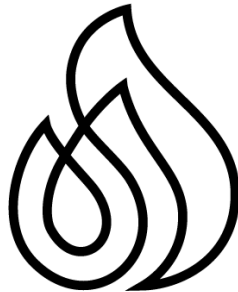


ENERGIA

Design for evolving
scenarios

Anshika Dhawan
Ilaria Greco
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promitheas

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Innovation Studio

MSc. Product-Service
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2022-2023

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*Prometheus. A long ago,
when mankind was shrinking
in their caves, he had defied
the will of Zeus and brought
them the gift of fire. From its
flames had sprung all the arts
and profits of civilization.*

Madeline Miller

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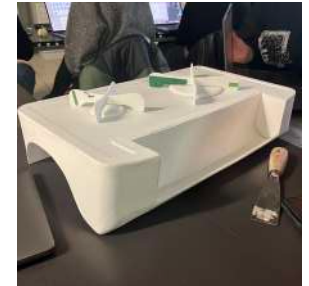
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INTRO

Energy Poverty in Social Houses in Milan



ENERGY POVERTY

Energy Poverty in Social Houses in Milan

"A situation where a household or an individual is unable to afford basic energy services (heating, cooling, lighting, mobility, and power) to guarantee a decent standard of living due to a combination of low income, high energy expenditure and low energy efficiency of their homes."

- European Commission definition.

Energy poverty describes a phenomenon that does not have a uniform definition. In the global North, it is more related to resource scarcity and access to fuel, while in the global South, it is more related to fuel quality. Even in Europe, there is no official definition of whether an individual is or is not energy poor.

Because of its vague nature and the difficulty of defining what "necessities" and "wellbeing" might mean, it is a problem that relies mainly on the experience of those living through it. It is a stressful and invisible si-

tuation in many cases that has come to light in recent years because of war, inflation and a general rise in the cost of living. While researching the topic, we realised it is a systemic and deep-rooted problem. However, we have tried to look at coping methods of people and developing technologies as a way to manage it, while a better definition and better considerations are taken into account to act against it.

Who are the most vulnerable?

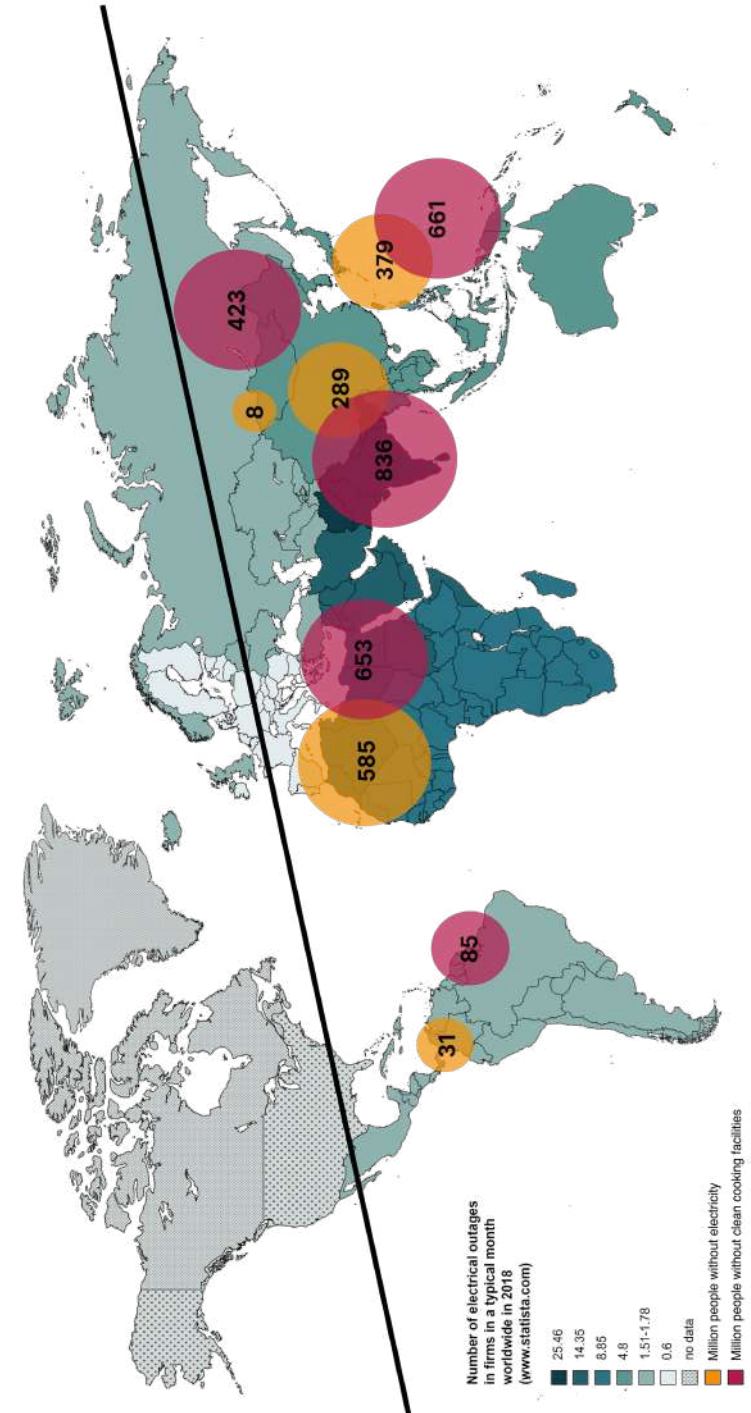
Our research has always focused primarily on Europe, thus remaining anchored in the global North. Energy poverty occurs when people do not have adequate access to energy services (light, heat, heating and cooling) to live a decent life.

Rationally, this means that those most exposed to the problem are already in a position of vulnerability. These will be people belonging to disadvantaged social categories (people with disabilities, single parents, immigrants and people from ethnic minorities, to name a few).

The low-carbon problem

One thing we noticed right away was how in more privileged parts of the world, there is a correct push for a low-carbon footprint, with countries acting to develop clean energy sources with the target of 2035.

However, plans to transition to a low-carbon economy in the global North have raised concerns about the impact of environmental policy on more vulnerable citizens. A just transition is risky for energy-poor households, which are already disadvantaged. Understanding this is important to have a fair input and allow the poor to be a priority when thinking about a cleaner energy future.





COPING MECHANISM

Coping with scarcity in the home

A key factor is that energy poverty is not an immovable force. It is a failure of the system, rather than of individual choices, that locks households into fuel vulnerability.

Systemic failure comes in many forms, mainly in a lack of government assistance and access to jobs for the already vulnerable individuals, which leaves them with fewer resources to access essential services. People have been able to cope with energy poverty for many years because of its silent nature.

On the individual front, people seek small shortcuts and quick fixes to reduce energy bills. Most have to deal with the perception of domestic discomfort, finding a shortcut to feeling comfortable at home and adapting according to the conditions they face. However, this creates a stressful situation for households in need as not one solution is a quick fix for every discomfort caused by

their energy vulnerability. Several actions are taken, ranging from going for a walk to deal with the cold, meeting an acquaintance at their home, heating only one space in the house to simply moving to a smaller one.

Most of the strategies are to manage two primary necessities, climate maintenance (heating and cooling the home) and sustenance (cooking). When needs remain unmet, people revise their hierarchy of needs to cope.

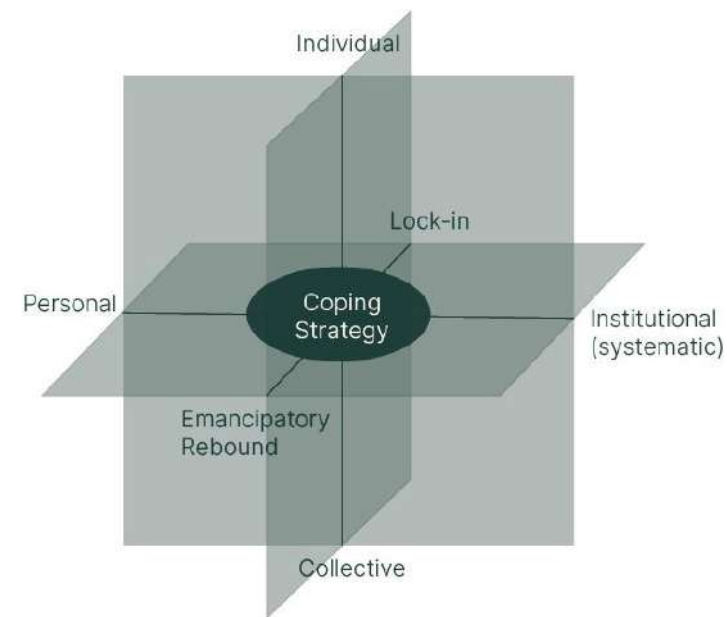
Coping in community

One of the main coping mechanisms that kept coming up in our research was in the collective sphere. Many individuals suffering from energy poverty will seek support and information and look for groups providing "resilience reserves" to help

them cope with the situation. Being part of a social circle and having access to community support is thus totally related to the ability to control the emotional load created by being in a situation of fuel vulnerability. Most of the strategies in these resilience groups are the same management techniques and quick fixes found in the individual sphere, but community building has the additional advantage of creating a safety net and a mechanism for stability.

Energy poverty tends to carry a stigma around it. Like generalized poverty, the poor are seen as "irresponsible" despite the evidence of its structural nature. In this sense, collectives and bottom-up organizing are a way to feel resilience and create a network of support for those who already seem isolated by nature. Newer studies in the matter have highlighted that the collective participation of consumers in problem-solving is empowering. Participation in social movements, in particular, makes the lived experience of the energy vulnerable visible and leads to their collective self-empowerment. Actions and

activism surrounding the issue have become intertwined with the idea of community, especially throughout Europe. These communities are no longer necessarily tied to a geographical location but by shared values and the advantages of digital connection. Participation can now extend to crowdfunding and issue canvassing from the other side of the world.



Stojilovska et al., [2021]. The device shows a crossing of concepts where the coping strategies come to light when a certain number of structural conditions. One axis describes whether the solutions are in the collective or done on its own. The second axis describes the conditions of the lock-ins, whether they come from the personal [size of family, single parent home, age, etc] or the institutional [poverty, class, race, gender, etc]. The final diagonal axis describes how strong the consequences of energy poverty are for the individual and how much can the coping strategy actually help.



SCENARIO

—



MILANO 2023 - 2028

One of the most significant reasons why more people are falling under the poverty blanket is the rise in energy prices.

Of all forms of energy, natural gas has become the most expensive one. These increases in pricing have prompted key markets to switch back to other types of energy, such as coal. Increasing CO₂ threatens the planet and the green goals of modern Europe.

Natural gas prices increased by +41.8% in 2022. The tenancy agreement for residents of public housing stipulates that individual tenants have to pay the bills, which puts this target group in great difficulty, especially as more than 20% of them have an ISEE of less than 3,000 €.

Tenants are reacting by reducing their energy usage. It happens in various ways: turning off the heat, by concentrating all their activities in one particular room, so that they only heat one place in the house. They also reduce gas usage by not cooking, eating raw food or using the microwave to heat pre-cooked food. The variety and quality of the food they are

making are rapidly decreasing. This results in the health of this population declining. There is a need for a cheaper, eco-friendly way of powering their cooking so that people can have an alternative for a nice, homemade meal every day without risking their health and the planet.

