G20

भारत 2023 INDIA

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RESOURCE EFFICIENCY AND CIRCULAR ECONOMY INDUSTRY COALITION

PRESIDENCY DOCUMENT

JULY 2023

TECHNICAL DOCUMENT DEVELOPED FOR THE G20

Acknowledgement

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Disclaimer: The report does not necessarily provide exhaustive documentation of all Resource Efficiency and Circular Economy related activities by G20 members and guest countries, rather it is an outcome of work that was conducted between November 2022 and July 2023.

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List of Acronyms used in this text

CCE	Circular Carbon Economy
COP	Conference of Parties
EV	Electric Vehicles
ECSWG	Environment and Climate Sustainability Working Group
EPR	Extended Producer Responsibility
GHG	Green House Gas
IOs	International Organisations
LED	Light-emitting diode
MSME	Micro, Small and Medium Enterprises
NGOs	Non-governmental organization
OEM	Original Equipment Manufacturer
PET	Polyethylene terephthalate
R&D	Research and Development
RECEIC	Resource Efficiency and Circular Economy Industry Coalition
RED	Resource Efficiency Dialogue
SDG	Sustainable Development Goal
UNFCCC	United Nations Framework Convention on Climate Change
WBCSD	World Business Council For Sustainable Development
WEF	World Economic Forum

1. Introduction

This Presidency Document provides the background and context for the establishment of Resource Efficiency and Circular Economy Industry Coalition (RECEIC) under India's G20 presidency. It presents a review of the landscape on circularity including current baselines, the major challenges faced and potential opportunities to increase the adoption of circularity by the industries. This document is for information purpose only and the recommendations do not bind or prescribe any G20 member country for any action. The document presents preliminary recommendations for the Industry Coalition and how G20 platform could be leveraged to accelerate the transition to a circular economy. These recommendations also expand and continue from the previous G20-led initiatives on circular economy such as the G20 Resource Efficiency Dialogue, which encourages multi-stakeholder engagement including public-private partnerships and knowledge sharing among multiple stakeholders. The Resource Efficiency and Circular Economy Industry Coalition (RECEIC) is proposed to boost partnerships at the highest level, with a focus on:

- Collaborations across the sectors and value chains
- Expanding the lens to include high-value and high-volume sectors
- Encouraging collaborative innovations, technology development and on-ground actions
- Reducing the cost of transition to circularity
- Channelising investments, structuring project pipelines and financing
- Enabling global breakthroughs by leveraging platforms like G20 RE Dialogue

2. Background and Context

Global economy is growing at a rapid pace, and with it, the use of natural resources. Resource consumption has more than tripled since 1970[1], a rate that significantly threatens the renewal capacity of our planet, and availability of finite resources for next generations. At our current consumption levels, we would need about 1.8 planets[2] to continue to provide the resources we are consuming and absorb the waste we are generating. 2.3 planets will be needed by 2040[2] if the global population, demand and consumption for materials continue to grow at their present pace.

To ensure that environment can sustainably replenish its renewable resources and extend the lifespan of finite resources for future generations, consumption of new materials should be reduced to a level that aligns with the resources of just one planet. This will help protect the climate, environment and provide greater societal equity. Resource efficiency and circular

[1] Global Resource Outlook 2019, UN Environment report

[2] OECD, Global Material Resources Outlook to 2060; Footprint Network, Ecological Footprint: Managing Our Biocapacity Budget

economy are the key tools that can enable sustainable consumption and production of resources. Therefore, the challenge calls-out for a plan of action to accelerate global transition towards circular economy and resource efficiency, through advancements in technology and innovation.

2.1 Enabling global breakthrough's

Higher circularity goals in line with the planetary boundaries and sustainable lifestyles can be achieved by expanding the focus across all critical areas (and not just limited to specific sectors like plastics, e-waste, textiles etc; or specific geographies).

