



PHENIX

A Circular Economy Business Model Case

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Executive Summary

The aim of the R2π project is to find and analyze sustainable business models for circular economy in a variety of industrial sectors. Then, it aims to develop propositions that will support such business models. This report develops the case of Phenix, a French company in the food sector, illustrative of a successful circular business model.

Phenix was created in 2014 by two entrepreneurs, Jean Moreau and Baptiste Corval and went through a steady growth, now having 18 regional offices in France and 3 international ones in Copenhagen, Lisbon and Madrid. The company's global mission is to "unleash the potential of waste". With an initial focus on food-waste, Phenix has set up a digital platform that works as an intermediary connecting waste "suppliers" (mainly retailers) and waste receivers (mostly charities). Through this service, Phenix prevents food close to expiration date from being wasted, and turns such waste into food donations. Beyond its matchmaking platform, Phenix also provides partners with a secured supply chain. Phenix achieves 'triple bottom line' value creation, by helping retailers to reduce the cost of food waste (economic benefit), enabling charities to get free access to food donations (social benefit), and helping society to reduce the overall amount of food waste produced in our economic system (environmental & circular economy benefit). It is, therefore, an example of a "mission-driven platform", built on a hybrid model that combines business, social and environmental value creation.

Presently, Phenix works with more than a thousand supermarket clients, has 100 full-time employees and helps to distribute over 40 000 meals per day. Phenix business model is circular by design. The organization offers a service to secure the recovery of unsold food products. Doing so, it organizes a circular sourcing for charities and helps retailers managing their products end-of-life. Because Phenix acts as a service provider, it does not generate waste but rather helps other organizations reduce their own.

As a multisided platform, Phenix has developed a distinct pricing scheme to address each side of the platform. Phenix revenue model is based on monetizing the supply-side of the platform, through a fixed commission on the waste-management gains achieved by distributors using the platform. On the other side of the platform (demand side), Phenix organizes free access to food for social charities, thus achieving a social benefit and facilitating the growth of the platform.

The French legal framework offered a favorable context for the development of a profitable business model for Phenix. As part of this regulatory framework, an existing tax incentive introduced in 1981 under the "Coluche law" providing for a 60% tax deduction for food retailers and producers who donate foodstuffs instead of generating waste. Through its secured supply chain, Phenix organizes traceability, secures savings for retailers and can charge a commission on the total savings on waste management, making the business model viable.

As a fast growing and profitable start-up, the company is currently exploring different opportunities for geographical diversification in other European and non-European countries. The company is also currently engaged in processes of horizontal diversification to expand its services to new types of waste, and explores how to improve its current offer through digital solutions.

While the company strategic position appears quite robust, few points of attention need to be considered: the business model remains dependent on favorable regulations, it remains labor intensive and new market acquisitions require large investments. Yet, new technology such as big data or IoT can radically improve the model's cost-efficiency. Lobbying skills and network effects can protect the regulatory framework and diversification strategy to other resources (non-food wastes) and new skills (consulting) can strengthen the business model.



Beyond the strategic analysis of the company, this case study has significant implications for public regulators. It first highlights the central role of public regulation in the innovation process. And it illustrates the hypothesis of Porter and Van der Linde, according to which properly crafted environmental regulations not only help to reduce environmental externalities, but they can also lead to profits for innovative companies (Porter & Linde, 1995). Overall our results points toward a mix between a regulatory framework and private dynamics of innovation to create successful circular business model. On the innovation side, the case shows how mission-driven platforms can reconfigure stakeholder relations in a given business ecosystem and improve operational efficiency of these relations in order to decrease waste and increase re-use.

Highlights of the case study:

- Phenix is a successful, fast-growing start-up which was “born circular”, with the mission to “*unleash the potential of waste*”. To date, the company main focus is food-waste.
- The company has *identified a profitable business* model and has experienced constant growth since its creation
- By connecting supply and demand through its *platform* and operations, Phenix achieves *triple bottom line benefits*, by creating both economic benefits for its clients (to date, mostly supermarkets), social benefits for food charities (who get access to food for free) and environmental benefits by reducing the quantity of waste.
- Phenix reveals a very original Circular Economy Business Model, that we define Platform-based CEBM.

Key managerial contributions:

Phenix exhibits some central innovation capabilities that have played a key role in its development:

- The company combines excellent execution skills with high innovation capabilities, appearing as an *ambidextrous organization* (Raisch & Birkinshaw, 2008)
- Beyond internal innovation capabilities, the company acts as a platform leader (Gawer & Cusumano, 2002), able to reshape and orchestrate relations (for example between supermarkets and charities) within its business ecosystem.

Key contributions for public policy:

- Regulatory incentives for food donations have played a key role in the development of a profitable and scalable business model. Clear and well-designed regulatory incentives could facilitate growth of such business models at a European level.
- Well-designed regulation, combined with private innovation capabilities can create virtuous circles for the development of circular economy business models
- Organizational structures hybridizing private and public welfare logics should be sustained and encouraged



1. Introduction

1.1. Background and context

R2π – Transition from Linear to Circular is a European Union Horizon 2020 project focused on developing new organizational models to transition toward a more sustainable economy and tackle the environmental challenges of the new century. One of the missions of the project is therefore to identify and understand successful sustainable and circular business models to draw conclusions regarding guidelines to strengthen future circular business model and the circular economy in the European Union.

R2π examines the shift from the broad concept of a Circular Economy (CE) to one of Circular Economy Business Models (CEBM) by tackling market opportunities and failures (businesses, consumers) as well as policy opportunities and failures (assumptions, unintended consequences). Its innovation lies in having a strong business-model focus (including designing transition guidelines) as well as in the role of policy development (including designing policy packages).

The ultimate objective of the R2π project is to accelerate widespread implementation of a circular economy based on successful business models and effective policies:

- to ensure sustained economic development,
- to minimize environmental impact and
- to maximize social welfare.

The mission of the project is therefore to identify and develop sustainable business models and guidelines that will facilitate the circular economy, and to propose policy packages that will support the implementation of these sustainable models.

A core part of this project is to work with organisations who are on the journey towards developing circular economy business models, as well as those who have the ambition to do so but have not yet begun. Finally, the project work with organizations (such as Phenix) born circular, which have a circular orientation since their inception. The project has conducted case studies of 18 selected organisations.

The 18 chosen cases covered all five priority areas highlighted in the EU Action Plan on the Circular Economy¹: plastics, food waste, biomass/bio-based, important raw materials, and construction & demolition. Additionally, the cases were selected to ensure learning in each of the seven business model patterns defined by the R2Pi project: re-make, re-condition, circular sourcing, co-product recovery, access, performance and resource recovery, and these will be discussed in more detail in this report. To gather wide-ranging lessons from differing company sizes and maturities, the following were selected: 7 large corporations, 8 small, medium enterprises, 1 public entity, 1 entire value chain with both public and private organisations and 1 ongoing social project.

This report presents the case of Phenix. It was chosen due to its leading role in the food waste sector and its “Phenix Exchange” Platform making it a fully circular organisation by connecting retailer (generating unsold food products) and charities (demanding unsold food products). The next section provides a more detailed overview of the case organisation’s business.

Background elements

¹<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614>



The food industry is facing major social and environmental challenges. In the world, every year, 1,6 billion tons of food products are thrown away. In volumes, this represents ten times the equivalent, in food, of Manhattan Island with every building and object on it.² One third of the food production is destroyed without being eaten. In France, 30 kilograms of food is thrown away, every year by every person. A quarter of this food is still packaged. Of course, this constitutes a social issue given that a quarter of our food waste would be enough to end hunger in the world, and feed the 870 million humans starving to death each year. It is also a strong environmental issue. If food waste was a country, it would be the third biggest pollutant in the world behind China and the USA. Waste are created all along the food supply chain from farmers to end consumers. Retailers, now key oligopolistic actors are responsible for about 10% off all the food waste. Accordingly, the food industry is of the key sector identified by the R2π project to explore new path for the circular economy.

Case presentation and relevance

This case is focused on the strategic analysis of the French based start-up Phenix. Phenix initially developed around a digital platform (called “Phenix Exchange”³) that connects distributors (firms that generate unsold food items) with various organizations that receive these flows (food banks, associations, or the animal feed industry).

Phenix was selected for the following reasons:

- Phenix is operating in the food sector, tackling the question of foodwaste, which constitutes a major circular economy issue at a European and global level, with huge social and environmental implications
- Phenix is a successful, fast-growing start-up which was “born circular”. As such it complements the sample of case studies of the R2π project, by questioning the conditions of transition towards circular business models *not only in established organizations*, but also in *new start-ups and innovative ventures* designing circular economy business models.
- As such, the analysis of Phenix enables to understand the conditions of success of start-up in the field of circular economy, both from the perspective of *internal resources and competencies* as well as *regulatory conditions*.
- Phenix is providing services (instead of products). The case illuminates how an external actor designing a new service may drive systemic change and facilitate the transition of a whole industrial ecosystem, in this case food-distribution.
- As a start-up company following a social mission, Phenix is a case of hybrid organization. The case shows how hybrid governance forms may facilitate the transition towards circular economy.

The case is particularly insightful to understand how a circular business model can transform and develop over time to encompass broader complementary activities. It also provides a clear view of the role regulation and law-making, particularly at an European level, can play to foster circular business-model and make them viable. This is particularly true in the food industry where social and environmental issues can offer opportunities to innovate and drive new businesses to success.

All these distinctive features of Phenix strategy, organization and operations reveal a unique pattern towards circular economy that we define “Platform-based Circular Economy Business Model” and explore in the rest of the document.

² <https://www.bcg.com/publications/2018/tackling-1.6-billion-ton-food-loss-and-waste-crisis.aspx>

³ <http://beta.wearephenix.com/Account/Login?ReturnUrl=%2F>





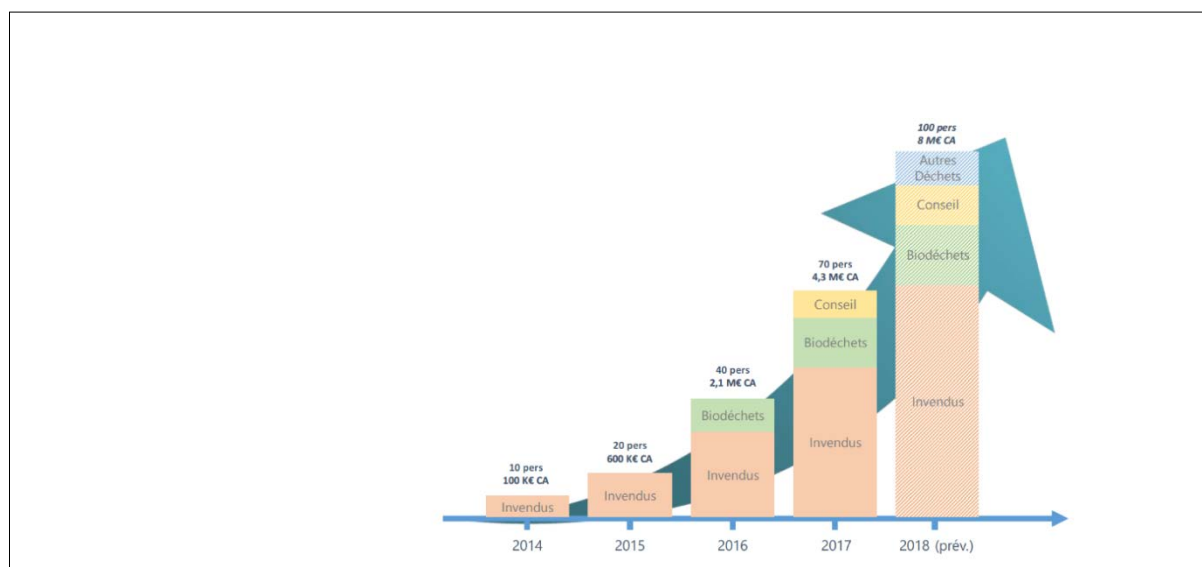
1.2. Business overview

Phenix was created in March 2014 by two entrepreneurs, Jean Moreau and Baptiste Corval. Jean Moreau quitted his job in the finance industry to create the company with Baptiste Corval, who developed the technical (IT) solution to create the matchmaking platform (Phenix Exchange), connecting retailers and charities. While the company is financed by private investors and run with profit seeking objectives, it follows social and environmental objectives. Next to its status of a private company, it also obtained a special status of a solidarity company with a social utility (“entreprise solidaire d'utilité sociale” under the French law⁴).

Since its creation, the company has experienced steady growth. In 2018, it has a turnover of 10 million euros, and a net profit of 1 million (see figure 1). It has 100 employees (35 in its headquarters in Paris) and 24 subsidiaries: 21 in French regions, 2 in Portugal and one in Spain (see figure 2). In September 2018, it had about 1000 supermarket clients 500 partnerships with charities.

To finance its growth, Phenix has collected 2.5 million euros in fundraising campaigns. The company is planning a new campaign in 2018 to finance its diversification strategy, both geographical and sectoral (towards complementary activities like non-food waste, consulting and research, branding and distribution channels).

