Concrete results for circular procurement

Rijkswaterstaat
Ministry of Infrastructure and the Environment

REBus

Project supported by LIFE funding

Company: Rijkswaterstaat, Rotterdam, Amsterdam, and Utrecht councils
Innovative business model type: Circular procurement
Sector: Construction
Company size: Large
Service: Pilots into circular raw materials procurement

Key facts

- Rijkswaterstaat is the Dutch waterways, public works and environment authority.
- Along with Rotterdam, Amsterdam and Utrecht councils, Rijkswaterstaat was looking for ways to introduce raw material efficient procurement, in particular ways to make the concrete chain more circular.
- REBus facilitated a workshop session regarding the possibilities for both pilots and financed an independent research and consultancy organisation to deliver an associated report.
- The councils' project explored a common strategy for the more efficient procurement of raw-material.
- The pilots concluded that circular procurement in the construction sector has a major positive impact on cost, time and reliability when procuring construction materials.

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Introduction

Rijkswaterstaat is the Dutch government department responsible for waterways, public works and environment. Part of its remit includes procurement for government office construction throughout the Netherlands.

The authority worked in partnership with Rotterdam, Amsterdam and Utrecht councils to explore the potential for specifying circular materials in high value contracts.

"Cycle-time is a crucial element of business models."

Evert Schut, Rijkswaterstaat adviser

REBus supported the pilot by facilitating a workshop to bring together possible stakeholders and discuss the potential for the pilots to go ahead. Once the pilots were confirmed, REBus provided the financial support for CE Delft (an independent research and consultancy organisation specialising in the development of innovative solutions to environmental challenges) to deliver a report.

REBM for raw material specification

The four organisations involved were all looking for ways to introduce raw and recycled material efficient procurement, in particular finding ways to make the concrete chain more circular.

They decided to explore the potential for including a specification in tender invitations for public contracts in infrastructure projects. The proposal consisted of two pilots, which REBus supported by organising a workshop and disseminating learnings.

Pilot One

This was Rijkswaterstaat's 'multi-water works project', which involved the replacement of 50 locks and dams between 2020 and 2040. Rijkswaterstaat was keen to create a more circular supply chain for concrete, and to develop a common strategy in raw material-efficient procurement.

The workshop for the multi-water works project focused mainly on non-technical aspects such as organisational innovations, new business models, chain management and raw materials passports.

Pilot Two

In the second pilot project, three major councils, Rotterdam, Utrecht and Amsterdam looked at a common strategy for more efficient raw material procurement, directed not just at re-use opportunities but also at new technology and innovative applications to increase the circularity of the procurement exercise.

A workshop was held which detailed the requirements involved for setting up a circular purchasing process in infrastructure.

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Results

The workshops delivered valuable insights into procurement aims, assessment criteria, evaluating bids, proof and monitoring. Rijkswaterstaat used the insights from the workshop in further research resulting in a strategy of standardisation of the locks. The aim of which was to:

- Reduce life-cycle costs.
- Increase predictability in construction costs and time.
- Increase the availability and reliability of materials (implementation planned in 2017).

Multi-water works project

The project assessed the potential for the use of more efficient raw materials to add value when replacing locks.

For example, Rijkswaterstaat wanted to know if it could take responsibility for the whole life cycle, including the demolition phase. Rijkswaterstaat calculated the potential savings of a single lock could be as high as 36% of CO_2 and 21% on materials.

Council workshop

Meanwhile, the council-run workshop contributed to a process initiated by Rotterdam Council to encourage the concrete industry to innovate via life cycle analysis (LCA). The method determines a product's total environmental impact over its whole life cycle, from the extraction of the raw materials to production, transport, use and finally end of life waste management.

Delegates stressed the importance of using a reliable method to calculate the Environmental Product Declaration (EPD) and CO_2 footprints. Setting standards for and completing Lifecycle Assessments was also described as encouraging and essential to a circular concrete chain.

The workshop considered calculation models including: LCA, EPD, CO_2 footprint, DuboCalc method and delivered valuable insights into procurement aims, such as:

- Assessment criteria.
- Evaluation of bids.
- Burden of proof.
- Monitoring.

The result is that Rotterdam Council organised a tender for concrete tiles, following the REBus facilitated workshop, based on the LCA method for a framework agreement for four years.

They asked concrete producers for innovative solutions and through the LCA concrete chain mapping to reveal the hidden environmental impacts. The result is that concrete producers managed to halve the environmental cost per tile.

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Lessons learned

The first major learning from the pilots was that embedding a reduction in environmental impact as a primary aim of procurement can, and does, make a difference. Infrastructure projects use large volumes of concrete, so authorities that tackle this will produce a major effect.

Measuring results can be problematic: the project came to the conclusion that the focus should be on creating raw materials passports, which explain exactly how a given product is put together – how much recycled material was used and what quantities of natural raw materials were extracted from the environment to make it?

In addition, the pilots helped to determine that:

- A lease construction for large infrastructure projects is not likely to be possible due to the cycle time of 50-100 years.
- A uniform European rollout would be difficult, since European regulations differ considerably.
- Methods used to measure environmental impact must meet the European Environmental Product Declaration.
- Both pilots found that the market needs more environmental and financial incentives to keep innovating; the measure of circularity should be the volume of primary raw materials used, as opposed to the volume of waste produced.

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Disclaimer

Case studies were generated as a result of pilots carried out for REBus by WRAP or RWS and the named organisations from 2013 to 2016.

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