Global leadership demonstrated by the G20 countries has the potential to drive significant breakthroughs. G20 presents a strong opportunity to drive technological advancement and greater collective action to foster sustainable growth. Circular economy as a topic was first included in the 2017 agenda, presided by Germany, when the Resource Efficiency Dialogue (G20RED) was launched. A roadmap to make efficient and sustainable use of natural resource a core element of G20 talks was put together. This was followed with the launch of an information portal for G20RED, to ensure timely and regular sharing of information during 2019, in Japan. In 2020, in Saudi Arabia, the G20 endorsed the Circular Carbon Economy (CCE) platform with its 4Rs framework (Reduce, Reuse, Recycle and Remove). During 2021, in Italy, "Finance" and "Technology" were first identified as critical enablers for achieving the global goals on sustainable consumption and production.[3] This build-up on the circular economy and resource efficiency over the last six G20's has set the stage for greater collaboration beyond knowledge sharing and competitiveness towards technological advancements and mobilizing de-risked finance - focusing on real-world implementation.

2.2 Circularity in Present Times

On an average, across major value chains and regions, currently we are recycling 25-35% of the-waste streams that, by value and volume, are the most detrimental to the environment[4]. These waste streams include concrete, plastics, metal, biowaste, E-waste, EV batteries, wood, paper, rubber, packaging glass and nylon. For example, concrete has a collection rate of 60-70% globally, but only 25-30% of waste products in this category are recycled. Only 50% of EV batteries are recycled vs 85-100% collection rate. E-waste collection rate is estimated to be 70-80% while only 17.4% of e-waste is currently recycled formally. Over the years there

[3] G20 Resource Efficiency Dialogue Web Portal

[4] Intergovernmental Panel on Climate Change (IPCC) Climate Change 2021: The Physical Science Basis

has been an imbalance among the countries in terms of waste generation, collection and recycling, primarily attributed to capabilities gaps. For example, some proactive countries recycle up to 60-65% of the waste produced, while others largely are recycling only 25-35% of waste streams[5].

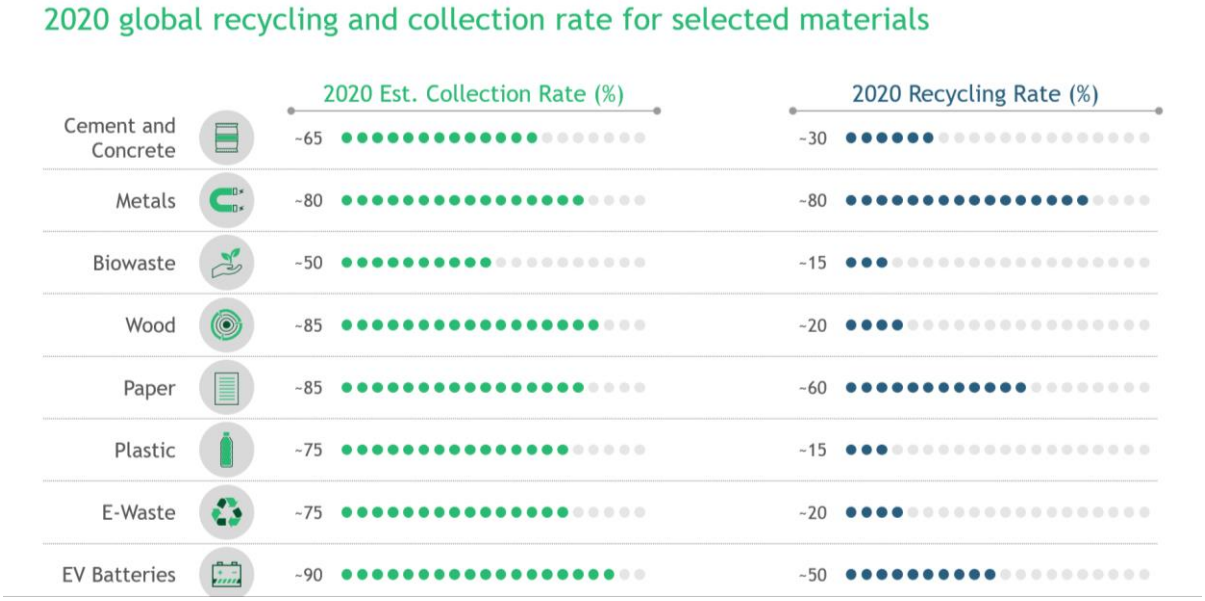

Figure 1: 2020 global recycling and collection rates for selected materials (As per BCG & WBCSD report)

It is pertinent to understand the circularity gap in key sectors, industries, and regions, before deploying measures to accelerate towards the global sustainability ambition. In most cases, collection rates or ability to bring materials back in the system is quite low. Even for materials with higher collection rates, their recycling and recovery percentages are inadequate. Gaps therefore need to be addressed at each stage of the circularity spectrum – right from design to manufacturing, utilisation to recovery, and closing the loop on materials.

