

EXPLAINER

How Indonesia can Transition to a Circular Economy through 5 Key Sectors



A circular economy offers various opportunities for the textile industry. Photo credit: ADB.

Wholesale and retail trade, textiles, construction, electronics, and food and beverage show high circularity potential.

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Introduction

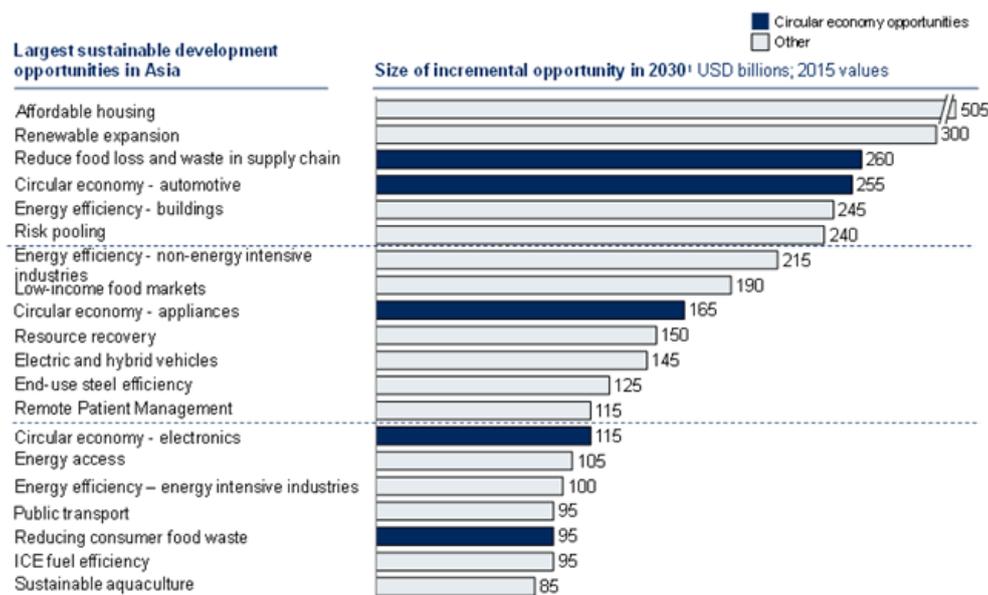
Compared to its regional peers, Indonesia is a bright spark in terms of placing emphasis on a circular transition. Having elaborated on circular economy concepts in Vision Indonesia 2045, the largest economy in Southeast Asia is pushing ahead with plans to develop a National Circular Economy Roadmap, which would be guided by the next National Medium Term Development Plan 2025–2029. Bappenas, in collaboration with the United Nations Development Program (UNDP) and with the support of the Danish Government, is leading these efforts and launched a study earlier this year which sought to estimate the different impacts that a circular economy could create in Indonesia by 2030. Five sectors—wholesale and retail trade, textiles, construction, electronics and electrical equipment, and food and beverage—offer the most potential for the country’s circular transition.

There are several important reasons for Southeast Asia to embrace a green-led recovery. First, with its location in the biodiversity-rich tropics and an additional 70 million people expected to live in its urban

areas between 2015 and 2025,^[1] Southeast Asia is particularly susceptible to future pandemics (and hence has high economic risk exposure). Second, according to the Global Climate Risk Index 2020, Southeast Asia is home to countries most impacted by climate change globally.^[2] Third, green stimulus policies elsewhere have proved to deliver significant economic benefits. For instance, the Republic of Korea’s green stimulus helped it recover faster from the global financial crisis than expected, directly creating 156,000 new green jobs from 2009 to 2011.^[3]

A key lever of a green-led recovery is to enable a transition of sectors toward a circular economy. While European countries like Denmark, Finland, France, Belgium, and the Netherlands have outlined their circular economy policies and strategies, such comprehensive strategies are lacking in developing Asia. Part of the problem is the lack of a solid fact base quantifying the size of the prize, at the country level, for transitioning towards a circular economy. This has contributed to the low level of awareness and urgency in this region. A relevant analysis was conducted by AlphaBeta for the Business & Sustainable Development Commission, which showed that across Asia, circular economy opportunities in food, automotive, appliances, and electronics are among the 15 largest business opportunities linked to the SDGs and could be worth almost \$1 trillion by 2030 (Figure 1).

