Rijkswaterstaat
Ministry of Infrastructure and the Environment

REBus Construction
Lessons report

Municipality Leeuwarden

www.rebus.eu.com

Inhoud

The EU LIFE REBus project[1] aims to reduce product consumption by demonstrating the commercial case for European businesses to change their business models. As a REBus partner, the Dutch Rijkswaterstaat has aligned these business models with public procurement budgets, asset management and legislation across a variety of procurement categories including textiles, furniture, electricals and construction.

This category report focusses on the opportunities and learnings from the REBus pilots relating to construction. Construction is a broad term and in the context of this report, it includes:

- Infrastructure.
- Building construction works.
- Fit-out and refurbishment.
- Facilities Management.


Municipality Leeuwarden

1 Developing Resource Efficient Business Models – REBus. LIFE12 ENV/UK/000608 www.rebus.eu.com

1 Construction in EU member states

General market

Construction generates about 9% of gross domestic product (GDP) in the European Union and provides around 18 million direct jobs. The European value chain includes a wide range of economic activities, from the extraction of raw materials, manufacturing and distribution of construction products up to the design, construction, management and control of construction works, their maintenance, renovation and demolition, as well as the recycling of construction and demolition waste. The EU strategy for the sustainable competitiveness of the construction sector focuses on five objectives: investments, jobs, resource efficiency, regulation and market access. It notes that the markets of the EU construction sector and the sector itself are highly fragmented, with many micro-enterprises, large differences between Member States in the performance of the sector and considerable difficulty in spreading good practices. Better value-chain integration would significantly increase the scope for spill-over innovation effects from collaboration.

The EU Waste Framework Directive's objective of reaching 70% of preparation for reuse, recycling and other forms of material recovery of construction and demolition waste contributes significantly to the European policy for a Circular Economy as well as to increased resource efficiency through closing product and material loops.

Production & consumption estimates

Table 1 is based on OJEU (TED) tendering data that show around €81,000 million of public procurement tenders were awarded in 2015 for construction works[2], with one-third (ca 34%) being based on a least cost criterion rather than MEAT (Most Economically Advantageous Tender) criteria. This distinction is even more pronounced when assessing construction tenders in different EU member states as some countries adopt least cost approaches[3] more than others:

- Mainly least cost and not value dependent, e.g. Austria, Belgium, Czech Republic, Croatia, Romania, and Slovakia.
- Mixture of both types, e.g. Germany, Hungary, Italy.
- Mainly, or fully using MEAT e.g. Bulgaria, Denmark, France, Ireland, Netherlands, Poland, Spain and UK.

Of the total contracts awarded, €17,242 million were for repairs and refurbishment works (21%) whilst €46,580 million was for (civil engineering) structures (57%) and the remainder building works.

Table 1 TED construction procurement contract awards, 2015

Service	TED Value (€)	percent
Water	€ 93,124,963	0.1%
Energy	€ 145,985,623	0.2%
Culture	€ 544,051,030	0.7%
Environment	€ 1,399,959,189	1.7%
Health	€ 2,674,041,974	3.3%
Education	€ 3,594,596,433	4.4%
Transport	€ 8,658,025,514	10.7%
Housing	€ 9,676,588,632	11.9%
Security & Defence	€ 11,073,673,502	13.7%
General services	€ 12,936,183,671	16.0%
Other	€ 30,250,308,789	37.3%
Total	**€ 81,046,539,321**	