Social housing as a starting point

The severe economic crisis we are facing now in Europe will continue to worsen over the next five years. More and more people will no longer be able to pay their rent, especially their utility bills, thus becoming energy poor.

What the city of Milan does to help this part of the population is to accelerate the supply of social housing for protected segments of the citizens. By 2022, social housing will have doubled to 2550 dwellings. In this increased speed, people are also occupying formerly unoccupied flats, which means there is no time for renovations or adaptations. The already rapidly decaying housing stock

is not considered a priority, as most of the attention is on housing these people. This number is not enough to help all 9414 citizens who applied this year. Because of their structure and organization, public housing allows us to help a homogeneous group of users who experience the same socioeconomic situation and are likely to share an interest in our project.

The areas where council houses rise usually bring together many equal buildings with an orderly urban organization. Therefore, it is easy to plan the number of touch-points in the area to distribute the population of the popular stock.

Transitional years: how we are approaching the future of energy

As mentioned in the context, throughout our understanding of Energy poverty in the global North, we realised that we must pay special attention when considering disadvantaged groups.

In the coming years, in the search for cleaner energy and to break the dependence on Russian gas, Italy and Europe, in general, will look into investing

in renewable sources and taxing those who rely on carbon-based fuel. However, this will create tension for already vulnerable people. That economic strain reflects in mental and physical tension as not only are they looked down upon, increasing the stigma surrounding poverty, but they are in the position of having to lower the quality of their livelihood. We see our pro-

duct-service as a transitional stone for those disadvantaged. It's a temporary solution that helps maintain a sense of agency when transitioning towards a greener city.



Milan 2022- 2023

Absolute poverty in Milan hit its peak in 2020 after the Covid-19 pandemic hit its peak. Until 2022 1.9 million households where in poverty around Italy (around 9.4%).Electricity prices in Italy hit an all time high of 737.43 €/MWh in August of 2022. Even though Milan is one of the wealthiest regions in Italy many of their vulnerable populations have been hit by the price increase. Since 2016 a2a Group pledged to help with the energy issues across Italy by founding Banco dell'Energia, however external forces like the pandemic and war have pushed energy prices to keep increasing.

The new 20's: Inflation and war

The last years have meant a turning point for the stressors that exalt Energy Poverty. The Covid-19 pandemic pushed for a global recession, and the recent war actions in Ukraine have created an opening to re-evaluate Europe's dependency on Russian gas as a cheaper energy resource. In Europe, electricity bills increased by 111% and power bills by 69%. In

Italy, energy costs have risen by 59%, exceeding the standard living costs and creating more stress for those already vulnerable or in energy poverty. When it comes to energy alternatives, we must once again remember the need to understand that the most vulnerable are already disadvantaged and do not have the resources to bear a costly transition.

Housekeeping and the "kitchenless" city

When understanding the coping strategies of those households dealing with energy poverty, we discovered that many have to do with housekeeping. Exploring the social aspect of energy management, we found that sharing systems for fuel and kitchens have evolved as a way of dealing with housework, starting with communal kitchens in Japan and Peru to energy sharing in Congo. It was initially hard to see how these could adapt to a more individualistic society like the one found in Italy, but again we went back to the idea that communities and

shared resilience have many shapes and forms. In most of Western Europe, the energy consumed by only housekeeping duties adds up to almost 30% of the national energy supply. People spend half of their time on housework, they generate an average of 30.1 kilos of waste per person per week. Once upon a time, social and collective housing shaped the types of houses themselves, seeking to improve the lives of the people they served. The housing and housing products were seen as a tool for social and urban transformation. What will these

co-living and housing strategies look like in the future? Are services shared? In the future, housing typologies and urban strategies will look at how to blur domestic and social spaces even more. Not only as a fluid space but one that allows more autonomy for the inhabitant within the restrictions society provides. Domestic and social environments are merging in a symbiotic way.

Understanding the HOW is the task the design challenge would have to face.





SOCIAL HOUSING

Social housing is a stock of housing that intends to serve a group of the population, based on their income and assets, are unable to secure ADEQUATE housing in the market where it lives.

This can obviously vary by context and management and formally correspond to the specific cultures and traditions [It

is very different talking about Soviet housing and modern Japanese housing tenements]. A quick search will tell you how historically, social housing has been moving away from the needs of the people inhabiting it, disconnected from the urban network and left to their own devices, with a lack of recogni-

European Subsidies

On the European front, the Directorate General for Energy of the European Commission has shown particular worry about the energy efficiency of social housing because, in many countries, it is one of the housing situations that seem to lead to greater vulnerability to fuel poverty. The Commission has

called for subsidizing incentives [communication, financing, etc...] to reduce the cost of tenant and heated electricity models. The Commission is trying to establish and collaborate with initiatives to accelerate and ensure a green transition for the social housing sector.

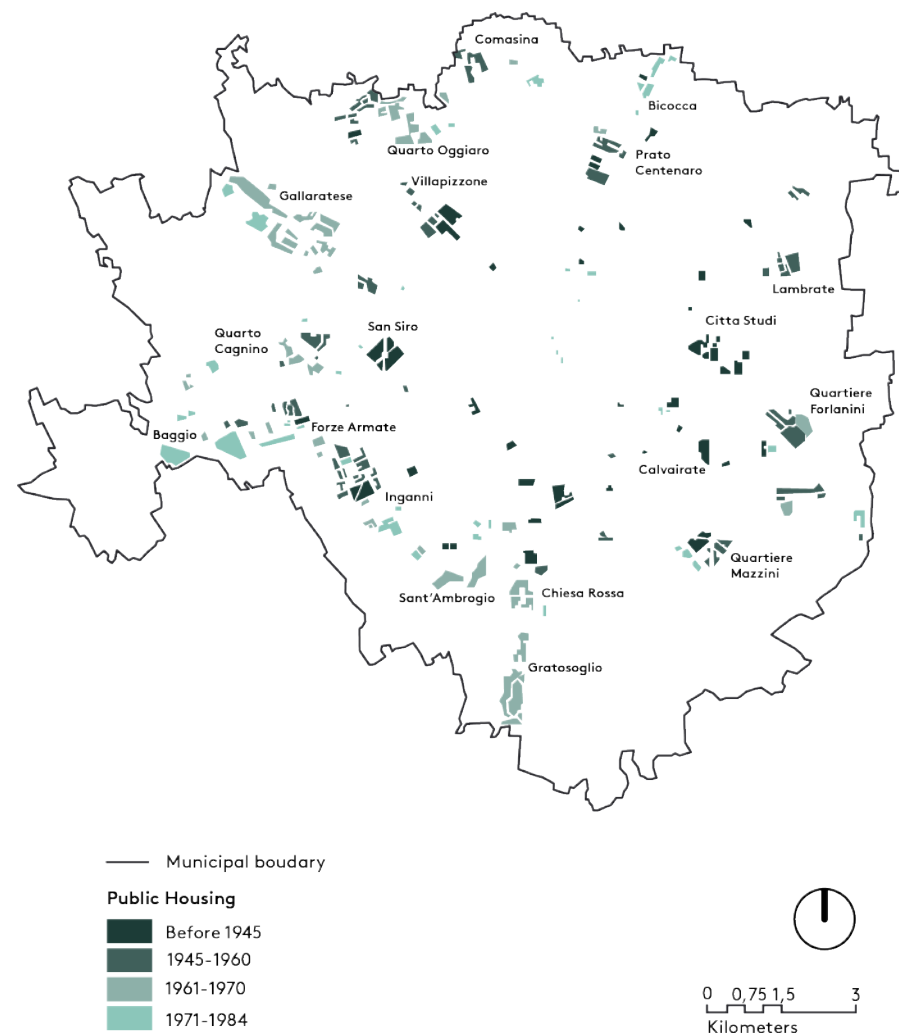
Social housing in Milan

Housing production happened during industrialisation from the late 1940s to the mid-1970s. This phenomenon occurred mainly in the city suburbs and led to a general belief that it had changed the urban social geography. Today, disadvantaged groups (including ethnic minorities, the elderly, single-parent families and the disabled) are the principal inhabitants of housing estates. Most of the stock shows signs of (often severe) physical deterioration. The fact is that many tenants do not pay their rent, and electricity, water and or gas bills have led to degradation and social conflicts within the buildings.

A vicious circle linking fragmentation, lack of investment, degradation and illegal occupation afflicts a high percentage of Milan's large housing estates.

The estates of Gallarate, Barona, and Quarto Oggiaro face several problems in terms of ageing structures (50 years old on average), unemployment, and youth unemployment. The most deprived areas are Quarto Oggiaro and Selinunte. The former has the highest rates of unemployment (12.5%) and young people out of work and out of the study (27%). Selinunte has the second highest population (22,210), with a concentration of ethnic minority groups (30%). Gallarate is also very deprived regarding youth

unemployment and ageing but has the lowest number of migrants (4%) and the highest home ownership (82%). But there are also housing estates such as San Siro, Comasina and Baggio with relatively low indices of deprivation in terms of unemployment, youth unemployment, and very low shares of rental accommodation (respectively 20%, 18%, and 32%). Significantly, the concentration of social problems is also due to long-term deprivation and the lack of job opportunities.



Social Housing Stock in Milan
Source: Social housing in Italy: Cultural continuity, social change and future scenarios.



THE DESIGN CHALLENGE

How might we provide a reliable and accessible shared system to bridge the access to a housekeeping basic like cooking?

How might we help enhance the experience and agency of those disadvantaged because of energy poverty?

How might we encourage a transition to a greener future that has those disadvantaged individuals in mind?

SERVICE
—



TECHNOLOGY

Urban metabolism and biodigestors

During our research towards alternative forms of energy, we stumbled upon systems of urban metabolism. The use of a passive biodigester system is nothing new it has been used for many years in the Global South in rural spaces in India, China and South Africa and newly built cities in the Peruvian Amazon jungle.

The idea behind urban metabolism is that instead of seeing the biodigester as just one solution, it can be implemented into existing city systems of waste management, shifting the flow of resources through a city. In the new system, waste follows a path closer to one of nutrients

and products occurring in a natural ecosystem.

The waste [food waste and organic waste from urban parks] and wastewater [sewage and stormwater] produced by the urban mass become a primary resource that becomes fertilizer and biogas to be reused and sold, adding a financial incentive for the city and their dwellers as well.

