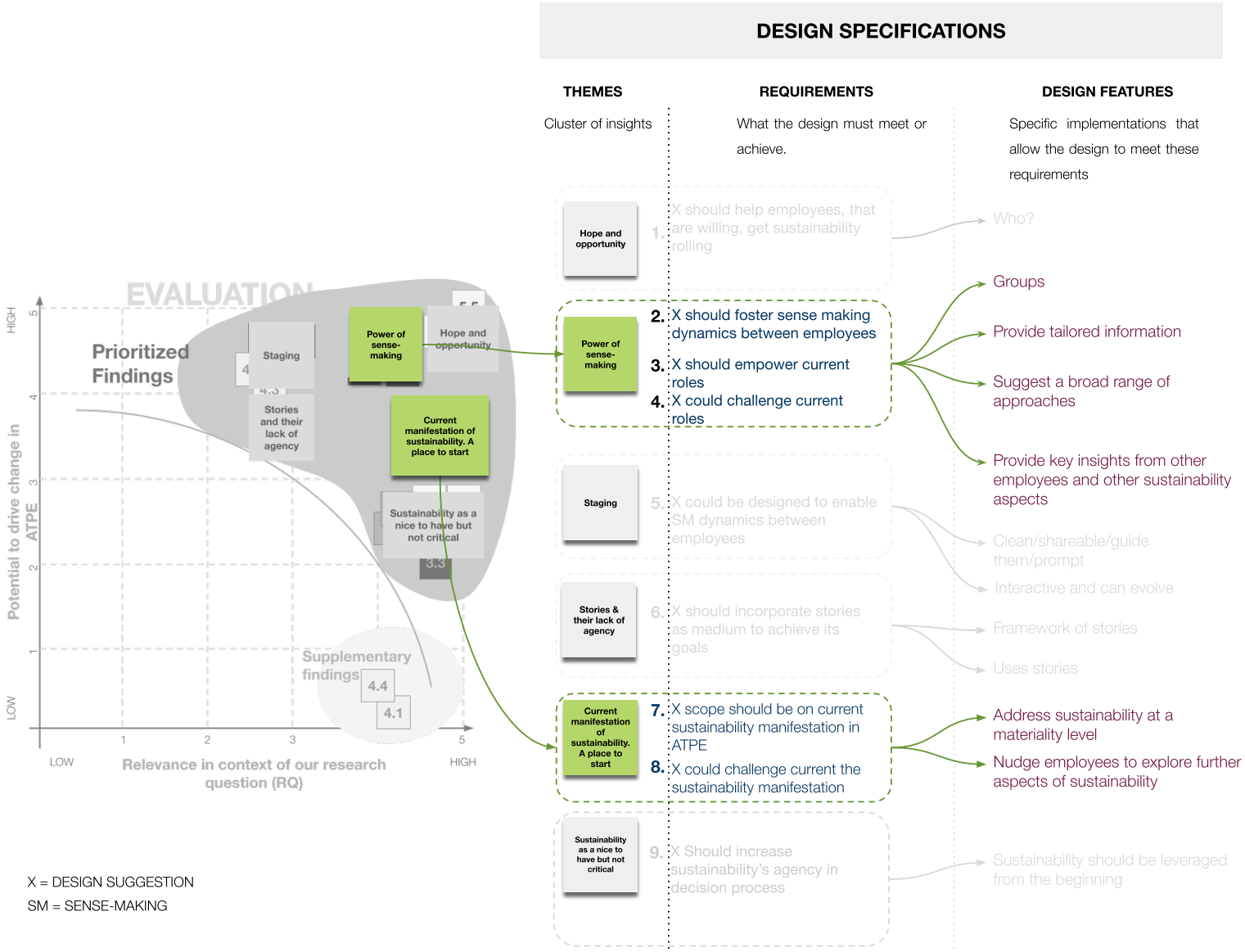
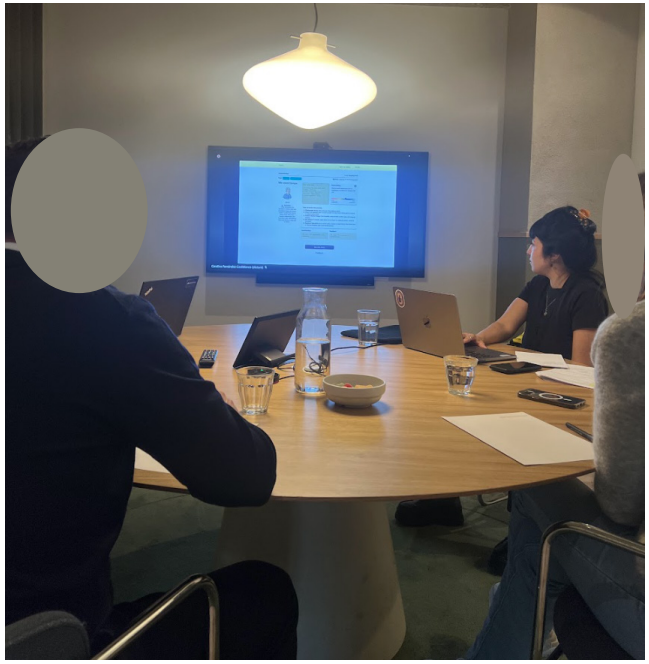


Fig 54: Chosen design specifications that are the basis of the two assumptions. Self-made illustration.

