

Visualising regional circularity

Accelerating transition to ecosystems for multiple value creation

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Extended abstract

In this paper we address the question how visualisation enables cooperation around multiple value creation and transition towards sustainable regional development. We present the modelling tool CEVIS (Circular Economy Visualisation) for circular economy initiatives in a regional context. This instrument is intended to bring together representatives of societal sectors parties around the topic of multiple value creation. In case of large-scale application through proliferation of its use, it could provide a means for scaling up circular initiatives. The modelling tool deliberately takes an ecosystem perspective on circular economy developments, through (1) visualisation of circular product flows in an economic system, (2) identification of involved actors, and (3) highlighting multiple value creation.

Value creation forms the central axis of business models, yet leaving much unclear on what it actually entails (Lüdeke-Freund, Rauter, Pedersen, and Nielsen, 2020), let alone what meaning may be ascribed to the concept of value. In pursuit of shedding light on these issues. Faber et al. (2022) present the value-actor matrix as a framework to identify multiple value creation challenges within a regional context. The regional perspective provides an intermediate level of analysis on the global issue of circular economy (see also Faber et al., 2022). It is at regional levels where industry, consumers, and government come together and give shape to collaborative, concrete action. For our purpose, this is also the level at which factors that contribute to sustainable development become manifest. The regional scale is small enough to do low cost experiments and to observe small strategic improvements (e.g.,

as is elaborated in Weick's (1984) small-wins theory). On the flip side, it is large enough to offer sufficient mass to expect proliferation of efforts, mobilise resources, and demonstrate impact.

Consequently, we conceptualise the region as a multi-actor system, where each actor group is responsible for the creation of one or more values identified. As a perspective on transition within such multi-actor systems, Faber et al. (2022) propose to utilise the concept of task democracy. This concept identifies five societal realms that are deemed mandatory in the transitions for a sustainable development and a circular economy. The vehicle in which multi-actor deliberation takes shape following the task democratic process is the product council. A manifesto for product councils lays down its foundations (Faber et al., 2022). In order to constitute product councils *ex nihilo*, a bootstrapping method has been developed (Faber et al. 2023). The visualisation tool we present here, is a next step in search of ways to provide footholds for sustainable regional development.

This paper presents a method of and an online tool for visualising regional value chains and demonstrates its role in shaping multi-actor collaboration for multiple value creation. The method and tool are intended as instruments for initiators of multi-actor deliberation in before-mentioned product councils. The tool enables visualisation of product flows, involved actors, their interdependencies, and their responsibilities towards each other and towards sustainable development objectives.

Hypothesis

Initialising society wide cooperation, rather than starting a 'coalition of the willing', is a somewhat paradoxical exercise. On one hand, the need for such cooperation may appear evident. On the other hand each potentially participating group may and often will hesitate to take the lead and invite the other four. All of this equally counts for task democratic cooperation, involving five task groups: science, citizens, government, businesses and non-profits. Consequently, we expect that new product councils will not emerge spontaneously before they are abundant.

The product council bootstrapping method (see Faber et al., 2023) was designed as a stepwise guideline for first movers. This may motivate initiators to stand up and invite opinion leaders from five task groups, to get together and discuss the need and feasibility of a product council. In this first phase of inviting influentials, they may meet hesitation in all task groups and will need more than just rational arguments to convince opinion leaders.

Our hypothesis is twofold. At first, we expect that in the situation described, visualising the (regional) product chain and its sustainability challenges may help. A diagram may convey the need for cooperation better than writing or speaking, following the proverbial 'a picture is worth more than a thousand words.' However, without guidance on how to draw such

diagrams, and without tools to do this efficiently, few will be drawn, and even less will convince. The second part of our hypothesis is therefore that an online available drawing tool may provide both guidance and efficiency.

Design criteria for a visualisation tool

We have applied the following criteria in the development of the visualisation tool. With regards to the production of diagrams, it should:

