


TRANS PED

TRANSFORMING CITIES
THROUGH POSITIVE
ENERGY DISTRICTS



TRANS-PED CASE STUDY ABATTOIR

TRANS-PED CASE STUDY ABATTOIR

The Abattoir Development Project started in 2008 and spans a period of several years leading up to 2030. It is located in the area of the Brussels Canal, within the Brussels Capital Region. The project, managed by the private company ABATTOIR, was launched with the ambition of creating a mixed urban community on a 10.5-acre site, with a focus on reinforcing economic and productive activities, preserving jobs and developing new facilities, such as student housing and a swimming pool. Its central theme, the „*Belly of Brussels*“, refers to the site’s historical function as a slaughterhouse. In the recent past, a food market, an urban farming project and socio-cultural activities, amongst others, have emerged on the site.

DIMENSION 1

TIME

PROJECT HISTORY

The history of the Abattoir site goes back to 1888 when the municipality of Anderlecht gives the then marshy area in concession of the *'Slachthuizen en Markten van Cureghem'* to develop a slaughterhouse and cattle market. After the necessary ground and building works (including the construction of the monumental and now listed market hall, the slaughterhouse and a railway station), the company starts its activities in 1890 (see figures 1 and 2). As enabled in the concession agreement, the municipality took over the flourishing site in 1922. Until well into the 1960s, the slaughterhouse and its related activities flourished, which also reflected on the thriving Cureghem neighbourhood. When business deteriorated from the 1970s onwards, the municipality decides to hand over the site's activities to *'Slachthuizen en Markten van Anderlecht'*, which later transforms into Abattoir nv.



figure 1: drawing of the Abattoir site in the 19th century (Abattoir nv)



figure 2: picture of the Abattoir market hall in the 19th century (Abattoir nv)

In an initial phase, Abattoir sought to modernise its existing facilities. In 1987, for instance, the new slaughterhouse was opened, including a renovated boiler room. Activities gradually diversified. In 1992, the cellars (the space underneath the listed market hall) were converted into an event space, and events have been taking place on the site since.

In 1996, a major fire destroyed part of the existing wholesalers' refrigeration installations and workstations, representing the B-to-B activities on the site. The destroyed facilities were replaced within one year. In 2004, Abattoir decided to diversify further with the construction of a covered fresh-food market hall with merchants' stalls selling fish, fruits and vegetables, adjacent to the weekly market, which is the largest in Belgium. Alongside the construction of the fresh-food market hall, the site's B-to-C activities were also extended.



figure 3: aerial picture of the Abattoir site before the start of the redevelopment (Abattoir nv)



figure 4: masterplan for the Abattoir site by ORG architects, 2012 (ORG architects)

A change of direction took place from 2010 with the decision to draw up a masterplan for the site, thanks in part to ERDF funding (see figure 4). The masterplan was presented to the public in 2012 and comprises several goals. With the ambition to preserve and strengthen existing productive activities, it also aims to incorporate new urban activities such as culture, housing and leisure. In addition, the masterplan strives for qualitative and sustainable architecture and, in terms of urban planning, focuses on the connection with the surrounding neighbourhoods.



figure 5: masterplan for the Abattoir site by BRUT architects and Karbon architects, 2015 (BRUT architects and Karbon architects)



figure 6: masterplan for the Abattoir site by 1010 architects, 2022 (1010 architects)

Since 2012, the masterplan and its successive revisions (see figures 5 and 6) have been used as a guideline in the development of projects. The year 2015 saw the opening of Foodmet, an indoor food hall with butchers and vegetable traders. The building also features an urban farm on its roof that opened in 2018 with greenhouses and a roof garden for vegetable farming as well as an aquaponic fish-farming system. Several innovative food businesses have established themselves on the site since, including a company involved in vertical farming. Meanwhile, the Manufacture project, construction for which began in 2022, was also initiated. The project envisages a stacked building with a production layer, a parking layer and a swimming pool on the top floor. The near future will see the creation of student housing and additional shops as well as an enormous square, with additional space for the weekly market but also for social and cultural interaction, and, shortly afterwards, affordable housing and new buildings for innovative economic activities.

