Assignment 1903 - Project proposal- OL643E-US085

# 2nd Chance for Textiles

*- Building capacity for textile recycling innovation "SIPtex" at Malmö University*

Project Management and Sustainability-HT22


Group 8

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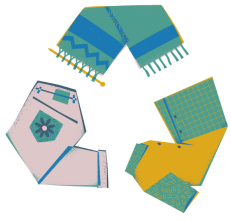
January 12, 2023



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# 1 Abstract

The 2nd Chance for Textiles project capitalizes on Siptex, the world's first automated textile sorting machine, located in Malmö, Sweden. This advancement in technology brings a new level of efficiency to the clothing recycling process, a cumbersome system in its infancy.

The linear take-make-waste model for clothing consumption is broken. 4.3 million tons of clothing and other textile waste end up in landfills or are incinerated annually in the European Union alone (Sysav, n.d.). Fast-fashion has increased this waste crisis and the need for circularity in the fashion industry is urgent and past due. As with many environmental crises today, recycling is a key part of the solution which this project aims to address. The impact on the environment is tangible; if we were to use all textile products currently in use twice through resale and other means, we could reduce the impact on climate by 47 percent (Sysav, n.d.).

To increase the amount of clothing entering the circular cycle of fashion consumption, this project aims to collect unneeded clothing and textiles from Malmö University's students and faculty otherwise destined for the waste stream. Addressing Sustainable Development Goal 12 "Responsible consumption and production," we seek to run a 13- month collection program hosted on the university's campus to raise awareness about clothing waste and offer a second chance for clothing.

Clothing from the collection point will be delivered sustainably to Sysav's recycling facility in Malmö, where it will be exported for primary round sorting to separate clothing appropriate for the second hand market and eventually returned to the Siptex facility for automated sorting by color and fiber type. Sorted clothing is then sold to companies like Renewcell and Recover, who process it into recycled fibers for new clothing creating one driver of the circular fashion solution.

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# 2 Overview

**Project Name:** 2nd Chance for Textiles - Building capacity for textile recycling innovation "Siptex" at Malmö University

## 2.1 Challenges addressed and project relevance

Clothing and other textile waste has become an environmental crisis since the advent of fast-fashion in the mid-nineties. Clothing can now be produced cheaply and in large quantities. In fact, clothing consumption has increased by 40 percent in the European Union since 1996, (European Parliament, 2022). Sweden has set an ambitious goal of zero carbon emissions by 2045, however, for every person in Sweden, 7.5 kg of clothing is incinerated annually causing enormous amounts of greenhouse gas emissions. Currently, only five percent of clothing is recycled in Sweden (Sysav, n.d.).

While this is a multi-factorial issue, a contributing factor to this crisis is that clothing recycling is sparsely available, time-consuming, and requires many steps. However, with the recent technological advancement in clothing recycling right here in Malmö, it's the perfect time to raise awareness of clothing recycling.

Since 2020, Malmö is now home to the Siptex facility, currently operated by Sysav. The Siptex facility is able to automatically sort up to 24,000 tons of clothing per year, providing material to other manufacturers who are able to reuse sorted clothing to make recycled fibers for new clothing. The United Nations developed 17 "Sustainable Development Goals (SDGs) for 2030" in 2015 in order to provide peace and prosperity for all people. Our project seeks to address SDG 12, "Responsible consumption and production" and specifically focus on 12.5, which is to substantially reduce waste generation through prevention, reduction, recycling, and reuse. Together with the support of Malmö University and Sysav, 2nd Chance for Textiles will provide an opportunity for students and faculty at the university to responsibly discard their unneeded clothing and textiles. The project team and members from the university's marketing department will design a marketing campaign to raise awareness among the university community about clothing recycling and inform them about our clothing collection bin located in the main university building, Niagara. For 13 months, students can drop off their clothes and feel good knowing that their waste will be handled responsibly.

## 2.2 Background/Context Analysis

### 2.2.1 State of Clothing Waste Crisis

In recent years fast fashion, low-cost and often low-quality clothing produced on assembly lines typically by underpaid labor, has led to a significant increase in clothing consumption resulting in a continuous flow of enormous clothing waste. Today, consumers in the European Union purchase 40 percent more clothing per person than they did in 1996 due to fast fashion's ubiquity and accessibility due to its low-cost (European Parliament, 2022). 4.3 million tons of textile

waste are either sent to landfills or incinerated annually (Sysav, n.d.), with individuals discarding 11 kg of clothing waste each year in the EU, (European Parliament, 2022). This issue is also prevalent in Sweden. Each year Sweden produces 140,000 tons of new textiles with a recycling rate of only five percent with 7.5 kg of clothing per person ending up incinerated (Sysav, n.d.).

The environmental impact of the clothing crisis is massive. According to the European Parliamentary Research Service, the fashion industry globally is responsible for an estimated 10 percent of greenhouse gas emissions. Beyond greenhouse gas emissions, clothing and textile production is incredibly resource heavy. 27,000 liters of water are needed to make a single cotton t-shirt. Even washing clothing is harmful for the environment - 0.5 million tons of microfibers from synthetic fabrics are released into the oceans every year accounting for 35 percent of all microplastics in the ocean, (European Parliamentary Research Service, 2017).

A possible solution to the clothing crisis is shifting the linear fashion market to a circular one. The use of virgin resources like cotton, to make cheaply manufactured clothing is not working for the planet. By improving the quality of clothing to increase durability, offering repair services, reselling unneeded clothing on the secondary market, reducing consumption, and recycling, we can significantly decrease unnecessary waste.

### 2.2.2 Current Clothing Recycling Process

When clothes are donated or discarded for recycling they need to be sorted manually by human labor. Sorting clothes by their ability to be resold on the secondary market is important, as reuse is less resource heavy and therefore a more sustainable option to recycling (see figure 1). The clothes unsuitable for sale are most often sent to the landfill. In order to recycle the unwanted textiles for fiber-fiber recycling, they have to be sorted again this time by material and color so they can be sold, deconstructed, and spun into recycled fibers for reuse for new clothing. This is currently done manually by hand, which is time consuming and costly since it involves labor.

## 2.3 Technological Advancement in Clothing Recycling in Malmo, Sweden

Enter Siptex. Since 2020, the clothing and textiles bound for the landfill or a second round of sorting have a new sustainable destination, Siptex. Siptex is the world's first automated textile sorting machine located in Malmö, Sweden at a facility operated by Sysav. After pre-sorted clothes make it to Sipex, they are sorted automatically using near-infrared (NIR) and visual spectroscopy (VIS) by color and fiber content. Siptex then resells these sorted textiles through their "Refab" brand as products such as "Cotton 90" or "Acrylic 70". Then, companies like Recover or Renewcell take those textiles and break them down and convert them into "recycled fiber." Clothing companies then purchase the recycled fiber and the process starts again; a circular recycling process. Siptex is a crucial tool to make this process more cost and time-efficient.

## 2.4 Clothing Recycling in Malmo

Most households in Malmö separate their waste into food waste, plastic, metal, glass, electronics and batteries, and a separate “other” waste bin. This system is quite effective. Sysav (SYSAV South Skania Waste), is the waste management company serving 14 municipalities and over 710,000 people in Skåne. According to their 2021 report, “Only 1.8 percent of the waste was landfilled, 98.2 percent was recycled as material and energy." Additionally, at two of their recycling centers within Malmö, they offer clothing and other textile drop off locations (Norra Hamnen and Bunkleflo).

As international students living in a variety of housing types (apartments, university housing), we realized we didn’t know where we could drop off our unneeded clothing since it’s not a recycling option in our waste sheds. We had heard about Siptex and saw an opportunity to help close the loop on textile recycling by providing a textile waste bin on campus at Malmö University.

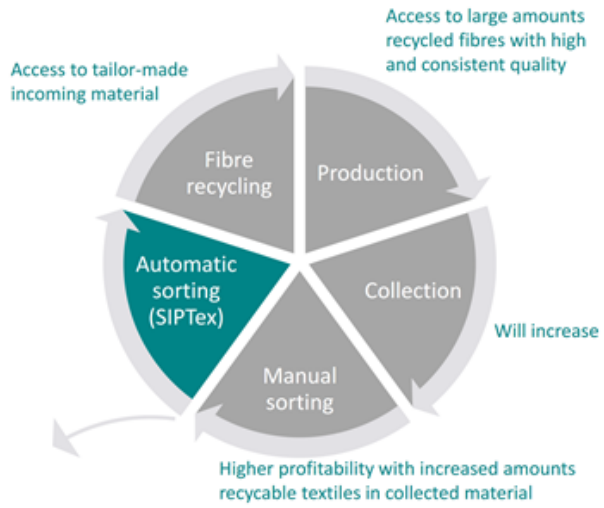


Figure 1: A diagram outlining the clothing recycling process (IVL, n.d.)

