

Approaches for Measuring India's Circular Economy Transition

Key design principles for policymakers and businesses



Approaches for Measuring India's Circular Economy Transition

Key design principles for policymakers and businesses





Table of Contents

Executive summary	7
Need to measure circular economy	12
Available options and challenges to measure circular economy	18
Design principles for the Indian context	24
Acknowledgements	36
Appendix	37

डॉ. वी.के. सारस्वत

Dr. V.K. Saraswat

सदस्य
Member

Tele : 23096566, 23096567

Fax : 23096603

E-mail : vk.saraswat@gov.in



भारत सरकार
नीति आयोग, संसद मार्ग
नई दिल्ली - 110 001
Government of India
National Institution for Transforming India
NITI Aayog, Parliament Street,
New Delhi - 110 001



Foreword

India is spearheading the sustainability agenda amongst the emerging economies. India has committed to achieve the net zero goal by 2070 through Panchamrit, five nectar elements of India's climate action presented at COP26. We have raised our climate ambitions by aiming to increase the non-fossil energy capacity to 500GW and fulfill 50% of its energy requirements through renewables by 2030. India has committed to achieve reduction in its projected carbon emission by 1 Bn tons by 2030 and reduce carbon intensity of the economy by 45% by 2030 over 2005 levels.

The fifth largest economy, India is third highest CO2 emitter in the world contributing to 6.9% of global CO2 emissions. India has seen a six times growth in material consumption from 1.18 billion tons in 1970 to 7 billion tons in 2015. The resource requirements in India are projected to be nearly 15 billion tons by 2030 and around 25 billion tons by 2050. Given this increased pressure on resources, it is necessary to promote sustainable consumption of natural resources and to minimize waste. Growing demand and limited supply of natural resources adopting circular economy can help India reduce 44% of greenhouse gas emissions.

India has already embarked on ambitious policy and regulatory landscape which guides the industries towards a path of sustainable development. India has implemented Extended Producer Responsibility through multiple regulations for different sectors such as Plastic Management Rules 2022, Battery Waste Management Rules, 2022, E-waste Management Rule, 2018, Steel Scrap Recycling Policy, 2019 etc. Private sector independently is also embracing circular business models to tap into the benefits of circular economy. Industry survey conducted by FICCI and Accenture reveals that 60% of Indian businesses are planning to report CE targets in the next 12 months and measure circularity through existing global CE measurement frameworks. However, measuring the circular performance will require addressing the challenges faced by the industry in adapting to global frameworks.

In this context, this paper adds significant value in understanding current state of circular measurement maturity in India and in identifying potential challenges faced by Indian companies in measuring circularity. The study based on insights from industry and existing global frameworks highlights some key design principles which will provide foundation to introducing and implementing CE measurement in India.

I congratulate FICCI, Accenture and NITI Aayog circular economy team for this well-researched theme paper. I am confident that this study would act as a good reference document for policymakers and industry practitioners working on circular measurement approaches. I would encourage diverse stakeholders to leverage this paper and hold next level of consultations in coming months.

(Dr V K Saraswat)



एक कदम स्वच्छता की ओर



Arun Chawla
DG
FICCI

Circular Economy has seen immense evolution over the years, and its importance is only rising exponentially as the world recovers from the pandemic and the associated supply chain constraints, while combating climate change, environmental degradation, geopolitical crises and increasing social inequality. The difficulties posed by these crises are now bolstering the global motivation to address these acute challenges by adopting a transition from linear value chains to closed loop/circular value chains. India needs to reduce its dependency on raw materials from overseas nations while conserving its domestic resources by adopting circularity and laying greater emphasis on resource efficiency as well as product life extension to boost the End-of-Life utilization of products to achieve the net zero goal by 2070.

Indian businesses are fast realizing the benefits of circular economy but absence of standardized framework for measurement is hindering the reflection on the environmental and financial impact of their ambitions and advancements on circular economy. This, in turn, is deterring it from being justifiably incorporated into its core business priorities and scaled business models. Being the representative of Indian industry and commerce, FICCI strives to address this challenge. The Circular Economy Symposium 2022 represents our efforts to measure India's progress in the circular economy transition.

This joint study by FICCI and Accenture Strategy showcases the current maturity of Indian businesses on circular economy measurement, assesses the existing global frameworks and proposes a new sector agnostic circular measurement framework which satisfies global standards while also catering to Indian regulatory and business context. The study also provides sector-specific guidelines and appeals for focus on national level strategic raw materials data aggregation to secure the country's interest.

We take this opportunity to thank all the organizations that have contributed to this critical study. We are certain that their expertise and contributions, reflecting in this study, will guide India through this essential transformation and catalyze creation of a large-scale impact in the foreseeable future.

Arun Chawla
DG, FICCI

PREFACE FROM ACCENTURE



Sanjay Dawar
Managing Director
Accenture Consulting,
Strategy and Sustainability



Sundeep Singh
Managing Director
Accenture Consulting,
Strategy and Sustainability



Vishvesh Prabhakar
Managing Director
Accenture Consulting,
Strategy and Sustainability

The Indian economy today is at an interesting stage of its growth journey. On one hand, we need to sustain the economic growth to continue our progress towards becoming a \$5 tn economy. On the other hand, it is important to address the risks emanating from a rapidly evolving global business environment - one that is characterized by challenges such as geo-political tensions, energy crisis, commodity price inflation, climate change, amongst several others. In this context, our vision of Atmanirbhar Bharat is critical to achieve sustained growth.

With just 2% of the world's total landmass and 4% of freshwater resources, it is important for us to decouple growth from resource consumption. This is where transition to circular business models is of paramount importance for our economy. The past studies by FICCI and Accenture have established that there is an estimated \$500 bn worth of value at risk (by 2030) in India that can be protected through circular models. Research studies also indicate that circular economy has the potential to address 20% of the total emissions. There are already diverse efforts underway to unlock this value. However, the key question remains - how do we monitor and track progress on transition to circular economy in India?

There are multiple existing frameworks and approaches to measure the extent of circular transition. However, these frameworks do not fully align with the specific needs and nuances in the Indian context - for instance, the role of MSME sector, the contribution of informal sector, the linkage to jobs creation potential, sector specific guidance, amongst others. A recent survey conducted by FICCI and Accenture indicates that 65% of corporates cite lack of industry-specific guidelines as the primary challenge towards measuring circular economy performance.

We would like to thank all the participating organizations for their contribution in making this report a starting point in measuring India's circular economy transition. This report outlines the key design principles based on an extensive research of the existing frameworks and inputs from business leaders in India. We are confident that this framework will enable India Inc. to streamline its efforts towards transition to circular and pave way for us to achieve our vision of Atmanirbhar Bharat while also making a positive impact on the environment and communities.

Executive Summary

Measuring progress of circular economy adoption is crucial for India to ensure an accelerated yet orderly transition over the coming years. Businesses will play a key role in this measurement process through standardized reporting of performance within their own and extended supply chains. This report seeks to assess the current maturity of circular economy measurement frameworks and outline key design principles for policy makers and businesses to shape a robust measurement framework for India. Here are the five key findings of the report.

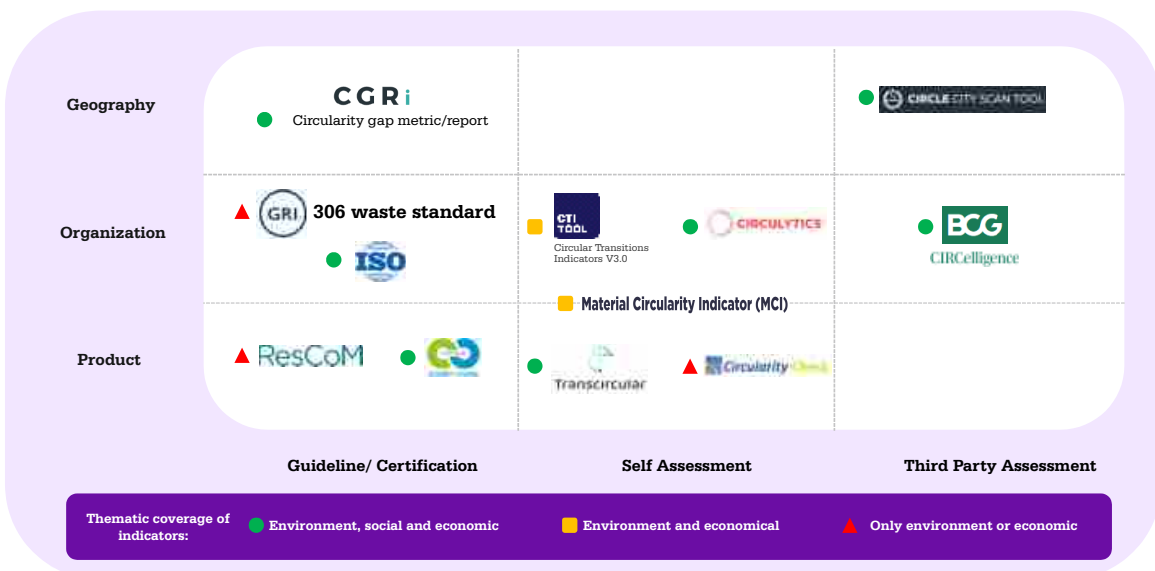
Finding 1 A consensus is emerging among large corporates that measuring circularity and disclosing progress is critical.

Approximately 50% of the companies surveyed are aware of at least three or more standards or assessment frameworks. Moreover, 60% of the companies surveyed are planning to report under any available circular economy measurement frameworks in the next one year. Our survey indicates that the top three key business drivers behind private sector’s interest in measurement approaches are:



Finding 2 More than 10 off-the-shelf measurement solutions are available. However, there are challenges with their applicability in the Indian context.

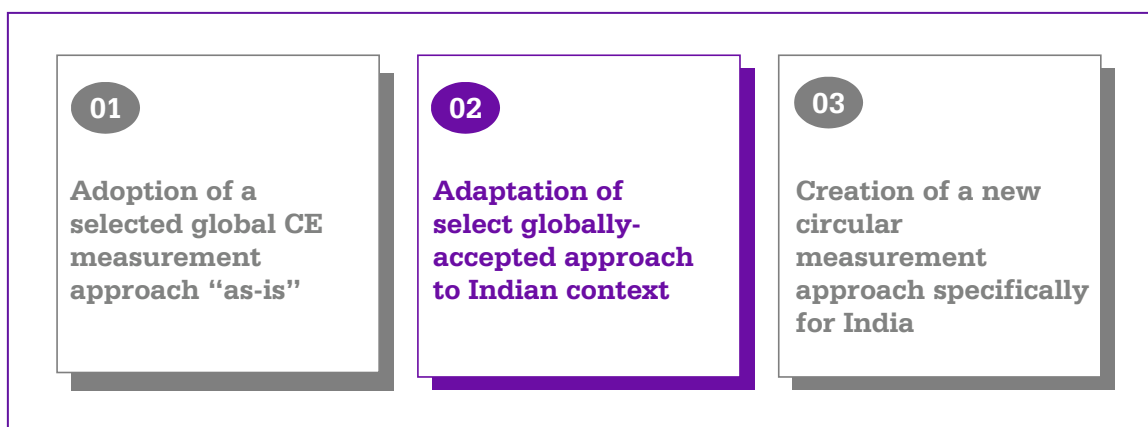
Solutions already exist across various scope boundaries and differ in nature in terms of being a standard or a guideline vis-à-vis an assessment tool.



While there are multiple existing circular economy measurement frameworks, there are certain gaps which need to be addressed to shape a measurement framework fit for Indian context. These include - a) missing linkage with existing regulatory requirements (e.g., SEBI's BRSR, EWM 2016, PWM 2016, BWMR 2022), b) lack of local contextualization such as applicability for MSME, coverage of green job creation in informal sector, c) complex data requirements, d) lack of sectoral guidance, and e) lack of direct linkage with business imperatives.

Finding 3 India should chart a path where it takes leadership on business-level circular measurement, yet is harmonized with global standards and frameworks.

