

Pathways for Circular Built Environments

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RMIT
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ICP



VICTORIAN
CIRCULAR *activator*

Circular Economy, Climate Change, Clean Energy
Catalysing your journey to circularity



10YFP

We are One Planet

- An implementation mechanism of Sustainable Development Goal 12
- The One Planet network: a multi-stakeholder partnership for sustainable development
- A network that leads the shift to sustainable consumption and production (SCP) providing unified and coherent direction, tools and solutions



700+ Programme Partners



200+ National Focal Points
From 130+ countries



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**Sustainable
Food Systems**
PROGRAMME



**Sustainable
Lifestyles & Education**
PROGRAMME



**Sustainable
Buildings & Construction**
PROGRAMME



**Consumer
Information**
PROGRAMME



Sustainable Tourism
PROGRAMME
Committed to drive the change



**Sustainable
Public Procurement**
PROGRAMME



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Built environment impacts

High resource use, environmental impact, employment

The BE consumes 40% of total global raw materials used

Capital and ongoing life cycle impacts

30% global material waste

40% energy related CO₂-e emissions

30% water use

Attributes to 6% of the global GDP

Employs 10% of the global workforce

Many informal workers

Circular built environments

Material use will double by 2060

Cement, sand, gravel, limestone, steel are the main materials

What does circular economy mean?

What?

Circular economy is about: designing out waste, keeping materials and products circulating in the system, optimising resources, providing long lasting solutions so we do not draw on the use of virgin resources, and regenerating natural systems.

Why?

Building stock will double by 2050 in Asia, Africa and Latin America. Global material use will double by 2060. Building materials comprise a third of material use. Concrete will contribute to 12% of GHG emissions by 2060.



Where?

Focus will be on the new growth regions of the world, in Africa, Asia, Latin America and the Caribbean. By 2050, almost 90% of the world's population is expected to be in urbanized Asia and Africa.

Advantages:

- Reduce and eventually eliminate the use of virgin resources.
- Reduce and eliminate environmental impact.
- Support local jobs and local economies

State of Play for Circular Built Environment

Publications

Background

- WCEF2017: Collective Impact for Sustainable Consumption and a Circular Economy
- WCEF2019: Circular Economy in Construction

Seven Regional reports

- Europe, North America, Oceania, Middle East, Africa, Asia & Latin America

+ Global recommendations

International Survey on UN 2030 Agenda

Sustainable Development Goals and Indicators

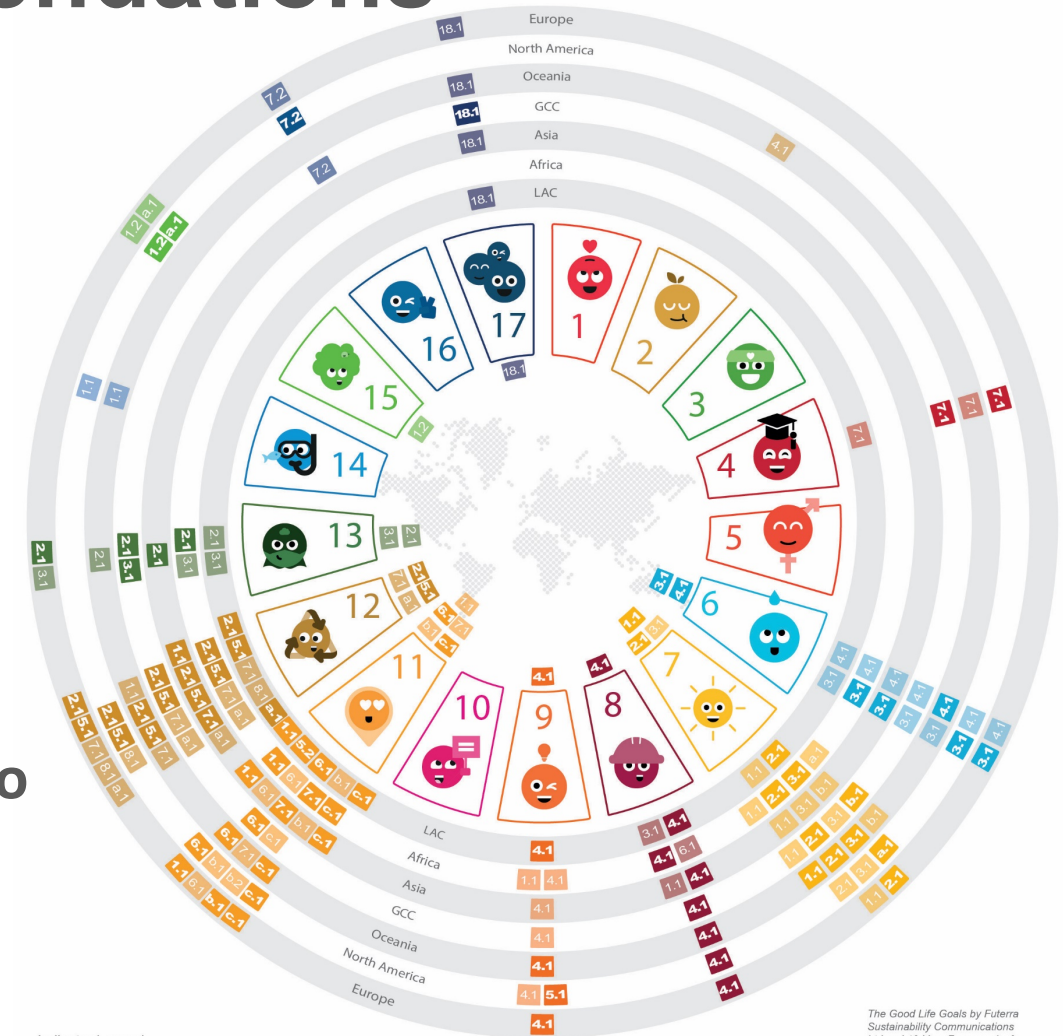
- 175 responses so far
- 82 from the Global South



