A Work Project, presented as part of the requirements for the Award of a Master's degree in Management from the Nova School of Business and Economics.

IMPACT AND SUSTAINABLE GROWTH IN SOCIAL INITIATIVES: LIPOR'S CREW PROJECT

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Abstract: CREW is the partnership program between Lipor and ERP Portugal to repair and donate Waste from Electrical and Electronic Equipment to social mediators. This work project intends to identify how impact is generated and measured in social initiatives and how they can grow sustainably. It is divided into three sections. The case study displays CREW's progress from its creation until the year-end of 2020, showcasing its limitations and success factors. The teaching note aims to provide the teaching staff with all the necessary information to achieve its pedagogical goals. The project evaluation report is meant to define practical strategies so that CREW can achieve a higher social return.

Keywords: Sustainable Business, Social Impact Measurement, Social Innovation, Circular Economy, Sustainable Development, Sustainable Development Goals, Community Partnerships, Waste from Electrical and Electronic Equipment.

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CREW – A Circular Approach to Electrical and Electronic Equipment

Section 1: Case Overview

Synopsis

The case begins in 2019 with the replacement of Lipor's reparation laboratory (R'LAB) by CREW, a more ambitious and partnership focused alternative between Lipor and the European Recycling Platform for Portugal (ERP). The project consists of a network of Centres meant to educate volunteers to repair Waste from Electrical and Electronic Equipment (WEEE), and donate it to social mediators. Tânia Pinto and Hélder Marques, two Lipor employees, are assigned the task of managing CREW without having previous managerial experience.

The following six sub-sections of the case provide background information on Lipor and their sustainability agenda, ERP, The United Nations (UN) Agenda 2030 and market trends concerning the growth of WEEE from a global perspective and specifically in Portugal. In 2019, the team starts to develop the management plan of CREW, passing through all activity process stages from the reception of WEEE to its repairing and donation. (See **Exhibit 1** for a glossary containing main stakeholders of activity stages.) The plan created by the team is met by the budget constraints of Lipor, which result in multiple challenges. Tânia and Hélder have to adapt the devised model to a more conservative approach, resulting in limitations in critical areas of the project. The case closes at the ending of 2020, preceding the yearly annual meeting with the board members of Lipor. Tânia and Hélder must prepare the plan to continue growing the project sustainably in 2021 considering its limitations and success factors.

Audience and Pedagogical Objectives

The case study can be a pedagogical tool for various courses in Sustainable Business and Business Administration such as Management of Impactful Projects, Corporate Social Responsibility, Sustainable International Business or Social Entrepreneurship. The following teaching objectives provide an overview of what teachers can expect when using this case

within courses such as those mentioned before:

- Identifying organisational constraints in social initiatives that hinder sustainable growth and illustrating courses of action to resolve them.
- Comparing the economic benefits and social impact that strategic decisions may have and recognizing the need for risk assessment in decision-making.
- Locating and quantifying social return in enterprises, understanding the need for measurement and reporting, and learning different methodologies for evaluating social impact.
- Recognising the need to embed the UN's Sustainable Development Goals (SDGs) into every decision taken by organisations to ensure a sustainable value chain in the short and medium-term.

Preparation questions:

1. What limitations can you identify in critical areas of CREW?
2. What success factors do you spot in the project? How does CREW generate social impact in the community?
3. If you were the project manager of CREW, what next operational steps would you take to grow the project sustainably?

Section 2: Teaching Plan

Pedagogical Approach

The case study can be used as a classroom discussion tool and should be handed out to students along with the previously presented assignment questions beforehand for preparation. A session of 75-80 minutes is recommended to discuss the topics presented below. (See **Exhibit 2** for a timetable with tentative time slots for each discussion block.) There are no specific content prerequisites to introduce the discussion, and the case should be the primary source of information.

Introduction to the case

The teacher can begin the class by displaying data on WEEE growth globally and in the specific case of Portugal. A valuable source for finding this information is the International Telecommunication Union – UN's agency for information and communication technology - notably the Global E-Waste Monitor. At the date of writing this teaching note, the report of 2020 is the most updated document and displays quantities, flows and the Circular Economy potential for WEEE (Global Waste Monitor 2020). This data is interesting to introduce the topic of WEEE growth and CREW's value proposition of a Circular Economy approach.

After briefly introducing market trends, the teacher may ask which aspects are limiting CREW's social impact and what success factors the students identified in preparation for class. Examples of limitations present at various critical areas of CREW are:

- CREW only operates in the eight municipalities managed by Lipor. Its impact in terms of the amount of WEEE reintroduced in the value chain is scarce compared to the national WEEE collected. Furthermore, since WEEE represents such a small proportion of the total waste that Lipor manages, budget allocation to the project is low.
- The current level of WEEE management awareness by the population is minimal, as shown by the survey. Additionally, e-waste separation is not a priority, and people are not concerned about repairing WEEE, nor are they familiarized with its components.
- There is not a clear marketing plan. No marketing strategies are defined, and the budget is used on an as-needed basis. Moreover, online communication and social media channels do not exist, making it harder to reach directly to the general population. Every piece of communication of the project is required to go through Lipor's channels.
- There is a volunteer shortage, and there is currently no strategy to recruit more human resources. Moreover, it is tough to recruit additional qualified volunteers to be technicians and mentors of participants of CREW activities.

- Only 10 of the 19 eco-centres are prepared to receive WEEE in good conditions. In addition, many of them do not have video vigilance systems meaning that WEEE is often stolen or vandalized.

CREW's success factors represent the dimensions of the project that generate social impact in the population. Examples of these are:

- Donated Electrical and Electronic Equipment (EEE) represent an increase in the quality of life of the people who receive it. Furthermore, it is also valorised WEEE that without the reparation process of CREW would be obsolete.
- Youngsters at Santo António Educational Centre (CESA) learn and develop new capabilities to repair WEEE. Youngsters who finalise CESA are more likely to find new job opportunities related to repairing activities.
- CREW advocates for better practices and WEEE management. On top of that, it involves the community by creating partnerships in the repair process promoting dynamic events, often in social locations such as the Social Centre of Ermesinde (CSE), where Centres, Clubs, Repair Cafés and workshops take place. CREW is a pioneer project in Portugal and an ambassador for the Circular Economy. The partnership with the Right to Repair movement and the award of iFixit won in 2020 showcase yet more success factors.

Identifying these limitations and success elements at the beginning of the session will help construct a better discussion among students.

Opening the discussion

To begin the discussion, the teacher can divide the class into smaller groups so that students feel more confident in participating and generate more insights into a stimulating debate. The number of students per group will be the teaching staff choice and depends on the number of participants per session. Students shall brainstorm solutions for each question in a group and

then present them to the class. After introducing the topic of WEEE growth and showcasing CREW's limitations and success factors, the teacher can ask the opening question to introduce the discussion:

1. What would be the next steps you would take to scale the project sustainably? Provide one or more operational recommendations for the functional areas of CREW (Operations, Marketing, Human Resources, etc.) that can be implemented in 2021. They should take into consideration the limitations and success factors identified in the project and be backed up by key performance indicators (KPIs) to monitor progress.

This question is meant to leverage the students' creativity and introduce solutions that help grow the project considering the current challenges. Two examples of potential answers can be:

- Pivoting the current strategy of opening three CREW Centres per year to opening CREW Clubs in shopping centres, universities, or technical schools. As can be seen, by **Exhibit 9** of the case study, the majority of EEE that CREW repairs can be repaired in Clubs as there is no need for heavy machinery or expensive tools. By establishing partnerships with the organisations mentioned before, CREW can decrease the costs of running each location (opening a CREW Club costs an average of 2700€ less than opening a Centre). Moreover, the locations mentioned before are likely to be more central and generate higher engagement with local communities. KPIs for this operational recommendation can be the number of additional volunteers participating in repairing Clubs and the number of additional repairing hours per Club.
- Improving the eco-centres' receiving conditions to increase the amount of WEEE with a higher potential to be repaired. In addition, establishing public-private partnerships (PPP's) with retailers and electronics stores to collect broken EEE with a high potential market value to be repaired at CREW. The quantity of additional WEEE that the project

repairs and the additional donated EEE are two KPIs to measure the impact of this recommendation.

Students can present many other answers, such as creating a marketing plan with a robust online value proposition or establishing partnerships with universities from other municipalities to create new Clubs. There are many possibilities. The end goal here is to provide relevant recommendations that KPIs can back up. The teacher can listen to the groups' suggestions and organise them by functional areas of the project that are improved.

To introduce the next question, the teacher can assign different groups to take opposite perspectives in regards to selling or not WEEE considering the impact it has on the social return aspect of the project:

2. Speaking to the juridical department, Tânia learnt that when Lipor created Nutrimais®, it opened a precedent in the company. It was now possible to sell products that were originated from the treatment and valorisation of all types of waste and not just organic waste – WEEE is included. Should CREW leverage this and start selling the WEEE that the project repairs? What effects can this have on the social impact of the project? What alternatives does CREW have for funding?

The purpose of this question is to analyse the pros and cons of using the extended Economic Activity Classification (CAE) of Lipor to sell EEE. This is meant to be a controversial question among students that fuels the discussion. No added bureaucracy costs will have to be incurred by the project. CREW's activities can now offer a new funding opportunity by creating an income stream with money for the EEE the project sells. However, monetizing the project can weaken or lose the social impact badge of CREW, as less or no EEE would be donated to people in need.

On the one hand, CREW can use the extended CAE of Lipor and sell EEE, thus creating a source of revenue for the project which can be used to reinvest in logistics, marketing and

human resources as well as other critical areas of the project that are currently constrained due to budget limitations. Noticeable in the *introduction to the case section*, investment is the primary limiter of CREW and what can drive solutions to all the critical areas. More investment can mean a better marketing strategy, more technicians, and a higher number of facilities. The main arguments to sustain this view are that by monetizing the project, Lipor would still be able to generate a positive social return by educating, training and sharing knowledge in key areas of WEEE management and repairing. Even though the EEE would be sold, it would still be reintroduced in the value chain, consolidating the company as an ambassador for a Circular Economy in Portugal (Lipor 2020). Groups of students who are required to defend the view of selling EEE are likely to produce arguments among this line of thought.

On the other hand, part of the Corporate Social Responsibility (CSR) of Lipor is to create a positive impact in the community it serves, by strengthening its actions with Local Communities. Lipor aims to provide support to the social mediators that operate in their management area and donating EEE to these entities is a component of its Governance policy. Students can further explore this argument by adding that partnerships with social mediators would most likely be terminated if EEE were sold and so would the educational and repairing activities that happen in collaboration with them. They can also advocate for different funding options, such as crowdfunding, grants and even an increase of the project's budget by Lipor with a thorough business plan of the project with higher social impact potential.

The teacher can finish this section by creating a bridge to impact measurement and reporting, which will be discussed in the next section. The teacher can thus explain that Lipor first needs to assess exactly how CREW generates social impact - measurement and reporting of the project's social return is critical to understand ways to move forward.

The following question is meant to lead students to brainstorm ideas on why impact needs

to be measured and reported in social enterprises:

3. Speaking to Diana, her colleague who started using the Social Return on Investment (SROI) method in a different department of Lipor, Tânia began thinking if it was important for CREW to measure and report the impact that it generates. What do you think about this? How can CREW and Lipor benefit from having an evaluation tool assessing the impact created by the project?

The main benefits of having impact evaluation tools are organisational learning for improving performance, increasing the potential for funding, and communicating the results of endeavours to end-users (Barraket, Jo and Yousefpour 2013). After listening to all groups' views on impact assessment, the teacher can introduce different tools for impact measurement and reporting for social enterprises. The overall goal of this section is for students to learn about different tools for impact measurement and understand that tracking the impact of endeavours is crucial for the success of the initiatives. Enterprises use different methodologies to assess the impact of social initiatives and more than one can be used as many of them such as the below mentioned, complement each other. The methodologies introduced will ultimately depend on the course's content, needs and relevance to teach different assessment tools. The teacher can choose to introduce different frameworks than the ones mentioned below to measure an enterprise's social impact. Examples of methodologies are:

- SIMPLE (Social impact for local economies) model. A holistic perspective on social measurement that provides five stages beginning in a situational analysis up until practical embedding of social impact in the enterprise's decision-making process. The different stages allow organisations to determine drivers for social return, construct impact measures for them and integrate the output in management decisions of the organisation. (McLoughlin et al. 2009).

- SROI method. The ratio for the estimated social value created by the project, assessing the net present value of benefits and investment. This indicator estimates the monetary value of factors that are often not considered in traditional organisation statements. Elements such as improving the quality of life for individuals are reflected in this indicator (Millar, Ross and Hall 2013).
- LBG model. This framework is helpful to quantify the value of the investment in communities and includes measures such as money, time, and management costs (Parlinska, Agnieszka, and Ewa Stawicka 2018). It captures business benefits and organises them as inputs, outputs, and impacts (on communities, organisations and the Environment) structuring the information in a way where impact is shown.

The teacher can provide an overview of one or more of these frameworks so that students can acknowledge different methods to track social impact. The next recommended step would be to finish the discussion segment of the class and conclude with an update of events of the project after 2020.

Section 3: Conclusion

CREW in 2021

Following the year-end of 2020, CREW counted with one full-time technician conducting repairs and educational activities. Speaking with the department managers of Lipor, it became clear that the company sees the need to optimize processes and upgrade the current conditions to outgrow the project's current pilot status. By 2021, CREW counted with one more technician working in the project and recruiting additional technicians is part of the strategy for the project's future. Furthermore, resources will be allocated to prepare an annual marketing plan with well-defined goals and strategies. It will count on a strong online value proposition and conventional marketing strategies.

Lipor is also in the process of implementing the SROI to quantify the social return of its projects. CREW had an SROI of 0.95, meaning that 0.95€ of social value were created for each 1.00€ invested in the project. There is plenty of room for improvement, and this value was negatively affected by the pandemic. The method is still in pilot status. Changes to social return and investment drivers are likely to happen in the near future so that the SROI can be standardized in the organisation to improve the decision-making process. As part of the strategic implementation plan, CREW will continue to generate efforts to upgrade the current CREW Centres, and it will pivot its focus to create new Clubs in central locations of the Greater Porto region as the social impact generated by these facilities proved to be higher.