## 2.5 Mission statement

2nd Chance for Textiles’ mission is to reduce clothing waste in the Malmö University community by providing a drop off location on campus where clothing will be collected to ultimately become part of a more circular fashion industry. This program will utilize education through a marketing campaign to create awareness around fast fashion and consumerism and their effects on the environment. The campaign will specifically highlight the world’s first automated clothing sorting machine situated in Malmö, Sweden, whose proximity serves to inspire the behavior of the individual on how they can help mitigate the effects of over consumption through clothing recycling.

## 2.6 Project Goals and Objectives

This project will engage the university community in the process of clothing recycling through a marketing campaign done in partnership and with the support of Malmö University. When clothes are collected, they will be sustainably delivered to one of Sysav's two clothing recycling drop off locations and eventually be either resold on the secondary market or entered into the fiber to fiber recycling process which starts with the Siptex automatic sorting facility.

| Goals | Objectives | Indicators & Scope |
|---|---|---|
| **1.** Collect 20 tonnes of clothing waste from students and faculty at Malmö University by June 30, 2024 | **1.1** To engage Malmö University students and faculty in a clothing recycling process through a marketing campaign | **1.1.1** Email open rates, social media enagement (likes/shares)<br>**1.2.1** Total weight of clothing collected |
| | **1.2** To inspire university community to responsibly discard their unneeded clothing | *Only students and faculty are targeted through marketing campaign to control amount of clothes collected* |
| **2.** Divert 20 tonnes of clothing from landfills into reusable second hand clothing or through fiber-fiber recycling creating a circular process from June 1, 2023 - June 30, 2024 | **2.1** To motivate Malmö University students and faculty to bring their unneeded clothing to campus collection bin. | **2.1.1** Total weight of clothing collected from the program is reused or recycled |
| | **2.2** Sustainably deliver clothing to recycling drop off location (Sysav) | *Clothes are only collected at Malmö University to control amount of clothes collected during program* |
| **3.** Create a project template by July 31, 2024 that is easy to use for implementers to continue the collection program at Malmö University and/or within Malmö city. | **3.1** Project template is designed to be simple, clear, and contextualized for Malmö. | **3.1.1** Project template document<br>**3.2.1** Template is shared with intended groups |
| | **3.2** Project template is shared with intended target groups, Malmö University administration and Malmö city administration | *Project template is designed for local use only due to unique recyling opportunity with Siptex facility* |

Table 1: Project goals and objectives

## 2.7 Expected impact

Students and staff of Malmö university are the target group, which means that it will include five faculties with around 24,000 enrolled students and around 850 full time employees (Malmö University, 2022). In total, we expect a participation rate of one out of ten in the beginning. That makes around 2,485 students and employees with an average Swedish clothing discard of around 7.5kg of clothing per person per year (Wennberg, 2000). For emptying the bin at university we can expect a total number of 20 tonnes.

The following values that the project seeks to develop were identified and categorized in the three-pillar model of the triple bottom line.

### Economic benefits

For economic reasons, Siptex will be able to access more textiles as input material which can be sorted and sold. Thereby, profit can be increased since more discarded material will be provided, the higher selling volumes from the side of Siptex will be increased. Furthermore, locally collected clothes save costs by having minimal transportation costs for the textiles getting to Siptex.

### Environmental benefits

A better local waste sorting can be identified, by promoting and providing a new sorting option. By breaking down people's waste by material, they can be recycled and reused which saves environmental resources, reduces general waste that normally gets burned, and brings them back into a loop and circularity. This project also creates awareness of the issues in the fashion industry since the fashion industry is one of the most harmful industries when it comes to resources and the environment. Local input material for Siptex saves significant carbon emissions compared to importing clothing from nearby countries. Additionally, due to regular checks of the bin, the collected clothing will only be transported when the bin is full and will be transported by an electric cargo bike. This will save carbon emissions as well.

### Social benefits

When it comes to optimizing circular processes, it also needs people to participate. Participation will be reached through educational advertising by introducing a marketing campaign. Thereby, circularity gets promoted by creating awareness of how to recycle one's unneeded clothing at the Siptex facility. This will enhance the awareness of Siptex and the option of clothing recycling. Lack of knowledge is a big issue identified when it comes to sustainable development and consideration. Educating Malmö University students and staff members brings together different generations who will spread this knowledge in their social surroundings and it will have a huge impact, not only in the university surroundings. By providing a transparent circular system people gain trust. Everyone has textile waste at some point and they need to get rid of it but don't want to put it into the waste stream. This project provides an easy solution to get rid of used clothing and additionally gives them a good feeling by doing something helpful for the environment. Many people are emotionally affected by climate change and have to contend with climate anxiety and compromise between the environment and consumerism. Therefore, the project has the potential to temporarily reduce people's climate anxiety by providing an opportunity for people to engage in a climate positive task promoting social cooperation.

### 2.8 Leadership aspect

For the project to succeed it requires hiring a project manager that can lead and steer the project. Therefore there's a need in hiring a project manager that possess the capability and qualities of leading the project. Several authors have shed light on leadership styles having an impact on project success in connection to sustainability. These include Northouse (2021) and Maqbool et al. (2017).

Northouse (2021) explained that transformational leadership inspires followers to commit to a shared vision by stimulating followers to be creative and innovative and thus this can contribute to solving sustainability issues. Moreover, authors and researchers such as Maqbool et al. (2017) described transformational leadership when combined with project managers skills and emotional intelligence having greater effects on project success (see figur 2).

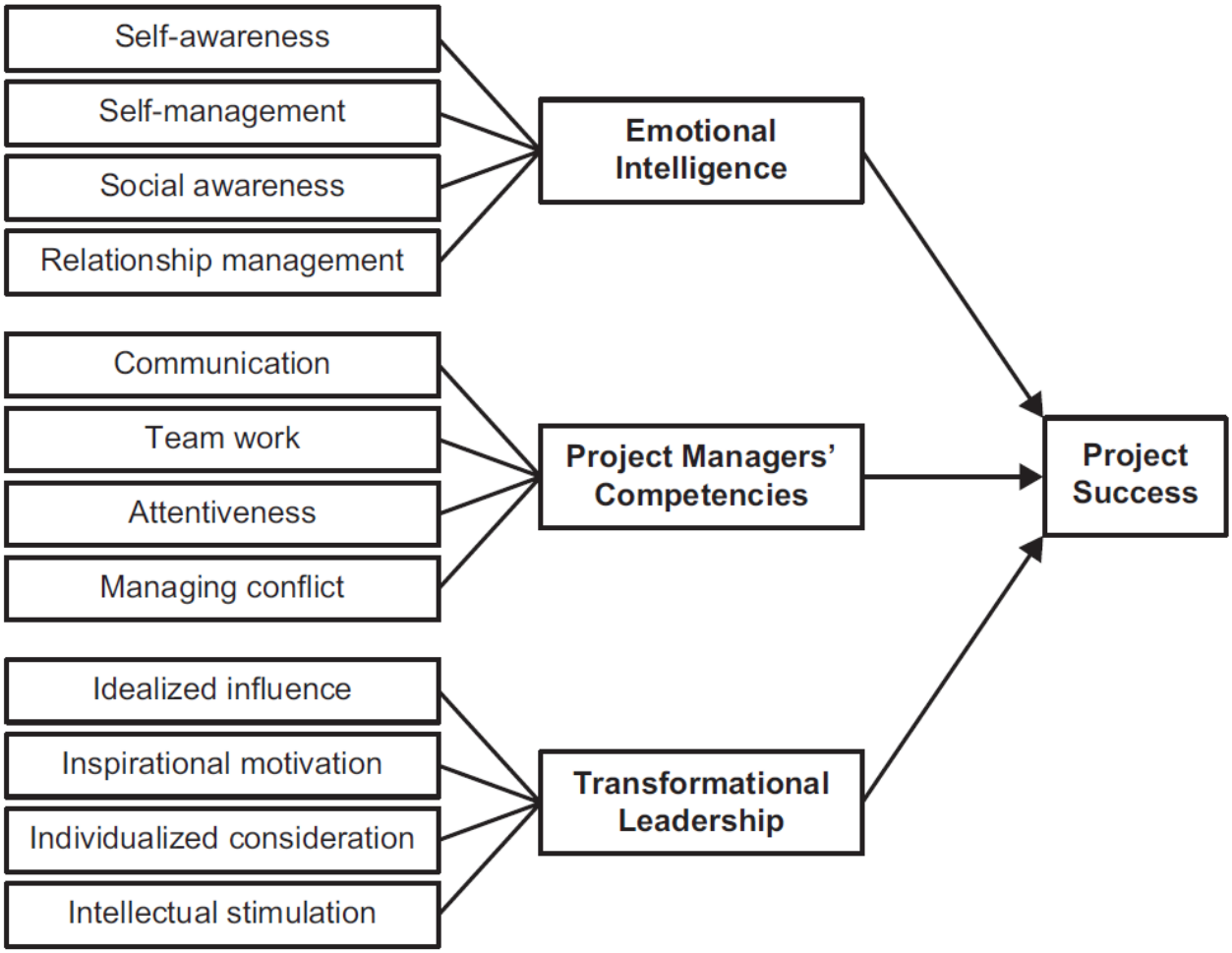


Figure 2: Qualities expected of the project manager (Maqbool et al., 2017)