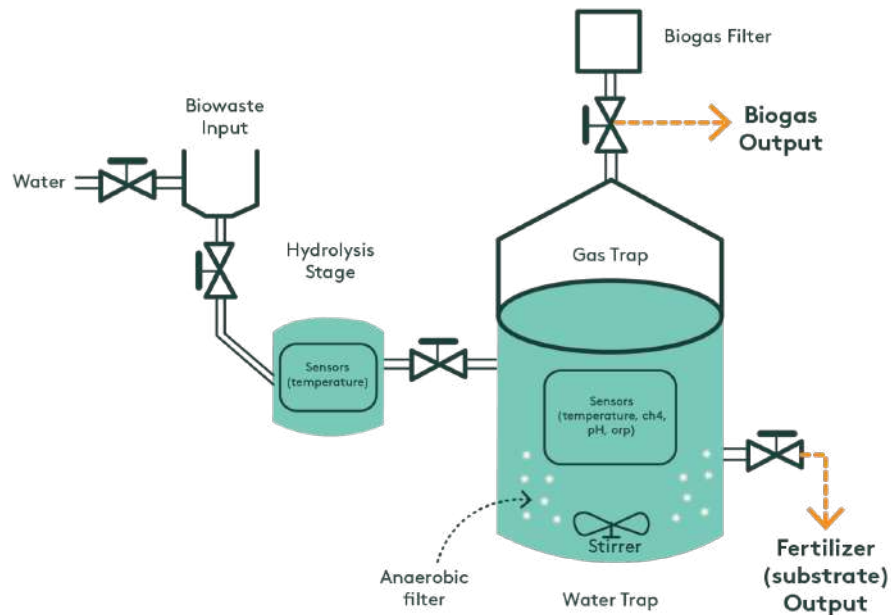
Waste management based on biodigesters would directly affect the urban system by closing the loop between organic wastes and food production in the form of usable gas for everyone's homes.



Biodigester

Biodigesters are popular tools in South America, where plant wastes abound and energy demand is high and widespread throughout the country. Smaller facilities can also be found in urban areas of Western countries, for example in the agrarian environments of North America. But while in Western countries this technology is only a method of obtaining additional energy, in Latin countries harnessing these wastes is now a necessity, and this has pushed the technology to pinnacles of avant-garde and modernity.

Anaerobic biodigesters are sealed containers that break down organic matter in an oxygen-free environment, producing methane-based biogas and nutrient-rich biosolids. They can accept a wide variety of organic wastes, from food waste and sewage sludge to agricultural waste and manure. The type and quality of inputs affect the outputs: food wastes, for example, have a high energy content and are valuable for biogas production. Food wastes can also produce high-quality soil amendments because of their low contamination.



Canister

Canister: The canisters have a re-sealable valve that allows them to be connected and disconnected from the stove even when they are not fully empty.



Stove: The pipes that connect the burners to the canister end on a safety valve. In case of pilot outage, they are used as controls to turn off the gas flow. By simply pushing the canister into the stove valve, it clicks and gets locked into place.



Kiosk: At the end of the pipes connecting the main gas cylinder with the portable ones for refilling, there is a no-return safety valve that allows for only one-way flow of gas. This prevents the biogas to go back into the main cylinder, causing reactions or even explosion.



PROMITHEAS

Our service is formed by bridging existing services and new technologies in order to create a easy transition for the most vulnerable to energy poverty.

Creating a way to get alternative fuel for the most basic need: cooking.

In the process we rely on the preexisting networks of waste management and social housing network, partnering in a way to create a feasible implementation.

What

Promitheas is a service that looks to democratize alternative access to energy, with a communal system that bridges the transition for those who are most in need.

How

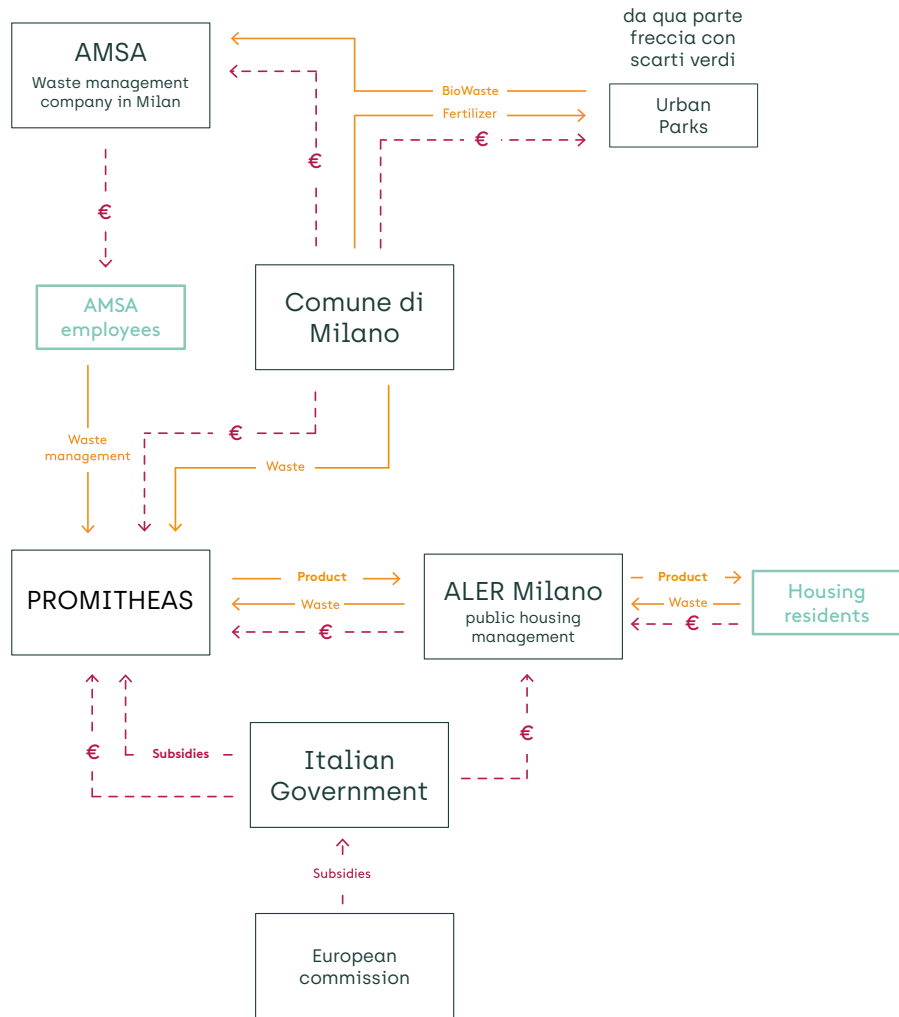
We provide a series of touch points that allow for an alternative cooking fuel without having to move away from their social housing estates. Access to the main touchpoint: the Promitheas cooker, and signing up to the system allows for users to access an unlimited amount of biogas only by providing their waste in the secondary touchpoint: The Kiosk. There they can also refill the gas cannisters for further use. We combine a municipal biodigester to the already existing waste management systems, closing the loop between waste and energy.

Why

When thinking about the near future of energy we think of the transitional space towards clean energy. We believe that everyone despite their situation should be able to access clean energy without having to struggle economically.

When thinking of those struggling with energy poverty our research has pointed to the vulnerable and the disadvantage and we want to think of them as the genesis of the service.

SERVICE SYSTEM SCHEME



The Service Scheme shows the connections between the Promitheas Service and our main stakeholders, direct or indirect.

STAKEHOLDER MAP

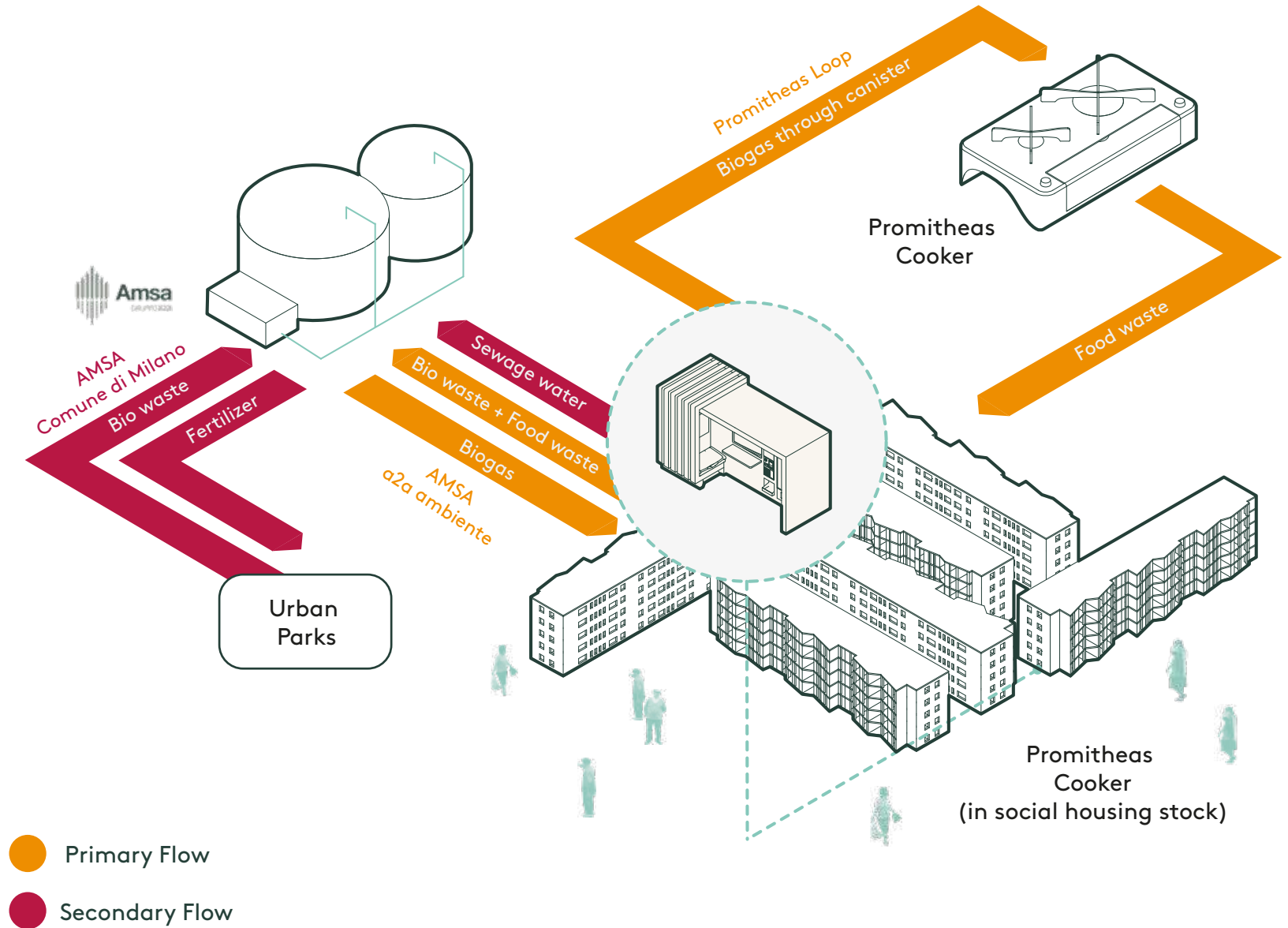
The stakeholder map shows the stakeholders of Promitheas. Our most direct ones are our users, the social housing tenants. There are also our core partners, AMSA and their workforce. These are considered as the stakeholders that Promitheas manages closely. The system needs their co-operation to co-ordinate but they also reap the benefits of

the secondary services provided by Promitheas. They are a part of the "keep informed" and "keep satisfied" stakeholders. Finally, there are the indirect stakeholders that consist of the Italian Government and the European Union, they only provide funding and subsidies to the system.