2 CPV 45000000 codes excluding hire of construction and civil engineering machinery and equipment

3 Based on analysis of 2015 EU Member State TED SIMAP data returns for 2015

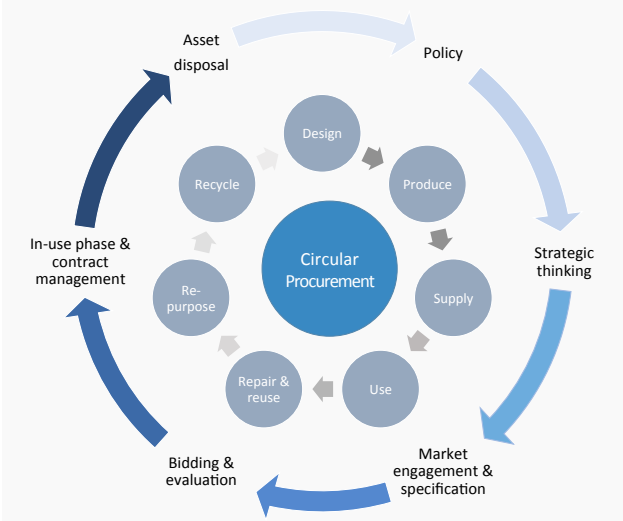
2 Circular procurement and construction

Circular procurement provides the opportunity for adapting the typical business-as-usual (produce-consume-dispose) model to a more resource efficient procurement model that delivers broader policy goals as well as cost savings, reduced environmental impacts and improving social wellbeing. There are broadly three types that can apply to (some part of the) construction projects:

- **take-back** – suppliers and /or manufacturers take-back construction at end of use cycle so that they can either be reused, repurposed or recycled more effectively than general construction collections;
- **buy & sell on/back** – revenue streams by incorporating arrangements for the purchasing body to sell-on construction at end of use either for reuse or recycling; and,
- **servicisation** - product service system (PSS) models, like leasing and pay-per-use of construction equipment can reduce in-use impacts by improving functional life. Procurement requirements need to be organised and specified in sufficient detail to incentivise PSS to include sustainable practices to ensure sustainability is fully embedded within the services required if the potential of circular construction products is to be realised.

When adopting circular thinking, the procurement cycle can be proactively used to influence key areas of the construction process, from product design and manufacture, to use and disposal. The inner loop of Figure 1 shows a simplified process cycle for construction projects. It highlights the key stages for embedding circular thinking and decisions within the product and procurement cycles. Each stage has differing degrees of complexity depending on the nature of the construction project, e.g. building or infrastructure. A key element of circular thinking in procurement is embedding thinking and action by the relevant stakeholders in each stage of the cycle.

Figure 1 Embedding circular thinking within the material and procurement cycles



3 Key themes

Construction projects have complex extended supply chains – each production step involves different stakeholders in and outside the supply chain. All of these parties are involved in different ways and to differing degrees in the planning, delivery and maintenance of construction projects. Stakeholders can be broadly divided into supply-side; demand-side; and, end-of-life. (Figure 2).

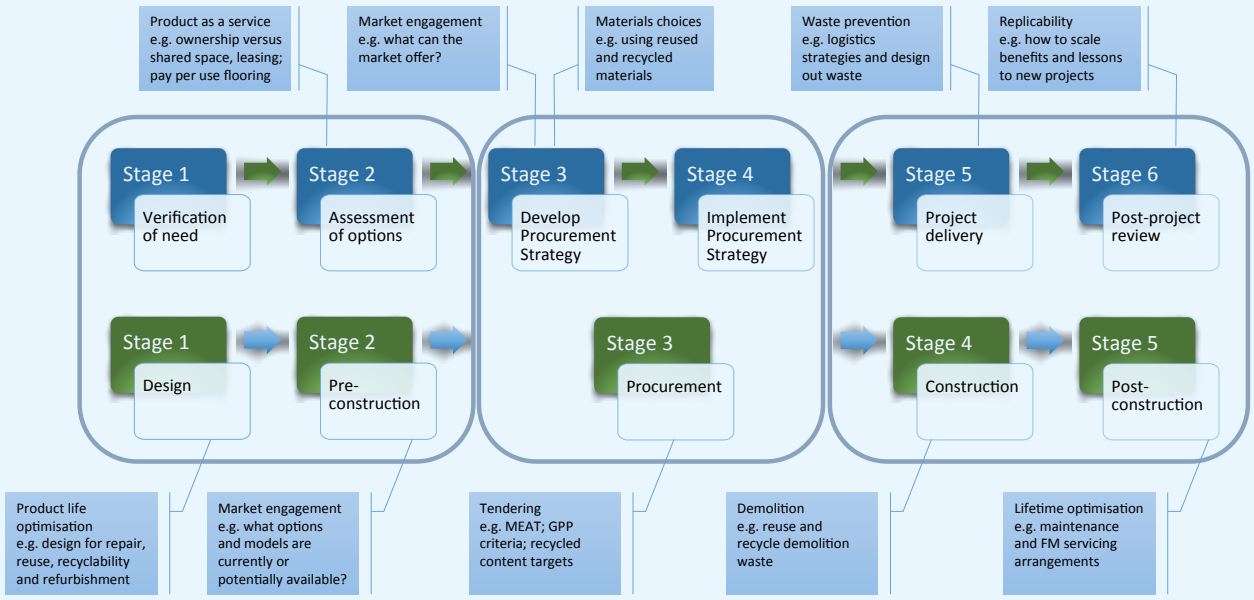
Figure 2 shows a simplified process cycle for generic construction projects and how this aligns with the broader procurement cycle. It highlights the key stages with some examples for embedding circular thinking and decisions at each stage. Each stage is complex particularly with production and distribution typically being on a global scale.

