



PARI(S)

COMPOST !

Faites le pari(s) du compost !

THE AVANT-GARDE TEAM

Aziza Chebil,
Connector



Maggie Schultz,
Restorer



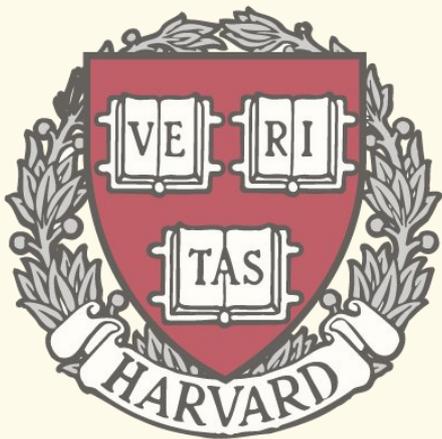
Kan Parthiban,
Futurist



Elodie Lemesre,
Achiever



Educational Partners:



SciencesPo.



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01 Executive Summary



- Paris lacks a systematic city-wide collection of
- biowaste for compost. Human behavior is difficult to change, and **PARI(S) COMPOST!** has two streamlined strategies to ensure the success of sustainable development goals for a city-wide biowaste collection system:

ADVOCACY



EDUCATION



An active **advocacy** for government mandate



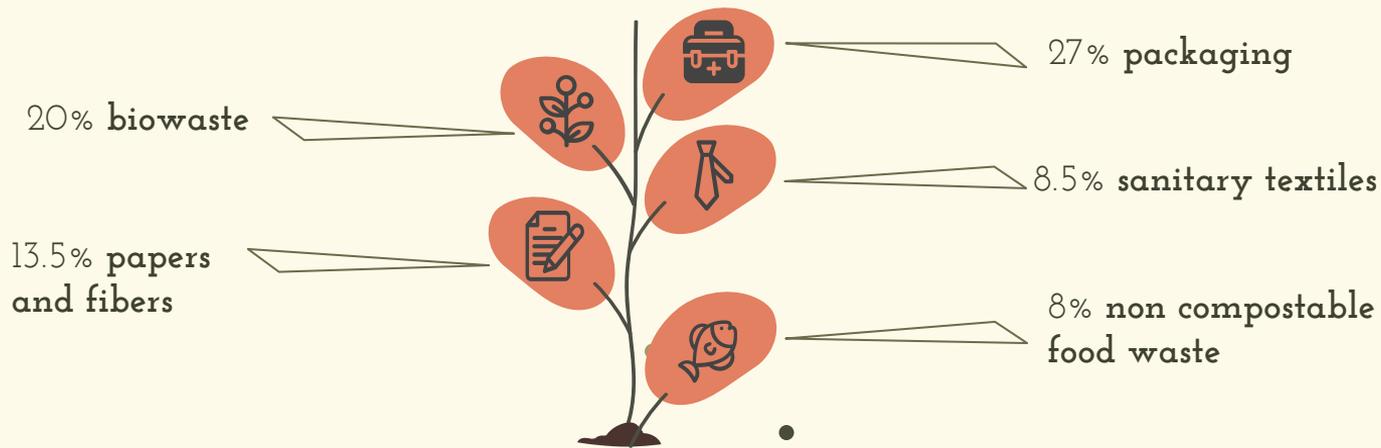
An **educational** outreach for the general public

02 Issues and Background



The Problem

Biowaste represents about **20%** of the total waste of Parisians [1].





The average
Parisian throws
away
three times
more than the
average French
citizen [2].

A large, thick black outline of an apple with a stem and leaf. A dashed line starts from the bottom of the apple, loops around, and ends near the map of France.

The Zero Waste
Strategy voted by the
City of Paris Council is
focused on reducing its
food waste
in half by 2025
[3].



Paris lacks mandatory & accessible city-wide composting

Paris' sustainability efforts can only be achieved by **mandatory legislation** and by overall **citizen participation**. Currently the municipality has launched initiatives to facilitate composting for Parisians. However, there are not enough composting systems in place to eliminate the tons of biowaste that are going into the regular waste stream to be incinerated (about 78% of the total waste) or buried (2.5% of the total waste) [4]. In order to achieve a circular economy, the biowaste (or food waste) that is currently being thrown away in the regular waste stream needs to be sorted as compostable waste. By incinerating biowaste, there are several **environmental consequences** including burning freshwater that is stored in the food waste, contribution to air pollution and depriving soil of organic matter [5].