Therefore by combining transformational leadership, emotional intelligence and project manager competencies, this project attempts to address sustainability issues in the recycling of used textile in Malmö by collaborating with Siptex, such that it will contribute to an enduring sus-

tainable and feasible solution in the collection process of used textile/clothing. Since a project manager will be hired it is therefor vital that the project manager should have good communication skills and is able to coordinate the team in the project work in order to succeed in the project.
The project manager should also possess emotional intelligence by creating social awareness regarding the subject and is able to foster positive relationships with relevant stakeholders such as Sysav, students, staff and other relevant project partners. In addition to the aforementioned, it is vital that the project manager have the ability to inspire and motivate people to drop off their used textiles at the assigned facilities and should have the ability to intellectually stimulate project team members to their fullest potential. These requirements will be taken into consideration when hiring the project manager, such that project success is ensured.

### 2.9 Implementation and post-project

The preparation will take two months. Key stakeholders need to be engaged, Malmö University and Sysav, and there is a need to work together with the staff of the university to create and execute the marketing campaign. We will need a contract with local company Move by Bike, who will provide couriers who use e-bikes to drop off collected clothing on a weekly basis. To begin the project, we'll need an approval from the university to drop a bin in Niagara, the university building with the highest level of foot traffic daily. We'll also need to have a relationship with Sysav as we will be dramatically increasing their flow of recycled clothing dropped off at their facility. We also would like to rent a bin from them for the duration of the project to collect the clothing. After this, the campaign can start and the students and staff will know where to find the bin, how to use it and how their efforts have a positive impact on the fast changing climate. Above mentioned require that the project manager should possess the qualities listed on figure 2.
Furthermore, after the project, a few steps will be taken to follow up on the learnings of the project, and to evaluate and expand purpose of the project. These steps are listed as following:

1. A survey to evaluate the process, the amount of awareness and the possible improvements for a future project

2. An evaluation of the amount of collected clothes and the impact made by the Siptex facility

3. An evaluation workshop with the project team to learn about the challenges in this project, how to improve the project, and how to expand this idea

# 3 Project structure

## 3.1 Stakeholder analysis

In this project, several stakeholders are involved or should be involved. To have an overview of the important stakeholders, the project team brainstormed about this and came up with the following stakeholders. The more clear defined stakeholders, the easier it is to engage, collaborate and communicate with those stakeholders. That is why the interest – power grid by Eden and Ackermann (1998) is used to divide the stakeholders in groups based on interest and power they have on the project. This impacts the way stakeholders are engaged before and during the project.

**Sysav**

Sysav is one of the partners on the campaign, since this company operates the Siptex facility, the machine that sorts fabrics for a better recycling process. This makes Sysav one of the most important stakeholders. To make it more specific, the CEO, CFO, marketing and sustainability employees and the employees working at the Siptex facility.

**Sysav's partners**

Sysav works with a variety of stakeholders to make the Siptex facility a success. The partners help, among other things, to collect pre and post-consumer clothes that can be processed in the Siptex facility. Sysav partners with companies like Gina Tricot, ICA, HM, Human Bridge and IKEA. For recycling the sorted clothes, Sysav works together with organizations like Boer group, Elis, Refashion, Renewcell. These partners are very important for the Siptex facility to succeed, but these are less important for the project. That is why these partners are not included in the stakeholders grid.

The partners of Sysav that can contribute to the campaign are partners like IVL Swedish Environmental Research Institute and Naturvardsverket. Those stakeholders could be relevant to conduct research during the campaign, analyze the relevance or evaluate the process.

Sysav works together with Malmö Stad and Stockholm Vatten och Avfall to collect and process the trash in the municipality. These are relevant stakeholders for the campaign, since the campaign includes the processing of collected post-consumer clothes. It is necessary to work together with partners to collect the post-consumer clothes, separate and check them and bring them to the Siptex facility.

**University students and staff with post-consumer clothes**

To collect more post-consumer clothes for the Siptex facility, the campaign targets people with aforementioned clothes. In particular, the students and staff of Malmö University. We chose Malmö University students as our target group since Malmö is a young city with many students that bring together different generations who will spread their knowledge to their sur-

roundings socially and professionally. Because of that, it will not only have an impact in university surroundings but also far beyond. This group will be the main focus of the campaign and the aim of the campaign is to make it as easy as possible for them to drop off their post-consumer clothes in a bin that will eventually be separated and processed in the Siptex facility. To do so, we also must work together with the staff of Malmö University like the reception, the board and the communication department during the preparation and duration of the project.

### Couriers

The bin will be filled with clothes and the bin will have to be emptied on a weekly basis. The clothes need to be transported to one of two Sysav clothing recycling locations in Malmö. Couriers will do this for us. They will get a message from our student worker when the bin is full and transport it. This will be in collaboration with Move by Bike. This cycle logistics operator specializes in goods transport based in Malmö. They use human powered bikes and e-bikes with cargo capacity.

### Power vs. interest grid

The interests of the stakeholders have to be taken into account during the project. To do so, the interests should be explored and related to. To decide how to deal with the stakeholders and their different interests, the interest vs. power grid can help. This will determine whether stakeholders are subjects, players, the crowd or context setters (Eden & Ackermann, 1998). The amount of power and interest determines how and in what amount a stakeholder can affect the project.

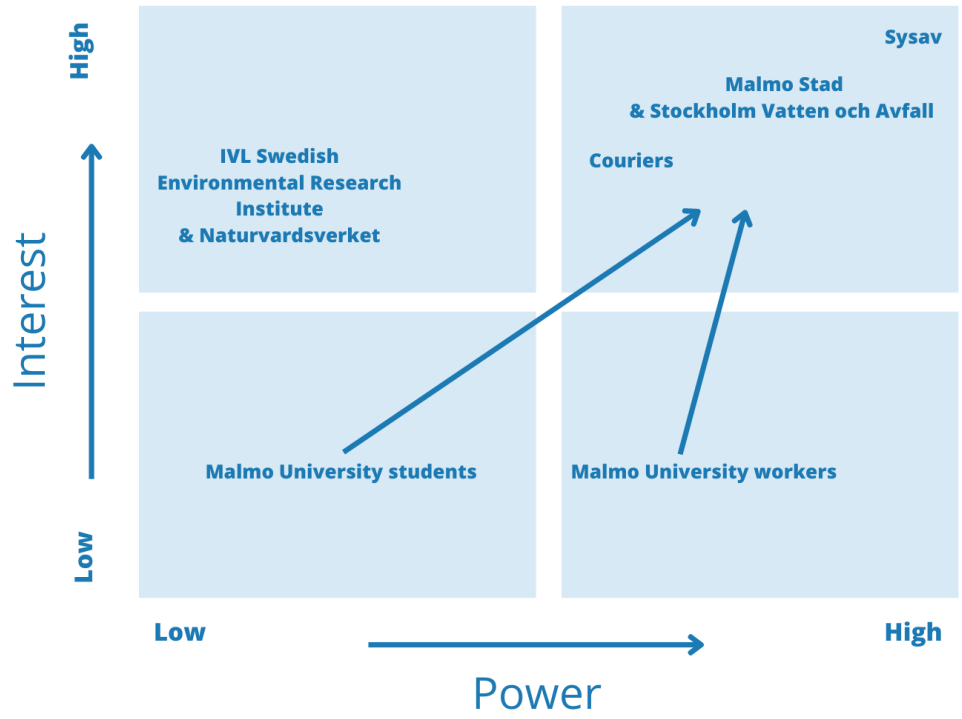


Figure 3: Power Interest grid

**Players**
Sysav, Malmö Stad, Stockholm Vatten och Avfall and the couriers are players during the project. They are involved from the start and will determine whether the project can work or not. Players have both an interest and significant power. These stakeholders and their interests and power must be taken into account in order to address the possible challenges during the project. They can help highlight the importance of the project and encourage students and staff to participate and provide information on how to engage the university's students and staff (Bryson, 2007). These stakeholders will co-create from the beginning of the project, by brainstorm and workshops on how to communicate with and engage the students and staff and how to make the project practically work in an effective way.