MAIN REFERENCES

- Abattoir website, in particular the sections on '[history](#)', '[projects](#)' and '[masterplan](#)' (in Dutch, French and English)
- [Projet de developpement global Abattoir \[Masterplan\]](#), 2013 (in French)
- [Abattoir masterplan \(2013\)](#) section on the website of ORG Platform for Permanent Modernity (in English)
- [Abattoir masterplan \(2015\)](#) section on the website of Karbon' architecture et urbanisme (in French)
- [Abattoir masterplan \(2015\)](#) section on the website of BRUT architecture and urban design (in Dutch and English)
- Abattoir masterplan (2022) by 1010 architecture and urbanism
- Abattoir presentation on the history of the site

PROJECT AMBITIONS

AMBITION 1

MAXIMIZE ON-SITE GREEN ENERGY PRODUCTION AND OPTIMIZE ENERGY FLOWS IN THE SUSTAINABLE REDEVELOPMENT OF THE SITE'S BUILDINGS

Renewable green energy on the Abattoir site is produced using PV panels. PV panels have been installed on several buildings: the Foodmet and other existing buildings in 2017 and the covered market hall in 2021 (see figures 7 and 8). PV panels will also be installed on the Manufacture building, construction of which started in 2022, and future residential and other projects. It should be noted that not all available roof surfaces will be covered with PV panels: some roofs are also designed for projects such as rooftop farming (Foodmet, 2018), roof terraces or roof gardens for common use by residents. This vision of considering the roof as a fifth facade with room for both energy and food production, but also collective functions such as roof terraces or a swimming pool, is in line with the urban-planning vision of the Abattoir masterplan.



figure 7: PV panels and urban agriculture on the Foodmet building, 2017 (Abattoir nv)



figure 8: PV panels on the covered market, 2021 (Abattoir nv)

In terms of a new approach regarding the optimisation of the buildings' energy supply, a first step was taken in the Foodmet project in 2015: a low-temperature ring pipeline, called the "*boucle*", connects the individual cooling installations of some 20 butchers and 10 traders of dairy products and fruits and vegetables. The water-to-water heat pumps of the individual merchants' installations are linked to this boucle pipe so that, among other things, the boucle's excess heat is transferred via a heat exchanger to the urban farm, which requires heat for its greenhouses and fish tank. The boucle pipe's design, moreover, is futureproof: it can be connected to the adjacent Kotmet project that will feature flats and student housing (completion planned for 2025), as well as with a heat network planned for the entire site (see Ambition 2). Plans for the Manufacture project also include a boucle pipeline that will connect to food companies' individual cooling installations. In this case, the heat will be dissipated to the rooftop swimming pool, while the boucle pipe will at the same time be integrated into the heat network for the entire site.

AMBITION 2

LINK THE VARIOUS BUILDINGS BY MEANS OF A HEAT NETWORK IN ORDER TO REDUCE GLOBAL ON-SITE ENERGY CONSUMPTION

The Abattoir masterplan envisions a mixed urban development where, on the one hand, productive activities – building on the site's historical function as a slaughterhouse – and, on the other, residential, cultural and social activities both have a place. Due to the diversity of activities with correspondingly diverse requirements, there is a real opportunity to match energy needs (in terms of both heat and cold) and optimise energy consumption. As explained in the section regarding Ambition 1 above, this is already happening on the scale of individual buildings, such as Foodmet and Manufacture. The next step is to create a heat network on the scale of the entire site. This heat network will be built up in several phases, the first of which will connect the Foodmet and Manufacture buildings. This part of the heat network will be completed by 2024, when Manufacture will also be operational. The Kotmet project will then be connected to the heat network in 2025. The technical studies for the heat network, including its financial feasibility, have been completed; tendering is planned for 2023, and implementation for 2024.

In the following phase, the heat network will be further extended to residential developments on the canal side of the site. This next phase is planned for the period 2028–2030. The preliminary studies for this second phase have now been completed. Eventually, the ambition is to connect structures beyond the site to the heat network, such as existing homes along *chaussée de Mons* or Erasmus College on the site's south side. The technical, financial and legal feasibility of such connections will be investigated in the short term. Finally, the possibility of extending the heat network beyond the site could be investigated. However, this ambition would require further involvement from the board of directors.

AMBITION 3

ACHIEVE ZERO-ENERGY CONSUMPTION ON SITE BY LINKING BUILDINGS TO EACH OTHER AND BY CONNECTING THE HEAT NETWORK TO A GEOTHERMAL STORAGE FACILITY

Ambition 2, i.e. the aim to create a heat network on site, was already part of the Foodmet concept, completed in 2015. In 2020, based on a financial feasibility study, Abattoir's board of directors decided to invest in two test drillings on the site to investigate the technical feasibility of linking the heat network to a geothermal storage facility. The exploratory drillings took place in 2021 and yielded positive results. It was therefore decided in 2022 to proceed with the concept of connecting the heat network to a geothermal storage facility, the technical studies for which are now complete. As for the heat network, tendering for the geothermal installation is planned for 2023, and implementation for 2024.