FIGURE 1: EVOLUTION OF PHENIX TURNOVER SINCE ITS CREATION AND BREAKDOWN BY ACTIVITIES



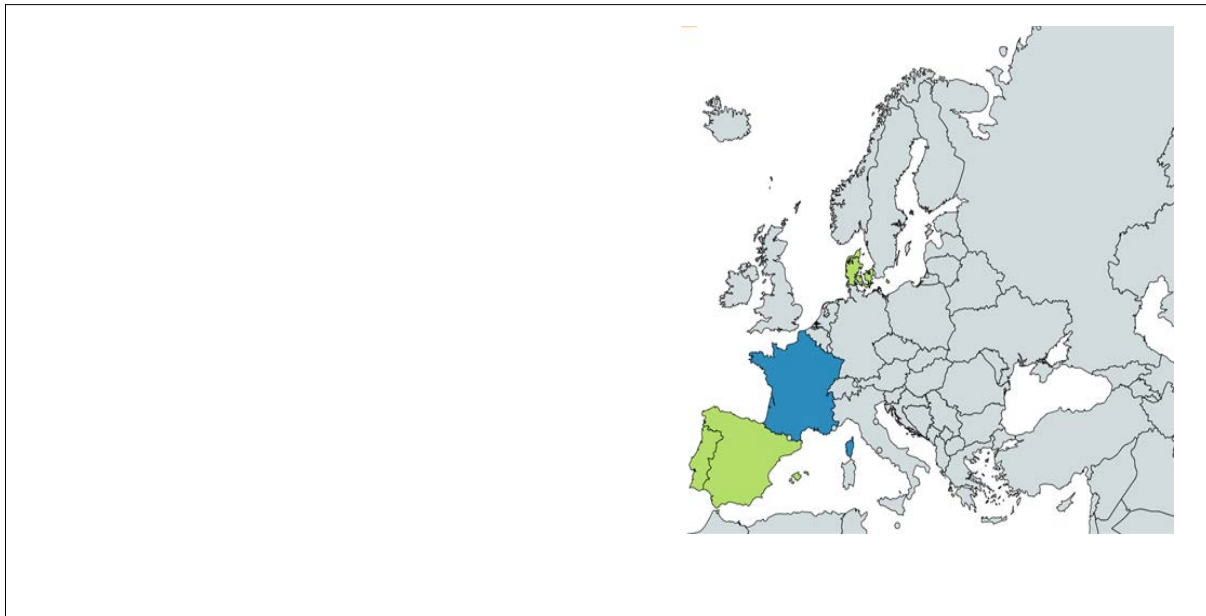
(source: internal data Phenix)

Since 2017, Phenix is engaged in a process of strategic diversification to extend and renew its strategic model through both geographical and vertical/horizontal diversification. These evolutions are detailed in section 3.1.5.

⁴ <https://www.service-public.fr/professionnels-entreprises/vosdroits/F32275>

Given the wide scope of activities and the current weight of food-waste related activities (accounting for 80% of the turnover), this report will focus on food waste prevention and the circulation of unsold food products from retailers to beneficiaries (mainly charities). As of now, the matchmaking platform is Phenix key asset, because logistics is only partially internalized, mainly to collect waste from small supermarkets and then distribute it to charities through optimized and multi-drop routings.

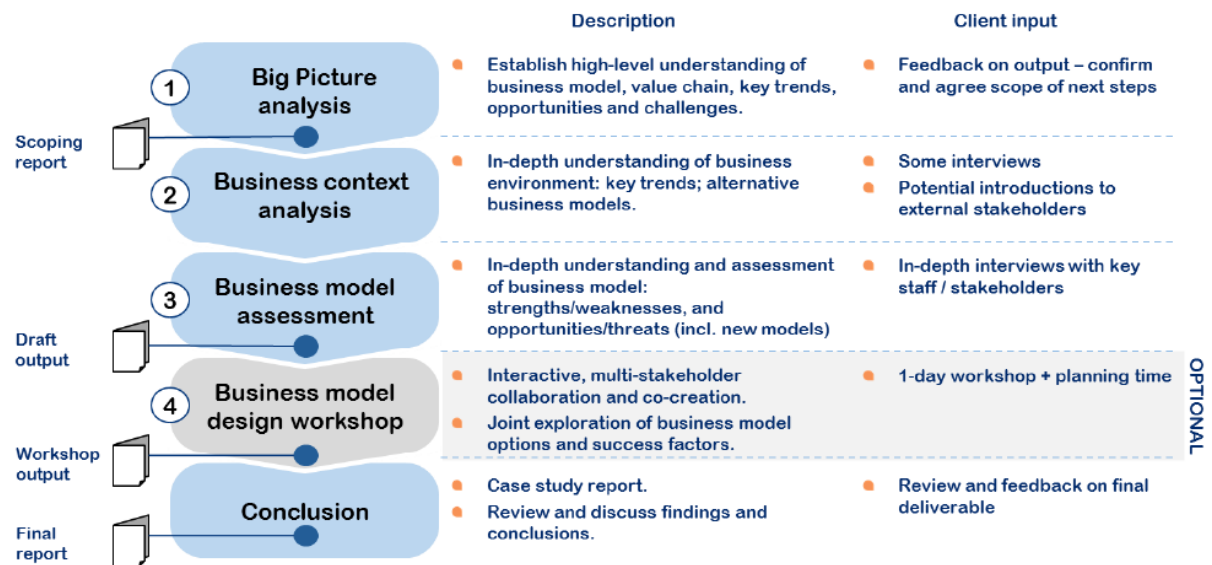
FIGURE 2: CURRENT COUNTRIES OF OPERATION IN 2018 (INTERNAL INFORMATION, PHENIX)



1.3. The case study analysis process

Our case study analysis follows the plan established in Deliverable 3.2a of the R2π project (see figure

FIGURE 3: OVERALL STRUCTURE OF THE CASE STUDY. SOURCE: CIRCULAR ECONOMY BUSINESS MODEL CASE STUDIES: INTRODUCTION AND METHODOLOGY.



below).

Data about Phenix was collected between October 2017 and October 2018. We conducted different interviews with Phenix top managers, enjoyed access to internal data and teams. In particular, our key informants were the Co-founder and President of the company and the Manager in charge of consulting and research activities.

Data was collected through various mechanisms and sources:

- 10 in depth interviews with internal members within Phenix
- Access to internal documentation (corporate presentations, strategic and activity reports) as well as external documentation related to food waste in France and Europe (see appendix)
- Interviews with Circular economy institute (*Institut de l'Economie Circulaire*) on food-waste in France
- Extensive interactions in the context of student projects as part of a specialized course on circular economy involving Phenix and the research team

Overview of the case-study process:

- Step 1: big picture analysis – October -> November 2017. This step directly involved on of Phenix co-founder and the manager in charge of consulting and research activities. Once the researchers improved their understanding of Phenix business model and key trends, the team identified key areas of exploration and development.
- Step 2: business context analysis: January -> March. Each key area and trends were explored by a team of students (ex: strategies for geographic diversification in Europe,

services towards end clients, business model transformation to reduce foodwaste at the source, etc.), supervised by professors and in interaction with Phenix, as part of a consulting project within a course on circular economy.

- Step 3: business model analysis: March -> July: restitution of team work on Phenix, identification of strengths and weaknesses, opportunities and threats related to each area of development.
- Step 4: conclusion: July -> Oct 2018 - Conclusion, writing and validation of the report: Two dissemination articles were validated

According to this process and the extensive work of student and research team with Phenix, step 4 (business model design workshop) was not formally conducted as a separate step. Rather, this step was integrated over the in-depth student workshops and throughout the whole process.

Finally, as part of the collaboration between the research team within ESCP Europe and Phenix, two articles (in French / English) were published about the case study on the online media theconversation.com :

- A.Acquier, L.Chappet, V.Carbone: The rise of the “Phenix”: giving a second life to food waste (june the 5th 2018)

<https://theconversation.com/the-rise-of-the-phenix-giving-a-second-life-to-food-waste-97407>

- A.Acquier, L.Chappet, V.Carbone: Gaspillage alimentaire : comment la start-up Phenix fait bouger les lignes (april the 3rd, 2018)

<https://theconversation.com/gaspillage-alimentaire-comment-la-start-up-phenix-fait-bouger-les-lignes-93992>

1.4. Report outline

In line with the case study process analysis depicted above, big picture analysis, already presented in section 1, will be followed by a detailed business context analysis in section 2. This will be based specifically on business context canvas with description of particular element of the canvas and referrals to sources on relevant business trends.

Section 3 explores business model assessment, based specifically on the business model canvas elements and their description, to identify Phenix strengths and weaknesses as well as business model circularity assessment.

Last section discusses the main findings and discusses managerial and public policy recommendations related to circular economy business model development.



2. Phenix business context

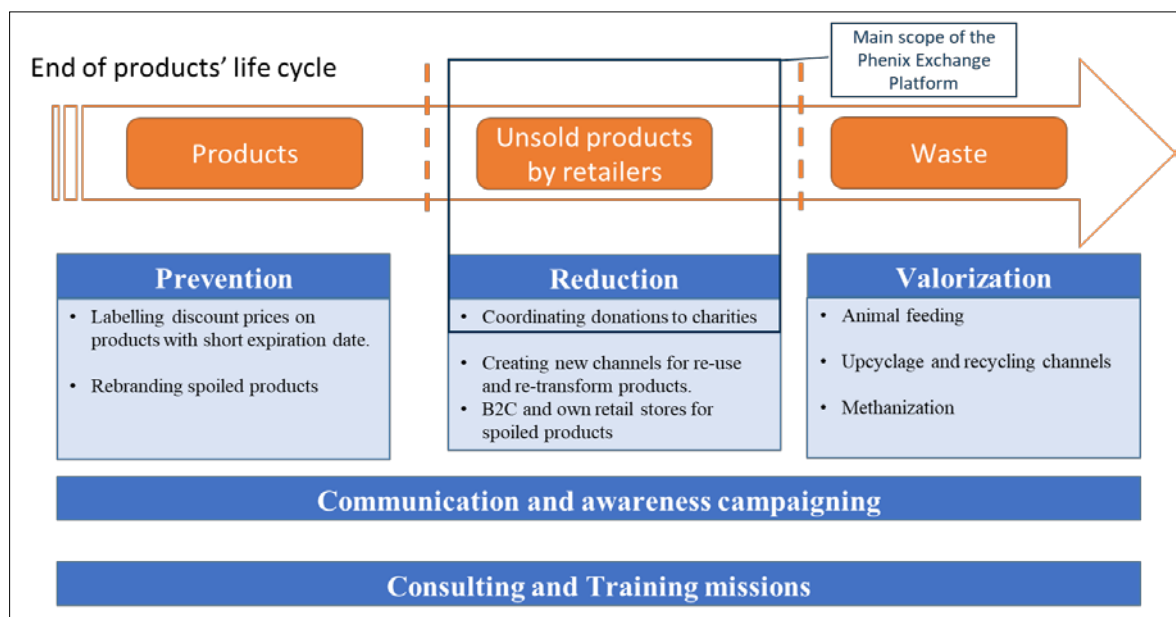
2.1. Scope of the Business context analysis

The business context analysis presents the key factors influencing Phenix business model, its strategy and potential transformations to come. Such analysis helps understanding Phenix's key success factors and potential threats to and opportunities for its future development. Food waste at every step of the supply chain, from agriculture to final consumption, sums up to a third of all the food produced in the first place⁵. Distribution and retail produce 200M tons of wasted food. This represents 13,3% of the total amount of food waste in volume and 17,65% in value⁶. Our context analysis is focused on food waste generated at the distribution and retail level, being this the main area where Phenix has been developing.

2.1.1. Phenix Food Waste Prevention, Reduction and Valorization Program

Phenix offers a wide range of services in order to implement concrete actions for the repurposing of end of life products. In this report we focus our analysis on Phenix "Food Waste Prevention, Reduction and Valorization Program", its main source of revenue and the core of its multi-activity business models. The main objective of the Program is to increase and professionalize the donation of unsold food by retailers to charities which in turn, distribute such food to people in need. Repurposing unsold and close to the expiry date food and devoting them to human consumption through charities stands as the main lever adopted by Phenix to limit the increase of food waste. The figure below shows the broad array of Phenix activities to tackle the issue of food waste and the focused scope of our study.