COMPOST.

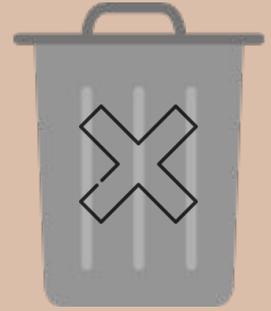
microorganisms do all the work

Composting is the decomposition process of transforming organic matter into a nutrient-rich, **natural fertilizer** known as compost. The full conversion from **biowaste to compost**, on average, takes approximately three months and requires active turning weekly.

Composting reduces and prevents the release of methane gas into the atmosphere which has 26 times the greenhouse gas effect of carbon dioxide. It also increases the **moisture holding capacity** and **nutrient composition of soil**, boosting the biological activity [6].



What is compostable?





The United Nations Sustainable Development Goals



The United Nations Sustainable Development Goals are a collection of 17 global goals set by the United Nations in 2015 as a call towards a more peaceful and prosperous future.

PARI(S) COMPOST! is inspired by and addresses four of these goals.

Quality Education

SDG 4.7. Pari(s) Compost! aims at educating Parisian **middle-schoolers as well as primary-schoolers** regarding the practice of composting and its benefits. Composting workshops would be inserted in teachers' **syllabuses** during the school year. Those workshops would involve as much the parents as their children. A **Compost Celebration Day** would also be organized every year to raise awareness on waste management issues.



4.7 "By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development" [7].



11.6 “By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management” [8].

Sustainable Cities & Communities

SDG 11.6. The act of composting will drastically contribute to the **reduction of CO₂** emissions caused by the incineration of waste, therefore contributing to a more sustainable city and community. Furthermore, Pari(s) Compost aims at advocating for the compost to be used as fertilizer for community gardens, landscapes, and urban farms, creating a **closed-loop system** within the city of Paris.

Climate Action

SDG 13.3. Pari(s) Compost! aims at increasing awareness of the general public on the issue of composting and air pollution. The project will focus on fostering **an educational campaign** in Paris through the organizations of punctual events, the distribution of flyers as well as informational statements on the bins regarding compost and its benefits.



13.3 “Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning” [9].

17 PARTNERSHIPS FOR THE GOALS



17.17 “Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships” [10].

Partnerships for the Goals

SDG 17.17. The technical realization of the project implies the creation of partnerships between **public** (the municipality of the 4th arrondissement), **private** (the waste collection company, Derichebourg) and **mixed entities** (the composting facility owner, Syctom), as well as the general **public**. These partnerships would mutualize shared **knowledge, technology, and financial resources** of these entities in order to provide Parisians with a viable biowaste sorting solution.

03 Previous Approaches and Solutions



GLOBALLY

San Francisco,
California

Cleveland,
Ohio



Seoul,
South
Korea

IN PARIS

Private Organizations

Individual
Composters



Subsidized
Biowaste Bins



San Francisco (USA)



Photo Credit: Cheryl Evans/The Republic 2017



San Francisco made composting mandatory in 2009

- 1990 : San Francisco diverts 27% of its waste
- 2009: Composting becomes mandatory
- 2011: 600 tons of organic matter per day was composted.



Success: The city currently diverts about 80 percent of its waste from landfills and aims to achieve zero waste by 2020 [11].

South Korea



South Korea went from recycling 2% of its food waste in 1995 to 95% in 2019:

2003: dumping food in landfill was banned.

2013:

- compulsory food waste recycling using special biodegradable bags
- waste collection at multiple apartment complexes across the city.



Success: The country achieved a massive reduction 36,000 tonnes of food waste and saved 7 billion dollars [12].



Photo Credit: MAX S. KIM / Huffpost 2019

Cleveland (USA)



Photo Credit : cccfoodpolicy.org



The city is creating an opt-in, public private system, 'Compost Collaborative'.

The program provides household composting services including educational materials and bins to willing residents. The food waste is picked up alongside trash and composted at a large bin on city property.



Success: The city can use the resulting compost for landscaping, community gardens, or to sell [13].

Composting in Paris

🍏 “**Composteurs de quartiers**”: These facilities are supervised by associations and supported by the municipality. Citizens have to sign up to be able to throw their biowaste in the bins during opening hours.

🍷 **Main issue:** The existing *composteurs de quartiers* are too full and often cannot receive more participants [14].