AMBITION 4

OPEN UP THE ABATTOIR PED TO THE NEIGHBOURHOOD BY ENABLING ENERGY EXCHANGE BEYOND THE SITE AND SUPPORTING/FACILITATING THE SUSTAINABLE REDEVELOPMENT OF THE CUREGHEM NEIGHBOURHOOD

There is a manifest ambition to further open the Abattoir PED to the neighbourhood, but this needs to be explored in further detail. In 2022, a part of the Abattoir site facing the canal was purchased by Brussels Capital Region. This area will accommodate a project with mainly affordable housing. The ambition, both on the part of Abattoir as on the part of the developer, Brussels Capital Region, is to connect these new homes to the Abattoir heat network. There are no final agreements regarding this at present since the project is not set to be complete before the period 2025-2030 and because its feasibility needs to be investigated in further detail, especially in terms of financial and legal questions. Furthermore, Abattoir also looks towards existing but aged housing stock in Cureghem. Houses along Chaussée de Mons that are immediately adjacent to the Abattoir site in particular could be considered for integration into the heat network. For this, however, several questions will need to be resolved, including the important matter of insulation. Erasmus College on the site's south side is also a candidate for connection to the heat network. The Erasmus site, moreover, features a large open space that would allow for the further expansion of the geothermal installation.

The opening of the Abattoir PED to the neighbourhood is part of the follow-up project to the TRANSPED project, the PED4ALL project that will start in early 2023.

AMBITION 5

THE CREATION OF (SOCIO-)ECONOMIC OPPORTUNITIES CONCERNING SUSTAINABLE ENERGY FOR ABATTOIR NV AND OTHER LOCAL ACTORS, AMONGST OTHERS THE SOCIO-CULTURAL ORGANISATION CULTUREGHEM.

In 2012, the socio-cultural organisation Cultureghem was created within the Abattoir private company. Cultureghem has since organised social activities on the site in complement to Abattoir's economic activities. Cultureghem and Abattoir have been working together since 2021 on a shared vision for the site's open spaces. This project, called "*Plein Abattoir*", aims to make the open spaces, and in particular the site's large central square, open to everyone, and for a great variety of activities. These include, of course, the weekly market, organised by Abattoir, but also activities for the neighbourhood's children and youth organised by Cultureghem. The square is physically bordered by various buildings and is also where a large part of the heat network will be installed. Moreover, the listed market hall, covered with PV panels, is located centrally on the square. The Plein Abattoir project therefore not only has an economic and social ambition, but likewise a vision in which energy, understood also in terms of human energy, plays a key role. Cultureghem, consequently, is also a partner in the follow-up project PED4ALL. The Plein Abattoir project will be further investigated within PED4ALL, with the ambition to investigate to what extent the PED concept can be developed within a broader sustainability approach where social aspects and inclusiveness also play central roles.

MAIN REFERENCES

- Abattoir website, in particular the sections on '[Foodmet](#)', '[Manufakture](#)' and '[masterplan](#)' (in [Dutch](#), [French](#) and [English](#))
- Abattoir presentation on the history and ambitions of the site

DIMENSION 2

SPACE

GENERAL SPATIAL CHARACTERISTICS

The Abattoir site is located in the dense city centre of Brussels, on walking distance to the southern tip of the historical centre (and the major railway station of Brussels South) and adjacent to the Canal Brussels – Charleroi. The site is located in the municipality of Anderlecht, which is also the owner of a large part of the site. Other parts are owned by the Brussels Region and by the private company Abattoir nv. The part owned by Anderlecht is given in long-term lease to Abattoir nv, who mainly organizes a large open market and meat cutting and processing activities on site. Next to access by main municipal roads, the site can be reached by two adjoining metro stations.



figure 9: the Abattoir site in 2017, note the PV panels on the existing facilities (Abattoir nv)

The Abattoir site is located in Cureghem. A diverse and vibrant, but socio-economically weaker neighbourhood. Although the site is bordered by buildings and a fence, the site is closely connected to the neighbourhood and its activities. The large open spaces of the site host multiple events and activities that attract visitors from all over the region. The open spaces of the site are flanked by large buildings, among which the classified cast-iron market hall. This contrasts with the dense building in the rest of the neighbourhood, which is characterized by little open space and many high row houses and the presence of mid-size manufacturing spaces. Both the site and the neighbourhood lack green space. The environment is highly characterized by a brick, concrete and asphalt materiality.