Key Takeaways

The case study is meant to provide students with a real-life example of an initiative in the social sector in Portugal, displaying the limitations that such projects usually have. Since no direct monetary return is associated with these initiatives, resource limitations are usually present and create constraints to the sustainable growth of the projects. With an eye on the UN's 2030 agenda and the CSR of organisations, higher efforts must be put into place to minimise social and environmental malpractices. SDGs should be inherent to every decision taken by organisations and projects like CREW that have a great potential to create change in consumer habits and promote a Circular Economy should be promoted more rigorously. The impact generated by projects like CREW should be enhanced and closely monitored so that organisations can learn from them and optimise the decision-making process.

Appendix:

Exhibit 1 Glossary

Term	Definition
Casa dos Acessórios	Electronic parts supply store. CREW has a 5.000€ yearly contract with both parts suppliers that provide repair parts for the project.
CREW Centres	Laboratory space where certified technicians work with volunteers to repair WEEE for CREW and conduct educational activities. CREW has 5 CREW Centres at the end of 2020: CESA, UFGVJ (Union of parishes of Gondomar, Valbom e Jovim), Lipor (External Platform Unit), CSE, CENFIM (Technical School of Ermesinde);
CREW Clubs	Events similar to the Repair Cafés where WEEE is repaired by volunteers to be donated. Locations of Clubs include shopping centres, local parishes and Universities.
Eco-centres	Reception centre, controlled and sealed, which is prepared to receive separated waste in respective containers; Properties of municipalities.
ERP - Portugal	Financial and strategic partner in the project. WEEE that cannot be repaired is handled by ERP. ERP invested 50.000€ at the beginning of the project and invests 10.000€ yearly.
ESTRAEE	Cross-Border Strategy for Waste from Electrical and Electronic Equipment. Partnership between Lipor, Energylab, Revertia and ERP to improve the receiving WEEE conditions and upgrade the facilities of 18 eco-centres in the North of Portugal and Galicia.
iFixit	The most significant international repair platform. CREW won an award by iFixit in 2020 for the success of the Repair Cafés.
Lipor	The public organisation that manages, recovers, and treats urban waste in eight municipalities of the Greater Porto area.
Matosinhos Habit	Social mediator that donates EEE to people in need.
Mister Puzzle	Electronic parts supply store. CREW has a 5.000€ yearly contract with both parts suppliers that provide repair parts for the project.
Nutrimais®	Lipor project that produces and sells fertiliser. Nutrimais® extended the Portuguese Economic Activity Classification (CAE) of Lipor to include the sale of products that come from the transformation and valorisation of organic waste.

O meu lugar no Mundo	Social mediator that donates EEE to people in need.
R‘LAB	The reparations laboratory of Lipor. Terminated in 2018 due to an increase in demand and lack of resources allocated to the project. CREW came as its successor.
Repair Cafés	Events that happen in smaller reparation spaces where WEEE is repaired by participants who show up to the events. The participants can bring their own devices, repair them, and take them home. Repair Cafés work as awareness promoting events.
Right to Repair Movement	European activist initiative focused on removing the barriers to repair EEE. CREW joined the movement in 2020.
SEMENTE	Lipor’s internal social mediator that donates EEE to people in need.
Sustainable Development Goals	17 goals set by the UN to be reached until 2030 to tackle social, environmental, and economic issues ranging from poverty, education, global warming, etc.

Exhibit 2 Recommended timetable for class discussion

Estimated time	**block information**
15‘	Introduction to the topic of WEEE growth; Limitations and success factors of CREW (question to prepare discussion); Dividing the class into groups.
12 - 15‘	Question 1: Operational recommendations to scale CREW sustainably in 2021. Half of the time should be for in-group brainstorming and the other half for presenting the found solutions to the class.
15‘	Question 2: Using the extended Lipor CAE to sell EEE or not. Half of the time should be for in-group brainstorming and the other half for presenting the found solutions to the class.
15‘	Question 3: How CREW and Lipor would benefit from having an impact measurement tool. Half of the time should be for in-group brainstorming and the other half for presenting the found solutions to the class.
10-12‘	Teacher summary and overview on impact measurement frameworks such as SIMPLE, SROI or LBG.
7-10‘	Epilogue and class conclusion.

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Lipor's CREW Project – Case Study on a Circular Approach to Electrical and Electronic Equipment

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CREW – A Circular Approach to Electrical and Electronic Equipment

It was February 2019 when Tânia Pinto and her colleague Hélder Marques received an email from Lipor's management board assigning them the responsibility to the CREW project, the successor of R'LAB - Lipor's reparation laboratory. According to the email, Lipor would be replacing the R'LAB project with a more ambitious and partner-focused alternative which would provide a higher social return. Tânia Pinto holds a degree in Biology, and Hélder Marques has a technical background in Chemical Engineering. They were previously working on technical facets of waste management and recycling. Tânia rejoined Lipor in November 2018 after she finished her work on a bio-waste management system in England. Hélder worked at Lipor for several years and was already involved with other e-waste management programs.

Tânia and Hélder had two main questions: *How can we make this project successful? And what does success mean in this context?*

Lipor - Intermunicipal Waste Management Service of Greater Porto

In 1982, Lipor was founded as the public organisation responsible for managing, recovering, and treating urban waste in the Greater Porto area. This area has 1 Million inhabitants (10% of the Portuguese society) and treats 500.000 tons of municipal waste each year. Lipor's waste intervention comprises 12% of all the municipal waste generated in Portugal (Lipor 2021). Updated public policies, particularly the EU's New Green Deal and the fact that the progress in cutting carbon emissions has not been sufficient to accompany the targets set by the EU, show the need for better practices collectively (World Economic Forum 2021). By running several projects that are extensions or even outstretches from their core business, Lipor leads as an example for Circular Business Models, which reintroduce waste as a resource in the value chain. (See **Exhibit 1** for Lipor's project overview.) Besides CREW, ESTRAEE is a good project to understand better how Lipor promotes a Circular Economy approach related to e-waste,

including procurement, intervention, and education to prevent misconduct. (**Exhibit 2** summarises Lipor's sustainability plan.)

ESTRAEE: Sustainable Cross-Border Strategy for Waste from Electrical and Electronic Equipment (WEEE)

In 2017, Lipor and its partners Energylab, Revertia and ERP Portugal developed a project to improve the receiving conditions of e-waste in 18 eco-centres in 15 municipalities in the North of Portugal and the cross-border region of Galicia (Lipor 2020). An eco-centre is a receive sealed controlled Centre where waste is disposed of in separated containers. They are properties of the municipalities and are managed by them. (See **Exhibit 3** to see eco-centres and get a better idea of how the selective recollection of urban waste works.) By adapting infrastructures and redesigning processes to be more suited to receive WEEE, the aim was to promote a strategy for sustainable management of end of the lifecycle (EOL) electrical and electronic equipment (EEE). The project's objectives were to increase the number of e-waste drop-off locations, reduce vandalism and steals, develop a detailed lifecycle analysis for various EEE, implement a second-hand raw material market, and create a best practice report to promote community awareness for sustainable WEEE management. With ESTRAEE, eco-centres received requalification adaptations and security improvements through support equipment and video vigilance systems. ESTRAEE also aimed to standardise the management conditions of EEE to result in better separation and classification of WEEE to allow for easier treatment during the refurbishment, reuse and recycling process. Two new buildings were constructed within the scope and budget allocated to ESTRAEE, enlarging Lipor's headquarters to support operations and underlining the project's pioneering character in Europe.

R'LAB - The pilot project

Another project of Lipor to understand the context of CREW is R'LAB. R'LAB started in 2013 as the reparations laboratory of Lipor, and its purpose was to repair EEE and donate it to

people in need. For this reason, the company assigned one full-time employee responsible for repairing submitted equipment. João Filipe had a working station at Lipor's headquarters in Porto. Since the R'LAB project management missed to roll out a proper communication campaign and a proper waste collection network, the employee assigned to fix the devices had spare capacity in his schedule. When other Lipor employees noticed that, they started to see João as their caretaker, who repaired their technical devices for work and private purposes. In 2015 when the amount of collected e-waste started to increase, João found himself overwhelmed with the demand for his reparations. Being stuck in this situation due to the project management's underestimation of the budget and scope, R'LAB was considered a failure and terminated in 2017.

Tânia reads the email closely:

Dear Tânia and Hélder,

CREW is the successor of R'LAB and intends to focus on repairing electronic waste and donating it to social entities. We know that we need to build a network of partnerships to avoid past mistakes and give new life to otherwise obsolete electronic equipment. We have signed an agreement with ERP Portugal, our partners in this project. We have also partnered with a juvenile reforming centre (CESA) to open the first repairing centre.

CREW's mission is to share knowledge and expertise on WEEE repairs, involving the community and promoting circular economies and the UN's Agenda 2030. We are confident that you won't disappoint, and we wish you good luck!

After brewing themselves a cup of coffee, Tânia and Hélder decided to sit down and get a better understanding of all the complicated buzz words in the CREW project context.

The European Recycling Platform (ERP)

Founded in 2002, ERP is the European waste management association founded by Gillette, Electrolux, Hewlett Packard and Sony with the purpose to ensure the correct implementation of the current WEEE European directives. The national spin-off, ERP Portugal, was established in 2005 to manage WEEE, batteries and accumulators and EEE packaging (European Recycling Platform 2021). Per EU legislation, manufacturers of EEE are obligated to handle WEEE disposal. To streamline these operations, referred to as the Producer Responsibility Principle, producers establish agreements with WEEE managers such as ERP or Eletrão (EU WEEE Directive 2007). Similarly, Lipor, the municipality waste manager, has a partnership with ERP.

The partnership works, so that e-waste disposed of in municipalities managed by Lipor goes through a trial. It goes through ERP's logistics to be recycled if it is obsolete. If it can be repaired or if parts can be reused, it stays at Lipor's facilities and is used for the CREW project. ERP is legally obligated to reintroduce 5% of the e-waste they manage into the value chain, and CREW, if scaled further, can be a valuable partnership in that regard. ERP invested 50.000€ at the beginning of CREW and committed to a 10.000€ yearly investment in the project. Lipor manages the repairs and the availability of spare parts and benefits from having a partner to share costs, vision and goals. Besides partnerships, another way to overcome budget limitations for Lipor is via European Union (EU) funding, such as the EU's POSEUR programme to incentivise sustainable corporate activities (Lipor 2020).

The United Nations and the SDGs

The UN's sustainable development goals (SDGs) or Agenda 2030 define idealistic goals that all 193 member states agreed upon pursuing. Any action of public and private sector companies and individuals should be guided by these 17 goals that range from fighting poverty and world hunger to gender equality, climate change and sustainability. Designed after the Millennium

Development Goals (MDGs), the SDGs were signed in 2016 with a project time horizon of 15 years (United Nations 2015).

Despite many positive consequences of Agenda 2030, critics argue that nationally determined contributions (NDCs) need to be coordinated with Agenda 2030 to face the ambiguous challenges coherently. Even though the International Telecommunication Union (ITU), one of the UN's supreme decision-making organs, sets goals to increase the global e-waste recycling rate to 30% by 2023, a significant issue is a precise quantification for all SDGs is missing. One issue that derives from this is the possibility of greenwashing. The SDG Challenge report of PWC in 2019 revealed concerning results among private sector companies. While 72% of companies mentioned SDGs in their reporting, only 14% mentioned specific SDG targets. Only 1% of companies report quantitative measures to show their progress, displaying a lack of clear guidance on how organisations can translate intent to action. It depends on the companies to embed the SDGs in their strategy, projects and corporate culture (PWC 2020). CREW is a prime example of a project aligned with the SDGs.

Information on WEEE

As the research revealed, the estimated global amount of e-waste generated annually is 53.6 Million metric tons (Mt) in 2019 (Forti et al. 2020). As their study also showed, growth estimations predict an increase to 74.7Mt by 2030, which equals a doubling over the last 16 years. (See the flow of EEE evolution in Portugal in **Exhibit 4**.) The resulting challenges are numerous. For once, there is a lack of global e-waste documentation - although, by 2019, 78 countries provide at least some sort of legislation, policy or regulation, there is still a shortage of this documentation globally. Similarly, not only the consumption varies per continent but also the execution of repair, reuse or recycling initiatives of e-waste and the applied legal compulsion. Resultantly, toxic parts such as mercury are mishandled and depict a great danger to the environment, end-users, and the labour force involved.

Zooming in on the improper management shows that the nontransparent documentation of e-waste treatment leads to approximately 100 Million tons (t) of CO_2 emitted into the atmosphere. Inadequate documentation is one of the main drivers why only 17.4% of e-waste is collected and recycled, leaving 82.6% of e-waste flows that are undocumented and presumably not used for repair, reuse or recycling (Forti et al. 2020).

However, the report further shows the market potential of such activities due to the valuable raw materials in WEEE. The value of natural materials such as gold summed up to 49 billion € globally in 2019. The extraction process is, unfortunately, cost and labour intensive. To remove, for example, 280 grams of gold, one ton of e-waste is needed (Forti et al. 2020).

All of those facts, figures and trends illustrate the market potential but most prominently the necessity to act on all levels. The e-waste collection rate of 42.5% in Europe shows in comparison to Asia's (11.7%), America's (9.4%) or Africa's (0.9%) that Europe has to lead by example and define best-practice standards on how to operate WEEE reuse, recycling, disposal as well as adequate documentation (Forti et al. 2020). This exemplifies once more the importance of CREW.

After finishing this research and their coffees, Tânia and Hélder started to develop the project management plan of CREW.

CREW – The Components of the Network and Conditions in 2019

CREW is a close collaboration of Lipor, ERP Portugal and community partners. The project's purpose is to extend the lifecycle of EEE with the engagement and cooperation of local communities. (The process in which a repaired device goes through is displayed in **Exhibit 5.**) Before explaining the intended flow of products, it is helpful to understand the system of drop-off locations.