Four key principles are commonly cited for circular construction:

- Circular design thinking by clients and design teams, including designing for disassembly and for reuse and recycling.
- Material choice by design teams, including use of non-toxic materials; reused materials (e.g. from demolition) and recycled content; using cradle-to-cradle products; and choice of recyclable products and materials.
- Regenerative use of natural resources by suppliers and contractors, including actively encouraging lifetime optimisation throughout the use-phase e.g. repair, reuse and recycling.
- Optimised use of resources by clients, including reassessing the need for ownership; increasing workplace utilisation through models such as shared space; and procuring adaptable buildings as a client.

The following sections provide some guidance, based on the specific evidence and lessons from the REBus pilots. These should therefore not be seen as a full and extensive list of the benefits and challenges but as REBus project insights into practical implementation of circular procurement principles.

Figure 2 Embedding circular thinking within the material and procurement cycles



Rethinking the need

» **Key internal stakeholders:** policy makers, budget holders, finance teams, client owners and developers, category managers

» **Key external stakeholders:** planners, architects, major contractors, product manufacturers & suppliers, financers, tenants/users/clients

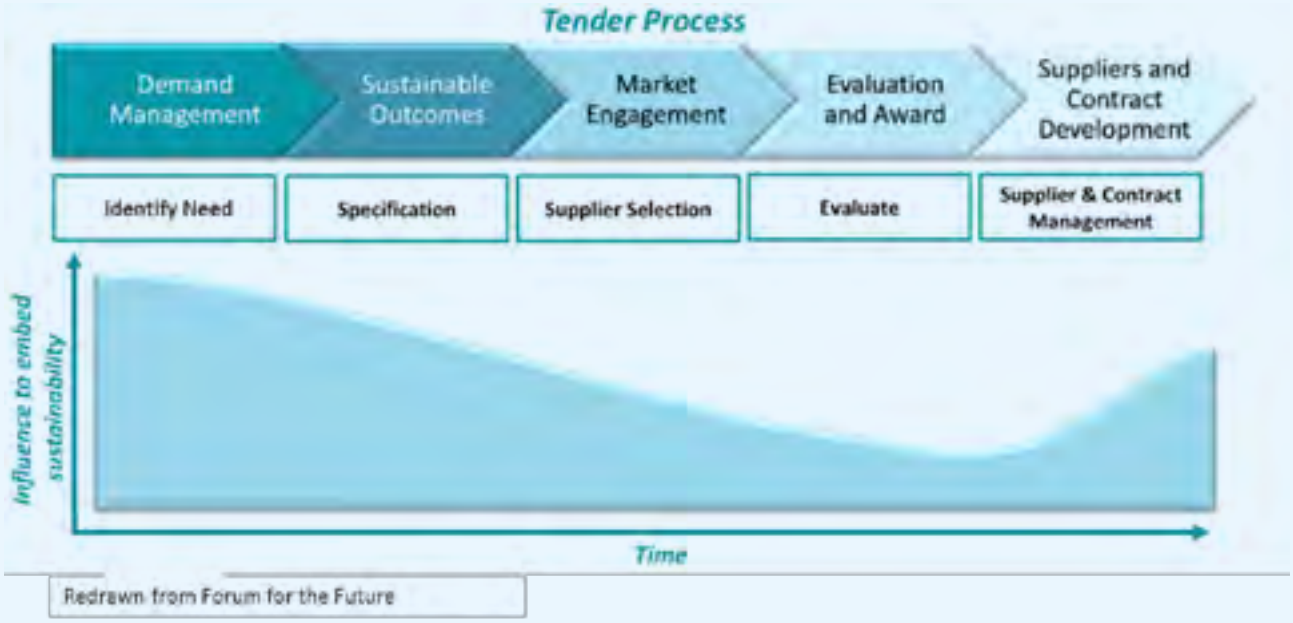
Knowledge and awareness - a key factor is the ambition and the knowledge of the client – the organisation procuring the construction project (whether a building or infrastructure). Construction projects can be singular or repeat in nature. Clients must either have the technical skills, or access to skills, in order to consider options and where necessary develop a reference design. This includes assessing where there is room for improvement in order to encourage the maximum environmental impact reduction.

