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“ Paris or no Paris, it is our conviction that we have no right to snatch from our future generations, their right to have a clean and beautiful earth. It is part of our thinking and for that reason we do not believe in exploitation of the nature. We people do not have the right to take more than necessary from nature. ”

**Honourable Prime Minister of India,
Shri Narendra Modi**



Overview

Our planet faces a climate crisis.

Living through a pandemic, we know what it feels like to have our lives upended, our schools and workplaces locked down, travel come to a standstill... We learnt that it is possible for the world to change overnight. So grim predictions on climate change don't feel alarmist or unreal anymore.

Before we dive into this conversation, we'd like to share a few observations as an Indian early-stage VC firm. We're lucky to have a ringside seat to India's ascent as a global startup hub. And every day we see amazing examples of India's innovative spirit and entrepreneurial zeal. This fills us with great pride and hope. When we started out in 2006, few predicted Indian startups would be such powerful agents of technological, economic and cultural progress. But here we are today, a global recession and pandemic later, celebrating the spectacular successes of Indian startups.

Startups have permeated every aspect of our lives. They have changed the way we interact socially and financially, especially as digital adoption accelerated in the wake of the pandemic. The broader point here is that startups are disruptive and transformative forces.

Coming back to the topic at hand. India has 1.4 billion people (one-sixth of the global population) but only 2% of the world's landmass and 4% of freshwater resources¹. India generates over 150,000 tonnes of municipal solid waste (MSW) per day. Yet, only 83% of waste is collected and less than 30% is treated². Sustainability is no longer good-to-have – it is a must have.

Adding to these woes is the spectre of climate change. Extreme weather events like heat-waves, cold snaps and floods are taking a severe toll on lives and economies around the world. The global mean temperature is expected increase by 2.4°C by 2100, killing 300 million people and devastating economies. By 2030, the failure to reduce emissions will cost the world \$2B per day³. India faces a warming of 0.5°C by 2030 (equal to the warming over the entire course of the 20th century)⁴, exacerbating air pollution and disrupting agricultural production.

Okay, the writing is on the wall and the fate of future generations lies in our hands. Surely India's brightest entrepreneurial minds are doing something about it?

Here's the thing: we don't see that happening... just yet. Not at the scale required. Just 2% of our deal flow comes from this space. Currently, there's a large gap to be bridged globally too – the world's economy is only 8.6% circular⁵. And we'll tell you why we think this is the case.

But first let's demystify the central idea of this report: the Circular Economy. We did a great deal of research; and while we unearthed a lot of useful information on the subject, what we couldn't find is good material on the Circular Economy in India. Why is it relevant and what does it mean for India's future?

A good place to start would be to explain the concept of the **Circular Economy**.

Cycles, such as of water and nutrients, abound in nature – waste becomes resources. It's a central tenet of Hindu philosophy too – all life goes through the cycle of samsara, birth, life, death and rebirth. Yet humans have strayed from nature's cycles: We make, use, dispose.

The Circular Economy seeks to mirror the cycles of the natural world. Reuse what you can, recycle what cannot be reused, repair what is broken, remake what cannot be repaired. Circular goods are essentially reborn at the end of their lives as resources for others, closing industrial loops and minimising waste⁶.

India's environmental situation as we discussed earlier is precarious; and this makes the Circular Economy transition an imperative. Adopting Circular Economy practices in India can help generate savings of over \$624B by 2050⁷ across food & agriculture, construction, and mobility. And of course, help save the climate along the way.

So back to the question we asked earlier: why aren't we seeing this urgent need translate into entrepreneurial action and deal activity?

Three reasons, or the 3Cs – cost, convenience and consciousness. We'll focus on each pillar in the report, but in a nutshell:

- 1. Cost:** We're seeing younger consumers more willing to pay a premium for sustainable goods and services, but Indian shoppers are also cost conscious. The key here is to strike a delicate balance.
- 2. Convenience:** Aside from price, convenience also informs customer decision making. To be successful, Circular Economy solutions need to solve for customer convenience vis-à-vis non-circular alternatives.
- 3. Consciousness:** Awareness on big picture environmental issues doesn't easily translate into business for sustainable brands. Consciousness will be the crucible of the Circular Economy. Bridging the gap between awareness and eco-conscious buying decisions is an important aspect. Part of the reason we're writing this report is to strike up conversations on key problem areas and opportunities in the Circular Economy.

Through the lens of these three pillars, we've suggested five emerging business models that should help unlock enormous value in the Circular Economy. Our attempt here is to create a playbook for entrepreneurs looking to build businesses in this space, while defining the funding landscape for the Circular Economy in India.

Now that you have all the necessary background and context, let's get down to brass tacks and talk Circular Economy.



Understanding the Circular Economy

The Circular Economy is an alternative to the Linear Economy. Historically, consumers have followed a linear model of value creation that begins with the extraction of raw materials and concludes with the end-of-life disposal of finished products. This is the “take-make-waste” model.

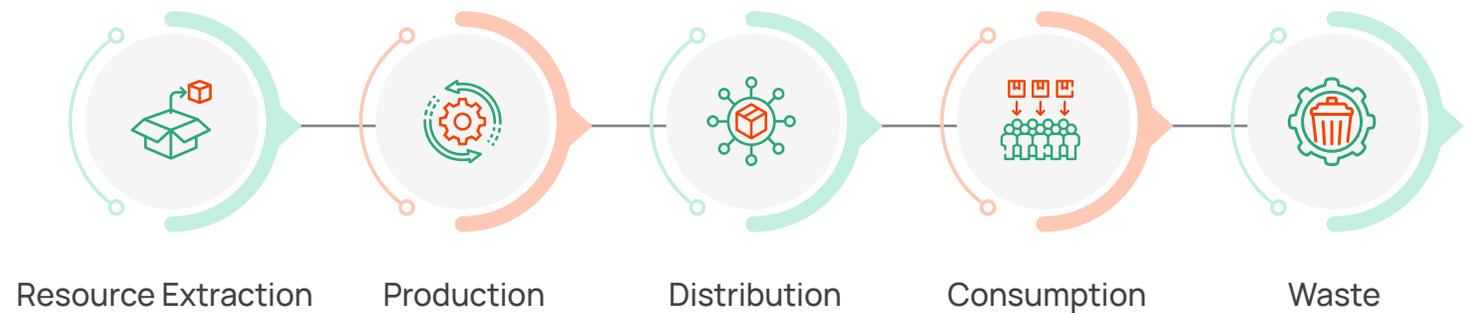


Figure 1: The linear consumption model



A Circular Economy, however, advocates a closed-loop production model where resources are reused and kept in the production loop, allowing for more value generation. The objective here is to retain as much value as possible from resources, products, and materials to create an ecosystem that sustainably promotes longevity, reuse, refurbishment, and recycling.