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Global Recommendations

1. **Think and act differently** now and in the near future
2. **Monitoring and reporting** is essential
3. **Lifecycle considerations** at the outset of planning and design
4. **Building materials** are the essential building blocks for the built environment
5. **Procurement processes** need to be considered
6. **Adaptation and resilience** will be needed
7. **Locally adapted solutions** and practices need to be encouraged
8. **New business models**
9. **Overhaul of education and skills**
10. **Collaboration and financing agreements**

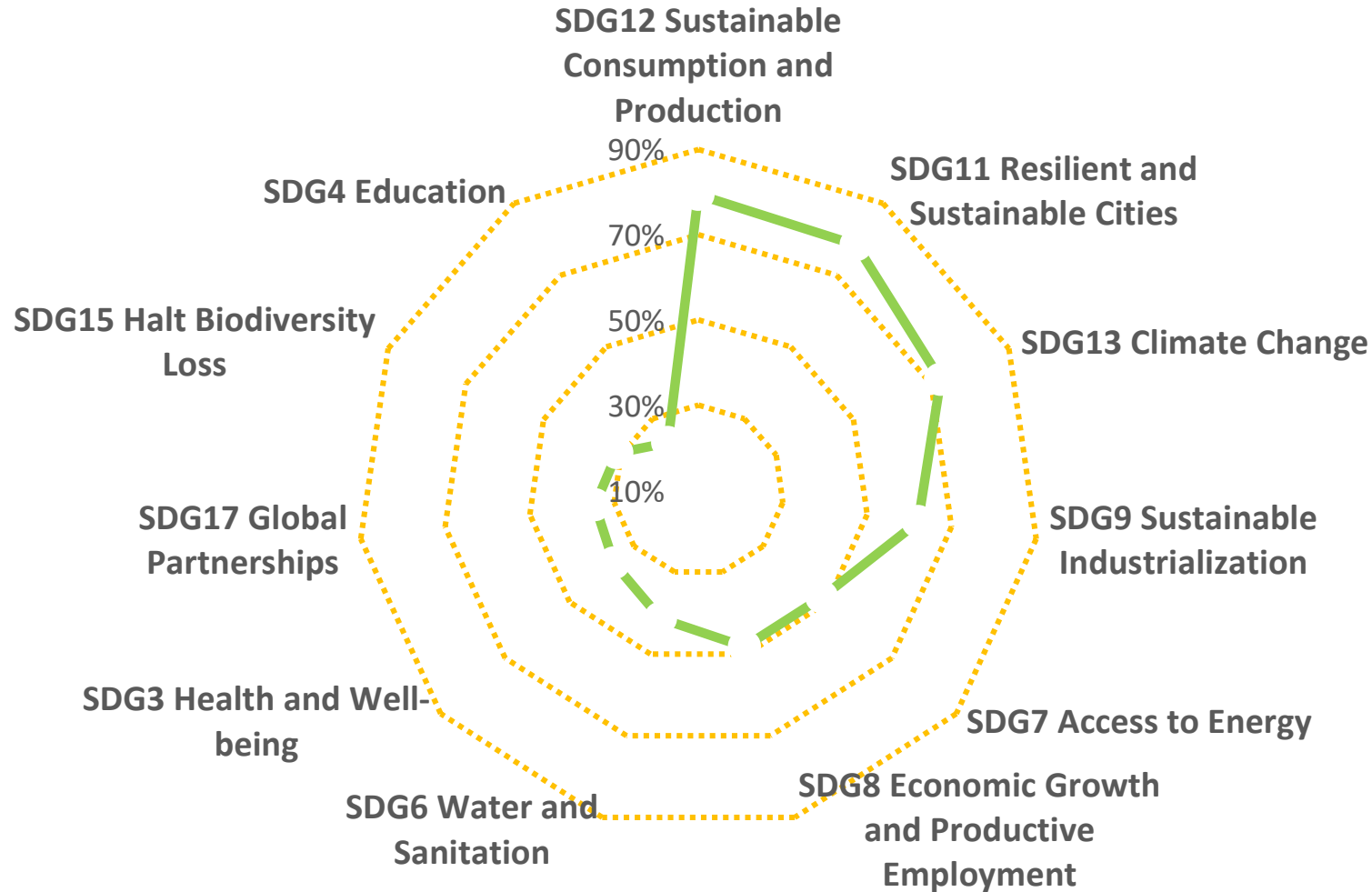


Indicator Legend
SBC programme circularity indicators appear within the wheel
Core indicators are denoted by darker colour and bold text

The Good Life Goals by Futerra
Sustainability Communications
Ltd and 10-Year Framework of
Programmes on Sustainable
Lifestyles and Education Programme