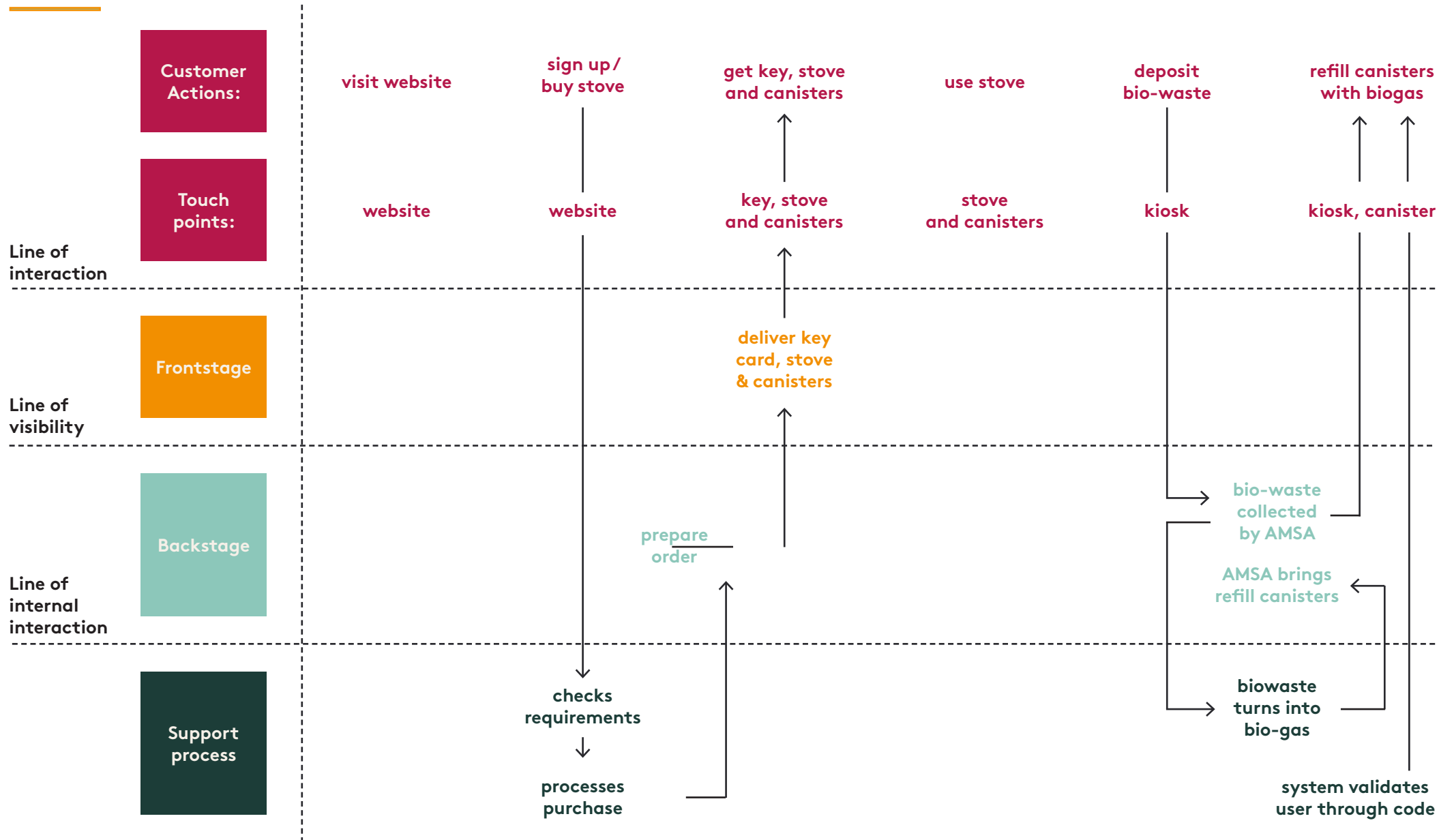


PSS FLOWS

The PSS Flow Map shows the basic interactions between the main parts of the Promitheas system (Stove & Kiosk) as well as the municipal places (Biodigester & Urban Parks) that play a role. The system works as a loop, starting with the bio-waste of the social housing residents (mostly produced by cooking). The waste is collected at the kiosk, which is located in the public housing neighborhood. The waste, as well as sewage water from the compound, is delivered to the biodigester. There bio-gas is being made and then delivered to the kiosk. At the kiosk, the residents can refill their canisters to power their stoves. Also, the municipality can add bio-waste and cuttings from the urban parks to the biodigester and get, in return, fertilizer; the fertilizer is composed of the remains from the process of turning bio-waste into bio-gas.



SERVICE BLUEPRINT



PUBLIC PRIVATE COOPERATION

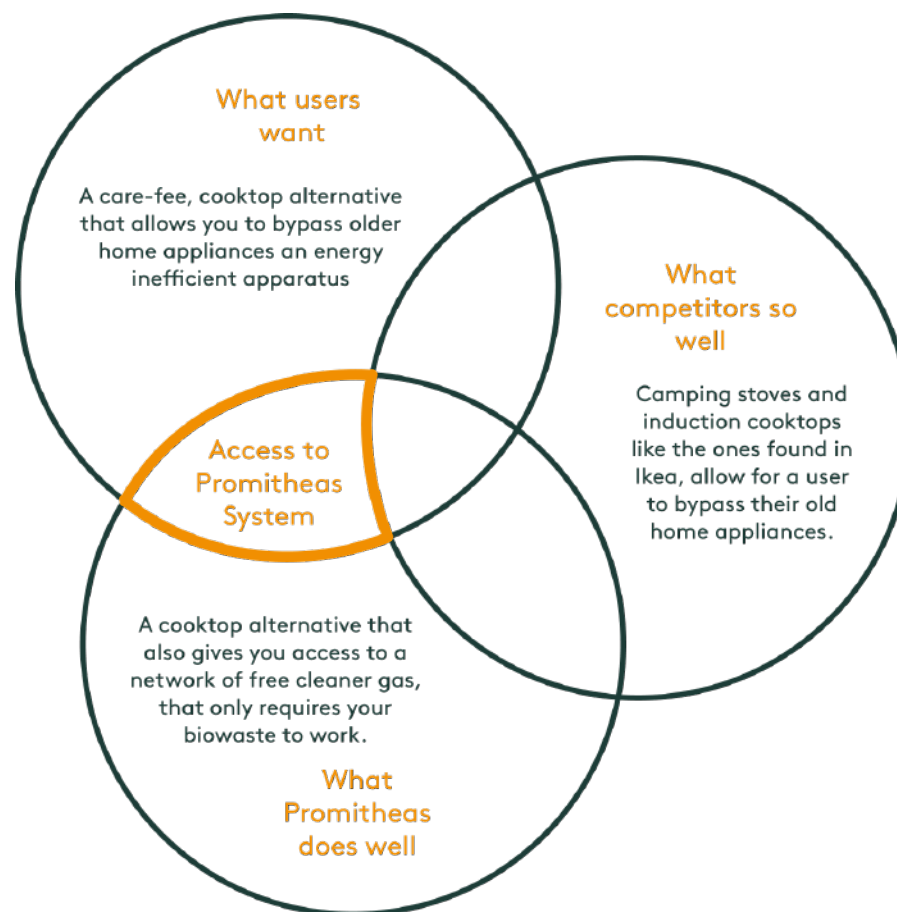
Promitheas works in as a platform of private and public cooperation. There are past success stories in this front with the relationship between AMSA and Comuna di Milano. Promitheas jumpstarts from AMSA as a pilot for the specific category of those most at need. The final value proposition is for this to act as a pilot for the future of urban metabolism, closing the loop between energy resources and waste management.

Access to system

You access the Promitheas service by signing up in the website. There you can purchase the cooker and sign up for the service. As it is a program provided only for social housing services, information on your housing situation must be entered beforehand. After being successfully authorized you are given access to the system. When the stove and canisters get delivered to you, a key card will also be in the package. This key card will allow you to use the kiosk. The kiosk that is closer to you has a key scanner and allows you to refill your biogas canisters and throw away your organic waste.

Unique selling proposition: Promitheas cooker

Although there are other independent cooktops in the market that might allow users bypass obsolete appliances, Promitheas unique selling proposition is that by buying the product you are accessing the system that allows for a self sustained circular energy alternative. This means that Promitheas is not dependent on other sources of energy like electricity or natural gas canisters.





PROMITHEAS KIOSK

The intermediate touchpoint

The kiosk is the key touchpoint that help bind the Promitheas service and the product. This space is where the user interacts directly with Promitheas. On one side they can collect their biowaste, the same way they would also take out their bio waste in the traditional differentiated waste management

system. On the other they can refill and take the biogas canisters, as fast an easy as they would refill a water bottle. This is allowed by enering a "key" or passcode that changes daily from the Promitheas app screen.





STORYBOARD



Food Collection

They collect their biowaste or "umido" the same as they used to before



Kiosk

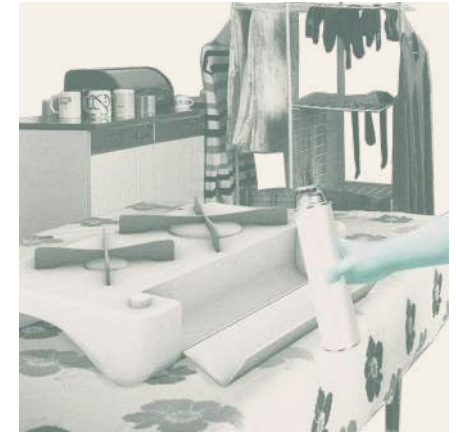
They take the empty canister and the biowaste to the kiosk.

It is the one located in their housing stock, closest to their home



Refill

They enter the code in the app and refill the canisters



Loading and Cooking

They load the cooker with a new canister.