FIGURE 4: PHENIX ACTIVITIES (ADAPTED FROM PHENIX INTERNAL DOCUMENTS)



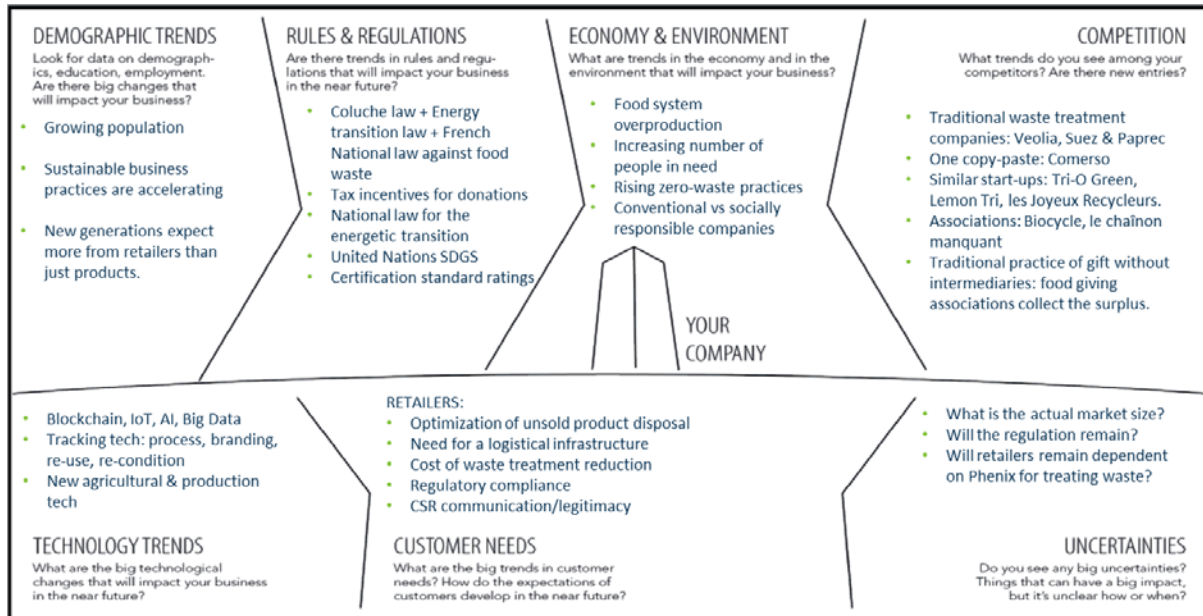
⁵ <https://www.bcg.com/publications/2018/tackling-1.6-billion-ton-food-loss-and-waste-crisis.aspx>

⁶ Figures from BCG, 2018

2.2. Contextual factor analysis

To analyse Phenix context, following the global methodology of the R2π project, we used the canvas map below. We detail each category in the following paragraphs. This canvas was ultimately presented to Phenix members to ensure its consistency with their own analysis.

FIGURE 5: BUSINESS CONTEXT CANVAS FOR FOOD WASTE REDUCTION



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2.2.1. Demographic trends

Phenix's core mission to "unleash the potential of waste" is meant to tackle the gap between the huge amount of food waste produced every day and the high number of human beings suffering from malnutrition or starving. In France, the natural balance between births and deaths remains positive with the highest number of children per woman in Europe. The migratory balance is also structurally positive⁷. Growing population in France and worldwide will only make the problem worse if nothing is done to limit food waste and shift towards circular business models.

Simultaneously, as the population is growing, new generations seem highly concerned about the threat of climate change, saving resources, and burying waste in landfills. New behaviours such as sorting, and recycling are induced by better educational campaigns and composting programs. Higher individual awareness and ethical consumption trends may encourage Phenix to explore B2C development opportunities. As per its main current activity, Phenix business model is based on bridging the gap between two phenomena (a highly productive food industrial system generating a lot of waste and an alarming unequal access to food) which shall perpetuate and remain a major concern for a while.

Overall, nothing in the demographic trends implies that Phenix's business model and its future developments will become irrelevant. Food waste and unequal access to food will remain critical issues in the years to come.

2.2.2. Customer needs

Phenix acts as a multisided platform, serving and connecting different targets of users. The two types of customers served by Phenix, are retailers (providers of unsold food) and charities (receivers of

⁷ Source : <https://www.insee.fr/fr/statistiques/1892117?sommaire=1912926>

unsold food). Since the promulgation of the French law on Food waste, retailers need to comply with the obligation to donate their unsold food. Beyond such need for legal compliance, the main objective of retailers is to reduce their waste and the associated management costs. Despite improvements in flow optimization and purchasing policies, food waste is still a major concern for retailers. Recent data show that on average a supermarket throws away about 3,3% of all its products, for a total amount, in France, of 4,5 million euros⁸. The root causes for waste are numerous: low turnover for some stock keeping units (SKUs), unpredictability of demand, constraining expectations and standards, in terms of freshness and aesthetic... Regulation on food hygiene and consumer health often meets socially constructed market imperatives for aesthetically perfect and up-to-date products. Moreover, managing large amount of waste is costly: beyond the direct cost derived from lost sales, other expenses are to be met to pay employees and waste companies to process and treat food waste. The burden of such costs seems all the heavier for retailers, in a context of severe and oligopolistic competition with high pressure on cost reduction. In the new French regulatory environment, waste can also be seen as an opportunity cost for not enjoying tax incentives linked to the donation of unsold food. All in all, retailers are in demand for an optimized logistical infrastructure to reduce the amount of food wasted every day and the cost of waste treatment. Finally, against the rising societal awareness for food waste, retailers are urged to implement responsible practices in this field, to support and boost their own legitimacy.

Charities active in the food aid sphere need to regularly source food to donate to people in need. Relying on volunteers and donations, they often lack resources, labour and logistical resources to efficiently pick up unsold food from supermarkets. In order to focus on their core activity, i.e. food distribution to people in need, their interest is to spend as less effort as possible to manage food waste flows between retailers and their food distribution sites. The end of government subsidized contracts for non-profit sector in France⁹ is amplifying Charities need for free resources.

⁸ <https://www.ademe.fr/sites/default/files/assets/documents/pertes-et-gaspillages-alimentaires-201605-rapport.pdf> (page 129)

⁹ Rey, M., Bellit, S., Guillon, V., Firquet, S., & Mourlot, L. (2018). Les dispositifs spécifiques d'emploi aidé et de formation au 2e trimestre 2018: La baisse des contrats aidés se poursuit.



2.2.3. Rules and regulations

The regulatory context is key to understand the origins and the successful development of Phenix. The first law to consider is the *Loi Coluche* promulgated in 1989 and named after the famous French actor, died in 1986. Coluche created *Les Restos du Coeur* (Literally, “restaurants of the heart”), one of the biggest French charities which goal is to end starvation by distributing free meals to those in need, working as a soup kitchen. Since 1985, the charity has distributed over two billion meals. In 2017, almost one million people in France received meals from *Les Restos du Coeur*. These figures explain why the charity relies heavily on food donations to organize its meal distribution. The *loi Coluche* introduces incentives for retailers to foster food donation. The law enables donators (retailers) a 60% tax exemption on the value of food donated to recognized and registered charities. In other words, if a retailer gives a 100€ worth of food to a charity such as *Les Restos du Coeur*, it receives a 60€ tax cut on its corporate taxes. Yet, the difficulty remains for retailers to prove, through a traceable supply chain that their food donation actually goes to such charities. This implies creating dedicated and costly tracking systems.

Such food waste regulatory frame was recently reinforced in France. The French law on Energy transition for green growth (August 17th 2015) constituted a first important milestone to raise awareness on the critical issue of waste and the need for a more circular economy. With its “National Pact to Combat Food Waste” in 2016, France made a commitment to reduce the phenomenon by half by 2025. The first national law against food waste, known as the “[Loi Garot](#)” (Law 2016-139), establishes a set of measures to reduce and manage this problem, particularly at the food retailing level.

This law established a hierarchy of priorities. First of all, it is vital to curb food waste at the source (for example, by selling products that are usually rejected). Second, unsold food items that are approaching their best-before date should be repurposed/recycled either through donation or transformation (by allowing foraging or the transformation of produce into compost). Third, some produce can be converted into animal feeds. And lastly, there is composting and energy recovery, notably through methanation.

This law introduces a new regulatory constraint: it is now illegal for retailers to discard unsold (before sell-by date) food items. It binds retailers to find ways to manage food waste hence reinforcing the original *loi Coluche*, adding a coercive dimension to the original incentive system. This new combination enables the emergence of a new ecosystem for social entrepreneurs and circular businesses.

While the national regulatory context constituted a key context enabler for Phenix business model, this legal infrastructure is specific to the French context. There are still few countries which pushed a combination of coercion and incentives through laws to actively prevent retailers from generating waste. Elsewhere, Phenix has to deal with less friendly regulatory environments which may represent a challenge for its geographical diversification strategy (see below).

2.2.4. Economy and market environment

Several economic trends and the features of the food industry are favourable to the consolidation and expansion of Phenix mission and activity. First of all, the food industry, comprising suppliers, manufacturers and retailers, is structurally in overproduction both in the upstream level of the chain and the downstream one, including retailers. European and French agricultural regulations (cf. Common Agricultural Policy) have contributed for years to structural overproduction, through State and European subsidies. Such generalized over production generates severe environmental consequences requiring diverse solutions to tackle the waste reduction challenge. New concepts



such as sharing and circular economy may attract more and more investments and support to enable the development of innovative business model such as Phenix's one.

Second, the increasing importance of the third sector in managing contemporary *grand challenges* reinforces the key role of charities, especially in periods of economic crisis and rising unemployment, which lead to increasing poverty (in France, over ten years, 630 000 more people have shifted in poverty¹⁰). The four biggest charities in France collecting food to feed deprived and disadvantaged people are *Secours Populaire*, *La Banque Alimentaire*, *Les Restos du Cœur* and the Red Cross. These big organizations, leveraging resources from several thousand members, have long established their own channels to collect unsold food from retailers, particularly through dedicated campaigns. However, a professional solution to their collection needs is proven to be helpful.

Third, new societal trends such as buying in bulk (several bulk shops opened in France since 2013¹¹) or do-it-yourself or home-composting show consumers' willingness to reduce waste and interest for retailing initiatives in this field. Phenix market captures 1000 retailers out of the 14000 present in France. Sticking to only big supermarkets (strategic clients generating most of the revenues), Phenix does business with 650 supermarkets out of 8000 (interview with Phenix manages). The market potential seems still very high. However, most retailers are far from a "zero packaging/waste" policy; not all of them are equally environmental friendly and it is unclear the extent to which the market will be sensitive to calls for better practices and less waste, beyond pure economic considerations.

Overall, Phenix business model remains quite independent from specific economic and market trends, as it finds its *raison d'être* in a structural food surplus availability and in a favorable regulatory context.

2.2.5. Competition

Although in France, Phenix is the leading actor in this sector, it has one direct competitor, Comerso, which captures value through a very similar B2B-oriented business model. However, Phenix is more active in urban contexts while Comerso is mainly present in rural areas where logistical needs are greater. Accordingly, Comerso has a more generalized integrated logistics solution compared to Phenix, which provides its logistics services predominantly to small retailers. Other less direct competitors include Tri-O Greenwhishes, doing recycling in its own sorting centers, Lemon Tree, providing innovating recycling boxes or *Les Joyeux Recycleurs*¹² providing solutions to recycle office waste (paper, coffee capsules, plastic cups...).

On a larger scale, the French waste management industry is still led by oligopolistic companies: Veolia, Suez and Paprec. They are in charge of collecting all forms of waste, including household waste, and own huge sorting and waste treatment infrastructures. Their size, in terms of employees and turnover is much larger than Phenix. Suez has global operations for resource management and waste treatment in the five continents and has more than 88000 employees. Paprec, the smallest actor among those mentioned above, has 8500 employees, a turnover of 1,5 billion euros and collect 10 million tons of waste¹³.

Companies on the B2C segment like Optimiam or RE-belle constitute another set of potential competitors as the start-up is currently exploring new expansion opportunities.

Abroad, there are many organizations on the B2C segment but very few similar competitors. Also, the optimization of food surplus flows is mostly taken care of by proprietary and for-profit models. In the UK for instance comparable initiatives are more isolated and fragmented: Morrisons, one of UK's largest retailers, has recently signed a partnership with the charity FoodCycle while Tesco has launched its new platform called Foodcloud.

¹⁰ <https://www.inegalites.fr/600-000-pauvres-de-plus-en-dix-ans>

¹¹ <http://daybyday-shop.com/vrac>

¹² « The happy recyclers » in French

¹³ <https://www.connaissancedesenergies.org/afp/paprec-prend-50-dinova-operations-specialiste-de-la-valorisation-energetique-180605>



2.2.6. Technology trends

Technological trends can deeply transform Phenix business model. Technologies which may offer interesting development opportunities include blockchain, Internet of Things (IoT), artificial intelligence (AI) and Big Data analytics. Using blockchain would improve capabilities in waste traceability and improve supply chains transaction security. AI can automate the matchmaking role of Phenix in multisided marketplaces, enabling real time and dynamic connection among different parties by using big data, thus reducing the need for labor intensive processes. IoT, through sensors and connected hardware can improve in-store waste management, feed data to Phenix and automate, accelerate and improve decision making in the waste supply chain. This would allow Phenix to provide a broader spectrum of services to its customers. New market offers could be developed reducing the company dependence on tax incentives for its revenue model. Finally, the collection, storage and analysis of consolidated “big data” regarding waste composition and geographical distribution can radically change Phenix service, which may include consulting for global waste management optimization. Overall, these technologies may reduce the high labor intensity feature of Phenix business model.

Secondary technologies may also impact Phenix: improved tracking technologies may enable an optimal track of food from producer to consumers, from crop surveillance to smart fridge. These technologies may also be employed to improve in-store services to retailers, for sticking solutions to better manage close to date products.