Through the project, we want to expand the interest and power of the students and expand the interest of the staff of Malmö University. Currently they are the crowd and the context setters, with less power and less interest (Bryson, 2007). By engaging the students and staff with the help of the campaign, they will be more aware of the impact of collecting and recycling clothes. The campaign will open their eyes to the importance of the subject and make it clear how easy it is to bring their clothes to the bin at the university. This will eventually expand their interest and hopefully their feeling of responsibility for the success of the project.

**Subjects**
IVL Swedish Environmental Research Institute and Naturvardsverket are subjects during the project. Subjects have an interest but little power (Bryson, 2007). They could be relevant to conduct research during the campaign, analyze the relevance or evaluate the process.

**Weak voices**
Besides the stakeholders written down, a project always involves stakeholders with weak voices. Those stakeholders are involved, interested or have some power, but you do not hear them a lot during the process. The success of this project depends on the participation of students and staff. They have to bring their clothes to the bin, otherwise the project will not be effective. Some of the students and staff will be proactive and want to be involved from the start. But there will be a big group of students and staff that will not be interested from the start. It is important to analyze how one can involve this group better and make them interested in this project and feel responsible as well to participate.

### 3.2 Project structure (organization, partners, management structure)
The project team is structured with project owners consisting of 4 SALSU students who will be responsible for and work with the project manager. In addition to that the project will also include the aforementioned a project manager who will be responsible for the project plan, budgeting, and sustainability of the project and a student worker. The student worker's responsibility will be focused on checking on the status of the collection bins and contacting Move by

Bike when the bins are full. They will also track weight collected when the bins are full. These are illustrated on figure 4.

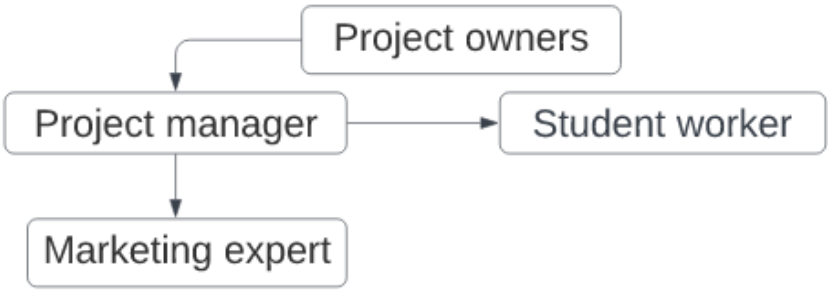


Figure 4: Project team structure

### 3.3 Project timeline with milestones

The project will begin in April of 2023 and run for 16 months. Beginning April 1, the first two months will be focused on pre-project planning with the program officially beginning on June 1, 2023 ending June 30, 2024. The month of July will be used as a post-project decommissioning month. The timeline with major milestones are listed in Figure 5.

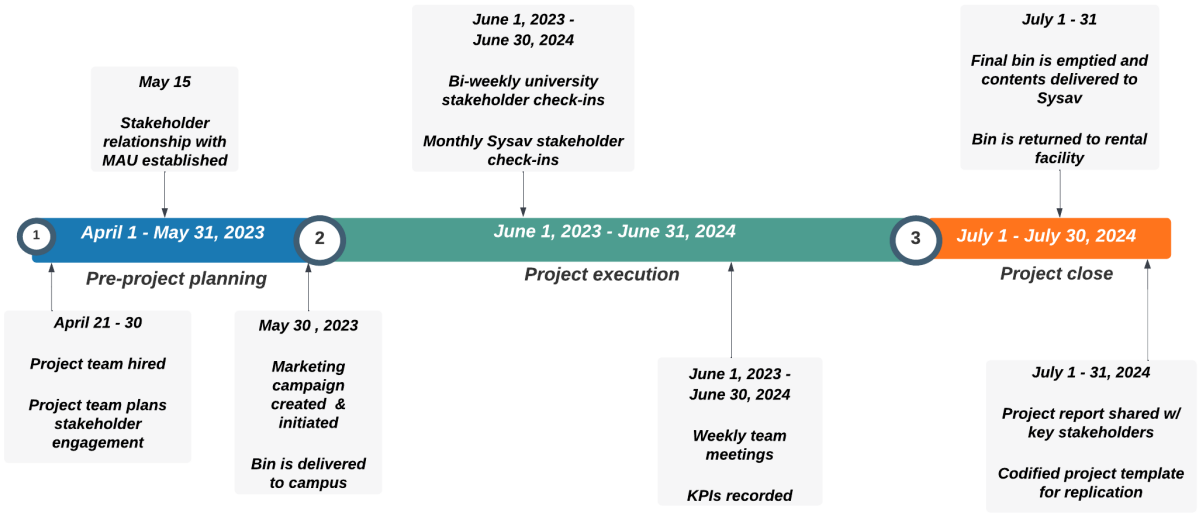


Figure 5: Project timline

### 3.4 Work Breakdown Structure – Work packages with tasks and deliverables

Work breakdown packages and deliverables are in three phases, 1. Pre-project planning, 2. Project execution, and 3. Project close. For detailed information, please see figure 10 in the appendix.

### 3.5 Approach to Sustainability

According to the Swedish Environmental Protection Agency, Swedes consume a significant amount of textiles per person per year (IVA, n.d.). Therefor in order to indicate and assess the aspect of sustainability of the project, the framework of the United Nations Sustainable Development Goals will be used. This will be done in two steps; firstly as outlined in above sections the project will address the SDG 12 target 5. This will be done by making an awareness campaign in line with the EU's waste hierarchy (see figure 9) such that once the used textiles are no longer valuable for the students and faculty members, they can drop them off at the collection bin on campus to be recycled. Secondly, couriers, from the local company "Move by Bike" electric bikes, will transport the clothes weekly or when needed and drop them off at one of Sysav's two textile recycling locations in Malmö.