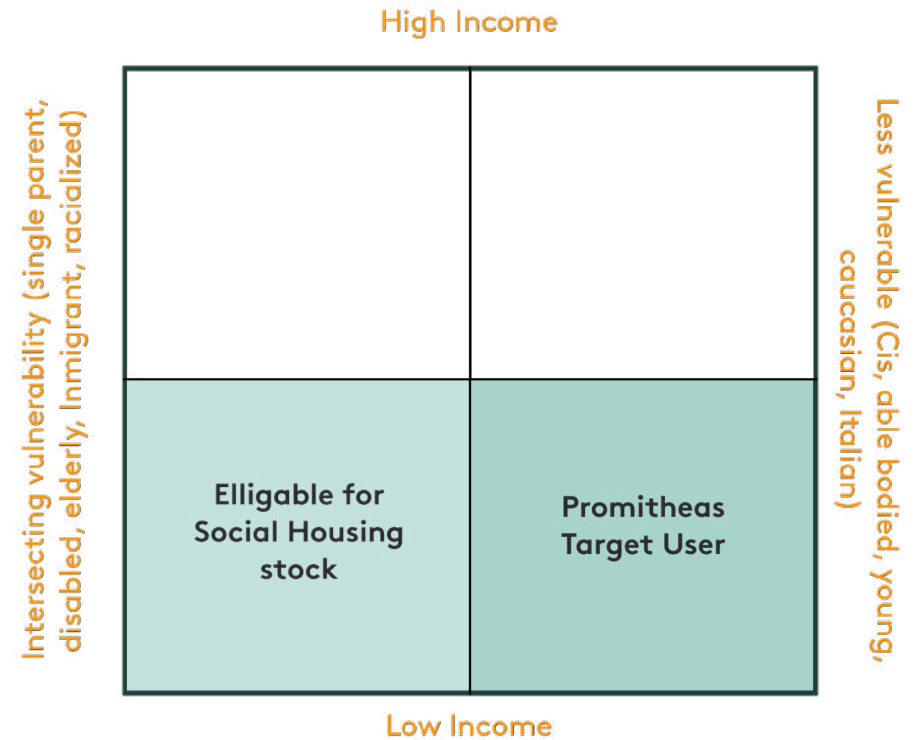
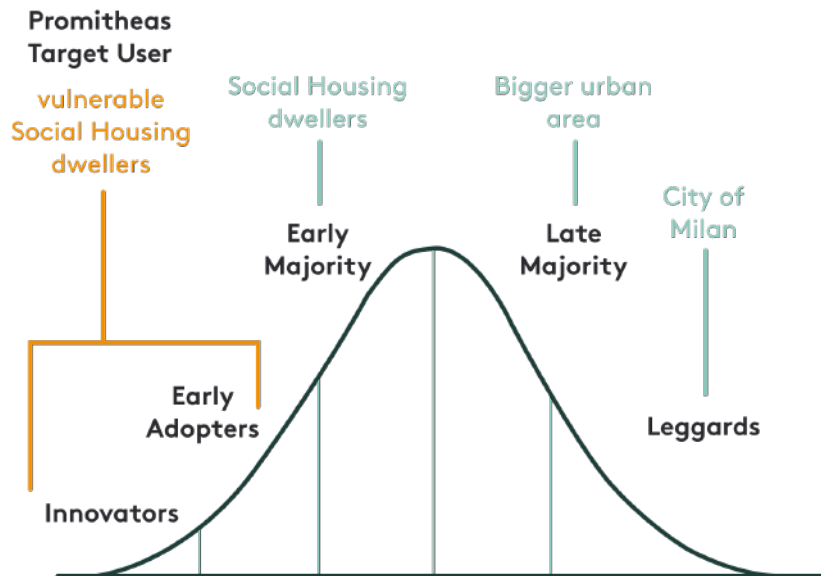
They locate the cooker in their kitchen or chosen heated area of the home. They get to start cooking

PERSONAS

If we are thinking our service as a transitional technology, we imagine it as something that will also evolve in the future. The Initial target user are those who might need it the most. The positioning map helps understand this user as intersecting between those low income pe-

ople living in Social Housing stock and those who are in a bigger vulnerable situation to energy poverty.

The service could then expand with probable variations in the touch points, moving towards the ideal of urban metabolism.



Our target user then varies in age, gender and background, however they are challenged by the rising cost of energy and living. They exist in the intersection of several vulnerabilities.

CARLA

Age: 35
 Occupation: Cook [part-time]
 Financial status: € 700/month
 Civil Status: Divorced
 Typology: Single-parent



Bio

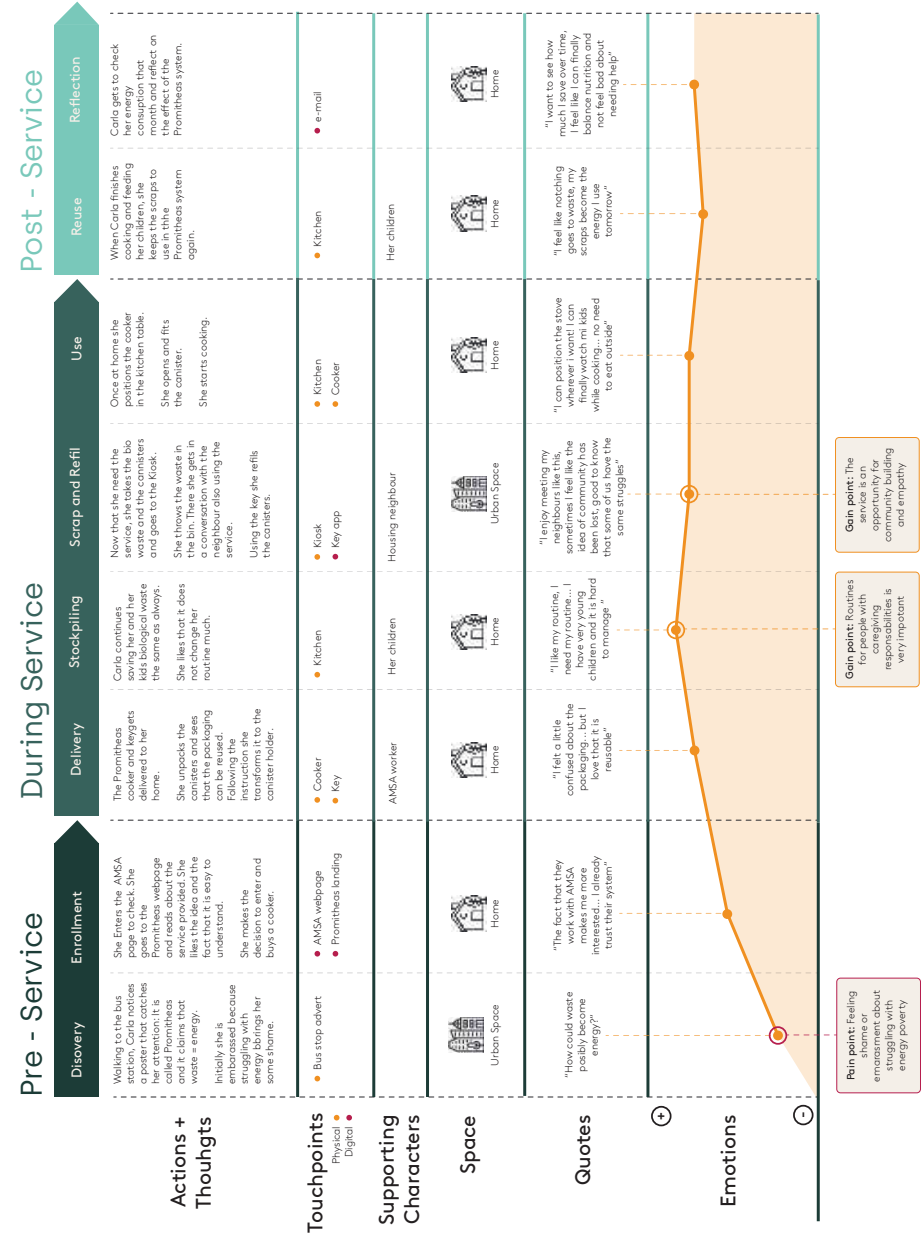
Carla is a 35 year old single mother who takes care of her two children. She used to dedicate herself fully to taking care of her children and the household, however after her divorce she has found a part-time job as a cook that allows her to balance childcare and also having an income. She is very strong and proactive, however the recent hike in gas prices and taxing have left her worried that she will have to feed her children left overs from the restaurant. Her social network is limited and therefore has a hard time asking for help. The fear of being stigmatized because of her situation is weighting on her and creating a high mental strain. She is embarrassed of having to ask for subsidies and going to food banks.

Needs

She want to be self-sufficient in providing food for her children. She feels the need of an understanding and helping community, ready to help her with childcare.

Concerns

The social house she's living in is an old and unefficient building so the gas costs are even higher, but she can't afford a better accommodation. Also, all the appliances in her social stock house are quite old as well and that's incrementing energy consumption.



MARCELLO



Age: 65
 Occupation: Plumber
 Financial status: € 2,300/month
 Civil Status: Married
 Typology: Older couple

Bio

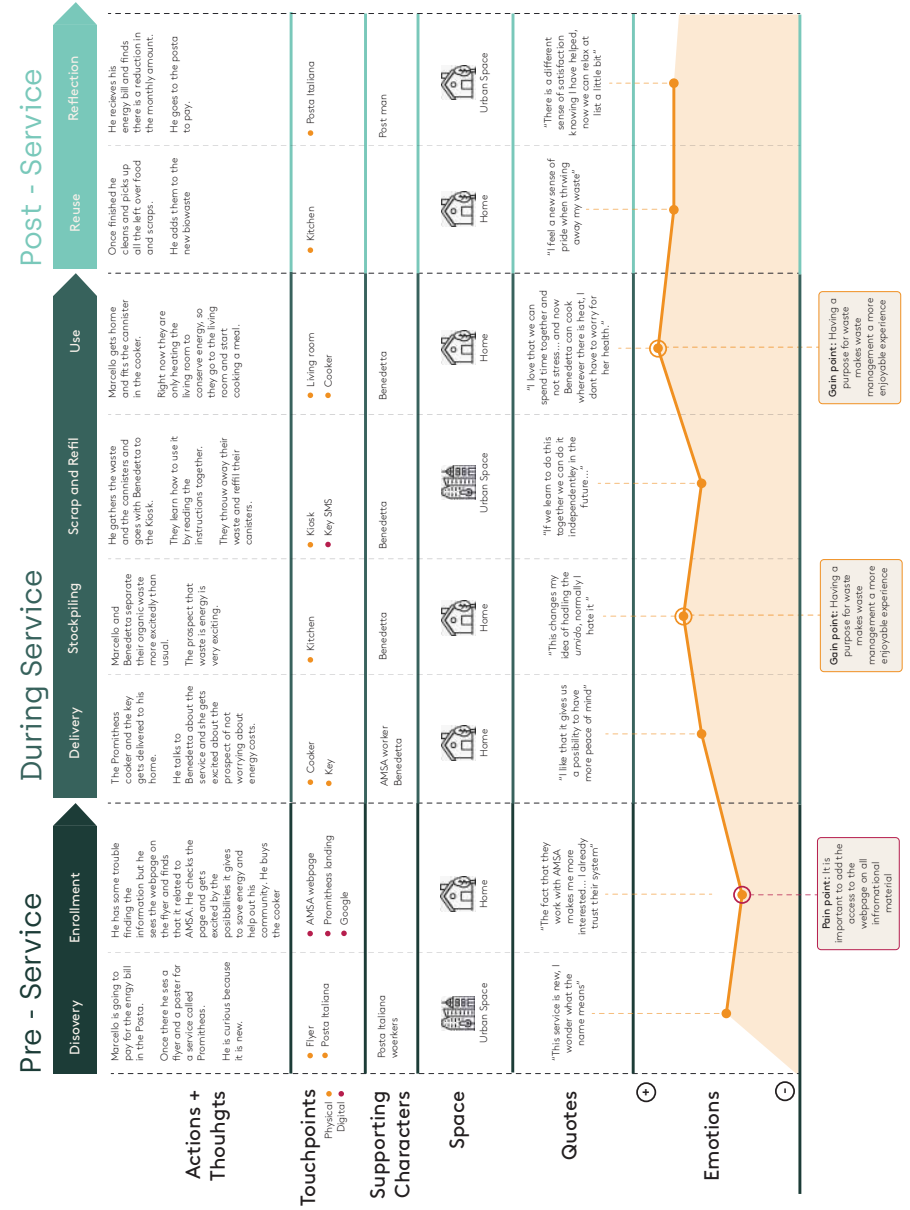
Marcello is a 65 year old plumber who is very close to retiring. He has been living in Social Housing Stock for over 30 years with his wife Benedetta. After she had some medical problems, Benedetta had to retire from her nursing job and in the last 7 years their house has had only his income as sustenance. He has seen her struggle to keep the energy prices low and started creating quick fixes to save some money. He insulated the windows on his own but there is so much he can do in such old housing. They started heating the living room only in order to save some heat. The recent energy hikes have left him worried specially for Benedetta who is at home most of the time, specially with her past health issues.