Lessons

Construction projects require significant internal engagement in order to embed circular thinking within projects. Rethinking the need therefore comes early in the procurement and construction cycle of thinking (Figure 1). Internal departments within large municipalities like Amsterdam and Den Haag all have roles to play in delivering their circular roadmaps, so internal communication is key. REBus pilots engaged early with policy and vision setting for circular procurement. Den Haag found this was particularly helpful in terms of buy-in with colleagues from the engineering division who make the technical specifications as the buyers had to convince internal clients of the usefulness and necessity of CE and they required the driver of clear targets and relevance besides the overall policy.

Whilst the scale of construction projects lends them more to whole-life thinking, their size, value and complexity can also increase risks of moving away from business as usual. It may therefore be appropriate, as REBus pilots have shown (e.g. Municipality of Amsterdam with their Concrete Forum), to initiate pilots or demonstrate benefits on more targeted elements of a construction project initially. Amsterdam started with a clear focus - the recycling of concrete. In order to understand the potential for circular concrete they started with local market engagement because logistics is a key element in implementing the circular thinking.

Figure 3 impact potential of circular thinking within the procurement cycle



Like the GPP2020 project[4], the REBus construction pilots have shown that changing behaviour in big purchasing organisations is slow to get started but once on the move they do it very effectively and can act as exemplars for circular procurement through their leadership, knowledge creation and demand-pull. The pilots also support previous evidence that embedding circular thinking early in procurement creates the greatest impact (Figure 3).

The impact of different financing mechanisms for construction projects are complex and require individual consideration as ABN AMRO found during the design and build of their conference and event Pavilion in Amsterdam. In order to understand the full potential of REBMs these need to be assessed alongside consideration of project financing early within the procurement cycle.

Netherlands, ProRail

Circular flooring

The ProRail pilot for new office furniture and carpet flooring at the new control centre in Utrecht (Netherlands) highlighted the importance of initially developing a vision first to embed circular thinking within the organisation and its procurement processes. This enabled consideration of existing assets – desks and chairs – to be considered alongside procuring new circular products.

In considering needs, ProRail has agreed a 10 year supply and maintenance (including cleaning) contract with the supplier as well as ensuring reuse at end of first life. The contract has highlighted the need to include third party finance arrangements as well as structuring payments to maintain and incentivise whole-term performance across the lifetime of the contract.

Lessons learned report ProRail
Summary lessons learned report ProRail
Factsheet

4 www.gpp2020.eu Accessed March 2017

Sourcing and design

» **Key internal stakeholders:** policymakers, client owners, client advisers, users, procurement & project teams

» **Key external stakeholders:** planners, architects, product designers, interior designers, manufacturers & assemblers, suppliers (materials, components & products), trade bodies, academia (research & development)

Design - the challenge is to design buildings in such a way that all of the materials in them are suitable for high-quality reuse and recycling given that the lifetime of buildings and structures can be many decades on from the original procurement. Key opportunities lie in design for:

- Materials optimisation – encouraging circular materials choices and utilising more recycled materials and mainstream products with high levels of recycled content;
- Off-site construction – reducing process waste and improving quality through standardisation of elements, components and modules;
- Reuse and recovery – reducing the quantity of materials being sent to landfill during
- The construction process by designing out waste and ensuring the design allows for reuse and recycling even where the disposal routes have yet to be identified;
- Waste efficient procurement – encouraging more circular design solutions that enable effective site waste management; and,
- Deconstruction and flexibility – enabling lifetime optimisation of structures and buildings.