9.5. Results

We tested the DS with one PM and one AM (see picture 1). Appendix 23 and 24 contain the test structure and the transcript. Moreover, as the DS is designed to have ATPE's ESG department as a moderator, we also chose to test it with ATPE's head of ESG see appendix 25.



Pic 1: Workshop picture taken 22.04.2024.

Utilizing the transcript, we have organized the feedback into two categories (see fig 55). Feedback that concerning the assumptions and feedback on the DS's design.

Fig 55: Feedback affinity map. Self-made in Miro.

9.5.1 Results on Assumptions

Overall, the feedback allowed us to conclude that the DS was intuitive for the employees. However, we also saw how the DS could benefit from another iteration to accommodate employee feedback. We will now unfold specific feedback regarding the two assumptions.

"The DS fosters group-based dynamics that help employees address 'low hanging fruit' initiatives (initiatives that can be implemented with minimal effort)".

We validated that if iterated, the DS can contain the necessary information for employees to integrate sustainable initiatives with minimal effort alone and in groups. This became evident through feedback such as: "Very good idea to have some kind of platform, so you can get inspired" (M, testing workshop, 22.04.24). See fig 56 for more quotes.

Fig 56: Quotes from test. Self-made illustration.

However, there was skepticism: "I'm trying to determine when it's a good idea to use this object. It's a guideline/overview to help me see where to start" (J, testing workshop 22.04.2024). See fig 57 for an overview of additional feedback.

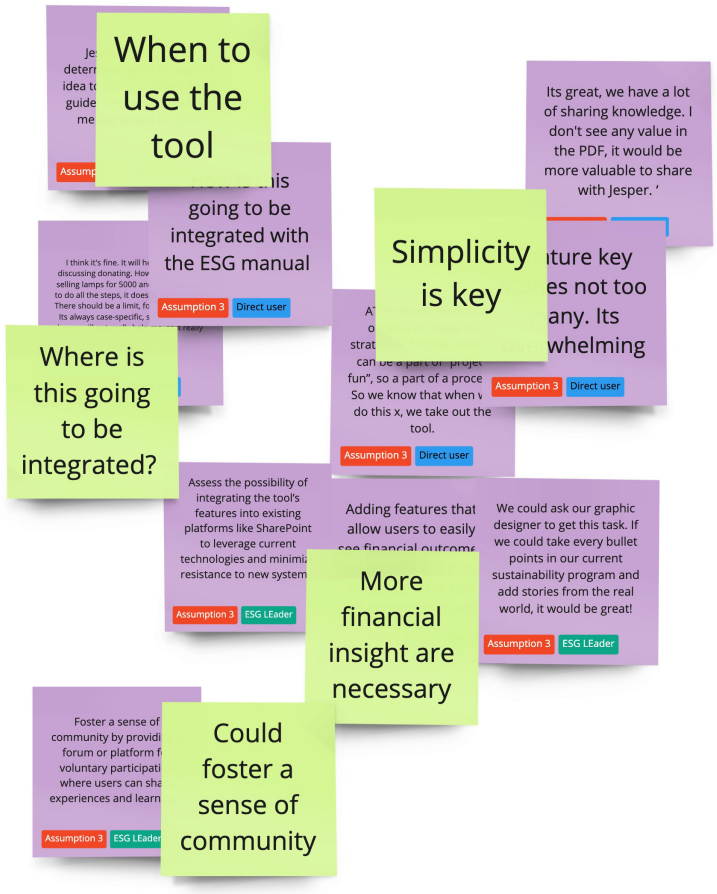


Fig 57: Feedback for assumption. Self-made in Miro.

We also collected feedback pointing towards the DS's shortcomings, such as on which platform it should be integrated, the need to improve the quality of the information regarding the financial implications of each story, and the risk of filling the DS with too many stories: "If there's a 100 stories/project, I would hate if there were 15 stories about lamps, so I had to read them all. If it gets too overwhelming, I would lose interest." (J, testing workshop, 22.04.2024).

The feature of a simple version of the ATP law seemed to help the employees in their frustration of when something is allowed or not, which we have previously identified as a barrier: "I think it's fine. It will help me when discussing donating." (M, testing workshop, 22.04.2024). We view this as a significant achievement. The ATP law has been frequently discussed throughout the case study, and we suggest that simplifying these topics for employees could enhance their chances of succeeding in sustainability initiatives.