While the properties and renewability factors vary greatly between one material and another, to prevent depletion of the environmental resources we will need to recycle an additional 55% of all the waste streams on average by 2040[3]. Taking into account the current rate and the additional recycling required, it becomes imperative to attain an average total recycling rate of 80-90%[3] for all materials by 2040. This 80-90% recycling rate can be seen as the circularity equivalent of the proposals in the Paris Agreement for limiting global warming. While this is not a one-size fits all approach, focus on certain sectors need to be prioritised.

[5] BCG & WBCSD report 'A "Paris Agreement" for recycling the Earth's resources'

2.2 Bridging the Gap

Circular Economy and Resource Efficiency needs to be mainstreamed across major economies through ambitious policy enablers, enhanced private sector actions and responsible community initiatives. It is crucial to recognize that circularity can be enhanced not only by boosting collection and recycling rates but also by improving material efficiency, advocating for circular design practices, and fostering a culture of reuse, among other strategies. In this report, further analysis is based on measures for increasing collection and recycling rates, while recognizing that other efforts may also be important to transition towards the circular economy.

Multiple challenges need to be addressed for effectively bridging the circularity gap. For the global co-operation and public private partnerships at the highest level to be effective, prioritisation on addressing specific high-ticket ones can help unlock breakthrough transformations and create ripple-effects that resonate across sectors.

3. Role of an Industry led Coalition to bridge the Circularity Gap

A global effort bringing together collaboration from key stakeholders across the private sector will help set the circularity ambition and bridge the gap between the present-day landscape and the desired goal. This plan can be actioned with industry collaboration at a global level, focussing on specific interventions and time-bound outcomes.

3.1 Addressing structural and capability gaps across the value chains

A global industry coalition can address a number of structural and capability gaps that exist across the value chains. There are existing structural gaps that hinder progress in circularity, including fragmented actions by different stakeholders, insufficient integration of circular practices across value chains, and a limited scope of circular efforts primarily focused on sectors like plastics, textiles and so on. A global industry coalition can also play a crucial role in addressing capability gaps that hinder the progress of circular practices. These gaps include a lack of expertise and capacity among small and medium enterprises (SMEs) and limited avenues for knowledge transfer between industries. By leveraging collective knowledge, experience, and resources, the coalition can help bridge these gaps and facilitate the advancement of circular practices across sectors.

Driving partnerships across the sectors and value chains

Siloed operations by various stakeholders including producers, governing bodies, investors, industry organizations, not-for-profit, and civil society, limit the potential to achieve systemic change and its associated positive impact. To implement circular economy business models, partnership across stakeholders in the value-chain is a key enabler. Beyond value-chain collaborations within industry, collaboration with government authorities such as urban local bodies, NGOs and even, consumers will ease the transition. Numerous examples spanning across sectors showcase the immense potential for collaborative innovation opportunities. In automotive sector for example, Tata's Jaguar and Land Rover sells the waste aluminium from vehicles back to the supplier (Novelis). The initiative has made possible recovery of over 50,000 tons of aluminium in 1 year and has also helped Novelis reduce its GHG emissions by 13%. A global partnership or a platform can help scale such one-off success stories, enable greater collaboration opportunities and result in multiple environment, economic and social benefits.