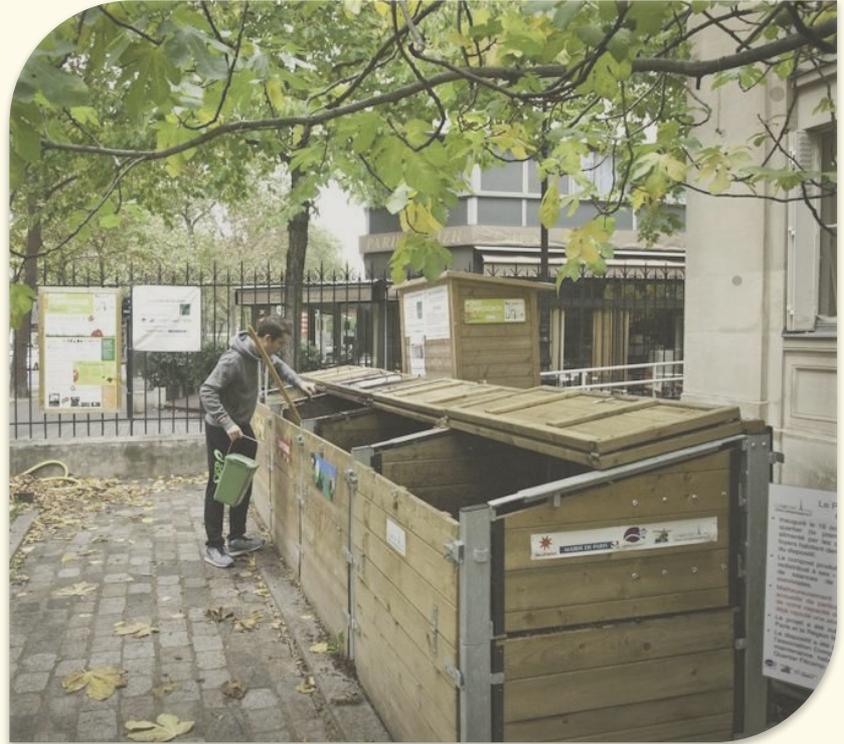


Photo Credit: Un Peu Bocaux, A La Folie, 2015.

Composting in Paris



Photo Credit: Ville de Paris, 2019.



Individual composters: The municipality has launched 3 campaigns of giving individual composters for free to 500 citizens in the past three years.



Main issues: The demand for compost is extremely high. More than 4,000 Parisians signed up for the last campaign. Also, some Parisians do not have a use of the compost they produce at home (eg. they do not have gardens)

[15].

Composting in Paris

 **Biowaste bins:** Since 2010, the municipality provides citizens with biowaste bins in their buildings if they apply. In 2016, 256 condominium, 186 schools and 35 administrative buildings took part in the initiative.

 **Main issue:** In some of the buildings, there is a lack of space to implement a compost bin, making it difficult to generalize this measure [16].



Photo Credit: *BFMTV*, 2016

Composting in Paris



Photo Credit: We Demain



Les Alchimistes: A Paris based non-profit using bikes to collect organic waste from professionals including supermarkets, restaurants, and offices. They process the biowaste at their electro mechanical composter inside the city.



Main issue: The project is not city-wide and is only available to those who pay and opt-in [17].