Needs

Finding a way for her to cook while maintaining the much-needed cost reducing solutions they are already implementing, without risking her health.

Concerns

Feeling that Benedetta might be at home cold to cut on other expenses
 Feeling that his wages are stagnant while the cost of living has gone up.
 Seeing his home go into disrepair because of all the quick fixes.



YUSUF

Age: 20
 Occupation: Gig economy worker
 Financial status: € 530/month
 Civil Status: Single
 Typology: Unstable employment



Bio

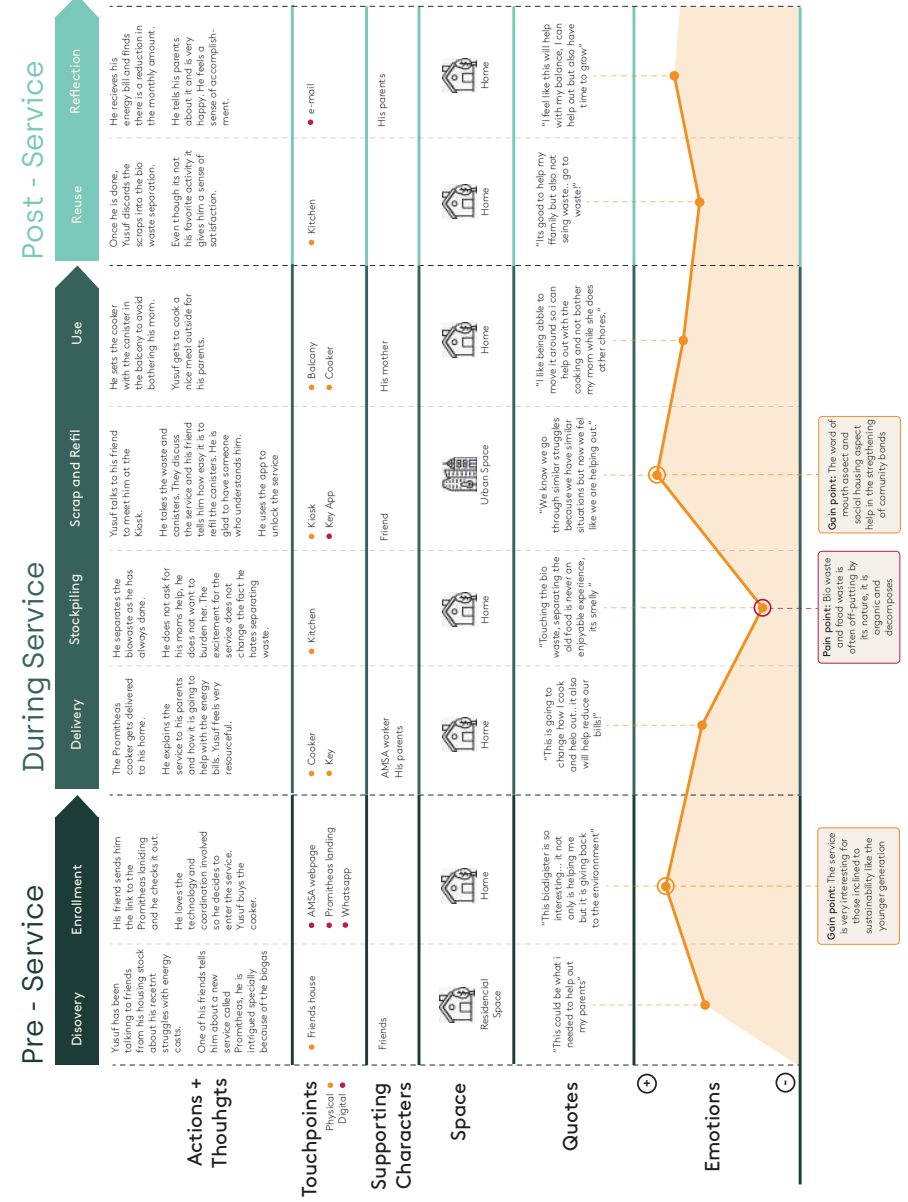
Yusuf is a 20 year old living with his parents. Because of the rising costs of living, he quit his studies in order to help out his parents, they are immigrants from Pakistan. He has not managed to find a stable job so he works as a gig economy worker. Even though he does not dislike his job, it is not constant and feels like he is not contributing enough in the home as he continues to see his family struggling. He has began helping his mom with the cooking and paying for the gas but he feels frustrated with the prices, feeling powerless to actually reduce their cost of living. He wishes he could do this for a lower price as he manages to get back on his feet and find a most stable job.

Needs

To help his parents out with the cooking with a cheaper alternative that allows for them to lower their energy costs. Finding less frustration and more economic stability.

Concerns

Getting stuck in a situation that does not allow him to save up money and continue growing as a young man. Leaving his parents without having contributed properly.



PRODUCT

—



PROMITHEAS COOKER

It is a tool to improve the quality of life and enable everyone to access the basic need of cooking, whatever their domestic situation.



IN THE KITCHEN

Promitheas cooker is a portable cooker which can be used in any room of the house which is cooking friendly. As shown in the image on the left, the cooker is in a kitchen and the user can cook food easily on it.

Promitheas cooker is a stove designed to suit existing domestic or emergency contexts. It can be used all around the house without restriction according to the recipient's needs. Moreover, as it does not take up much space, it can be easily stored and partly dismantled after use. The ceramic finish and its organic shape make the product a domestic and functional sculpture that gives the context in which we use it a sense of beauty and importance regardless of its utilization.

Being a biogas stove with refillable cylinders, it has a door on the side that allows the user direct access to the canister to take it out and change or refill

it. The materials chosen and the possibility of removing the elements from the top of the product make cleaning quicker and easier. In addition, the hobs come as separable components held together using half-thickness joints that allow continuous assembly and disassembly, which facilitate the storage of the products themselves, and formally resume the lines of the entire product. Their dimensions are designed to ensure the correct distance between the cooking utensils and the flame to allow the fire to oxygenate.



AROUND THE HOUSE

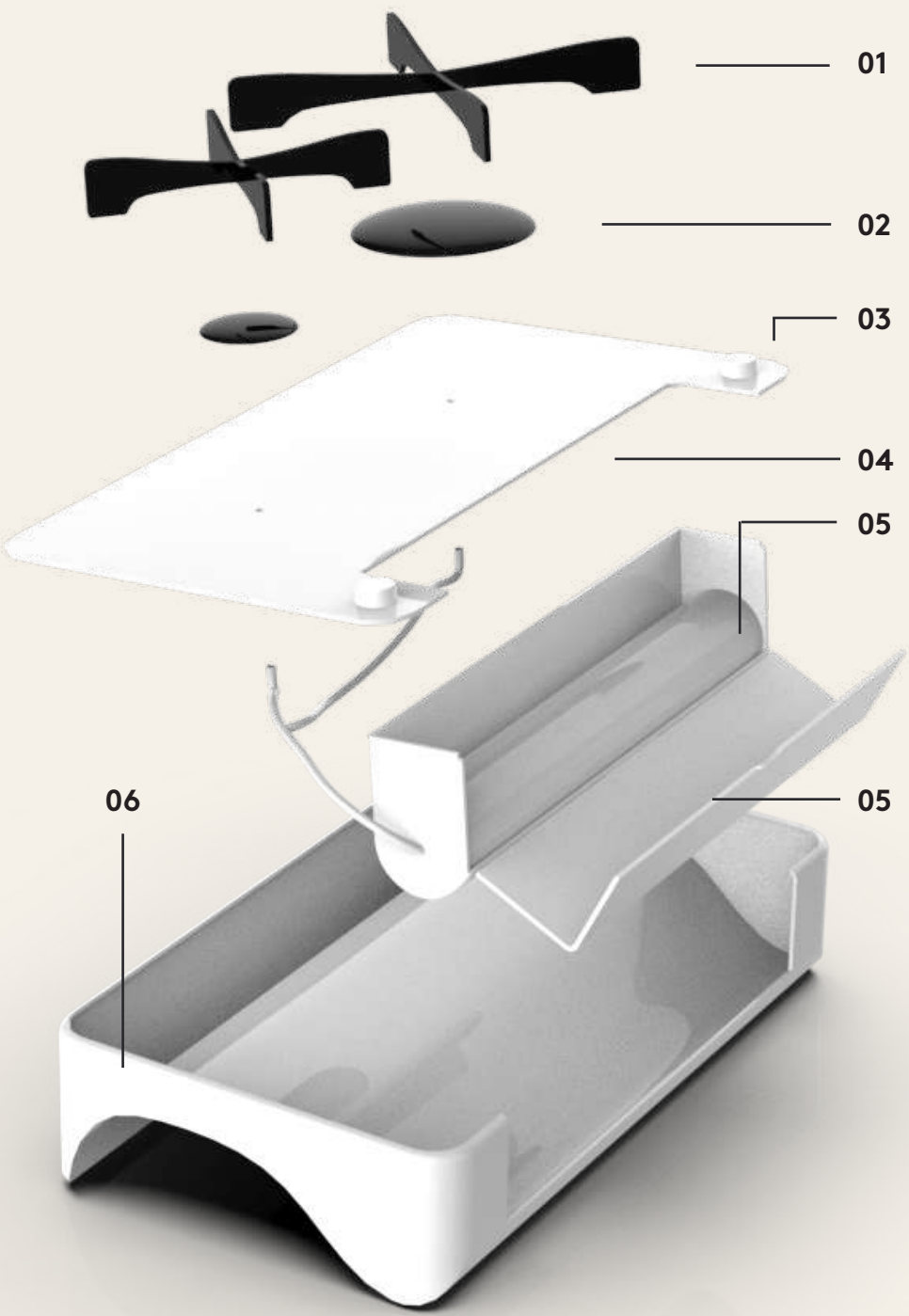
Promitheas cooker is a light weight cooker which can be moved around in the house. The agronomical design of Promitheas cooker makes it easy for the user to hold the stove easily as it balances the weight.

Promitheas cooker has one other prominent feature, its portability and adaptability to the user's needs, thanks to its lightweight and the materials used. The combination of this cooker's characteristics, therefore, allows it to perform both indoors and outdoors. Thus, if, as research on energy poverty shows, you cannot heat every room in the house, this object allows you to cook in whatever space you prefer and thus enables you to eat hot meals even if you do not have the energy resources.