Materials choice - one of the biggest opportunities (and challenges) with construction is the sheer volume of materials consumed. Small improvements in closing materials loops can have big impacts. Construction materials represent a very high potential for closed regional and local loops as they are typically manufactured and used locally or regionally. Aggregates producers have demonstrated this by vertical integration, i.e. incorporating recycled aggregates into their range of products and services.

Lessons

Following internal engagement, REBus pilots also recognised the need to spend time preparing the market. Circular thinking was not an instant outcome and requires a long term shift in practice if a critical mass is to be achieved within the sector. Market engagement adds time to contracting procedure – the normal period for standard linear procurement of a fit-out (carpet) would be around 6 months. This is doubled in the circular procurement process and there are even pilots spending up to 2 years engaging with the market.

Netherlands, ABN AMRO

Circular Pavilion building, CIRCL Amsterdam

ABN AMRO has pioneered work to move towards a fully circular economy. The most striking example is the Conference and Event Pavilion CIRCL in the Amsterdam Zuid as area adjacent to its office.

The aim has been a complete circular exercise in which supply chains, circular procurement and sustainable financing have come together.

Circular design and build is still in its infancy. So the aim has been to learn by doing alongside it project partners. One concept employed has been that of buildings as materials banks.

In terms of circular sourcing of products, recycled content helps create demand for secondary materials and so encourage higher recycling quality and overall rates. One novel example employed was utilising 10,000kg of old clothes in acoustic panels.

Circular principles have gone beyond the building fabric – building in design for reuse and recycling – to consideration of more circular flooring, furniture and ICT solutions. The building demonstrates a fully integrated whole life approach to procurement.

A key learning is to focus attention on the design phase, e.g. to ensure 'cradle to cradle' approach such as design for reuse, re-purposing and recyclability; and, lifetime optimisation for more circular products. Furthermore material choice and market engagement are key. This approach encourages consideration of new technologies that can reduce waste through better design alongside ways of reduce waste in the design and materials choices.

Purchasing and supply

» **Key internal stakeholders:** budget holders, construction project team, purchasing teams, users

» **Key external stakeholders:** Major construction contractors, quantity surveyors, specialist & sub-contractors, suppliers, building services managers, logistics, transport and distribution businesses, financers

Procurement process - the linear nature of construction projects (cf. Figure 2) acts as a barrier to circular thinking within the supply chain and highlights the role that clients can play in creating demand for circular solutions, e.g. Brummen Town Hall extension, The Netherlands – with a 20 year lifespan. One of the biggest challenges with implementing the circular procurement pilots was the need to lengthen procurement times, to re-evaluate the need and in order to assess new options. This is typical of shifting away from business as usual and, as Figure 2 shows, construction projects typically already include these stages due to their size, value, length of project and complexity. It also enables whole life costing analyses to be undertake. Further barriers (including technical, financial and 'cultural') however still drive 'business-as-usual' behaviours in construction procurement and delivery.

Construction site practices – Supply side attention to construction site waste management and practices such as waste separation can have a significant impact in diverting waste from landfill (where permitted) and on increasing recycling rates. Construction and demolition waste (C&DW) separation is still not common practice although it enables contractors to identify high volume waste streams (impacts of poor design and over-ordering and wastage), increase the volume and quality of recycling, and reduce the costs of disposal.

Lessons

Additional time spent on market engagement early in the procurement cycle (Figure 1) was considered a worthwhile investment. Market engagement was found to stimulate knowledge of both the client and the supply chain. It also stimulated sustainable product development of the supply chain. For example, the Amsterdam Concrete Forum and Green Deal Concrete where the sector has started working to analyse the supply chain impacts and identify potential improvements.

The REBus and Green Deal Circulair Procurement pilots noted that Life Cycle Analysis (LCA) approaches (including total costs of ownership and CO2 reduction calculators) and recycled content are elements and indicators of sustainability in construction but not circular per se unless they are being used as steps in closing materials loops along with materials reduction e.g. using less virgin and creating markets for recyclate which is closing loops. The municipality of Rotterdam, Netherlands challenged concrete producers to use LCA for the mapping of the concrete chain and expose the hidden environmental impacts. The result was halving the environmental cost per tile.