Additionally, while it was not the aim of our test, the feedback provided by the ESG department revealed that the DS has good potential to support ATPE's ESG strategy as it could: "Foster a sense of community by providing a platform for voluntary participation where people can share experiences and learnings." (P, testing workshop, 24.04.2024).

"The DS effectively informs employees about the relevance and impact of sustainability in their initiatives".

The test revealed that the DS is designed so that employees can grasp the sustainability level of the stories as they successfully grasped the R-hierarchy. Moreover, the use of tags aligned with their current level of sustainability (focused on materiality) also resonated well with them (see fig 58).

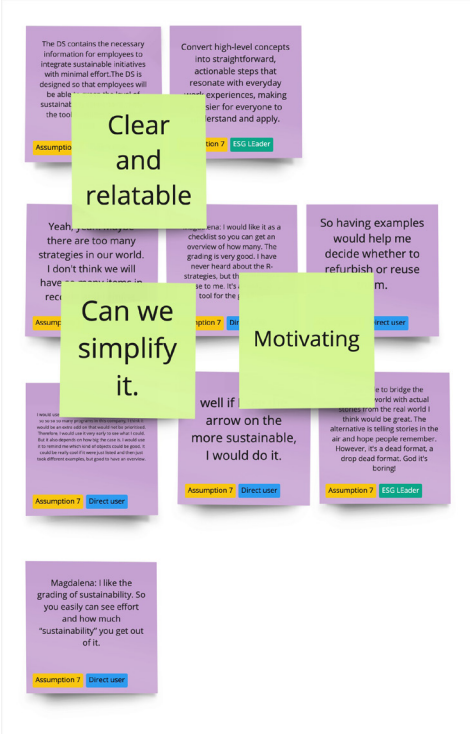


Fig 58: Feedback for assumption. Self-made in Miro.

As expected, the test also revealed constructive feedback to refine the DS. For example, they wanted direct examples under each r-strategy to help employees connect the strategies with specific stories (initiatives). We find this feedback telling, as it could imply that employees find the R-hierarchy a starting point for them to start assessing the sustainability level of their initiatives (with help from the ESG department). The feedback also showed that the R-hierarchy could be simplified to the strategies relevant to their tasks (see fig 59).

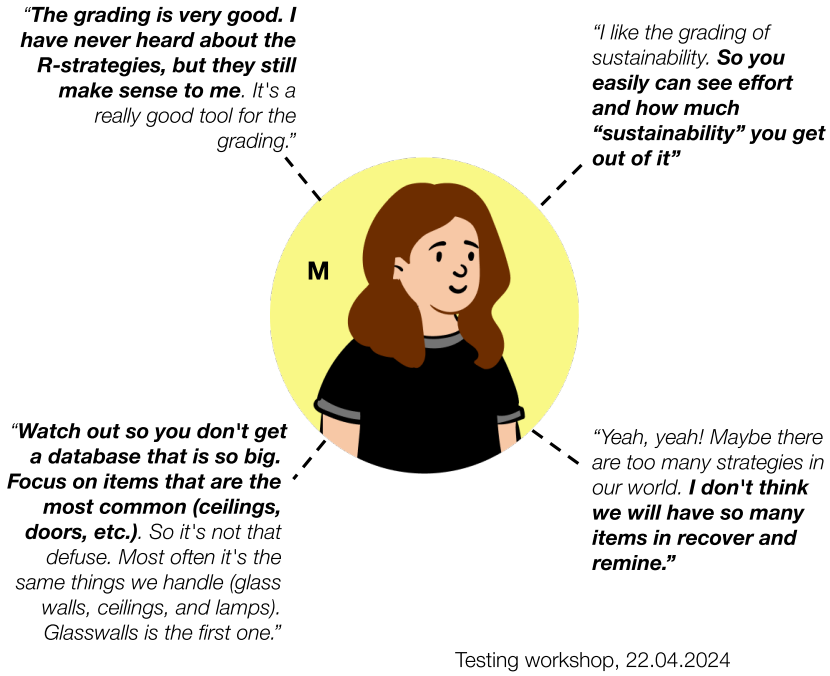


Fig 59: Quotes from test. Self-made illustration.

9.5.2 Design Feedback

Although the feedback on the overall design of the DS, including suggestions for improving usage, content, and governance, is not directly related to the two assumptions in our study, we recognize its importance. Therefore, while we will not explore this feedback in depth, we still present it in fig 60.