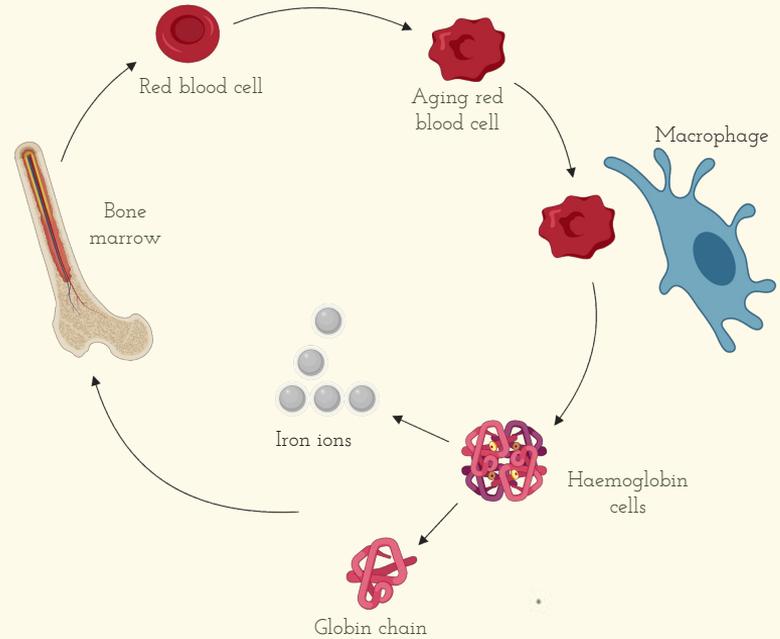
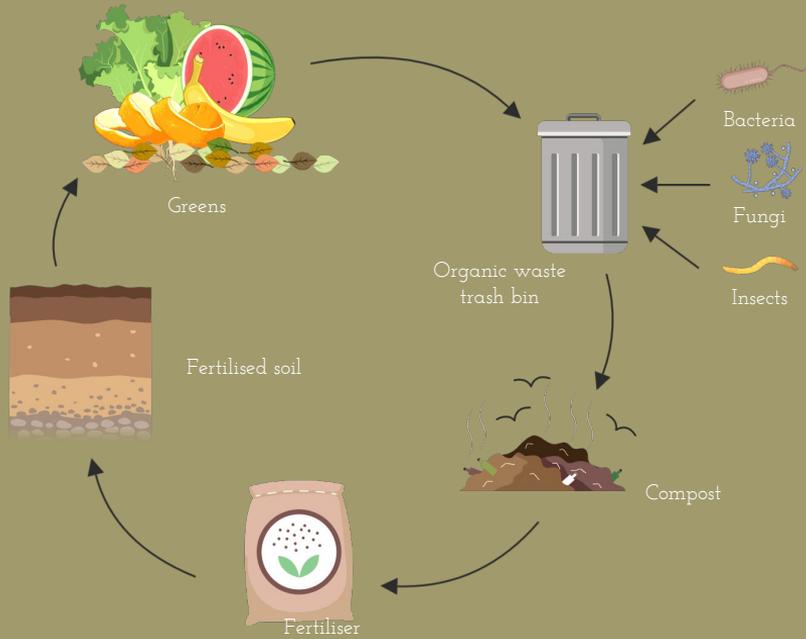
04 Biological Metaphor



Composting

VS

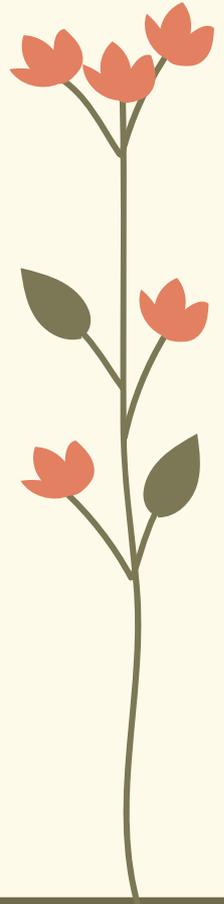
Red Blood Cells



Composting models the functioning of **red blood cells**

Composting vs. Red Blood Cell Recycling

Our bodies have intricate ways in which they function. Since energy and primary materials are so **scarce and important**, it has to maintain their level so they can be used by as many tissues as possible. Red blood cells are developed in the bone marrow and live on average 120 days. Since they continue to **change shape** to pass through narrow blood vessels they have to get destroyed when they are too damaged. Eventually they get recognized by macrophages in the spleen, liver or lymph nodes and they die. Most of the leftover compounds, such as iron, are **recycled** to form new red blood cells and hemoglobin is stored in the liver (LC Biology Class 1, Organism, 2019). In a way, we can say that the body is reusing the rest of those cells to remake new ones. Composting works the same way; it's a **natural biological process** that should be a necessity to each community to reuse their green waste in agriculture.



Composting models the function of **red blood cells**

05 Business Plan





Value Proposition



PARI(S) COMPOST! presents varied **public solutions** to urban composting. Unlike private sectors, **PARI(S) COMPOST!** offers **consultation and advocacy** for a mandatory expandable **composting legislative initiative** through localized large scale biowaste receptacles and public **educational measures**.