2.2.7. Uncertainties.

An important field of uncertainties concerns the regulatory environment. The US example illustrates how a radical political shift (eg. Donald Trump election in 2016) can jeopardize already established pro-environmental regulations. Given that Phenix business model partly relies on tax reduction to financially incentivize retailers’ better food waste management, a shift in the law could have critical consequences, affecting Phenix capacity to generate profit from its current activities. This dependence on law is managed in two ways. Firstly, Phenix keeps investing into research and communication, to measure the positive social and environmental impact generated by its activities, thus contributing to positive lobbying for food waste. The company also follows political developments to take positions and have a voice in new legal developments. Secondly, Phenix explores new business opportunities to decouple its business model from existing fiscal advantages (see section 3.1.5 on diversification).

However, a drastic regulatory shift -such as a repeal of the law against food waste in France- does not appear as a likely threat to Phenix, as it would create political tensions and represent a high political risk for any government. Rather than a drastic change, a reduction of the tax incentive could be a more likely threat.

On the positive side, current parliamentary debates in France foresee the extension of the binding mechanisms of the law to other types of waste producers (toys, building materials...), potentially opening up new business opportunities for Phenix.

Another type of uncertainty concerns the real size of the market. Although meant to last, the binding French law is not currently strictly enforced, and not all retailers are sensitive to the environmental issue of a better waste management. Phenix’s diversification and expansion strategy can thus be read as an answer to the possible limitation of the attainable retail market.

3. Business Model Assessment

3.1. Phenix Bussiness model

3.1.1. Business model evolution

Phenix started its operation in 2014. As previously described, the main enabling law for its business model, the *loi Coluche*, has already been in place since 1989. But this law only set in place an incentive-based system. In 2016, when the new law was introduced with coercive measures against retailer producing waste, the spirit of Phenix's business model changed. While it was until then exclusively relying on enabling tax reduction through a matchmaking platform, it is now also providing users a ready-made solution to comply with a regulatory constrain.

Phenix business model has been shaped to provide retailers a solution to manage their food waste and secure charities with a steady and reliable access to unsold food. Such objective is materialized through a collaborative platform (Phenix Exchange) matching demand and offer between waste receivers and waste producers to shorten and secure the waste supply chain.

Over the years, Phenix has enlarged its client portfolio to include on the one side wholesalers, manufacturers, public institutions and events' organizers, and on the other side farms (for animal feeding) and other receivers of unsold products. To all these clients, Phenix offers waste management services. Simultaneously, Phenix has developed complementary skills: consulting missions, expertise and research work for institutional or corporate actors.

In the following sections we'll focus on the original business model, focused on food-waste management and involving two main categories of customers, representing each of the two sides of the matchmaking platform created and managed by Phenix: retailers (providers of unsold food) and charities (receivers of food for distribution to people in need). For the current evolution of Phenix BM see section 3.1.5.

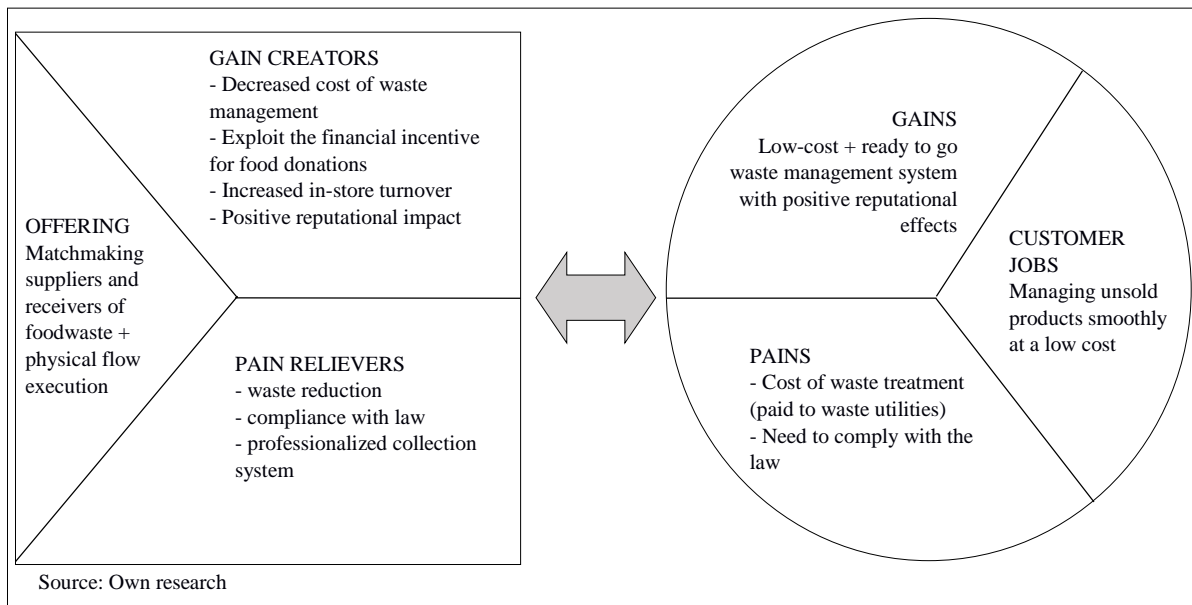
3.1.2. Business model overview

3.1.2.1. Value proposition and customer need assessment

Phenix's mission is to work as an intermediary between retailers generating food waste and actors - mostly charities- seeking food donations. As a multisided platform in a bi-face market (Rochet & Tirole, 2003), Phenix simultaneously addresses two customer segments with different needs: retailers and charities. Accordingly, the company has distinct value propositions to address each side of the platform.

Value proposition for retailers

FIGURE 6: VALUE PROPOSITION CANVAS – VALUE PROPOSITION TOWARDS RETAILERS



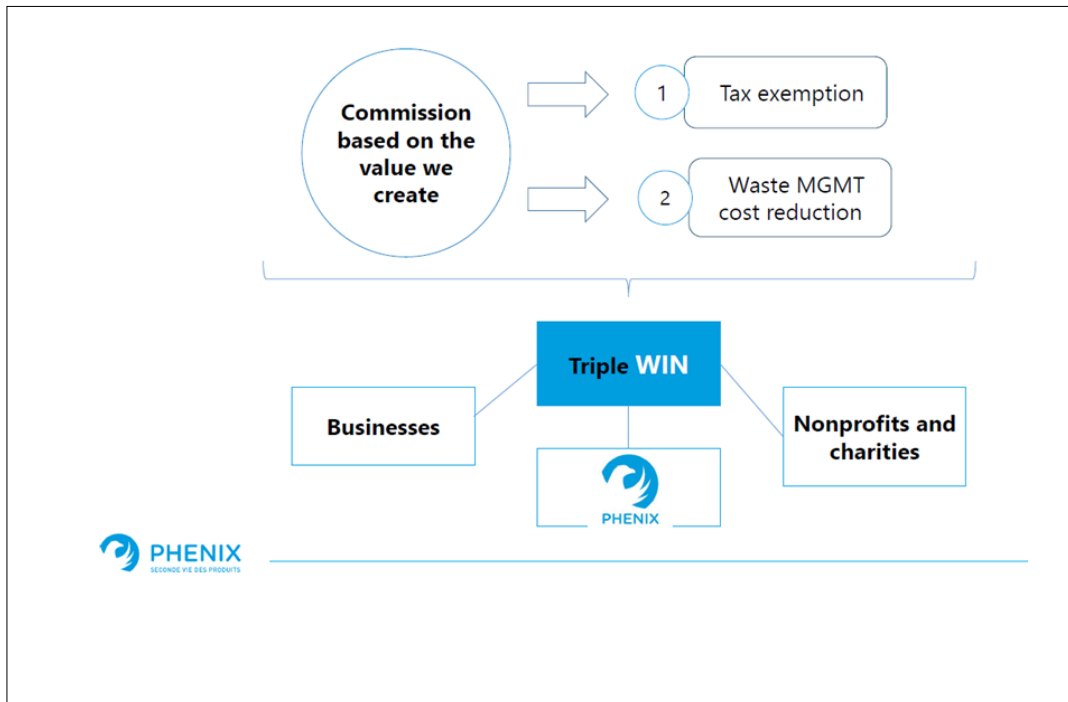
Phenix value proposition addresses retailers of perishable food products. The unpredictable nature of demand and purchasing behavior combined with the expiration date constraint generates large amount of food waste and unsold products at the retail level. However, unsold products may not be suitable for sale anymore due to legal constraints but yet be proper to human consumption. Phenix acts to transform linear supply chains to include circularity elements through a two-sided platform matching suppliers (retailers) and seekers of food (charities), thus avoiding the destruction of unsold product and the generation of waste.

Although the French regulation provides tax cuts for retailers donating their unsold food products, Phenix value proposition goes beyond this. Its overall proposition is to lower waste costs through three mechanisms: lower waste, increased sales and lower tax. Because of its strategic partnership with *Zéro Gâchis*, it is possible to decrease unsold products by labelling them with discount prices, helping managers with the decision-making process regarding when and what to discount. The remaining unsold products are then channelled by Phenix towards partner charities. This, in turn, opens rights for tax cuts.

Waste management is costly for both retailers and receivers of food donations. It is time consuming, labor intensive and, for retailers, requires paying traditional waste management companies such as Veolia or Suez. To create value, Phenix leverages the French regulatory framework on food waste. If retailers can prove that their unsold food goes into food donation, then up to 60% of its value opens right to tax reductions. Through long-term contracts with charities and dedicated supply chains, Phenix offers the needed traceability to prove that food waste is turned into food donations.

This business model creates positive outcomes for all the parties involved. For instance, if a retailer proposes 1000€ of milk bottles on the platform and an association books them, the retailer can deduct 600€ from its taxes on which Phenix absorbs 30%. Joining such scheme is also an opportunity for retailers to fine tune their CSR strategy and make their commitment to circular economy visible to external stakeholders.

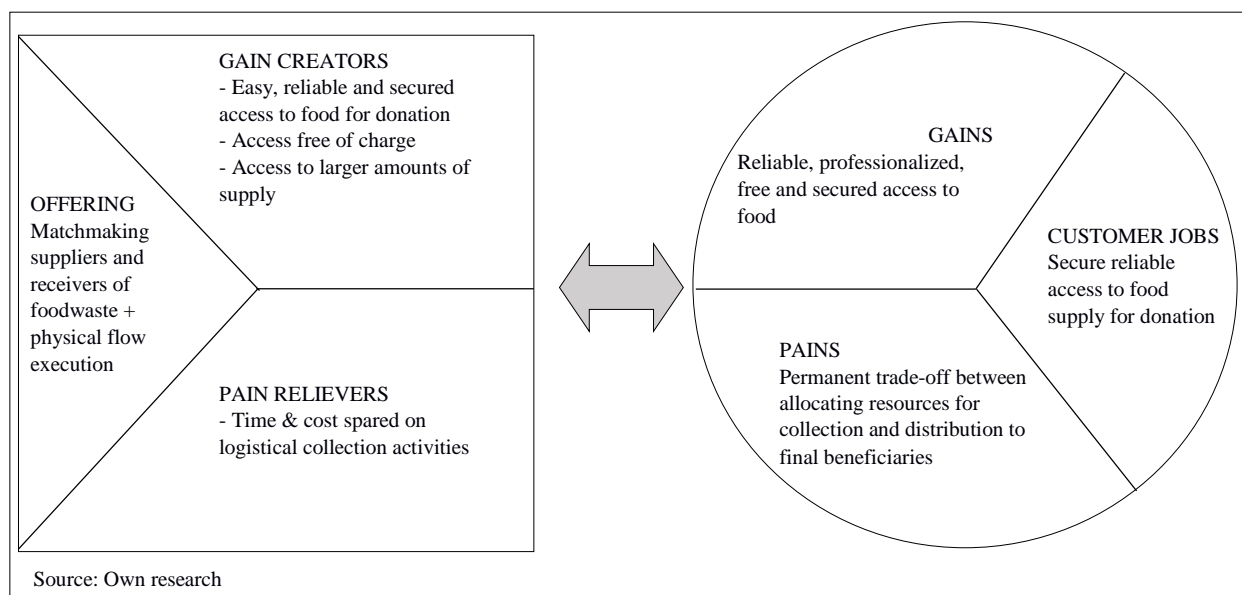
FIGURE 7: PHENIX TRIPLE BOTTOM-LINE BUSINESS MODEL



Value proposition for charities

On the receiver's side, Phenix organizes free access to food for social charities, thus achieving a social benefit and facilitating the growth of the platform. Associations receive notifications from the platform and if they are interested in the available products, they can freely collect them (or being delivered, when Phenix also integrates the logistics) by signing the documents ensuring flow traceability. This arrangement provides time and resource saving: free access to food, more time to spend on welcoming and distribution activities rather than on food collection.