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Sustainable Development Goal Survey

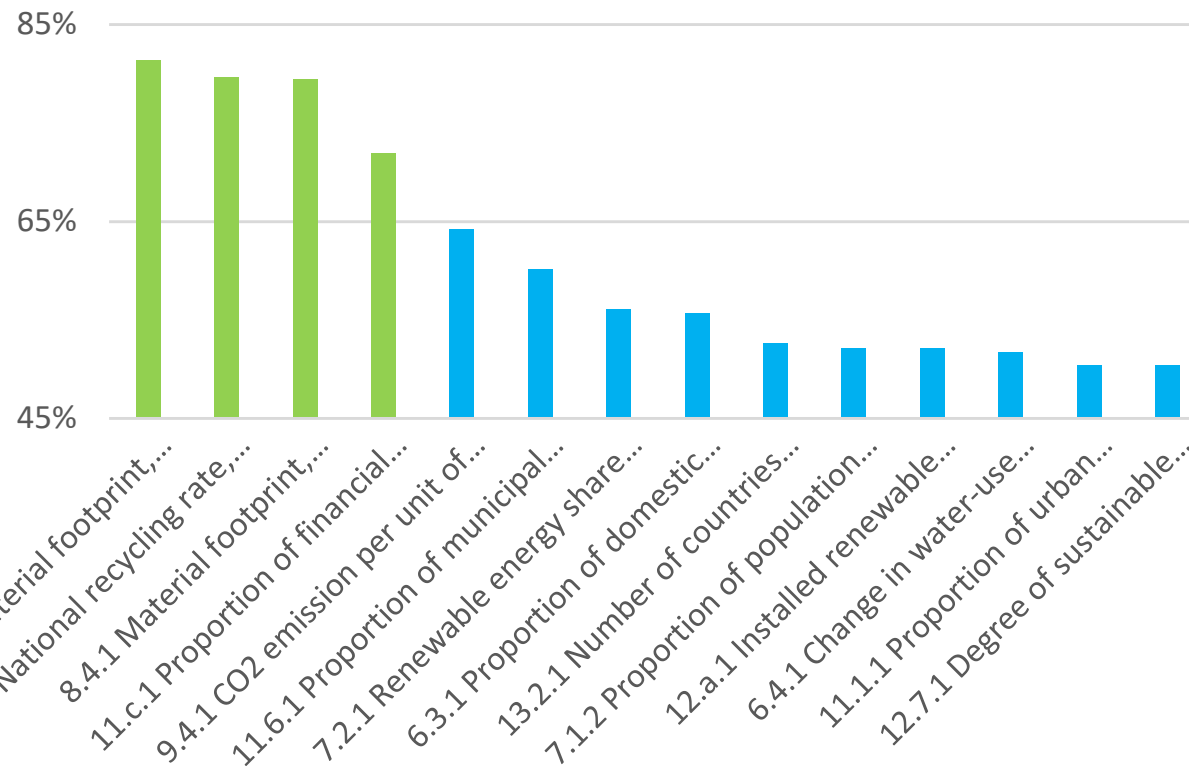


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Indicator Survey

Four Core Indicators

- 8.4.1 / 12.2.1 Material footprint
- 12.5.1 Recycling rate
- 11.c.1 Local materials



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Indicator Survey

Ten Secondary Indicators

- 6.3.1 Wastewater safely treated
- 6.4.1 Water-use efficiency
- 7.1.2 Reliance on clean fuels
- 7.2.1 Renewable energy share
- 9.4.1 CO2 emissions
- 11.1.1 Inadequate housing
- 11.6.1 Municipal solid waste
- 12.7.1 Public procurement policies
- 12.a.1 Renewable energy
- 13.2.1 NDCs, strategies, NAPs



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Circular Built Environment in Africa, Asia and LAC

Indicator work

- identifying regional priorities
- implementation in country policies
- customization at a project level?