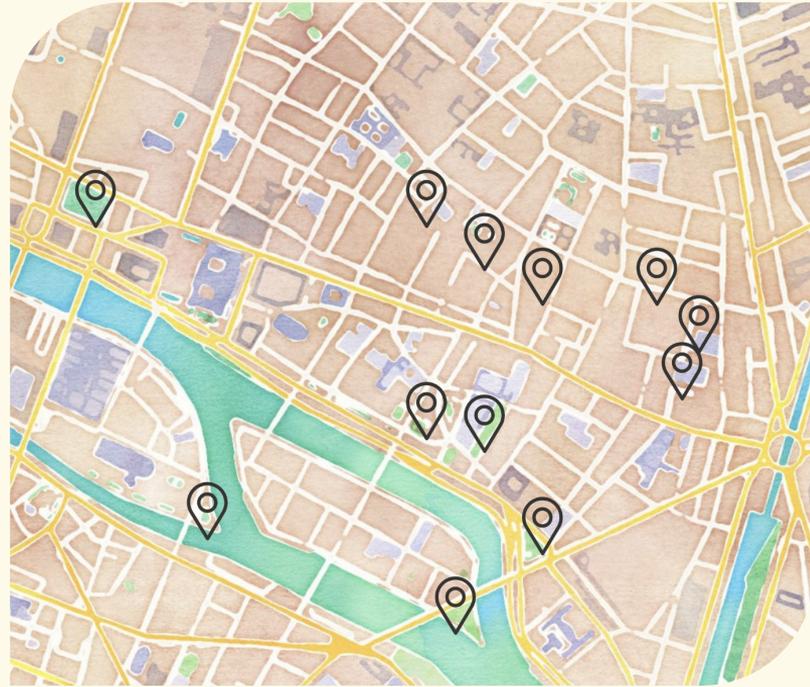
What are we doing?

PARI(S) COMPOST! aims at **providing citizens with biowaste receptacles in public spaces**. Our pilot experimentation would initially take place in the **4th arrondissement** and would expand to be city-wide.

 **Why the 4th ?** Its socio-demographics are the most suitable for this small-scale localized experimentation. The arrondissement has a population size of about 28,000 people in 2019, and it is not an arrondissement where numerous composting options are available. Furthermore, the arrondissement is mostly composed of young people (the average age is 41 years old) making it more likely that people will be accepting of environmental-friendly initiatives [18].



Photo credit: Glasdon



4th Arrondissement Proposed Collection Sites

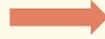
How are we doing it?

The centralized collection bins would be implemented in **public parks**, as they are a frequent point of passage for Parisians in their daily routine and are often where the most biowaste is generated. Through having 12 biowaste collection points, citizens of the 4th arrondissement would be able to transport their biowaste easily to these centralized locations. Although trash and recycling are both currently collected from the curb, **public collection sites** for organic waste would reduce the overall carbon emissions of the project. Furthermore, these sites would solve the problem of constricted space and narrow residential streets that further prevent the collection of biowaste.

Key Partners



Mairie de Paris



Key Resources

Provides **biowaste bins** in the parks of the 4th arrondissement



Syctom



Facilitates the **picking up** of the biowaste
Sends it towards appropriate **composting facilities**



Environmental
Associations and
Companies
(Zero Waste France...)



Partake in the **public education campaign**
Provide funding by purchasing advertisements on the compost bins



Timeline of Implementation



Stage 1:
Public education,
legislative advocacy,
and networking

Stage 2:
Implementation of
pilot composting
program in the 4th
arrondissement

Stage 3:
Expansion to the 18th
arrondissement and to
other feasible
arrondissements

Stage 4:
100% Biowaste
sorting for all of
Paris

Continual until 100%
biowaste sorting

~1 to 4 years
By 2023

~3 to 6 years
By 2025

~11 years
By 2030

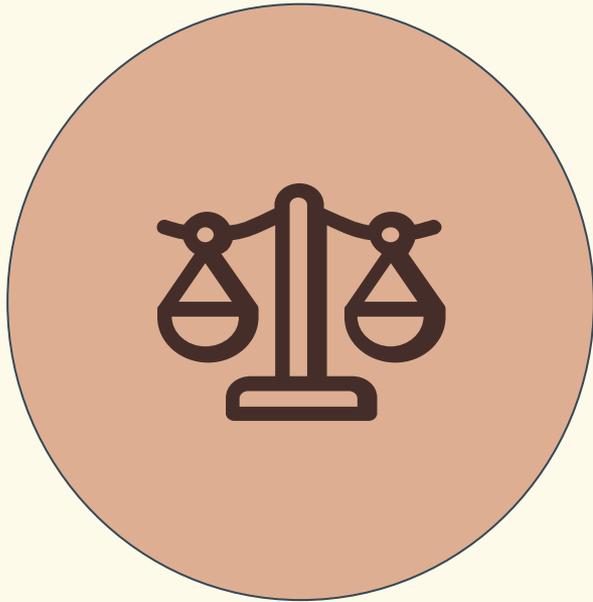


Stage 1.1: Public Education

“It’s not
in the
Parisian
culture.”