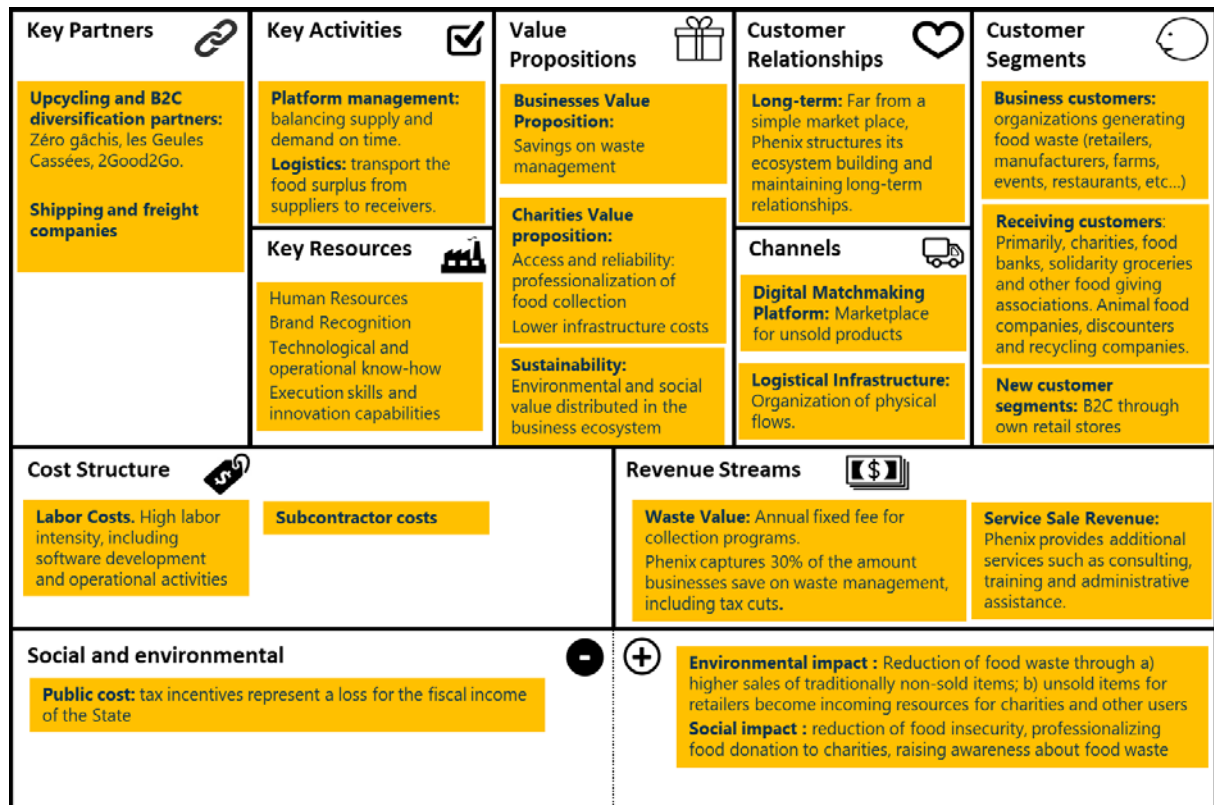
FIGURE 8: VALUE PROPOSITION CANVAS – VALUE PROPOSITION FOR CHARITIES



3.1.3 Business Model Canvas

This case study explores the different features of Phenix circular business model. Business model canvas was used to assess Phenix’s business model. A detailed description of each item is provided in the following sub-sections.

FIGURE 9: BUSINESS MODEL CANVAS



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Adapted by R2PI

3.1.3.1 Key partners

Phenix holds several key partners that help the start-up broaden its value proposition for retailers through prevention activities meant to limit waste generation, or to innovate towards new markets.

Two main partners (Les Gueules Cassées and Zéro gâchis) provide services, stickers, labels and training sessions to help retailers reduce waste, speed turnover and remarket damaged products. Remaining unsold products are then channelled to charities by Phenix through its platform, but their amount has decreased a lot: up to 90% of damaged products could be sold in-store through proper labels, recognized by clients.

Zéro Gachis is a circular food company. Their partnership is materialized by a joint contract with retailers. Zéro Gâchis focuses on providing labels (stickers with discount prices) for soon to be unsold food products. This operation allows retailers to boost the sales of close to date products. Dedicated stands are installed in shops to display the discounted (-20% up to -50%) products. Phenix and Zéro Gâchis also provide trainings and advices to improve store managers decision-making regarding sticking and tracking solutions, when and what to discount to decrease waste.

In a similar fashion, through its partnership with *Les Gueules Cassées*, Phenix helps retailers to get the most out of downgraded or damaged products that consumers are not likely to choose. This

partnership eventually led to the creation of a retail channel, owned by phenix, with two stores opened in the city of Rennes (French Brittany), since 2017. The stores, Nous Anti-Gaspi¹⁴, only offer products unsold by regular retailers because of aesthetics criteria or with short expiry dates.

Phenix tested a partnership with TooGoodToGo (another international start-up fighting against food waste by giving stores a platform to sell their surplus food directly to consumers - BtoC.) to launch the Phenix Box (a 2 to 4 euros mystery box with close to date products). Although the partnership ended in 2017, it was a leading experience for the ongoing diversification strategy in the B2C market.

FIGURE 10: STICKERS "GUEULES CASSÉES" AND ZÉRO GÂCHIS SHELVES.



3.1.3.2 Key activities

Phenix key activities are about preventing, reducing and valuing food waste (see figure 4 for details).

Waste prevention is done by improving sales for products with short expiry dates (see section above). Phenix core activity is food waste reduction by preventing unsold products to be turned into waste. To do so, they created a platform for optimizing supply and demand matching. This platform coordinates donations to charities and ensures the quality and quantities of donated food. This reduces the amount of waste left to manage by retailers.

When unsold food is not edible anymore, valuing waste is done by opening new channels such as farms (for animal feeding) or methanation centres to produce energy.

As a leader in its ecosystem of food waste, Phenix has also created new channels for the re-use and re-transformation products, such as B2C retail stores selling unsold products by regular retailers because of aesthetics criteria or with short expiry dates.

In 80% of the case, charities organize themselves to pick up unsold products but for small retailers, Phenix organizes the physical and logistical flows of recovered products. Although the founders had a light structure in mind when they launched the initiative, they gradually came to understand the importance of developing logistics and operational expertise, which entailed the creation of jobs to operate the local collection and distribution networks.

Phenix also developed annex activities and services: communication and training sessions to raise awareness about waste issues and spread good practices. The company has also created a Phenix Lab, an initiative to incubate and support the next wave of start-ups in the circular economy. Through its "studies and consulting" wing, the company is also developing relations with public-

¹⁴ "Us Against Waste" in French.

sector bodies (such as Ademe in France), producers and industrial companies that want to reduce food waste further upstream in the value chain.

3.1.3.3 Key resources

Phenix main resource is the matchmaking platform they developed. This platform is the channel through which value is created by offering a convenient service to retailers and charities. In a digital market with first-mover advantages, good software tools are key to acquire and capture new clients which are, in result, hard to acquire for competitors. Users rarely use simultaneously two platforms. Because software tools are so critical, they are developed internally by Phenix. The team of developers is thus also a key resource, mainly taking into account the diversification process in which phenix is engaged.

Another, less obvious, key resource is the ecosystem of actors and relationships created by Phenix. It puts together for-profit retailers and charities around a circular model in which everyone can benefit from others' activities. This ecosystem offers a solid leverage for lobbying and political strategies to preserve the current French regulatory frame, beneficial to Phenix and its clients. The capability to create, sustain and coordinate relationships in a consistent and long-lasting manner must not be underestimated to grasp the critical factors for Phenix success story.

Because small retailers had difficulties to find their place in phenix initial business model, based on pure information intermediation, the circular start-up had to invest in its own logistics to offer a full waste management service. This resource is key to attract small supermarkets (about half of all French supermarkets) which are often out of scope for charities because of the too small quantities to collect. In the future, logistics capabilities could potentially be key for all suppliers, as they enable a full control over the waste supply chain, nourish Phenix visibility on the ground and allow regular contacts with retail managers.

Finally, Phenix benefits from a knowledgeable workforce on the food value chain requirements and on broader circular economy principles. This enables a smooth diversification in consulting missions but also sustains Phenix capability for innovation and exploration.

Blending together excellent execution skills, relying upon IT development and logistics capabilities, with high innovation capabilities, enables the organizational ambidexterity of Phenix, one of the key elements of its success.

3.1.3.4 Cost structure

Although Phenix business model is already profitable, its structure remains costly. Labour is by far the main cost. Our informants estimate that over 90% of Phenix spending goes to wages. Firstly, the digital platform is still developing with major changes yet to come to accompany the diversification strategy. This implies Phenix has its own software developers to maintain the platform, monitor its operation and work on new developments. Secondly, new market acquisitions require large investments to develop a dense network of retailers and charities in the new areas, through a rich field work to develop and sustain these relationships. Finally, when developing in-house logistics, particularly for small retailers, Phenix has to spend a lot on workforce to accompany its clients and monitor the proper functioning of the supply chain.

This explains why the development of Phenix was very capital-intensive, and why it still requires capital injection to finance its growth. In the current state of development, the organization has nevertheless very few physical assets: no owned sorting centers, a limited number of owned trucks, no need for a costly server to host the intermediation platform. The cost structure could, however, radically change depending on two strategic orientations. First, if Phenix decides to switch to a fully internalize supply chain it will have to invest in physical assets, a fleet of trucks, with drivers and operators, managers, and parking areas. On the opposite, as technological change can lower labour costs by automating many decisions and ease the match-making process, the structure could be less



dependent on human labour. Retailers would also need less direct interventions from Phenix workers to solve their operational issues, if waste prevention and management processes were more automated.

3.1.3.5 Customer Relationships

By design, Phenix builds long-term customer relationships. Given the costs to acquire new users for its platform, long-term relations are key. Contracts are often signed for a one-year period engagement. Through its salesforce, Phenix is in constant relations with clients, retailers and charities, receiving feedbacks, demands and ensuring the quality of service for each actor. These relationships are completed by physical and logistical flows directly managed by Phenix, in which case, direct relations with customers are even more consolidated.

Relationships with customers are nurtured with new services: waste management assessment, consulting and training, to further boost circularity. As such, Phenix acts as an ecosystem leader within its organizational field. Tight relationships, dense flows, and a multidimensional service offering reinforce the circularity of Phenix business model.

3.1.3.6 Channels

Phenix has set up a direct distribution channel through its digital and logistic platform between food surplus donators and charities. In most cases, once connected to the platform, charities are in direct relation with retailers to pick up unsold products. To acquire new platform users, Phenix prospects directly both businesses and receivers through a dedicated salesforce. Such “recruitment” activity in multisided marketplaces is key, as the two sides of the market need to be taken care of in a balanced manner, to enjoy the positive network externalities. Phenix also targets events like music festivals to organize collect events and at the same time raise awareness about food waste and boost their brand reputation. Also, the start-up benefits from positive and steady media coverage since the issue of food waste reached the political agenda and received support from the civil society. The market rests on a “winner-takes-all” system which means that new users’ acquisition will be less and less costly for Phenix if it keeps its leading position.

Phenix also works directly with small retailers through its own logistics teams. This direct channel is currently minimal in Phenix overall business model. However, it is extremely useful to make Phenix value proposition to retailers more visible and to nourish the relationship with store managers. The purely intermediation service is less tangible in comparison to operational problem solving on a daily basis. This explains present debates about the possibility to extend Phenix in-house logistics services to bigger customers.

3.1.3.7 Customer segments

While developing Phenix, cofounders Jean Moreau and Baptiste Corval first focused on building the two sides of their digital platform. Retailers represent 10% of the total food waste worldwide which make them key actors to target when aiming at eliminating food waste. They targeted the biggest players in food retailing, whose unsold food items are valued at between 500 and 2,000 euros daily per retail outlet. In less than four years, they gathered 1000 stores, which are now using solutions developed by Phenix to optimize the process of using/reusing, repurposing or recycling unsold items and waste.

At the same time, the two entrepreneurs managed to bring on board numerous charitable organizations involved in food donations and distribution, such as Banque alimentaire (food bank), Secours Populaire Français (major non-profit that combats poverty and discrimination) or Restos du Cœur (chain of French meal centres/soup kitchens), by organizing the collection of food donations free of charge.

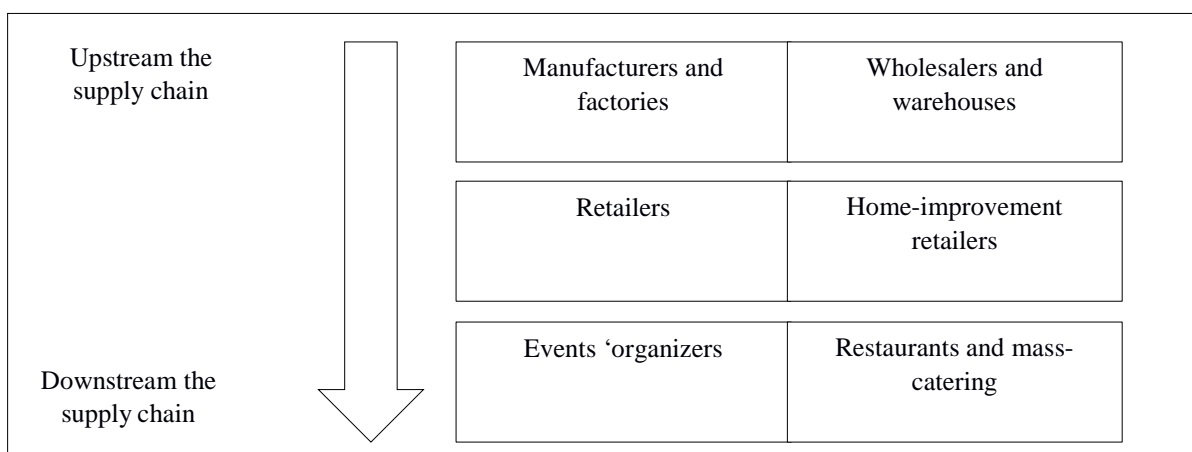
If retailers provide most of the surplus food offered on the platform, Phenix also gathers surplus from manufacturers, big events and restaurants. Figure 10 below shows the six different types of customer



segments Phenix is now operating with. These six different types of customers include upstream actors in the supply chain: manufacturers, wholesalers and “Do It Yourself” stores since Phenix has been developing skills in managing non-food waste; and downstream actors: events’ organizers and mass-catering organizations cooking food for direct consumption. Not all these customers are bound by law to reduce and sustainably manage their waste. However, more and more are concerned with the waste issue and wish to develop CSR policies in this field. This means that new customers might be willing to pay Phenix for sustainable waste management beyond the regulatory constraint existing for food waste. This could be a positive sign for the future of the company and its will to expand internationally in less regulated environments.

