Identification of Innovative Industrial Symbiosis Solutions in the Construction Industry

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Overview

380 million tonnes of resources are consumed by the construction industry each year[1]. Pressure to improve the industries performance in terms of resource efficiency coupled with rising prices of resources[2] has led the industry to seek innovative solutions in waste management.

The broad legislative framework in the Europe is the EU waste Framework Directive which requires 70% of construction and demolition waste to be diverted from landfill for preparation for re-use recycling and other material recovery. In the UK many companies are already diverting 97% of waste from landfill[3]. The challenge is to improve the value of waste by implementing systems that push material streams up the waste hierarchy.

Industrial Symbiosis engages industries in collective sharing of waste resources involving physical exchange of materials energy water and by-products to gain competitive advantage[4]. Through the implementation of industrial symbiosis principles there could be far reaching benefits for the construction in terms of resource efficiency.

Research Aims

- Identify current best practice in construction resource efficiency and savings that can be made through adoption throughout the UK.
- Identify the main barriers to implementation of current best practice throughout the industry.
- Identify recycling rates of materials and opportunities to increase the value of materials through finding synergies with alternative industries.

Methodology

Case studies of highly efficient construction projects will be analysed to identify current best practice. Analysis of materials and waste in construction will be conducted to gain and understanding of the key flows of materials through a buildings lifecycle from construction to deconstruction. Current best practice will be modelled throughout the UK construction industry to show how resource efficiency can be improved and the barrier s to implementation defined. Interviews will be conducted with professionals in the industry to ascertain opportunities for industrial symbiosis.

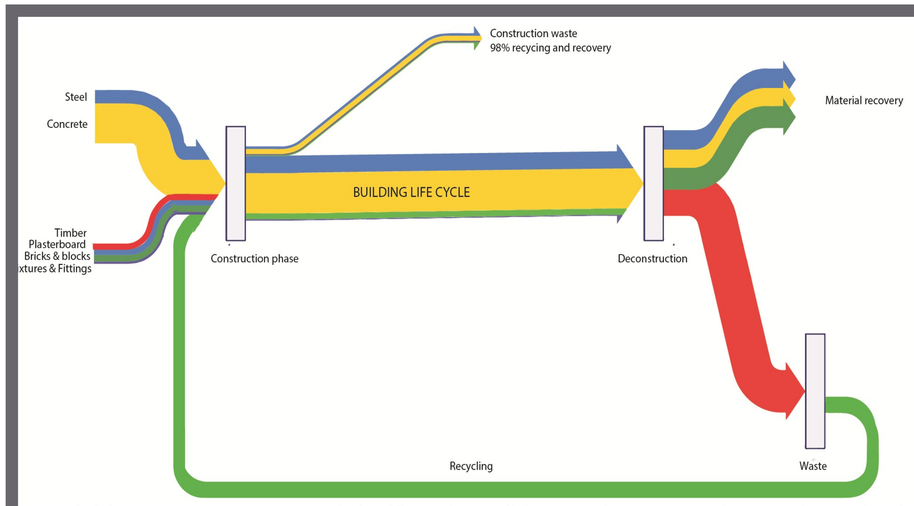
References

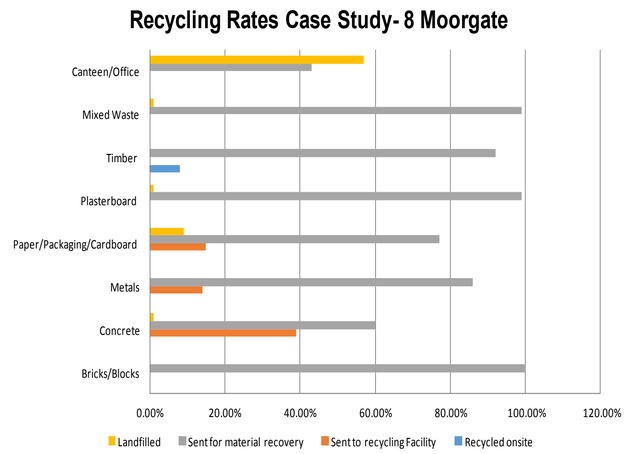
1.Construction Resources and Waste Platform, 2010. *Construction Resources and Waste Roadmap* , Garston: BRE.