These words from a representative from Marie de Paris illustrate the **skeptical mindset** towards the **feasibility of citywide composting**. It is extremely important to Pari(s) Compost! to demonstrate to the public that not only can large scale composting be achieved but that it must in order to **ensure a sustainable future** for the city. Another part of the first stage of Pari(s) Compost!’s work would be to inform the citizens of the benefits of composting and the **environmental and economical effects** of food waste. Our goal is to shift the consumption based culture of Paris to a culture of consumption awareness and **community-based** responsible waste management. Our **education** efforts will involve advertisements through brochures, events, and canvassing for the project.

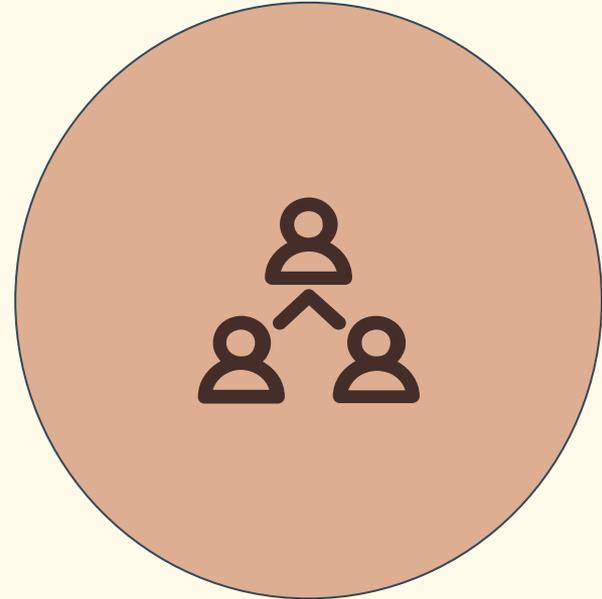
Stage 1.2: Legislative Advocacy



Pari(s) Compost! will **advocate for mandatory biowaste recycling** to kickstart the initiative. The Energy Taxation Law of 2025 mandates that each county must provide a solution to citizens for sorting their waste [19]. In order to meet this mandate, Pari(s) Compost! legislative efforts would **encourage the municipality** to ban throwing out food waste. Furthermore, it would advocate for an expansion of this project to the entire city of Paris as well as **generate public funding** for the initiative.

Stage 1.3: Partnership & Networking

Pari(s) Compost! plans to **partner** with Sycotom as the third-party waste collection service. The company would pick up the waste from the 12 locations at least once a week and transport it to their biowaste plant in Est Ensemble, Paris Est Marne. Furthermore, this stage would involve finalizing partnerships with **environmental associations**. These groups would purchase ads on the outside of the biowaste receptacles. The **sponsored ads** would both **educate the general public** on environmental issues and fund the project.



Stage 2: Pilot in the 4th



Pari(s) Compost! aims to utilize funds from advertisements to purchase 12 'Biowaste Bins Abri Conteneur Modus™ 1280' from Glasdon®, the unit costing €1997 [20]. It is ideal for buildings, courtyards, and public parks. The bins are designed in a way that will minimize the attack of rodents.. They will be **installed in parks** around the 4th arrondissement. Their installation will signify the commencement of the project, and from then on, citizens will be expected to bring their food waste to these receptacles.

Stage 3: Expansion to the 18th



After initiating the project in the 4th arrondissement, Pari(s) Compost! plans on expanding to the **18th arrondissement**. With over 200,000 residents in 2019 and a more diverse population, this arrondissement poses a **greater challenge** in mandatory composting [21]. Nevertheless, the number of public parks in the district allows for the project to be adapted to a larger setting.

Stage 4: Expansion to all of Paris

Current Population

26,796



Pilot: 4th Arrondissement

199,135



Expansion: 8th Arrondissement

2,220,445



Ideal Goal: All 20 Arrondissements

As the population graph shows, expanding this project to all of Paris would provide biowaste sorting to a much greater amount of people. While difficult, Pari(s) Compost! anticipates that the ongoing work with the municipality and environmental agencies will provide sufficient funding to upscale the project. While other arrondissements are currently working on their own composting systems, Pari(s) Compost! plans to **expand to all districts** lacking an easy biowaste collection system.