On the receivers’ side, if the surplus cannot be distributed as human food then Phenix has to consider other options: some produce can be converted into animal feeds, composted or used for energy recovery, notably through methanation. To do this, the platform serves animal feed companies, discounters and recycling companies. It should be pointed that in Phenix circular business model, these customers (receivers) are not paying the company for its services. As of now, only one side of the two-sided market is paying for the whole service Phenix is providing.

FIGURE 11: PHENIX'S CUSTOMER PORTFOLIO



3.1.3.8 Value Proposition

Value proposition to the main customers served by Phenix, retailers and charities, through its multi-sided platform, has been described in session 3.1.2.1. *Value proposition and customer need assessment*.

3.1.3.9 Revenue streams

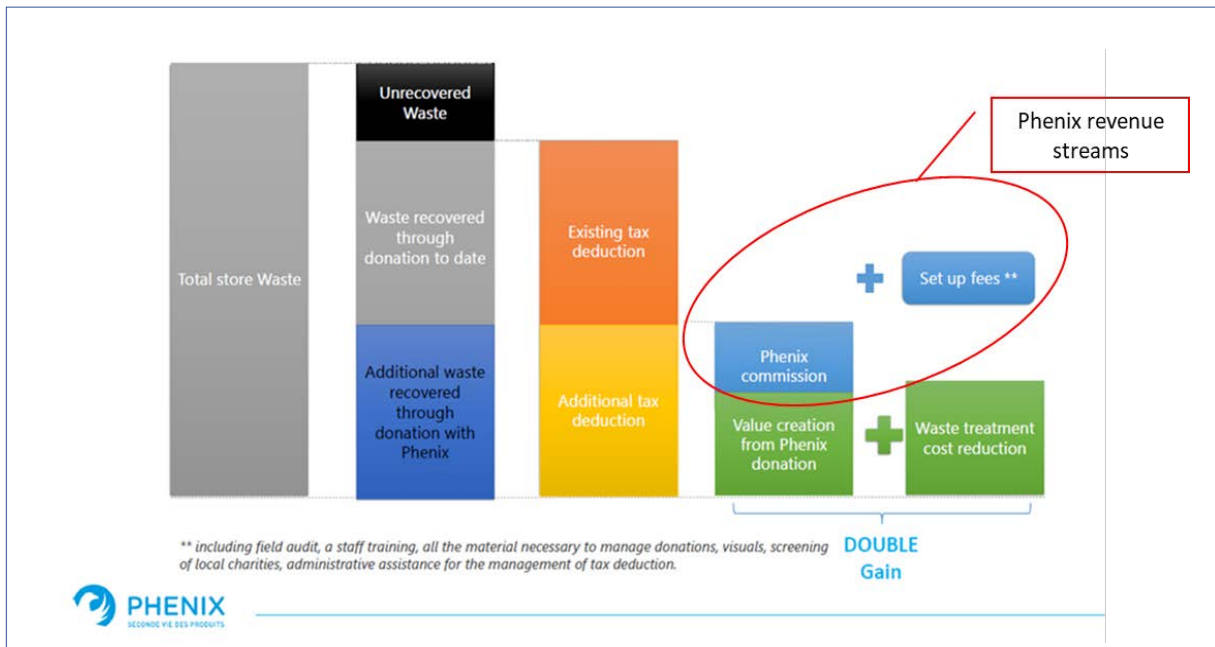
Phenix income mainly comes from its waste management services provided to the customers of one side of the platform: retailers. When Phenix operates through joint contracts with Zéro Gâchis they split the generated turnover. Phenix contract with retailers is built on an annual fixed fee for the collection program. Phenix captures 30% of the amount retailers save on waste management, including tax cuts. Besides commissions, Phenix charges a set-up fee which includes a field audit, staff training, all the documentation to organize donations (brochures, a snapshot of local charities) and administrative assistance for obtaining tax deduction. Food donation receivers do not pay the service.

Phenix is engaged in other activities generating different revenue streams. The company has created a Phenix Lab, an initiative to incubate and support the next wave of start-ups in the circular economy. Through its “studies and consulting” wing, the company is also developing relations with public-sector actors, producers and industrial companies that want to reduce food waste further

upstream in the value chain. Consulting missions for private or public actors and food-waste optimization studies and research are good examples of Phenix exploration and innovation capabilities and knowledge-oriented organization.

These revenue streams make the company profitable and its business model sustainable.

FIGURE 12: PHENIX REVENUE STREAMS (ADAPTED FROM AN INTERNAL DOCUMENT)



3.1.3.10 Social and environmental consequences

Phenix is a mission-driven platform built on a hybrid model that combines business, social and environmental value creation. Overall, the main impact of its activity is to create the ecosystem for fighting against food waste and enable its professional clients' (supermarkets, manufacturers, events sector, etc.) transition towards circular economy, providing innovative solutions to reduce and better recover waste.

The main environmental impact, which is at the core of the mission of the company, is the reduction of food waste, achieved through different levers: helping retailers to better value food items which were traditionally unsold (stickers and discounted prices), thus increasing their sales; connecting retailers with users of unsold food, according to an established hierarchy (first charities for human consumption through food distribution; second animal feeding, third energy recovery through mechanization) in terms of decreasing environmental and social impact.

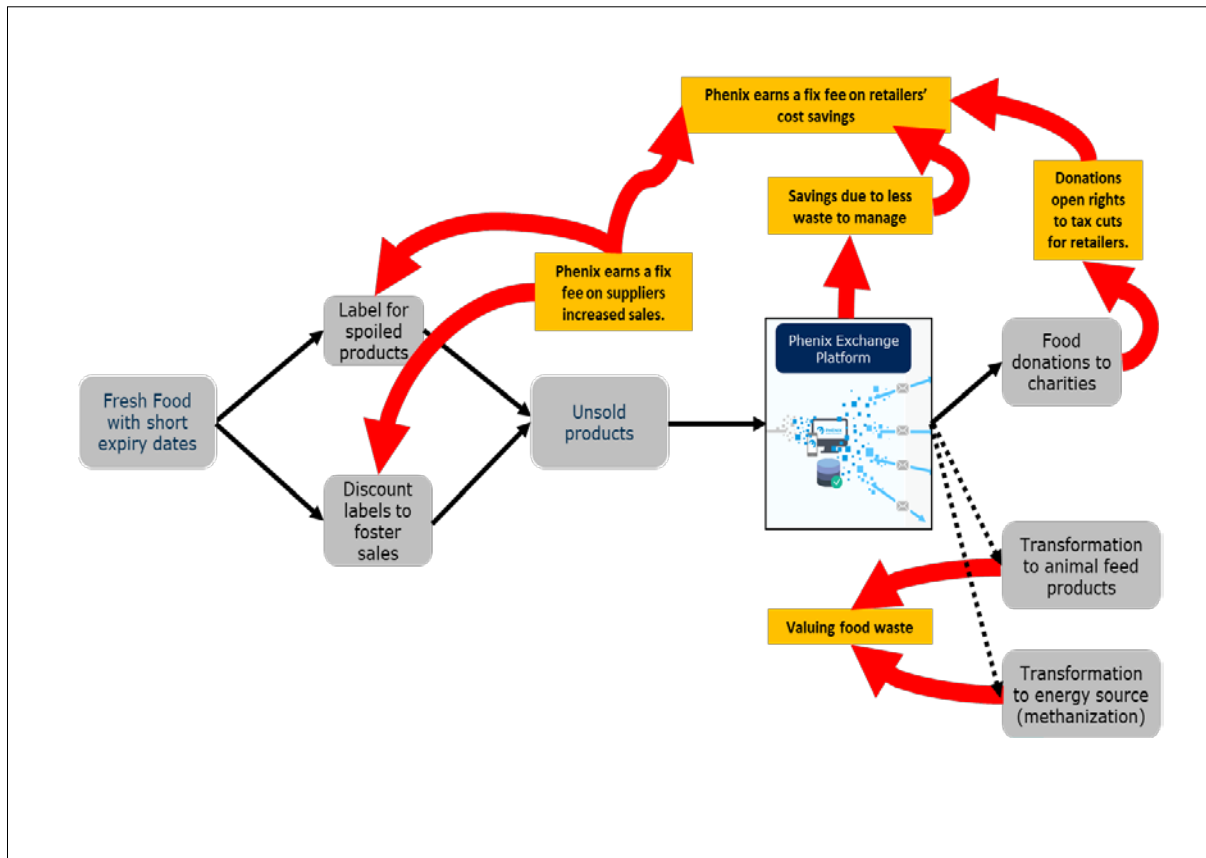
The main social impact is to contribute to food insecurity, professionalizing the collection of food donations to charities and helping local actors (donors and receivers) to get in contact. To a broader societal level, the high media coverage Phenix has enjoyed coupled to its positive lobbying effort, have consistently raised awareness about the urgency to tackle the (food) waste issue.

Overall, the circular value proposition of Phenix is positive for the society, as a whole. It shows how a born-circular business model can create a virtuous circle, generating positive externalities on society. However, when looking closer at this circular business model, we must point out that it goes through reduced income for the State through lower corporate tax. This means that enforcing such value proposition implies fiscal incentives from the State. A thorough assessment of the public costs-benefits could be useful to improve the regulatory framework and adjust incentives.

3.1.4 Material and value flows

Phenix has built a circular business model, connecting suppliers of unsold-food to receivers and users of these items. Overall, the set-up of such circular flows transforms potential waste into resources. To make sense the flow complexity we draw a material and value flow map to identify the main steps and value creations mechanisms along the product life cycle.

FIGURE 13: MATERIAL AND VALUE FLOWS IN PHENIX BUSINESS MODEL



This figure shows how value is created along the life cycle of food products, from shelf to waste. The first type of lever used by Phenix to implement a circular business model aims to reduce the number of unsold products. While retailers already try to optimize their assortment, and refine their purchasing policies, Phenix provides supplementary services. For example, through its joint services with Zéro Gâchis, it helps retailers by labelling close to date products with discount prices or specific messages to prompt consumers to buy them. This creates value for retailers by increasing sales and reducing unsold products.

For the remaining unsold products, Phenix uses its own platform (Phenix Exchange) to match charities demand with suppliers' offer. Thanks to the platform, retailers can distribute a larger part of their unsold products and reduce the total amount of waste. This reduces waste management costs (less time, employees and infrastructures needed), saving money for Phenix's clients. The platform also offers traceability to prove that unsold products are actually turned into food donations. These donations open rights to tax cuts for retailers, a third source of savings. Consequently, Phenix fee is a way of capturing a share of this triple value creation mechanism for retailers.

Finally, to face situations when there is no demand from charities, Phenix has created new channels to value unsold food products by transforming them into animal feeding or energy. In this case, unsold products have a direct value paid by animal feeding and energy companies.