There are three partnership archetypes that can contribute to bridging the circularity gap. Firstly, partnerships across the value chain can be established to address the capacity building needs of small and medium enterprises (SMEs) lacking technical know-how and resources to adopt circular practices. For example, collaborations between integrated steel producers and distributed forging and smelting units, or between automotive original equipment manufacturers (OEMs) and steel processing units, can enhance scrap availability and consequently improve circularity in the steel sector. As an example, one of the largest Indian companies was able to achieve 100% red mud utilization worldwide. The company supplies red mud to cement plants where it is used as an effective substitute for clinker. Red mud is a by-product of alumina refining. Such examples of reusing residue from one industry in another industry demonstrates significant potential to reduce material use. Using red mud, cement plants were able to reduce consumption of clinker raw mix by 3% (by volume). Similar opportunities also exist in the biomass space – where waste streams from agriculture production can be intertwined within the energy sector, or textiles sector.

Secondly, partnerships focused on efficient waste utilization can be formed, wherein waste from one industry is utilized as raw material in another. For instance, waste streams from the rubber and tire industry can be utilized to recover carbon black, or PET bottles can be processed to produce fibers and textiles. Similarly, by incorporating red mud from bauxite mining or steel slag in cement and concrete production, or utilizing biomass for energy generation, significant progress can be made in achieving circularity.

The third archetype involves partnerships between different industries to promote knowledge and best practices sharing across various areas, including ecodesign, use of recyclable materials, adoption of circular and efficient manufacturing processes, and facilitating ease of repairability and remanufacturing. These collaborations enable cross-industry learning and foster innovation towards achieving circularity goals.

Collaborations to expand the focus beyond traditional sectors and include high-value and high-volume sectors

Circularity efforts have traditionally focused on specific areas such as plastics, but there is a vast untapped potential to further enhance circularity and minimize environmental impact by directing attention to other sectors also. Sectors can be prioritized based on several dimensions including contribution by volume, by value, by impact – on biodiversity, GHG emissions, livelihoods etc. Several sectors, such as cement and metals contribute significantly to waste generation by volume. Emerging sectors like electric vehicles (EV) and areas such as e-waste represent high-value sectors with significant potential to foster and promote greater circularity. Sectors like plastics, while lower volume, have a considerably high impact on the environment given their mixed-materials nature and inability to breakdown. Finally, sectors like textiles have a significant socio-economic impact, given the overall construct of the value chain, especially from an emerging economy focus.

Sectors characterized by high volume and value, are the key targets for circularity initiatives. Industry coalition shall bring together participants from various sectors and across different stages of the value chain, to expand the focus beyond traditional sectors and work towards closing the circularity gap. By prioritizing collaboration and concerted efforts in these high-volume, high-value sectors, we can significantly advance circularity goals and create a more sustainable and resource-efficient future.

3.2 Addressing technology barriers and capability gaps

In many cases, the cost of virgin raw materials is lower than that of recycled materials, primarily due to the lack of efficient technologies for recycling without compromising material properties in a cost-effective manner. This cost disparity acts as a disincentive for manufacturers to adopt circular practices. Technology collaborations can therefore be a crucial factor in addressing this circularity gap.

Encouraging collaborative innovations, technology development and actions

There are significant challenges in the supply chain related to technological knowledge and

workforce capabilities, particularly in design, collection, sorting, and recycling processes. Downcycling occurs during recycling when materials lose their original properties and become less suitable for high-performance applications. Currently, many recycling options default to downcycling due to material contamination, diversity, and difficulties in disassembling different materials. As a result, lower-value products are often not brought back into the system, leading to lower recycling rates due to cost constraints. For instance, mechanical recycling of plastics, which involves physical processes like washing and grinding, is limited to specific types of polymers and often leads to downcycled materials. Therefore, it is crucial to focus on advancing technologies that can improve the efficiency and quality of plastic recycling, especially in mechanical recycling.

Collaborative technology efforts by leading businesses can address these challenges, promote upcycling, and create commercialization opportunities. To improve recycling rates and circularity, immediate advancements in technology and innovation are needed across all stages of the process, from design to collection, sorting, and recycling. Co-development opportunities further facilitate the transfer of impacts between different circular value chain steps, such as improved design enabling better material recovery.

Reducing the cost of transition to circularity

High cost of transition to circularity because of the unorganized nature of value chains, lack of standards across material inputs, and unavailability of cost-effective technologies often result in lower costs of virgin materials and disincentives for producers to source recycled materials. Technology collaborations can thereby reduce the cost of repair, recycling, remanufacturing, and reusing the materials resulting in higher circularity rates.