2. Ellan MacArthur Foundation, 2014. *Towards the Circular Economy: Accelerating the scale-up across global supply chains,* Geneva: World Economic Forum

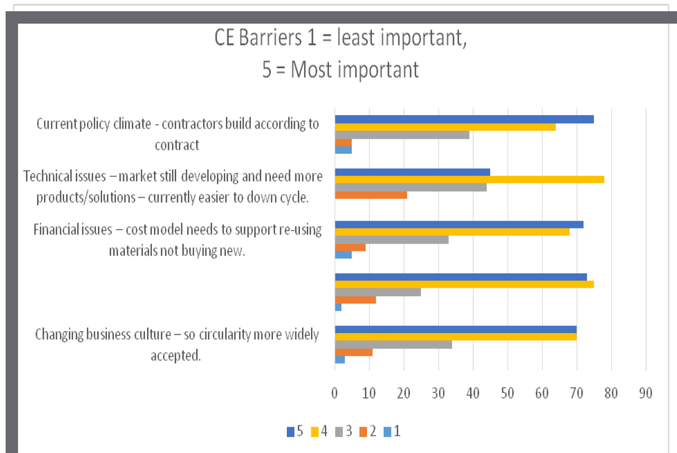
3. WRAP, 2014. *Opportunities to take action in resource efficiency in refurbishment and fit out projects,* Banbury: Resource Efficient Scotland

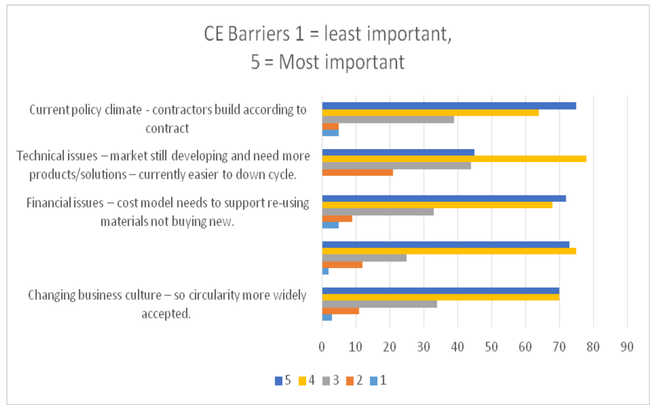
4. Chertow, M., 2004. Industiral Symbiosis. In: *Encyclopedia of Energy.* San Diego: Elsevier





8 Moorgate a commercial office demolition and construction project obtained excellent rates of waste diversion from landfill. The effectiveness of material recovery will be analysed and opportunities to improve the value of waste as a resource assessed.



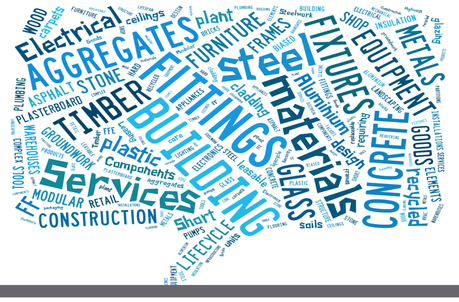


Circular Economy Survey

A survey was conducted with over 240 professionals working in the construction industry in order to gain an insight into how the concept of the circular economy is viewed within the industry.

- 94% agree that Circular Economy offers an excellent solution to future challenges in resource scarcity
- 77% said rising prices of resources was a highly important driver
- 42% considered current contractual problems to be major issues
- When asked what materials would suit the circular economy model it was considered that fit out materials and products were the most viable but it could be possible with almost all other materials if the model was right.

Circular models already exist for many building products such as carpeting and lighting. The key to implementation across construction is altering the contractual model so buildings are designed for adaptability and deconstruction.

Recommendations

- A study to look at how contractual issues are preventing circularity. Potential to develop standard contractual wording to promote circularity.
- Further communication is required throughout the supply chain on Circular Economy ideas.