3.1.5 Current strategic evolutions of Phenix Business Model

Since 2017, Phenix is engaged in a process of strategic diversification to extend and renew its business model:

- **Geographic diversification:** next to France, its home and dominant market, the company expanded in Denmark, Spain and Portugal in 2016. It plans to continue its European expansion (Italy, Benelux) and outside Europe (US) in 2019.
- **Vertical diversification:** the company is engaged in both upstream and downstream diversification:
 - *upstream diversification:* the company is trying to prevent waste at the source, through collaboration with industrial partners and distributors. The company is exploring data based services to help clients to reduce their waste.
 - *downstream diversification:* the company is going down the value chain to address end-clients. The company experiments concepts of integrated distribution channels (proprietary grocery shops in Rennes), working with new actors (collective catering), or the ability to adapt its platform for the B2C market. Last the company explores new opportunities for waste valuation, next to its traditional donation model.
- **Horizontal diversification:**
 - the company is extending its model to new markets and new types of waste beyond food-waste (eg. replicating its model to handle waste in the construction industry / specialized distribution such as textile, etc.).
 - It is also exploring how big data and Internet of Things may enrich current services or open new market opportunities
 - Developing research and consulting activities related to circular economy and waste management

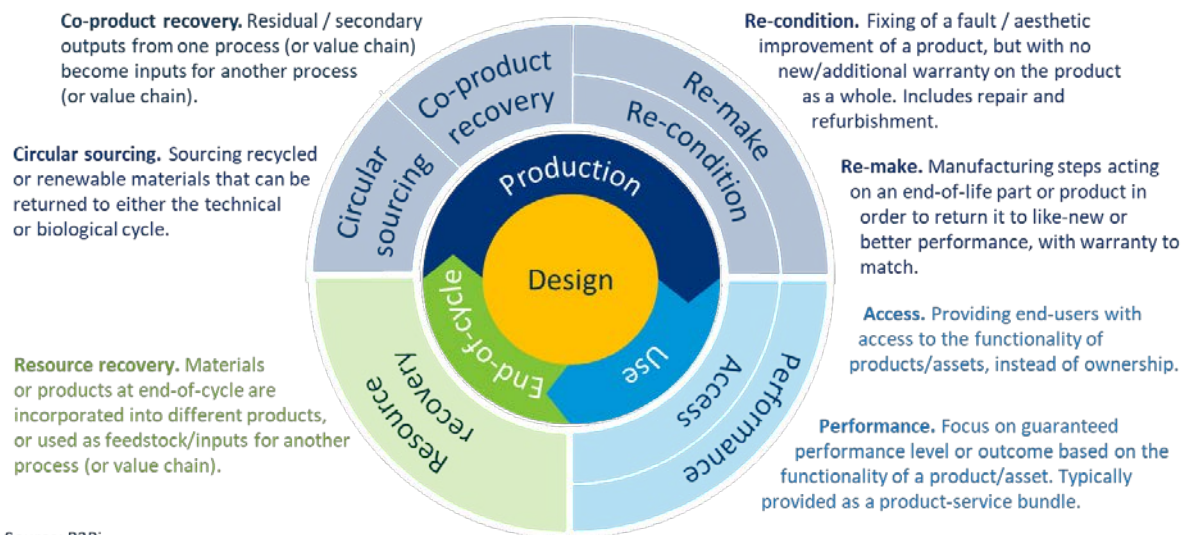


3.2. Assessing the Circular Economy Business Model

3.2.1. Circularity assessment

To understand what is circular with Phenix business model, we use the circular business model patterns figure (see below). This model presents the different steps of products life-cycle from production to consumption and end-of-life. It is presented in a circular way to illustrate the possibilities of creating circular business model by connecting products' end-of-life to the production of new products.

FIGURE 14: CIRCULAR BUSINESS MODEL PATTERNS

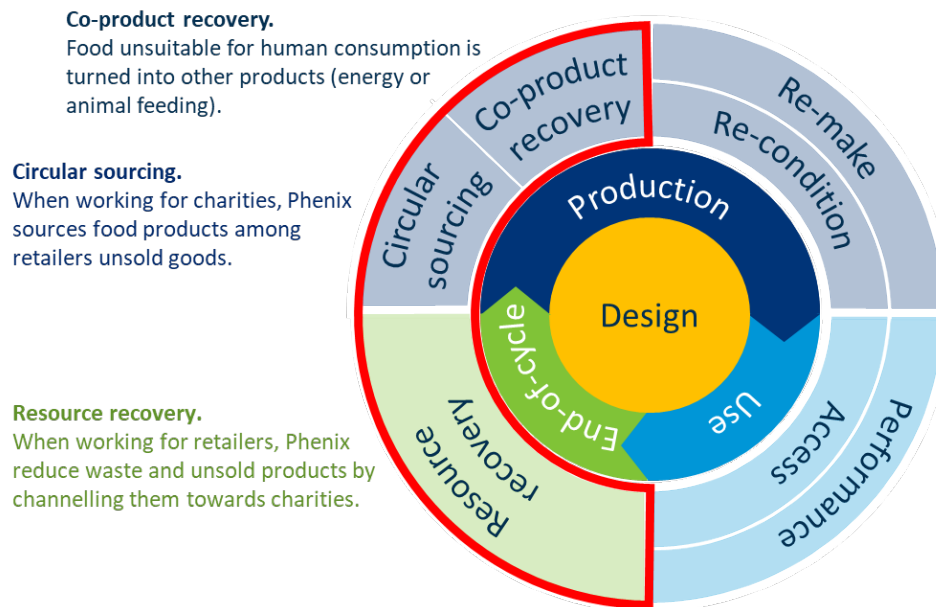


Phenix reveals a unique CEBM pattern, which partially overlaps with three of the patterns identified above (resource recovery, circular sourcing, co-product recovery), but is also characterized by the distinctive feature to rely on a matchmaking platform. This is why we defined Phenix Business Model a Platform-based CEBM, which recalls the Circulation-Platform Operator model (Kortmann and Piller, 2016).

Through its platform, Phenix acts as a service provider, without any direct production activity. Collaborating with several partners, it helps retailers to reduce waste and increase sales. For instance, Zéro Gâchis' label system is a form of product reconditioning. Likewise, retailers' new practice to transform spoiled products into soup is a form of product re-making. Issues of access and performance are not relevant in our case. Food products are perishable goods, it is not possible to increase products longevity by increasing their "performance" or changing the use of food products from an ownership system to an access-based system. This is not applicable to our case study.

The next figure illustrates how Phenix model can be considered as fulfilling different circularity logics, according to the different served customers. The service offered to charities follows the circular sourcing logic, the service offered to animal farms or energy producers follows the co-product recovery logic, and finally, the service offers to retailers ensures the recovery of end-products to prevent turning them into waste.

FIGURE 15: PHENIX CIRCULAR BUSINESS MODELL PATTERNS



Phenix core activity is centred on the management of products close to their end-of life, more precisely on the optimization of food surplus flows. As a mission-driven platform, its bottom line remains to reduce waste. To this matter, Phenix business model best corresponds to the **Resource recovery** business model pattern. However, if the term recovery conveys the idea that the products at end-of-life are used as inputs for a different process, then the word « re-circulation » seems more appropriate to describe the matchmaking role of Phenix. Indeed, Phenix can be seen as a facilitator who allows donators to do Resource recovery and charities to implement circular sourcing.

Accordingly, its model is 100% based on enabling **circular sourcing**. All food items proposed on Phenix' platform come from unsold products and overproduction emanating from retailers' operations. The business model thus entirely rests on the recovery of resources from retailers. Finally, in the case of unsold products improper to human consumption (because food is out-of-date or because charities have no current needs), Phenix levers new channels to recover these co-products (out-of-date food is waste when not proper for human consumption), following the **co-product recovery** pattern. It can be used for animal feeding or turned into biogas to produce energy. However, co-products recovery is not Phenix priority. The priority is to reduce waste by increasing sales and foster circular sourcing for charities.

Overall, Phenix business model is circular in all its operations. As a mission-driven organization, oriented towards waste reduction, implementing circular operations is primary. Pursuing this circular model, Phenix diversification and expansion model looks at create only new circular channels and activities and thus remains a full circular business model. As circularity is at the core of Phenix identity and corporate mission (« give a second life to products »), it is fully incorporated within the organization's business model. Phenix is a hybrid organization combining a for-profit orientation and a commitment towards circular economy. Innovation at Phenix cannot bypass its social mission: no matter the profit opportunity, the company's diversification strategy must remain consistent with circular economy principles and goals.

3.2.2. Financial and non-financial outcomes assessment

Food waste is a critical issue on several levels. It is a source of pollution, a waste of a resource millions a starving people are needing and a financial loss for retailers. With a third of the total food production wasted every year, food waste is a major source of pollution and an environmental mess.

According to the FAO, food waste accounts for 8% of global greenhouse gas emissions¹⁵. Growing, transporting and throwing away this food creates pollution at every level of the supply chain. Phenix's mission of limiting food waste thus have positive consequences in limiting pollution. By better allocating food to those in need and preventing waste at the retail level, waste prevention reduces the amount of food our society need to produce in the first place and limits the pollution generated by the necessary agriculture. Compared to targets to cut emissions in the EU by at least 40% below 1990 levels by 2030¹⁶, the 8% global emission of food waste is significant. In France, "[t]hese losses for human food have a very deep carbon impact, which is estimated at about 3 800 000 t.CO2 per year. It is as much as 1000 tractors doing Lyon – Paris"¹⁷. By tackling this core issue, Phenix confirms it is a mission-driven company.

Food waste is also a critical societal issue and a deleterious waste of resources when millions are starving in France and worldwide. In France, an estimated four million inhabitants are registered for food stamps¹⁸. Our current linear business model and supply chains are not efficiently balancing supply and demand. These unsold products, while million individuals struggle to access food is also a cost for retailers. Phenix estimates that French retailers throw away between 500€ and 2000€ worth of food every day. Confronted to this huge waste, Phenix's mission is to tackle simultaneously these issues through its innovative circular business model.

Currently, its results are very positive. It works with more than 1000 client supermarkets in France through long-term contracts. Over 50 tons of waste is exchanged on its platform daily according to them¹⁹. It represents 18 250 tons per year. Even in comparison to the 1.6 billion tons of yearly food waste worldwide, this figure is encouraging and express the potential of an efficient circular business model in tackling societal and environmental issues.

Partnership with charities channels this unsold food products to those in need, which represents in France, 100 000 meals distributed per day (figure by Phenix, April 2018) thanks to Phenix platform. The positive societal and environmental outcomes of Phenix circular business model are coupled with cost savings for retailers and profits for Phenix which, in 2018 generates a surplus.

3.2.3. SWOT Analysis

According to the overall methodology, we conducted a SWOT analysis of Phenix (see figure below). After a first round of data collection, we created a first SWOT frame. We draw on the common questionnaire (see Appendix B) and our own data collection because the case specificity was not always in line with the questionnaire which focus on industrial organizations rather than service providers. It was then discussed and completed with Phenix members. A SWOT is a basic matrix to give an overall, yet useful, view of a company possible strategic orientation. It is composed of intern positive and negative dimensions (Strengths and weakness, top of the matrix) and extern positive and negative dimensions (opportunities and threats, bottom of the matrix).

¹⁵ <https://www.bcg.com/publications/2018/tackling-1.6-billion-ton-food-loss-and-waste-crisis.aspx>

¹⁶ <http://www.europarl.europa.eu/news/en/headlines/society/20180208STO97442/cutting-eu-greenhouse-gas-emissions-national-targets-for-2030>

¹⁷ <https://www.ademe.fr/sites/default/files/assets/documents/pertes-et-gaspillages-alimentaires-201605-rapport.pdf> (page 129)

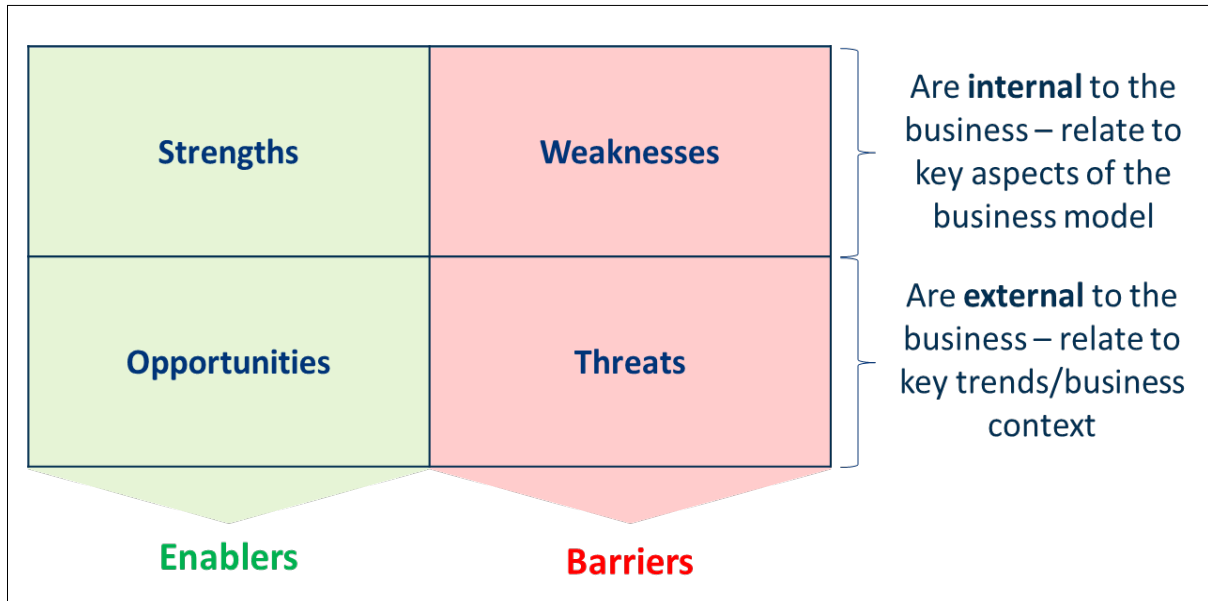
¹⁸ https://www.lemonde.fr/societe/article/2016/11/25/4-millions-de-beneficiaires-de-l-aide-alimentaire_5038023_3224.html

¹⁹ https://www.youtube.com/watch?v=2COwVP_3OP8



The figure below detailed the structure of a SWOT matrix:

FIGURE 16: SWOT GENERAL OUTLINE (SOURCE R2PI)



Each category is detailed afterwards.