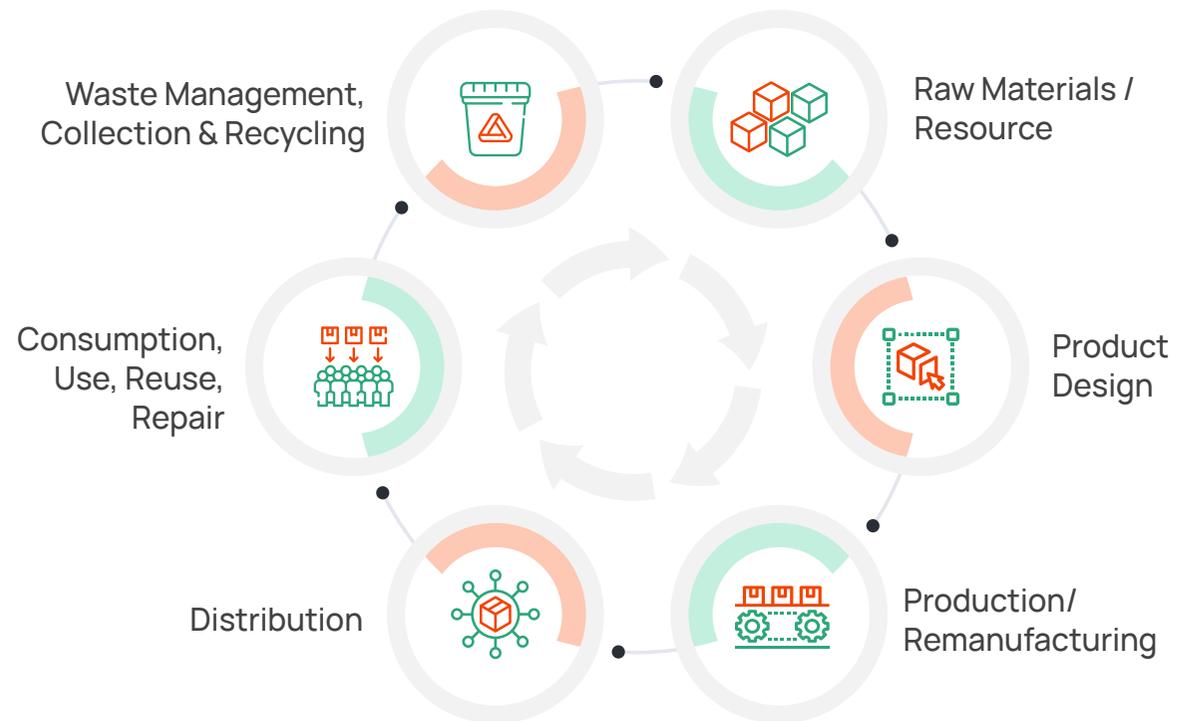


Figure 2: The closed production model



Principles of Circular Economy

There are **three guiding principles** of the Circular Economy – without them circular products and businesses do not exist.



Reduce waste and pollution

Recycling should be done to reduce pollution and waste production. Waste generated should be treated adequately to generate as much energy as possible, and then the remaining should be disposed in a phased manner.



Keep products and materials in use

To keep products and materials circulating in the economy, the focus should be on designing for durability, reuse, repair, and recycling. The idea is to preserve value in the form of material energy, labour, and material.



Focus on regenerative systems

In a circular economy, the focus is on minimising non-renewable sources of energy and replacing them with renewable energy. It also focuses on using materials that are regenerative to reduce waste production.

So now that we understand how products and solutions may be engineered to be circular – let's present the case for immediate action.



Why is Circular Economy Important Now?

01 To bridge the widening supply-demand gap

India is expected to be the most populous nation by 2027⁸. The logical question to ask is – are we well positioned to provide for 1.4 billion people? There is already a huge strain on the supply of resources and this in turn, casts the spotlight on the need to improve resource efficiency. Given this context, the Circular Economy offers a unique window of opportunity for India to continue its growth trajectory without excessively draining its resources.

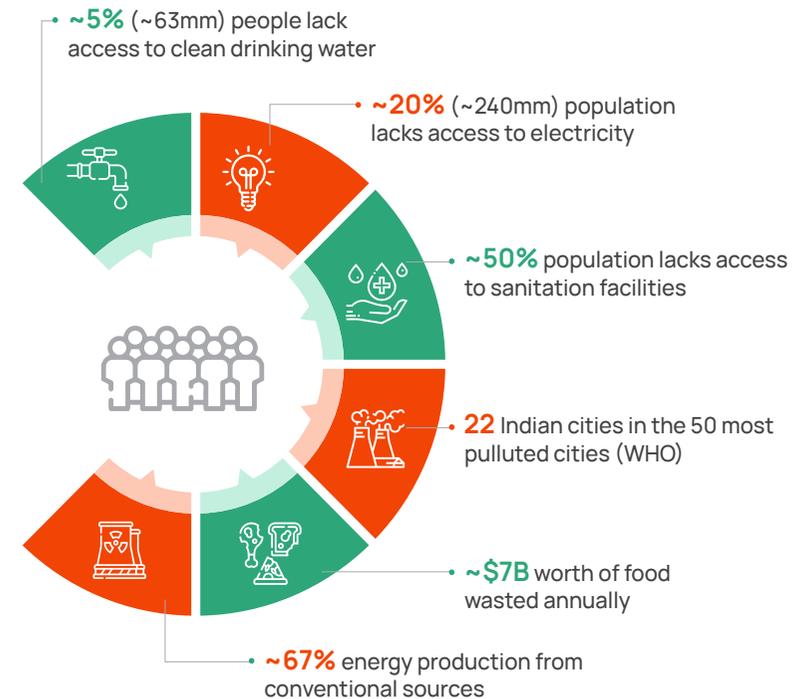


Figure 3: The demand-supply gap of key resources



02 To reduce economic vulnerability to global events

In fact, if India is to become self-reliant, it will need to cut down on imports and foreign debt. This makes embracing the Circular Economy imperative in the context of reducing the increasing demand-supply gap. India's dependence on oil and gas imports stands at 77%⁹ of its domestic needs, making us particularly vulnerable to global events that cause dramatic fluctuations in oil prices. Any increase in global prices sends our import bill spiralling, stokes inflation and widens our trade deficit. The current Ukraine-Russia war exposes this vulnerability. Adopting a Circular Economy thus aligns perfectly with the Government's mission of '*Aatmanirbhar Bharat*'.