The Abattoir site and its surroundings have in recent years become subject to multiple official planning initiatives for the urban redevelopment of the neighbourhood such as the Kanaalplan, the visual quality plan for the Canal area, the PAD Heyvaert or Good Move.



figure 10: relation of the Abattoir site to Brussels historical city centre (the 'Pentagone') and the 19th-century infrastructure along which the city expanded (ORG architects)

MAIN REFERENCES

- Canal Plan website ([in Dutch](#), [French](#) and [English](#))
- Section on the 'visual quality plan for the Canal Area' on the Perspective Brussels website ([in Dutch](#) and [French](#))
- Section on the 'PAD Heyvaert' on the Perspective Brussels website ([in Dutch](#) and [French](#))
- The Good Move plan for the Brussels Capital Region, including a plan for Cureghem ([in Dutch](#) and [French](#))

BUILDING TYPOLOGY AND ACTIVITIES

Three large buildings or building complexes dominate the site and are complemented by a range of smaller buildings (notably at the edges). There is the monumental late 19th-century market hall, the meandering complex that houses the slaughterhouse, meat-cutting and meat-processing activities and the newly developed Foodmet with an indoor food market and rooftop urban aquaponics farm. The Foodmet is the first realized project in the site's redevelopment trajectory (figure 11). In a next step, the slaughterline and its associated activities will move to the similar large-scale, multi-purpose industrial building, the Manufacture project (figure 12 and 13). Later, new large, free-standing buildings introducing new activities to the site will be constructed (e.g. public housing blocks, including ground-level economic spaces). The restored market hall remains as the focal point to the site's large central open space around which these new projects are organized.



figure 11: Foodmet (ORG architects)



figure 12: render of the Manufacture project (Baukunst)

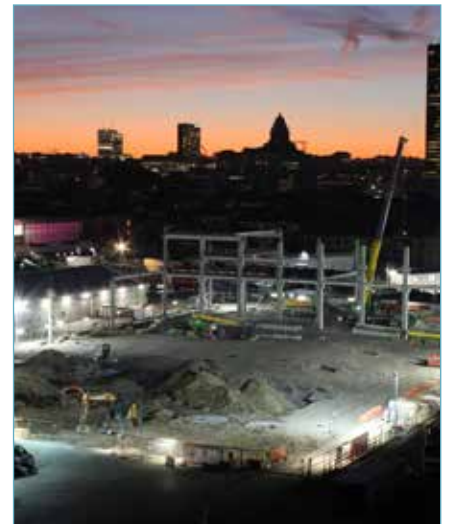


figure 13: Construction site of the Manufacture project (Abattoir nv)

While smaller urban manufacturing warehouses can be found throughout the neighbourhood, these are mostly part of city blocks consisting primarily of early 20th-century four- to five-storey row houses, the main building typology of the neighbourhood. Often these houses are subdivided in relatively small apartments.

MAIN REFERENCES

- [Abattoir presentation on the activities on the site](#)
- [Foodmet project on the website of ORG Platform for Permanent Modernity \(in English\)](#)

ACTIVITIES

On the Abattoir site the main activities taking place are the processing of meat, the market (three days a week, attracting more than 100.000 visitors each week), the organization of other events, the socio-cultural activities of Cultureghem and several forms of urban agriculture (including an aquaponic, a mushroom and a microgreen farm – see figure 14).



figure 14: scheme of the buildings per substation for the microgrid project (Monika Topel)

As part of the Abattoir masterplan, new functions will be introduced on the site. These include residential functions (student housing and social housing), public functions such as a swimming pool, and potentially also small offices and catering facilities.

Beyond the site, the neighbourhood is characterized by a mix of residential functions with retail (including several butchers and ethnic grocery stores), (second-hand) car dealers and small-scale urban manufacturing.



figure 15: representation of the (future) activities on the site on Mondays (Abattoir nv)



figure 16: representation of the (future) activities on the site on Thursdays (Abattoir nv)



figure 17: representation of the (future) activities on the site on Saturdays (Abattoir nv)



figure 18: representation of the (future) activities on the site on Sundays (Abattoir nv)

MAIN REFERENCES

- Abattoir presentation on the activities on the site

DIMENSION 3

SOCIAL**SOCIO ECONOMIC PROFILE****THE CROISSANT PAUVRE**

Abattoir and the Cureghem neighbourhood are part of what is termed Brussels '*croissant pauvre* (*the poor crescent*)'. This region stretching out over the immediate North and West of the historical centre (the Pentagone or Vijfhoek) groups some of the Brussels Region's poorest quarters. Cureghem combines low household incomes, with a high population density, small apartment size and a – for Belgium uncharacteristic – low home ownership rate. Additionally, more (serious) health problems are recorded for the inhabitants of the *croissant pauvre*. This can be possibly linked to environmental factors: a high level of air and sound pollution, and the absence of (public) green spaces.