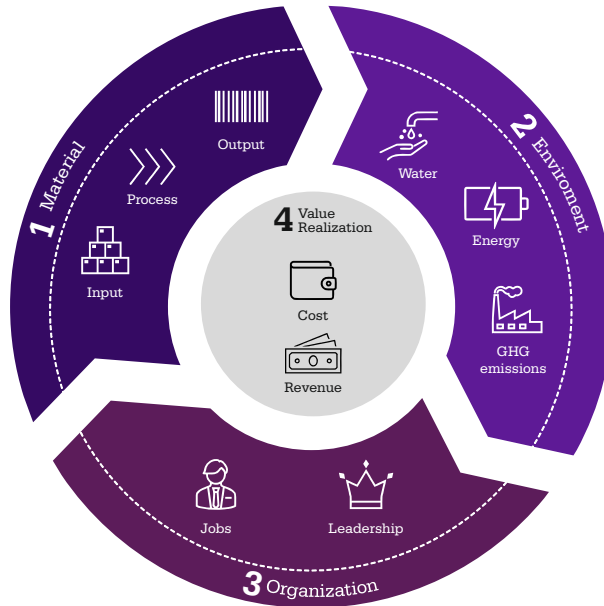
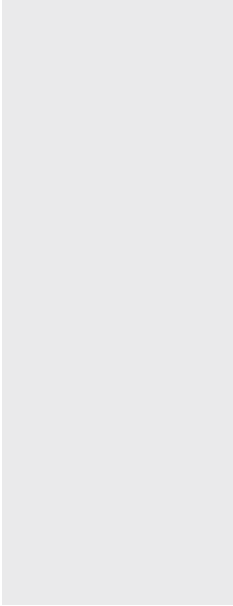
We have three options moving forward. On one side of the spectrum, Indian businesses can adopt one of the existing assessment frameworks that are emerging as the leading approaches globally, despite the challenges described above. On the other side, Indian policymakers and businesses can develop an entirely unique approach for Indian context. We propose a middle path, wherein India adopts an approach which is harmonized with globally accepted approach but with enhancements specific to the Indian context.



Finding 4 We propose three design principles which should underpin the development of a circular economy measurement framework for India.

01
Harmonize with global foundational framework, and enhance for Indian context

- Based on analysis of globally accepted foundational frameworks (namely, CTI and Circulytics), the report identifies **18 KPIs** which form the core and support harmonization.
- However, there were still missing elements such as linkage with regulations, disconnect with business strategy and lack of coverage of social benefits. Therefore, the report proposes to enhance the core by adding **10 additional KPIs**.
- As the final output, report proposes a framework with **28 KPIs** classified across four categories (Material, Environment, Organization, and Value Realization) and eight sub-categories.



02
Provide sector-specific guidelines that supplement the sector-agnostic framework

- The second design principle recommends translating the overarching framework into sector-specific guidelines. Based on an analysis of raw materials, consumers, by-products, and waste streams in three sectors (Steel, FMCG and Automobiles), the report has created a sector-specific list of KPIs.
- To assess the ease of implementation, the report evaluates the existing public disclosures of the top five companies (by market cap) in each sector to assess their readiness to adopt the proposed framework.

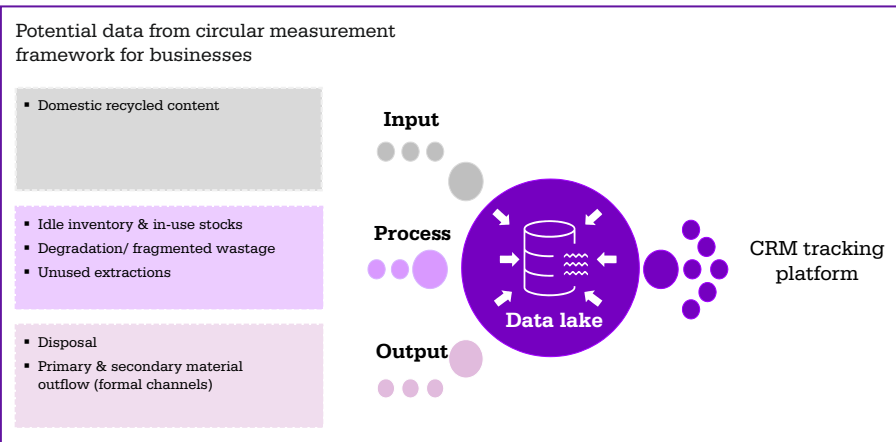
Sub-category	Steel	Automotive	FMCG
1. MATERIAL			
Input	High maturity	High maturity	High maturity
Process	Medium maturity	High maturity	High maturity
Output	High maturity	High maturity	High maturity
2. ENVIRONMENT			
Water	High maturity	High maturity	High maturity
Energy	High maturity	High maturity	High maturity
GHG	Medium maturity	High maturity	High maturity
3. ORGANIZATION			
Leadership	High maturity	High maturity	High maturity
Employment	High maturity	High maturity	High maturity
4. VALUE REALIZATION			
Cost	High maturity	High maturity	High maturity
Revenue	High maturity	High maturity	High maturity
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #2e8b57; margin-right: 5px;"></div> High maturity (3 or more KPIs in the sub-category widely reported) </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #90ee90; margin-right: 5px;"></div> Medium maturity (1-3 KPIs in the sub-category widely reported) </div> <div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #d9ead3; margin-right: 5px;"></div> Low maturity (No KPIs in the sub-category reported) </div>			
<small>Note: Detailed analysis for the three sectors available in appendix</small>			

- While the readiness of companies is high on sub-categories such as output (i.e., end-of-life materials), input (i.e., raw materials), water and energy, there are opportunities to strengthen reporting on more nuanced metrics (such as the ones related to value realization and organization).

03

Enable aggregation at sectoral-level and critical raw material-level

- Developing a methodology to track performance on critical raw materials (CRM) is key to achieving Atmanirbhar Bharat ambition.
- The disclosures on 28 proposed KPIs should be leveraged as an input into India's CRM tracking mechanism and also develop a sectoral view of circular transition in India year-on-year.



Finding 5 A three-pronged public-private joint action can help carve out an efficient CE measurement approach for India.



Evolve a circular economy measurement framework with an overarching industry-agnostic framework, list of indicators and scoring methodology.



Develop sector-level guidelines and action plan to provide an approach to companies which is customized to their sector's context.



Mobilize early adopters such as leading players across each priority sector and scale-up adoption.

The scope of this report is not to present a definitive point-of-view but rather provide a tool which can be used by policymakers and industry members to have deeper consultations. We believe that the design principles laid out here and the analysis performed would support a fact-based discussion in coming years.

01

Need to measure
circular economy



Need to measure circular economy

Benefits of circular economy for businesses range from strategic competitiveness to increasing resilience

Globally, circular economy transition presents a ~\$4.5 tn in value potential by 2030 and ~\$25 tn by 2050. Industries globally can unlock¹ -

- **\$500 bn value through cost reduction**, through initiatives such as designing lean products, sourcing circular materials, improving the forecasting methods to produce efficiently and reduce the unsold stock.
- **\$400 bn through value migration** between industry players or from one product/service to another like use of refurbished markets for fashion or automotive markets.
- **\$100 bn through additional revenue sources** such as premium pricing, brand differentiation and gaining market share.

India has the potential to capture 11% of this global value (Figure 1) i.e., half-a-trillion dollars by 2030.² This value can be tapped through value drivers such as revenue increase, cost reduction, increase in brand value and risk management.

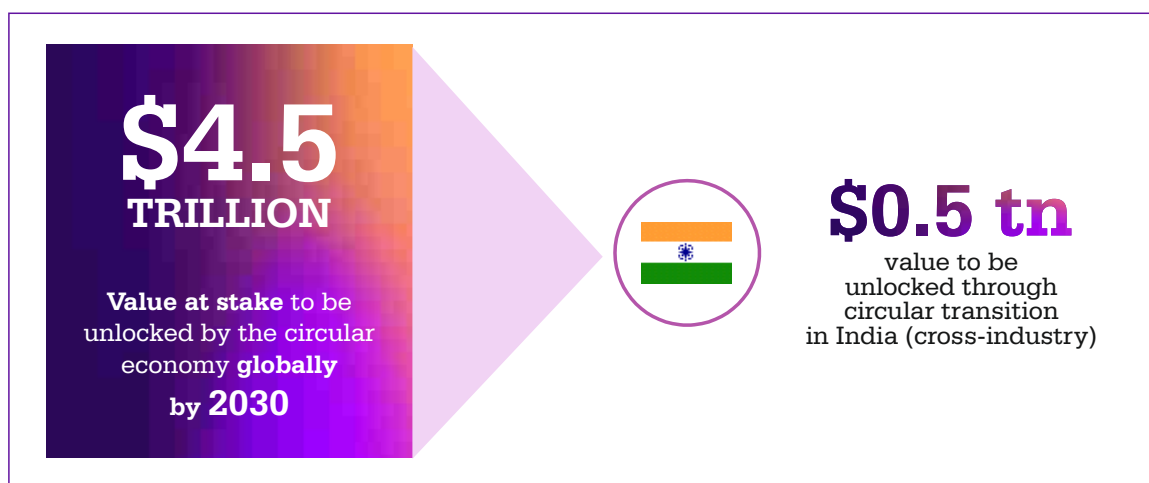


Figure 1: Circular economy opportunity in India

Business value manifests itself in the form of revenue increase (growth in volume, price premiums or launching of new products and services), and cost reduction (reduction in CAPEX and OPEX, and process efficiency). Beyond the business value, there are multiple intangible value creation opportunities that may be achieved through brand enhancement and risk reduction (Figure 2).

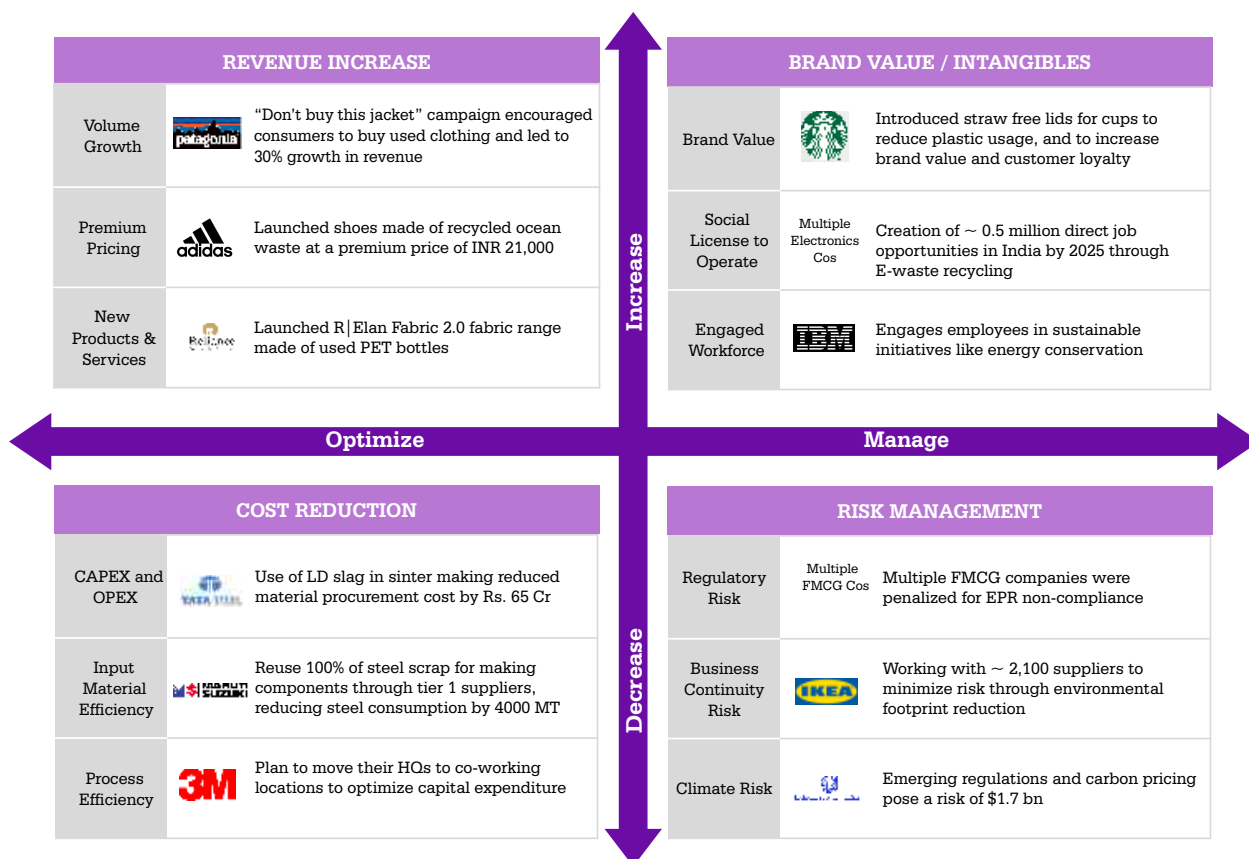


Figure 2: Business value from CE models³

There are also significant co-benefits for environment and society

While increase in economic value is a well understood benefit of circular economy, the social and environmental benefits are underestimated. It is estimated that circular economy has the potential to reduce 44% of total GHG emissions.⁴ As India currently contributes to 6.9% of global CO₂ emissions⁵ which is expected to further increase if a linear economy is followed, any possibility of significant GHG emission reduction is a major environmental benefit. Environmental benefits are also derived from effective waste management and resource efficiency, including decarbonization. As India's resource requirements are projected to reach ~15 bn tons by 2030 and ~25 bn tons by 2050⁶, it becomes important to decouple economic growth with resource consumption by leveraging on principles of circular economy.