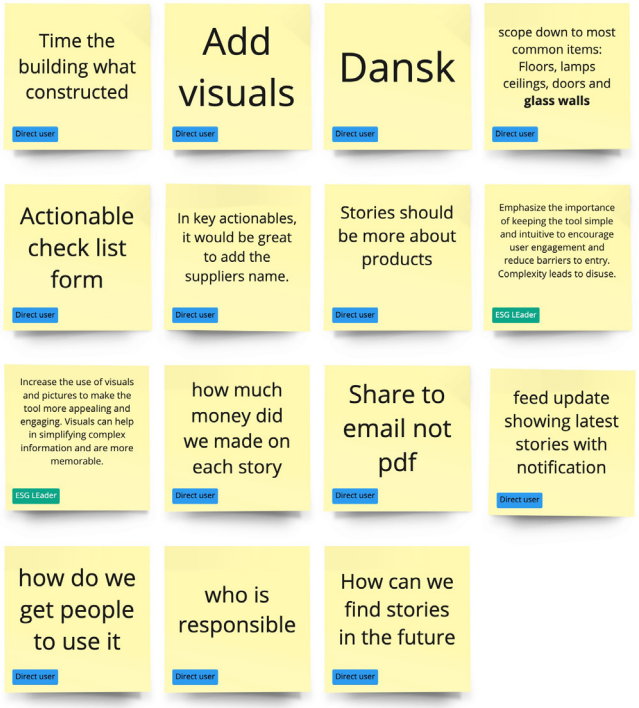


Fig 60: Design feedback. Self-made in Miro.

9.6 Further Work with the DS

The following two sections outline our recommendations for implementing the DS in ATPE. The first will present our suggestions based on our experience within ATPE, and the second will detail the employees' perspectives.

9.6.1 Our Recommendation

9.6.1.a Where to start?

We do not see the implementation of the DS possible within the timeframe of our case study, but we suggest that the first step would be to spread awareness. Then, the DS should go through multiple iteration processes based on employee feedback. Finally, with help from executive management and department leaders, it could be integrated into the existing network inside ATPE (see fig 61).

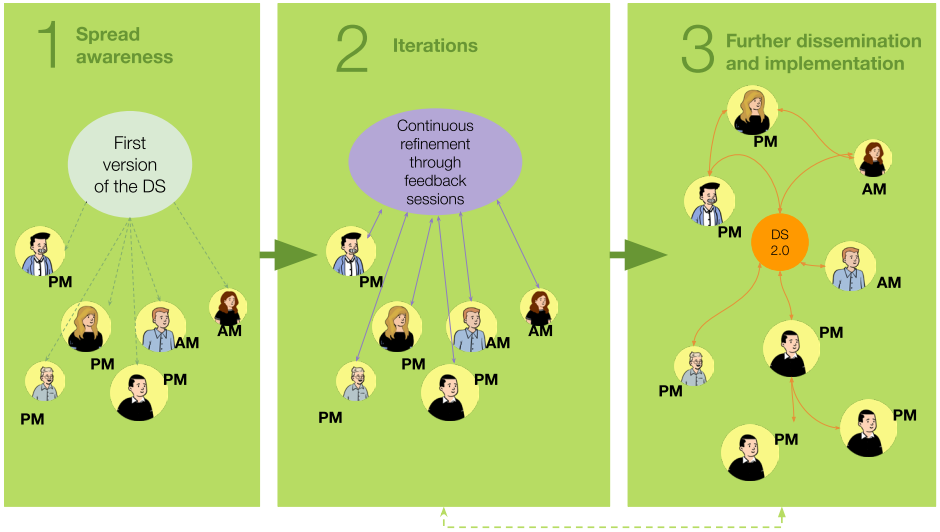


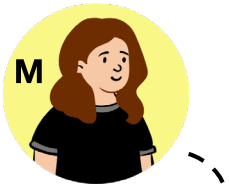
Fig 61: Implementation suggestion. Self-made illustration.

Established platforms such as “Soklen,” the primary source for ATPE employees for updates on internal happenings, could be used as a dissemination tool (see fig 62) to inform employees of the DS’s existence.

Fig 62: “Soklen” ATPE’s internal news-feed overview.

9.6.2 Employees’ Suggestions

The employees were asked how they would suggest we move forward with the DS and where they could see it having the highest potential for success. We have gathered some of their ideas in fig 63.



“I think if we get a manual for smaller renovations, this tool should be integrated in that. As long as we have a manual for renovations I wouldn’t use it, but I would make it as a part of ESG.”

*“**In our ERP** system or dalux system, or any platform we already use.”*

*“**Because we have so many tools I would use my email more to share information and not in your tool (referring to the ongoing stories feature).** At the moment, I would share it by talking to people.”*

*“I think is very important to make it a tool that you **use in every new project** and that would be the key way to know if it is a success.”*

“The ERP system is the most used system.** More on the project team. That’s how we share our taks. I could use it (the DS) in my ESG tool and then we could use it to discuss on each item, **what is the impact.”

Fig 63: Employees’ suggestions. Self-made illustration.

The following reflections wrap up this chapter and address our subquestion three: What could it take to engage employees further in sustainability initiatives?