Eco-centres

As mentioned in the ESTRAEE section, eco-centres consist of a reception centre, controlled and sealed, which is prepared to receive separated waste in respective containers. Eco-centres are financed and set up by municipalities, and the WEEE deposited in them is forwarded to waste management entities such as Lipor. The end-user can dispose of their e-waste at these places or call their municipality to get their WEEE picked up at their preferred location. The picked-up waste will then be forwarded to an eco-centre. Lipor manages 19 eco-centres in the Greater Porto region. Over the past year, Lipor introduced 12 mobile eco-centres - containers of ample dimensions, prepared to receive several types of waste – among them, WEEE. These mobile eco-centres change locations around the municipality to reach more people and collect more WEEE. Lipor compiled an average of 3 tons per month at these containers (Lipor 2019). From these containers, the e-waste is brought to CREW Centres.

CREW Centres

A CREW Centre is a facility of Lipor or a business partner, where volunteers conduct repair sessions. Centres consist of laboratory space and must provide at least a technician, often a volunteer, who is responsible for guaranteeing the quality of the repaired equipment. Each Centre also has a team of volunteers learning to repair equipment. They are provided with specific training to fix the equipment and manage the laboratory safely. Lipor and ERP are responsible for providing the Centres with all materials and tools to repair.

The first CREW Centre site to open in 2018 was the Santo António Educational Centre (CESA). A youth detention centre for young males aged from 12 to 21. The Centre opened up new ways for youngsters to learn and develop new capabilities. Repairing devices for CREW even became part of the CESA-Curriculum, adding another social facet to the project (Lipor 2018).

If the appliance cannot be repaired, it will be deconstructed to reuse its parts. Since these spare parts were not enough in number, ERP Portugal and Lipor established contracts with two electronic supply stores in Porto named "Mister Puzzle" and "Casa Dos Acessórios". Lipor and ERP pay 5.000€ annually to cover the costs for the repair parts. As of 2019, CESA was one of three CREW centre sites. Tânia and Hélder set the goal to open three new CREW centres each year. (A list of all CREW centres until the end of 2020 can be seen in **Exhibit 6**.) Besides the Centre in CESA, they opened a centre in the facilities of the Union of Parishes of Gondomar (UFGVJ). They reutilised the Exterior Platform Unit of ESTRAEE at Lipor's facilities to be another CREW centre.

Social Mediators

Repaired devices are handed to SEMENTE, a part of Lipor's social responsibility department. SEMENTE volunteers work to improve the quality of life for citizens in Lipor's operating area. One of these actions is donating EEE to citizens in need by sending out a catalogue of available devices from which social mediators can order repaired gadgets need-based.

Consumer Behaviour

One structural problem of R'LAB was the general public's lack of awareness of the project. To avoid that in CREW and understand consumers' behaviour when dealing with WEEE, Tânia and Hélder decided to initiate a survey, which received 315 responses from residents in the Greater Porto area, 71% between 19 and 35 years old.

It showed that a lack of knowledge about e-waste was prevailing. Respondents tended to keep their old and outdated devices to keep the data/information (42%) and to have a spare device (13%). 16% of the respondents claimed to keep their old devices instead of giving them away because the machines were still worth money. Noteworthy in that context is that 57% of participants indicated a general willingness to pay for professional repairing services. Another

strong reason that flashed through all answers was inertia (23%). Regarding finding out where and how to refurbish the device, 60% of the respondents indicated a perceived overwhelming effort that hinders them from bringing it to a facility. Adding upon that, 70% of respondents quoted that nobody in their circle of friends and family repairs broken EEE. Further questions regarding awareness of campaigns and repair shops unmasked improvement potential because 61% were not aware of any campaigns in their city. (See **Exhibit 7** for survey findings.)

The study showed that communication and understanding of the end-users, availability and awareness of centres, documentation and scalability were core issues to improve the CREW project for more social impact. Assessing the situation, Tânia and Hélder channelled these intentions in three concrete fields that they wanted to focus on in 2020. Scaling up CREW would mean increasing the number of CREW Centres, improving the current drop-off locations, and creating new community partnerships.

Scaling up – The Plan for CREW in 2020

CREW Centres

One goal was to open three new Crew Centres a year, the other to repair between 0.8 to 2.5 tons per CREW Centre of what previously would have been e-waste. Each Centre has a setup cost for machinery and tools of approximately 3.000€. Although somewhat expensive, the cost of setting up a CREW Centre would be the more straightforward step to deal with. When scaling up CREW, the primary concern was to find volunteer technicians to run each Centre, repair devices and act as a local counsellors. When Tânia and Hélder tried to open new Centres, they ran into problems finding volunteers in the Greater Porto region qualified enough to have such responsibilities and motivated enough to take this compromise as volunteers. To tackle this, they planned a flyering campaign, advertising at CREW facilities and a door drop advertising effort to solve the problem and find enough qualified volunteers.

Drop-off sites

Given that a reasonably big part of the e-waste that reached the CREW facilities had water damages, Tânia and Hélder went to several eco-centres to investigate why this happened. Being on-site at Águas Santas eco-centre, they realised that the drop-off containers for e-waste were not safe from rain. Water-safe containers were available for purchase, but the cost of installing the new containers in an eco-centre was 7.000€. Given the budget limitation of the project, it meant that the change could only be executed incrementally. From the total of 19 eco-centres in the catchment area of Lipor, only ten could collect e-waste with new containers that prevented water damage.

Furthermore, the remaining nine eco-centres had severe security and video surveillance system limitations. (See **Exhibit 8** to find out more about Lipor's eco-centres.) Another problem with the eco-centres is that they were not visible enough. Changing the location was, however, rather impossible. Tânia and Hélder planned to follow a different path - by having more community involvement, they wanted to raise awareness and increase the traffic at the eco-centres.

Repair Cafés, CREW Clubs, and the involvement of the community

Optimising communication and increasing the number of social events were promising vehicles to promote awareness since they implied an increase in education through communication. Tânia and Hélder wanted the community to know that they had an important role in disposing and taking care of WEEE correctly. One idea the two wanted to implement in 2020 was the Repair Cafés.

The concept of Repair Cafés began in 2009 in Amsterdam as an open-door event where people could join in and repair broken items while sharing skills, knowledge, space and tools (The New York Times 2012). They started participating in the Circular Economy and

promoting education on e-waste management and urban mining. The CREW team decided that something similar to Amsterdam Repair Cafés would be great to engage with the community. They started planning these events so that they happened regularly - their goal would be to have two Repair Cafés per month at various locations in the Greater Porto region.

With the CREW Centres constantly operating and the Repair Cafés happening more frequently, the partnership with the community would finally start to gain traction. Aligned with Lipor's marketing channels advertising, marketing communication on the event itself was expected to be a success lever for the project goals. Due to a company policy, projects were not allowed to have their communication and social media channels, so Lipor's marketing channels were all that could be used. In December of 2019, Tânia and Hélder organised the first Repair Café at Gondomar's High School. Due to the great feedback, they decided to repeat it regularly but differently. Instead of sporadically, they would create more timely consistent activities (weekly or bi-weekly) in already established venues such as universities, shopping centres and local parishes. The Repair Cafés were the only CREW events where end-users could bring their devices and take the repaired device home. The focus of Repair Cafés is not a donation but rather awareness and knowledge about EEE in the general public.

Another campaign they started in 2019 as a collaboration between the project management and Lipor's IT department was a software tool to document every repairing process. The idea was to create a way to keep track of the equipment currently in the repairing process and keep a log of every device repaired by CREW. Costing 15.000€, the project management software was planned to be implemented in 2020 to track all actions inside CREW, allowing for easier control and performance management.

As a final commitment in 2019, CREW joined the Right to Repair movement – a European activist initiative focused on removing the barriers to repair EEE. They seek EU legislation that

promotes fair access to spare parts independent from manufacturers and set minimum design requirements to ensure an easier disassembly of EEE (CREW 2019).

With three CREW centres opened and three new more planned for 2020, Tânia and Hélder closed 2019 confident that the board of Lipor would be joyous with their ideas and vision.

Early Lessons and Project Limitations – CREW in 2020

In January 2020, as at the beginning of every year, each project team at Lipor had to report their status quo and goals for the next year to the management of Lipor. The division and department management assign the budget per project depending on these meetings. Lipor, as a public company, receives funding from the Portuguese Government and has to allocate it to its projects based on the assigned purpose and own goals in the strategic plan.

For CREW, a project that substantially consisted of reparations of electrical goods, this meant that there was a limited scope that did not allow for very labour intense, complex and cost-intensive reparations. One influential factor in Lipor's budget allocation is the waste that each project handles. Since e-waste represented 1.000t per year of the overall 500.000t that Lipor managed, a limited budget was allocated to CREW. This put Tânia and Hélder in a tricky situation, where they faced limitations in the growth potential and the need to work with limited resources. The associated threat of under allocating money to the project became even more of an issue when considering the estimated growth in the amount of e-waste over the following years and the infrastructure needed to cope with it properly.

Unfortunately, the management board did not assign as many resources to the project as expected. The meeting resulted in a 10.000€ budget for CREW in 2020. With 3.000€ of setup costs per CREW Centre, 15.000€ of software costs and 7.000€ for each new container at eco-centres, CREW started running into a cash shortage. The yearly 10.000€ that ERP contributed to the project were already allocated to communication purposes. New ways were needed to deal with the limited budget.

Thinking back to the tremendous success of the Repair Cafés, the idea for "CREW Clubs" was born. Clubs could handle reparations on smaller appliances, TVs, IT equipment and monitors, which represented most of the repaired devices at CREW. (See **Exhibit 9** to understand which types of devices CREW repairs.) The significant advantage of Clubs over Centres was the cost. Setting up a CREW Club meant an investment of only 300€ for tools compared to 3.000€ for a CREW Centre. Depending on the demand for CREW services, CREW Clubs could be a cost-efficient way to scale the project and to increase the awareness of CREW. Lower space, less heavy machinery and tool requirements allowed CREW Clubs to be located in fragmented areas such as shopping centres or high schools.

Despite the idea to scale the project by creating more CREW Clubs, money was the primary limiter of CREW. Another project at Lipor faced a similar problem in the past. In 2016, new EU regulations forced countries to have better waste separation measures (European Comission 2016). Lipor saw this as an opportunity to use organic waste to create a fertiliser and sell it. This fertiliser was called Nutrimais®. Lipor's activity consists of waste management –to sell fertiliser, they had to apply for another Portuguese Economic Activity Classification (CAE). This classification would allow Lipor to pursue a business branch outside their main activity area. One thing to have in mind is that Nutrimais® could generate positive cash flows, but Lipor, as a public company, could not make profits. Similarly, CREW could apply for a new CAE to offer paid repair services to increase the budget and spread awareness. However, applying for another CAE involved a lot of effort and could potentially reduce the project's social impact. The consideration was dismissed and overshadowed by another limitation of 2020.

Besides the limited budget, CREW, like the rest of the world, faced COVID-19. CREW came to a hiatus with COVID-19, only to be resumed after the first lockdown. Despite the stop of CREW Centres, CREW Clubs and Repair Cafés, the team continued to work and used the

online platforms of Lipor to promote online repairing workshops and webinars. They kept involving the community, promoting social impact events and cooperating with Lipor Academy – the online learning platform of Lipor to achieve this.

CREW regained traction after the first COVID-19 wave when physical events became possible again. However, the growth limiting factor budget came to a head due to the pandemic. Also, finding qualified voluntary staff to run operations and opening new CREW Centres proved more challenging than expected. Still, by enduring efforts, Tânia and Hélder managed to open two of the three initially planned Centres - the Social Centre of Ermesinde and the CENFIM Centre site - the technical school for metallurgy in Ermesinde. CENFIM proved to be a success - with one extra collaborative initiative, CREW and CENFIM developed together a 200h on-site workshop to form repairers at the CENFIM facility. The new repairing course was intended to be taught in 2021 and would be an opportunity to escalate the awareness of CREW and the importance of WEEE management. Moreover, Tânia and Hélder hoped to recruit more volunteers by taking that step. The team also established partnerships with two more social mediators – "Matosinhos Habit" and "O meu Lugar no Mundo".

Overall, CREW donated 328 units of EEE to people in need until the end of 2020. This corresponds to 2.77t of equipment. At the end of 2020, CREW had five centres fully operating, 13 volunteer technicians had been trained, and a new paid job position was created but had to be terminated due to COVID-19 related budget constraints. 14 repair cafés were organised, and more than 150 volunteers were engaged. The Repair Cafés became so successful that they won an award promoted by iFixit – the most significant international repair platform (Lipor 2020). Adapting to the new circumstances due to COVID-19, webinars were also introduced to Lipor's training platform with a total of seven hours of training in digital format. 2.500 people were reached at the social impact events, and news advertising with an estimated marketing value of 10.696€ were published among various media channels.

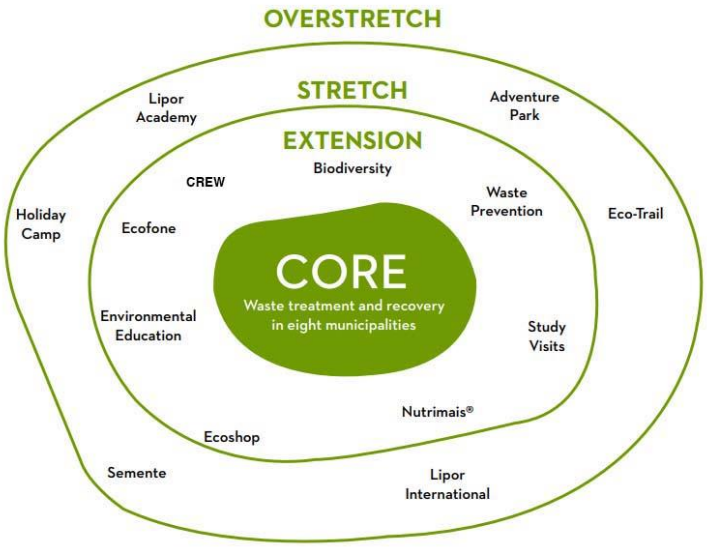
Assessing the software at the end of 2020, it became apparent that the lack of clear documentation deadlines resulted in insufficient data. The information was partially missing and unstructured. The objective for 2021 was to inform and educate the volunteers and repairers about the importance of proper documentation.