In terms of social benefits, circular economy contributes significantly to employment generation through creation of green jobs. These green jobs are created in two ways a) formalization of informal sector leading to better work conditions and higher pay, and b) introduction of innovative business models creating space for newer jobs. For instance, waste management and services sector would grow by 45 and 50 mn jobs, respectively.⁷

India has shown visible progress on circular economy-related reporting and disclosures across public and private sectors

Public sector: Regulatory landscape and government initiatives

The government has introduced various regulations related to circular economy in recent years. These regulations focus on the following listed themes:

- 1 **Ensure end-of-life management:** Plastic Waste Management (PWM) 2022, E-Waste Management (EWM) 2022, Battery Waste Management Rules (BWMR) 2022 have mandated extended producer responsibility;
- 2 **Improve design to increase recyclability:** increase in minimum thickness of plastic bags, reusable packaging models (PWM 2022), inclusion of electronics refurbishment under EWM 2022;
- 3 **Use low emission production alternatives:** encouraging use of electric arc furnace, co-firing of coal power plants with bio-pellets, use of flexible plastics in co-processing, and similar low emission alternatives;
- 4 **Create secondary material demand through minimum recycled content targets:** construction and demolition waste utilization and recycled content targets as per Construction and Demolition Waste Management Rules (CDWMR) 2016, recycled content targets based on total dry weight of a battery as per BWMR 2022.

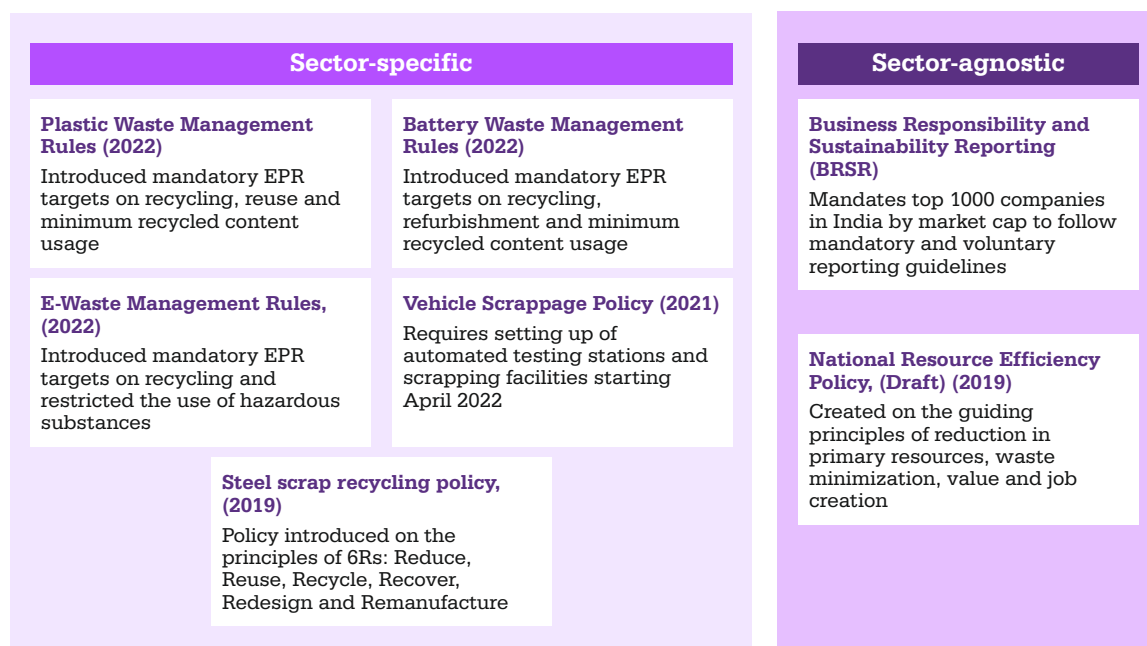
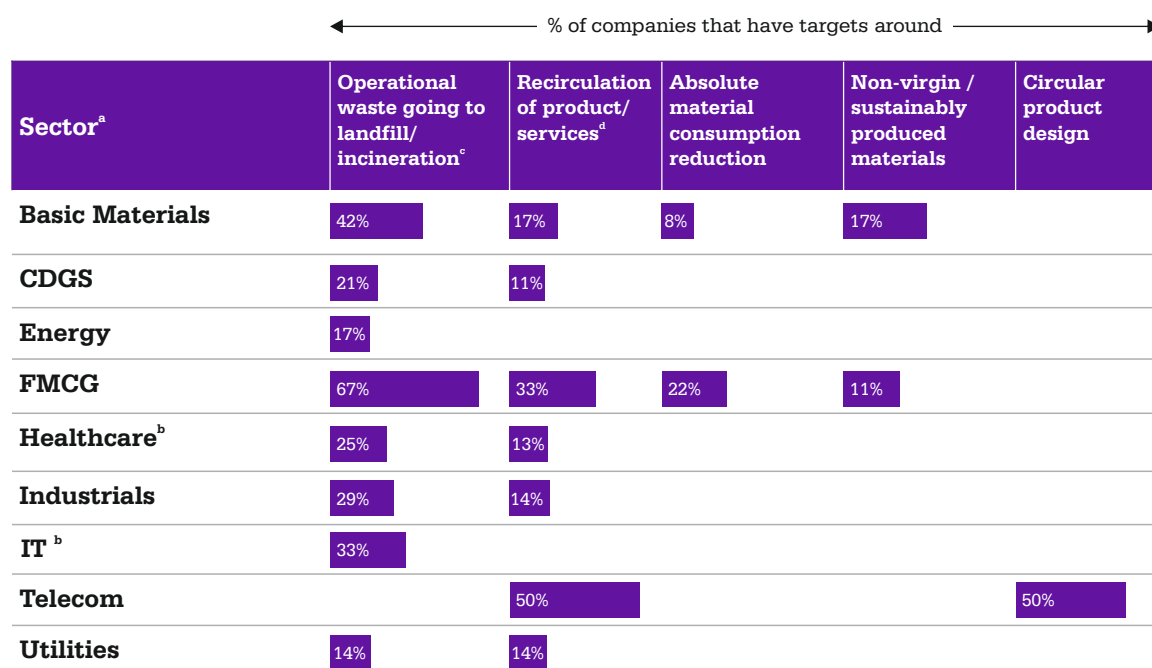


Figure 3: Recently introduced policies and regulations on CE⁸⁹

Private Sector: Business initiatives and circularity commitments

Our research conducted in 2021 shows that 97% of the leaders from leading 100 Indian companies understand the importance of linking sustainability performance to financial performance.¹⁰ The majority of companies have adopted sustainability initiatives around water conservation, net zero, renewable energy but only 27% disclosed their circular economy related targets. FMCG sector leads with 67% companies reporting targets in operational waste to landfill / incineration. 33% companies are committed to product / services recirculation, 22% companies have absolute consumption reduction goals, only 11% are committed to using non-virgin / sustainably produced materials (Figure 4).

Of the top 100 companies by market capitalization, only 27 companies have disclosed circular economy related targets, only 3 companies have disclosed targets on absolute material consumption reduction



Notes:

- a Finance and Diversified sectors have been excluded as there are no companies that have relevant circular economy targets.
- b Finance, Healthcare and Information technology are considered to have a low circular economy impact.
- c Operational waste excludes post consumer wastage.
- d Recirculation occurs through remanufacture, reuse, recycle, refurbishment, etc.
- e CDGS - Consumer Discretionary Goods & Services; FMCG - Fast Moving Consumer Goods; IT - Information Technology

Figure 4: Number and types of circular targets disclosed - classification by sector (2021 data)

There is no agreed upon way to measure the progress yet and risks of not measuring circular economy are high

In the absence of a unified measurement framework, the impact of government regulations and private sector initiatives cannot be measured, therefore, making it difficult to evaluate the impact of these actions. In addition, different sectors have taken diverse approaches, resulting in sectoral silos, fragmented and non-comparable ESG disclosures and potential greenwashing. As a starting point, ESG reporting and GHG accounting can offer insights into the maturity cycle of standardization.

- **ESG reporting:** Initially introduced in a fragmented manner, ESG reporting has been standardized through a toolkit of frameworks and guidelines such as GRI, MSCI and SASB etc. Moving forward, a new International Sustainability Standards Board (ISSB) is being developed, targeting the convergence of diverse standards
- **Carbon reporting:** While it took 20 years of development, GHG Protocol has been used by 92% of Fortune 500 companies while responding to the Climate Disclosure Project (CDP).¹¹ Similarly, Science Based Targets Initiative (SBTi) has set up a net-zero standard which provides guidance and tools required by companies to set their net-zero targets.

Therefore, the business case for creation of a unified circular economy measurement framework that enables standardized reporting and benchmarking is strong.



02

Available options and challenges to measure circular economy



Available options and challenges to measure circular economy

Over 10 well-known standards and assessment frameworks exist to measure circularity

We have conducted an analysis of more than 10 circular economy guidelines, certifications, self, and 3rd party assessments (Figure 5) across product, organization, and geographic levels.

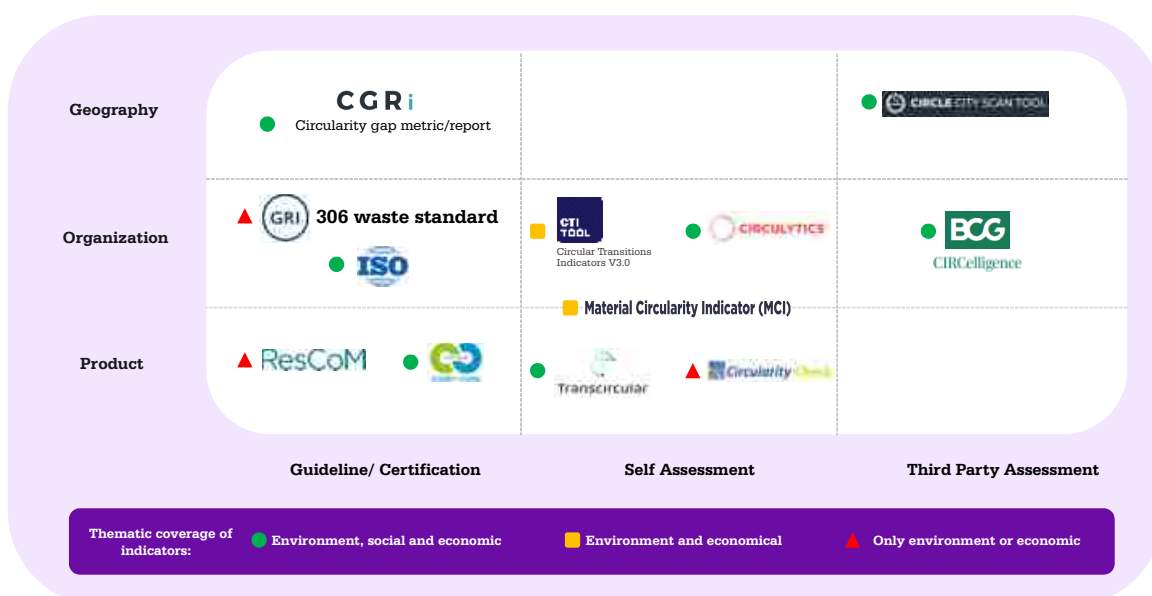


Figure 5: Analysis of circular economy measurement approaches

- **Geographic level:** There are tools such as Circularity Gap Metrics and Circle City Scan Tool which assist decision makers in calculating circularity at the regional level or at sectoral level.
- **Organizational level:** Tools such as GRI 306, Circular Transition Indicator (CTI), Circulytics and Circelligence are widely used across businesses. ISO has also recently established a technical committee on circular economy to support standardization through developed¹² frameworks, guidance, supporting tools and requirements.
- **Product level:** The Material Circularity Indicator (MCI) tool provides product level assessment, and once available at an organization level, can be used for CTI.¹³

These individual frameworks complement each other to some degree in certain cases. For self-assessment, CTI and Circulytics are the most widely leveraged frameworks for companies. To understand current awareness and reporting level of measurement in India, we conducted a survey with 25+ sector-wide corporates. GRI 306 waste standard is the most widely known circular economy measurement framework amongst Indian companies with 80% awareness amongst respondents. More than 50% of respondents are aware of other frameworks such as Cradle to Cradle Certified, Circulytics and CTI.