Figure 1: Circular Economy Opportunities in Asia

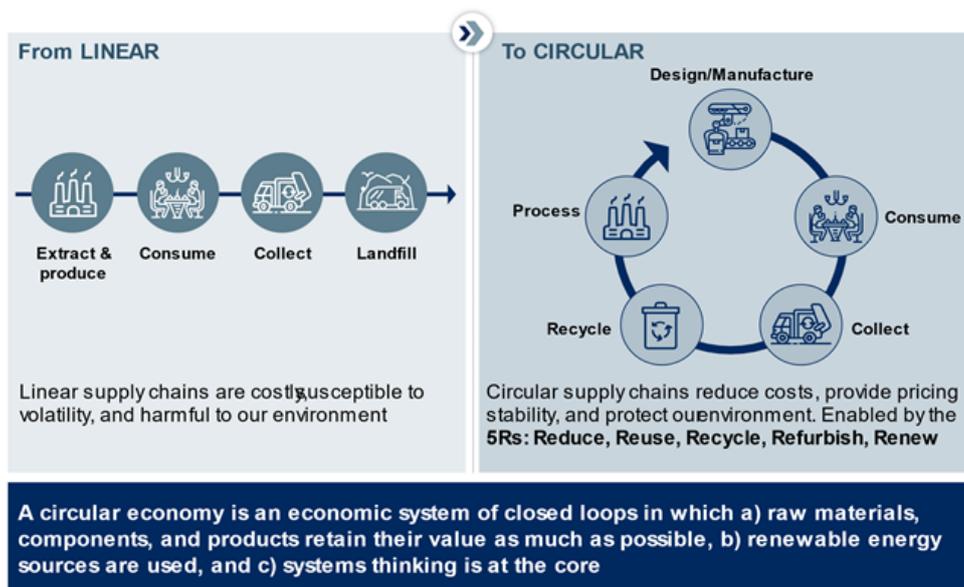


¹ Based on estimated savings or projected market size in each area. Only the high case opportunity is shown and is rounded to the nearest \$5 billion.

What is a circular economy and what are the available opportunities?

A circular economy aims to generate economic growth by maintaining the value of products, materials, and resources in the economy as long as possible, thereby minimizing the social and environmental damage caused by a linear economic approach. It embraces a broad set of interventions across all economic sectors, and activities focused on the 5R principles: Reduce, Reuse, Recycle, Refurbish, and Renew (Figure 2).

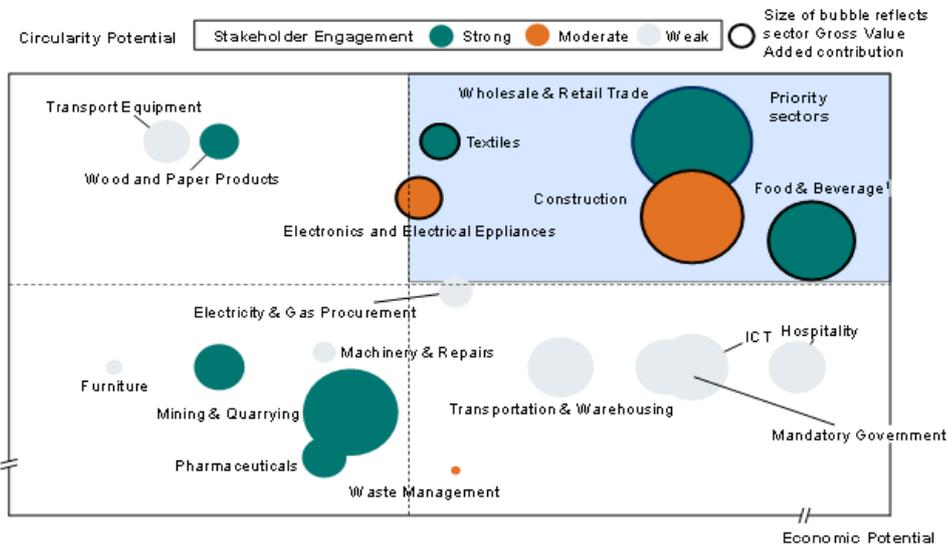
Figure 2: Differences Between a Linear Economy and a Circular Economy



Source: Ellen McArthur Foundation and AlphaBeta

While Indonesia's circular economy transition is technically feasible across many sectors, this study, supported by AlphaBeta, deep-dived on five key sectors (Figure 3) assessed to score well on circularity potential (e.g., material intensity, waste volumes, share of waste unrecovered), economic potential (e.g., sectorial gross value added and employment), as well as stakeholder focus (e.g., priority in government strategies). Together, these five sectors—wholesale and retail trade, textiles, construction, electronics and electrical equipment, and food and beverage—play a pivotal role in Indonesia's economy, contributing over 30% to Indonesia's current gross domestic product (GDP) and employing more than 43 million people, or one-third of Indonesia's workforce.