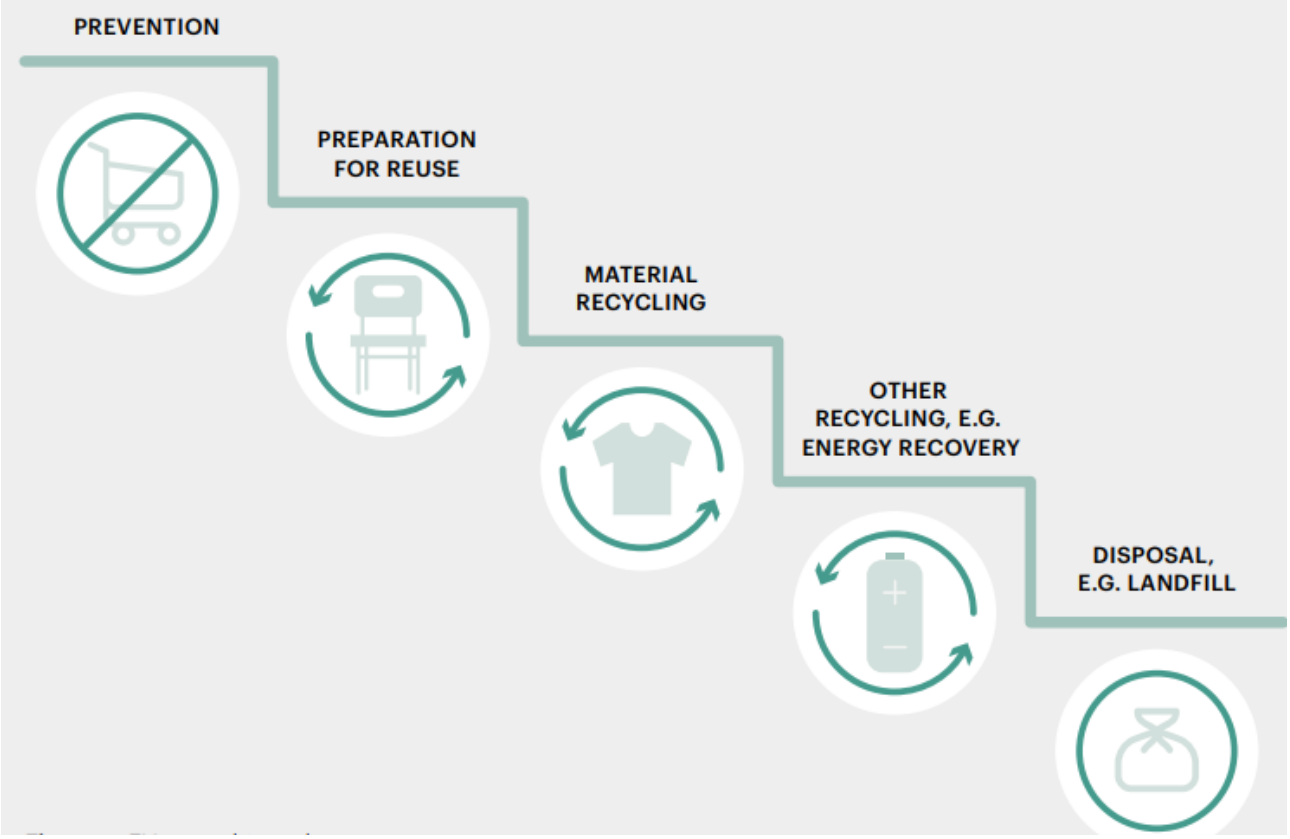


Figure 6: EU waste hierarchy

By facilitating an easier approach to reuse and recycle and by creating awareness of how to responsibly recycle used textiles when it is no longer needed by communities, this project can enable and promote reduction in waste generation through 'prevention' in the sense that people can buy clothes made by recycled textiles when buying new clothes, 'reduction' in the sense that the project will enable people to reduce their own textile waste generation through awareness campaigns, 'recycling' their old unwanted textile by dropping them off at the drop off lo-

cations specified, and reuse enabling circularity in line with the SDGs. Firstly, the production of newer textiles can be reduced significantly by recycling used textiles, which is line with EU policies. Secondly, the project will enable and activate stakeholders, to take responsibility by making them aware that, they too can make an impact on the environment by reducing their own textile waste generation through recycling. The approach can then be implemented in other parts of Sweden and eventually be spread to other neighboring countries - such that it will be beneficial in resolving global environmental problems concerning textile production.

## 4 Budget outline

Swedish krona (SEK) was chosen as the project currency since the project is locally based in Malmö, Skane. By having Malmö university as a target group, it will include around 24,000 enrolled students and around 850 full-time employees (edurank, n.d.). In total, we expect a participation rate of one out of ten in the beginning. That makes around 2,485 students and employees with an average Swedish clothing discard of around 7.5kg of clothing per person per year (Sysav, n.d.). Since the project aims to collect clothing for 13 months, we can expect a total weight of around 20 tonnes. Breaking it down into months, we would collect around 1.5 tons every month. Therefore, it would be necessary to empty the containers regularly according to need, presumably every week. Our chosen salary for the project manager is SEK 400 per hour. The working hours will depend on the project stage. The first months and the last months of the project will be the most labor-intensive months for the project manager. Working with an internal marketing specialist from Malmö University would allow us a discount from SEK 1,200 per hour to a total hourly wage of SEK 800. For the student worker, we were planning a salary of SEK 150 per hour, and externally hired craftsmen, who will construct and deliver the bin, will cost us SEK 800 per hour. Other costs are based on general rates or by requesting the prices of our stakeholders. In terms of costing out office space, all employees of the university are allowed to use the university building Niagara as office space, so we don't incur any costs there. The overall budgeting plan is divided into three phases and can be observed on tables 2, 3, 4: Firstly, the pre-project phase, then the project execution phase, and lastly the project closure. After the calculation, the estimated cost of the project is SEK 124,900. We propose adding a 10 percent project budgeting buffer (SEK 12,490), if possible, which would allow the project manager more scope of action giving us a final budget of SEK 137,390. In the pre-project phase as outlined in table 2 defining tasks and responsibilities is expected to cost SEK 3,200 with a time consumption of 8 hours. Stakeholder communication is expected to cost SEK 2,400 taking a time consumption of 6 hours and with an hourly rate of SEK 400. These are followed by hiring staff, working with a marketing expert from Malmö university, developing the marketing campaign and applying for additional costs. The total cost in this phase is calculated to be SEK 27,650 as illustrated on table 2. For the execution phase and project closure phase, as well as the areas of expenditure are illustrated on tables 3 and 4.

Table 2: Pre-Project Phase budgeting

| Pre-Project Phase | | | | | |
|---|---|---|---|---|---|
| **Area of expenditure** | **Quantity (Hours)** | **Rate/Hour(SEK)** | **Quantity** | **Unit Costs (SEK)** | **Total (SEK)** |
| **Pre-project Administration** | | | | | |
| Takeover of the project, defining tasks and responsibilities | 8 | 400 | | | 3200 |
| Stakeholder Communication | 6 | 400 | | | 2400 |
| Handscale | | | 1 | 250 | 250 |
| Fairtrade bags for transport | | | 20 | 50 | 1000 |
| Sourcing of Material | 4 | 400 | | | 1600 |
| Hiring Staff | 10 | 400 | | | 4000 |
| Develop Risk Management Plan | 4 | 400 | | | 1600 |
| **Marketing Campaign** | | | | | |
| Marketing Expert from Malmö University | 10 | 800 | | | 8000 |
| Develop Marketing Campaign | 10 | 400 | | | 4000 |
| **Funding** | | | | | |
| Apply for Additional Funding | 4 | 400 | | | 1600 |
| **Total** | | | | | **27650** |

In the pre- project phase as outlined in table 2 defining tasks and responsibilities is expected to cost SEK 3,200 with a time consumption of 8 hours. Stakeholder communication is expected to cost SEK 2,400 taking a time consumption of 6 hours and with an hourly rate of SEK 400. These are followed by hiring staff, marketing campaign, marketing expert from Malmö university, developing marketing campaign and applying for additional costs. The total cost in this phase is calculated to be SEK 27,650 as illustrated on table 2. For the execution phase and project closure phase, as well as the areas of expenditure are illustrated on tables 3 and 4.

Table 3: Project Execution budgeting phase

| Project Execution Phase | | | | | |
|---|---|---|---|---|---|
| **Area of expenditure** | **Quantity (Hours)** | **Rate/Hour (SEK)** | **Quantity** | **Unit Costs (SEK)** | **Total (SEK)** |
| **Familiarisation of Staff** | | | | | |
| Project Manager (Host) | 3 | 400 | | | 1200 |
| Student Worker | 1 | 150 | | | 150 |
| Marketing Expert | 2 | 800 | | | 1600 |
| **Clothing Container** | | | | | |
| Delivery of clothing container | | | 1 | 1000 | 1000 |
| Installation of clothing container (Externally hired Craftmen) | 4 | 800 | | | 3200 |
| Navigation by Project Manager | 2 | 400 | | | 800 |
| Container Print | | | 1 | 1000 | 1000 |
| Monthly rent (13 months) | | | 13 | 1500 | 19500 |
| **Marketing Campaign** | | | | | |
| Execution of Marketing Campaign | 10 | 400 | | | 4000 |
| Clothing Transportation to Siptex Moving by Bike (every week for 13 months) | | | 52 | 500 | 26000 |
| **Student worker** | | | | | |
| Coordination/communication with Moving by Bike (every week for 13 months) | 13 | 150 | | | 1950 |
| Emptying of the container & collecting statistics (every week for 13 months for 2h) | 26 | 150 | | | 3900 |
| Update Meeting with Project Manager (every week for 13 months) | 13 | 150 | | | 1950 |
| **Project Administration** | | | | | |
| Stakeholder Communication | 5 | 400 | | | 2000 |
| Update Meeting with Student Worker (every week for 13 months) | 13 | 400 | | | 5200 |
| Project Documentation | 13 | 400 | | | 5200 |
| Promoting/Marketing | 13 | 400 | | | 5200 |
| **Total** | | | | | **83850** |

Table 4: Project closure phase

| Project Closure | | | | | |
|---|---|---|---|---|---|
| Area of expenditure | Quantity (Hours) | Rate/Hour(SEK) | Quantity | Unit Costs (SEK) | Total (SEK) |
| **Removal of the clothing container** | | | | | |
| Navigation by Project Manager | 2 | 400 | | | 800 |
| Destruction of clothing container (Externally hired Craftmen) | 4 | 800 | | | 3200 |
| Pick-up of clothing container | | | 1 | 1000 | 1000 |
| **Closure Administration** | | | | | |
| Project Reporting | 10 | 400 | | | 4000 |
| Submit of final project report to stakeholders | 2 | 400 | | | 800 |
| Plan for next steps | 4 | 400 | | | 1600 |
| Communication to stakeholders | 5 | 400 | | | 2000 |
| **Total** | | | | | **13400** |
| | | | | | |
| Total Sum | | | | | 124900 |
| Budgeting buffer (10%) | | | | | 12490 |
| **TOTAL BUDGET (SEK)** | | | | | **137390** |

# 5 Project feasibility

Feasibility phase is the part of a project where the project team discovers if the project is going to be realistic. To check this, the expected impact is measured and a risk analysis is done. Then we dive into the implementation of the project and what happens after the project.