Companies demonstrate ambition to measure and report their progress on circular economy



Figure 6: Percentage of organizations planning to report on circular economy targets

The readiness of the businesses is evident as 60% of the survey respondents are planning to report under any available circular economy measurement frameworks in the next one year. Most companies plan to report under GRI, followed by CTI.

We also tried to demystify the underlying business drivers (Figure 7). The most prominent driver is the investor recognition & expectation as there is increasing pressure from investors to take concrete actions on sustainability, and on circular economy. The second most crucial driver is the risk reduction associated with resource availability through circularity measures such as reuse and recycling of raw materials.



Figure 7: Key drivers for businesses to measure circularity

Despite multiple existing frameworks, there is no winning approach yet

Our evaluation of circularity frameworks for businesses resulted in four potential solutions: GRI 306 waste standards, CTI, Circulytics and Circelligence. GRI 306 waste standards guide organization on waste disclosure methodology but do not provide any assessment score. Among the remaining tools, CTI comprises of more extensive list of quantitative metrics, while Circulytics and Circelligence integrate qualitative aspects as well. Though Circelligence is a hybrid tool capable of measuring circularity, it is a tool developed by a private organization with potentially limited accessibility. Therefore, we evaluated (Figure 8) the remaining two tools, Circulytics and CTI, which are the most widely used assessment tools presently.

Analysis of key circular economy assessment frameworks	
Circularity Transition Indicators 3.0	Circulytics
<ul style="list-style-type: none"> Provides a quantitative measure of circularity and the ability to track over time Serves as a benchmark of other data model and circularity calculations Provides examples of KPI definitions with open-source formulae Sector-specific customization or guidelines not available, hence leaving little room for tailoring Direct benchmark against the sector/ industry not available, limiting the scope of measurement tracking to an individual business level 	<ul style="list-style-type: none"> Provides a quantitative measure of circularity and the ability to track over time Captures qualitative aspects related to the activities towards circular economy Facilitates direct benchmark to other companies from the same sector Data submission via questionnaire does not provide an accurate calculation of certain KPIs Obtaining the weighted coefficients to tailor each individual company is an iterative process and vulnerable to bias

Note: Analysis is based on interpretation of existing frameworks using publicly available information

Figure 8: Comparative analysis of CTI and Circulytics

The comparison also highlights that CTI tracks 11 indicators focusing on material and resource efficiency¹⁴, whereas Circulytics tracks around 37 indicators to reveal the level of circularity achieved by the organization across its operations.¹⁵

There are challenges related to applicability of existing frameworks in the Indian context

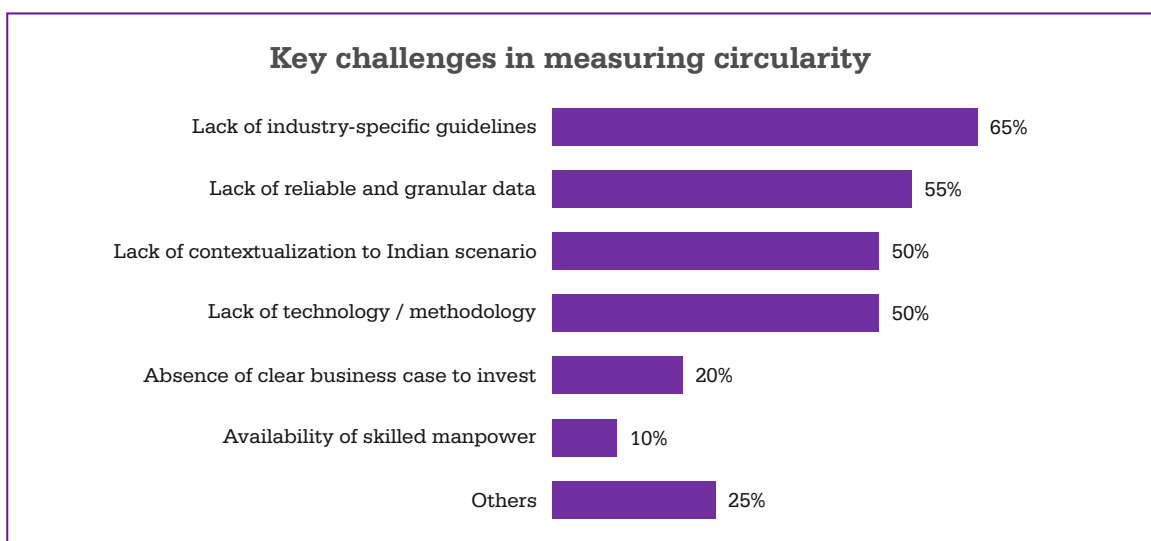


Figure 9: Key challenges faced by industries in measuring circular economy

Survey results highlight lack of industry specific guidelines, lack of reliable data and lack of contextualization to Indian scenario as the major challenges (Figure 9) experienced by the Indian businesses in measuring circularity. Additionally, the presence and role of informal sector in India poses socio-economic contextual challenges, that add to the complexity of measuring circular economy in India. The informal sector manages end-of-life products such as plastics, electronic waste, batteries waste and other solid waste streams, and many large business operations have high dependency on the sector for its waste management and sourcing requirements.

Despite challenges, there is progress on measuring circular economy albeit in a fragmented way, and more tilted towards downstream operations

The regulatory landscape in India has made considerable progress in nudging businesses to take first steps in their circular economy journey. NITI Aayog has formulated 11 committees focusing on 11 end-of-life products, recyclables, materials and wastes to expedite the transition from linear to circular economy.¹⁶ Though regulations require businesses to track, report and improve their circular performance, they emphasize more on the downstream waste management (Figure 10). On the other hand, there are examples such as European Union which has introduced a slew of policies and regulations focusing on design and manufacturing-level KPIs with regulations such as eco-design directive, plastic tax, and reparability index.

Business Responsibility and Sustainability Report	National Resource Efficiency Policy	Extended Producer Responsibility (Plastics, e-waste and batteries)
<ul style="list-style-type: none"> Recycled or reused input material to total material Reclaimed products and their packaging materials Products and packaging reclaimed at EoL Waste recovered through recycling, reusing or other recovery options R&D and CAPEX Investment to improve ESG Energy intensity per rupee of turnover Water withdrawal by source Total water consumption Water intensity per rupee turnover Emissions (Scope 1 & 2) per rupee turnover Scope 3 emissions per rupee of turnover Waste generated in metric tonnes per stream 	<ul style="list-style-type: none"> Resource productivity Domestic material consumption Domestic material extraction Direct material input Secondary raw materials recovered Sector-specific resource use Primary material use Secondary material use Waste to waster/air/soil Waste recycling efficiency Resource productivity Environmental Emissions/stressors relevant to the sector 	<ul style="list-style-type: none"> Extended Producer Responsibility target Recycling target by weight Minimum obligation to reuse packaging Refurbishment target Mandatory use of recycled content plastic/batteries Waste collected, segregated of concrete, soil and others

Figure 10: KPIs introduced through recent regulations and policies

There are three possible directions for Indian businesses

Given the plethora of existing frameworks, progress already made through regulations, and India's specific contextual requirements, there are potential measurement pathways (Figure 11).



Figure 11: Potential pathways for circular economy measurement framework for India

- **Adoption of a selected global circular economy measurement framework "as-is":** Explore the option of adopting the existing global circular economy measurement frameworks such as CTI and Circulytics without any modifications.
- **Enhancement of a selected global framework to Indian context:** Adapt the global framework to the Indian context by incorporating key enhancements such as including social-inclusion KPIs, linkage with business priorities, and India-specific adjustments.
- **Creation of a new circular measurement approach for India:** Create an entirely new measurement framework for India, which is not necessarily harmonized with globally emerging approaches.

The reports suggests that, moving forward, we should adopt the second pathway as it brings the best of globally available frameworks in a way that harmonization is possible, as well as ensures customization for India's unique local context. In the next chapter, the report delves into the implementation-level details for the proposed pathway.



03

Design principles
for the Indian
context

Design principles for the Indian context

To develop a circular economy measurement framework for India, we propose three design principles

- **First design principle:** Harmonize with the foundational global frameworks by identifying select KPIs from CTI and Circulytics (which form the core KPIs), and then supplement with regulatory, economic, and Indian context specific KPIs.
- **Second design principle:** Provide sector-specific inputs to customize the framework for three sectors: steel, automotive, and FMCG.
- **Third design principle:** Enable aggregation at sectoral and material levels. This can help drive a national initiative for the identification, measurement and dashboarding of critical raw materials.

Design Principle 1: Harmonize with global foundational frameworks

The core KPIs are inspired from the globally acknowledged circularity assessment frameworks. These metrics help in the fundamental assessment of a company's circular performance in terms of materials requirement and business processes. Supplementing the core are KPIs which establish linkage with (i) existing/anticipated regulations, (ii) Indian context, and (iii) business value (Figure 12).

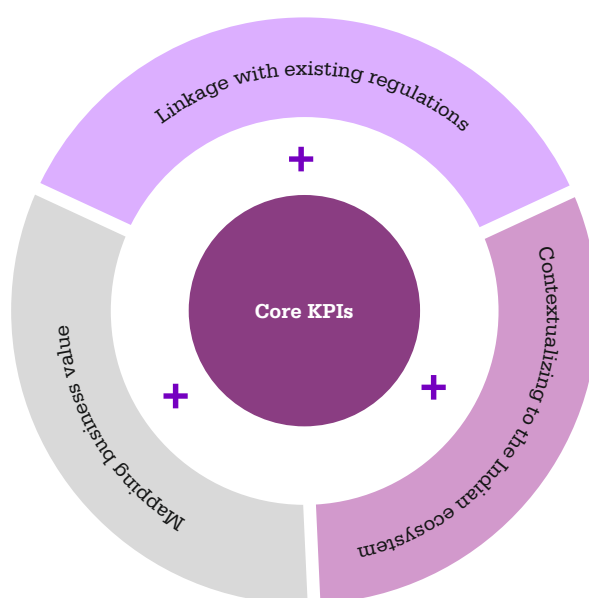


Figure 12: Foundational design basis for proposed circular economy measurement framework

Building the foundation: creating the list of core KPIs

We leverage CTI and Circulytics as the foundational frameworks for measuring circular economy progress for Indian businesses. The list of core KPIs (Figure 13) has been formulated by recognizing synergies and in addition we have included KPIs unique to the global frameworks.