Figure 3: 5 Key Sectors Analyzed to Understand the Potential of Circular Economy in Indonesia



¹ The F&B sector includes the agriculture and fisheries sectors.

Source: Badan Pusat Statistik, Bano Indonesia, Ellen McArthur Foundation, and expert interviews.

Based on extensive industry interviews and desktop research, a list of circular opportunities (referenced against the 5Rs framework) within these sectors was drawn up. Table 1 shows the example of the textiles sector. The good news is that many Indonesian (or Indonesia-based) businesses are already adopting elements of the 5R principles in their operations. Some examples include:

- **Reduce.** In the construction sector, the use of emerging technologies, such as 3D printing, modular construction, and Building Information Systems have significant potential to reduce the generation of construction and demolition waste. PT. Bondor Indonesia has developed modular buildings in Merauke and Timika (Papua) and Muara Tuhup (Kalimantan).^[4]
- **Reuse.** Rentique, Style Theory, and Tinkerlust are examples of businesses that provide garment rental services to consumers in Indonesia, utilizing the reuse potential of garments. CupKita, a start-up based in Jakarta, provides a reusable container service to reduce the use of single-use plastic cups.^[5]
- **Recycle.** Anaerobic digesters—operationalized in Jambi city in South Sumatra, Malang Regency in East Java, and Bandung city—process food waste and help extract biogas for use as fuel, and bio-slurry for use as fertilizer.^[6]
- **Refurbish.** PT Sigin Interactive Indonesia repairs and refurbishes used electronics and home appliances, dead-on-arrival products, and printed circuit boards.
- **Renew.** Indonesian start-up Evoware offers a sustainable alternative to plastic packaging by making cups from farmed seaweed and designs food wrappings and sachets made from edible seaweed-based material. Some companies have demonstrated their commitment to using recycled waste. Danone’s bottled water brand, Aqua, uses bottles made of 100% recycled plastic.^[7]

Table 1: Examples of Circular Economy Opportunities and Benefits in the Textile Sector

#	Circular opportunities	5Rs	Brief Description	Significance/Examples
1	Reduce waste in production	Reduce	Reducing waste during the manufacturing phase through more efficient use of resources. An example is to track and control steam pipe temperatures, and regulate the air-fuel ratio in boilers etc	Up to 15% reduction in energy costs possible in textiles
2	Reuse products	Reuse, Refurbish	Aims to alter the consumer value proposition (e.g. "servitisation" models that encourage leasing / repairs)	Higher clothing utilisation rates – global customers miss out on USD460 billion of annual value by throwing away clothes that they could continue to wear
3	Use more sustainable materials	Renew	Involves altering supply chain processes to use more sustainable materials (e.g. sustainable sourcing or innovation to develop sustainable alternatives)	In 2019, 57% of all materials sourced by H&M group were either recycled or sourced in a more sustainable way
4	Recycle materials	Recycle	Increased recycling of waste materials from textile production. This will require the redesign products to improve recyclability, and overall improvement in collection systems to enhance recycling	Dutch Awareness creates clothes using 100% recyclable polyester that uses 95% less water, 64% less energy and produces 73% fewer carbon emissions compared to cotton