MAIN REFERENCES

- General statistics on the [Brussels Instituut voor Statistiek en Analyse \(IBSA\) / Institut Bruxellois de Statistique et d'Analyse \(BISA\)](#) website, in particular the *wijkmonitor / monitoring des quartiers* (in Dutch and French)
- Health statistics on the [Intermutualistisch Agentschap \(IMA\) / Agence Intermutualiste \(AIM\)](#) website (in Dutch and French)
- Air quality statistics on the [IRCELINE](#) website (in Dutch, French, German and English)
- Statistics and information on the environmental quality on the [Leefmilieu Brussel / Environnement Bruxelles](#) website (in Dutch and French)
- General statistics on the [Statbel](#) website (in Dutch, French, German and English)

A SUPERDIVERSE CONTEXT

The official level of foreign nationals (excluding EU15 nationals) in the neighbourhoods surrounding the Abattoir site range from 30 to more than 45%. For Belgium the average is 13% (including EU15 nationals). Moreover, the nationalities of the Cureghem inhabitants is characterized by a large diversity. Research into the social tissue of these neighbourhoods has also indicated a high level of informality. Inhabitants draw on parallel, weak or non-institutionalized social, cultural and economic networks. This level of informality might furthermore suggest that not all official statistics on the neighbourhood are correctly mapped.

Several organizations operate in this superdiverse and socio-economically precarious context. On the Abattoir site, for example, Cultureghem organizes a whole range of activities (people's kitchen, collection and redistribution of market left-overs, animated playground, etc. – see figures 19 and 20) that bring together, support and empower the diverse inhabitants of Cureghem.



figure 19: Wednesday afternoons, Cultureghem transforms the space of the market hall into a big playground for the neighbourhood children (Cultureghem)



figure 20: a field kitchen organized by Cultureghem (Cultureghem)

MAIN REFERENCES

- General statistics on the [Brussels Instituut voor Statistiek en Analyse \(IBSA\) / Institut Bruxellois de Statistique et d'Analyse \(BISA\)](#) website, in particular the *wijkmonitor / monitoring des quartiers* (in Dutch and French)
- General statistics on the [Statbel](#) website (in Dutch, French, German and English)
- [Cultureghem](#) website (in Dutch, French and English)

ENERGY-RELATED SOCIAL ASPECTS

ENERGY SUBSIDIES

The Brussels Capital Region has implemented several programmes to increase the sustainability of its built environment, including the granting of subsidies for energy-efficient building and renovation projects and the setup of renewable energy installations. Although the need for energy renovation is high in Cureghem, statistics suggest that its inhabitants do not benefit from these subsidies. While the need for renovation is highest for the houses of lower income groups, most of the subsidies go to middle to higher income groups. This might have to do with the overall low building quality of the houses of lower income groups making the necessary budget for energy renovations higher (certainly relative to their income), the complex ownership structure of these houses, the general weak socio-economic profile of the inhabitants and complex procedures to apply for these subsidies.

MAIN REFERENCES

- General statistics on the [Brussels Instituut voor Statistiek en Analyse \(IBSA\) / Institut Bruxellois de Statistique et d'Analyse \(BISA\)](#) website, in particular the [wijkmonitor / monitoring des quartiers](#) (in Dutch and French)
- [Leefmilieu Brussel / Environnement Bruxelles](#) website (in Dutch and French)

LOCAL INITIATIVES TOWARDS A SUSTAINABLE CUREGHEM

The neighbourhood houses several initiatives working on the sustainability transition in Cureghem. Examples include the Centre de Rénovation Urbaine which assists inhabitants in their (energy) renovation projects; Circularium, a hub for local innovation and circular economy in the city; Cosmos, an association active in neighbourhood development for Cureghem and Cultureghem.

MAIN REFERENCES

- [Centre de Rénovation Urbaine \(CRU\)](#) website (in French)
- [Circularium](#) website (in Dutch and French)
- [Cosmos](#) website (in Dutch and French)
- [Cultureghem](#) website (in Dutch, French and English)
- mapping exercise during a TRANS-PED workshop on the [Abattoir](#) project

DIMENSION 4

ENERGY (AND OTHER METABOLIC FLOWS)

ELECTRICITY FLOWS (INCLUDING PHOTOVOLTAICS)

ORGANISATION AND PRODUCTION

- on the one hand, the Abattoir site is equipped with two high-voltage, grid-connected units; low-voltage distribution is organised by the Abattoir company.
- on the other hand, the Abattoir site is equipped with three PV-panel installations managed by the Abattoir company:
 - PV panels on the Foodmet building with 312 kWp peak power, operational since 2017.
 - PV panels on the existing buildings with 1,167 kWp peak power, operational since 2017.
 - PV panels on the covered market building with 1,944 kWp peak power, operational since 2022.

TECHNOLOGY USED

Abattoir uses grid connection and PV panels.