TCO works well for infrastructure, but for buildings there are other circular approaches involving planning and design, e.g. short life cycles like the Brummen Town Hall (Netherlands) project. The municipality of Enschede, Netherlands chose to pilot a new circular procurement approach designed with construction in mind, in this case Rapid Circular Contracting (RCC), on a lower risk category of beverages first. RCC calls for a partnered approach through a 'cooperation contract' rather than tenders offering a predetermined final solution[5]. This enabled the procurement function to understand the strengths and weaknesses of the approach by initially focussing on a low risk, high volume purchase category rather than low volume, high risk and high cost construction projects. The municipality of Leeuwarden, Netherlands chose to pilot the RCC-methodology on the construction of a Waterbar and pavilion for visitors. In 2018, Leeuwarden is the cultural capital of Europe.

They wanted to challenge market parties to come up with innovative, circular solutions. The tender is not completed successfully, because none of the suppliers have submitted an offer. The evaluation showed that the budget was insufficient to realize both the construction and the operating of both buildings. In addition, there were few exploitation opportunities, also for after the cultural capital-period (see factsheet Leeuwarden).

In terms of infrastructure, the Rijkswaterstaat pilots (A6 infrastructure project and 50 locks project) have highlighted the potential to use existing green public procurement criteria to focus on carbon reduction. This has been primarily achieved by using more circular materials choices in design. It highlights the ability of circular procurement to also deliver significant carbon as well as economic savings. Across seven projects (with variable REBus input), they demonstrated CO2 savings potential of around 43% on average. This equates to a total CO2 saving of 180,000 tonnes over the standard reference designs, for example by adding energy consumption during the construction and use phases as part of a tender life cycle assessment requirement resulting from low energy/ energy neutral project bids.

Netherlands, Rijkswaterstaat

A6 infrastructure project

The Dutch Rijkswaterstaat (RWS) calculated a reference design of the environmental impact prior to tenders and the market is challenged to submit a design with a lower environmental impact. Initially, the reduction target was 20-25% and this has since been increased to 50-60%.

The A6 Almere Motorway Reconstruction project set a reference of around 100,000 tonnes of CO2 emissions. In the tender phase RWS asked for an environmental impact of 50% less than the reference design. The successful tender offered a design with a carbon emission of just over 50,000 tonnes (50% reduction).

The procurement method was applied successfully and Rijkswaterstaat will continue applying this method in the coming tenders.

5 Rapid Circular Contracting https://sway.com/6wETwxondfb5YHeI Accessed April 2017

Use and asset management

» **Key internal stakeholders:** asset & facilities managers (internal), users, budget holders, waste managers

» **Key external stakeholders:** facilities managers (outsourced), suppliers, building services managers, M&E (mechanical & electrical) contractors, third sector / civil society organisations

Utilisation – Building utilisation rates are poor. The average European office is used only 35–40% of the time, even during working hours. This includes offices on expensive inner-city land[6]. Quick win opportunities can be made by focusing on asset utilisation rates for existing buildings.

Building use - resource efficiency is one of the main challenges that the sector faces in the short term. Operational energy consumption is the main contributor to most organisations' Scope 1 and 2 carbon emissions and energy typically account for about 5% of building occupancy costs. Resource management planning as part of facilities management services helps to provide a robust forecast of waste generation, energy and water consumption and associated carbon emissions together with defined and costed proposals for achieving performance improvements. The rapid development of Building Information Modelling (BIM) strategies across EU member states is providing the framework for a broader, life cycle approach to be taken by public and private procurement in construction projects. BIM can provide significant efficiency benefits to public works, to public value for money and be a driver for growth and competitiveness. The approaches demonstrated within the REBus construction pilots have shown how circular procurement can contribute to these strategies and vice versa.

Refurbishment – and fit-out provide significant potential to prolong functional lifetimes of buildings and structures as well as creating opportunities for flexible (and more productive) workspaces. Approximately 70% of energy consumption in a typical office building is used for heating, ventilation or air conditioning (HVAC).