77% of India's domestic Oil & Gas needs are met by imports



03 To promote equitable growth

Lastly, current growth in India is coming at the cost of a wider disparity in income and resource distribution. When resources become increasingly scarce and expensive, those with deep pockets remain unaffected for longer, while the rest suffer the consequences. A circular model allows for better resource utilisation, and therefore ensures more equitable growth. Thus, the Circular Economy route is essential for a sustainable growth that benefits all members of society in the long run.



Solving the 3Cs: the way forward for the Circular Economy

*The Circular Economy is inevitable. But to get there, consumer mindsets and behaviours will need to shift – and fast. **Convenience and Cost** have always been at the core of consumer decision making. But in the case of Circular Economy, a third factor: **Consciousness** is also key. Let's look at how startups might approach these pillars to drive mainstream adoption of circular products.*



Convenience

Everyone looks for the **quickest** and **easiest** way to get what we want. As Evan Williams, a co-founder of Twitter put it, “Convenience decides everything.” Convenience has the ability to make other options unthinkable. Once you have tasted 10-20 min grocery deliveries, planning for your orders seems irrational even if it may be cheaper. Hence, circular products and services simply won't catch on unless they are as convenient as their linear economy counterparts, if not more. For instance, **Product-as-a-Service** is rapidly gaining popular owing to the convenience of leasing products compared with the hassle of owning them (owning, storing, maintaining, and selling products).

Our definition of Convenience here encompasses **quality** and **functionality**. The fact is consumers don't want to choose between Sustainability and Convenience. And if they're forced to, Sustainability isn't likely to come out on top, even if it's bad for the planet. Surveys have shown customers generally think of



themselves as eco-friendly – they care about the planet. But they don't necessarily buy green unless the products or services match their expectations for Convenience.

Embedding Convenience into the development Circular Economy products and services makes a lot of business sense. But it's easier said than done. Sustainable ingredients may for instance be more expensive and more difficult to source, which in turn affects Convenience for customers.

Brands and startups have a long way to go before they can convince the average Indian consumer to opt for sustainable options that feed into the Circular Economy. And **Convenience is key**.



Cost

Another key factor for the adoption of circular products is **value for money**. Indian consumers have always been highly cost-conscious and this is to be expected in an economy that is still developing. While some consumers might be willing to pay a premium for high-quality sustainable products, there is a delicate balance to be achieved between quality and cost.

When we talk about value for money, we do not necessarily mean that circular products need to be priced lower than linear alternatives to attract customers. Instead, circular products need to be priced competitively, taking into account the **Lifetime Value** of the product. For instance, a one-time use product priced lower should indicate less value than a multiple-use circular product priced higher.

Another approach startups can adopt to attract the value-conscious consumers is through **Product Life Extension** business models, which provide refurbished or second-hand goods. These refurbished products are cheaper than newly manufactured ones and often of comparable quality. Such businesses are thus attracting attention from cost-conscious and pragmatic millennials.



This trend of upcycling belongings or being open to buying pre-owned goods is rapidly catching on within India's metros. While consumers are adopting refurbished products, products should also be easy to repair, maintain and refurbish, thereby extending the life of the product. Today the second-hand goods market in India is valued at \$10B and expected to grow at 17% annually. In fact, the pre-owned clothes market, currently a \$1.5B market in India, is one of the fastest growing segments within the second-hand goods industry¹⁰. This is why we're seeing global resale marketplaces such as Poshmark into India – a testament to the rapidly growing base of sustainability- and value-conscious consumers.



Consciousness

Awareness on climate issues is growing. It is clear that sustainability is key for brands in terms of the products they develop, the talent they attract, and of course, the perception of investors. But the business opportunity here remains **largely untapped**. Awareness on big picture environmental issues doesn't easily translate into business for sustainable brands. Consciousness will be the crucible of the Circular Economy – it will help bridge the current gap between awareness and conscious purchases.

Consciousness is thus the **critical new lens** for the Circular Economy. There are two caveats while assessing a circular product from the perspective of consciousness.

Firstly, while consciousness is an important factor in evaluating any product, it may not be the prime reason for mainstream adoption of circular products for most shoppers. To adopt a circular product in daily use, they will first seek **convenience** (quality/functionality) and **value** (cost) before thinking about its impact on the environment. Only some consumers are driven primarily by their consciousness towards the environment, regardless of quality or price of the product. For instance, consumers using D2C brands that offer recycled apparel and accessories are driven mainly by consciousness. Often these products are more expensive or inferior in quality to linear products.



Secondly, compared with convenience and cost, consciousness is **more qualitative** and not easy to measure. Even when consumers place an emphasis on this factor, they cannot assess it easily. So, clearly labelling the positive environmental impacts of circular products can help consumers become aware and choose these products.

Playbook for Circular Economy startups

While many circular products/ services have one or two of the 3Cs (Convenience, Cost, Consciousness), achieving all three may seem daunting. For instance, most linear products offer Convenience (quality) as

