

DE CEUVEL

Design & Development:
Space&Matter, Smeearchitectuur

Year(s):
2012-2014

Location:
Amsterdam, The Netherlands

More info:
<https://deceudel.nl/en/about/general-information/>

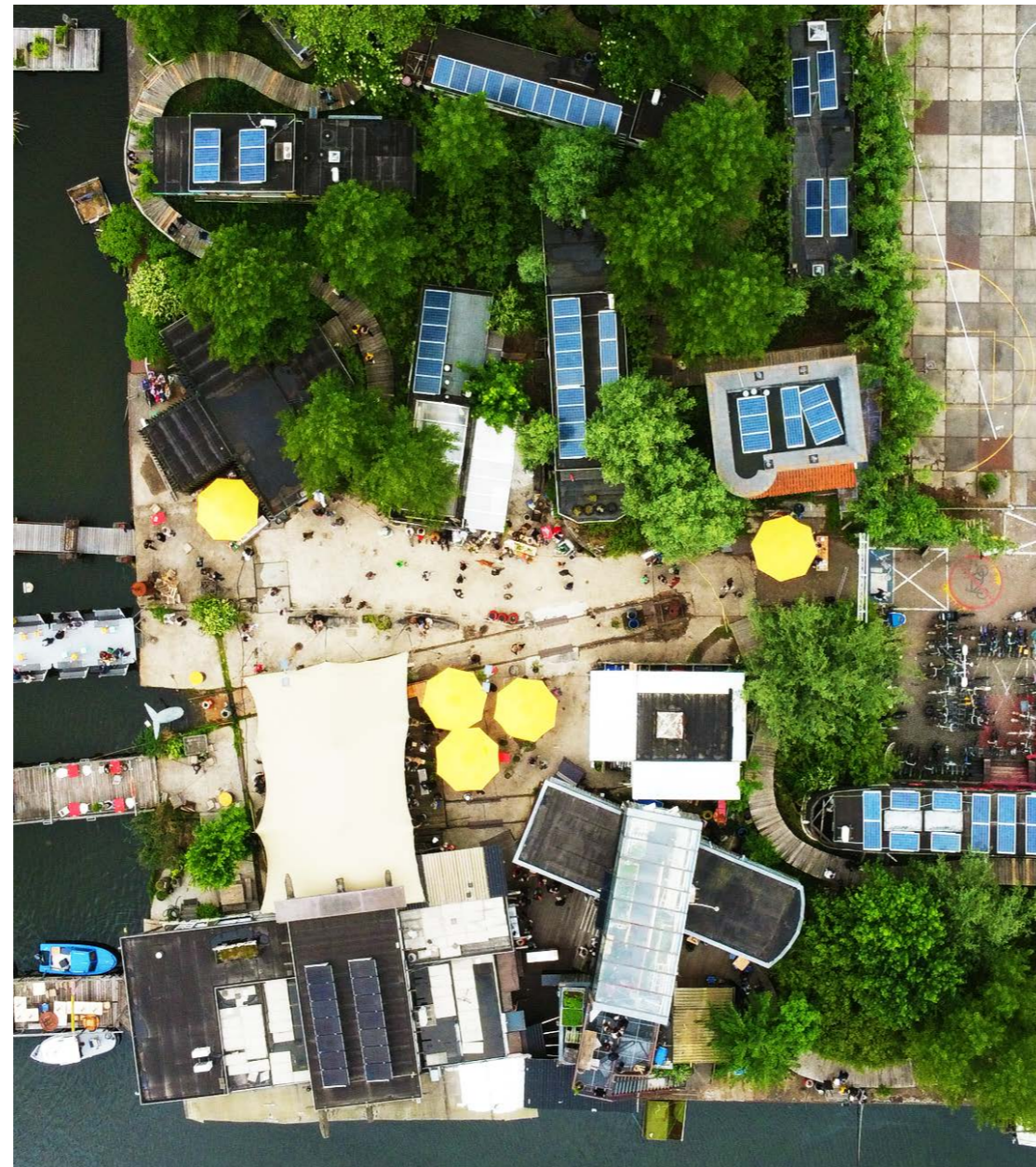
Scales:
Neighbourhood

Resources:
Energy, Nutrients, Water,
Secondary

Design Approaches:
Regenerative Design, Design for
disassembly

R-Strategies:
Rethink, Reuse, Refurbish,
Repurpose

Aspects:
Design, Management, Resource
Flows, Stakeholders



DE CEUVEL, also called 'cleantech playground', is a pioneering, small circular neighborhood with a community café and 17 workspaces for about 30 businesses. The project is located near Buiksloterham, the former shipyard in the post-industrial area of Amsterdam North. Nowadays, it is one of the most popular Circular Districts and Living Labs. De Ceuvel, was initiated simultaneously with the Schoonschip project. Schoonschip and De Ceuvel are separate community development projects undertaken by different but overlapping

citizens. Circularity has been a key objective of both projects since their inception, with both groups requiring all members to sign a manifesto committing them to sustainable living and practices. The De Ceuvel project was initiated by Space&Matter and Smeearchitectuur, and the concept for the site was developed from 2012 to 2014 by various stakeholders, including architects, people of the community, and sustainability experts who won a competition with their concept of upcycled houseboats. De Ceuvel is a 10-year temporary urban

development in which retrofitted houseboats are placed on the land and surrounded by a "forbidden garden" of soil-cleaning plants. The architectural plan for both sites has been developed by Space&Matter, and the phytoremediation plan for the De Ceuvel has been designed by the Delva Landscape Architects office in collaboration with the University of Ghent in Belgium. The overall feasibility study for both projects was conducted by Space&Matter, with Duurzaam Drijvend Wonen also considering the financial perspective.

1. Conceptualization of Circularity

What is the circular idea, theory and approach behind this project? What is the aim and purpose of it?