Despite its lightness, the product is stable thanks to the two legs on the two long sides,

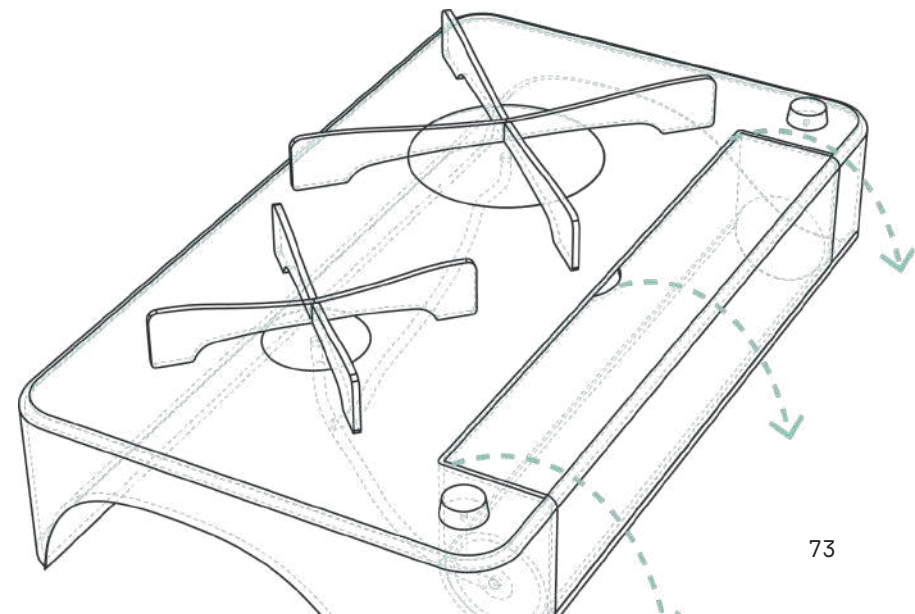
which weigh one side and the compartment for the cylinder on the other. Between these two elements that create stability, a curved cavity facilitates portability and ergonomics, like a handle.





HOW DOES IT WORK?

- 01 - Hobs
13cm and 19cm
- 02 - Burners
6cm and 12cm [diameter]
- 03 - Control valve
2.5cm [diameter]
- 04 - Base for the burners
30 cm X 50 cm
- 05 - Biogas canister
- 06 - Storage unit for the canister
38cm X 6.5cm
- 07 - The curved shaped outer structure for easy grip of the product





7000 Series Aluminium

Sheet metal alloy that is also used in the automotive and aerospace industry. It is lightweight but strong and can be heat treated to support strong temperatures. Because of its sheet quality it can be pieced and assembled in an industrial capacity, allowing for different shapes and curves but maintaining its strength.

The chosen alloy number 7075, is very lightweight and its strength-to weight ratio is perfect for a product that requires a strong structure [as it contains gas, a flammable material that needs to be treated with care] but is still portable.

The production would be mechanized, in a similar way to the model building and it is pieced by a strong welding bond.

Ceramic Finish

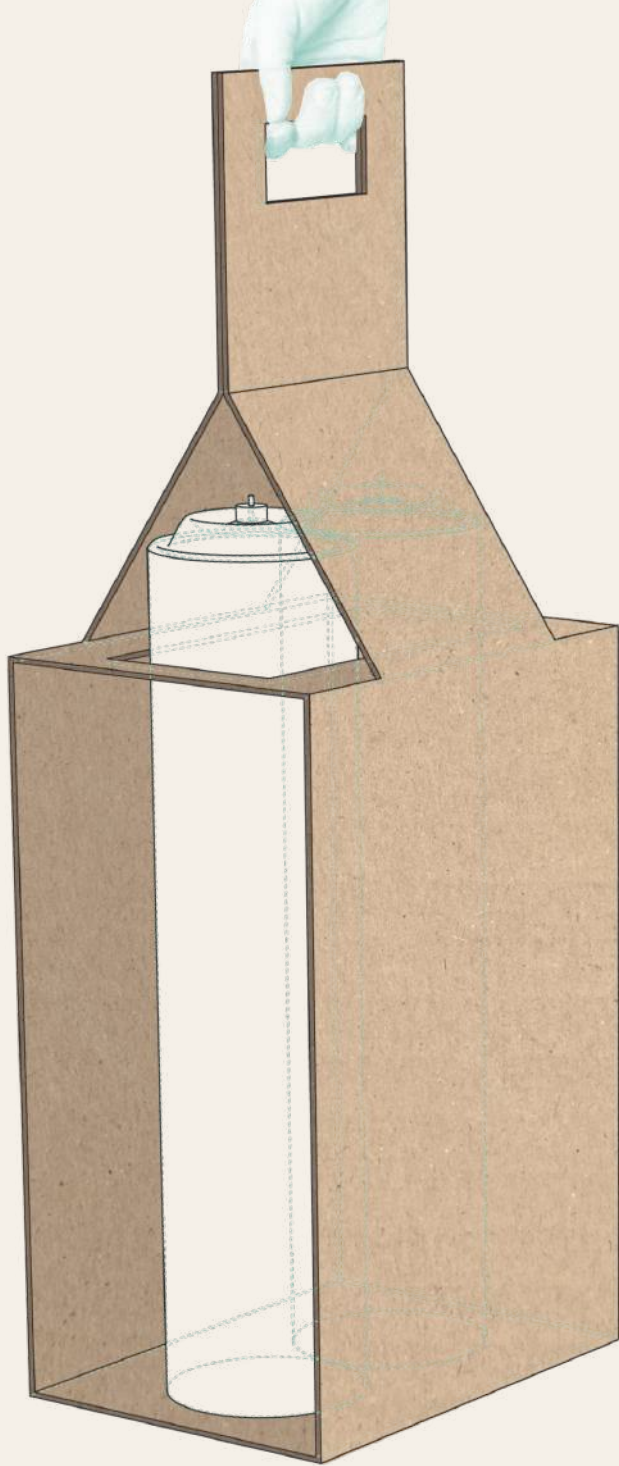
A ceramic is a material that is neither metallic nor organic. It may be crystalline, glassy, or both crystalline and glassy. Ceramics are typically hard and chemically non-reactive and can be formed or densified with heat. If we're summarizing their properties, we can say that ceramics have the:

- High melting points (so they're heat resistant).
- Great hardness and strength.

This material is perfect for the exterior finish as it adds a uniform exterior, that is easy to clean and heat resistant. It also creates a nicer-looking surface to have an object that not only works well but also looks beautiful in the home.

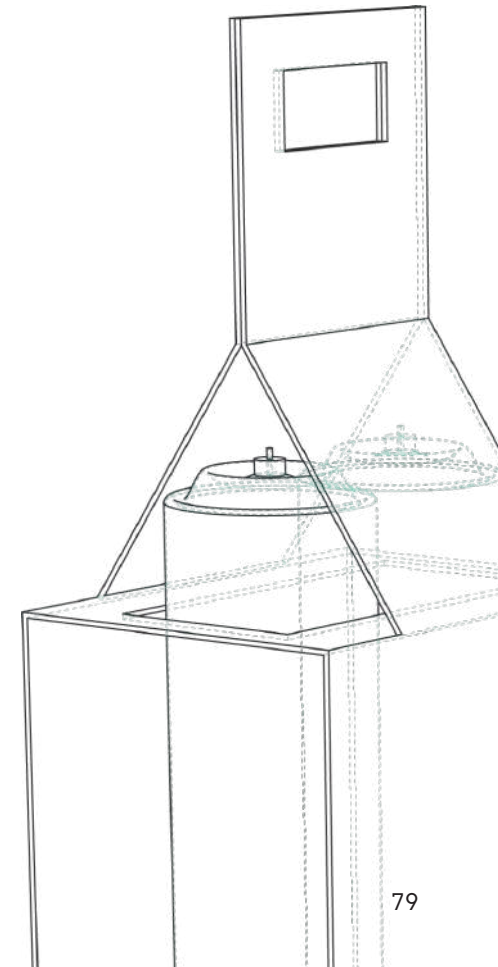






PACKAGING

The product arrives to the customer in cardboard packaging designed to hold the product perfectly. A canister container can be constructed from this cardboard. Lines to be followed are drawn on the cardboard along with instructions that guide the customer step by step. This avoids waste and provides a method for transporting canisters from the home to the kiosk.



IDENTITY
—

LOGO AND NAMING



promitheas

The Promitheas logo should be close to the style of municipal initiatives, and therefore should maintain a clean, precise, and modern tone. We wanted to evoke the idea of the flame as a physical image of energy and gas, but present it in fluid forms. The main color of the palette is forest green, reminiscent of nature, accompanied by very bright and bright color accents. Promitheas is the Greek name for Prometheus, a character from Greek mythology. The name was chosen precisely to recall the mythological story, considered the origin of the human existential condition. Prometheus, who from Olympus watched in fascination as humans inhabited

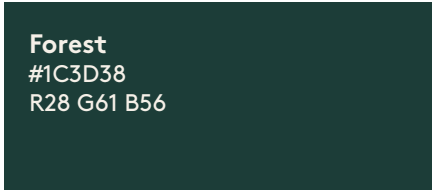
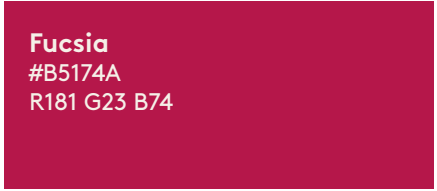
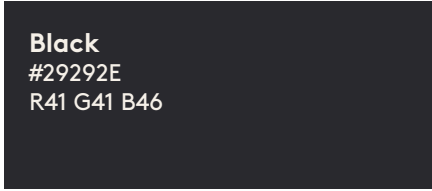
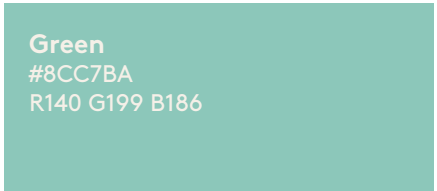
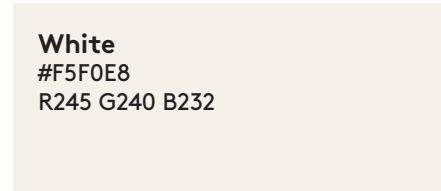
the Earth, decided to go against the will of Zeus and give them fire, and thus access to science and technology that led to an improved quality of life. Like the god, Promitheas also chose a subversive attitude to change the system rules and turn what is commonly considered waste into a vital resource to help bring fire to the homes of those in need. The Greek version of the name resembles both the Italian version, Prometheus, and the English version, Prometheus, so that it is recognizable across multiple cultures. In addition, the choice of an international name strip the brand of any national identity.