VOLUME

approx. 5,500 MWh, about 80% of which are provided by the grid and about 20% by renewable green energy by means of PV panels (these are figures based on information from 2021; the share of renewable green energy will have increased considerably with the PV installation on the covered market building that has been operational since 2022).

AMBITION

Abattoir's ambition is to increase on-site electricity production using photovoltaics.



figure 21: aerial view of the Foodmet project, with the photovoltaic installations (and the aquaponic and other urban agricultural activities) clearly visible. (Abattoir nv)

GAS FLOWS

ORGANISATION

There is a central connection to the grid, managed by Abattoir.

TECHNOLOGY USED

Gas boilers for heating (offices) and sanitary warm water production (cleaning of food-production workstations).

VOLUME

approx. 4,500 MWh.

AMBITION

Abattoir's ambition is to phase out gas use entirely.

HEAT /COOLING FLOWS

The productive activities on the Abattoir site are characterized by a large demand for cooling, with the extensive use of fridges, cooling counters and freezers for butchers' facilities such as cutting rooms, etc. This large cooling capacity results in the availability of considerable volumes of residual heat. In the older installations, residual heat is lost through evaporators and cooling towers. In the Foodmet project, it was decided that only water-to-water heat pumps would be used in the future, where waste heat from individual installations is collected in a ring pipeline, called the "boucle", at building level. Via a heat exchanger, residual heat is recovered for activities that require heat such as, in the case of the Foodmet project, an urban farm and, in the future, residential functions. In the case of the Manufacture project, this involves an indoor and outdoor swimming pool (figure 22). The boucle pipes in the Foodmet and Manufacture projects can be seen as a first step towards a heat network for the entire site (figure 23). The aim of this district-level heat network is to achieve an optimal balance between cooling and heat demand. The combination of productive activities requiring cooling and urban activities requiring heat is an ideal situation to achieve this balance.



figure 22: render of the Manufacture project. The workshops - needing cooling to store meat - are at the ground floor, the indoor and outdoor swimming pools will be built on the top layer of the building. (Baukunst)

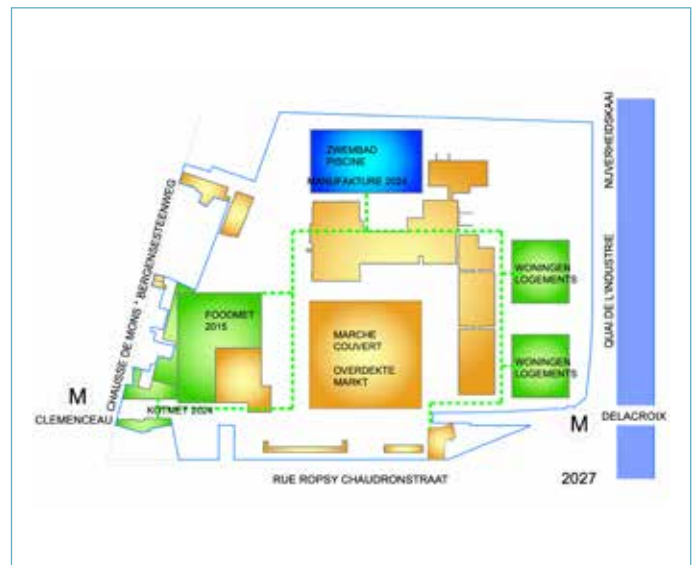


figure 23: schematic representation of the 'boucle' as a local heat network for the site and, potentially, the neighbourhood. (Abattoir nv)

GEOTHERMIC STORAGE

As a backbone for energy exchange on-site (and possibly also beyond the site). By linking the heat network to geothermic storage, the balance between heat and cold can be further optimised, thereby additionally reducing energy consumption. A first section of the heat network and geothermic storage system will be accomplished by 2024. The next few years will also show to what extent buildings adjacent to the Abattoir site can be connected to the heat network and/or to what extent the network could be extended to adjacent plots of land.

Since taking over the site from the municipality of Anderlecht in 1984, Abattoir has occupied the role of activity manager. This means that Abattoir is responsible for conversion works and new construction projects, but also maintenance, cleaning, and energy production and distribution. Whereas initially these tasks were handled rather organically and as dictated by operational needs, a change of direction occurred, beginning in 2010, with the drawing up of the masterplan. The masterplan is based on a new urban-development vision involving the organisation of urban warehouses as flexible, multifunctional buildings around a central square. At the same time, this masterplan was the start of a new vision for the future of Abattoir in terms of sustainability, energy management and the organisation of the site's open spaces.