3.3 Channelising investments, structuring project pipelines and financing

Circularity also depends on prevalent infrastructure, and its effectiveness to support various life cycle stages of products and waste streams. In general, the private sector often faces lack of financial incentives and economic viability to heavily invest in the sorting, aggregation, collection, processing, and disposal networks for key waste streams. These also do not take into account the environmental and societal costs of virgin material extraction and waste generation as well. Circular economy, resource efficiency and waste recycling networks are at the cusp of the “infrastructure” categorisation given multiple co-benefits, broader emphasis on public and private good, along with the need to close the larger gap. This calls out for unique and differentiated financing approaches applicable for other sectors that indulge into

creating facilities for public good viz. roads, bridges etc. In terms of the overall outlay, an estimated capital expenditure of USD $2.1-2.2 trillion will be needed to reach a recycling rate of 80-90% across critical materials globally by 2040[4].

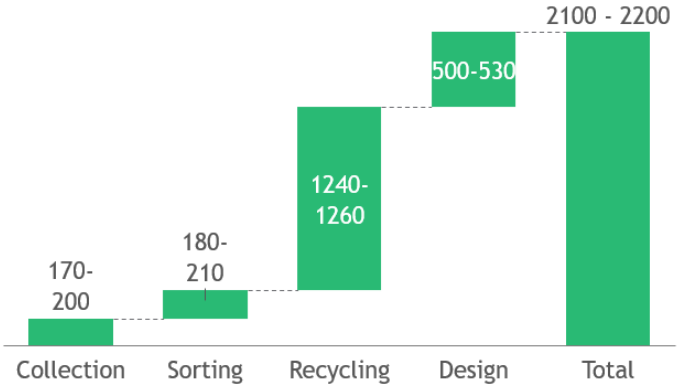

Figure 2: Financial requirement split between design, collection, sorting and recycling 4.

However, these investments often present positive business opportunities. The capital allocation mapped accounts for less than 1% of the total annual market size (by industry revenues) for the materials covered here. For example, the investment required to achieve the recycling aspirations for the wood industry is USD $7.5 billion per year, equivalent to only 1.2% of the industry's annual revenue; while the investment needed in the paper industry is USD $11.5 billion, equivalent to a product price increase of only 1.3% on average[4]. For these initiatives to scale and investments to materialise – de-risked or concessional finance offered via dedicated channels can be a game changer.

A global collaboration would enable critical investments towards circularity for key markets and innovations boosting market action. In addition, it would provide access to enhanced waste management technology and scale to meet corporate commitments. Information sharing on accessing de-risked finance for undertaking circularity and resource efficiency projects can also be helpful.

4. Resource Efficiency and Circular Economy Industry Coalition

In order to bridge the existing gaps in the circular economy ecosystem and unlock the potential of collaboration in enhancing circular economy, a global coalition should focus on three priority areas. These three priority areas should serve as core pillars or the guiding principles of the industry coalition to drive impact at scale and going forward, the coalition may decide to add or remove suggested pillars and prioritize sectoral focus if required.

Core Pillars

4.1 Partnerships for Impact

Showcasing success stories, learnings and impacts from the bottom-up:

The coalition should bring together high impact initiatives which can be successfully scaled up across sectors, geographies and across the value chains. The coalition members may convene to discuss breakthrough initiatives, joint interventions, and share best practices and peer learnings in enhancing circularity. For this purpose, the industry coalition may leverage and build upon the existing initiatives and utilize existing frameworks for effective governance. Engagement with existing and complementary initiatives like the Alliance to End Plastic Waste or the Global Cement and Concrete Association, or local industry associations or proactive businesses can be structured in the form of a "showcase" within the G20 framework, such as using the G20 RE Dialogue for annual stocktake and sharing key achievements as well as roadblocks to take forward the global agenda on circularity and resource efficiency.