Due to the small budget and temporary nature of the development, the multidisciplinary team focused on developing an innovative concept that prioritized mobility and reuse. The urban plan was designed in such a way that wasteland and waste materials would be transformed into valuable resources.

The site features imaginatively retrofitted houseboats branching off of a winding bamboo walkway that is, in turn, surrounded by an undulating landscape of soil cleaning plants designed by Delva Landscape architects. This green oasis creates a terrestrial harbor for boats that would have otherwise been demolished. As largely self-sufficient elements, the boats are able to leave the site without any trace when the ten years are up.

The circularity concept at the heart of the Design of the De Ceuvel project is fourfold:

- **Design by reusing and upcycling building structures and materials** of old existing houseboats, which would otherwise have been demolished. The offices are mainly made of upcycled materials collected on site, with old houseboats lifted onto the land and renovated into offices. Furthermore, the café is created from an old lifeguarding kiosk with 80-year-old nautical bollards.

- **Regenerate the polluted land** on which the project is located through phytoremediation processes. Phytoremediation is a well-known treatment of pollutants by using

plants that remove, degrade, or stabilize undesirable substances (such as heavy metals). Delva Landscape Architects designed the "Forbidden Garden" of De Ceuvel in collaboration with the University of Ghent.

- **Close material cycles through new technologies.** This implies the reuse of nutrients and energy on-site.

- **The transition towards a circular society** is not only a technical shift but also a cultural change. People should learn new modes of thought and apply new techniques and technologies; therefore, De Ceuvel was conceived as a circular hub for hosting sustainable workshops and lectures.

2. The Sectoral Dimension

On which economic areas is the circularity focusing? What kind of system, supply chain, and flows is the project addressing?

De Ceuvel aims to align with the primary principles of the circular economy. In particular, it focuses on 'closing the loops' in five areas: energy, organic waste, wastewater, food, and soil regeneration.