Next Steps for CREW

With five CREW Centres, ten drop-off facilities and three repair clubs, the network of CREW and its availability experienced substantial improvements. Nevertheless, 2020 closed, and the annual board meeting with project managers in January 2021 was approaching. There are still unanswered questions regarding the growth: How can CREW grow sustainably and generate more social return? How much more scaling makes sense? Does opening up more CREW centres make sense? In which area does the project face the most considerable improvement potential? How can CREW's impact be measured?

Recently a different Lipor department introduced social return on investment (SROI) as an impact measure. Tânia and Hélder are unsure about its purpose, how to use it and wonder if other models are better. Confused by so many new ideas, existing problems to tackle and constraints to manage, they looked back at the project start. Preparing the presentation for the upcoming meeting, they again asked themselves the same two questions: *How can we make this project successful? And what does success mean in this context?*

Exhibit 1 Lipor's project overview and letter from the CEO



"In 2006 we started our Waste Production Prevention strategy, to reduce the amount of waste we produce at the source. We started marketing our 100% natural organic compost, Nutrimais®®, in 2006. We implemented a Circular Business Model, associated with an integrated waste management system. We got engaged in strategies to promote Industrial Symbiosis. We developed voluntary commitments to fight climate change and promote biodiversity. We rethought the business model for a transition from waste manager to product producer."

Source: (Lipor 2021)

Exhibit 2 Lipor's sustainability agenda from Lipor's 2020 integrated report

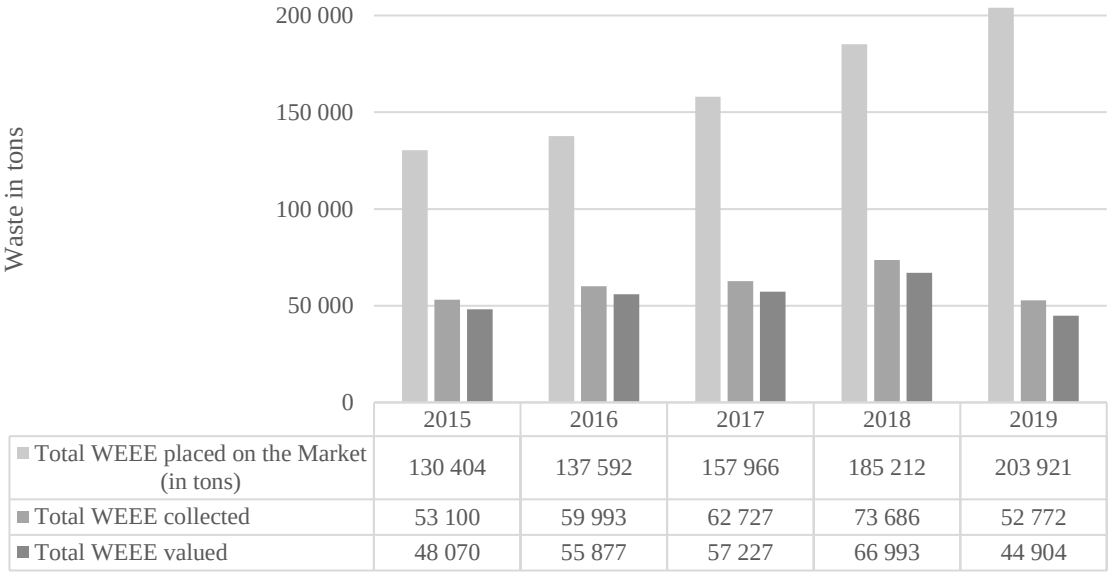
Source: (Lipor 2021)

Exhibit 3 Eco-centres in the Greater Porto region managed by Lipor (left: Eco-Centre; right: Mobile eco-centre;)

Source: (Lipor 2021)

Exhibit 4 Evolution of WEEE in Portugal

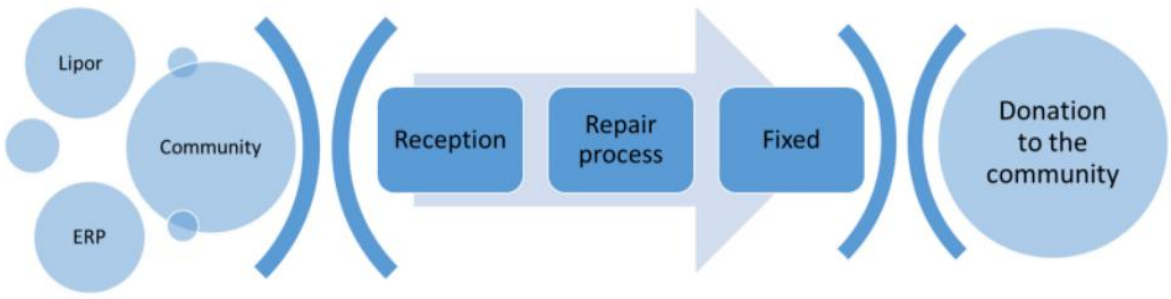
The Portuguese Government has the national goal of collecting 85% of the generated WEEE in Portugal (per EU community legislation), considering all WEEE generated from private and non-private entities.



	2015	2016	2017	2018	2019
Total WEEE placed on the Market (in tons)	130 404	137 592	157 966	185 212	203 921
Total WEEE collected	53 100	59 993	62 727	73 686	52 772
Total WEEE valued	48 070	55 877	57 227	66 993	44 904

Source: (Portuguese Agency for the Environment 2019); and internal data

Exhibit 5 Flowchart of the CREW process



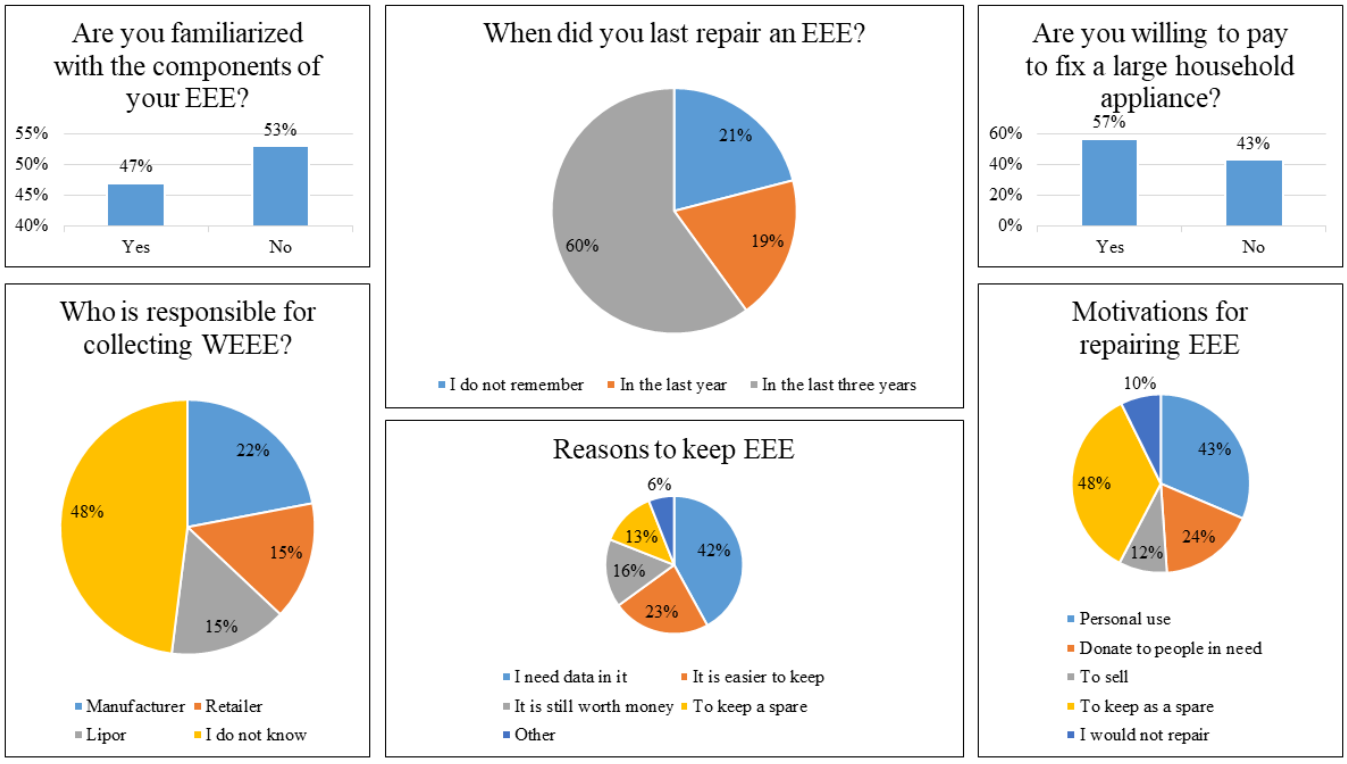
Source: Internal documentation that underlies an NDA

Exhibit 6 CREW Centres

Centre site	Opening year	Info
CESA: Educational Centre of Santo António	**2019**	Located in the city of Porto, CESA was the first CREW centre to open doors. It is a social rehabilitation centre for young males aged 12-21 operated by the Portuguese General Director for Reinsertion and Prisons Service.
UFGVJ: Union of parishes of Gondomar, Valbom e Jovim	**2019**	Located in Gondomar, UFGVJ was the second CREW centre to open. It is a parish council and serves the townships of Gondomar, Valbom and Jovim.
Lipor: External Platform Unit	**2019**	Located at Lipor's facilities, the External Platform Unit was constructed as part of the ESTRAEE project and became the third CREW centre to be operated.
CSE: Social Centre of Ermesinde	**2020**	Located in the township of Valongo, CSE is the no-profit social solidarity institution of the region. It was the first CREW centre to open in 2020.
CENFIM: Technical School of Ermesinde	**2020**	Located in Ermesinde, the Technical School of CENFIM promotes learning in the metalworking industry. It offers a variety of courses to help youngsters, adults, and organisations gain competence in the subject. It is the fifth, and last CREW centre opened.

Source: (CREW 2019); and internal data

Exhibit 7 Survey findings:



Source: Internal documentation that underlies an NDA

Exhibit 8 Lipor managed eco-centres:

Marked with (*) are the eco-centres which have the conditions to receive WEEE properly

Township	**Eco-centre**
Espinho	Eco-centre da Anta
	Eco-centre de Silvalde (*)
Gondomar	Eco-centre da Cal (*)
Lipor	Eco-centre da Formiga (*)
Maia	Eco-centre de Águas Santas
	Eco-centre de Avioso (Stª Maria)
	Eco-centre de Folgosa
	Eco-centre de Moreira (*)
	Eco-centre de Nogueira(*)
Matosinhos	Eco-centre da Maínça
	Eco-centre de Custóias (*)
	Eco-centre de Perafita
	Eco-centre de Sendim (*)
Porto	Eco-centre da Prelada (*)
	Eco-centre das Antas
Povoa de Varzim	Eco-centre de Laúndos(*)
Valongo	Eco-centre de Ermesinde
	Eco-centre de Valongo (*)
Vila do Conde:	Eco-centre da Varziela

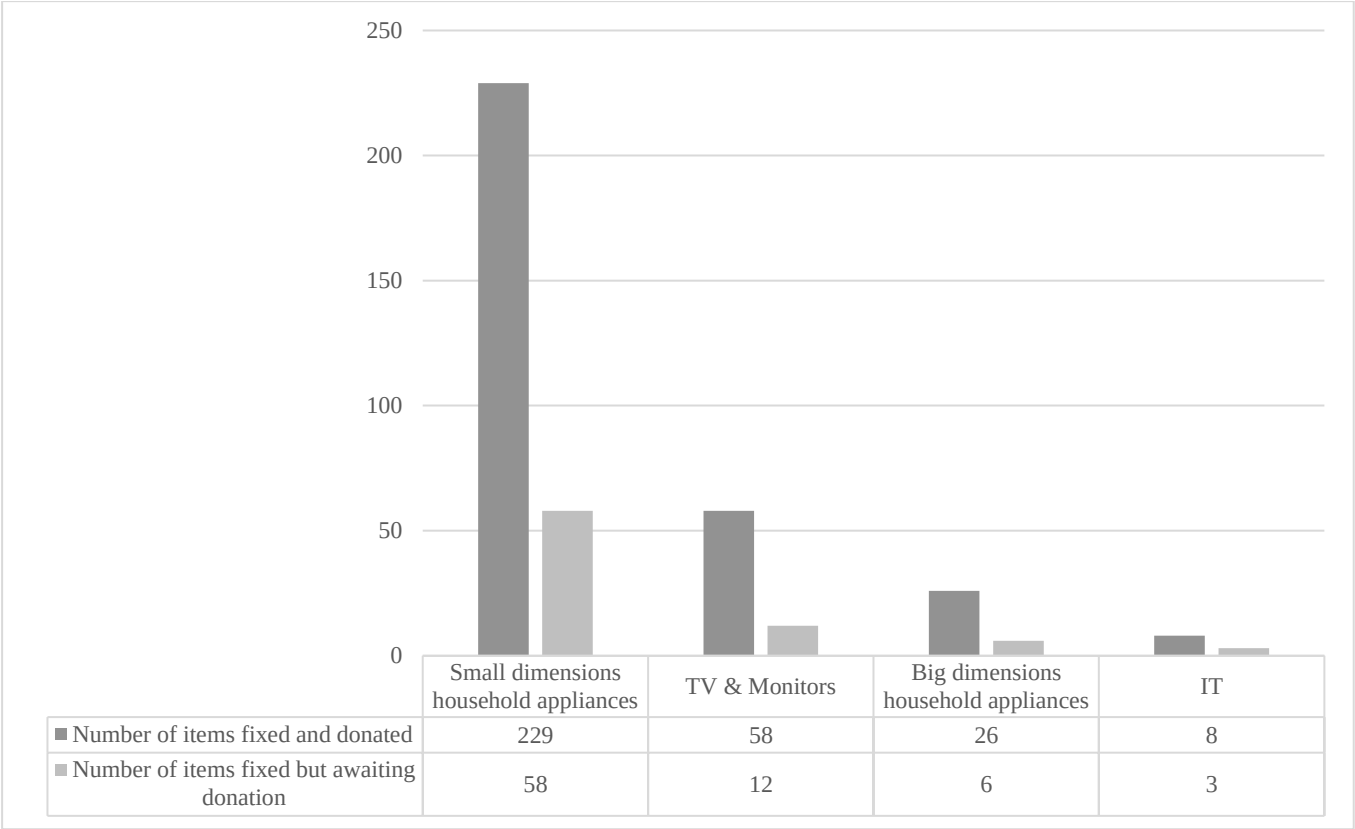
Source: (Lipor 2020); and internal data

Exhibit 9 CREW Management Software data

During 2020, CREW managed to fix and donate 328 EEE, which correspond to 2.77 tons of otherwise e-waste. They have 79 repaired EEE awaiting donation, corresponding to 0.7 tons of otherwise e-waste. They still have at their facilities 792 EEE to repair, which correspond to 7.1 tons of otherwise e-waste – 705 items are small dimension appliances, IT and TVs which can be repaired at CREW clubs.