## 5.1 Brief description of your methodology (for investigating project feasibility)

To understand the feasibility of the project, the project team has analyzed the context of various elements to determine whether the project has the potential for success. In doing this a number of questions came up during the project concerning, budget of the project, operational efficiency, duration, etc. These included questions such as:

- Technical competence to overcome project challenges
- Sufficient funds to conduct project
- What are the legal provisions related to the project
- What kind of risks exist in undertaking the project
- Does the proposed scope meet the project objectives and stakeholder's requirements
- Can the project be completed in the proposed time frame

In doing this a preliminary analysis was conducted and the market conditions were outlined to determine the obstacles before continuing with the project. Thereafter a market research was conducted by investigating the volume of the market, opportunities, location, etc. Following this, analysis and calculations regarding the cost of the required services as well as costs of operations were conducted as outlined in section 4. Following this the methodology for investigating project feasibility was conducted in following five steps outlined in table 5.

Table 5: Methodology for investigating project feasibility

| Legal feasibality | Economic feasability | Techincal feasibility | Operational feasibility | Schedueling feasibility |
|---|---|---|---|---|
| **Does the project conforms to the legal and ethical requirements.** | **Cost benefits analysis to identify how well, or how poorly, the project will be concluded was conducted.** | **A validating of the technical resources and capabilities to convert the ideas into working systems were conducted.** | **Analysis of how well the proposed solution solves the problems** | **An estimate or measure of how reasonable project duration was conducted in line with project budget** |

Firstly the the project was looked at from a legal perspective and whether the project conforms to legal and ethical requirements from the point of circularity as well as using the university's space. Secondly, a cost and benefit analysis was conducted to investigate whether the project is economically doable. Thereafter the technical resources and capabilities to convert the project ideas into working systems were evaluated and put forward by also looking at operational feasibility and how well the project addresses the problem or contributes to solving the issue of textile dumping. And lastly the project duration was aligned with project budget.

### 5.2 Risk analysis with mitigation strategies

To minimize the challenges in the project, risks are analyzed before the project starts. This means that risks are identified, evaluated and prevented or mitigated for the project.

**List of potential risks:**

1. One of the necessary partners is not willing to collaborate, like Sysav, the university or the couriers;
2. Awareness will not be raised by the campaign and students' and staff will not participate or they don't end up discarding the estimated amount;
3. Too many clothes are brought to the bin, so the bin will overflow and the couriers cannot

keep up with it, so they will need to pick up more frequently increasing costs.

**Possible alternative strategies for mitigation:**

1) One of the necessary partners is not willing to collaborate.
**Sysav:** Sysav is one of the most important partners during this project. It is almost impossible to make it work without them. They are in charge of the Siptex facility, so they need to approve more clothes for the dividing process. If they are not willing to receive those clothes, we have to look for another sorting and recycling facility. When that is not possible, the purpose of the project can change into a reusing project, which also meets the vision of making the life cycle of clothes longer. Students and staff can bring their unwanted clothes and if it is still usable, the project can instead focus on selling or trading those clothes in the university. Another risk within the collaboration with Sysav is the rental of the bin. In the current project proposal, we rely on Sysav for renting us a bin. When they are not willing or not able to rent us the bin, the project team has to reach out to other companies that rent bins, like moving companies in Malmö.
**Malmö University:** To be able to put out the campaign and place the bin, collaboration with the university is a necessity. If they are not willing to open their doors for this project, the project needs to be located somewhere else. This makes it harder to target the university's students and staff. The project can still use them as a target group if the bin is placed near the university buildings. For instance in the student union's building or the shops close to the university buildings. Another option is to change the target group into a broader group of Malmö citizens. This way, the bin can be placed in supermarkets, public libraries or other shops or organizations where a lot of citizens will pass through. These locations are an alternative, but it makes it harder to enroll a campaign if the target group is this broad.
**Couriers:** The collected clothes in the bin need to be transported to the Siptex facility. To do this in a sustainable way, bike couriers can do this. Move by Bike is a Malmö based (e-)bike courier company. If they are not able to work on this project, an alternative way of transportation needs to be found. Another (e-)bike or an e-car courier company could be contacted or students of the university can help with this part of the project. Engaged students could be asked to transport the clothes from the bin to the Siptex facility, when it is possible to buy the project's own electric courier bikes.

2) Students' and staff won't participate or they bring fewer clothes than anticipated.
When students and staff of the university are not bringing the amount of clothes we expected, research is needed to find out why this is occurring. If there is not enough awareness, the campaign needs improvement. If the bin is not visible enough, the bin should be relocated. This will require constant reflection and flexibility of the project team.

This is also an important part of the preparation of the project. When there is an understanding of the reasons why students and faculty may not use the bin, this could be addressed by adjusting the marketing campaign. To have an insight into the reasons, the project team did a survey among students and staff of Malmö University. One of the main factors that causes participation from the students and staff in this project is accessibility of the bin. The location might be too far or the clothes will be too heavy to bring there. The participants of the survey also explained what could make it easier to participate in the project. The results are found in appendix A.

3) Too many clothes.
If too many clothes is brought to the bin, the bin can overflow and/or the couriers cannot keep up with it. When this happens, the project needs to expand. More bins or couriers should be involved and the workers at the Siptex facility need to be warned about this extra amount of clothes coming in. This would increase our budget since it would require additional pick-ups from Move by Bike. We would need to apply for additional funding, which we have built into our budget.

### 5.3 Identify key success factors

Several key success factors were identified for the project. These are listed on table 6.

Table 6: Key succes factors

| University administration | Project employees | Stakeholder engagement | Marketing campaign |
|---|---|---|---|
| **In order to realize this project, we'll need the support of and approval from the university administration to use their space to collect clothing** | **Hiring of program manager, university student, marketing professional to execute the project** | **Participation of students and faculty, building strong relations with Sysav. Move by Bike partnership** | **A well designed and executed marketing campaign** |

In order to realize this project, the support of and approval from the university administration to use their space to collect clothing as well as execute the project is needed. Therefore, building strong relations with the university is important. Furthermore, the hiring of a program manager, university student, and a marketing professional to execute the project is necessary and considered valuable for project success. Moreover, participation of students and faculty members, for them to bring their unneeded clothes to campus to drop off at the bin is also considered one of the key success factors as this will determine project outcome. It is therefore important to have a well designed and executed marketing campaign. Moreover, it is vital to develop and build a strong relationship with Sysav/Siptex such that the impact of the project is deepened

for long-term purposes should the project continue in the future. Renting or purchasing a second hand clothing collection bin to support circularity within the project is also one of the key factors determining the circularity aspect of the project. Last but not least forming a partnership with Move by Bike, to keep costs low, and to have reliable drop offs is important to consider.

### 5.4 Cost vs benefit ('Value for money')

Conducting a Cost-Benefit Analysis generally includes the steps of identifying the scope, a determination of the costs and stating the benefits. This already took place in earlier chapters. Even though the project is a non-profit initiative, it is designed to provide value to different sorts of stakeholders. In total, following four main success indicators were identified:

1. The increased awareness of textile waste
2. Protect the environment by bringing resources back into circularity
3. Higher utilization, revenue and sales for the Siptex facility by providing more input material
4. Offering and easy way to get rid of burdening textile waste of our target group to reduce the feeling of climate anxiety

These benefits can be assessed by motivating and convincing the target group to participate in the project. Therefore, the marketing campaign will be helpful as well as having the bin physically at the university which makes the project visual and tangible reminding students and faculty how easy it is to drop their clothes off. Some of the benefits of the project are tangible and measurable, some of them are intangible and therefore difficult to measure. For example, by weighing the drop off clothes, the project participation and input material for Siptex is easily measurable. On the other hand, people's satisfaction and happiness are more complex to measure. The direct costs of the project was determined to total 137,390 SEK and includes funding, labor costs, and needed materials. The intangible costs are the time and effort exerted by the project team but also by the target group. Since most of the stated benefits are not easy to measure in numbers and have no direct monetary value, it is difficult to perform a direct cost vs benefit analysis and therefore value must be measured by impact of the project. The project's risks are comparatively low because the cost of the project is low and it is not a complex procedure. To be able to carry out the project, we are planning to apply and receive funding. In the end, by comparing and evaluating the project's costs and benefits it can be said that the benefits are higher than the cost and the project has a net benefit since a win-win situation for all involved stakeholders was found.

