

Circular Economy Implementation: Construction

Team 2: Alya, Bauran,
JM, Hoan, Wira



Contents

- Introduction
- Objectives
- Methodology
- Challenges and Use Cases
- Discussion on Risks
- Potential Benefits
- Recommendations for Implementation in ASEAN and Timor-Leste



Introduction (1/2)

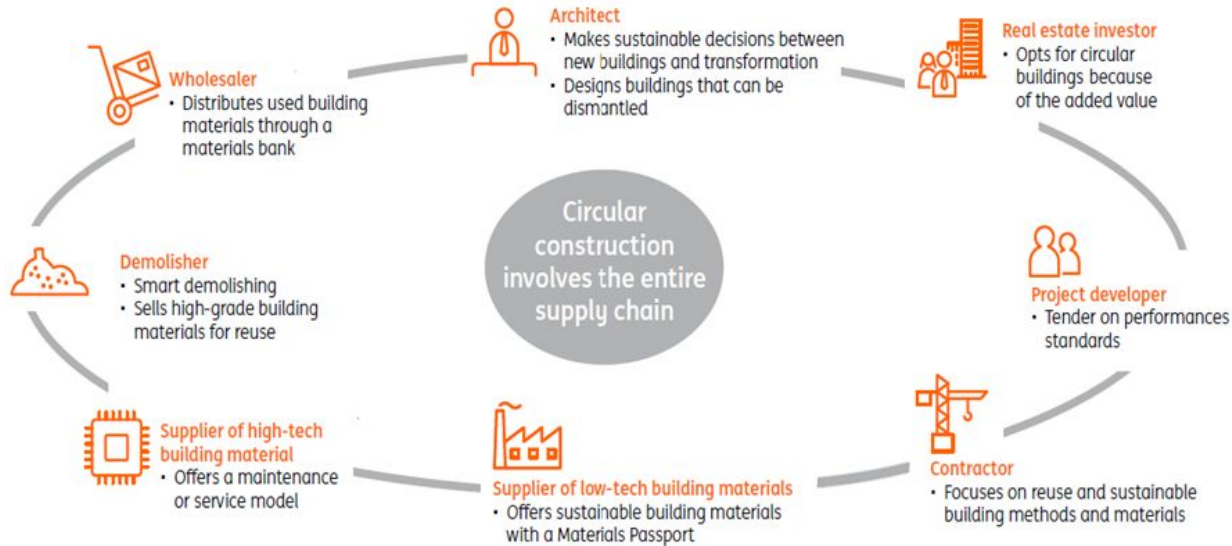
Circular Economy is a space “where the **value of products, materials, and resources is maintained in the economy for as long as possible**, and the generation of waste is minimized” (European Commission, 2015).

It holds particular promise for achieving multiple SDGs, including:



Fig. 1 Focus areas for circular economy in the construction sector. Adopted from principles described in MacArthur (2013). Pictures from the Norwegian Defence Estates Agency

Introduction (2/2)



Advancing
environmental
performance through
**systemic and
holistic thinking**

Objectives



Source: <https://asean.org/asean-adopts-framework-for-circular-economy/>

To explore **feasibility of implementing circular economy (CE) in the construction industry in ASEAN and Timor-Leste.**

- The construction sector is one of the largest consumers of raw materials.

If viable, this is in **alignment with ASEAN's circular economy strategy** for the ASEAN Economic Community in order to reach the 3 strategic goals.

Research Methodology

Data Collection

Literature Review



- Circular economy;
- Circular construction;
- Sustainable development in ASEAN;
- Sustainable construction;
- Sustainable waste management.

Search Media



ScienceDirect



ELSEVIER

& more

Sources Criteria

Credible Sources



- Peer-reviewed journals;
- Published thesis and dissertations;
- Within the period 2010-2022;
- Official policy documents;
- Credible articles.

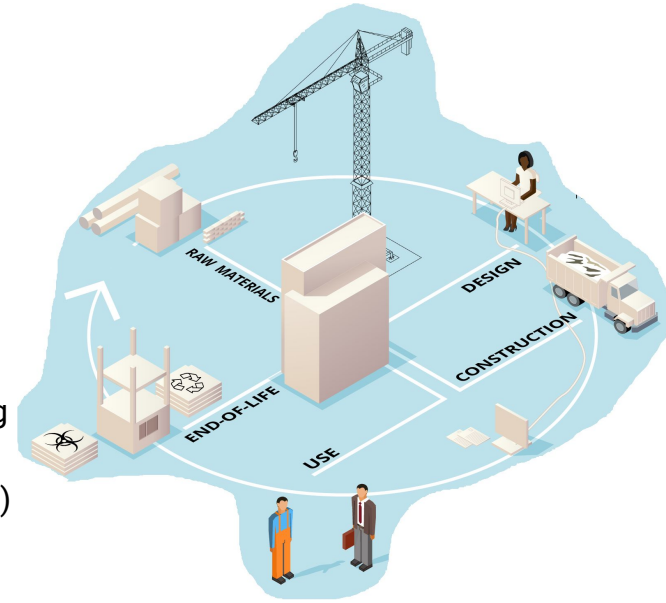
Use Cases and their Challenges

Challenges and opportunities in circular economy actions that improve the management of construction and demolition waste