ICT is becoming increasingly significant because of the cooling load it imposes on air conditioning systems. Linking refurbishment with ICT requirements is therefore an opportunity to consider flexibility especially given the rapid changes in ICT requirements, e.g. shift to cloud based services. In commercial refurbishment projects, packaging waste is typically the largest stream followed by metals, cement/plaster, inert materials and timber. There is significant potential to close the loops for most of these streams and packaging can be dealt with through take-back arrangements.

Pay-per-use services – Construction is not limited to materials and building, the lifecycle also includes provision of maintenance and other services. Thomas Rau Architects and Philips Lighting collaborated to design out overcapacity from the start and purchase light as a functional on-demand service. The end result was a bespoke 'pay-per-lux' intelligent lighting system to fit the requirements of the office space and available at a manageable price. Similar models have been demonstrated elsewhere, e.g. Schiphol Airport and the National Union of Students building, U.K. In retaining control over the items they produce the manufacturer is able to provide better maintenance, reconditioning and recovery, and implement technological innovations like LED lighting, more quickly into existing contracts.

Lessons

Buy-in from building owners can help unlock potential of fixed construction budgets for maintenance and refurbishment as Copper8, in the Netherlands, found. In a traditional budget the cost of materials generally takes up most of the budget and limits the scope of works so reducing materials costs through circularity extends the scope of the budget. However, they also noted that scale was important. As a small tenant, their ability to benefit from service models – light as a service – offered by Philips to large clients such as Schiphol Airport was limited because of the size of their contract. Suppliers typically factor greater business risk (e.g. length of contract), with smaller clients in service models. However it did lead to Phillips offering reused low energy lighting as an alternative.

6 Delivering the circular economy a toolkit for policymakers. Ellen MacArthur Foundation, 2015

As the Sundtkvartalet (Healthy Quarter) Business Centre in Norway has shown, developers also have an important role to play in helping to deliver more circular construction. Real estate owners benefit from being able to offer flexibility to customers which can improve tenures, as well as better rental agreements. In return, the tenants benefit from flexible office spaces and cheaper modification processes.

Asset disposal and waste management

» **Key internal stakeholders:** facilities managers, sustainability teams, waste managers

» **Key external stakeholders:** demolition contractors, waste management contractors, recyclers, regulators

Demolition and regeneration – there is ample evidence to highlight the economic and environmental benefits of utilising demolition materials in new build construction works. Materials from the demolition can either be transported off-site for recycling or more efficiently re-incorporated into the newbuild works as part of the procurement specification. Concrete is the most used material in buildings and it can often be recycled (e.g. as recycled concrete aggregates) at demolition or construction sites close to urban areas where reuse will reduce transport demand saving costs and related emissions. The municipality of Amsterdam chose successfully to focus on concrete as a specific area for market engagement to improve recycling through its Concrete Forum, with the market engagement exercise leading to the signing of a collaborative consulting agreement.

Construction and demolition waste (CDW) – estimates for total European CDW vary but are around 100 million tonnes per annum. The production of CDW also varies from country to country within the EU with generation per capita ranges from less than 0.1 tonnes per capita to nearly 6 tonnes per capita. CDW arises from a combination of procurement practice (e.g. design and wastage) to construction methods and site practices. A large majority of CDW is recyclable but with the average recovery for EU27 still around 50%, there is considerable scope for improvement through better design, procurement and site waste management.

Municipality Venlo

4 Replication scale-up potential

The REBus and Green Deal Construction pilots in the Netherlands have demonstrated that encouraging the procurement of more circular construction projects is practical and delivers on national circular economy goals as well as reducing environmental impacts and in some case providing revenue streams through higher quality reuse and construction waste recycling.

Delivering the wider potential identified by the REBus pilots requires a broader and longer term vision for an construction sector that needs greater understanding and integration of the technical process, business models and financing. The tender analysis has shown that in order to encourage a shift towards more circular products and service, the current prominence of least cost tendering has to be switched to a life cycle based approach either through TCO or Best Price-Quality Ratio.

If the REBus pilot benefits from the Almere A6 motorway reconstruction project alone were extrapolated at a national level in the Netherlands this would deliver impact savings[7] of around:

- 45,000 tonnes of CO2 equivalent.
- 2,700,000 tonnes of material savings.