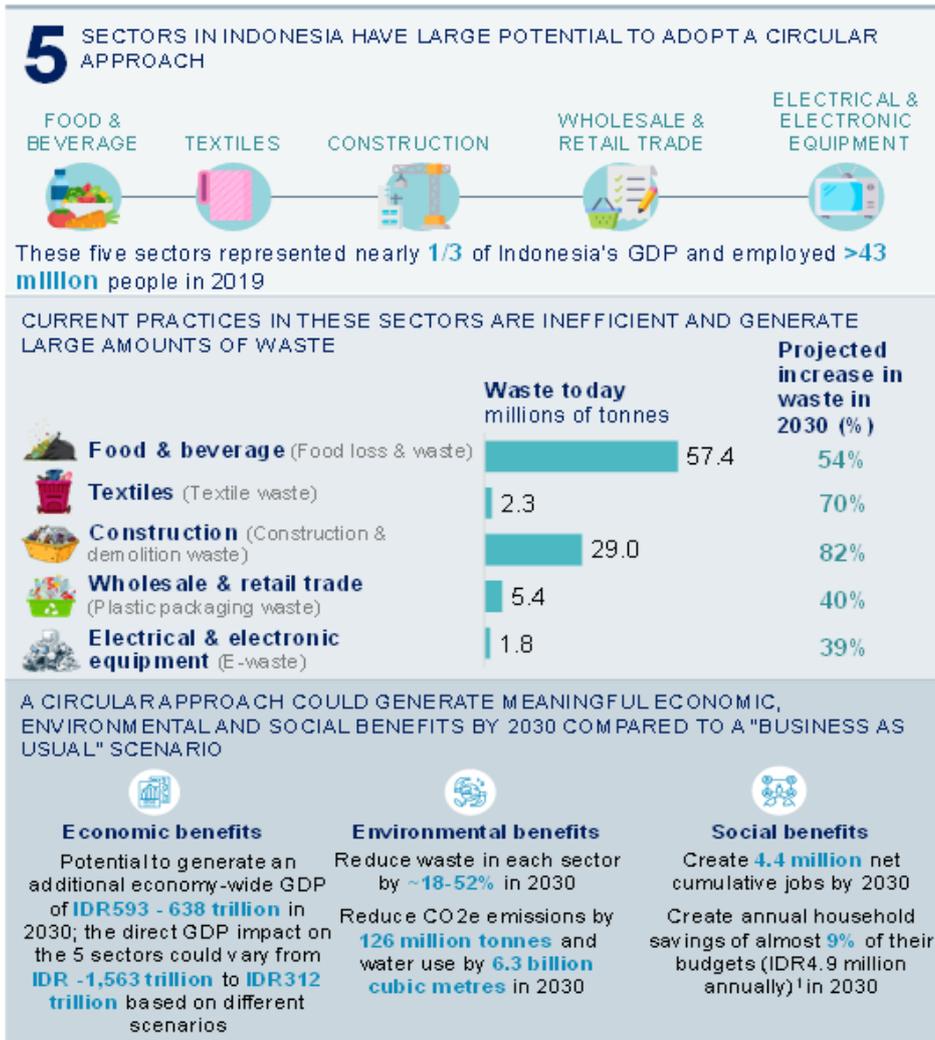
Source: Ellen McArthur Foundation, focus group discussions, and expert interviews.

What are the projected benefits of a circular transition for Indonesia?

The benefits of a circular transition in these five sectors can be examined based on their economic, social, and environmental impacts. In summary, we find that the circular transition is:

- **Net positive for the economy.** By adopting circular economy opportunities in the five priority sectors, Indonesia's GDP could increase by 593 to 638 trillion rupiah (\$42–\$45 billion) in 2030 (than it would under a "business-as-usual" approach). This could translate to adding 0.6 percentage to its GDP growth in 2030.
- **Net positive for households and the labour market.** A circular economy could create 4.4 million cumulative net jobs between 2021 and 2030. Moreover, 75% of these net jobs could be for women. This is driven by the potential job displacement in male-dominant and upstream sectors in Indonesia (e.g., construction, where women make up only 2% of the total jobs) and the likely job creation in female-dominant and downstream sectors. A successful shift towards the circular economy could also lead to monetary savings for households, either through direct savings from shifts in consumer demand or a pass-through from producers. An average Indonesian household that spends approximately three-quarters of its budget on food and housing and household facilities (e.g., sanitation and electricity) could save around 4.9 million rupiah, or 9% of its annual household expenditure.
- **Net positive for the environment.** The total carbon emissions avoided under the circular economy scenario (relative to the business-as-usual scenario) could be nearly 126 million tonnes in 2030 (equivalent to 9% of the current total emission levels). Reducing carbon emissions by 126 million tonnes is equivalent to keeping close to 27 million cars off roads for a year. In addition, total water savings across the sectors could reach 6.3 billion cubic meters in 2030—enough to meet the demand of nearly 15 million households for a year.

Figure 4: Circular Opportunity for Indonesia



¹ Based on Input-Output methodology.

Source: Badan Pusat Statistik, Ministry of Environment and Forestry, World Economic Forum.