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# A Appendix - Questionnaire

Our team's project proposal is to create a recycling process on campus for unneeded clothing and other textiles. We would place a bin centrally on campus (Niagara) and you can bring your clothes to drop off. From there, the clothing will be e-biked to a recycling facility nearby in Malmö. The clothing will be sent within Europe to be sorted by the clothing's quality and if it can be resold on the secondary market. The clothes that can't be resold will be sent back to Malmö's SIPTex facility, the world's first automatic clothing sorting machine where it will be sorted by fiber and color. The sorted clothes will then be sold to companies who will break down the clothes into recycled fiber and kept within a closed-loop recycling system.

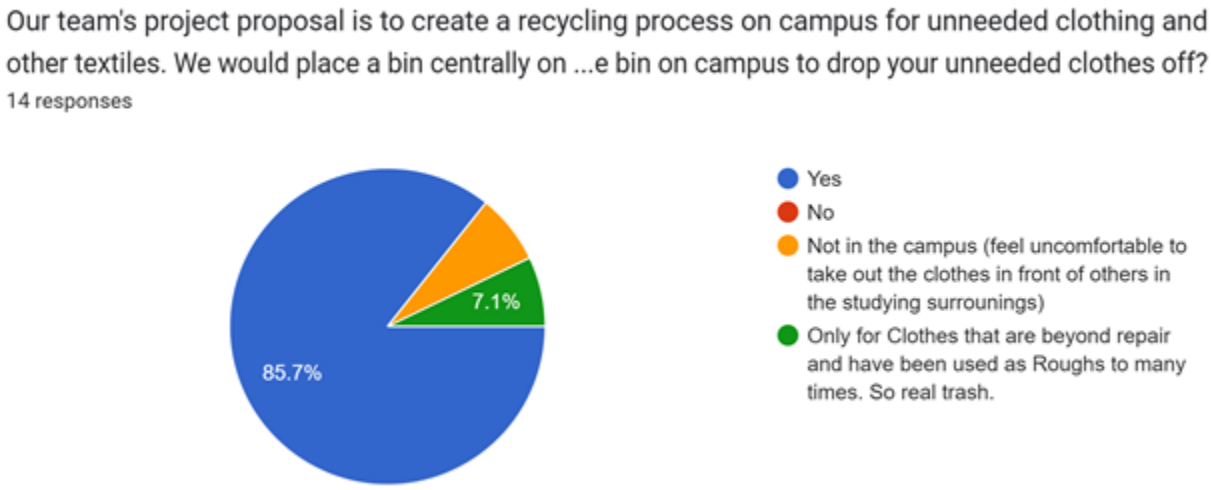


Figure 7: Would you use the bin on campus to drop your unneeded clothes off?

Table 8: 12 respondents answered what deters them from dropping off clothes

| What would deter you from dropping off your clothes in the clothing bin on campus? |
|---|
| Giving clothes to other second hand stores or selling higher quality ones online |
| Amount of clothes to be carried |
| Having to bring all the clothes to campus |
| Answered above |
| if Uni is far from where I live and if I don't have time to do it |
| If the bin is in a hard to find, poorly lit or other difficult location. |
| Forgetting about it, not knowing what will happen with the clothes |
| Laziness |
| Location and ease of access |
| The clothes might get stolen and the people who actually need it won't get the clothes. |
| I do not see the benefit over bringing the cloth to a second-hand shop, if the cloth are still wearable. |
| Malmö is too far from my home. |

Table 7: 14 Respondents answered what motivates them

| What motivates you to drop off your clothes in the clothing bin? |
| --- |
| Sustainability reasons, no waste |
| Its easy to do and circular |
| It will be recycled |
| Reducing waste |
| Money (not in this case though) / doing good for the environment |
| It would be on my way to University anyways, so I am happy to do it. |
| I would like my unneeded clothes to have a second or third life. |
| Easy, on my way to class and good to recycle |
| It's easy, centrally organized and accessible. |
| To maintain circular economy concept. |
| Sustainability |
| It is sustainable and people in need can use it. |
| It is a way to recycle the clothing, that is beyond repair, and I don't have a use for any more. |
| Recycling |

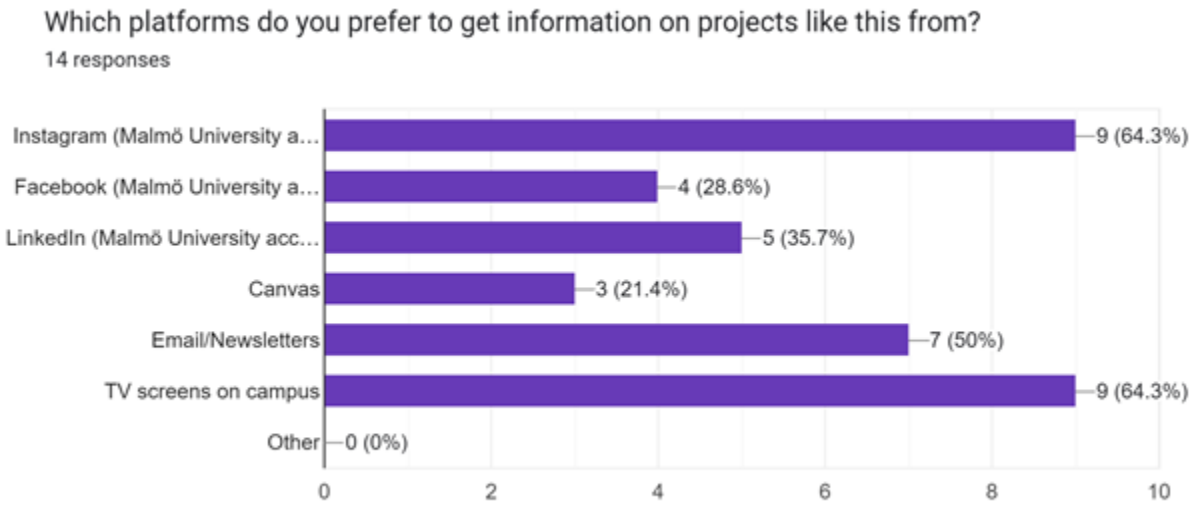


Figure 8: Which platforms do you prefer to get information on projects like this from?

## B Appendix – Interview

Från: fleck$_r$@*web.de* < *f leck$_r$@web.de* > *Skickat* : *den*15*december*202219 : 08*Till* : *AnnaViln* < *anna.vilen@sysav.se* > *mne* : *SiptexProjectIn f ormation*

Hi Anna,

we got your contact information from Jakob Sahlen. We recently came across Sysav and the Siptex-project by doing some research regarding our project management course of our master studies at Malmö University. In relation to that, my team and I want to tackle textile waste and how to make clothing more circular. In an article we read about you having a high demand and the facility could produce even more products. Therefore, our idea is to develop a project proposal for a simple, cost-effective, and sustainable process to source unwanted clothing. We are planning to design a local sustainable process in Malmö to collect pre- and post-consumer textiles to promote circularity in fashion. A major component of this project proposal could include creating awareness of how to recycle one's unneeded clothing at the Siptex facility. By reaching out to you, we wanted to have a first-hand account of Siptex's needs and move forward with designing a project proposal that would provide value for you while promoting circularity and waste reduction. Therefore, we came up with the following questions: Would it be valuable for you to have more clothes coming in? What are local options for Malmö citizens to drop of their clothes? And how do they get to Siptex? Who collects the trash from the trash houses of private households? Do clothes need to be pre-sorted before being brought to Siptex?

Looking forward to hearing from you!

Kind regards, Rebecca Team

Sv: Siptex Project Information Von: "Anna Vilén" <anna.vilen@sysav.se> An: "fleck$_r$@*web.de*" < *f leck$_r$@web.de* > *Datum* : 16.12.202215 : 24 : 37

Dear Rebecca,

Anna: Thank you for your interest in Siptex
**Group 8: Would it be valuable for you to have more clothes coming in?**
Anna: Yes, but we have to deal with big volumes to be cost-efficient
**Group 8: What are local options for Malmö citizens to drop of their clothes? And how do they get to Siptex?**
Anna: In malmö, visitors at the two recycling centers can leave textiles in a bin, the textiles are then sorted manually abroad. The material that we sort in siptex comes from manual sorters in Europe. That is because re-use is better than recycling, we don't want to handle material that could be sold on the second hand market.
**Group 8: Who collects the trash from the trash houses of private households?**

Anna: In Malmö it is VA Syd

**Group 8: Do clothes need to be pre-sorted before being brought to Siptex?**

Anna: Yes, we cannot handle multiple layered clothes for example, e g jackets.