- High-grade products with high recycled content
- Design for disassembly
- Material passports
- Extension of construction service life
- Selective demolition

The main challenges in transitioning towards circular economy can be:

- **The EU goal's 100% circular city in 2050:** While EU countries are on track to meet the 70 % recovery target of 2020 with most countries already exceeding the target in 2016.
- **The commitment from the stakeholders** (Gov., Construction Industry, Clients) to engage in CE Practices: EEA briefing “preventing or recycling the large amount of waste produced by the construction.”
- **The regulatory and the driving force to implement policies** still has limited to regulate/enforce construction and demolition waste: lack of trust in the quality of secondary materials, lack of information on the composition of materials used in existing buildings and the long delay between implementing actions on new buildings



Examples of Overcoming Challenges



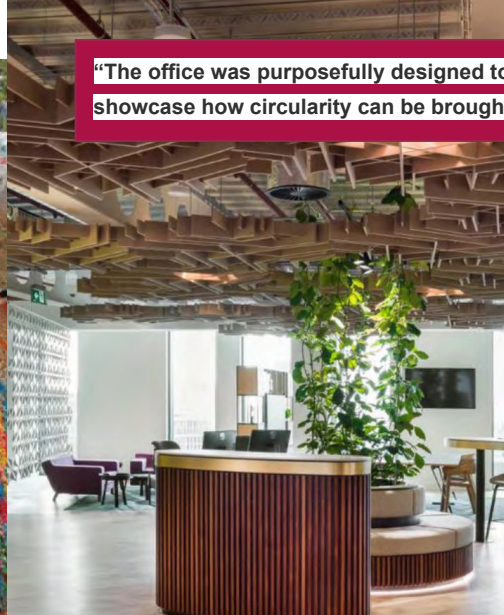
If There's Trash, Just Build A School There, Use plastic water bottle.

The house makes innovative use of renewable hemp-based materials (natural fiber)

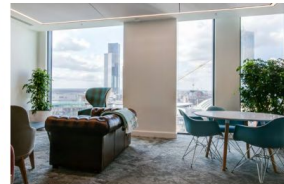


MARGENT FARM: FLAT HOUSE

"The office was purposefully designed to showcase how circularity can be brought to life"



JLL: LANDMARK OFFICE MANCHESTER



Location: Manchester

Project type: Fit-out

Building type: Office

Circular principles being addressed: Reuse (including refurbishment and repurpose) / Design buildings for flexibility and optimisation / Servitisation and leasing / Design and construct responsibility

Key Impact: 62 tonnes of carbon saved through circular approaches in fit-out

Discussion on Risks

Risk is defined as the uncertainty concerning the occurrence of a loss (Rejda, 1989).

Classification of Risk

- Financial - additional cost with design
- Standard of Care/Legal - legal liability
- Performance - execution of green products
- Consultancy - experience and consultation
- Regulatory - standardization
- Green Technology - amount of sustainable materials, people, and technology



Potential Benefits of Circular Construction



Economic Benefits

- Material cost reduction through reuse;
- Increase revenue from waste sales;
- CC creates new business models;
- CC creates job opportunities from recycling activities.

Potential Benefits of Circular Construction



Environmental Benefits

- Conserve the non-renewable resources;
- Minimize the environmental impacts through sustainable energy production and transport minimization;
- Recovers the ecosystem through raw materials demand reduction and materials life cycle extension.

Potential Benefits of Circular Construction



X-Frame Building



Technological Benefits

- Induce sustainable technology development;
- Allows exploration of modern/advanced (sustainable) technology and techniques;
- Enables the adoption of clean technology.

Recommendations for Implementation (Wira)



Specific and reachable circular goals



Improve commitment and awareness



Anticipate the negative side effects of CC practices



Regulate Circular Construction

THE IRISH TIMES

Sun, Jan 10, 2021

NEWS

SPORT

BUSINESS

OPINION

LIFE & STYLE

CULTURE

MORE

Editorials

Letters

Columnists

An Irishman's Diary

Opinion & Analysis

Martyn Turner

Our failure to hit greenhouse gas targets reflects unrealistic goals set in 2009

Green Party was part of government that signed up, without any apparent economic analysis, to an unachievable target

© Fri, Apr 14, 2017, 12:28

Denis Naughten

4

“Goals and targets without sufficient specification tend to become marginalized in monitoring reports and therefore lose attention”
(Loewe & Rippin, 2015, p. 5)