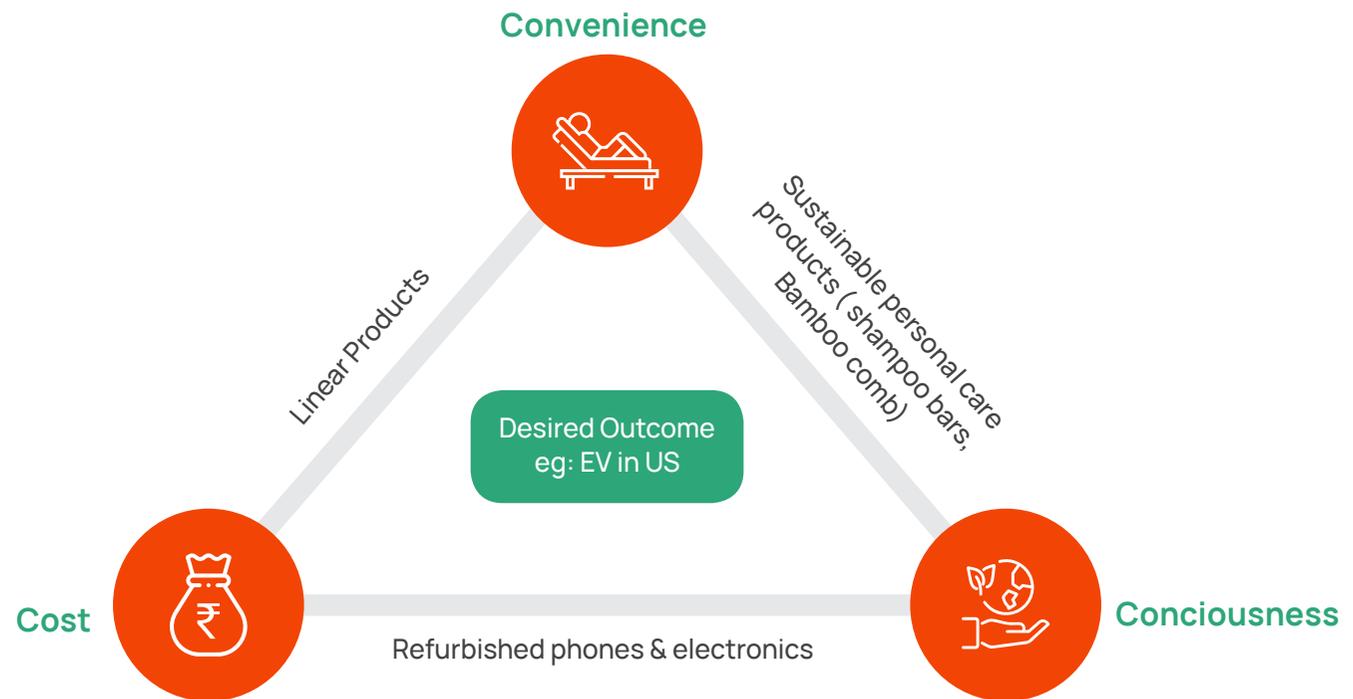


Figure 4: The 3C Trinity



they are made from new resources and Cost since they are priced competitively. But these products do not address consciousness as they end up as waste. Now let's look at zero-waste and sustainable alternatives, e.g. personal care/ home care products such as shampoo bars, bamboo combs, detergents. They may offer a degree of Convenience (quality) and give expression to Consciousness, but tend to be pricier than linear options. Hence, they have a limited demand, driven solely by conscious consumers. On the other hand, refurbished smartphones are purchased owing to lower costs or customer consciousness, but their quality isn't comparable to new smartphones, thereby reducing the appeal of owning recycled phones.

To ensure widespread adoption of circular products, **cracking the 3C trinity is key**. And it's not impossible. Consider, for instance, electric vehicles (EVs) in the US and some other global markets. EVs offer the same convenience or functionality as petrol vehicles. In terms of cost, the lower cost of electricity compared to petrol makes EVs more attractive in the long run. And lastly, there is a direct environmental benefit of using EVs. Since EVs possess all three traits, they have been widely adopted and are now seen as an obvious choice for consumers in these regions.

In India, however, EVs haven't solved the 3C trinity yet. Firstly, EV batteries are expensive. So the upfront cost of purchasing an EV is much higher than their internal combustion engine (ICE) counterparts. Secondly, there isn't enough public infrastructure for charging. This renders EVs unsuitable for long haul travel. And also triggers range anxiety among customers, the fear that the battery will run out of power before the destination or a suitable charging point is reached. Solving these two issues will make EVs the natural choice for customers. Though India will also need to reduce reliance on thermal (coal) power for electricity generation to make EVs genuinely eco-friendly.

As circular products solve for the 3Cs, they will shift from niche to mainstream.





Market Opportunity For Circular Economy

The global opportunity for the Circular Economy is expected to touch \$4.5T¹¹ by 2030. The methods described below help capture this market opportunity:

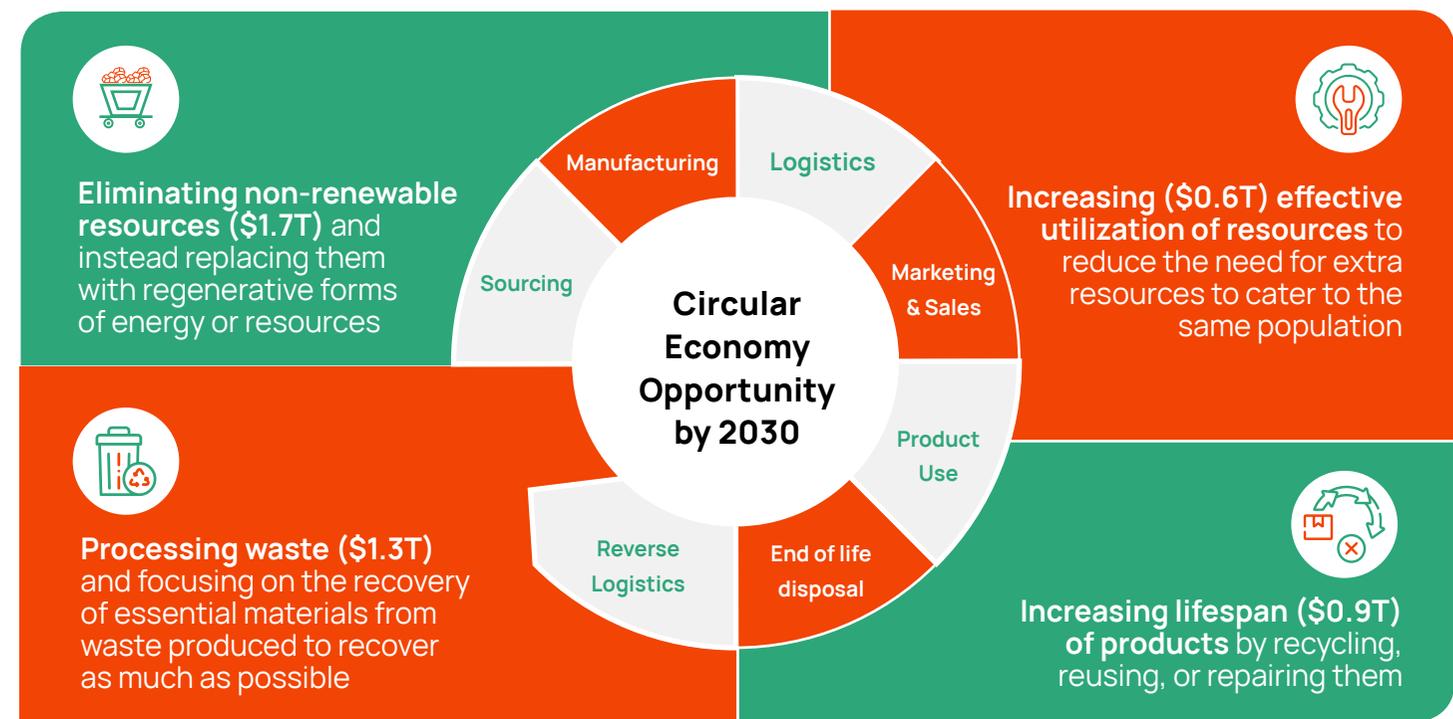


Figure 5: Circular Economy Opportunity by 2030



Market Opportunity *in India*

India is expected to become the world's third largest economy by 2030¹², accounting for about 8.5% of global GDP. If the global Circular Economy touches \$4.5T by 2030, then we're looking at a \$45B+ opportunity provided India captures just 1% of this market. If India's share of the Circular Economy matches its contribution to global GDP at 8.5%, we'll have a \$380B+ Circular Economy here.