Anna: Please get back to me if you have more questions!

Med vänliga hälsningar

Anna Vilén
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## C Appendix - Contact information

Table 9: Contact information

| Company/institution | Name | Contact informtion |
|---|---|---|
| Sysav/SIPtex | Anna Vilsen | anna.vilen@sysav.se |
| Move by Bike | Gabriel | malmo@movebybike.se |

# D GANTT-schedule and WBS

| WBS NUMBER | TASK TITLE | TASK OWNER | DUE DATE |
|---|---|---|---|
| 1 | **Pre-project planning** | | |
| 1.1 | **Project Creation** | | |
| 1.1.1 | Project Charter | project owner | |
| 1.1.2 | Research | project owner | |
| 1.1.3 | Initial budget written | project owner | |
| 1.2 | **Project Administration** | | |
| 1.2.1 | Hire Project Team & Onboarding | project owner | |
| 1.2.2 | Stakeholder identification | project mgr | |
| 1.2.3 | Stakeholder analysis | project mgr | |
| 1.2.5 | Scope and Goal Setting | project mgr | |
| 1.2.6 | Budget finalized | project mgr | |
| 1.3 | **Project Initiation** | | |
| 1.3.1 | Stakeholder engagement/initial meetings | project mgr | |
| 1.3.2 | Marketing campaign completed | project mgr | |
| 1.3.3 | Risk Management Analysis performed | project mgr | |
| 1.3.4 | Solidify partnerships with key stakeholders (MAU, Sysav) | project mgr | |
| 1.3.5 | Sign agreement with e-bike courier service | project mgr | |
| 2 | **Project Execution** | | |
| 2.1 | Rent bin(s) & arrange for drop off at designated locations across campus | project mgr | |
| 2.2 | Marketing campaign begins & runs throughout project | project mgr | |
| 2.3 | Track KPIs - weight collected on weekly basis | student worker | |
| 2.4 | Monitoring & project check-ins with team | project mgr | |
| 2.5 | Project Updates with stakeholders | project mgr | |
| 2.6 | Couriers pick up clothing waste | student worker | |
| 3 | **Project Close** | | |
| 3.1 | Bin is returned and final contents are delivered to Sysav | project mgr & student worker | |
| 3.2 | Reflection on project success & challenges | project mgr & student worker | |
| 3.3 | Codify project for replication, future use | project mgr & student worker | |
| 3.4 | Share project outcomes with stakeholders | project mgr | |

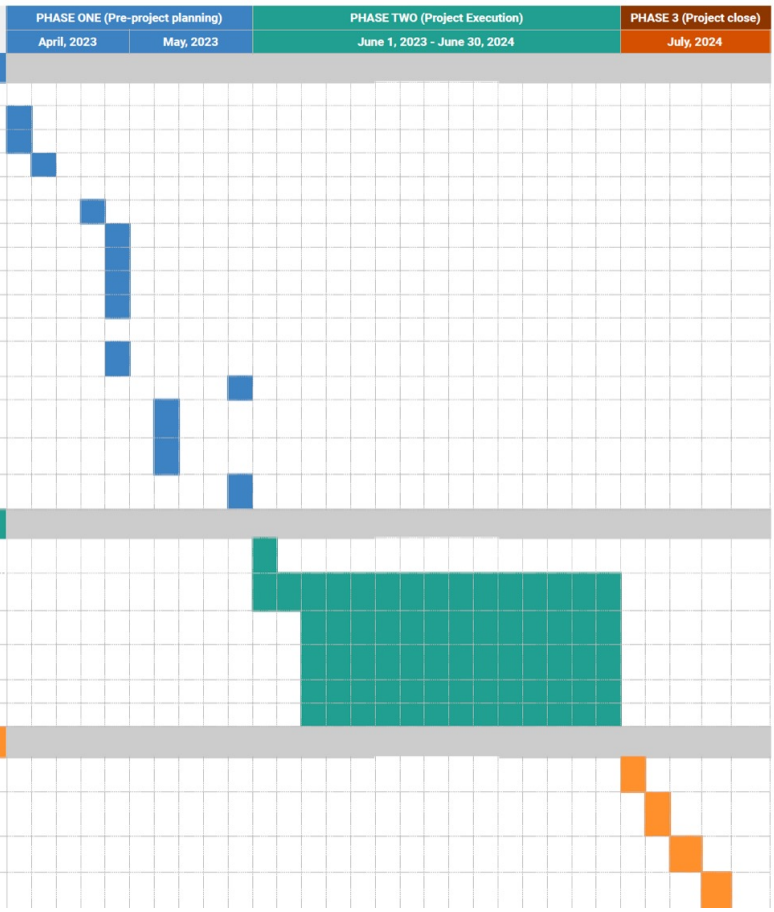


Figure 9: Gantt chart

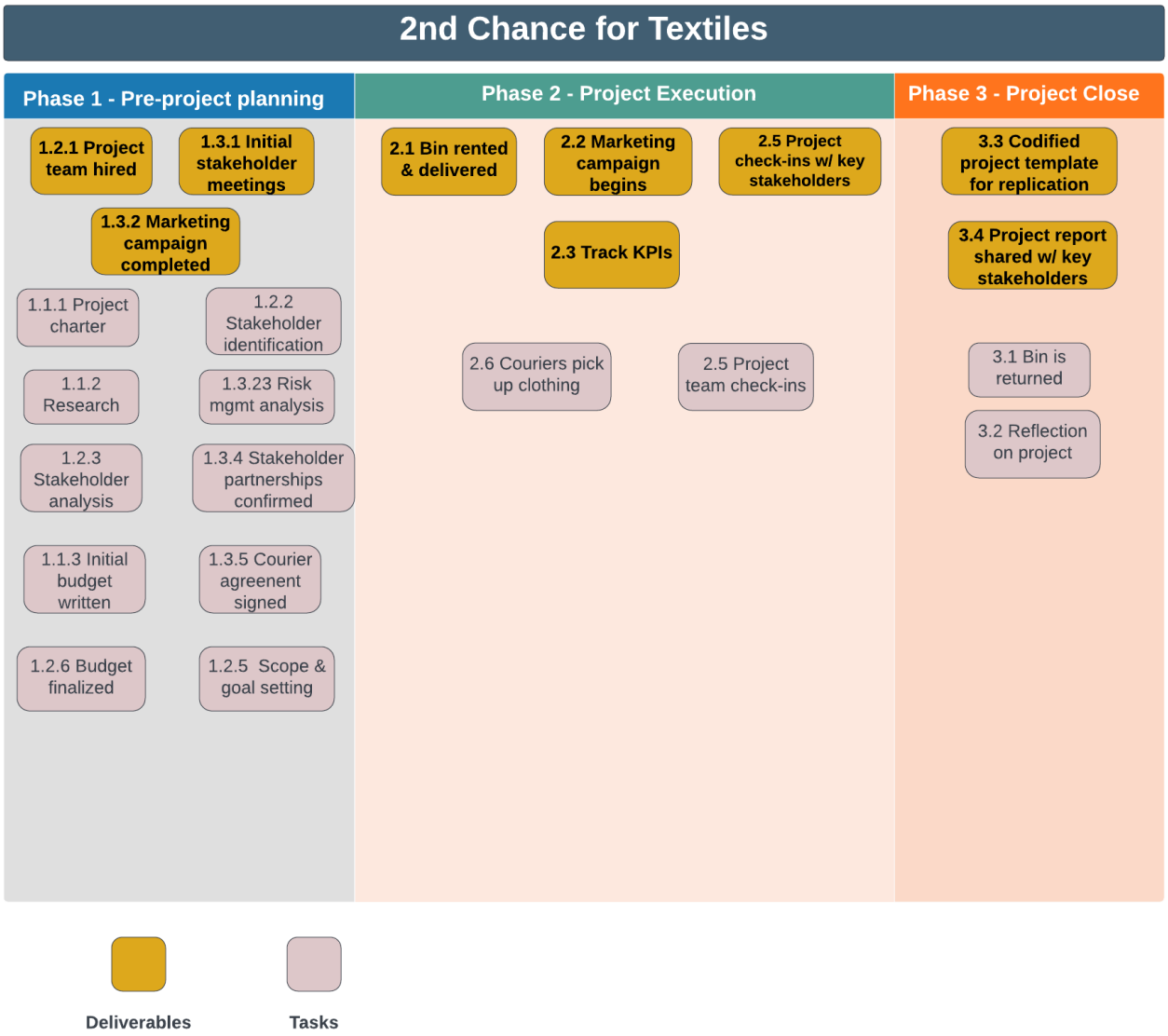


Figure 10: Work breakdown