Advancing circularity by closing and intertwining the loops:

The industry coalition should also work towards the improved utilization of waste streams and by-products while promoting steady supply chain and infrastructure for waste like steel scrap, biomass etc. Industry coalition could facilitate dialogues and establish partnerships among different industry players such as, steel manufacturers, coal power plants, and cement producers. These collaborations enable the utilization of waste materials generated by one industry as raw materials in another industry.

Enabling co-operation across value chains:

Industry coalition should also include knowledge and capacity building programs to involve MSMEs and the unorganized sector to drive circularity across the value chain. This includes opportunities to reduce waste generation through trainings, knowledge, and technology sharing programs, streamline and optimize waste collection and processing network.

4.2 Enhancing Capabilities and Technology Collaborations

Dialogues to identify technology and innovation gaps:

The coalition should explore collaborations among businesses to identify technology and innovation gaps. These structured and targeted dialogues, planned across specific timeframes, are aimed to bring in multi-dimensional perspectives and prioritise the

technology / innovation gaps to focus on. The dialogues could also be seeding opportunities to engage with the emerging enterprises, start-ups within climate-tech and circular-tech space, for running specific "challenge" programs identifying solutions in an unconventional manner.

Identify highest-impact use cases for technological innovation:

For each priority sector, the coalition may initiate comprehensive assessments across the end-to-end value chain, map economic costs of production and consumption, as well as the impacts on carbon emissions, biodiversity, socio-economic benefits and so on. Basis this, technology pathways and investments may be identified across the value chain, encompassing the broad spectrum of circularity – right from design, manufacturing to collection, to sorting and recycling.

Enhancing multiple stage technology interventions:

Technology collaborations will also focus on the interventions that enhance circularity across the six Rs of circularity – redesign, reduce, reuse, remanufacture, repair and recycle.

For example, on plastics, only 15-20% of plastics are recycled today globally[4], given the nature of products, use cases and so on. To make progress on the circularity agenda, the coalition will drive innovation at the design stage itself, which enables better sorting and shredding, to be able to separate out and bring back different forms of plastic. This will be complemented by actual recycling and processing technologies to increase blending in feedstocks etc. For the textile industry, there is a need to develop and test low-impact natural raw materials and alternative fibres and such as regenerated fibres and cellulosic or recycle existing material to create virgin-grade outputs. Additionally, innovations are needed in final production e.g., in cut-and-trim methods, to reduce overall waste.

4.3 Investments for Scale

Access to finance is very critical to ensure large scale changes in production and consumption of resources. One such large scale program was India's LED replacement program, which provided over 360 million LED bulbs to Indians at subsidized prices. Having a clear line of credit was one of the key factors behind the success of program. Therefore, third pillar of the coalition will focus on mobilizing de-

risked and concessional finance for circularity projects by sharing investments best practices, map circularity projects pipeline and engage investors to mobilize funds for research, development and scale-up of technologies.

The global industry coalition may collaborate with funders across industry, philanthropy, multilateral and government sources to facilitate deployment of climate finance and private capital to promote research and development, develop infrastructure to support circularity, pilots, regional programs, and sectoral partnerships to access the feasibility and effectiveness of circular technology solutions.

Core pillars of RECE Coalition to embed sustainable lifestyle/LiFE principles

Although industries have already adopted to policies and regulations like extended producer responsibility (EPR) which encourage waste collection and transition to circular economy, there is an opportunity to further this agenda by involving communities and encouraging sustainable lifestyles. Industry coalition may also work in the following areas to engage communities and promote circularity:

- Enhance last mile connectivity and build waste collection mechanisms involving community/individual participation. Industries can collectively pool in resources and build training modules to educate and train communities to improve waste collection at the last mile.
- Educate the end user/communities and encourage waste segregation and sorting to increase waste collection and recycling rates as well as reduce the cost of segregation at later stages.
- Collaborate and co-develop technologies that enable participation of communities. Industries will collaborate to equip communities with technology that accelerates adoption of circularity among community. For example, industry can collaborate to create digital applications that enable users to resell, reuse and repair electronic gadgets/products.
- Industry partnerships to mobilize campaigns to promote circularity as a trend. Creating awareness about circular brands to encourage and engage end users/communities to adopt sustainable lifestyles. This will also help industry to build brand equity.