The families of equipment are split into four categories:

- Big dimensions household appliances refer to washing machines, dryer machines, stove plates, ovens, etc.
- Small dimensions household appliances refer to coffee machines, toasters, irons, hairdryers, lamps, vacuum cleaners, etc.
- IT refers to desktops and laptops
- TV & Monitors refers to LCD's, TFT Monitors, TDT



	Small dimensions household appliances	TV & Monitors	Big dimensions household appliances	IT
Number of items fixed and donated	229	58	26	8
Number of items fixed but awaiting donation	58	12	6	3

Source: Internal documentation that underlies an NDA

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A Work Project presented as part of the requirements for the Awards of Masters' degrees in Management and Business Analytics from the Nova School of Business and Economics.

Lipor's CREW project – Application of the SROI framework to analyse the status quo of the project and to derive potential improvements

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List of abbreviations

Abbreviation	Definition
Mt	Metric tons
EEE	Electrical and Electronic Equipment
WEEE	Waste of Electrical and Electronic Equipment
PACE	Platform for Accelerating the Circular Economy
EOL	End of Life
SROI	Social Return on Investment
WBS	Work Breakdown Structure
SR	Social Return
YoY	Year over Year
CESA	Educational Centre of Santo António
CSE	Ermesinde Social Centre
PEPAL	Internship Program for Professionals in Local Administration
KPI	Key Performance Indicator
SEO, SEM	Search Engine Optimisation, Search Engine Marketing
FEUP	Faculty of Engineering of the University of Porto
ISEP	Portuguese Engineering Superior Institute

Lipor's CREW project – Application of the SROI framework to analyse the status quo of the project and to derive potential improvements

1. Introduction

1.1 The Global E-Waste Market:

The Global E-Waste Monitoring Report 2020 showcases that the amount of e-waste globally was 53.6 Million metric tons (Mt) in 2019, with Asia being the most significant contributor with 24.9 Mt. In the face of an estimated increase in annually produced e-waste to 74.7 Mt by 2030 and the potential market value for contained materials such as precious metals of approximately 57 billion $, the industry attractiveness becomes apparent. The report also outlined that a significant danger associated with the Waste from Electrical and Electronic Equipment (WEEE) is the contained and potentially harmful and toxic materials such as mercury. Shorter Electrical and Electronic Equipment (EEE) lifecycles, more WEEE, a small number of documented WEEE flows (20% globally), and the fact that the amount of recycled EEE grows slower than the amount of waste from such products highlight the importance to treat this problem (Forti et al. 2020).

1.2 European and Portuguese E-Waste Market:

According to the Monitoring report, the EU stands out by a 42.5% e-waste documentation rate of WEEE material flow, and the monetary value captured in e-waste was 12.9 billion $ in 2019 (Forti et al. 2020). Of the 12.0 Mt of e-waste in Europe in 2019, Portugal was responsible for 203.900 tons (t). The amount of e-waste collected by managing entities was 52.800 t, of which 44.900 t were recycled—leading to a recycling rate for valued WEEE of 84.5%. This represents a slight decrease in the numbers of the previous year due to a lower collected amount of e-waste (Portuguese Agency for the Environment 2019). These figures highlight the leading role of Europe when it comes to turning visions for e-waste management, such as those outlined in the 2019 report of the World Economic Forum in collaboration with the Platform for

Accelerating the Circular Economy (PACE), into reality. The report outlines success factors for circular e-waste treatment and a holistic model to implement it.

1.3 Trends in the e-waste market and the connection to CREW:

The cornerstones for implementing the visionary roadmap of the PACE report are the knowledge and awareness about the issue's importance and the individual role of end-users, a collaboration network between various public and private institutions beyond borders and in that regard, collegial action taking (World Economic Forum 2019).

The proposed target system goes through manufacturing, use, life extension, end of life (EOL) and (re-)sourcing. Designing products to be more durable without using harmful materials is the goal of the manufacturing stage. Also, manufacturers ought to introduce scrap as a resource to other processes. Life extension and initiatives to repair and refurb are the keywords for the use stage, and incentives such as buy-back systems are the means to achieve a high collection rate at the EOL stage. This implicitly also helps for the last step, sourcing, where extensive high tech recycling and recapturing methods are applied for urban mining. Obtained materials are transported to manufacturers through a reverse logistics system and then reintroduced back into the value chain (World Economic Forum 2019).

CREW, the partnership program of Lipor and ERP, has a circular approach to e-waste and hence already incorporates mentioned success factors such as partnerships, community involvement and education. This evaluation report combines findings from our academic research and insights obtained from our survey and expert interviews. It serves as a decision-making aid to the project management of CREW and, more generally, policymakers in NGOs or other institutions related to social impact projects (The Impact Investor 2021).

2. Methodology

Due to the variety of social projects ongoing at Lipor, the management decided to use the social return on investment (SROI) to quantify the impact of their endeavours. This evaluation report uses an analysis along this framework to identify areas of improvement and gives solidified recommendations and implementation suggestions based on the analysis combined with interviews and a survey.

Advocating Lipor's decision, the SROI framework applied in this report can help CREW strengthen its operations, weighing up the costs of social, economic, and environmental impact (Maier et al. 2014). As documented in their report, SROI seeks to identify, measure and account for social impact while also being a framework for reporting on social value creation. Looking at the research, the usage of the SROI certainly makes sense since it is a holistic model taking into account the investment itself as well as positive and negative externalities (Maier et al. 2014).

The prominent critic is that the SROI is a backwards-looking impact measure and hence is hard to use for forecasting and planning purposes (The Impact Investor 2021). Other main shortcomings of the model are the high cost and effort of a complete SROI analysis and the danger of an isolated figure evaluation (Maier et al. 2014). Accompanying a comparison of project relevance based on the SROI, disregarding the underlying thread can result in poor allocation decisions of organisations. A more ethical stream of research also argues in a similar direction, saying that a problem of SROI is that it seeks to quantify social impact monetarily (Maier et al. 2014).

Despite this, the application of the SROI is widely endorsed since it has a high potential to be a vital communication tool internally for investors and the general public. Also, the SROI can help the organisation improve its resource allocation decisions because the structured approach clarifies goals and assumptions (Maier et al. 2014).

Besides these scientific considerations, Lipor already established the SROI model as a standard tool for project assessment. Analysing CREW along its value chain, Lipor identified six drivers of the project's social return. The formula below shows how the SROI is calculated.

$$SROI = \frac{\sum(Social) Value\ Generated - Total\ Costs\ of\ (social)\ initiatives}{Total\ Costs\ of\ (social)\ initiatives}$$

With preceding research, every driver of the framework provided by Lipor was analysed individually. Levers to increase the social return per driver were discussed with the project management and experts during workshops/interviews. The outcome was a 2x2 matrix of targeted recommendations mapped among the dimensions "expected impact" (low, high) and "effort to implement" (low, high), which considered time and mandatory resources to realise the change. (The results are displayed in **Exhibit 3**.) Subsequently, the most attractive recommendations were grouped into three main pillars to increase the project's performance: Communication strategy, Human Resources, Strategic Partnerships & Community involvement. In close collaboration with the project management and experts, we developed a detailed work breakdown structure (WBS), including milestones and appropriate key performance indicators (KPIs), to ensure a successful realisation in all three areas. Completing the image, we also provide a projection for the increase in SROI and risk analysis, including a mitigation plan. (This can be found in **Exhibit 6**.)

Information from expert interviews used in this report resulted from semi-structured interviews with leading stakeholders: the social mediator Matosinhos Habit managers (Bárbara Sousa and Teresa Saturnino), the department manager of CREW at Lipor (Alexandre Ventura), with ERP Portugal environmental manager (Joana Araújo) and with Nutrimais project's responsible at Lipor (Nuno Filipe). (The set of questions can be seen in **Exhibit 1**.)

In an attempt to get a more holistic picture and identify the most relevant challenges and value levers, we complemented the quantitative SROI analysis and the targeted expert interviews by conducting an online survey on the Qualtrics Management software in English

and Portuguese language. It contained questions based on the Likert scale, single/multiple-choice and text-entry questions concerning the general knowledge and awareness regarding e-waste and more specific questions regarding areas of the CREW project. (Insights taken from our questionnaire can be seen in **Exhibit 2** in the appendix.) The survey, conducted between November and December 2021, received 62 answers for ageing 21-65 with a median age of 38. 52.4% of the respondents were female, 42.9% were male, and 4.8% were non-binary/third gender. Since 35 of the respondents were working at Lipor or a partnering institution, the results are biased and do not represent the population of Lipors' managed municipalities. The 28 employees of Lipor who answered the survey represent 13.8% of the 203 Lipor employees (Lipor 2021). Besides data visualisations and critical summary statistics, no data processing or further analysis were performed.

3. Results of the SROI driver analysis

In 2019 CREW had an SROI of 1.15 compared to 0.95 in the pandemic year 2020. The value of 0.95 means that for every 1€ invested in CREW, 0.95€ of social value were created. Hereafter, the six drivers for CREW's SROI identified by Lipor are analysed individually. Due to a non-disclosure agreement, the figures cannot be made more concrete.

Lipor uses the SROI as a central performance indicator of projects, and the project manager has to justify the project's progress based on drivers of the SROI. The drivers span holistically over each impact area of CREW. This involves the community and number of events, the fixed equipment and the social value of donating it, and education internally and towards the general public.

3.1 Driver 1: Hours of certified formation.

This driver indicates the estimated value of the training hours provided to volunteers to become autonomous workforce for CREW. The computation for the social return (SR) of this driver can be seen below:

$$SR_{Hours\ of\ certified\ formation} = \#\ hours\ provided * €\ value\ per\ hour$$

The number of hours is documented and multiplied by the value generated by one hour of formation sessions. The SR of this driver increased by 35% year over year 2019-2020 (subsequent YoY 19-20). This results in a contribution of 12% to the overall SROI in 2019 and 15% contribution in 2020. After investigating options to improve this driver, the most promising opportunities are to increase the number of weekly training hours provided by three means. First, the current average of three formation hours per week can be improved. Secondly, more technicians can be hired to replicate the training at, for example, the currently dormant facilities at CENFIM. Third and lastly, the digital infrastructure of the Lipor Academy can be leveraged to offer specified CREW online courses. The latter argument can be of particular importance when considering recently experienced lockdowns and the disability of physical events.

Limitations of this driver represent CREW's ongoing problems to find people interested in volunteering as technicians for CREW with enough technical knowledge and experience. Moreover, demanding more hours from current technicians can further address this problem. While our survey showed that the CREW volunteers are currently satisfied with the working hours, the job satisfaction might become unbalanced with increasing workload.

Increasing the number of hours of certified formation to five hours instead of the current three by allocating more hours to current technicians with a better work plan could have led to an SROI of 1.06 in 2020 compared to the current 0.95.

3.2 Driver 2: Lipor's brand strength

This driver indicates the estimated value added by increased brand awareness in the general public. It is calculated by an external agent, Cision Portugal, a local marketing agency, as follows:

$$SR_{Lipor's\ brand\ strength} = \#\ news\ impressions *\ €\ value\ per\ impression$$

The number of news impressions where CREW is mentioned in newspapers, the radio, television and online magazines is documented and multiplied with a certain value per media channel. The resulting figure represents the financial value for the favourable editorial space based on the list prices for commercial publicity marketing. This activity is outsourced due to a lack of information to accurately calculate every impression's monetary value. A further breakdown is thus not available to us. The social return provided by this driver accounts for 26% of the SROI generated by CREW in 2020. The social return of this driver increased by 62% YoY 19-20.

Like the previous driver, the value per impression cannot be changed quickly due to a lack of data. The primary lever to increase the social return of this driver is to increase the number of impressions to reach a higher brand awareness. A measure to achieve this could be to use marketing channels of partnering institutions. Other promising options to accomplish this can be increasing the frequency/penetration rate of currently used media channels or exploring new channels such as social media channels. An annual marketing strategy followed through was identified as the most favourable recommendation in that regard. So far, changes in staff and responsibilities and the COVID-19 pandemic pushed a thoughtful development and pursuit of a marketing plan for CREW in the background.

Having a more substantial appearance on currently used channels, however, would raise the question of whether the value per impression/channel decreases as a result. Yet another limitation can be Lipor’s company policy prohibiting projects from having their own social media channels. The potential of independent channels for CREW to promote projects and form a community was evaluated to be of minor importance by Lipor´s management in expert interviews. The discussion made it apparent that no information such as customer target groups is currently extracted from social media at Lipor. The advantages of such endeavours are explained in the operational considerations part of this report. Lastly, one must mention that the

impact of educational efforts on the public is not considered in the SROI calculation. Later on, options where end-users can walk in and find help in repairing their EEE are discussed. This represents another great way to increase CREW's awareness because it is the first option for end-users to experience the advantage themselves and not dispose of WEEE that is then repaired and donated.

