

GROW4 BRUSSELS 2030

How can a historical building help pave the way towards a climate and economic transition aligned with the regional objectives related to direct and indirect greenhouse gas emissions by 2030?

How can an initiative of this scale function as a catalyst for rethinking spatial planning and the relations between production, public facilities, economic activity, leisure and green spaces?

Grow 4 Brussels 2030 initiative aims to not only help the Brussels Capital Region to strengthen its commitments as included in the NECP [National Energy and Climate Plan] and raise the objectives of the European union, but also spearhead the transition towards a circular and regenerative economy with focus on social and democratic entrepreneurship and the respect of the of the urban ecosystems.

For those targets to become reality, a seemingly complex yet quite simple holistic approach was drawn transforming the former complex of CIVA to an integrated centre of food production, agricultural entrepreneurship, research, training, education and preservation. The once conceived as an enclosed and egocentric space gets the needful porosity to create the ideal conditions both for nature and the local population to come and reactivate the building with a multitude of different activities.

Staying true to the values of circular construction, a “Function Follows Form” approach was taken for the repurposing of the complex. The notes taken during the visit of the building helped with the assignment of appropriate uses for every space in a way that turns the challenges into potentials.

The two challenges to which the new functions had to cater, were the extensive area of basements with their build in archival equipment and the thermal performance of the upper floors of the complex, which although designed in the 90s no longer meet the criteria of thermal comfort and energy performance.

The answer to the first challenge was found rooted in the traditional practice of using the basement as a place to grow Belgian endives or often referred as the “White Gold Brussels”. Looking at this practice through a 21st-century lens and making use of some of the latest innovations, vertical hydroponic farms are created. The isolated and protected environment provided by this vast underground space, offers the ideal sterile conditions for the implementation of this method of farming. Lighting, ambient temperature, soil conditions and nutrient levels can all be controlled resulting to high quality produce with zero use of pesticides and minimal growth cycles.

The existing movable shelving system of the archives are maintained in situ and transformed to accommodate growing trays, helping with the optimisation of space while being in line with the principles of reuse and circularity. To secure the optimal lighting conditions a combination of red and blue led lights are chosen which assist directly in the growth of plants while eliminating energy waste that white led could cause. The energy for those lighting sources is provided by solar panels installed on the roof of the vertical circulation volumes and for a higher efficiency are combined with biodiverse green roofs.

Growing plants in subterranean spaces result in an excess production of oxygen. This oxygen could turn harmful in great quantities. To eliminate any threats created by an influx of oxygen, the vertical farming is combined with fungiculture. This would not only result in the production of a great variety of mushrooms, but also other types of fungi that can be used to produce plant-based proteins and viable, eco-friendly alternatives to Styrofoam.

In stark contrast with the controlled subterranean environment, the double high volume of the library was suffering from a greenhouse effect making it uncomfortable for the users. Instead of denying those already present characteristics and try to solve them with energy and material costly mechanical means, this aspect of the construction is emphasised by the decision to create a productive hydroponic greenhouse. The fact that the space was created for hosting a library with weight of books in mind, offers the possibility to create an infrastructure for aquaponics. Composed by wide and shallow water bodies spread equally over the two side wings of the room, aquaponics offers the possibility of farming a variety of fish species at the same cycles as leafy greens. The double height of the central space offers a great opportunity for implementation of a vertical column like growing infrastructure which operates with the use of the nutrients rich water of the fish farm and without the use of any growing medium.

The presence of corridors encircling the main volume of the room offering a panoramic view of the space underneath make this area ideal for accommodating a visitors and information centre. Here people can come and see how an urban farm operate, what possibilities it offers and how can the rainwater be managed in a stainable and beneficial way. They can also take part in a multitude of activities from planting workshops to cooking masterclasses with the use of produce from the farms. Of course, all those activities are for adults as well as for children of every age. In this way the consumer is reconnected with the source of its food and the whole process of food production becomes once again tangible and transparent.

To enhance even more the connection between source and consumer a restaurant is created inside the circulation volume on the right side of the main entrance. The restaurant has besides its interior space, which provides views towards the aquaponics hall, terraces on two levels. One just above the main entrance and the other one on the recess of the second floor. Those two terraces, treated as edible foraging gardens with a mix of 100% native and edible plants, offer not only an idyllic place for people of the city to relax and enjoy their meal but also offer a constant source of seasonal ingredients for the restaurant itself. As a continuation of those two gardens, on the roof of the new building, an edible forest mantle is created using not only native plants but also a great deal of varieties of fruit and vegetables considered forgotten.

The last two functions completing the programmatic mosaic of the new part of the complex, is a logistics centre on the ground floor from which the product can be packed and transported to the final users which could include hotels, restaurants and cafes in the area but also markets such as the one at Flagey and Châtelain. The fact that there is an extensive market for fresh products in the area means that the transportation of them can happen with ecologically friendly means and thus a bicycle parking was created able to accommodate a small fleet of delivery bikes as well as the ones of the personnel.