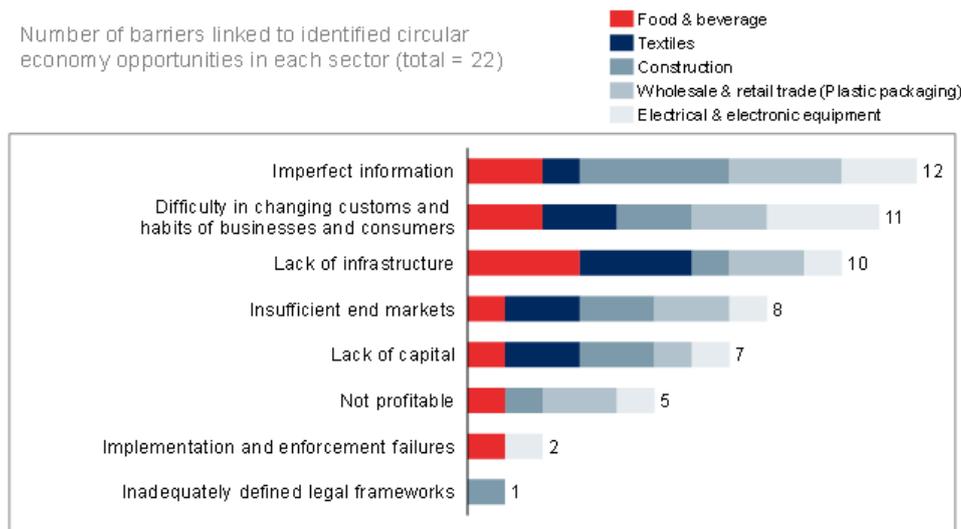
What are the adoption barriers and next steps?

Realizing these benefits would require unlocking several barriers. Engagement with stakeholders across the focus sectors found that of the 22 circular economy opportunities identified, the most common barriers (Figure 5) relate to imperfect information (e.g., lack of technical knowhow, lack of understanding of cost-benefit tradeoffs), difficulty in changing entrenched behaviors (e.g., gifting and/or over ordering of food during festive periods), and lack of infrastructure (e.g., waste management and recycling facilities). Another crucial challenge is capital, where substantial investment is needed to plug infrastructure gaps and create the business models that can unlock the circular economy opportunities. This study shows that Indonesia would need around 308 trillion rupiah (\$21.6 billion) of annual investment across the five focus sectors between now and 2030 to do so. Policies to enable a range of innovative financing solutions such as green bonds, sustainability-linked loans, blended finance, and impact investing assets managers must be considered.

A comprehensive understanding of these barriers by sectors is crucial so appropriate policies could be

developed and implemented to support the circular transition. This is not an easy task and requires commitment and collaboration between the public and private sectors. As Indonesia formulates its National Circular Economy Roadmap, it is necessary for the government to create the appropriate governance structure that will facilitate this multistakeholder approach. This includes (i) representation across the full value chain, including firms of different sizes, (ii) frequent engagement and buy-in from relevant government ministries, possibly guided by a strong "sponsor ministry," and (iii) setting up task forces to systematically remove regulatory barriers.

Figure 5: Barriers to Circular Economy Adoption according to Private Sector Firms and Sector Experts



Source: Team analysis based on surveys and sector-specific discussions.

Conclusion

This study sets out to quantitatively illustrate the benefits of a circular economy transition in Indonesia, putting in place the first of many steps toward the eventual goal. The COVID-19 pandemic should be seen as a catalyst for this transition as it underlined the importance of improving resource security, prioritizing environment conservation, and improving socio-economic equity in Indonesia. The findings may be country-specific but could reasonably be extrapolated to other regional countries, particularly those with similar economic structure, such as production and consumption patterns) and stage of development.

[1] Based on AlphaBeta analysis of statistics on urban population in Southeast Asian economies by the [United Nations Population Division](#). The estimate relates to 10 Southeast Asian countries: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam.

[2] The [Global Climate Risk Index 2020](#) analyzes and ranks countries worldwide on the extent to which they have been affected by impacts of weather-related loss events (storms, floods, heatwaves, etc.). D. Eckstein et al. 2020. *Global Climate Risk Index 2020*. Bonn: Germanwatch.

[3] Y. Jung. 2015. [Is South Korea's Green Job Policy Sustainable?](#) *Center for German and European Studies. Sustainability*.

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[4] PT. Bondor. Modular & Transportable Building.

[5] R. Hicks. 2020. Indonesia's First Reuseable Cup Rental Service Launches in Jakarta. *Eco-Business*. 7 July.

[6] E. Amit et al. 2016. Socio-Economic Considerations of Converting Food Waste into Biogas on a Household Level in Indonesia: The Case of the City of Bandung. *Recycling*. 1 (1). pp. 61–88.

[7] Aqua.

Resources

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Bingxun Seng is an experienced economist and expert on Southeast Asian economies. As director of Economic Advisory at EY, he provides strategic advice to clients by applying an economics lens. He is also an advisor at Circular Cities Asia. Before joining EY, he was a principal at AlphaBeta, where he led the public sector and economic development work of the Singapore-based economic strategy firm.