The urban warehouses themselves are conceived as sustainable and future-proof structures, with the aim to maximise the circularity of materials and fluxes within each building. To this end, each warehouse contains its own miniature energy network aimed at reducing energy consumption and allowing exchanges both between the various activities within the building itself and also with future nearby developments. Furthermore, the network allows for coordinated management by Abattoir, which includes energy production and distribution as well as charging for energy costs. In that respect, Abattoir acts to some extent as its own network's energy producer and manager. To date, connections to the public power and gas grid remain in place, notwithstanding the fact that since the installation of PV panels began in 2017, an increasing share of the site's energy needs has been produced locally. It is the ambition of Abattoir to take further steps towards self-sufficiency. The construction of the first part of the heat grid by 2024 that will connect the first urban warehouses, as well as the linking of the heat grid to a geothermal storage installation, are to be understood as efforts toward that goal.

A number of elements sustain Abattoir's ambition of extending the heat network into the surrounding neighbourhood, such as the fact that energy production and distribution are both part of the economic activities of the Abattoir company. Furthermore, it is observed that the diversification of activities, energy coupling, as well as an increase in scale would contribute to further sustainability and, in the long term, to carbon neutrality. However, it is clear that this will not only require a demonstration of technical and financial feasibility, but that legal issues will also have to be resolved.

ORGANIC AND WASTE MATERIAL FLOWS

The table below gives an idea of the most important waste flows and their volumes, origins and destinations. About 15 years ago, it was investigated whether biogas production could occur on site, but this proved impossible for safety reasons, including the large influx of visitors to the weekly market. Nevertheless, considering technical advances since, Abattoir wishes to re-examine this opportunity. A biogas plant could be an interesting addition in terms of locally produced energy.

TYPE OF WASTE	WEIGHT (TONNES)	ORIGIN	DESTINATION
biosludge	233	water treatment	combustion
fruit & vegetables	347	weekend market	biogas production
rest waste	870	weekend market	combustion with energy valorization
paper / cardboard	691	weekend market	recycling
meat waste (DA1)	713	slaughter lines	powder (replacement coal in cement oven)
meat waste (DA2)	172	slaughter lines	powder (replacement coal in cement oven)
meat waste (DA2)	559	slaughter lines	biogas production
meat waste (DA3)	88	slaughter lines	pet food
mixed blood (DA3)	625	slaughter lines	pet food
TOTAL	4298		

RAIN AND PROCESS WATER FLOWS

Abattoir is one of the major water consumers within Brussels Capital Region, with a total annual consumption of more than 110,000 m³. In addition, we know that some 80,000 m³ of rainwater falls onto the Abattoir site every year, of which only a very limited amount is reused today.

Abattoir wants to investigate various aspects of water management with the aim of reducing water consumption by using rainwater at various steps in production (which is particularly difficult nowadays because of the food sector's strict hygiene rules) and reducing the discharge into the public sewage system, possibly reducing it to zero in the long run. In the future, it can also be investigated whether rainwater, which is abundant on the site and can be collected relatively easily, could be shared with surrounding houses that have no space for rainwater collection.

TRANSPORT FLOWS

In the development of Abattoir as a PED and as a market site, public transport plays a crucial role for attracting visitors. The Abattoir site is adjacent to two underground stations: Delacroix in the west and Clémenceau in the east. These two stations are crucial for the market which attracts more than 100,000 visitors every week, spread over Friday, Saturday and Sunday. This makes the Abattoir market the largest in Brussels and even in all of Belgium. Improving the connection between these underground stations and the site is very important to motivate people to reach the site by public transport. In this regard, a project by Bruxelles Mobilité for the coming years aims to facilitate accessibility between Delacroix station and the site for the numerous visitors who use shopping trolleys. The proportion of market visitors who reach the site by public transport has been growing for years.

MAIN REFERENCES

- Visie Duurzame Stadslandbouw [Inagro report], 2021 (in Dutch)
- [The Space of Waste / Designing Waste](#) [research paper] by Andrea Bortolotti, 2017 (in English)

DIMENSION 5

GOVERNANCE AND POLICY CONTEXT

PROJECT'S GOVERNANCE STRUCTURE

ABATTOIR NV

Abattoir is a private company which partly owns the site (approx. 2.5 ha) and partly has property rights via a long-lease agreement running until 2087 (approx. 6 ha). Part of the site was acquired by Brussels Capital Region in 2022 (approx. 2 ha): this concerns the part of the site along the canal.

Abattoir acts as manager of the site and is therefore in the lead for its development. This means that Abattoir carries out both conversion and new construction projects, maintains and cleans the buildings and the open spaces between them, leases buildings (slaughterhouse, meat-cutting companies, butchers, events, urban farm, etc.) and open spaces (market traders), and is partly responsible for energy production and distribution.