Leveraging global frameworks to create core KPIs

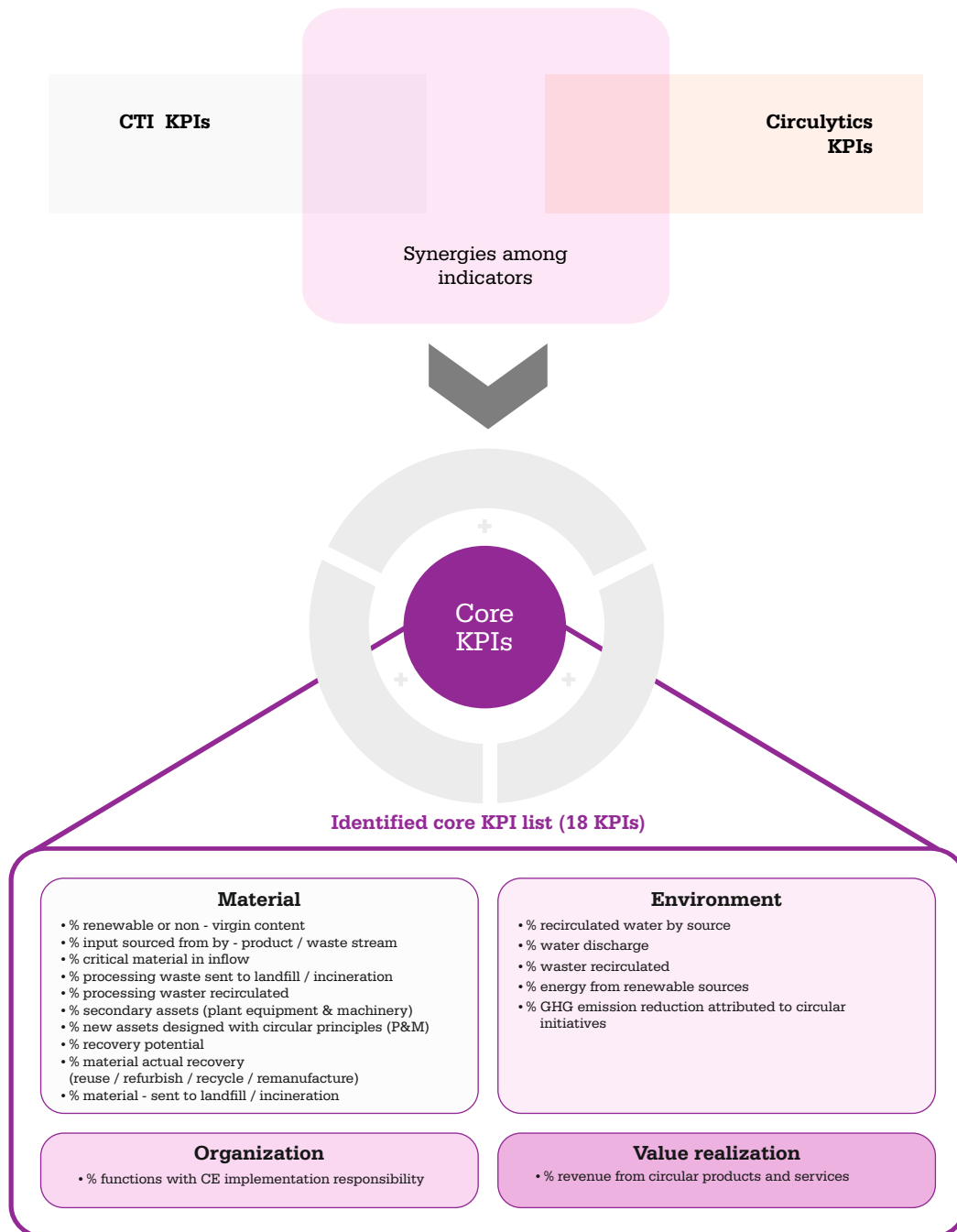


Figure 13: Approach to develop list of core KPIs

Enhancing the core list

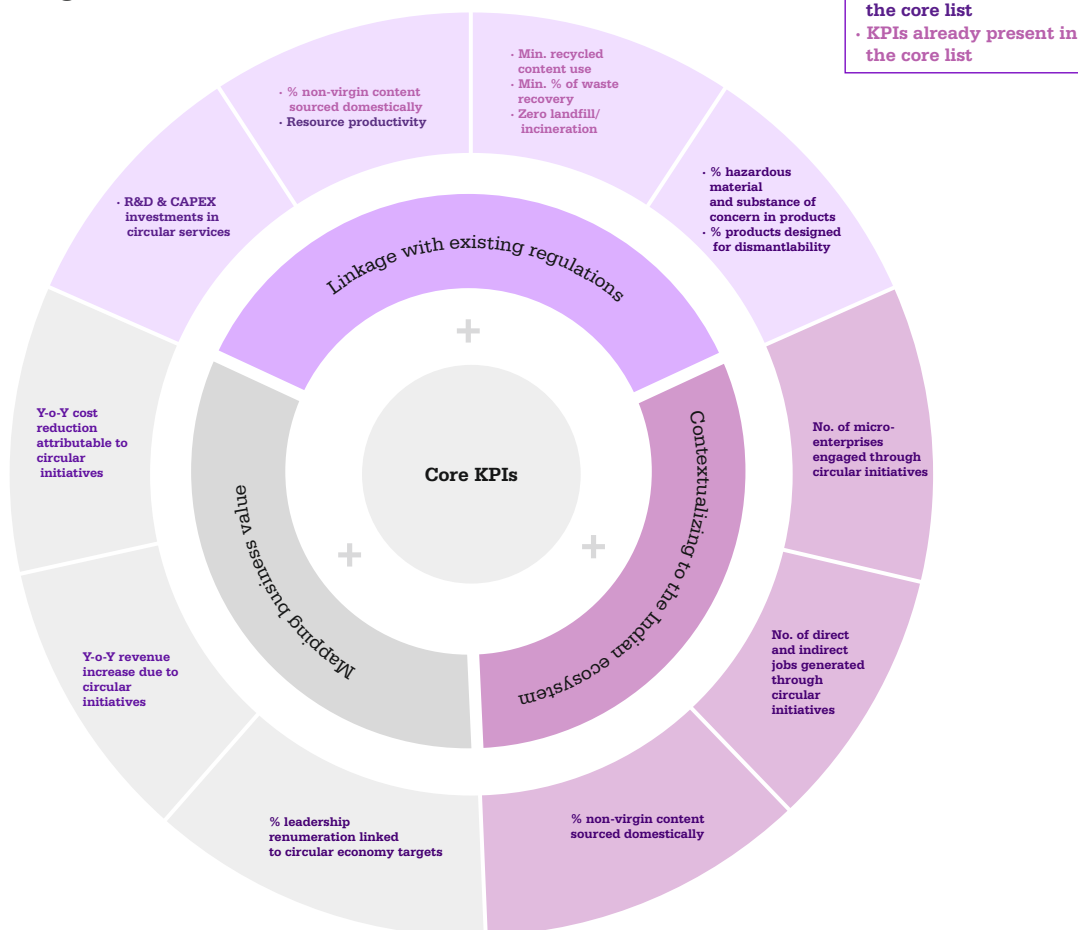


Figure 14: Accommodating existing and proposed regulations and policies

a. Linkage with existing regulations

The intent is to accommodate the existing/anticipated indicators introduced by regulatory authorities to measure the circular performance of businesses

- **Core overlapping KPIs:** Several indicators mandated by regulations are already covered in the core KPIs. For instance, minimum recycled content use, zero landfill/incineration and others are regulatory indicators have already been incorporated in the list of core KPIs.
- **Additional KPIs:** There are certain KPIs which are unique to regulations and should be included in the framework. For instance, BRSR requires companies to report on R&D and CAPEX investments made to improve environmental and social impacts of products and processes. This would also encompass investments made in circular initiatives.

b. Contextualizing to the Indian ecosystem

The global measurement frameworks are focused on business level and do not include indicators which could cater to combining development complexities with circular economy initiatives. For instance, certain sectors in India have dependency on import of raw materials. Steel industry, as an example, has high dependency (~7 mn tons) on steel scrap import to meet its production demands. The demand instead can be fulfilled through steel recycled by the informal sector (which collects ~25 mn tons).¹⁷ To track

circular economy for raw materials with import dependency, we have added KPIs such as percentage secondary raw material procured domestically.

Similarly, to track engagement with MSMEs we have introduced KPI - number of MSMEs engaged through circular initiatives. MSMEs are crucial to circular economy given their contribution to India's GDP (30% of Gross Value Added (GVA) to the GDP in 2019) and job creation potential (111 mn jobs created in 2015-16).¹⁸ Considering the potential role of circular economy in creating green jobs, we have included KPIs which measure number of jobs created through circular programs. This can provide impetus to move towards a formal economy with regulated jobs. For instance, in the PET plastic and recycling ecosystem, the employment footprint exceeds 7 million currently.¹⁹

c. Mapping business value

There is a significant value creation potential from circular initiatives. For instance, efficient use of raw materials such as iron ore and coal limestone can significantly reduce operational costs. Similarly, for FMCG industry, it could cover measures on utilization of virgin plastic, glass, and metals or for automotive industry it could include resource optimization for materials like paint, sheet metal, batteries, and rubber.

Proposed circular economy measurement framework

Combining the KPIs mapped from the three different dimensions (as described above), we have enlisted relevant KPIs across a synthesized list of four categories and underlying 'sub-categories' (Figure 15).

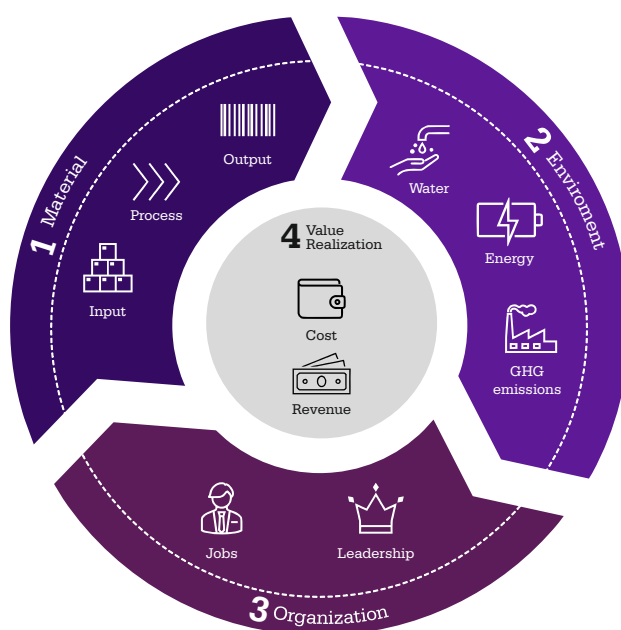


Figure 15: Proposed circular economy measurement framework

The proposed circular economy measurement framework comprises of 28 KPIs:

- There are 18 core KPIs and 10 enhancement KPIs
- The KPIs arising from the linkage with regulations are largely categorized under materials category
- Business value KPIs are captured under the value realization category
- The KPIs identified to cover for local Indian context are broadly categorized under the leadership and jobs sub-categories

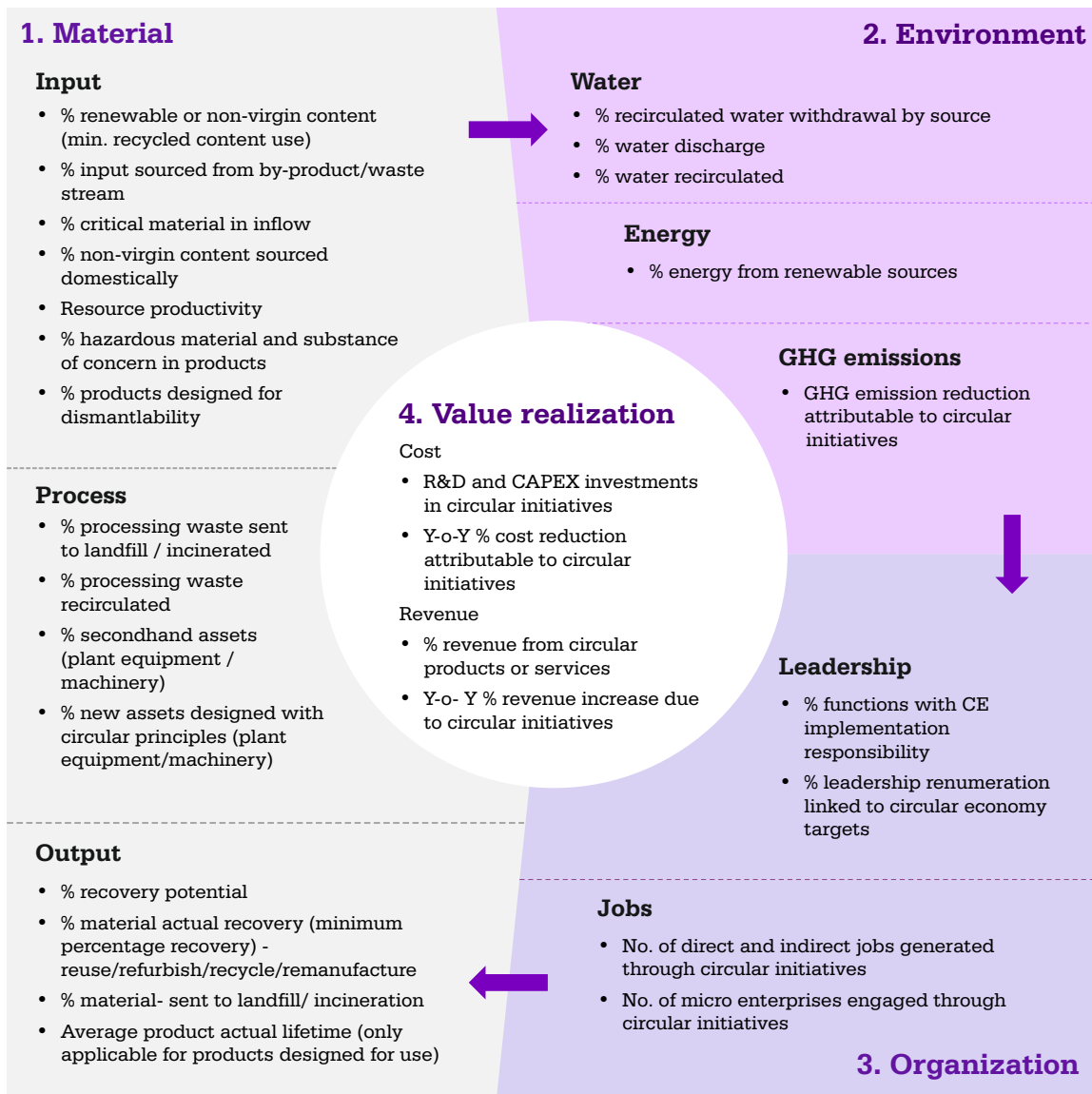


Figure 16: List of 28 KPIs as per the proposed circular measurement framework

There could be various assessment methodologies for the KPIs disclosed as part of the proposed circular economy measurement framework