Potential Incentives & Developments



Navigo Card

Citizens scan their metro card and then deposit their green waste, earning rewards for the quantity and quality of the waste.



Communal Reward

The 4th arrondissement earns a collective reward, such as community events or parties, for meeting a percentage reduction in biowaste thrown away.



Compost App

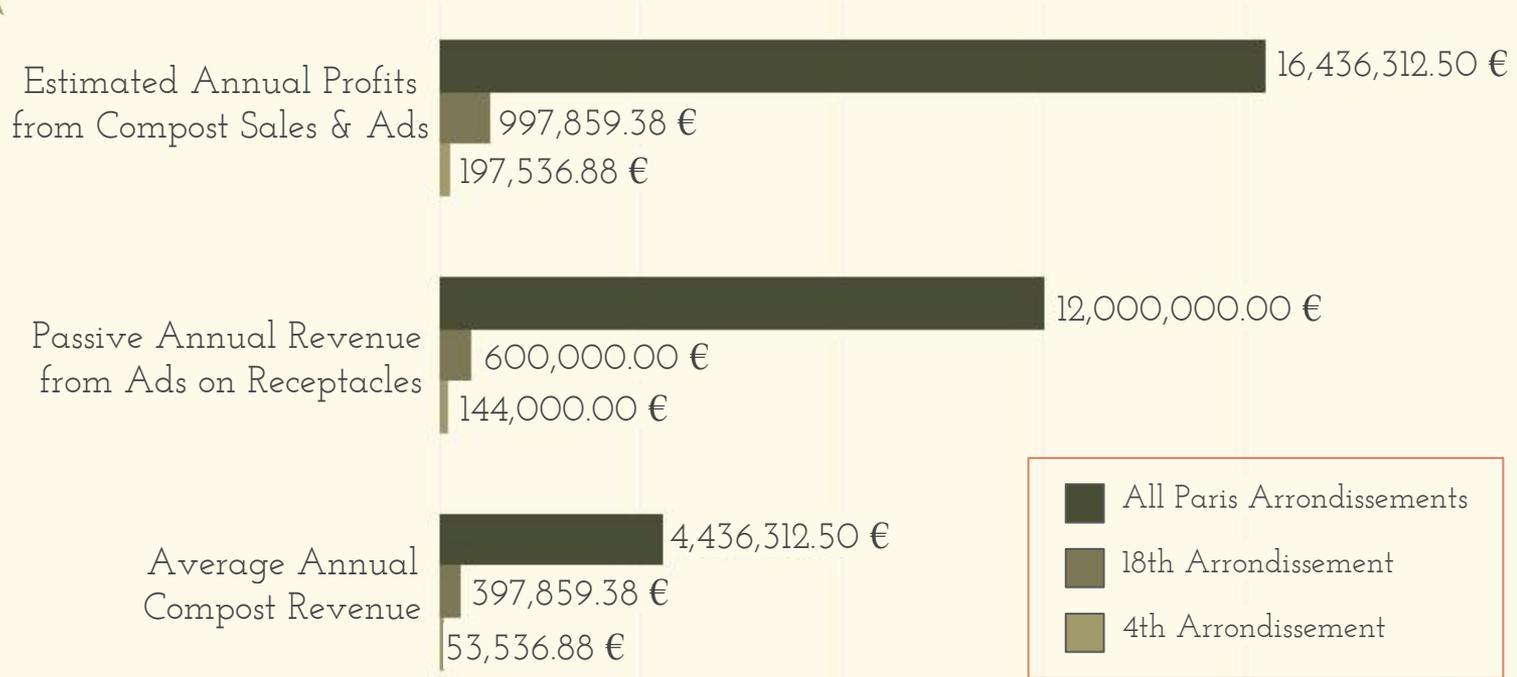
Residents use their phones to find the nearest food waste receptacle and scan a QR code to identify themselves, once again earning rewards for the quantity and quality of the waste.



Coin System

Users deposit a coin before throwing away their food waste in order to make the act of recycling food waste more conscious.