So looking at the size of the opportunity, it's clear that the Circular Economy has the power to fuel India's growth in the decades to come. And along the way, bring huge environmental benefits such as reduced levels of congestion and pollution.

Where will demand for circular products come from? Construction, food & agriculture, and mobility represent more than two-thirds of the average household spend in India¹³. Let's look at some broad insights that showcase the Circular Economy opportunity in India:



Leading hub for technology and innovation

Given India's existing dominance in the IT sector and pool of tech talent, we're well placed to use digital technology to create innovative and cutting-edge circular businesses. This can help catapult India into a global leader of the Circular Economy revolution.



Early success compared to global economies

Mature economies currently have a linear lock-in for most of their processes; thus, switching costs will be high and time-consuming. Public infrastructure, for example, has been built to a large and construction materials are not sustainable. In contrast, many new activities can be started in India on Circular Economy principles. For instance, as India develops its public infrastructure, there emerges an opportunity to use circular methods of production such as sustainable building materials, sustainable construction designs and renewable energy. This approach could provide India with a competitive advantage over mature developed economies.



Easy acceptance of circular products

Culturally, several aspects of circularity are already ingrained in Indian mindsets, as evident by high rates of utilisation and repair of vehicles or the extensive recovery and recycling of materials post-use at the household level. For example, India recycles 60% of plastic waste compared to 56% by Germany and 9% by the US^{14,15}. Similarly average car ownership in India is 9 years compared to 7-8 years in the US. Due to this cultural acceptance, circular products and services are likely to be used more widely, thus creating a larger market.



Cost-centric Market

There will be a direct financial impact of Circular Economy adoption in India. The cost of providing services to individuals following a circular path will be lower than the traditional take-make-waste model. Adopting circular practices in India can help generate savings of over \$624B by 2050¹⁶ across construction, food & agriculture, and mobility. This will help drive widespread adoption, especially among India's cost-conscious consumers.



Emerging Business Models in Circular Economy

There are several business models in the Circular Economy, but we've highlighted five consumer-focused ones based on the principles we highlighted earlier (reduce waste and pollution, keep products in use, focus on regenerative systems). We believe these models are most suited to mainstream Circular Economy adoption:



Circular Supply Chain

This model follows the principle of focus on regenerative systems. This model introduces fully renewable, recyclable, or biodegradable materials that can be used across lifecycles. Examples of consumer-focused business could be providing alternate battery chemistries or replacing fossil fuel-based vehicles with electric vehicles. Some of the start-ups in India include Log 9 Materials, which builds Aluminium Fuel Cells that offer better performance and are cost-effective. Electric Vehicle OEMs like Ather Energy, Ola Electric, and Euler Motors build EVs across different formats.



Recovery & Recycling

This model follows the principle of reduce waste and pollution. It captures value from the waste stream (end-of-life products, waste products, by-products), thereby eliminating the concept of waste. Consumer-focused businesses include D2C brands selling footwear, clothes, handbags, daily essentials, all made from recycled materials. Examples of some global start-ups include Allbirds and Patagonia, which sell sustainable and recycled products across different categories.



Product Life Extension

This model follows the principle of keeping materials and products in use. It caters to products that might be broken, out of fashion, or no longer needed and extends the working lifecycle of such products by repairing, upgrading, and reselling. Consumer-focused businesses include marketplaces like OLX, Quikr, and Amazon, which offer refurbished electronic items, and Servify and Onsitego, which provide trade-in, repair, and refurbishment for electronic items. This model also includes manufacturing products that has a longer lifespan that can typically last for several years without wearing out. Consumer-focused businesses include companies selling stainless steel utensils which last for generations as opposed to melamine, glass or plastic utensils which need to be replaced every few years.



Sharing as a Service

This model follows the principle of reduce waste and pollution. It seeks to address the underutilisation of assets by connecting two or more parties to drive up the net asset utilisation through co-access or co-utilisation. Consumer-focused businesses include platforms that allow C2C (customer to customer) sharing. Examples of some start-ups include Ola, Uber, BlaBlaCar. These businesses provide users with a new way of saving money while offering an asset-light business opportunity to the organisations.



Product as a Service

This model follows the principle of reduce waste and pollution. It aims to tap the shift in consumer behaviour towards “access-over-ownership.” In this model, the manufacturers bear the total cost of product ownership, offering it to customers as a service. The customers become users rather than product owners. Consumer-focused businesses include asset leasing companies and subscription-based companies. Examples of some startups include Revv and Zoomcar, which allow users to take assets on



lease for an extended period. Additionally, some OEMs such as Nissan and Volkswagen offer direct leases to consumers. It is a win-win situation for both companies as well as customers. The companies gain a new revenue stream while customers realise significant cost savings, superior performance, and reduced risk of ownership.