To leverage the KPI framework for making decisions, it is important to design the assessment approach for the recommended framework. There are two possible approaches to utilize the assessment framework

- Single score for the company: Scoring a company's performance on the identified categories and coming up with a cumulative score for the whole company.
- Category-wise scores for the company: Instead of a single score, using category wise performance indicators to assess performance.

Design Principle 2: Provide sector-specific guidelines

At a high level, the framework entails sector-agnostic metrics to facilitate standardized reporting and benchmarking. However, there is a definite need to augment it with sector-specific guidelines.

In this section we dive deeper into three major sectors namely - steel, automotive, and FMCG sector to test the robustness of the proposed framework.

We conducted a reporting maturity assessment of the sectors' existing circular KPIs in business as-usual scenario to assess the ease of implementation and readiness to adopt the proposed framework. For this assessment, we mapped the KPIs of top 5 companies (by market cap) in each of the priority sectors available in existing public disclosures with the KPIs proposed in the circular economy measurement framework. A high maturity level means that 3 or more companies in the sector are reporting on the specific KPI, whereas a low maturity level indicates no traction of the specific KPI among the leading players.

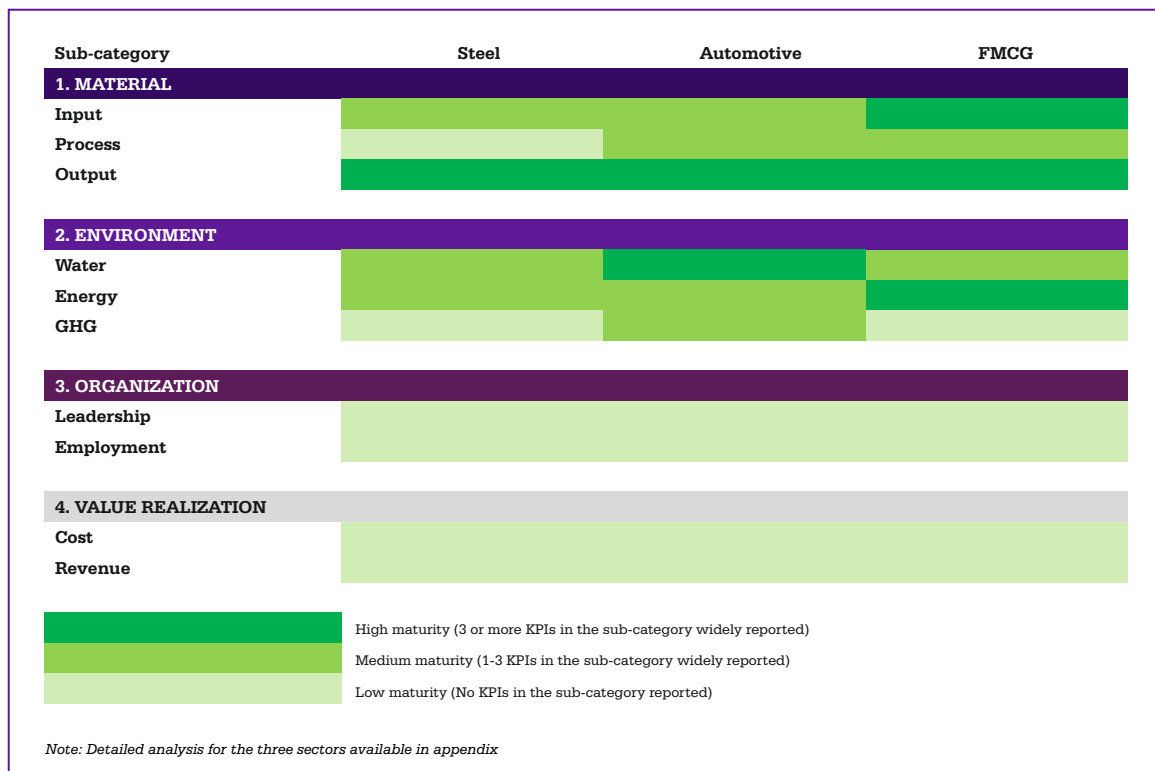


Figure 17: Sector-wise circular measurement maturity assessment results



Steel Sector

The Indian companies under consideration are reporting on 12 KPIs (8 high maturity & 4 low maturity), while remaining 16 KPIs are currently not tracked or publicly disclosed.

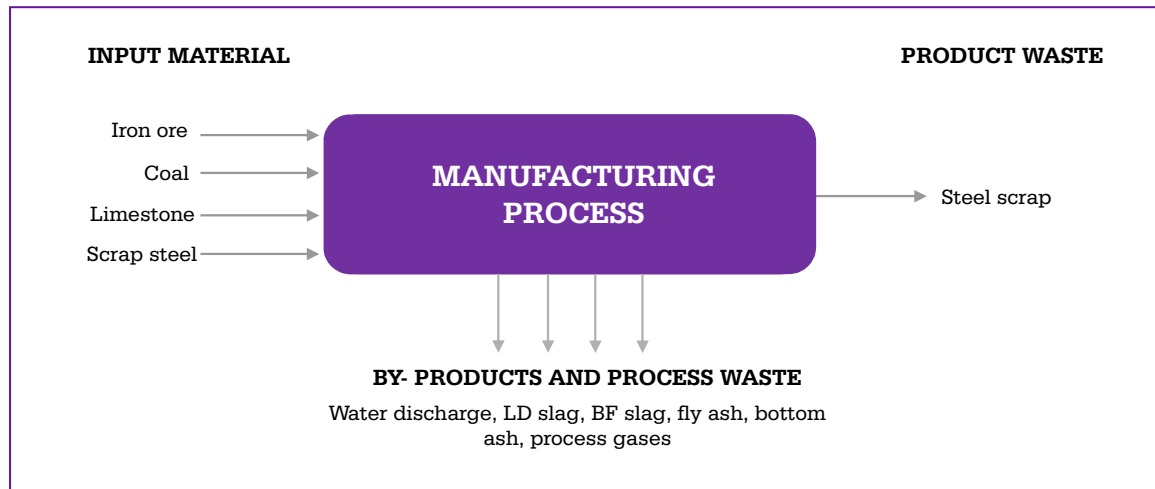
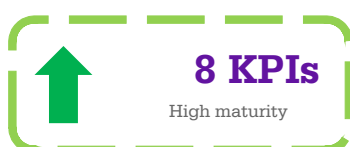


Figure 18: Steel sector input-output matrix

The major waste in steel sector is steel scrap which is 100% recyclable. Increasing the share of steel production through Electric Arc Furnace (EAF) process can considerably reduce the consumption of raw materials like coal, limestone, and iron ore by over 60%.²⁰ The sector has been actively focusing on circularizing material flow, with multiple existing performance indicators to measure alternate usage of its by-products like Linz-Donawitz (LD) slag, Blast Furnace (BF) slag, fly ash, bottom ash and has also set up targets for the same (e.g., Tata Steel has created sub-brands like Tata Aggreto and Tata Nirman for selling its LD slag for construction industry²¹). Yet, in our assessment we found that there are a few categories in which the sector does not have sufficient measurement and reporting focus. Based on these observations, we have identified the following sector specific guidelines / best practices:

- Disclose the utilization of by-products like LD slag, BF slag, fly ash, bottom ash and more
- Disclose the reduction in raw material consumption due to increasing EAF adoption
- Report the revenues derived through alternate use of by-products
- Report the energy savings obtained through waste heat recovery
- Quantify and disclose informal sector integration and organizational circular alignment initiative impacts



Automotive sector

The sector is currently reporting on 16 KPIs (12 high maturity & 4 low maturity), while the remaining 16 KPIs are currently not tracked or publicly disclosed.

In the automotive sector, the major material flows required are steel, aluminium, plastic, glass, rubber, non-ferrous alloys, special fibres, paint and lubricants. Businesses in the sector are taking proactive actions to measure circular indicators, with the new vehicle scrappage policy providing further impetus. Some of the leading examples of circular measurement in this sector include:

- Tata Motors measures the amount of recycled inputs in their vehicles²²
- Mahindra & Mahindra reports the recycling rate of its products like Scorpio and XUV²³
- Toyota discloses the reuse, recycling, and recovery rate of its end of life vehicles (ELVs)²⁴

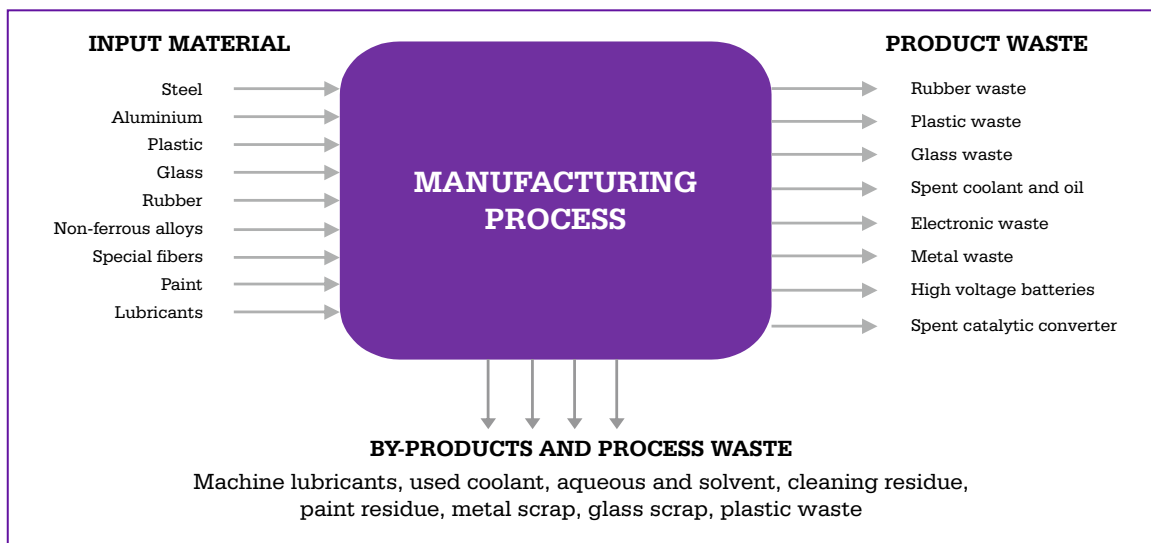


Figure 19: Automotive sector input-output matrix

Based on the metrics that are currently not tracked, there could be opportunities for the sector to track engagement with micro-enterprises and drive integration of the unregulated post-use downstream value chain into the formal value chain. Additionally, following best practices could help companies improve their circular measurement and tracking:

- Provide the recycling rate of each vehicle model under production
- Report the volumes handled by the resource recycling and vehicle take-back business
- Disclose the renewable and recyclable packaging used
- Report the quantity of plastic collected & disposed through EPR
- Provide year-on-year increase in recycling and recovery of ELVs, spare parts, batteries, engines and plastic, electronic and composite components



FMCG Sector

There is evidence of low-to-high maturity measurement & tracking on 16 (of the 28 identified KPIs) for the FMCG sector in India.