5. Governance and Operations

5.1 Mandate

The Resource Efficiency and Circular Economy Industry Coalition (RECEIC) should aim to bring together businesses to enhance cooperation for incorporating circular economy principles. The Coalition is proposed to advance global resource efficiency and circular economy goals by boosting collaboration, cooperation and knowledge sharing. It is envisaged to accelerate the implementation of:

- The 2030 Agenda for Sustainable Development and its Sustainable Development Goals (including but not limited to SDG 7, 8, 9 and 12)
- Climate Goals under the Paris Agreement
- Goals and targets under the Kunming Montreal Global Biodiversity Framework (including but not limited to Target 15)
- Kigali Amendments, Resource Efficiency Dialogue Roadmap and other relevant international goals as adopted within the UN, G7, G20 etc.

5.2 Institutional Mechanism and Operating Framework

RECEIC shall be conceived as a unique industry-led initiative, where the participating members from the industry coalition shall independently organize and manage its functioning, with an appropriate institutional infrastructure and a self-sustaining funding mechanism. The coalition should invite companies that have voluntarily undertaken several initiatives and commitments to encourage resource efficiency and circular economy within their operations for being its founding members.

RECEIC may seek funds from industry members, grants from international and philanthropic organizations to manage itself, as deemed appropriate by its founding members. The underlying premise, is to create an overarching platform enabling industries to address information and coordination gaps, accelerating the transition to circular economy and resource efficiency.

RECEIC will require a secretariat to manage day-to-day operations such as facilitating working group meetings, board meetings, planning and documenting coalition activities, managing events, logistics, internal communications, social media, member onboarding and recruitment, partnerships in other forums, design and upkeep of web portal and updating technical content from working groups.

RECEIC should carry out extensive consultation with the participating members to define the

work packages and activities to be prioritized by the coalition. RECEIC may work along the following themes / workstreams:

- **Science:**
    - Circularity Measurement and Indicators: Analyze different reporting tools available based on use cases, feasibility, and ease of use etc.
    - Circularity through transparent supply chains: Detailed analysis including feasibility check, cost of implementation and impact on the business of the tools that leverage cutting edge technologies to drive transparency in the supply chains.
- **Policy:**

  Strategies for Circular economy transition:
    - Analyzing the impact of key policies such as EPR on increasing circular economy in different countries and sectors.
    - To study incentives in different countries for different sectors for promotion of RECE.

- **Capacity building and knowledge sharing:**
    - **Nudging consumer behavior towards resource efficient and circular future:** Awareness campaigns to transform consumer perception and increase demand for circular and sustainable products and services.
    - **Sector focused efforts** to analyze the importance of circular economy for the sector, assessment of circularity gap and the actions needed to close the gap. Sectors such as steel, cement, plastics, food and agriculture, textiles, electronics etc. may be taken up.
    - **Workshops and knowledge sharing webinars** on
        - Innovations around topics like eco-design, metal transformation technologies, sustainable materials, new business models in circular economy etc.
        - Share success stories of collaborations across the value chain, cross-sectoral and technology partnerships etc.
        - Inviting investors, DFIs, MDBs for knowledge sharing on finance for circular economy transition, green taxonomies, green financial product standards.

RECEIC should engage with the G20 RE Dialogue, providing an opportunity to industry coalition members to present on the actions undertaken for enhancing Resource Efficiency and Circular Economy. This engagement with the G20 may spread across one or more of the following:

1. The G20 RE Dialogue may engage with RECEIC for additional convenings, annual stocktake, sharing success stories, knowledge-exchange etc.
2. The G20 RE Dialogue web-portal may be utilised for housing knowledge products, best practices, technology use-cases etc.
3. The updated G20 RE Dialogue Roadmap may reflect the RECEIC engagement with the G20 RE Dialogue, as appropriate.

To operationalize the industry coalition, it is recommended to establish a temporary steering committee comprising of representatives from industry founding members. The steering committee shall finalize the detailed 1-year roadmap for the coalition after extensive consultations with the participating members and propose indicative time-based action plan for the first 3 years. The committee shall also finalize the institutional mechanism, meetings cadence, annual convenings and events, membership criteria and funding mechanism.

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