VISUAL IDENTITY

Archia abcdefghijklmnopqrstuvwxyz 0123456789
 ABCDEFGHIJKLMNPOQRSTUVWXYZ

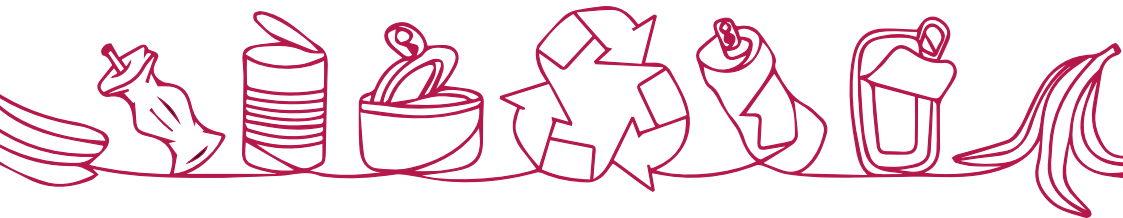
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POSTERS AND ADV

Promitheas' communication plays two main components: irony and collaboration. The main purpose of the communication campaign is to present the idea behind the brand, namely the reformulation of the meaning of energy. With this in mind, it aims to teach that organic waste has gone from being household waste to a valuable resource for heating one's home in a more economical and cleaner way for the planet. To emphasize this shift, the collabo-

orative posters invite citizens to make their urban spaces their own by creatively participating in the campaign and presenting their idea of energy. In fact, they are given the opportunity to draw or write on the posters to express their voice. Moreover, the creation of energy is only possible if everyone participates in the project since the greater the doses of biowaste, the greater the energy produced by the biodigester.



@promitheas_mi

www.promitheas.mi.it

Draw what's **energy** for you

*with one
line only!*



We transform organic
waste into biogas

@promitheas_mi

www.promitheas.mi.it

~~Waste~~

~~Trash~~

~~Debris~~

~~Litter~~

~~Garbage~~

~~Rubbish~~

~~Junk~~

Energy



We transform organic
waste into biogas

ANNEXES

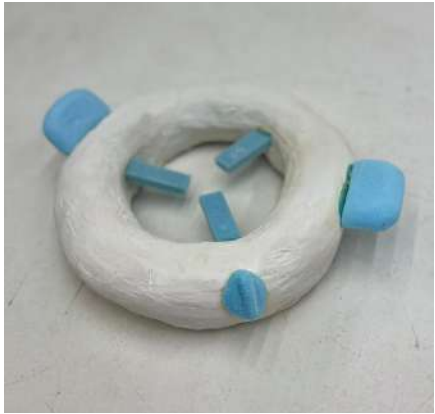


CONCEPT GENERATION

The project originated from observing the phenomenon and research concerning energy poverty. During this first phase, some data were highly relevant for the continuation of the project, for example, various coping mechanisms from different parts of the world and ways of facing the emergency by households. Hence the need to create something that would meet basic human needs such as feeding, and consequently something with which to cook hot meals even in situations of insufficient, inefficient, or unavailable energy supply. In addition to enhancing health and enabling a richer nutrient intake, this would also improve life quality. Due to this background and the idea of a flexible product that could also adapt to extreme situations, like using only certain areas of the home, Promitheas was born. Since the product and service did not yet have specific forms,

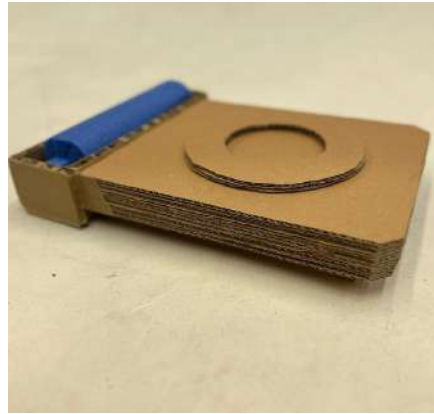
the following keywords inspired the creation of this concept: adaptability and portability, for transition, loop, self-sufficiency, and affordable. Sketch after sketch with the broadest range of forms, each focusing on one or more of the suggested aspects, started to emerge in this system. Numerous potential solutions were proposed, including the stove-backpack, modular cookers, and multi-level cookers, along with many mechanisms varying from different types of joints to rotary movements. Some shared features found in many of the ideas proposed and also tested three-dimensionally through prototypes are, for example, the need to never have sharp corners or edges as a matter of safety and usability, organic shapes even if of different kinds, and the biogas technology that inspired and has always been the strong point of the entire design.

TIMELINE



BioLoop

The ring-shaped stove is designed to be easily transportable. The idea was abandoned due to the technical impracticality of the canister.



Side Canister

The prototype began to take a shape more like the present one. The cylinder was arranged sideways as in ordinary camping stoves.



Rotating stove

From a simple stove we approach the idea of a portable kitchen. In addition to providing access to gas, you can use the product to cut and serve food. The prototype features several rotating tops.



Portable kitchen

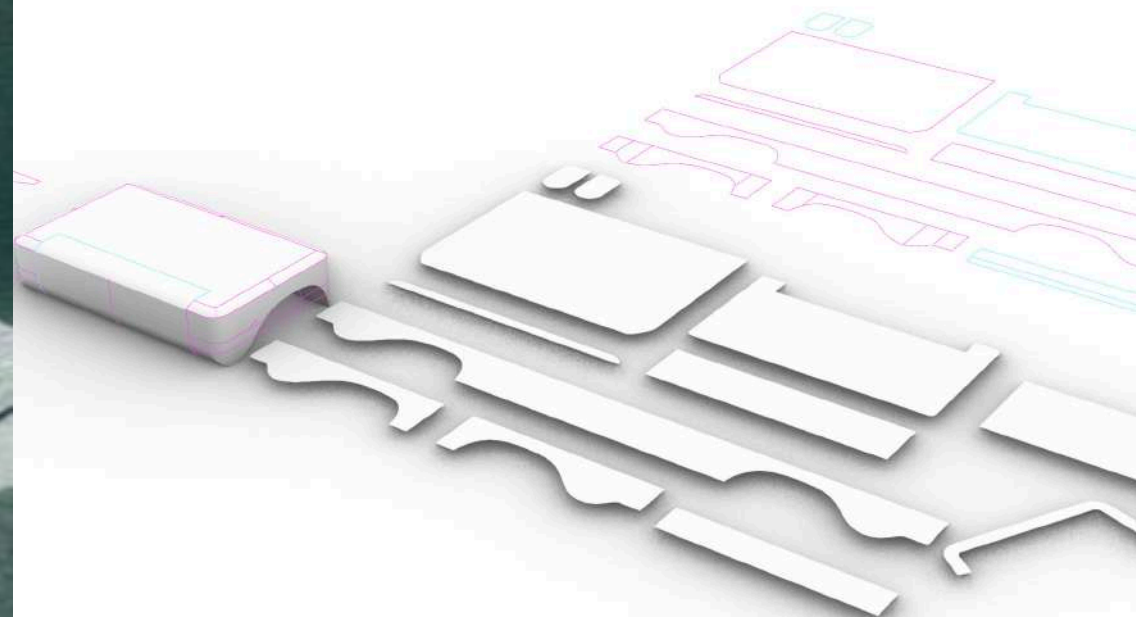
The product becomes a real kitchen with gas access, food preparation area, and space to store dishes and cutlery. The product is a portable kitchen with ties that allow it to be used as a backpack.

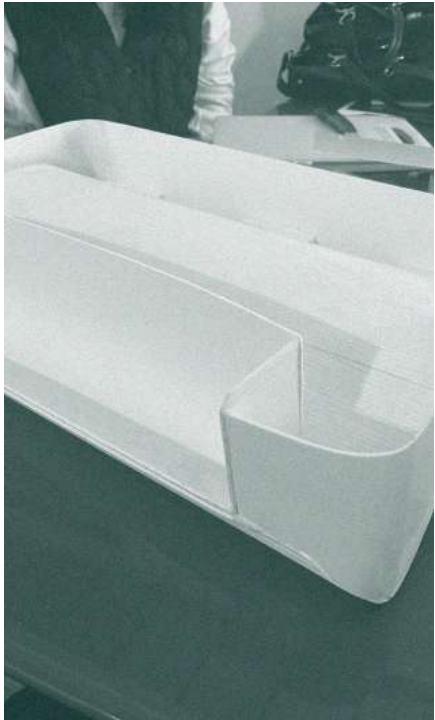
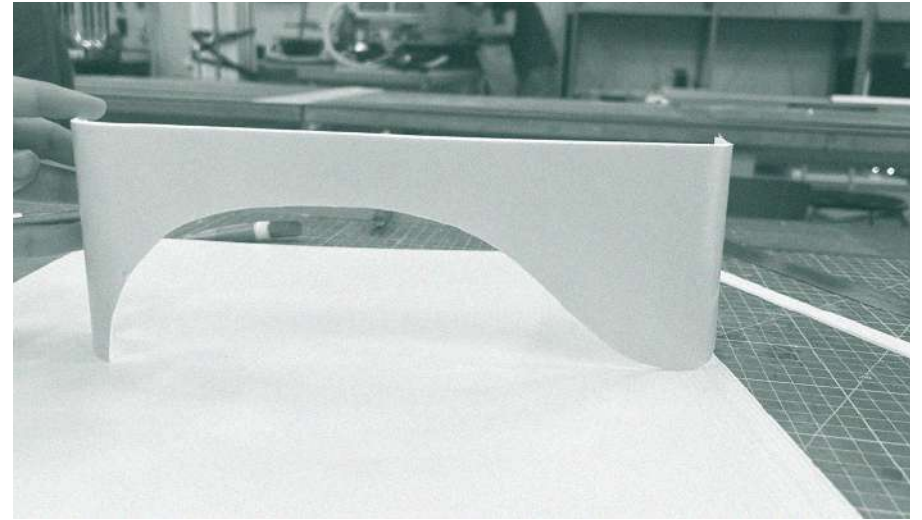
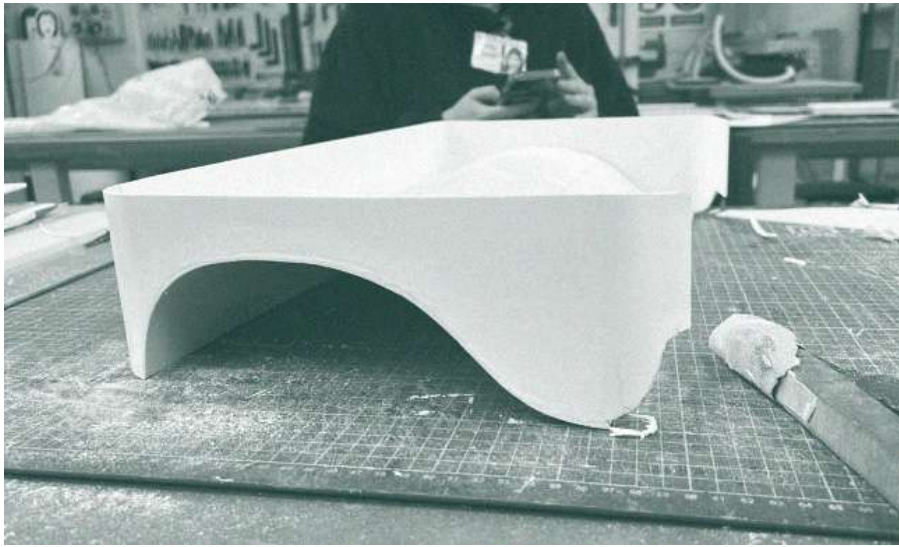


PROTOTYPING

The prototype has been made by keeping the same scale as the product but replacing the aluminum with lighter, cheaper, and easier-to-shape material. The prototype was made entirely by hand. The aluminum has been replaced by Forex, a plastic PVC foam ma-

terial that is easily shaped but durable. Given the complex curves of the stove, cutting was done through the use of molded floor plans, with longitudinal incisions in the material to promote flexibility.





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EVOLVING
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