The sector primarily relies on agricultural commodities, soda ash and chemicals which together constitute the product. The sector also has a heavy dependence on materials such as plastic, paper, glass, aluminium and steel for packaging. On the product side, companies have initiated sustainable measures to reduce their ecological footprint and to transition towards a circular product. For instance, Rallis India has innovated GeoGreen, a biofertilizer product made from wastes from sugar mills and distilleries.²⁵

Companies are also focusing on tracking, segregation, and collection of waste generation. For instance:

- P&G classifies its recycled metal inputs into post-consumer recycled & post-industrial recycled metal, augmenting traceability.²⁶
- Britannia discloses the amount of virgin plastic used in secondary packaging.²⁷

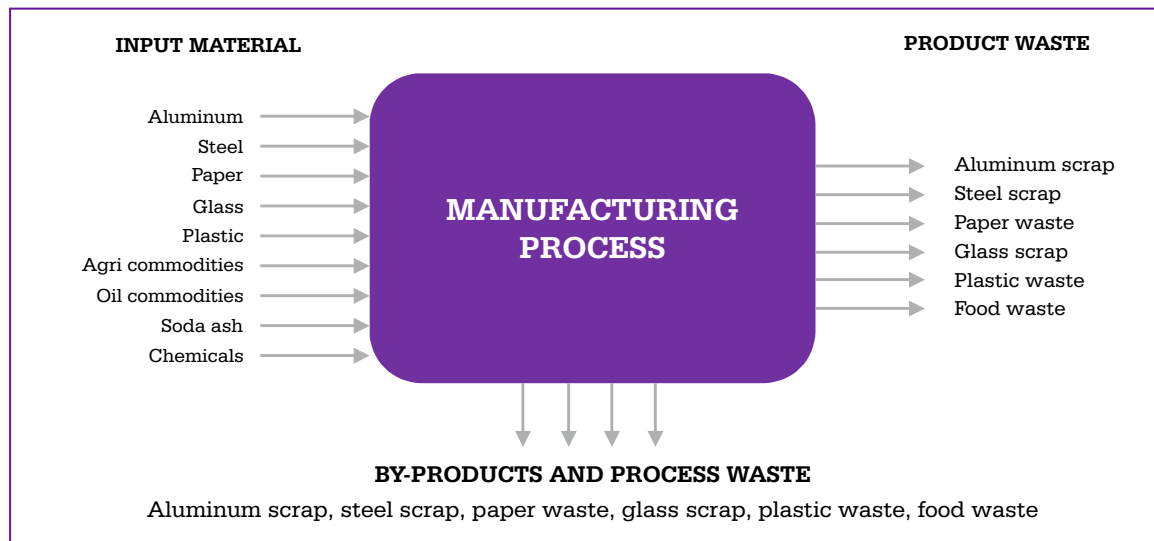


Figure 20: FMCG sector input-output matrix

From our assessment, it is evident that the FMCG sector has been converging on measuring upstream material input (through indicators such as percentage of recyclable & bio-based materials in their packaging) and waste input reduction (through design improvements and innovation-based indicators). The regulations are also mandating the companies to monitor and reduce their plastic footprint. The rapid shift in consumer demand for climate-conscious brands has also compelled companies to reduce their emissions and use renewable sources of energy.

Yet, there are opportunities to enhance circular economy tracking through metrics such as revenue growth from circular products. The sector has an opportunity to leverage following best practices:

- Track product-wise ecological and revenue impact to compare performance of circular products with linear products
- Mobilize investments in circular process improvement activities

- Report the reduction in virgin plastic in secondary packaging
- Provide an overall recycling rate
- Disclose the plastic consumption per ton of finished goods
- Track reduction in plastic usage because of reuse measures like refilling

Note: The sector-specific KPIs shown above are illustrative in nature and are not intended to be exhaustive at this stage. The objective is to use the analysis as a tool during the consultations and deliberations planned ahead.



Design Principle 3: Facilitate aggregation at sectoral and material level

Tracking performance of critical raw materials is urgently needed to build resilience

Critical raw materials (CRMs) are the mineral resources (both primary and processed) which are vital for manufacturing activities in an economy, and whose supplies may face disruption due to non-availability or risks of unaffordable price spikes.²⁸ India controls minimal known reserves of critical materials. For instance, India currently controls <6% rare earth (China controls 37%), <1% phosphates (Morocco controls 72%), zero known reserves of cobalt (DRC has over 50%), nickel (Australia and Brazil control roughly 40%), and lithium (Chile has over 43%). The access to CRMs is vital for the realization of Atmanirbhar Bharat vision, and fundamental for industrial growth and competitiveness. The accelerating tech innovation cycles coupled with ever increasing demand in emerging economies have led to an unprecedented rise in demand for these highly sought-after metals and minerals.

A recent study under Department of Science and Technology, Government of India by Council of Energy, Environment & Water (CEEW), made a pioneering attempt at computing the criticality index for 49 non-fuel minerals, including rare earth minerals.²⁹ The study identified 13 minerals that would become most critical by 2030, of which six were critical even in the reference year 2011.³⁰ Centre for Social and Economic Progress also issued a working paper which analyses the level of criticality for 23 select minerals and raw materials for Indian manufacturing sector. The findings are currently in research stage and no mineral has been officially notified as a critical raw material.

Lessons can be learnt from EU's approach of tracking critical raw materials

Access to Critical Raw Materials (CRM) is considered a strategic security question in EU as they transition to climate neutrality by reducing dependency on fossil fuels and increase dependence on clean technologies like solar and electric vehicles. To transition smoothly on this path, EU has created a list of CRMs which is reviewed every three years.

Some key measures taken by EU for critical material flow identification, data dashboarding and assessment are:

- a) Raw Materials Information System (European Commission's information gateway and knowledge service center).
- b) Criticality assessment methodology - uses a formula which takes into consideration supply risk assessment & economic importance of the material.³¹

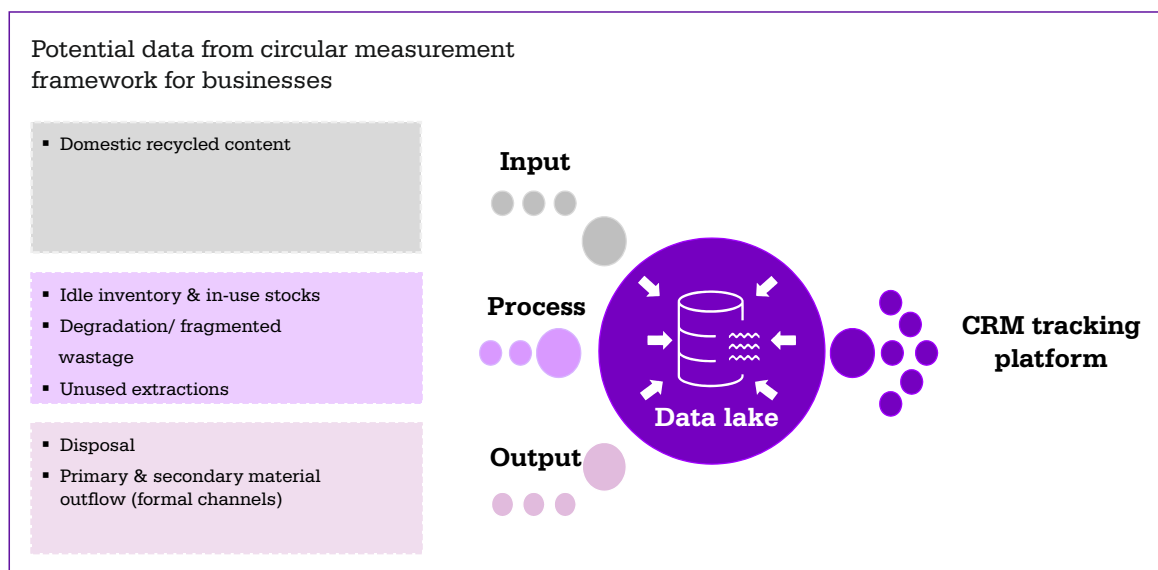


Figure 21: Illustrative country level input-output critical raw material flow chart

Policymakers should be able to analyze the disclosures made through circular economy measurement framework to develop aggregate view at sector level, to be able to compare the overall progress over the years.

In summary, the three design principles when applied alongside, the existing frameworks like CTI and Circulytics will serve the following purpose:

- Enable a holistic framework that encompasses business value imperatives, regulatory and emerging economy considerations.
- Provide direction to the sectors to adapt the proposed framework to their sector specific needs.
- Facilitate assimilation of data from corporate level to a national material level view to start building resiliency for SRMs.

While this initial position paper outlines the broad contours of the required CE measurement framework for India, it will undergo multiple rounds of deliberations and iterations in the next six months to shape the "ready-to-deploy" CE measurement framework for India Inc.

Call to action

Measuring circular economy progress is going to be a complex exercise for businesses. Some of the key imperatives are as follows:

- **Change the mindset:** Shift the narrative from status-quo focus on regulatory compliance and downstream waste management to overall value creation and raw material security to engage CXOs.
- **Create single source of truth:** Need to invest in digital technologies to streamline process of data collection and analytics to ensure data quality, granularity, and integrity, which is the backbone of any such measurement process.
- **Make studied approximations:** Lack of data availability in the initial stages is a barrier but not a showstopper. Logical approximations and estimations should be made to keep advancing, and incremental improvements can be made over the years.
- **Align on a sectoral taxonomy:** Alignment on an industry-wide accepted taxonomy (e.g., list of specific activities in a sector which advance circular economy goals) will be required to remove ambiguity and subjective interpretation.
- **Work with suppliers and buyers:** Onboarding upstream raw material suppliers, downstream waste management service providers, customers and other supply chain partners is key to institutionalizing collection of required data.

The proposed measurement framework is still at an early stage and will require continuous engagement with corporates, policy makers, academic institutions, other industrial sectors to evolve. Adoption and implementation of such a framework requires a systematic and well-thought roadmap - one that can only be designed and implemented through collaboration across diverse stakeholders. Concerted actions across three pillars can help fulfill this ambition.




FOCUS AREAS		
 Creation of a circular economy measurement framework	 Sector-level guidelines and action plan	 Mobilize early adopters and scale-up adoption
POTENTIAL MEASURES		
<ul style="list-style-type: none"> • Organize consultations with industry to improve the proposed framework • Develop consensus on list of industry-agnostic indicators, scoring methodology and weightages • Develop a national-level circular measurement approach on the back of company-level disclosures 	<ul style="list-style-type: none"> • Prioritize top 5-7 industrial sectors for pushing the adoption of the framework • Evaluate existing sector-specific circular economy measurement approaches • Develop sectoral guidelines in consultation with sector-specific industry associations 	<ul style="list-style-type: none"> • Encourage pilot-mode voluntary adoption by top 3 leading companies in each of the prioritized industrial sector • Revise the overarching framework and sector-specific guidelines based on feedback received • Support exchange of best practices among companies and organize an adoption campaign

Figure 22: Call to action for catalyzing circular economy measurement framework adoption

Acknowledgements

PROGRAM SPONSORS

Manish Singhal
Vishvesh Prabhakar

STUDY LEADS

Sundeeep Singh
Shruti Goel
Arpit Srivastava

ACCENTURE CONTRIBUTORS

Anurodh Sachdeva
Krishnan Naganathan
Sarthak Singh
Snehal Falak
Tushar Tulsian

FICCI CONTRIBUTORS

Mritunjay Kumar
Tanya Khanna

KEY CONTACTS

Sundeeep Singh
Managing Director, Accenture
sundeeep.singh@accenture.com
Mobile: +91-9818119794

Mritunjay Kumar
Additional Director, FICCI
mritunjay.kumar@ficci.com
Mobile: +91-9911164501

Appendix 1:

The authors would like to thank experts from the following companies for providing valuable insights.

- Aditya Birla Fashion Retail
- CMR Green Technologies Ltd.
- Dalmia Bharat Ltd.
- E-Parisaraa Pvt. Ltd.
- Epsilon Carbon Pvt. Ltd.
- First Solar
- GRP Ltd.
- Hindustan Coca-Cola Beverages
- Hindustan Unilever Ltd.
- JSW Steel
- Larsen Toubro Ltd.
- Luthra Group - LLP
- Mahindra Group
- SABIC
- Signify Innovations India Ltd.
- Tata Sons Pvt. Ltd.
- Tata Steel Ltd.
- The Chemours India Pvt. Ltd.
- UltraTech Cement Ltd.