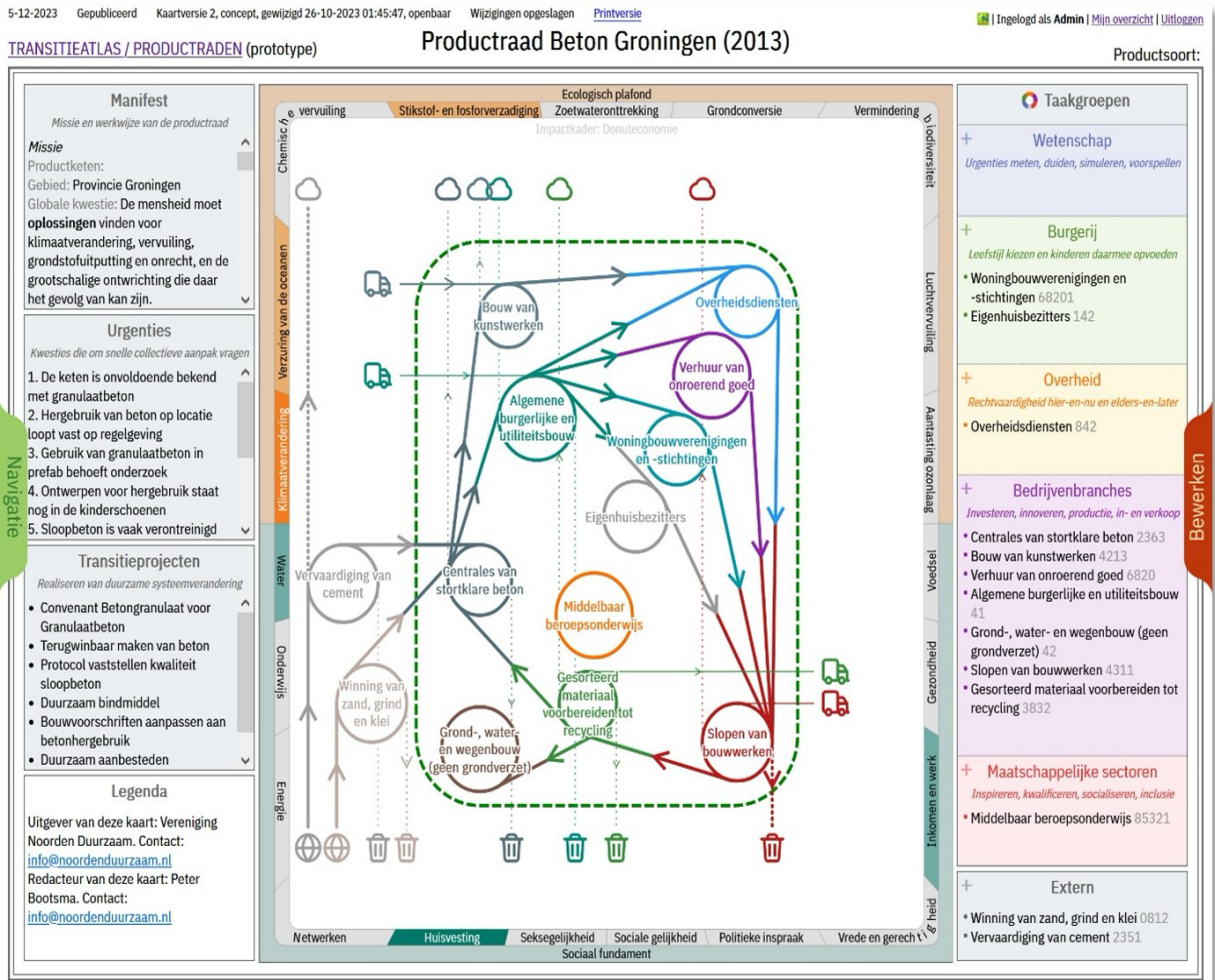
- depict the system border of the product council;
- depict five task groups and their sub groups, like business branches;
- depict product flows between these sub groups;
- depict import, export, extraction and emission flows;
- indicate relative proportions of subgroups and product flows;
- indicate ecological and social impact of the product chain;
- are embedded in a product council (home) page.

Regarding the generic design of the tool, it should:

- be available online;
- be easy to learn;
- enable to make multiple diagram versions per product council;
- allow to choose between impact frameworks like SDG's and Donut Economy;
- export diagrams in a scalable format;
- enable to navigate between a potentially large number of product councils;

The tool

A prototype of a tool is constructed at the Noorden Duurzaam association, as an extension to their Transition Atlas prototype (see Noorden Duurzaam, 2024). Also, a detailed manual is written, to be used as a tutorial. The tool is currently available to association members. Figure 1 shows a screenshot.



Field tests

The tool validation is designed as a multiple case study. The process of visualising the intended circular configuration of the value chain by involved actors is monitored. For each case both the initial and desired product chain configuration and its estimated impact are developed and described using the tool. In a series of semi-structured interviews, involved actors are questioned about the process of developing from IST to SOLL, about the challenges they face, their expectations and to what extent these are met or need to be adjusted, and the responsibilities towards other actors and sustainability objectives. On a meta level, actors (including the first mover) are asked whether and how the diagrams altered their opinions on the need to combine the forces of five task groups, and about the feasibility of a circular economy product council.

Keywords

Product council, circular economy, visualisation, regional sustainable development, multiple value creation

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