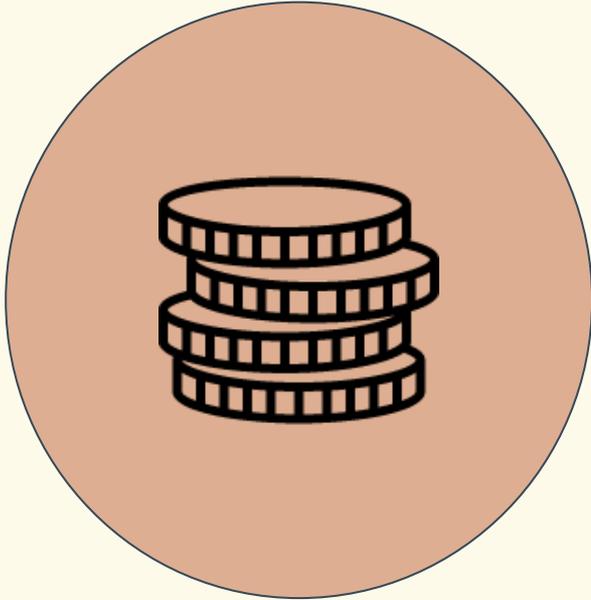
Proposed Revenue Streams & Projected Profits



Proposed Revenue Streams & Projected Profits

	4th Arrondissement	18th Arrondissement	All Paris Arrondissements
Population estimate 2014	<u>26,796.00</u>	<u>199,135.00</u>	<u>2,220,445.00</u>
Individual biowaste generation kg/year	29.00	29.00	29.00
Annual biowaste estimate kg/year	777,084.00	5,774,915.00	64,392,905.00
Annual biowaste estimate ton/year	856.59	6,365.75	70,981.00
Sales from low-end compost - \$25/ton retail	\$21,414.75	\$159,143.75	\$1,774,525.00
Sales from high-end compost - \$100/ton retail	\$85,659.00	\$636,575.00	\$7,098,100.00
Average compost revenue (50/50 mix)	\$53,536.88	\$397,859.38	\$4,436,312.50
Communal neighborhood composting bins	15.00	50.00	1,000.00
Ad cost per bin	\$1,000.00	\$1,000.00	\$1,000.00
Passive revenue from ads annually	\$180,000.00	\$600,000.00	\$12,000,000.00
Estimated Total Profits:	\$233,536.88	\$997,859.38	\$16,436,312.50

Proposed Revenue Streams & Projected Profits



One of the main revenue sources to fund the composting program for the City of Paris is the expected **sales from the compost** made with the collected biowaste from within Paris. The compost is anticipated to be sold to urban farmers to enrich the local Parisian soils contributing to a **closed-loop circular economy**. Another source of revenue is anticipated to come from the **advertisements** on the physical biowaste receptacles. Advertisement spots could be allocated to eco-friendly or eco-oriented local businesses as well as educational institutions and organizations. However, the advertisements would be a passive revenue stream as they would not generate enough revenue to fund the entire project. The projections of the revenues were calculated using current market rates for compost and the current market rates for advertisement spaces.

06 Assessment Plan and Proposed Impacts



How do we assess our results ?

The **Pari(s) Compost!** will provide a monthly assessment of the results of the experiment to major stakeholders of the project. This monthly report will inform our partners about the various dimensions listed below.

Targeted biowaste collected out of the total biowaste of the 4th:	Presence of non biowaste within the bins	Perception of the public	Compost quality
1st month: 40%	Assessment of presence by analyzing the trash collected from the bins.	Monthly interviews with the residents of the 4th arrondissement to question them on their perception of the biowaste bins.	Assessment and reporting of compost quality every month by Sycotm to ensure it conforms to legislative standards.
2nd month: 50%.			
3rd month: 60%.	Adjustment of the information campaign according to the results.		

Desired Impacts



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Interview Personals:

Les Alchimistes:

- Alex Guilluy
- Arthur Berta



Marie de Paris:

- Anne Laure Beraud
- Patrice Poignard
- Lola Bergès



Cityzens Factory:

- Nicolas Le Berre





Teaching Staff



Dr. Robert Lue
Dr. Alan Viel
Michel Becuwe
Magda Maaoui
Julie Le Bot



“I find that **a real gardener** is not a man who cultivates flowers; he is a man **who cultivates the soil**. He is a creature who digs himself into the earth and leaves the sight of what is on it to us gaping good-for-nothings. He lives buried in the ground. He builds his **monument in a heap of compost**. If he came into the Garden of Eden, he would sniff excitedly and say: **“Good Lord, what humus!”**”

Karel Čapek, *The Gardener's Year*, 1929 [19].