The space underneath the main entrance and the amphitheatre is allocated to the installation of an extensive internal condensation harvesting, rainwater collection and distribution system, as

well as to the installation of an anaerobic digester system able to collect the agricultural and food waste produced by the farm and the restaurant and turn them into biogas able to fuel the professional kitchen of the restaurant. Its central location in the junction of the two volumes of the building allows this area to operate as the functional heart of the building.

Whereas the 90s extension has come to host the main load of productive activities, the old electric station is housing some more social functions. The entire ground floor is opening to receive a function of a market where produce of the farms and various other like-minded initiatives can be sold to individuals on daily basis. The distance between farm and plate could never be shorter than that since in this instance it's just a lift apart.

The first and the half of the second floor is where the research and training centre of Grow 4 Brussels 2030 comes to nestle. The aim of the centre is to make a link between the initiative and the neighbourhood around complementing and that enhancing the social aspect of the initiative. In the centre people that might have fewer opportunities on the labour market can come together with employees of the different parts of the farm, specialist, researchers, and apprentices and gradually be pushed closer to the labour market by acquiring skills knowledge and practical experience.

Viva & Aqua

On the backside of the second floor the installation of a building integrated greenhouse will use the heat generated by the research centre in the market underneath to produce a variety of heat loving crops. At the same time, it will provide home to colonies of honeybees. The bees will have the ability to collect nectar and pollen from the roof of the water reservoir of Vivaqua which is turned into a native wildflower meadow specifically designed for bees and other pollinators. In a way the reservoir, although it still remains inaccessible to humans, will buzz from activity as it will fulfil the double function of providing water to the city and providing food and shelter for some of the most important but threatened part of the ecosystem. In the composition of the plant list for the water reservoir, special attention was made so that the roots of the species chosen will not disturb the structure of the reservoir.

Not only the roof of the reservoir will become a paradise for insects but the slopes of it are getting a makeover as well. With the choice of the right sorts of all native plants a biodiverse and yet impermeable-for-humans-border is created. Plants like *Crataegus Monogyna*, *Prunus Spinosa* and *Rosa Canina* offer not only visual interest all year round but with their sharp thorns will deter anyone from trying to go through them. Though they will not deter a great variety of birds and mammals from feeding from their seeds during autumn and winter months. This change of approach of the planting of the slopes, especially on the side of Rue du Couvent, in combination with the total reconfiguration of the street, create the necessary conditions for a smooth and timely transition of the park Solvay into a preamble green lung for the city and a haven for nature.

Rue du Couvent itself is turning from a residual street lined with high fences and parked cars into a protected green valley between two extensively planted slopes. That is ideal for children of the neighbouring schools to play and do sports and for their parents to wait in the evenings. Embracing fully the idea of a valley, a biodiverse bioswale is created on the side of the reservoir, enabling the rainwater falling on the roof of the school to be infiltrated into the ground and not ending up in the sewage system.

The same approach of water management is being followed on the Rue de la Vanne and Rue Paul Spaak. On both streets the street level parking has given its place to planted bioswale creating a wetland ecosystem allowing rainwater to infiltrate in plain sight. This approach in combination with the water buffering street construction enables the great majority of rainwater falling not only on the street but on the neighbouring buildings as well to infiltrate in the ground. In essence this trade will protect the area of the Maelbeek valley which are prone to flooding, inspired by tragic events as the one witnessed in the summer of 2021 in Belgium because of extreme rainfalls due to the climate change.

Although both streets fulfil the same basic function, Rue de la Vanne works on the scale of its neighbourhood hosting a part of a running track that encircles the building plot containing the reservoir and offering a much-needed sport facility to the schools.

On the other hand, Rue Paul Spaak is acting as an invitation towards the building of Grow 4 Brussels. The steep slope of the street means that the bioswale gets the form of a water cascade and the visual and audio stimulation it creates entices people to deviate from the busy Rue Lesbroussart and climb up towards the main entrance of the building.

Although the main entrance of the building has remained in the same place it has change form and function. Instead of functioning as a lobby the closed space has been opened on both ends and it has been treated as a passage and as a covered square. A water element at the centre of it acts as a reflective pool, as a play element for the children of the neighbourhood and as a water source for the wild fauna. A hovering metal staircase connect with that nature zone behind the building, here a wild playing zone has been created for children of an older age.

Viva & Aqua plan is designed for supporting the transformational process of the complex of Rue de l'Ermitage from being the building of CIVA to becoming the hub of Grow4Brussels 2030 and ensuring its transition towards its new functions and new urban dynamic. Both initiatives, although maintaining the inherent qualities of the site, are ensuring openness and integration to the neighbourhood and the local economy. Any renovation, new construction and public space has been designed with respect to the exceptional architectural heritage of the site. Ultimately by letting the core principals of the circular economy serve as guide through the entire process has resulted in the creation of a flexible and strategic system which sets its invariables while allowing freedom to adapt and develop leading to a project than can change assignment in a short time in order to adapt in any new challenge that might arise.