If these savings were extrapolated across the whole of the EU 28 member states this would create savings of around:

- 590,000 tonnes of CO2 equivalent.
- 35,000,000 tonnes of material savings.

The Ellen MacArthur Foundation concluded that better production processes such as modularisation could reduce both building times and structural waste using more circular approaches to construction. Reuse and high-quality recycling of building components and materials could reduce the need for new materials and decrease construction and demolition waste, and multi-purposing and repurposing of buildings could reduce the demand for new buildings through better utilisation of existing floor space. If these three opportunities are realised benefits could amount to €450–600 million, €100–150 million, and €300–450 million, respectively by 2035.

Scaling up the benefits from the whole REBus project[8], would result in the following annual benefits at the EU level:

- 184 million tonnes direct material savings plus 172 million tonnes material diverted (e.g. reuse);
- 154 million tonnes of GHG emissions savings; and,
- €324 billion net financial benefit (GVA).

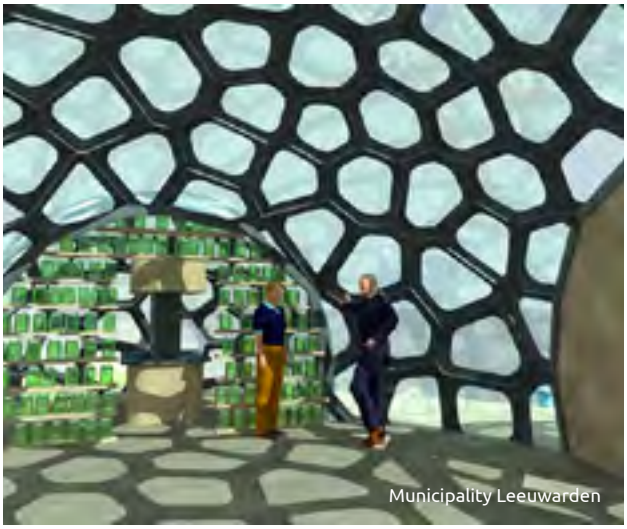
The basis for the extrapolation of environmental benefits was the Eurostat EU27statistic 'turnover of construction of motorways, roads, airfields and sport facilities. Turnover is an indication of the relative size of motorway construction activities per member state. We assume that the environmental benefit is proportional to turnover. So if project costs of 200 million euro result in 1000 tons of CO2 savings per year, then it is assumed a 10 billion euro turnover on a national scale, 50 times as much, would result in 50 times larger CO2 savings of approximately 50,000 tons. The assumption that the environmental benefit is proportional to the volume of turnover is a strong one. It requires tendering practices and technical opportunities for environmental benefits to be similar between road construction projects and countries. In practice there will be differences between projects and member states. A better founded extrapolation of the environmental benefits would be based on observations over a wider range of projects and countries.

7 Based on assumptions and impacts from Monitoring resource efficient business models: REBUS cases. Rijkswaterstaat Bedrijfsinformatie, 2016

8 Categories covered include construction, textiles, food, ICT and furniture.

Factsheets Dutch pilots Construction

- Rijkswaterstaat (Dutch waterways, public works and environment authority.
- Alliander (energy network company)
- Municipality of Rotterdam
- Municipality of Venlo
- Municipality of The Hague
- Municipality of Amersfoort
- Municipality of Amsterdam
- Schiphol Airport
- Royal library of the Netherlands
- Municipality of Leeuwarden
- Copper8



Municipality Leeuwarden

Colophon

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REBus

REBus (Resource Efficient Business Models) is a project financed by EU Life+ with the goal of gaining knowledge about the potential of circular business models and investigating whether they can deliver the target of 15% savings in resources and costs. The project is partially being implemented in Great Britain and partially in the Netherlands.

In the Netherlands, REBus is working with other governments and progressive companies to explore models that make circular procurement possible within five industries: IT, office furniture, construction, textiles and catering. By conducting pilot projects, REBus is learning more and more about what is needed for circular procurement.

REBus also applies the knowledge gained in new pilot projects and stimulates participants to share their knowledge. With the intended ripple effect, a project such as REBus will not longer be necessary over time. More information:
www.rebus.eu.com