Conducting a scenario analysis to compute the potential SROI of CREW given we implement the changes suggested in this section led to an SROI estimate of 1.13 compared to the current 0.95.

3.3 Driver 3: Job Positions Created

The social value, computed with the formula below, is the Portuguese Government's savings.

$$SR_{Jobs\ created} = \#\ positions\ created * \ €\ value\ per\ position$$

The number of job positions created in the CREW project per year is multiplied by the annual salary, 65% of the Portuguese minimum wage. The social return per job position is the unemployment support that the Portuguese Government does not have to pay thanks to the created position. This driver contributed 0% to the social return in 2020 but 19% in 2019. The pandemic and its consequent reduced operations, forced Lipor to cancel the job position created in 2019, and hindered the creation of new positions.

The most attractive targeted recommendation to improve the return of this driver is to increase the number of jobs created by hiring long-term unemployed people from the Social Centre of Ermesinde (CSE). Hiring one employee to lead the CREW centre at the Educational Centre of Santo António (CESA) can, as an example, have a huge multiplier effect on the overall SROI due to an increased number of volunteers participating, and also by potentiating future job positions by youngsters' of CESA. This recommendation is beneficial for technical positions. From the expert interview with the department manager of CREW at Lipor (Alexandre Ventura), we understood that hiring technical staff and administrative support is

needed. Administrative staff can best be recruited from a pool of interns for Professionals in Local Administration (PEPAL). PEPAL aims to promote practical experiences and employability for level 6 qualified young people less than 35 years old. Lipor would be directly responsible for the recruitment and selection process of candidates with the financial support of the Local Government. The main limitation is that Lipor already has difficulties recruiting staff, especially volunteers. Offering salaries combined with the previously discussed exploitation and definition of target groups using social media can help reduce the influence of this limitation.

Hiring one employee can lead to a potential SROI of 1.21.

3.4 Driver 4: Youngsters' new opportunities for work

This driver indicates the estimated value of the training hours provided to young inmates of the rehabilitation centre at CESA to train them as autonomous workforce for CREW.

$$SR_{ys' new\ opportunities\ of\ work} = \#\ ys' * \ value\ added\ per\ ys'$$

Although part of the SROI method since 2019, this driver has not generated any social return so far because the CREW centre at CESA is suspended as there is not a technician who can lead the project at this branch. Since it was not relevant, the computation is undefined. The value-added per youngster shall be computed as a job qualification factor and the saved unemployment support. The resurrection of the CREW centre at CESA would not only help CREW fix more devices and make youngsters more attractive to the general job market, but it would also make them more attractive to CREW. Fully trained to work as repairers, they can either stay volunteers or, depending on personal development and professional inclination, become a technician and centre leaders. The latter option would also prevent potential unemployment after leaving CESA. Consequently, CREW activities becoming a part of the CESA Curriculum is a tremendous lever to increase the social return of CREW.

Currently, the entire driver is limited. On top of the general difficulties in finding technicians comes aggravatingly that the centre leader at CESA had to work with young inmates. Past experience showed that this is a heavy responsibility that cannot be neglected. A well-received workaround from the workshop with the project managers was to use CREW's only technician as a leader of the CREW centre. By that, the burden of working with youngsters is taken out of the recruiting process.

Assuming that a technician was found and one youngster completed the program, the 2020 SROI would have been 1.21 instead of 0.95.

3.5 Driver 5: Repairing hours

The return of repair hours performed describes the value added by CREW's main operation, fixing broken EEE in CREW Centres, CREW Clubs and Repair Cafes.

$$SR_{Repair\ hours} = \#\ repairing\ hours * value\ per\ hour$$

The number of hours used for repairing is tracked, and the value per hour represents, like in driver 1, the value added by one hour of repairing session. The SR in 2020 was 31% of the overall SROI, with a YoY 19-20 development of this driver's SR was –33%. COVID-19 and restrictions mainly cause this decrease in operating.

The primary vehicle to increase the social return is offering more repair hours. The authoritative and limiting factor is again the number of available workers. A new option that came up during a workshop was to hire staff at technical universities and to form partnerships with the Faculty of Engineering of the University of Porto (FEUP) and the Portuguese Engineering Superior Institute (ISEP). Given the technical orientation of both institutions, they are promising in finding sufficiently skilled technicians.

Quantifying these ideas, we assumed three more people participated in repairing activities for 2 hours per week. In that case, the potential SROI would have been 1.31.

3.6 Driver 6: Donated EEEs

The repaired device value is not considered in driver five because it represents an individual driver.

$$SR_{Donated\ EEE} = \sum market\ value\ of\ repaird\ EEE$$

The individual market value per device is estimated as a product from the number of units fixed and 45% of the price per device, representing the value of used EEE in the market. This data is benchmarked by retrieving prices from local retailers. The resulting market values are then summed and describe the social return. The contribution of this driver was 28% to the overall SROI in 2020, with social return YoY growth 19-20 of 129%.

To further increase the return of this driver, the number of repaired devices can be improved, or the value the device adds to the recipients can be considered. The proposed and well-received suggestion regarding the latter option was to develop a survey that every recipient of CREW devices has to be answered. This survey queries several parameters such as the opportunity cost, time and effort saved or the improved quality of life for individuals and others. Based on the responses, one of three values is assigned. Alternatively, the number of fixed devices can be increased by offering more repair hours, and a new option could be to expand the current network of physical locations of CREW. Leveraging partnerships to open more CREW Clubs in prominent areas such as shopping centres and high schools increases awareness and leads to more people donating broken devices.

Limitations are also found in this driver since there are difficulties in collecting WEEE with high potential to be repaired – partnerships between manufacturers, retailers, and CREW are scarce and difficult to establish since they imply potentially lost sales. Offering more repair hours comes with a respective cost which means more increased investment by the board of Lipor. It is worth mentioning that another possibility to enhance this driver would be to improve the receiving conditions of WEEE at eco-centres.

The potential SROI could have been increased to 1.72 if one more ton of WEEE was repaired by CREW. As of September of 2021, the weight of WEEE restored by CREW had surpassed the weight fixed in 2020 by 11%. Lipor experts consider that this goal is realistic and can significantly impact the return generated by the project.

On the one hand, this analysis exemplified the strength of the SROI. We mean that the investigation brought a more structured approach to project management and fostered easier scaling. Lastly, it is a vital communication tool, that in the case of CREW, Alexandre can use to negotiate for a higher budget for CREW. On the other hand, the analysis also showed the pitfalls of an isolated assessment (Maier et al. 2014).

A summarising chart on the impact of our recommendations can be seen in **Exhibit 4**. If all changes were applied in parallel, the SROI 2020 would have been 2.63 instead of 0.95. While consolidating all targeted ideas in an effort-to-impact map is in **Exhibit 3** of the appendix, we identified three areas of improvement potentials to achieve the overall objectives for CREW.

4. Discussion of Results – Operational Considerations for 2022

The goals are to increase the general knowledge about WEEE, awareness of CREW, participation in CREW events, recruiting and sustainable growth for the project. The following section explains the actions displayed in **Exhibit 5 and 6** of the appendix in greater detail.

4.1 Communication strategy:

The demonstrated impact potential of a structured approach and the lack of planning with SMART® goals (Specific, Measurable, Achievable, Relevant and Time-bound) underline the importance of a marketing plan for CREW (O'Neill 2000). The first steps to build it consist of assessing the project's current situation and then defining the mission, marketing and financial objectives, based on a budget of Lipor and EPR and market needs, and conducting an audit and

marketing research (Anwar and Capko 2001). An essential work package in auditing is segmenting the customers and developing a targeting strategy (Kotler and Keller 2012, 17-20). This approach can be beneficial to recruiting volunteers. According to our survey, volunteers are motivated by the social impact of the work and by repairing learning opportunities resulting from the projects growth and the number of fixed devices. CREW should leverage these insights when designing its marketing content for this target segment. Equally important are implementation schedules and evaluation processes (Anastasia 2019). Here, a survey based on ours should be assessed by the project management of CREW to monitor change in the public's perception regarding the project and awareness of WEEE consumer practices.

CREW should develop an online marketing strategy and search engine optimisation (SEO) to achieve its goal. A solid online value proposition can also help build up visibility on the internet. Phases and corresponding milestones for an SEO project are the preliminary analysis, including website, keyword and competitor analysis, the website design and content creation phase, and the off-site optimisation, where the website goes live and surrounding optimisations take place (Anastasia 2019). The first steps are to understand the recipient and the competitive landscape (Powell 2021).

Specifically, online marketing platforms such as Facebook or Google Analytics make it easier to understand the consumer. CREW should focus on being high ranked for topics related to e-waste, its repairing and disposal, and Sustainable Development Goals (SDGs).

Similarly, an e-learning area on e-waste should be included on the website to attract more users. This should be a central part of CREW’s marketing plan to increase awareness. Measuring the current website’s performance during the optimisation, the final search engine ranking and the click-through rate, the ratio of clicks on the website to the number of search results where the website is listed, should be the key performance indicators (KPIs) (Landsgesell 2019). More details are contained in **Exhibit 5.** The estimated length for such a

project ranges from four – twelve months, depending on the project's complexity. While the first and last two months approximately represent the first and final phase, is the value creation and optimisation phase arguably the longest (Steimle 2015). Prices vary based on the payment model and the scope and level of support needed externally. Project-based pricing models often cost around 1.000 – 3.000€ per month, while the hourly cost of consultants lies between 100 - 250€ (Brown 2021). We see a solid lever to increase the awareness regarding CREW and the participation of events through a better internet presence. As a result, recruiting might become more manageable since more people see postings.

Furthermore, the website's optimisation should be supplemented by content marketing over an e-mail newsletter, ad campaigns, and social media usage (Powell 2021). Among the same lines is the plan to produce a TV series consisting of 3-5 minute videos presenting CREW, e-waste problems and guides to fix household appliances. To leverage the momentum, it is essential to use social media channels such as Facebook, where CREW has an actively managed group, Instagram, Tik Tok or YouTube to advertise events, share repair guides or collaborate with other creators (DataReportal 2021). The proposed implementation plan can further help Lipor by reproducing the strategy to other projects of Lipor.

4.2 Human Resource Planning:

As of now, there are four part-time employees and two full-time employees working on CREW - both of them hold technical positions. With the project operating at the capacity limit, technician personnel is the most critical area to scale the project further. The previously described digital expertise can be applied here to optimise the recruiting process. Our implementation consideration is to use the current volunteers' demographic information, such as age and occupation, interests, background formation, location of residence etc., to produce a persona (Koponen 2017). Besides customer identification, paid channel advertising and affiliate marketing with bloggers such as Ana Varela (@anavarelaofficial), João Manzarra

(@manzarra), or Catarina Barreiros (@catarinafb) can be an attractive option to improve awareness and engage more people in the project (Quicksproud 2021). They all have followerships of at least 80.000 and are well known for their environmental cautious sustainability promotion. Especially the latter option might be attractive due to low implementation costs (Sramek 2021). Key performance indicators are the number of clicks and the conversion rate. In that regard, the project management should examine the cost per click to see which initiative yielded which impact on the number of clicks. We see great potential for Lipor to work with affiliates to try out how different creators and formats, such as video, social media posts, e-mail, etc., affect the project (Sramek 2021). To find affiliate partners, the last recommendation is to increase the partnerships.

4.3 Strategic partnerships:

As of 2021, there are already ten existing partnerships that have resulted in 16 volunteer technicians and the active promotion of a Circular Economy. Operational considerations regarding strategic partnerships outlined here intend to help CREW find a partner to improve its online performance. As shown in **Exhibit 5**, the steps are choosing the right partnership type, looking for partners, having a contractual agreement, and monitoring the developments (Gryaznova 2021). Important in this context is sticking to deadlines and aligning them with the heightened general engagement regarding online marketing in 2022.

5. **Limitations and concluding remarks**

In this section, we want to outline limitations to our research. One big subject is limitations in the data collection process. Despite various efforts to share the survey, we only reached 62 responses in the given time frame of this thesis. Hence the sample was too small to represent one million inhabitants of the Greater Porto region. For this purpose, we needed at least 385 people at a 95% confidence level with a 5% margin of error, using a z score of 1.96 and a proportion of 0.5 (Qualtrics Survey Analytics 2021). A list of participants interested in the

project who answered our survey was shared with Lipor. Beyond this project, Lipor can receive answers until reaching the threshold. Another limitation, as pointed out in the SROI driver analysis, is that an in-depth analysis of certain drivers was impossible due to a lack of information. For that exact reason, we decided to compute the improvements in SR, leaving the other drivers untouched and not considering synergy effects. Mentioning SROI, it is crucial to point out that our research showed the present tendencies towards false incentives when solely considering SROI as an assessment tool (Maier et al. 2014). Lipor should consider establishing a more holistic impact measurement.

Similarly constraining was the unavailability of essential partnering institutions for expert interviews. Lastly, CREW is a pioneer project in Portugal and Europe. This report did not include a benchmarking section since initiatives like CREW either did not reply or could not enrichen our analysis with lessons learned on impact measurement. Similar to CREW and promising vocal points were www.ewasteconnection.com in Australia and www.electronicrecyclingassociation.ca in Canada. The contacts were shared with the CREW management for further talks.

Concludingly, this report demonstrated a case for the advantages of applying the SROI as an impact measure. Based on the example of CREW, we showed that an in-depth assessment could be used for both a status quo analysis and the identification of improvement potential (Maier et al. 2014). As theoretically outlined by the PACE report, this evaluation showed the possibility to use SROI as a tool to structure efforts and to force clarity on goals and assumptions (World Economic Forum 2019). Thereby, SROI can help to scale the project. Beyond the contained recommendations for the project management, the insights obtained can be used for both the internal and external communication of Lipor. Internally it can be used to argue for a higher project budget. Externally quantification and soundness can be used for marketing purposes and, as imposed in the PACE report, as a signal to the private sector, demanding

reproducible data regarding sustainable action rather than lip services (World Economic Forum 2019). In general, impact measurement helps to reduce greenwashing (PWC 2020). In that regard, the report also provides value to other policymakers as it provides a case use example of a duplicable impact measurement approach.