Actors like our DS are one way the employees could move from compliance-oriented behaviors toward self-driven ones. In particular, the testing shows that our DS has the potential first to activate the insights gathered in the exploratory and deep dive rounds to harness the root of compliance-oriented behaviors and, together with a lean yet validated approach, empower employees to discuss sustainability understandably through the R-hierarchy.

If our DS entered the ATPE network as an actor and improved through employee feedback, it would have high potential to address the frustrations and confusions and discover more mechanisms that may be contributing to their compliance-oriented behavior while also guiding them through the initiative's sustainability implications without creating a conflict with current organizational structures, such as the ATP Law.

We would like to emphasize the relevance of non-human actors. We have learned that employees need actors who facilitate movements of knowledge by fitting employees' tasks, who they can relate to, and who they can easily use. Stories as actors in our design suggestion fit this need. Therefore, we posed that through our approach and the use of stories, we have created a DS that humanizes sustainability. Lastly, further research could validate all the design specifications to increase our confidence about the DS's total value. Although the two assumptions have been validated, we have identified improvement opportunities. Extended validations of the remaining design specifications are necessary to identify potential issues and further opportunities for improvement.

Now, having explored the critical findings of our three subquestions in the four previous rounds, let us delve into their implications and discuss the broader context of this case study.

10. Discussion

10.1 Contextualizing our Case Study

By exploring employees' beliefs and perceptions about sustainability we found that employees exhibit perspectives influenced by their professional roles and personal values. This aligns with existing research explored in section 6.3. For instance, on the relevance of exploring employees' beliefs and behavior as they shape the organization. Current literature suggests that the visibility of sustainability efforts and the underlying ethos of the organization are all factors that shape employees' beliefs of sustainability and, thereby, their willingness to engage in sustainability initiatives. Our research, diverging from these insights, shows two mechanisms during sensemaking dynamics that shape the employee's values and narrow down a starting point for transition. First, the roles that the employees take, shapes the tone of sensemaking dynamics and defines the level of engagement among employees. Second, the analysis of key enactment moments (see section 7.7.2) revealed that actors, such as the ATP law and tenants, have higher agency than sustainability in employees' decision-making processes.

During our case study, we discovered and harnessed the role of stories as non-human actors. The literature review (see section 6.3) confirmed the power of stories, highlighting the use of stories as mediums to include all types of actors. This aligns with our experience of how stories have the power to successfully engage employees who are not typically involved in the sustainability agenda within ATPE. Nevertheless, our findings, revealing that stories alone are not agents of change, put stories under the microscope. Our findings suggest that stories inherently hold transformative potential, but require specific mechanisms to enhance their effectiveness. Additionally, stories should be crafted with a balanced simplicity for broader appeal and complexity to address specialized challenges, but the effectiveness of stories varies among employees. In retrospect, the literature used mediums such as voice recordings and videotapes, indicating that perhaps the researchers were aware of the vulnerability of undocumented stories, precisely one of the challenges we surfaced during our research in ATPE.

Our case study diverges from reviewed literature by employing a qualitative approach with a smaller sample size, focusing on interviews and workshops instead of the extensive surveys and large samples. While the reviewed literature did find a correlation between how organizations engage with sustainability and the willingness of employees to engage further in sustainability, we were able to delve deeper into the inner workings of employees' such as what exactly shapes their perceptions (personal values contrasting with work-related values) and why they would be willing to engage in sustainability initiatives. In short, our research offers insights into the emotional responses that sustainability triggers in employees in ATPE, suggesting that if ATPE wants to engage their employees more in sustainability, they must understand how they perceive sustainability and what fosters willingness among employees.

10.2 Sustainability's Agency in the Future of ATPE

The assessment of the five faces of sustainability in the DfS framework by Ceschin & Gaziulusoy (2016), made it clear that ATPE focuses on materiality. Knowing how ATPE creates revenue by owning and managing properties, we suggest that it is natural that ATPE has several faces of sustainability present at the product level, as it shows a glimpse into its maturity level regarding sustainability. On the one hand, it is expected that ATPE showcases multiple faces of sustainability at the product-level, as the DfS framework, theoretically, emphasizes more design strategies at this level compared to others. Conversely, our research indicates a high potential for engaging employees in sustainability, as we identified multiple faces at the socio-technical level, but this would require ATPE's top management to adopt different renovation practices and accept higher financial risks. This underscores ATPE's need to recognize and overcome internal barriers to progress and actively support employees pursuing self-directed sustainability initiatives.