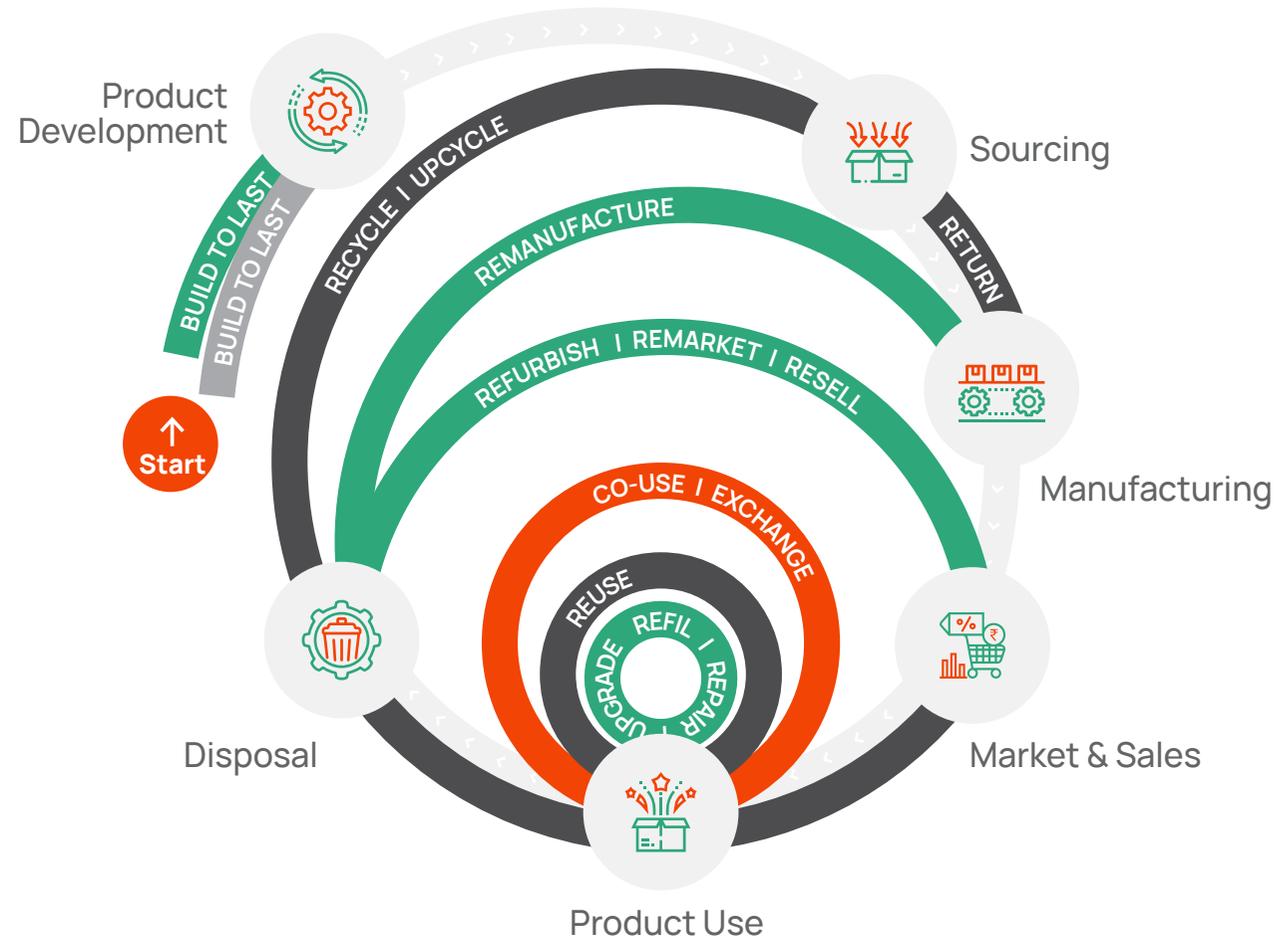


Figure 6: Circular Business Models



Funding Landscape In India

The Circular Economy in India, though nascent, has attracted investments totalling \$1.8B across sub-sectors over the past five years. Over 60% of the deal volume and ~80% of the value of deals comprise of mitigation-oriented innovations in energy and transportation¹⁷. This mirrors the prominence of energy and mobility start-ups globally. Over the last decade, significant techno-commercial progress, a favourable policy environment, and the evolution of standardised frameworks for impact measurement have fuelled increased adoption. Given these sectors' large share of contributions to global GHGs (Green House Gas) (~70%+), funding growth is an encouraging trend.

On the other hand, sectors like smart-agriculture, waste, environment, and natural resources are still ramping up in India. This presents an enormous opportunity for Circular Economy innovation as touched on earlier.

One of the notable companies that has raised large funding rounds is Ola Electric. It recently raised \$200M at a valuation of \$5B¹⁸, with a cap table of marquee investors such as Softbank, Tiger Global, and Falcon Edge. Not just private investors, but even governments, regulators, and central banks are reorienting public spending and policies towards the transition to an inclusive Circular Economy. The investment landscape is rapidly evolving, the Circular Economy is no longer a trend but a groundswell.

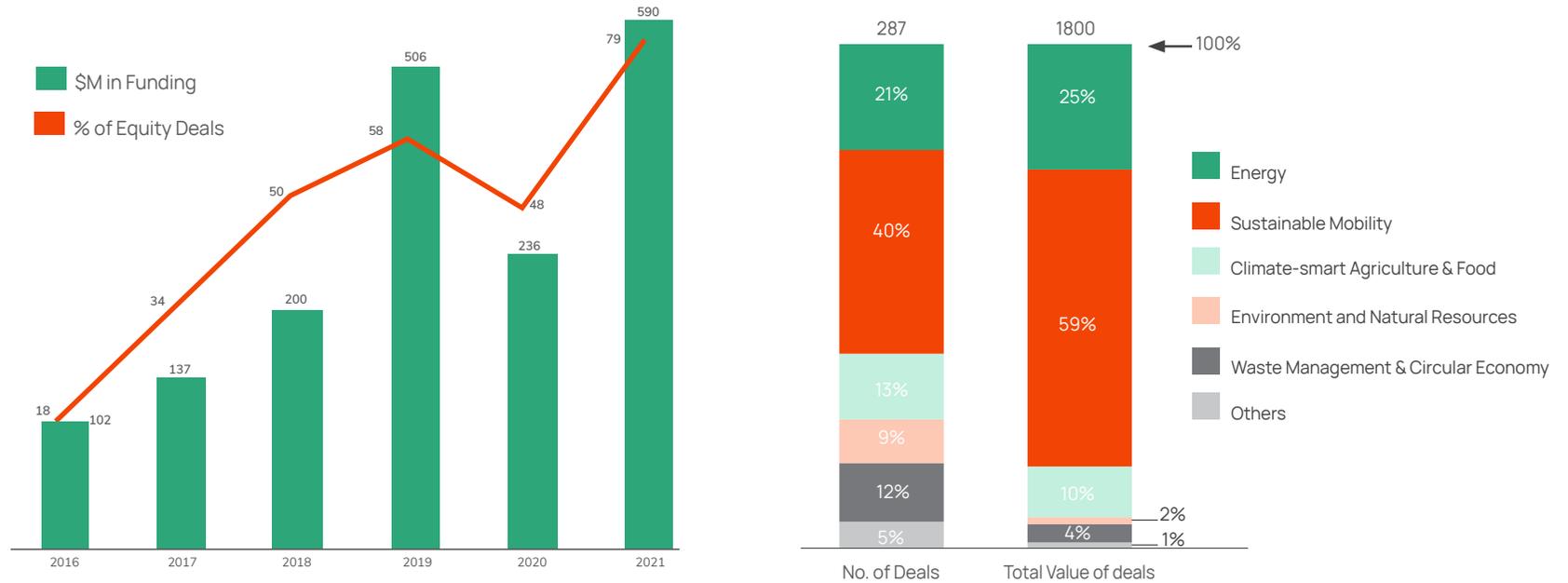


Figure 7: Funding Landscape in India

“Over the last 18 months, funds that focus on environmental focused investments have outperformed almost all other forms of index, some people will call that a momentum investment I would call that a sea change, I would call that a recognition that we have to move forward fast.”