BRUSSELS CAPITAL REGION

The Brussels Capital Region holds bare ownership of the long-lease agreement and in 2022 acquired in full property part of the site intended for the construction of affordable housing. Brussels Capital Region is in the lead for this project. However, the development of this part of the site will occur in accordance with Abattoir's vision contained in the masterplan. In this sense, the ongoing consultation between Abattoir and Brussels Capital Region is set to continue.

ACTORS ON THE SITE

Various actors are involved in the site's development projects to a greater or lesser extent, including the tenants of buildings and open spaces: the slaughterhouse, meat-cutting companies, butchers, the urban farm, market traders, etc.

There is also the socio-cultural organisation Cultureghem, which was founded as part of Abattoir and has been active on the site for more than ten years already. Abattoir and Cultureghem have since worked together on various projects and aim to develop a joint vision and projects for the site's open spaces in the coming years, in a scheme bearing the name "Plein Abattoir".

KEY NEIGHBOURHOOD, COMMUNAL AND REGIONAL ACTORS

Numerous stakeholders are involved in the site's development. These include both actors at the level of the Cureghem neighbourhood (including the Centre de Rénovation Urbaine (CRU), the Union de Locataires d'Anderlecht-Cureghem (UlaC), Cosmos, etc.), stakeholders at the level of the municipality of Anderlecht (including, of course, the municipal administration of Anderlecht), and stakeholders at the level of Brussels Capital Region (Urban.Brussels, the Bouwmeester Maître Architecte, the Société d'Aménagement Urbain (SAU), Perspective.Brussels, Bruxelles Mobilité, Bruxelles Environnement, etc.).

COLLABORATIONS WITH INNOVATION PROJECTS AND RESEARCH

Abattoir has always been open to collaborations with the academic and research sectors. In that respect, there have been several collaborations with universities and research institutes in the past, from home and abroad. To name but a few: Architecture School La Cambre of ULB (Université Libre de Bruxelles), Cosmopolis of VUB (Vrije Universiteit Brussel), ETH Zurich, etc. Abattoir is, further, involved in three JPI projects: SYNCITY (completed), TRANSPED (final stage) and PED4ALL (to begin in early 2023).

MAIN REFERENCES

- [Abattoir website](#) (in Dutch, French and English)
- [Maatschappij voor Stedelijke Inrichting \(MSI\) / Société d'Aménagement Urbain \(SAU\) website](#) (in Dutch, French and English)
- [Perspective Brussels website](#) (in Dutch and French)
- [Leefmilieu Brussel / Environnement Bruxelles website](#) (in Dutch and French)
- [Cultureghem website](#) (in Dutch, French and English)
- [Centre de Rénovation Urbaine \(CRU\) website](#) (in French)
- [Union de Locataires d'Anderlecht-Cureghem website](#) (in French)
- [Urban Brussels website](#) (in Dutch, French and English)
- [Bouwmeester Maître Architecte website](#) (in Dutch, French and English)
- [Brussel Mobiliteit / Bruxelles Mobilité website](#) (in Dutch, French and English)

POLICY CONTEXT

In line with the European Renewable Energy Directive and the Fourth Energy Package (also Clean Energy Package), the Brussels Capital Region has enacted a new legal framework on (peer-to-peer) energy sharing and energy communities in March 2022. This framework makes it possible to set up energy communities and organize the sharing of energy on a local level. Moreover, the regional administration appointed a facilitator, Energy Commune, to help interested parties (citizens but also civil society organizations and enterprises) to set up energy sharing arrangements and energy communities. While pilot projects have already been established to test the implementation of these activities in the region, the scale and complexity of the Abattoir project make it unclear how the PED activities of Abattoir can fit in this ordonnance. Points where this lack of clarity manifest include the balance between private and non-for-profit activities and the combined governance of an energy community and a (privately driven) PED project. To deal with these ambiguities, and as a pilot case for larger and more complex projects, a trajectory is set out by the Abattoir project partners and the involved regional administration.

MAIN REFERENCES

- 'Energy Sharing and Energy Communities' section on the Leefmilieu Brussel / Environnement Bruxelles website (in [Dutch](#) and [French](#))
- 'Energy Sharing' section on the Sibelga [DNO] website (in [Dutch](#) and [French](#))
- 'Energy Sharing' website by BRUGEL [DNR] (in Dutch and French)
- [Energie Commune](#) website (in French)

Resources for PED practitioners & researchers

For more resources and project results from the Trans-PED project, visit the results section on its [website](#).



All about the Trans-PED project

Check out the Trans-PED [website](#) for details on the project, the international consortium of partners, as well as the participating PEDs.



TRANS PED

TRANSFORMING CITIES
THROUGH POSITIVE
ENERGY DISTRICTS



www.trans-ped.eu