10.3 Sustainable Design Engineering

As this is our final semester and the culmination of our education, we want to reflect on our role as Sustainable Design Engineers (SDE's) and how we approached this project. As SDE's we accept that solutions cannot be imposed without consulting the people involved, so our methodology has focused on creating an object in collaboration with ATPE employees. This approach is integral to our identity as SDE's, differentiating us from traditional engineers who might not prioritize creating objects collaboratively with relevant actors. Throughout the project, we received validation from employees, despite some finding our exercises "disruptive". Interestingly, this disruption did not lessen engagement, as we observed nothing but interest in our case study. As we conclude our studies, we also want to discuss the market readiness for our skills. Over the past two years, we have observed a growing demand for sustainability consultants across various sectors. However, through job interviews and social media such as LinkedIn, we have noticed that organizations often struggle to define the exact role and contributions of SDE's. This suggests a need for SDE's to carve out their own positions and be able to demonstrate their value within organizations strongly.

10.4 Generalization

As for the generalizability of our case study it is a nuanced consideration. While it may not have universal applicability, it could hold relevance within subsidiaries of pension funds. This potential stems from the shared objective of pension funds, which all strive for long-term returns on investment. We suggest that our findings, revealing why people exhibit compliance-oriented behaviors and how we could transition them towards self-driven behaviors (with the help of the DS), could apply to other pension fund subsidiaries.

11. Conclusion

This case study presents our journey in understanding observed compliance-oriented behaviors. We designed our case study to investigate how individuals' beliefs and perceptions of sustainability shape current sustainability initiatives. With this knowledge, we aimed to create a concept to explore how employees' behaviors could shift from compliance to self-driven.

With the help of sensemaking theory, we found that employees' perceptions of sustainability are influenced and shaped by their tasks and personal values. We subsequently performed a deep dive into sensemaking dynamics regarding sustainability, which showed us that employees' roles influence the employees' perception of sustainability and their level of engagement. The study of the dynamics surfaced actors with higher agency than sustainability in employees' decision-making process. Additionally, the research showed that the employees experienced emotional responses towards sustainability, indicating that the employees are ready to transition towards self-driven behaviors.
Inspired by the concept of enacted sensemaking, we present how designed dynamics can shape some employees' perceptions of sustainability. The research highlights that while some values are genuinely embedded and remain unaffected, some of the employees' sustainability values were validated and expanded, and some changed towards accepted ones. These values reflect how employees approach sustainability.

Using the R-hierarchy, we assessed the sustainability of the current initiatives and found them more sustainable than discarding materials that still hold value. However, these initiatives lack scalability, which poses a risk of greenwashing if presented as fully integrated practices, especially given ATPE's significant portfolio of 84 properties. We additionally employed the DfS framework to assess the five faces of sustainability in ATPE. The assessment revealed that APTE's maturity level is strongly linked to product-level material aspects. This served as a start point for suggestions to transition employees' behaviors from compliance to self-driven. The DfS also revealed that manifestations of sustainability in ATPE often involve complex socio-technical systems, particularly among highly motivated employees to integrate their strong belief in sustainability in their work tasks.

Our design suggestion (DS), upon testing, indicated that to engage employees in self-driven behaviors, non-human actors, such as the DS, must address the emotional responses regarding sustainability, e.g. frustration over the ATP law and harness relevant sustainability insights understandably through the R-hierarchy while seamlessly integrating with current organizational structures. We argue that stories, in particular, carry characteristics such as relatability and ease of use, which help movements of knowledge. This allows us to conclude that our approach and the use of stories resulted in a DS that humanizes sustainability. Careful attention should be paid to integrating such non-human actors in ATPE networks. For instance, to legitimize them, further employee feedback and refinement are required, as well as gaining executive-led support.

12. Bibliography

Alvesson, M., & Sköldbjerg, K. (2018). Reflexive Methodology - New Vistas for Qualitative Research (Third Edition ed.). SAGE Publications Ltd.

ATP. (n.d.). Fælles om en tryg fremtid. Retrieved from ATP: https://www.atp.dk/

ATP Ejendomme A/S. (2023). ÅRSRAPPORT 2023. Retrieved from ATP Ejendomme: https://atp-ejendomme.dk/media/2023-atp-ejendomme.pdf

Bakker, C., Hollander, M. d., Hinte, E. v., & Zijlstra, Y. (2019). Products That Last. Bis Publishers.

Balasubramanian, N. and Balaji, M. (2022), Organisational sustainability scale-measuring employees' perception on sustainability of organisation, Measuring Business Excellence, Vol. 26 No. 3, pp. 245-262. DOI: https://doi.org/10.1108/MBE-06-2020-0093

Bejtush, A., Klungseth, N. J., (2023). Addressing sustainability: setting and governing sustainability goals and targets. IOP Conference Series: Earth and Environmental Science. 1176, 012038, 1-12. DOI: http://dx.doi.org/10.1088/1755-1315/1176/1/012038

Beskæftigelsesministeriet. (2024). ATP-loven. Retrieved from Retsinformation: https://www.retsinformation.dk/eli/lta/2014/1110

Bhattacharya, C.B., Sen, S., Edinger-Schons, L.M. et al. (2023), Corporate Purpose and Employee Sustainability Behaviors. J Bus Ethics 183, 963–981. DOI: https://doi.org/10.1007/s10551-022-05090-5

Boligstyrelsen, S. o. (2023). Lys og udsyn (§ 377 - § 384). Retrieved from Bygningsreglementet: https://bygningsreglementet.dk/Tekniske-bestemmelser/18/Krav

Burrell, G., & Morgan, G. (1979). Sociological paradigms and organizational analysis: Elements of the sociology of corporate life. Heinemann Educational Books.

Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: economic analysis and literature review. Review of Accounting Studies, pp. 1176-1248. DOI: https://doi.org/10.1007/s11142-021-09609-5

Ceschin, F., & Gaziulusoy, I. (2016). Evolution of design for sustainability: From product design to design for system innovations and transitions. Design Studies, 47, 118–163. DOI: https://doi.org/10.1016/j.destud.2016.09.002

Czarniawska, B. (2005). Karl Weick: Concepts, style and reflection. The Sociological Review (Keele), 53(1), 267–278. DOI: https://doi.org/10.1111/j.1467-954X.2005.00554.x

Czarniawska, B., & Hernes, T. (2005). Actor-Network Theory and Organizing. Sweden: Liber & Copenhagen Business School Press.

Danva. (2021). Fakta om vandforbrug i Danmark. Retrieved from Vandetsvej.dk: https://vandetsvej.dk/faglig-viden/vandforbrug/grundviden/fakta-om-vandforbrug-danmark

Flyvbjerg, B. (2006, April). Five Misunderstandings About Case-Study Research. Qualitative Inquiry, 12(2), pp. 219-245. DOI: https://doi.org/10.1177/1077800405284363

Guardigli, L., Monari, F., & Bragadin, M. A. (2011). Assessing Environmental Impact of Green Buildings through LCA Methods: A comparison between Reinforced Concrete and Wood Structures in the European Context. Procedia Engineering, pp. 1199-1206. DOI: https://doi.org/10.1016/j.proeng.2011.11.2131

Gudmundsdottir, S.; Sigurjonsson, T.O. (2024). A Need for Standardized Approaches to Manage Sustainability Strategically. Sustainability, 16, 2319. DOI: https://doi.org/10.3390/su16062319

Ioannou, I., & Serafeim, G. (2017). The Consequences of Mandatory Corporate Sustainability Reporting. Harvard Business School Research Working Paper, pp. 1-49. DOI: http://dx.doi.org/10.1088/1755-1315/1176/1/012038

Jayasundara, S. (2015). How much water is needed to produce 1 m3 wood? Retrieved from: https://www.researchgate.net/post/How_much_water_is_needed_to_produce_1_m3_wood

Jensen, T. E. (2003). Aktør-Netværksteori – en sociologi om kendsgerninger, karakker og kammuslinger. New Social Science Monographs, pp. 1-28.

Johan Rockström. (2015). “Bounding the Planetary Future: Why We Need a Great Transition,” Great Transition Initiative, retrieved from: https://greattransition.org/publication/bounding-the-planetary-future-why-we-need-a-great-transition

KPMG. (2024). Corporate Sustainability Reporting Directive - Is your organization ready for the Corporate Sustainability Reporting Directive? Retrieved from KPMG: https://kpmg.com/nl/en/home/topics/environmental-social-governance/corporate-sustainability-reporting-directive.html

Kuhlman, T., & Farrington, J. (2010). What is Sustainability? sustainability, 2(11), pp. 3436-3448. DOI: https://doi.org/10.3390/su2113436

Lima, M. S., Duarte, S., Exenberger, H., Fröch, G., & Matthias, F. (2024). Integrating BIM-LCA to Enhance Sustainability Assessments of Constructions. Sustainability, pp. 1-15. DOI: https://doi.org/10.3390/su16031172

Liu, S. (2024). Using Sustainable Development Goal Indicator 14.7.1 to Measure Sustainable Fishery: The Statistical Limitations. Fishes, pp. 1-9. DOI: https://doi.org/10.3390/fishes9020057

López-Arceiz, F. J., Río, C. D., & Bellostas, A. J. (2020). Sustainability performance indicators: Definition, interaction and influence of contextual characteristics. Corporate Social Responsibility and Environmental Management, pp. 2615-2630. DOI: https://doi.org/10.1002/csr.1986

Matmatch. (n.d.). Density of wood in kg/m3, g/cm3, lb/ft3 – the ultimate guide. Retrieved from Matmatch: https://matmatch.com/learn/property/density-of-wood

McCloud, S. (1993). Understanding Comics: The Invisible Art. Kitchen Sink Press.