Case studies

- Burkina Faso, Egypt, Kenya, Malawi, Morocco, Rwanda, Senegal, South Africa, Uganda
- China, India, Indonesia, Nepal, Pakistan, Sri Lanka
- Brazil, Chile, Colombia, Costa Rica, Uruguay

Next steps

- report launch 3 November in COP26 (14:15 GMT)
- adaptation, replication and scaling up
- North-South, South-North, South-South learning



Asia case study

C&D Recycling waste plant, Surat, India 2020

Life Cycle Phase(s)



Project type

Material, deconstruction



Keywords

Policies promoting circularity, Construction and demolition waste management, Use of reused or recycled content in new products and buildings

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Impacts

Environmental impacts, new businesses & green jobs and skills



Related SDGs

SDG8, SDG9, SDG12, SDG17



Overview

India generates an estimated 150 million tonnes of C&D waste every year. But the official recycling capacity is less, i.e., 6500 tonnes per day (TPD)—just about 1%. (Anumita Roychowdhury, 2020). In accordance with the C&D Waste Management Rule, 2016 by the Ministry of Environment, Forest and Climate Change, India, a state-of-the-art mobile wet processing C&D waste recycling facility has been established to process 300 TPD waste at Surat, India in 2020, under a public-private partnership (PPP) model awarded to Surat Green Precast Private Limited (SGPPL) as management facility and CDE Asia as technology provider. Based on the circular model (refer to Figure 27), the waste is collected from 10 collection centres or transfer stations (TS). The collected waste is further processed using ReUrban Compact technology, latest in India, that allows 96% recovery of high-quality sand (50%), aggregates (28%), and soil (18%). The recycled sand and aggregates are reused in construction and to manufacture certified products such as tiles, blocks, pavers, etc. A similar approach is now being replicated in various other cities of India.

Impacts

This circular model of recycling of C&D waste has showcased considerable *environmental impact savings* (refer to Table 2) as opposed to landfilling for the city of Surat. Though, the capital cost (USD 1,481,730) and operational costs are high, it will reduce 508 tonne of CO2 emissions, which is the same as burning 250,000 kg of coal every year. This will save 9100 Giga Joules of energy, enough to power 3000 Indian homes for an entire year, free 30,000 sq. yards of land from landfills, thus unlock 100 crore worth of real estate every year. *New businesses, green jobs and skills*: The manufactured recycled products are sold at 30% cheaper rates in the market with a buyback of recycled products by the Surat Municipal Corporation.

Replicability and scalability

The ReUrban plant is a mobile technology in which the same set-up can be used in a different location thus making it highly replicable and scalable.

Figure 4 (on the left): ReUrban Compact Technology by CDE Asia



Figure 5: Circular model adapted for C&D waste recycling at Surat, India

Table 2:

Projection of environmental impact savings in one year for Surat Plant. (Environmental Benefits of C&D Waste Recycling- LCA analysis of Surat, 2019)

| Impact Strategy | Unit | ENVIRONMENTAL SAVINGS | | |
|----------------------|------------------|--|---|--|
| | | Based on current recycling data (26,424 tonnes/year) | Daily operation at full recycling potential (109,500 tonnes/year) | Entire portion of C&D waste in Surat is sent for recycling (182,500 tonnes/year) |
| Global warming | tonnes CO2 eq | 73,5 | 73,5 | 508 |
| Non-renewable energy | GJ primary | 1317,4 | 1317,4 | 9099,3 |
| Land occupation | Acres of garbage | 0,88 | 0,88 | 6,1 |

Main challenges

- Comparison of recycled sand and aggregates is a challenge in the market as there is not set standards to compare the recycled products.
- Even after five years of Construction and Demolition Waste Rule (2016) and Swachh Bharat Mission's Swachh Survekshan, a pan-Indian annual competition to encourage cities to improve the condition of urban waste and sanitation, the implementation of C&D waste plant is very low. As of January 2020, there were at least 16 operational C&D waste recycling facilities in India of which three are in New Delhi. (Anumita Roychowdhury, 2020)



Source:

https://www.oneplanetnetwork.org/sites/default/files/from-crm/SBC_cases_web_ASIA_211102.pdf

Survey is still open

[One Planet SBC Circular Built Environment \(CBE\) State of Play](#)



Thank you!

