04. An Interdisciplinary Approach to Circularity

Envisioning Circular Urban Projects, Cities and Regions: the case of Porte Ouest in Charleroi, Belgium

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Circular cities and regions are not simply containers of circular practices and businesses. They are very complex *socio-economic and environmental systems*, in which material inputs and outputs are related, and 'waste' is used as a resource. So, how can we envision circular urban projects, cities, or even regions in terms of economy, society and environment?

The importance of mapping

Well, first *we need a clear picture of what is available*. Mapping allows us to observe phenomena that are unnoticeable at a first glance. By redrawing the territory, its landscape structure, its productive landscape, and its material and economic flow movements, we can unveil existing territorial rationalities. In order to do that, we can employ several analytical tools and design frameworks such as *interpretative mapping, social impact analysis, thinking in time and flows, and systemic design* to bridge and integrate these complementary perspectives and largely disconnected data levels. Despite their flat nature, *maps can be rather thick*. Nevertheless, the over-imposition of several layers allows one to correlate different materials, revealing their interrelations and generating a systemic understanding of a context.

Let's take a look at the case of the Porte Ouest

in Charleroi, Belgium to understand how mapping works. For this project, we focused on existing and underused renewable resource streams. The most obvious ones were the *waste flows* for their potential to become the material providers of the future. One waste flow that was identified as quite interesting for Charleroi was biomass from landscape waste. In addition, we mapped underused *infrastructural elements*, such as former railway lines and the ravel along the river Sambre. Also, with its terril, this post-industrial site was reclaimed by ruderal vegetation, rendering the landscape as a resource ready to be repurposed. Lastly, *geothermal and biomass energy* were mapped as static resources. The mapping of these resources was not just a numbers exercise. A key challenge was understanding how these flows were rooted in space.

Integrating circularity

So, back to envisioning a circular built environment. Circularity demands that we broaden our imagination and explore the possible futures of space without necessarily constructing something. In a circular perspective, the designer's task should be multi-dimensional and should begin by *rethinking the existing*.

For this project, the in-depth map operation allowed us to read the industrial ruins of the

post-mining landscape of Charleroi, no longer as a waste landscape but as a land in rest: *fallow land*. This interpretation is rooted in the agricultural tradition of crop rotation in which the land is regularly alternated between use, rest, and reuse. The agricultural metaphor establishes the critical framework where land is not referred to as a static object, but as space in movement, in which vegetation, buildings, and hard surfaces are transitional manifestations. It also supports the idea that land and urban territories are resources and therefore finite.

Furthermore, according to *Paola Viganò, "territories can be rethought as parts or as a whole, they can be transformed under external action or by themselves and they are characterised by different life-cycles. Hence, by constantly being built and rebuilt, territories are like renewable resources."* This view allows the possibility of observing the urban and territorial metabolisms as open agents capable of reconfiguring into new cycles.

Translating circularity into design

So, how does all this translate into design? In order to configure a new cycle for the fallow land of Porte Ouest, we envisioned three main actions: *regenerating, reconnecting, and recirculating*.

The starting points for rethinking this post-mining territory was its ruderal vegetation, the reclaimed post-industrial sites, and the terril that was generating a different biotope where human and non-human activities meet. In the project, the presence of vegetation was not only recognised as an existing condition but used as a structural design element to define the new urban configuration. It was also a way to reclaim/remediate the polluted soil on site; purify the water and recycle on-site waste streams generating new productive activities. The key was to design a development strategy for *regenerating* that gradually activates the landscape as an infrastructure that deals with different challenges and flows at the same time.

The *reconnecting* action led to re-establishing an infrastructural connection with the site, surrounding its ecological landscape and embedded history. Finally, through a *recirculating* process, we envisioned new circular economies based on the life-cycle of wood and the reuse of wood waste and biomass for energy production and soil composting processes. The site could become a hub for new economies and companies related to the wood, energy and recycling sector.

Wrapping up

Designing with circularity as an underlying concept implies operationalising circular principles across time, spatial scales and flows, and understanding how the landscape profoundly connects and shapes these flows. It's not necessarily the economic potential guiding our design efforts in the first place, but the potential of flows and infrastructures to connect different socio-economic agendas.

The proposed approach in the Europan Project for Port Ouest in Charleroi synthesises how multiple circular economy dimensions could merge in space. The proposed design is not a blueprint or master plan. It instead presents a scenario and a vision for a possible future. Designing with flows requires new methods of collaboration and design, such as:
1. mapping territorial dynamics,

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2. systemic design in which waste, including waste space, is seen as a resource,
3. designing with the existing and local resources,
4. thinking in time and across spatial scales, and
5. thinking about connecting different agendas and how to translate them into space.

While the spatial dimension is key, circularity can only be achieved with collaboration where all the actors and spatial components are involved in the process. Circular design projects, visions and scenarios can act as a medium between politicians, policy-makers, designers, investors, communities and local inhabitants, as well as flora and fauna in a necessarily open and collaborative dialogue. *The value of design in these cases transcends pretty images; instead it integrates knowledge and helps shape alternative coalitions.*