Moilanen, F., Toikka, A. (2023), Measuring employees’ perceptions of sustainability transitions at work: a novel survey with findings from Finland. Discov Sustain 4, 45. DOI: https://doi.org/10.1007/s43621-023-00163-5

Moniz, S., Karia, A., Khalid, A. F., & Vindrola-Padros, C. (2023), Stories for Change: The impact of Public Narrative on the co-production process. Health Expectations, pp. 919-930. DOI: https://doi.org/10.1111/hex.13718

Petrovic, M., Bonanno, S., Landoni, M., Ionio, C., Hagedoorn, M., & Gaggioli, A. (2022), Using the Transformative Storytelling Technique to Generate Empowering Narratives for Informal Caregivers: Semistructured Interviews, Thematic Analysis, and Method Demonstration. JMIR FORMATIVE RESEARCH, 6(8), pp. 1-14. DOI: https://doi.org/10.2196/36405

Prideau, F., Crawford, R. H., Allacker, K., & Stephan, A. (2023). Approaches for assessing embodied environmental effects during the building design process. IOP Conf. Series: Earth and Environmental Science, pp. 1-15. DOI: http://dx.doi.org/10.1088/1755-1315/1196/1/012053

Reike, D., Vermeulen, W. J., & Witjes, S. (2018). The circular economy: New or Refurbished as CE 3.0? — Exploring Controversies in the Conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options. Ressources, Conservation & Recycling, pp. 246-264. DOI: https://doi.org/10.1016/j.resconrec.2017.08.027

Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Jonathan, D. F., . . . Rockström, J. (2023). Earth beyond six of nine planetary boundaries. SCIENCE ADVANCES, pp. 1-16. DOI: https://doi.org/10.1126/sciadv.adh2458

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. I., Lambin, E., . . . Foley, J. (2009). Planetary Boundaries: Exploring the Safe Operating Space for Humanity. Ecology and Society, 14(2). Retrieved from: http://www.ecologyandsociety.org/vol14/iss2/art32/

Shrivastava P, Kasuga F, Grant J (2023). From climate science to climate action. Global Sustainability 6, e21, 1–6. DOI: https://doi.org/10.1017/sus.2023.19

Sílvia Luís & Inês Silva (2022), Humanizing sustainability in organizations: a place for workers' perceptions and behaviors in sustainability indexes?, Sustainability: Science, Practice and Policy, 18:1, 371-383, DOI: https://doi.org/10.1080/15487733.2022.2068751

Strand, R., Freeman, R. E., & Hockerts, K. (2015). Corporate social responsibility and sustainability in Scandinavia: An overview. Journal of Business Ethics, 127(1), 1–15. DOI: https://doi.org/10.1007/s10551-014-2224-6

Torres, T. (2021). Continuous Discovery Habits: Discover Products That Create Customer Value and Business Value—Bend, OR: Product Talk LLC.

UN. (2023). Building Materials And The Climate: Constructing A New Future. Retrieved from UN Environment Programme: https://www.unep.org/resources/report/building-materials-and-climate-constructing-new-future

UN. (2024). Facts about the climate emergency. Retrieved from UN Environment Programme: https://www.unep.org/facts-about-climate-emergency?gad_source=1&gclid=Cj0KCQjwiMmwBhDmARIsABeQ7xRmyLf6rxqqkVcISuJzoitzu1JliUBllhARt7gWvjcec9vpfhziWUMaAv3kEALw_wcB

UN. (2024). Greenwashing – the deceptive tactics behind environmental claims. Retrieved from United Nation: https://www.un.org/en/climatechange/science/climate-issues/greenwashing

UN. (n.d.). History. Retrieved from United Nations: https://sdgs.un.org/goals

UNCC. (n.d.). What is the Paris Agreement? Retrieved from United Nation Climate Change: https://unfccc.int/process-and-meetings/the-paris-agreement?gad_source=1&gclid=Cj0KCQjwn7mwBhCiARIsAGoxjaJBmApdBseSpLfxpPUfTCPU7uDa0AuGLtS1OqZhLxALIUbKKTTvQmsaAsF1EALw_wcB

Veeckman C, Claes S, Van Audenhove L and van der Graaf S (2023), A framework for making citizen science inclusive with storytelling methods. Front. Environ. Sci. 11:1211213. DOI: https://doi.org/10.3389/fenvs.2023.1211213

Weick, K. E. (1988). Enacted sensemaking in crisis situations. Journal of Management Studies, pp. 305-317. DOI: https://doi.org/10.1111/j.1467-6486.1988.tb00039.x

Weick, K. E. (1993). The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster. Administrative Science Quarterly, pp. 628-652. DOI: https://doi.org/10.2307/2393339

Weick, K. E. (1995). Sensemaking in organizations. Sage Publications. ISBN: 9780803971776

Yin, R. K. (2003). Case Study Research - Design and Methods (3 ed.). SAGE publications.

Zappalà, S., Radassao, L., Toscano, F. (2023), Greening Organizations: The Relationship between Employee Environmental Concern, Perception of Advantages of Eco-Innovations, and Support for Innovation. Sustainability, 15, 16718, pp.1-12. DOI: https://doi.org/10.3390/su152416718