Recommendations for Implementation (Wira)



Specific and reachable circular goals



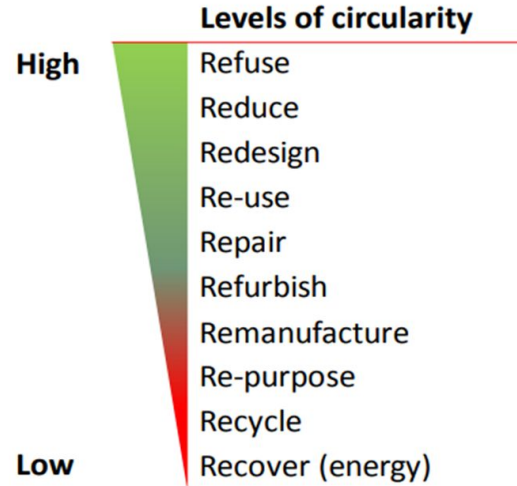
Improve commitment and awareness



Anticipate the negative side effects of CC practices



Regulate Circular Construction



“The goal should be to which extent certain country/city can reach higher circular level”

Recommendations for Implementation (Wira)



Specific and reachable circular goals



Improve commitment and awareness



Anticipate the negative side effects of CC practices



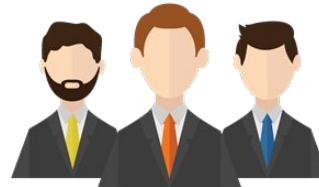
Regulate Circular Construction



GOVERNMENT



INDUSTRY



CLIENTS

Willing to engage in CC practices

Recommendations for Implementation (Wira)



Specific and reachable circular goals



Improve commitment and awareness



Anticipate the negative side effects of CC practices



Regulate Circular Construction



CC requires enormous amount of energy



Employment loss in the construction industry



CC engenders financial risks



Parts of the construction industry could be harmed from CC

Recommendations for Implementation (Wira)



Specific and reachable circular goals



Improve commitment and awareness



Anticipate the negative side effects of CC practices



Regulate Circular Construction



Incorporate circular criteria in land allocation tender & building permit



Avoid regulatory discrepancy



Labor



Raw material

Tax shift from labor to raw material



Thank You! Questions?

Citations/Sources

- Circular Construction: Opportunities and Threats - Olabode E. Ogunmakinde, William D. Sher & Kim Maund: <https://research.bond.edu.au/en/publications/circular-construction-opportunities-and-threats>
- Circular Economy as a Catalyst for Progress towards the Sustainable Development Goals: A Positive Relationship between Two Self-Sufficient Variables: <https://www.mdpi.com/2071-1050/13/22/12652/pdf>
- Case studies on Circular Economy models and integration of Sustainable Development Goals in business strategies in the EU and LAC, [Case Studies Circular Economy Eu Lac | PDF | Sustainability | Economies \(scribd.com\)](#), 2018
- Circular economy in the construction sector: advancing environmental performance through systemic and holistic thinking, <https://link.springer.com/content/pdf/10.1007/s10669-021-09803-5.pdf>, 2021
- Circular economy and its disclosure in the basic concepts of improving production processes in construction Laplace em Revista (International), vol.7, n. 3D, Sept. - Dec. 2021 https://www.researchgate.net/publication/355352212_Circular_economy_and_its_disclosure_in_the_basic_concepts_of_improving_production_processes_in_construction
- Abroon, Q., Shamayleh, A., El-Sayegh, S., Formanek, S. (2020), Prioritizing risks in sustainable construction projects using a risk matrix-based Monte Carlo Simulation approach <https://doi.org/10.1016/j.scs.2020.102576>
- Apine, A., Valdes, F.J.E. (2016) Risk Management in Sustainable Projects in the Construction Industry – Cases of Swedish Companies
- Hwang, B-G., Shan, M., Phua, H., Chi, S. (2017) An Exploratory Analysis of Risks in Green Residential Building Construction Projects: The Case of Singapore
- Ismael, D., Shealy, T. (2018) Sustainable Construction Risk Perceptions in the Kuwaiti Construction Industry DOI: [10.3390/su10061854](#)
- Loewe M. & Rippin N. (2015). *Translating an Ambitious Vision into Global Transformation The 2030 Agenda for Sustainable Development* (Deutsches Institut für Entwicklungspolitik Discussion Paper No. 1860-0441). Retrieved from https://www.die-gdi.de/uploads/media/DP_7.2015_NEU2_04.pdf
- Rejda, G.E. (1989), Principles of Insurance, 3rd ed., Glenview, Illinois: Scott, Foresman and Co.
- Zurich Services Corporation (2011) Green Building: What are the Risks?
- Srinivas, K. (2021), Risk Mitigation: Sustainable Management in Construction Industry DOI: [10.5772/intechopen.100215](#)