Energy

In the neighborhood, office boats are heated through solar energy. And approximately 150 solar panels are built in. Heat exchange ventilation systems are also fitted to each boat to maintain the heated environments more efficiently. Moreover, recently a blockchain-based energy sharing token called the Joullette has been installed. This system allows De Ceuvel buildings to track their energy usage as well as exchange energy locally (dependent on whether they are producing an energy surplus or drawing a deficit). Through a point assignment system, users are rewarded for reducing consumption and efficient usage of electricity and solar panels. In De Ceuvel café, a map of the site visualizes in real time where the energy is being generated, traded and passed back to the grid, making a positive, renewable contribution to the power needs of the city.

Organic Waste and Wastewater

In De Ceuvel, any waste is considered a resource. In particular, kitchen wastewater is purified through helophyte filters before being released into the ground as clean water. The helophyte filter is a mixture

of sand, gravel, shells and vegetation. Additionally, each building is fitted with a compost toilet. Contrary to conventional flushing toilets that release wastewater into the sewer, dry toilets produce solid compost that can be harvested for its high nutrient value. Urine is collected separately and processed via a struvite reactor, which has the phosphates needed to create fertilizer for local food production.

Food

Many businesses in the neighborhood also focus on tackling food waste challenges and raising awareness through different practices of broader food-related sustainability issues. De Ceuvel café serves mainly organic, locally sourced vegan food. For instance, some aromatic herbs and vegetables are grown right on-site. The local aquaponics greenhouse showcases how clean technology, food cultivation, and nutrient recovery systems can be integrated into urban environments, resulting in better efficiency in food production. The aquaponics greenhouse integrates fish and vegetable production in a closed-loop system, where, for instance, fish excrement supplies nutrients for the local vegetation, and the vegetation filters the water for the fish to live in. The worms also offer essential nutrients for food production from the on-site composting bin and the struvite bioreactor. The struvite reactor collects and processes urine from the nearby offices.

Soil regeneration

As previously mentioned, the project site is an abandoned and polluted shipyard. To regenerate the polluted ground, the soil has been covered with specific living plants and microorganisms that absorb pollutants through their roots in a process called 'phytoremediation'. Phytoremediation is a well-known process that, together with agronomic techniques, is adopted to either contain, remove or render toxic environmental contaminants harmless. It is a non-invasive and expensive process; however, according to the type of pollution, it requires a more extended period to be effective.

3. Sustainability Framework & Transition Concepts

What is the context of the project? What is the socio-economic, legal, and political structure established to develop the project?

De Ceuvel was planned to stimulate a new sustainable framework for managing resources in neighborhoods and communities through a temporary project. The financial resources to develop De Ceuvel came from Innovatie Netwerk, a Dutch Ministry of economic affairs program that enhanced the transition towards a concrete business case. The project is a concept that responds to the ambitious sustainability targets set early on by the community while offering a fun and engaging educational environment. Throughout De Ceuvel, there are showcases of technologies and techniques that operate on a small scale to close local cycles of waste and resources, upcycle materials, and bring us back in touch with our basic needs. The creative reuse of waste materials throughout the site is critical to extracting value and nutrients from what many people view as waste. In the project, transitioning towards circularity requires collaboration with technology partners, research institutes, and government agencies, enabling us to create a rich educational environment for exploring the future of circular urban environments. De Ceuvel's transition concept and sustainability lessons are now adopted as blueprints in the Netherlands and Europe. Lastly, it is crucial to mention the temporary nature of the project, as, after ten years of lease, the property should return to the Amsterdam Municipality. However, as with many other temporary projects, this does not imply the neighborhood or the dismantling of such a successful and pioneering area.

4. The Social Dimension

Is this project bottom-up or top-down in its approach, and what role do local inhabitants, stakeholders, and circular innovators play? Does it have a flagship / pioneering character for others? Does this project view people as consumers, users, or pro-sumers in the context of a circular economy? Does it have a pioneering role, with impact beyond its region?