Appendix 2: Steel sector circularity indicator maturity assessment

Theme	Criteria	Sr. no.	Framework Indicator	Illustrative KPIs for steel sector
Materials	Input	1	% renewable or non-virgin content (minimum recycled content use)	Scrap utilization
		2	% input sourced from by-product/waste stream	% solid waste (like LD slag, BF sludge, fly-ash) utilized
		3	% critical material in inflow	
		4	% non-virgin content sourced domestically	
		5	Resource productivity	% material utilization, % material efficiency
		6	% hazardous material and Substance of concern in products	Amount of hazardous waste disposed
		7	% products designed for dismantlability	NA
	Process	8	% processing waste sent to landfill/incinerated	Solid waste sent to landfill/incineration
		9	% processing waste recirculated	% steel scrap recycled (internal & external), % BF and %LD slag recycled
		10	% secondhand assets (plant equipment/machinery)	
		11	% new assets designed with circular principles (plant equipment/machinery)	
	Output	12	% recovery potential	
		13	% material actual recovery (minimum percentage recovery) - reuse/refurbish/recycle/remanufacture	Amount of steel scrap shredded
		14	% material- sent to landfill/incineration	Solid waste sent to landfill / incineration, Hazardous and non hazardous waste disposed
		15	Average product actual lifetime (only applicable for products designed for use)	NA
Environment	Water	16	% recirculated water withdrawal by source	Specific freshwater consumption, total water consumption
		17	% water discharge	Effluent discharge volume
		18	% water recirculated	wastewater recycled, performance on zero liquid discharge target
	Energy	19	% energy from renewable sources	
	GHG emissions	20	GHG emission reduction attributable to circular initiatives	Specific CO ₂ emission, Scope 1 and 2 emissions measurement
Organization & value realization	KPIs not being reported			

High maturity – 3+ companies reporting

Medium maturity – Reported by 1-3 companies

Low maturity – Not being reported

Appendix 3: Automotive sector circularity indicator maturity assessment

Theme	Criteria	Sr. no.	Framework Indicator	Illustrative KPIs for steel sector
Materials	Input	1	% renewable or non-virgin content (minimum recycled content use)	% recycled steel, aluminium, plastic, other packaging material
		2	% input sourced from by-product/waste stream	% of waste generated in steel (steel scraps) reused as inputs for new components
		3	% critical material in inflow	
		4	% non-virgin content sourced domestically	% of the materials (by value) from local sources
		5	Resource productivity	No. of vehicles manufactured from recycled and reused materials
		6	% hazardous material and Substance of concern in products	total quantity of hazardous & non-hazardous waste
		7	% products designed for dismantlability	% increase in spare parts recycling
	Process	8	% processing waste sent to landfill/incinerated	No. of locations achieving zero waste to landfill
		9	% processing waste recirculated	Amount scrap steel recycled from production process
		10	% secondhand assets (plant equipment/machinery)	
		11	% new assets designed with circular principles (plant equipment/machinery)	
	Output	12	% recovery potential	% recycling rate of each model
		13	% material actual recovery (minimum percentage recovery) - reuse/refurbish/recycle/remanufacture	% material recycled
		14	% material- sent to landfill/ incineration	% of zero waste to landfill
		15	Average product actual lifetime (only applicable for products designed for use)	% Reuse and Recovery rate for End of Life Vehicles
Environment	Water	16	% recirculated water withdrawal by source	% RO water reused for processes
		17	% water discharge	Total water discharge
		18	% water recirculated	Total volume of water conserved through recycling, reuse & rainwater harvesting
	Energy	19	% energy from renewable sources	Total power sourced from renewable energy
	GHG emissions	20	GHG emission reduction attributable to circular initiatives	
Organization & value realization	KPIs not being reported			

High maturity – 3+ companies reporting

Medium maturity – Reported by 1-3 companies

Low maturity – Not being reported

Appendix 4: FMCG sector circularity indicator maturity assessment

Theme	Criteria	Sr. no.	Framework Indicator	Illustrative KPIs for steel sector
Materials	Input	1	% renewable or non-virgin content (minimum recycled content use)	% recycled content in packaging, % proportion of packaging made from renewable sources
		2	% input sourced from by-product/waste stream	Quantity of paper and board packaging made of recycled fibres
		3	% critical material in inflow	
		4	% non-virgin content sourced domestically	% of responsibly sourced raw materials
		5	Resource productivity	% reduction in plastic usage because of refills, Plastic consumption per tonne of finished goods
		6	% hazardous material and Substance of concern in products	% of hazardous waste generated
		7	% products designed for dismantlability	% reduction in plastic use with easy-squeeze pack (design change)
	Process	8	% processing waste sent to landfill/incinerated	% of operational waste landfilled
		9	% processing waste recirculated	% of waste arising from production recycled, converted to biogas or incinerated in waste-to-energy plants
		10	% secondhand assets (plant equipment/machinery)	
		11	% new assets designed with circular principles (plant equipment/machinery)	
	Output	12	% recovery potential	
		13	% material actual recovery (minimum percentage recovery) - reuse/refurbish/recycle/remanufacture	% overall recycling rate, post consumer plastic recycled
		14	% material- sent to landfill/ incineration	% of waste to landfill, total waste generated that is incinerated with/without energy recovery
		15	Average product actual lifetime (only applicable for products designed for use)	
Environment	Water	16	% recirculated water withdrawal by source	% of regenerative water usage
		17	% water discharge	No. of Water Stewardship Certified sites (Manufacturing + GLT)
		18	% water recirculated	% of total water recycled
	Energy	19	% energy from renewable sources	Total renewable power for production sites
Organization	Leadership	20	GHG emission reduction attributable to circular initiatives	Co ₂ e intensity reduction
		21	% functions with circular economy implementation responsibility	
	Jobs	22	% leadership remuneration linked to circular economy targets	
		23	No. of direct and indirect jobs generated through circular initiatives	
Value realization		24	No. of micro enterprises engaged through circular initiatives	% of responsibly sourced raw materials
	KPIs not being reported			

High maturity – 3+ companies reporting

Medium maturity – Reported by 1-3 companies

Low maturity – Not being reported

Joint thought capital of Accenture and FICCI on **circular economy**

2018



Accelerating India's Circular Economy Shift

Future-proofing growth in a resource-scarce world
Setting the context for CE in India and evaluation of the opportunities, enablers, and success factors

2019



Making Plastics Circular

Insights and actions transform India's plastic waste management
State of circularity of plastics in India and imperatives for its acceleration across the value chain and stakeholders

2020



Strategies for Sustainable Plastic Packaging in India

A USD 100 Billion opportunity till 2030
Three-pronged approach towards sustainability packaging in India and recommendation system level accelerators

2021



Beyond Incrementalism

Pulse check on India's circular transition, near term CE outlook, key barriers to circular adoption in Indian context, action plan to accelerate CE transition

REFERENCES

- ¹ <https://www.accenture.com/in-en/about/events/the-circular-economy-handbook>
- ² FICCI-Accenture_Circular Economy Report_OptVer.pdf (ficcices.in)
- ³ As per information from respective sustainability reports
- ⁴ <https://ellenmacarthurfoundation.org/circular-economy-in-india>
- ⁵ <https://moef.gov.in/wp-content/uploads/2019/07/Draft-National-Resourc.pdf>
- ⁶ <https://moef.gov.in/wp-content/uploads/2019/07/Draft-National-Resourc.pdf>
- ⁷ Effects of the Circular Economy on Jobs (iisd.org)
- ⁸ <https://egazette.nic.in/WriteReadData/2022/233568.pdf> ; <https://egazette.nic.in/WriteReadData/2022/238351.pdf> ;
<https://egazette.nic.in/WriteReadData/2022/235903.pdf> ;
<https://morth.nic.in/Circulars-Notifications-related-to-Vehicle-Scrapping-Policy>,
<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1705811> ;
- ⁹ <https://steel.gov.in/sites/default/files/213770.pdf>
https://www.sebi.gov.in/sebi_data/commondocs/may-2021/Business%20responsibility%20and%20sustainability%20reporting%20by%20listed%20entitiesAnnexure2_p.PDF,
<https://moef.gov.in/wp-content/uploads/2019/07/Draft-National-Resourc.pdf>
- ¹⁰ <https://www.ficcices.in/FICCI%20Accenture%20Report.pdf>
- ¹¹ About Us | Greenhouse Gas Protocol (ghgprotocol.org)
- ¹² ISO - ISO/TC 323 - Circular economy
- ¹³ Circulytics Resources (ellenmacarthurfoundation.org)
- ¹⁴ <https://www.wbcso.org/content/wbcso/download/14172/204337/1>
- ¹⁵ <https://ellenmacarthurfoundation.org/resources/circulytics/overview>
- ¹⁶ <https://pib.gov.in/PressReleasePage.aspx?PRID=1705772>
- ¹⁷ <https://steel.gov.in/sites/default/files/Steel%20Scrap%20Recycling%20Policy%2006.11.2019.pdf>
- ¹⁸ Untitled-1 (msme.gov.in), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1744032>
- ¹⁹ <https://timesofindia.indiatimes.com/blogs/voices/recycling-to-achieve-a-circular-economy/>
- ²⁰ <https://worldsteel.org/wp-content/uploads/Fact-sheet-steel-and-raw-materials.pdf>

- ²¹ <https://www.tatasteel.com/media/16654/tata-steel-ir-2021-22-1.pdf>
- ²² <https://www.tatamotors.com/wp-content/uploads/2021/06/28075755/annual-report-2020-21.pdf>
- ²³ <https://www.mahindra.com/resources/pdf/sustainability/Mahindra-Sustainability-Report-2020-21.pdf>
- ²⁴ https://www.toyota-tsusho.com/english/ir/library/integrated-report/pdf/ar2021e_all.pdf
- ²⁵ <https://ficci.in/spdocument/22977/FICCI-Circular-Economy.pdf>
- ²⁶ <https://in.pg.com/environmental-sustainability/>
- ²⁷ http://britannia.co.in/pdfs/sustainability/Britannia_Sustainability_report_22.pdf
- ²⁸ https://csep.org/wp-content/uploads/2022/10/Critical-Minerals-for-India_UPDATED.pdf
- ²⁹ <https://www.ceew.in/publications/critical-non-fuel-mineral-resources-indias-manufacturing-sector>
- ³⁰ Critical-Minerals-for-India_UPDATED.pdf (csep.org)
- ³¹ <https://rmis.jrc.ec.europa.eu/?page=crm-list-2020-e294f6>



ABOUT FICCI

Established in 1927, FICCI is the largest and oldest apex business organisation in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organisation, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry. It serves its members from the Indian private and public corporate sectors and multinational companies, drawing its strength from diverse regional chambers of commerce and industry across states, reaching out to over 250,000 companies.

FICCI provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

Disclaimer:

This Report has been published for information and illustrative purposes only and is not intended to serve as advice of any nature whatsoever. The information contained and the references made in this Report is in good faith and neither FICCI and/or Accenture nor any its directors, agents or employees give any warranty of accuracy (whether expressed or implied), nor accepts any liability as a result of reliance upon the content including (but not limited to) information, advice, statement or opinion contained in this Report. This Report also contains certain information available in public domain, created and maintained by private and public organizations. Accenture's role in this report is limited to a knowledge partner, Accenture does not control or guarantee the accuracy, relevance, timelines or completeness of such information. The Report is a joint property of FICCI and Accenture, both FICCI and Accenture jointly hold the copyright or any intellectual property over the Report. No part of this document may be reproduced in any manner without the written permission of FICCI and Accenture. Opinions expressed herein are subject to change without notice.



ABOUT ACCENTURE

Accenture is a global professional services company with leading capabilities in digital, cloud and security. Combining unmatched experience and specialized skills across more than 40 industries, we offer Strategy and Consulting, Interactive, Technology and Operations services - all powered by the world's largest network of Advanced Technology and Intelligent Operations centers. Our 721,000 people deliver on the promise of technology and human ingenuity every day, serving clients in more than 120 countries. We embrace the power of change to create value and shared success for our clients, people, shareholders, partners and communities.

Visit us at www.accenture.com