- Larry Fink, CEO, BlackRock



Key Opportunity Areas

If we look back and see, we observe that with the advent of electricity and telephones, significant social behavioural changes spawned huge companies. Another example is the internet economy, which gave rise to the likes of Microsoft, Amazon, Google and Apple. Without the internet, Microsoft & Apple would just be a computer, and the other companies would not even exist. Like how the internet economy brought the world closer, we believe that the Circular Economy will bring in opportunities for startups to innovate and solve for the linear lock-in model.

Can India produce a homegrown global tech giant in this space?

We've established that there is huge opportunity here and it follows that there is a potential for a large outcome. Let's take a closer look at the circular opportunity across key sectors we have identified:

Fashion

Clothing production has doubled in the last 15 years while clothing use has shrunk by more than a third, owing to the rise of fast fashion¹⁹. Fast fashion has made shopping for clothes more affordable but at a massive environmental cost.



• Annual benefits of
\$560B
globally



Fashion production makes up 10% of humanity's carbon emissions, dries up water sources, and pollutes rivers and streams. More than 60% of fabric fibres are now synthetics, derived from fossil fuels, so our clothing does not decay when it ends up in a landfill²⁰. And when you consider every second the equivalent of one garbage truck full of clothes is burned or dumped in a landfill, you get a sense of the scale of the problem.²¹

The \$2.5T global fashion industry is also the second-largest consumer of water worldwide²². It takes about 700 gallons of water to produce one cotton shirt. That's enough water for one person to drink at least eight cups per day for three-and-a-half years!²³ The fashion industry emits more carbon than international flights and maritime shipping combined²⁴. Moreover, 85% of all textiles go to the dump each year²⁵, and washing certain clothes sends a significant amount of microplastics into the ocean.

Adopting Circular Economy methods is thus critical. Circular models may encompass a range of businesses involved in reusing and extending the lifespan of garments, taking clothes on rent, making clothes high-quality and durable, making resale of clothes attractive and boosting cloth care. This presents a massive opportunity for startups to transform our fashion habits and will help generate global savings of over \$560B by 2050²⁶.

Agriculture and Food

India is primarily an agrarian economy. With 850 million people living in rural areas, India houses the world's largest rural population, of which almost 60% depends mainly on agriculture²⁷.

Unlike most developed countries, food wastage in India is spread across the value chain (see figure 8). About 40% of the food produced is lost even before it reaches the consumer and about





10% of the food wastage can be attributed to the consumption stage²⁸. This presents a huge opportunity for startups solving for food wastage at the production and pre harvest stage.

The entire food value chain is susceptible to wastages from agri-waste and slurry to industrial byproducts, food loss, and packaging waste. As such, startups can solve different problems across the value chain.

For instance, startups offering Product-as-a-Service can help improve asset utilisation at the farming stages, while product recovery and recycling models can be effectively leveraged at the post-consumer stage. Food wastage and asset underutilisation are among the major problems Circular Economy startups can look to solve, thus creating annual benefits of \$61B in 2050²⁹.

Opportunities in this space will encompass tech-enabled agri practices, intelligent supply chains and circular packaging.

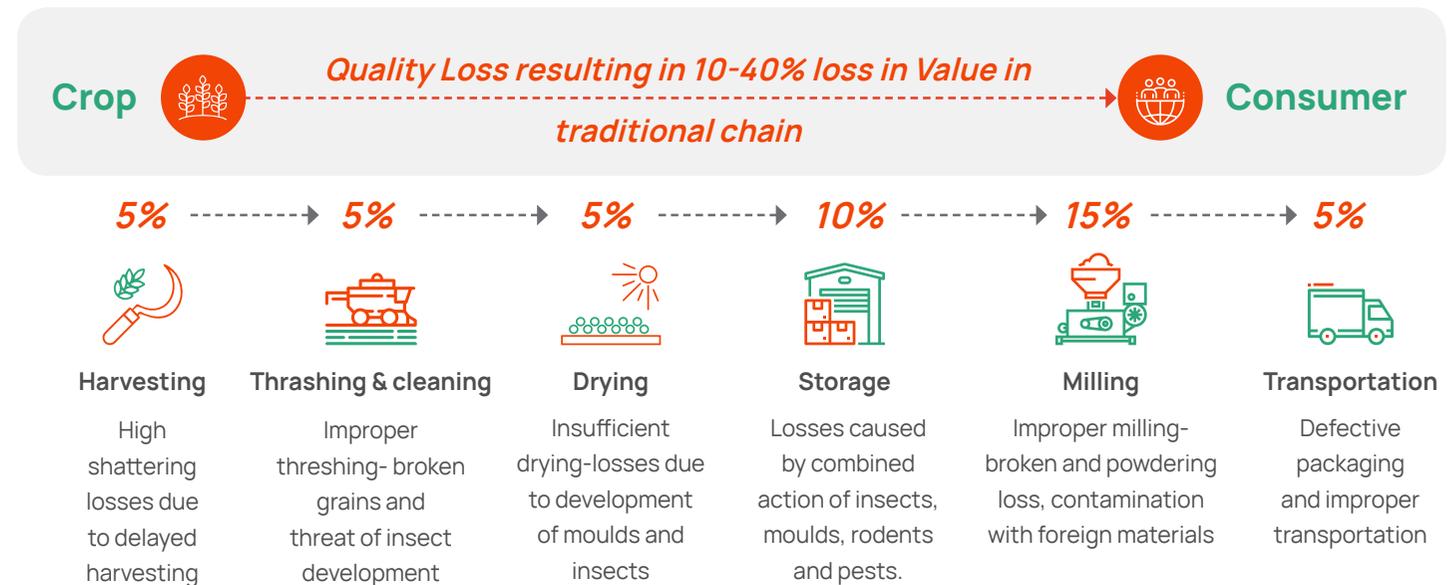


Figure 8: Food wastage across value chains in India



Mobility

India's transport demand has grown by almost eight times since 1980 – more than any other Asian economy³⁰. However, with an ever-increasing population, rising urbanisation and a fast-growing economy, India's demand for personal mobility is expected to increase. India had 22 cars per thousand individuals in 2018, and this is expected to grow to 175 cars per 1,000 individuals by 2040³¹.