As a final note and after investigating the CREW project for the duration of this thesis, we firmly believe that it can lead as an example in the industry. However, its current characteristics constrain the progress. It must solve these limitations and outgrow the pilot status to significantly promote a Circular Economy through EEE reparations and be an ambassador for better WEEE management in Portugal and Europe.

Appendix:

Exhibit 1 Expert Interview Questions, a compilation of questions for all stakeholders

Getting Perspective on CREW

- General:
  - What is your role in the CREW project?
  - Would you rate the CREW project as a success? If not, why and how can it be improved?
  - How do you evaluate the importance of the CREW project compared to other projects in your department? Does that change when taking into account the projected growth in e-waste?
  - How is your workload affected by CREW?
  - What are the success factors of the project, in your opinion?
  - What could be done better, and what are the challenges that are coming?
  - Why is it not an option to apply for a CAE? Could that help to scale CREW and solve the issue of HR at least?
  - What is your vision and wish for the CREW project
- IT:
  - What do you think of the project management software? Would you evaluate it as helpful, if so, to which user group?
  - What are the challenges in regards to it?
  - Does Lipor perform data analysis on the information obtained?
  - Does Lipor track the right KPIs in the software? If not, which ones would you see as helpful?
- Communication (and Education) Intern:
  - How do you rate the communication of CREW regarding stakeholder institutions such as social mediator partners (Semente etc.), educational institutes etc.? Were there any complaints/ issues in the past?
  - What are challenges regarding the communication? Maybe specifically with the future scaling in mind?
  - Does CREW have access to a CRM system?
- Communication (and Education) Extern/ Marketing efforts:
  - How do you rate the communication efforts of CREW towards the general public?
  - What are challenges regarding the communication? Maybe specifically with the future scaling in mind?
  - Does CREW have access to a marketing plan for each year?
- HR:
  - Would you recommend the job (technician) to a friend? If not, why?
  - How did you become aware of the position (technician)?
  - Does CREW need more workforce? If so, in what areas?
  - Given CREWs shortage in fixers, what should be changed to have more success?
  - Where do you look for repairers?
  - What are challenges regarding the communication? Maybe specifically with the future scaling in mind?
  - What could be alternative ways to solve this issue?

- Specifically for the Nutrimais project management:
  - What was the process in decision-making regarding the extension of the CAE
  - What was the final argument to outweigh the bureaucratic effort of this endeavour?

- Would you please describe the main areas of operations changes after the change?
- What might be the pitfalls of the decision?
- How is the current decision-making process of Nutrimais? Does the project management have more independence, or is the supervision level the same?
- How many Lipor employees are assigned to Nutrimais?
- What is the general public's perception in regards to the brand? Do they always know that it is a Lipor brand, or do they see it as a regular company?

Exhibit 2 CREW Project Survey Insights

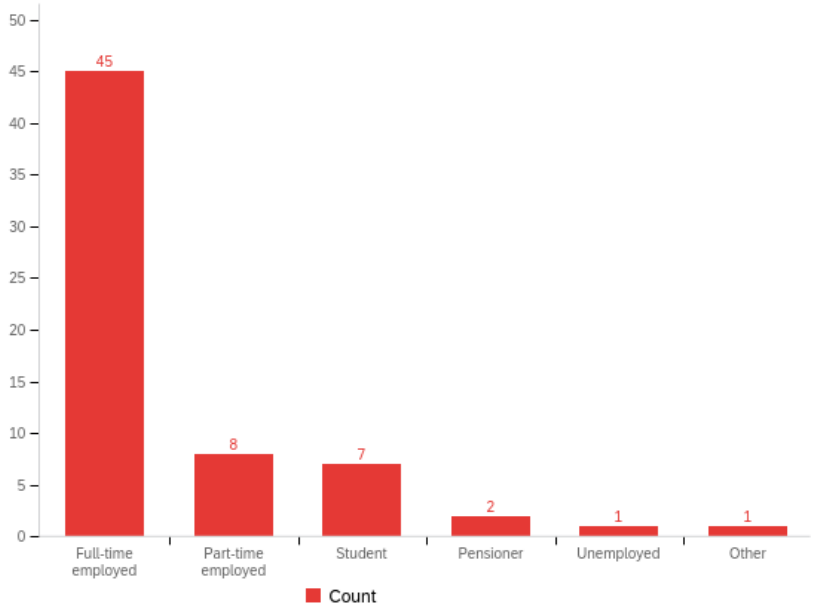
Q1: Gender

#	Answer	%	Count
1	Male	42.86%	27
2	Female	52.38%	33
3	Non-binary / third gender	4.76%	3
4	Prefer not to say	0.00%	0
	Total	100%	63

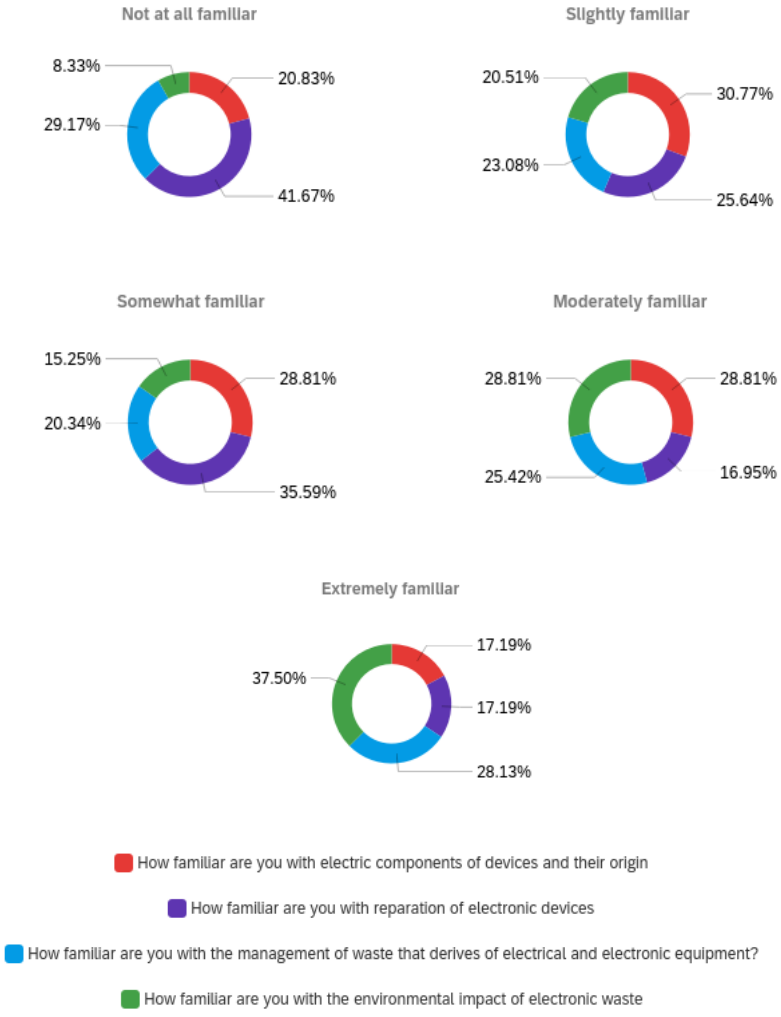
Q2: Age

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Age	21	65	38,37	11,50	124,47	63

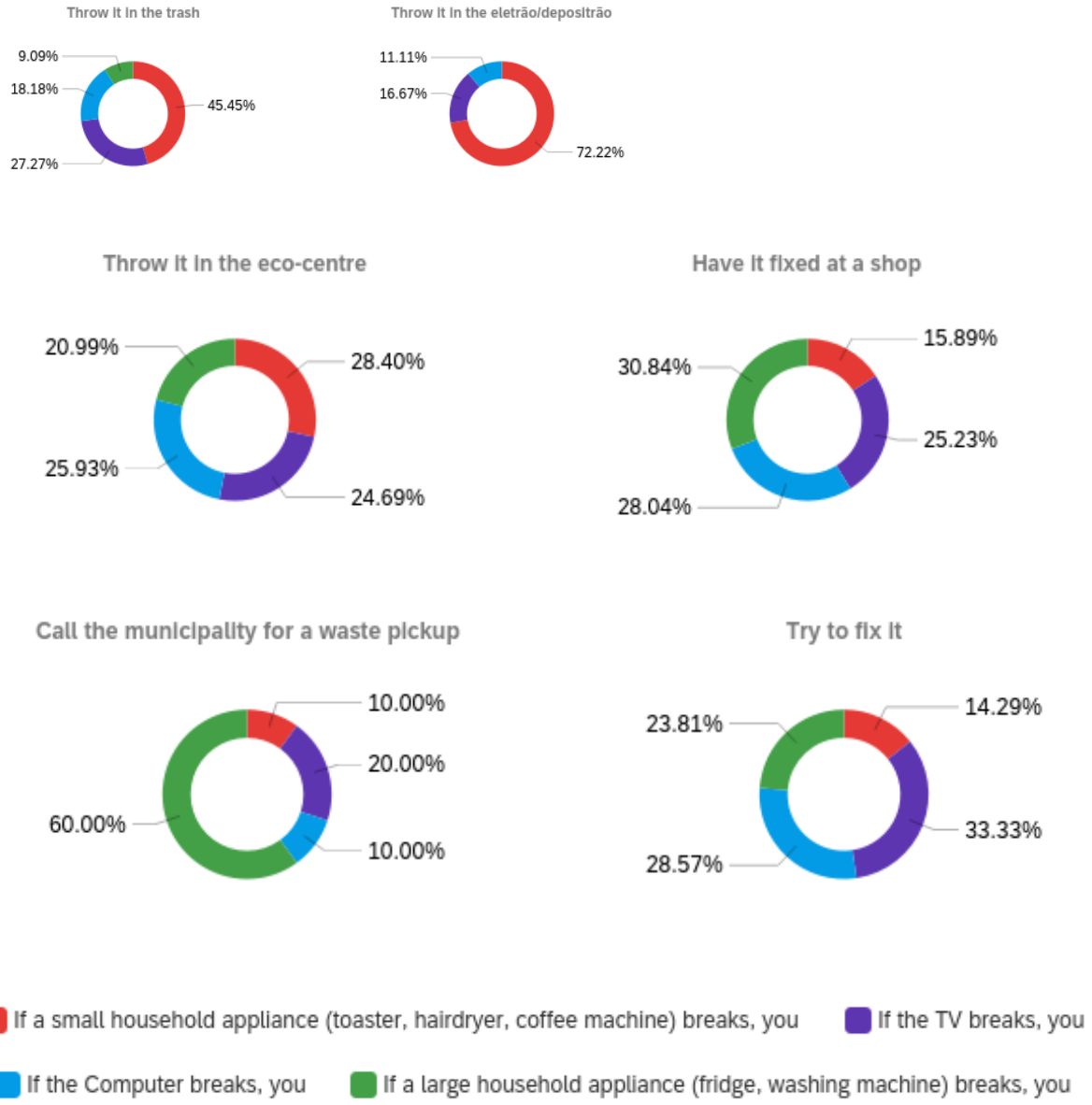
Q5: Current work status



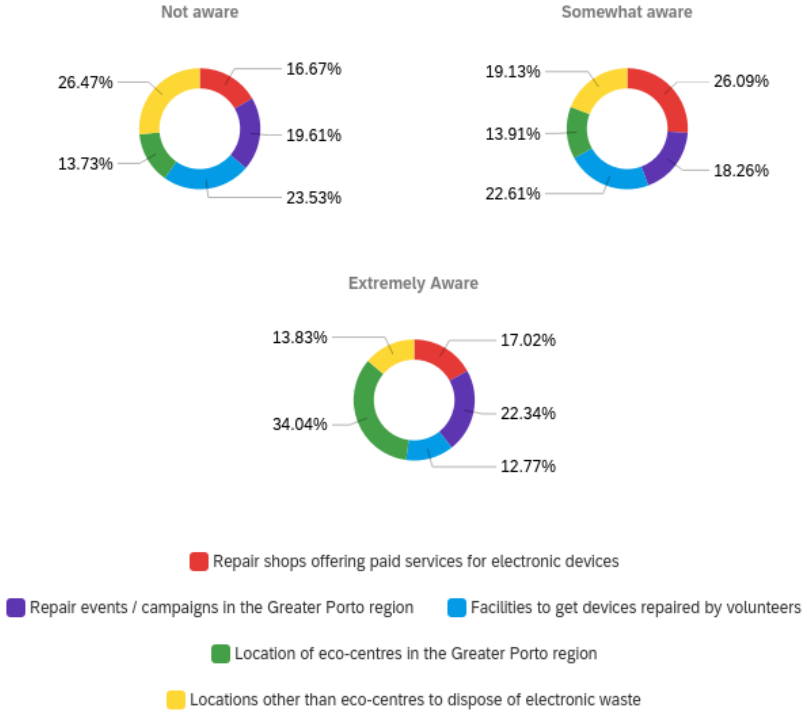
Q6 - Please indicate your personal level of familiarity with the factors mentioned.