FIGURE 17: SWOT ANALYSIS

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> • Strong position in its home market • Positive network effects -> winner takes all • Profitable business model • Excellent image & communication associated with circular economy, with triple bottom line benefits, mission driven identity • Strong partnerships in biface market (and good reputation with nonprofits) • Strong teams • Ambidextrous company, with Strong exploration skills (innovation lab, diversification) and exploitation skills (internal logisticstics /operations) 	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> • For the company: • Business model partly reliant on national regulation limits international scalability • High local entry cost. 6 months to one year to create local networks. • Weak position in other European markets • Paradox: success of the mission of Phenix (reducing waste) implies to decrease their own market • For circular economy: the business model is based on waste generation -> shifting to waste reduction?
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> • Diversification in new areas of activities upstream and downstream the value chain (expertise & service provider, integrated distribution in Rennes) • Horizontal diversification: new type of waste. • Potential for growth in the market • Light assets • Geographical diversification opportunities 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> • Lack of common regulatory and incentive framework in Europe • Customer internalizing the waste treatment service • Regulatory changes in France (the tax cut % can be lowered). • New entrants or acquisition by a waste management company • Saturation of volumes? Optimization of upstream waste management.

Source : Own research

3.2.3.1. Strengths

Phenix is currently leader on its market. This strong position in its home market is self-reinforcing as the platform creates a positive network effect. The more users it has, the more useful and attractive the platform is. Establishing matchmaking platform is usually capital intensive and require large investments. Phenix is currently upgrading its platform and thus reinvesting and organizes a fundraising campaign. Its business model is already profitable which secures future investments.

Phenix is also a leading actor of the food waste recycling ecosystem. It built strong relationships with both actors of its two-sided market: Charities, previously collecting unsold products on their own, acknowledge the Phenix' services increase quantities and quality of the food collected. Retailers recognize the costs saved through a better unsold products management system. Because of its great image, Phenix is also able to gather all actors of the market and develop lobbying activities to defend the present enabling regulations.

Finally, Phenix proves to be an ambidextrous company (Raisch & Birkinshaw, 2008): it simultaneously and successfully engages in exploration and exploitation, the two hands of organizational development. It is able to exploit its business model, to develop its everyday operations and makes them profitable. This monetizes and makes profit out of previous investments and researches. At the same time, Phenix is still working towards improving its business model. Phenix is constantly diversifying and innovating with dedicated teams working towards exploring new potential markets, creating new business opportunities and leveraging its leading position on the market.

3.2.3.2. Weaknesses

The main weakness is that profitability of the unsold food products recovery program is largely reliant on the favorable French regulation. This holds back international expansion and participates in explaining weak position in other European markets.

The current business model of Phenix is also costly to replicate. Regional or international expansion require the constitution of new local networks of retailers and charities. According to Phenix members, this require between six months and one year each time to consolidate networks before the model can be profitable in a new region. Economy of scales are thus limited.

Finally, the business is based on a paradox: Phenix success means retailers produce less waste and thus the need for Phenix services diminished in the long-term. If the market comes to be saturated (which is far from the case presently), it could jeopardize Phenix's profitability. In terms of societal impact, this means that Phenix model requires waste generation. Reducing the total amount of wastes the retail industry, a key goal for our society, giving the detrimental effects of food waste, will eventually harm Phenix present business model.

3.2.3.3. Opportunities

Regarding opportunities, for our informants, the key element is that the market is yet to conquer. They have a small market share if they consider that a lot of supermarkets still do nothing about their waste. Less than a tenth of French supermarkets work with Phenix. Considering their weakness described above, they also engage in diversification to expand their potential market. They keep developing geographical diversifications opportunities in Europe (Italy and Benelux) and aimed at entering the US market soon²⁰. They also started horizontal diversification by launching non-food waste reduction programs through their platform, even though the regulation is different for these products. Horizontal diversification also includes developing research and consulting activities related to circular economy and waste management. Big data and Internet of Things may enrich current services or open new market opportunities. Finally, opportunities lie in vertical diversification. Through upstream diversification, Phenix could prevent waste at the source, through

²⁰ https://www.youtube.com/watch?v=2COWVP_3OP8 (promotional video April 2018)

collaboration with industrial partners and distributors. On the other hand, through downstream diversification, the company is going down the value chain to address end-clients by working with proprietary grocery shops or collective catering.

All this diversification is enabled by Phenix current platform model which entails light assets. Physical investments are limited.

3.2.3.4. Threats

The current threats are weak. There is a lack of common regulatory and incentive framework in Europe which prevents launching copycat subsidiaries rapidly. The regulatory framework in France is, however, unlikely to be radically challenged. The tax cut % (presently of 60%) could be lowered but Phenix members, considers this possibility unlikely. Present contracts with retailers are sometimes jeopardized when retailers, particularly at the group level decide to internalize the waste treatment service.

Another potential threat is a saturation of unsold products to exchange on Phenix platform, particularly if retailers optimize their purchase practices and in-store management. A saturation of volumes would cap Phenix revenue in the food waste market.

Finally, Phenix remains a SME with only 80 employees. This is small compared to the three biggest waste management actors (Veolia, Suez and Paprec). An acquisition by one of those large companies is possible. Similarly, a new entrant, with an innovative technology could rapidly disrupt the market and challenge Phenix current position.

3.2.4. Conditions, enablers and barriers for a Platform-Based CEBM

The case reveals an innovative approach to Circular Economy Business Models (CEBM) based on the development of a *platform logic*, and the creation of an ecosystem of actors involved in (food) waste management. Platform-Based CEBM constitutes a unique configuration in terms of CEBM (Kortmann & Piller, 2016): beyond its role of matchmaker (Zaoual & Lecocq, 2018) connecting peers, Phenix acts as an ecosystem leader (Cusumano & Gawer, 2002) enabling transition towards circular economy of a given ecosystem.

One the key takeaways of this study is that **Phenix constitutes an innovative governance arrangement for circular economy**: Phenix is neither a public actor, nor an organization financed by state or with a public delegation, nor a federal organization created by incumbent companies -such as eco-organisms for waste management in France-. As it promotes sector-wide transformations towards the reduction of waste, Phenix plays the same kind of function as existing eco-organisms. However, it is a market-driven start-up –legally and financially independent from incumbent companies- following both social, environmental and economic objectives. As such, it is an exemplary mission driven company combining private and public value creation logics.

The case suggests that such a governance arrangement has high potential to contribute to the transition towards the circular economy at a systemic level. The main enablers for this type of CEBM pattern are of two types: managerial and regulatory enablers.

Managerial enablers: the case highlights the need for specific innovation skills and dynamic capabilities. As regards internal capabilities, the company combines excellent execution skills (operational excellence, fundraising capabilities) with high innovation capabilities, appearing as an *ambidextrous organization* (Raisch & Birkinshaw, 2008). To amplify the social and environmental



benefits of such platform-based CEBM, the company must be able to conduct a wide-ranging diversification. For example:

- by moving from an “end of life” approach (managing waste) to upstream levers (preventing waste).
- By learning from existing success stories to replicate the CEBM to other sectors and markets (B2C, other waste, etc.)

Beyond internal capabilities, the company acts as a platform leader (Gawer & Cusumano, 2002), able to reshape and orchestrate relations (for example between supermarkets and charities) within its business ecosystem. This is done through a variety of mechanisms:

- intensifying, professionalizing and mainstreaming the relationships between distributors and charities;
- organizing their exchanges;
- taking part in the execution of the engendered flows;
- anticipating new societal, regulatory and economic trends;
- structuring innovation –incubating start-ups- and research in the field.

Regulatory enablers:

Regulatory incentives for food donations have played a key role in the development of a profitable and scalable business model. In the case, the regulatory framework combines fiscal incentives with coercive measures, which provided an impetus to design a profitable and sustainable business model. This was key for the company to explore new services, markets and diversification opportunities.

The case suggests that well-designed regulation, combined with private innovation capabilities can create virtuous circles for the development of circular economy business models. Likewise, clear and well-designed regulatory incentives could facilitate the development of similar business models at a European level.

Barriers:

Phenix success is the result of a rare encounter of an enabling regulatory regime and a set of unique managerial skills. As such, barriers can either come from the absence of a clear and incentivizing regulatory regime, or from the lack of internal managerial capabilities to expand the platform and disseminate its model.

Without a more homogeneous European regulation, the business model will remain hard to expand internationally.



4. Discussion and conclusions

4.1. Summary and conclusion on the case study: a Platform-Based Circular Economy Business Model

Created in 2014, Phenix is a successful, fast-growing start-up which was “born circular”, with the mission to “*unleash the potential of waste*”. Phenix subscribes to a business logic, with profit and growth objectives, while at the same time pursuing an environmental and social mission. It is, therefore, an example of a “mission-driven organisation”, built on a hybrid model that combines business, social and environmental value creation.

The case reveals an innovative approach to Circular Economy Business Models (CEBM) based on the development of a *platform logic*, and the creation of an ecosystem of actors involved in (food) waste management. Through its two-sided platform, Phenix connects “suppliers” of unsold food -retailers- and “receivers” of donations -charities-.

Relying on a favorable regulatory context (2016 law against food-waste in France), the company has *identified a profitable business model* and has experienced constant growth since its creation.

By connecting supply and demand through its *platform* and operations, Phenix achieves *triple bottom line benefits*, by creating both economic benefits for its clients (to date, mostly supermarkets), social benefits for food charities (who get access to food for free) and environmental benefits by reducing the quantity of waste.

To date, the company’s main focus is food-waste, although Phenix is currently engaged in a wide-ranging process of horizontal, vertical and geographical diversification.

The potential vulnerabilities of the case study are linked to the need to preserve a favourable regulatory context, the need to build market opportunities beyond charities, and the relatively high resource intensity of scale-up processes.

4.2. Key business and policy insights

Key managerial contributions:

- Platform-Based CEBM constitute a unique business model configuration, likely to reshape relations among stakeholders at a sectoral level
- Phenix reveals some central innovation capabilities required to develop a Platform-Based CEBM:
 - The company combines excellent execution skills with high innovation capabilities, appearing as an *ambidextrous organization* (Raisch & Birkinshaw, 2008).
 - Beyond internal innovation capabilities, the company acts as a platform leader (Gawer & Cusumano, 2002), able to reshape and orchestrate relations (for example between supermarkets and charities) within its business ecosystem.

Key contributions for public policy:

- Platform-Based CEBM offers an innovative governance arrangement (neither public, nor sectoral/federal), with high potential to achieve Circular Economy benefits at a systemic level
- Well-designed regulation, creating private incentives, is crucial in the development of such platform-based models



- Well-designed regulation, combined with private innovation capabilities can create virtuous circles for the development of circular economy business models.
- Organizational structures hybridizing private and public welfare logics (mission driven companies) should be sustained and encouraged



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Appendix A: Phenix's contextual analysis tool results



Appendix B: Phenix’s business model strengths and weaknesses

		Weaknesses					Strengths					
		N/A	1	2	3	4	5					
Value Proposition												
	1						X					Our value proposition fulfils all significant needs of target customer segments
	2						X					Customer satisfaction is high
	3						X					Our value proposition has strong network effects
	4						X					Our charging and pricing models effectively meet customer needs and expectations
	5						X					We do not capture 'sustainability value' created for customers
												We fully capture 'sustainability value' created for customers
Cost/Revenue												
Margins	6						X					Our margins are low compared with competitors
Revenues	7						X					Our revenues are unpredictable
	8						X					Each sale requires additional effort
	9			X								We earn no revenue before incurring costs of goods/services sold
Costs	10						X					Our costs are unpredictable
	11	X										Our product cost structure is substantially higher than that of competitors
	12						X					Our service cost structure is substantially higher than that of competitors
	13				X							Our cost structure has low economies of scale
	14				X							Our cost structure is asset-heavy and costs are mainly fixed
	15					X						Our cost to serve customers is misaligned with customer segments
Operating Model												
Key Activities	16			X								Our key activities can be easily copied by competitors
	17			X								Our key activities need significant investment in order to scale with growth
	18						X					Our key activities do not fulfil the core competencies we need
	19						X					Our key activities poorly support circular economy within our business model
Key Resources	20						X					Our key resources do not meet the needs of our business model
	21						X					Our key resources poorly support circular economy in our business model
	22				X							Our key resources can be easily built or acquired by competitors
Key Partners	23						X					Key partners do not provide us with competitive advantage
	24						X					Key partners poorly support circular economy within our business model
	25				X							Key partners do not contribute any value to us for free
	26				X							Customers do not contribute any value to us
Customer Interface												
Customer	27						X					We do not understand the full potential value that could be created for customers
Segments	28						X					Customer loyalty is low
	29						X					Customer churn is high (customer retention is low)
	30						X					New customer acquisition rate is low
	31					X						Our market share is shrinking
Customer	32						X					Our customer channels do not effectively communicate our value proposition
Channels	33						X					Our customer channels do not effectively deliver our value proposition
	34						X					Our customer channels are misaligned to target customer segments
	35						X					Our customer channels do not effectively reach target customer segments
Customer	36						X					Our customer relationships are weak
Relationships	37						X					Our customer relationship model(s) are misaligned with customer expectations
	38						X					Our customer relationship model(s) are misaligned with our value proposition
	39			X								Our customers can switch to a competitor at any time