With growing demand for mobility, there will be environmental consequences. Mobility has known to be one of the most significant pollutants of the environment. A round trip from Bengaluru to New York alone emits 1500 metric tonnes of CO₂ equivalent³². This emission is enough to melt 4500m² of Arctic ice - for every 100 flights between Bengaluru to New York, we lose Arctic ice equivalent to the Vatican City!

Mobility and vehicle manufacturing startups plugged into the Circular Economy have the power to annual benefits of \$482B in 2050³³.

We expect several exciting opportunities emerge in this space including multimodal transportation systems, Mobility-as-a-Service (MaaS), Manufacturing of Electric Vehicles and Smart Battery Technologies.

Annual benefits of
\$482B
in India





Construction

Most objects around you have been made unsustainably and reek of carbon emissions. The floor, furniture, sofa, dining table, desk, refrigerator, chairs, even the walls contribute to climate change.

Durable goods and man-made environment alone account for more than 10.2 gigatons of CO₂ emissions yearly, or nearly one-third of total emissions³⁴. Startups can tackle this problem statement to build solutions with a new goal in mind: Sustainable production for hundreds of years to come.

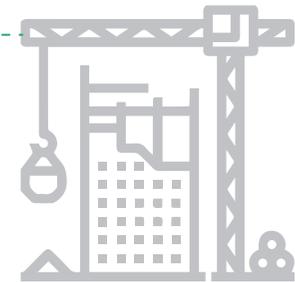
By 2050, 60% of India's population will live in urban areas, up from about 35% in 2021³⁵. While the construction industry remains a crucial driver of the Indian economy (contributes to 8% of GDP), it accounts for about 20% of total material demand³⁶. Additionally, construction and waste demolition generate a third of India's solid waste and consume 34% of India's energy. Growth in construction is so rapid that 70% of the buildings that will be used in 2030 are yet to be built³⁷, highlighting the need for energy efficient construction.

We thus believe that the construction industry offers significant room for circular innovation. Solving for energy efficiencies, carbon credits neutralisation, effective waste management, and adopting modular construction techniques are among the key opportunities in this space. The Circular Economy opportunity can help reduce carbon emissions and create annual benefits of \$76B by 2050³⁸.

Annual benefits of

\$76B

in India





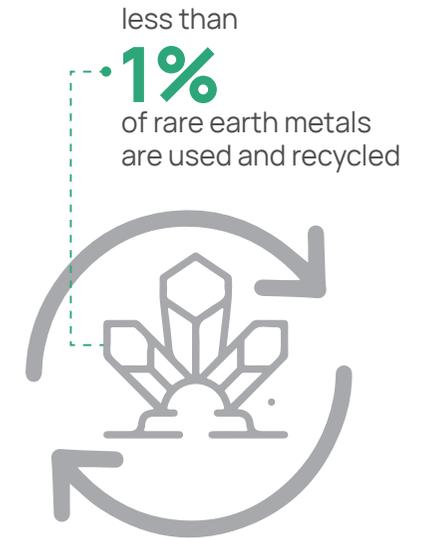
Rare Earth Metals

Rare-Earth metals is the collective name for a group of 17 elements: 15 from the “lanthanides series” in the periodic table, along with the elements scandium and yttrium.

Rare Earth metals are widely used in mobile phone technology, e.g. gallium is used for LEDs and the camera flash; tantalum is used in capacitors and indium powers the phone display. One out of every two people³⁹ have mobile devices, and manufacturers are rolling out bigger, better, slicker models every year. This, in turn, means that demand for Rare Earth metals is growing.

Lots of other industries also rely on Rare Earth metals. An electric car requires six times⁴⁰ the mineral inputs of a conventional car, and a wind plant requires nine⁴⁰ times more minerals than a gas-fired plant. Demand for rare earth elements could increase six-fold⁴⁰ by 2040 in light of current consumption patterns. Lithium and cobalt demand could increase ten to twenty times⁴¹ by 2050 because of electric cars. However, these rare earth elements are harmful and have a massive environmental footprint as less than 1% of REEs used today are recycled. India is heavily reliant on imports from China, which controls over 85%⁴² of rare earth elements supply globally. Thus it is important to look for alternatives that are operationally viable and cost effective.

We expect startups to tap on several emerging opportunities in this space. For instance, replacing rare earth metals with sustainable materials in motors, urban mining practices, and industrial symbiosis can help reduce the harmful effects of rare earth elements on the environment.





Conclusion

With global economies recognising the need for immediate climate action, decarbonisation is set to be the next major disruptor of the 21st Century. Our net zero future is an imperative so big that it will bring about changes in every aspect of our daily lives. This in turn will present a plethora of opportunities for startups, from plant-based proteins and carbon emission trackers to electric vehicles and new battery technologies.

Given the host of benefits, we believe that now is the best time to adopt circular principles in India. We expect an increase in awareness and technology advancements to enable us to embrace Circular Economy solutions that may not have been feasible earlier. Some of the key learnings from this report are:



The Circular Economy opportunity is inevitable amid a widening demand supply gap and excessive dependence on imports to meet energy requirements



India's leadership in technology and innovation creates an opportunity accelerate its transition towards the Circular Economy, especially in light of greater cultural acceptance towards circular practices



Solving the Convenience-Cost-Consciousness trinity will be crucial for the success of the Circular Economy. Companies generally find it difficult to achieve all three factors together, and solving for this triangle will be a key differentiator



Fashion, Construction, Agriculture and Food, Mobility, and Rare Earth Materials are expected to provide the biggest opportunities for Circular Economy startups



We, at Kalaari Capital, are looking to back innovative and patient founders who are passionate about sustainability. Entrepreneurs who have the vision to change how we think about our footprints and have the gumption to champion breakthrough circular innovations. We're truly excited by circular business models that will undoubtedly create immense value for consumers, the environment, and the world.

We are ready to invest and make an impact!





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