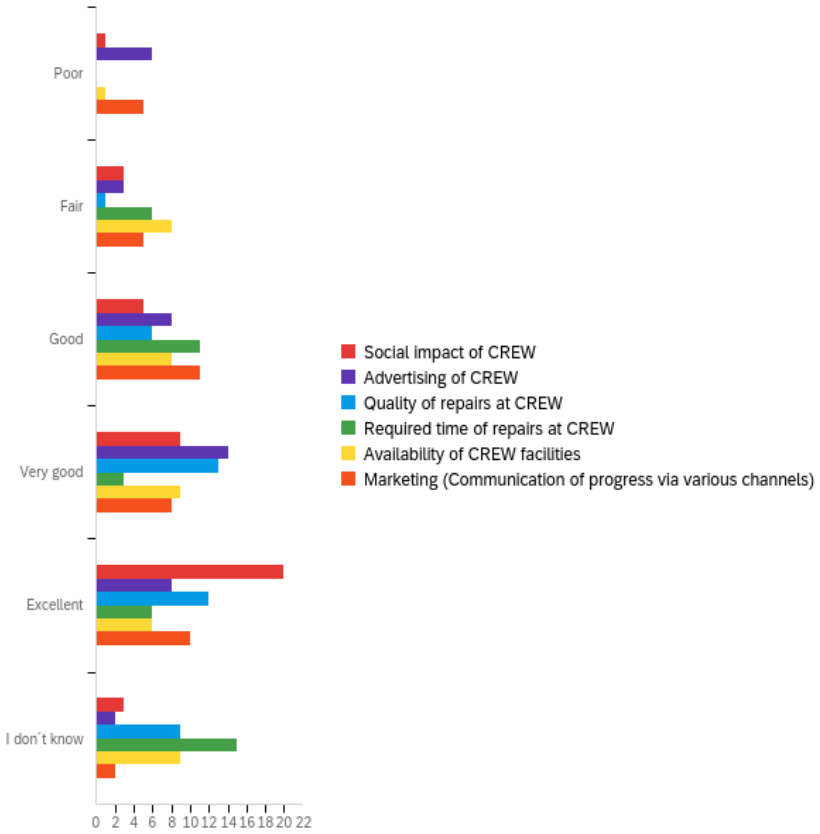
Q7 - Please indicate the answer that most accurately displays your behaviour.



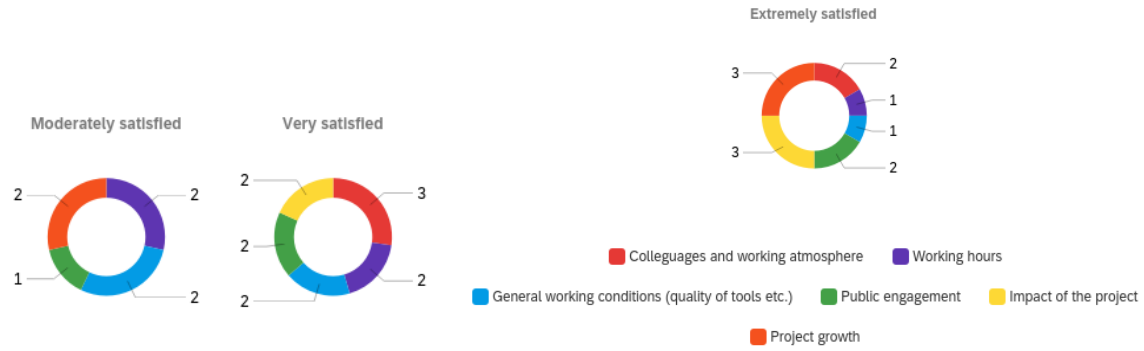
Q8 - Please indicate your awareness of each initiative mentioned on the left



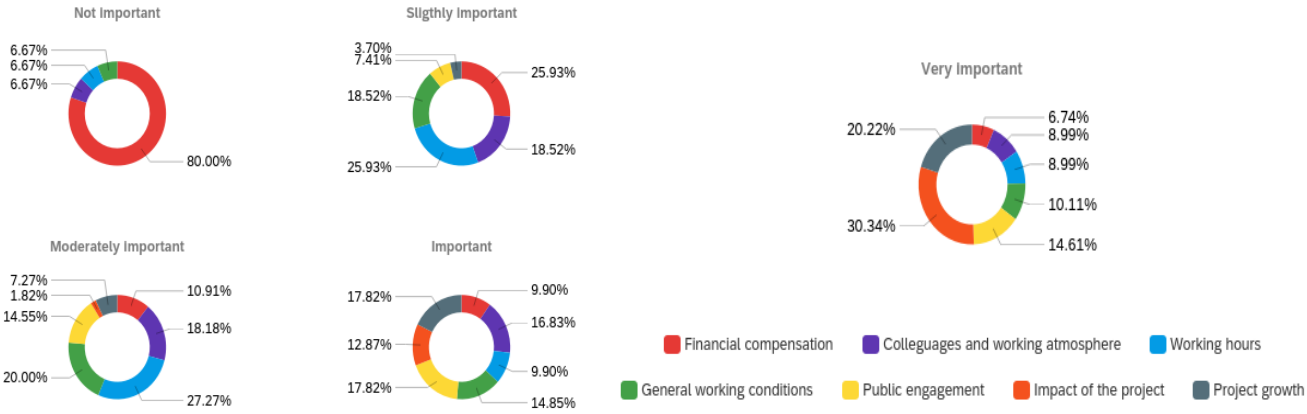
Q17 - Please evaluate the project in each of the areas mentioned on the left



Q18 - Please indicate your level of satisfaction with each of the factors on the left (Question was only visible to CREW's stakeholders)



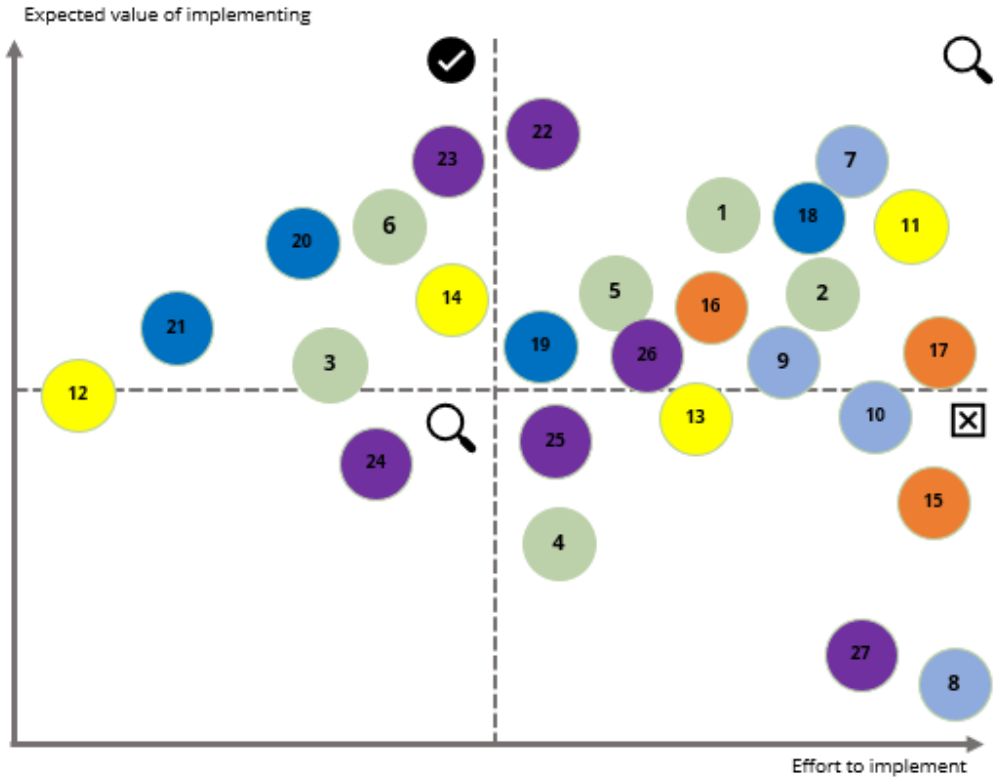
Q20 - How important are the following CREW areas for you to recommend it to a friend or join yourself?



Q22 - Which suggestion would you give to the project managers of CREW to improve the project?

#	General working conditions	Expansion of CREW	Hiring and Communications	Other
1	5	15	17	3

Exhibit 3: Targeted recommendations to increase the social return of CREW



Suggestions regarding Driver 1: Hours of certified formation

1. Hiring paid, skilled technicians to carry out more sessions per week.
2. Establishing CREW´s own social media channels to raise awareness in the general public.
3. Leveraging Lipor Academy to share knowledge and establish online CREW courses at the Academy.
4. Estimate the value per hour and develop a controlling system.
5. Replicating CREW training in CENFIM's facilities nationally.
6. Increase the number of formation hours per week.

Suggestions regarding Driver 2: Lipor's brand strength

7. Defining an annual concrete marketing strategy for CREW.
8. Investigate a (partial) in-house solution.
9. Exploit the full potential of Lipor's existing communication channels.
10. Establish CREW's own social media channels.

Suggestions regarding Driver 3: Job positions created

11. Hiring specialised paid technician(s) to repair at CREW (targeting volunteers from information sessions).
12. Allocating interns of PEPAL and IEFP to an administrative job.
13. Recruiting volunteers for CREW with the option of hiring them 6/9/12 months later (future internship opportunities with monthly scholarship).
14. Trying to contract long term unemployed people from CSE.

Suggestions regarding Driver 4: Youngster's new opportunity for work

15. Hiring a part-time technician to lead the project at CESA. (this attempt was tried and failed in the past).
16. Allocating a Lipor employee to lead the project at CESA.
17. Recruiting a volunteer to lead the project at CESA.

Suggestions regarding Driver 5: Repairing Hours

18. Hiring a part-time employee to be a repairing leader and mentor.
19. Recruiting an interested volunteer from a University / technical school to be a repairing leader and mentor at CREW.

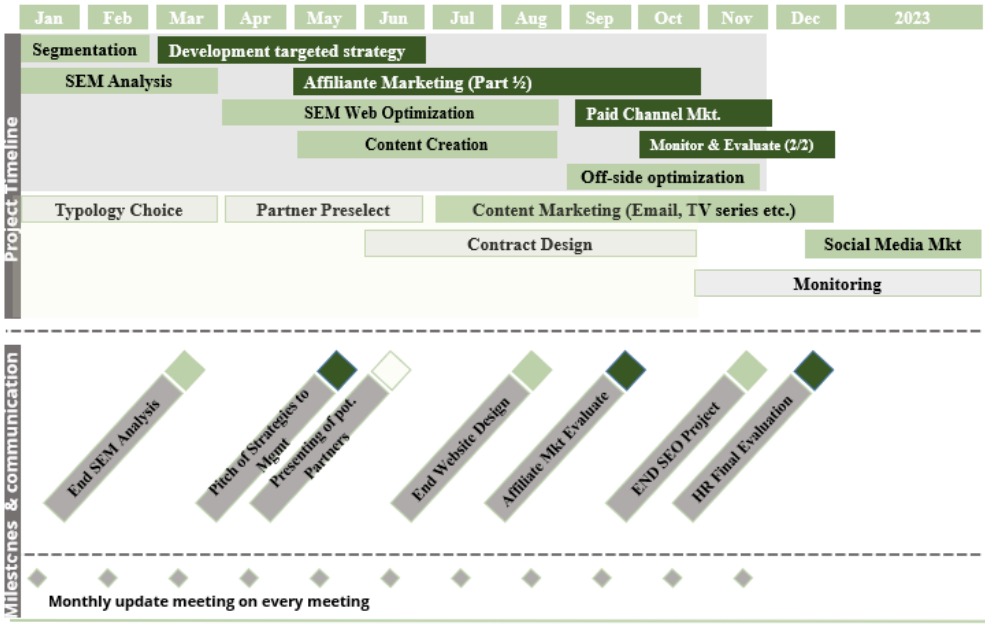
20. Allocating more repair hours for sessions with volunteers to current technicians of CREW.
21. Creating a CREW club at institutional partners (FEUP, ISEP).

Suggestions regarding Driver 6: Donated EEE

22. Establishing PPP's to increase the amount of WEEE with high value and potential to be repaired.
23. Offering more repairing sessions per week.
24. Expanding the network of CREW clubs.
25. Inquiring people who receive donated EEE to evaluate social impact.
26. Improving the receiving conditions at the remaining nine eco-centres.
27. Investigate the actual value of goods

Exhibit 4 Potential SROI Forecast 2022

Exhibit 5 WBS and KPI's for communication strategy



Monitoring

KPI related to the Communication Strategy

1. Number of interations/ Interaction Rate (website performance)
2. Conversion rate – number of users who participate in call-to-actions,
3. Search engine ranking
4. Social media audience growth percentage;
5. Social media engagement growth percentage (likes/followers; views/subscribers);
6. Number of views/clicks;
7. Number of followers of the various platforms CREW is in;
8. Click through rate – percentage of people that click on elements of the website or networks of CREW;
9. Sentiment of comments in social networks;

KPI related to Human Resource planning

1. Number of promoted events (formations, workshops, Repair Cafés, etc.);
2. Cost per click
3. Engagement rate with CREW Website
4. Changes over the time of affiliation
5. Growth rate of participants in initiatives;

KPI related to Strategic Partnerships

1. Value-add (SROI) based on project necessity

Exhibit 6 Risk Assessment

ID	Risk	Probability	Cost/ Capacity needed	Impact	Mitigation plan
01	CREW can not role out digitalization strategy	■■■■■	■■■■■	Limit to the role out plans of the digital campaign	• Try to convince management from the plan to allow CREW its own channels • Use Lipor's channels but still engage in SEO project • Increases focus on the channels of partners such as ERP
02	CREW can not deal with more demand for service	■■■□□	■■■■■	CREW can not scale further, ERP misses recycling target again	• Implement digital strategy and use channels of partners to recruit new technicians • Optimise operation at current centres to repair more e-waste • Communicate with the SROI to negotiate a higher budget
03	Budget limitation	■■■■□	■■■□□	Limited scaling and hiring of new team members	• Use the SROI and data on e-waste growth trends to get a higher budget • Follow scaling options with more budget from partner institution ERP
04	Missing of targets	■■■□□	■□□□□	Less budget gets assigned next year, lack of knowledge	• The danger is that the fulfillment of the marketing plan is not evaluated. Processes and projects might not be realised. To avoid it an embedding in personal performance targets is recommended • A concrete work breakdown structure and project management can help here
05	Loss of important employees / partners	■■■□□	■■■■■	Brain-Drain can lead to temporary stop of project	• Profound process management and knowledge management • Regular surveys and feedback sessions with both technical staff, volunteers, Lipor employees and partners
06	COVID-19 or disruptive event	■■□□□	■■■□□	Budget constraint, hindered operations	• Facilitate remote work and set the mandatory environment. Expand endeavours that are independentt of physical meetings such as the e-learning platform
07	CREW can not meet quality standards	■□□□□	■□□□□	Less people participate, reputationn, knowledge stays low	• Keep up high teaching standards • Stay up to date , use existing partnerships and create PPP to form a repair knowledge exchange

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