De Ceuvel is a bottom-up project and is community-based. Although since its origins it was conceived as a community hub it soon became the Amsterdam Living Lab. The creative and social enterprises in the rented houseboats-turned-offices are custodians of sustainable technologies and initiatives and collaborate with the surrounding

enterprises and inhabitants. Moreover, they are required to spend 40 hours a year working within and further developing De Ceuvel. This collaboration fosters a sense of community, to enjoy shared experiences and participate in creative projects. One such initiative -Het Ware Noorden Light Festival- brings together 'makers and doers' from Amsterdam North to experiment with creative reuse in upcycling objects into a light art installation. On top of that, external trainers provide a variety of educational programs, public workshops and seminars to share knowledge about circularity and sustainability, as well as provide healthy and sustainably produced food and drinks in their café. By promoting it as a living lab the project aims to educate and inspire others to think about how workspaces could be different. Aligned with the core principles of the circular economy, it focuses on upcycling and working systemically. Tangible examples of circular and systemic approaches can provide valuable lessons and inspiration for other urban hubs to build upon. This educational aspiration is fostered through national and international workshops, masterclasses, educational programs on designing cities and urban space as well as building aquaponic systems.

5. The Territorial & Spatial Dimension

What is the scale of the project? Are urban planning policies design strategies cross scale? If yes, how and which flows are involved? What is the role of space and territory in this circular project?

The project focuses on the neighborhood scale. Since the plot is only leased for ten years, the project concept also includes refraining from using ground foundations for the renovated houseboats. Indeed, after the expiration of the contract, the houseboats can be moved easily, even back on the water. Also, since the project is located in Buiksloterham, it is part of the vision of a circular Amsterdam.

6. Assessment & Monitoring

How are strategies and policies monitored and evaluated? How is the qualitative and quantitative success of a project evaluated?

De Ceuvel is an internationally known and successful project, visible in several writings by renowned journals such as the Wall Street Journal and the New York Times, which have written, "De Ceuvel isn't just the hippest office park in town. It's considered a model of eco-design" (Gagliano 2016) and "The project is an example of Amsterdam's commitment to urban experimentation" (Schuetze 2014). Since its conception in 2012, the project has generated significant national and international interest and income. This pioneering project's technical and circular results are not yet quantitatively monitored. However, what is constantly measured is the number of visitors coming to observe the site, approximately 35.000 visitors a year before COVID-19. The project's innovative character attracts everyone, from young students to locals from an older generation. Beyond a quantitative assessment, the project is considered a tangible achievement of Amsterdam's Circular ambitions.

Colophon

Contributor(s):

Cecilia Furlan
Laetitia Augustyniak
Mariette Overschie
Kim Sinnige

Image credits:

Photo: © Arne Elgersma

References & further reading:

Metabolic. (n.d.). *De Ceuvel: A cleantech playground*. <https://www.metabolic.nl/projects/de-ceuvel/>

Space&Matter. (n.d.). *De Ceuvel: a Playground for Innovation*. <https://www.spaceandmatter.nl/work/de-ceuvel>

liito, P. (2020). *De Ceuvel - From Polluted Land to a Cleantech Playground*. Sustainability Leap | Database of Impressive Solutions. <https://kestavyysloikka.ymparisto.fi/en/de-ceuvel-from-polluted-land-to-a-cleantech-playground/>

Schuetze, C.F. (2014). *Ex-Shipyard in Amsterdam Houses Shops and Offices*. The New York Times. <https://www.nytimes.com/2014/11/20/business/energy-environment/ex-shipyard-in-amsterdam-houses-shops-and-offices.html>

Gagliano, R. (2016). *One-of-a-Kind Experiences in Amsterdam*. The Wall Street Journal. <https://www.wsj.com/articles/one-of-a-kind-experiences-in-amsterdam-1462978040>