

STG Policy Papers
POLICY BRIEF

**DECODING RESOURCE EFFICIENT
CLIMATE MITIGATION: LESSONS
FROM EU TO DEVELOP MISSING
POLICY LINKS FOR INDIA**

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EXECUTIVE SUMMARY

India is yet to adopt a policy framework for resource efficiency and circular economy.¹ At the COP 26, India announced ambitious emission reduction targets for 2030 and a net zero by 2070. Achieving these extra miles will require integration of resource efficiency along with its existing climate and other sectoral policies. India's emission and resource consumption rates are already alarmingly high. At the same time, the country is still in the process of securing access to basic services for all which will further increase its per capita consumption and emissions. Thereby, it is essential for India to build a material efficient circular economy using the scope of its transitioning economy while achieving its climate and sustainable development commitments. The policy brief discusses why integrating material efficiency is critical for achieving Paris Agreement and the Sustainable Development Goals. Taking the European Union's flagship Circular Economy Action Plan and the following policies and practices in Europe as a lead, this brief analyses the existing relevant policy frameworks in India and makes recommendations towards a best-case scenario for a National Resource Efficiency Policy.

¹ Resource efficiency refers to a sustainable use of resources, that is, creating more value with less input while minimising impacts on the environment. Circular economy denotes a model of economy which replaces the linear 'extracted-processed-used-dumped' economic model with a closed loop economy where minimisation of waste, emissions and use of resources are applied throughout the production and consumption value chain.

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1. WHY RESOURCE EFFICIENCY FOR CLIMATE MITIGATION?

1.1 Current climate actions are not enough to meet the Paris Agreement target

There is a growing momentum amongst the global leaders to promise net zero and curve decarbonisation pathways for achieving their [Paris Agreement](#) commitments. But are the actions, taken or promised, enough to reach the goals and commitments of countries to keep global warming below 1.5°C or 2°C? Unlikely so, as the emission gap remains large according to the 2021 UN report². Current pledges or [Nationally Determined Contributions](#) (NDC) can only reduce projected emissions in 2030 by 7.5%, while the required emission cut is 30% for below 2°C and 55% for the 1.5°C target. End of century global warming is estimated to reach 2.6°C if all unconditional and conditional 2030 pledges are fully implemented. With fully implemented net zero emission pledges additionally, this estimate is lowered to 2.2°C. Most of the net zero pledges are still uncertain, and are not supported by specific policies or targets. Out of the 136 net zero or carbon neutrality aiming countries, only 44 have named the emission targets in national legislation or policy documents and 15 more have declared their pledges³. Even G20 nations, as a group, are off track to achieve their original or new 2030 pledges. Climate actions, clearly, need a dramatic push, across sectors. Resource efficiency, is a critical tool, in this approach.

1.2 Resource efficiency is critical

Natural resources play an integral role in the global commitment towards the United Nations Conventions of Climate Change (UNFCCC), Biological Diversity (CBD), Combating Desertification (UNCCD) and the Sustainable Development Goals (SDGs). Resource efficiency is directly linked to 14 SDGs, indirectly to the rest and if excluded, makes impossible to achieve them. Emissions are also directly linked

to material consumption in both their absolute level of use and environmental impact for material transformation into product. However, the importance of resource efficiency has not been enshrined in the implementation of these international agreements.

Extraction and processing of material resources⁴ contribute to about half of the climate change impacts and emissions (excluding climate impacts related to land use)⁵. Emissions from the production of materials – which includes mining, energy, transport and industrial production processes – was 11 gigatons of CO₂ equivalent (GtCO₂e) in 2015 accounting for 23% of global greenhouse gas (GHG) emissions. These global emissions from material production have seen a sharp rise, by 120% from 5 GtCO₂e and from 15% of global share in 1995⁶. Circular economy strategies, if applied in just 5 key industries of cement, aluminium, steel, plastics and food, can eliminate almost half of the emissions projected from the production of goods in 2050 (9.3 GtCO₂e) which is equal to all transport emissions (Fig 1). Sectors like food and waste, textile and construction can hugely gain emission reduction too from resource efficient strategies. Global food loss and waste annually generates 8% of total GHG emissions which is equivalent to emissions from all global road transport. Textile, one of the most unsustainable industries with less than one percent of the material used being recycled, annually produce 3.3 Gt GHGs across the value chain⁷. Construction is a huge scope too, assuming that 50% of the urban environment needed by 2050 is not yet built. Material efficiency strategies in construction of residential housing can reduce annual GHG emissions by 80% in China, and 50% in India by 2050, compared to a scenario without material efficiency. This alone can save 130-170 million tons of GHG from G7 countries in 2050. Similarly, life cycle emissions from cars can be reduced by 40% by 2050 with material efficiency strategies⁸. Given this, efficient use

2 United Nations Environment Programme, 2021. [Emissions Gap Report 2021: The Heat Is On – A World of Climate Promises Not Yet Delivered](#), Nairobi.

3 [Net zero tracker](#). 2022.

4 Note: Material resources are often categorised as biomass, metals, non-metallic minerals and fossil fuels

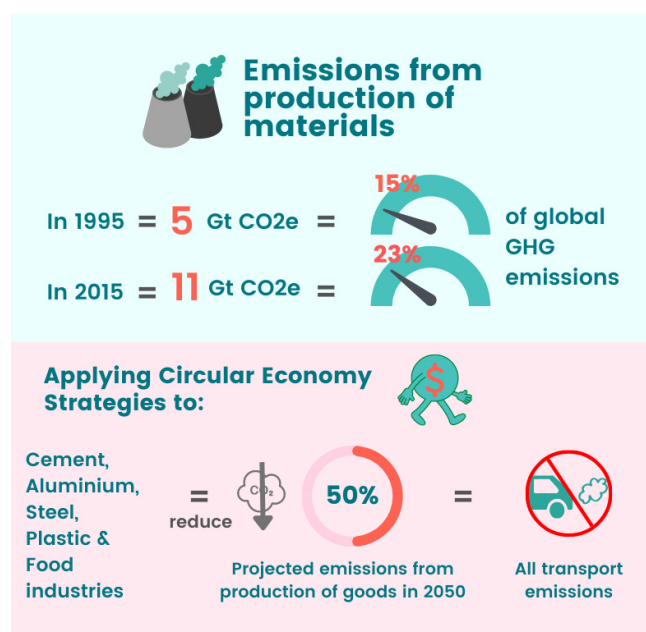
5 UNEEnvironment & International Resource Panel, 2019. [Global Resource Outlook 2019](#).

6 Hertwich, E.G., 2021. Increased carbon footprint of materials production driven by rise in investments. *Nature Geoscience* 14, 151-155. <https://doi.org/10.1038/s41561-021-00690-8>

7 Global Alliance on Circular Economy and Resource Efficiency (GACERE). 2021. [GACERE working paper: circular economy and climate change](#).

8 International Resource Panel (IRP). 2020. Resource efficiency and climate change: material efficiency strategies for a low-carbon future. Hertwich, E., Lifset, R., Pauliuk, S., Heeren, N. IRP and UNEP, Nairobi, Kenya. DOI: 10.5281/zenodo.3542680

FIGURE 1: CIRCULAR ECONOMY CAN REDUCE SIGNIFICANT EMISSIONS^{5,6}



Source: The author

of resources should be integral to any climate policy, which will further help fulfil promises and trigger actions.

1.3 Resource consumption trends are alarming

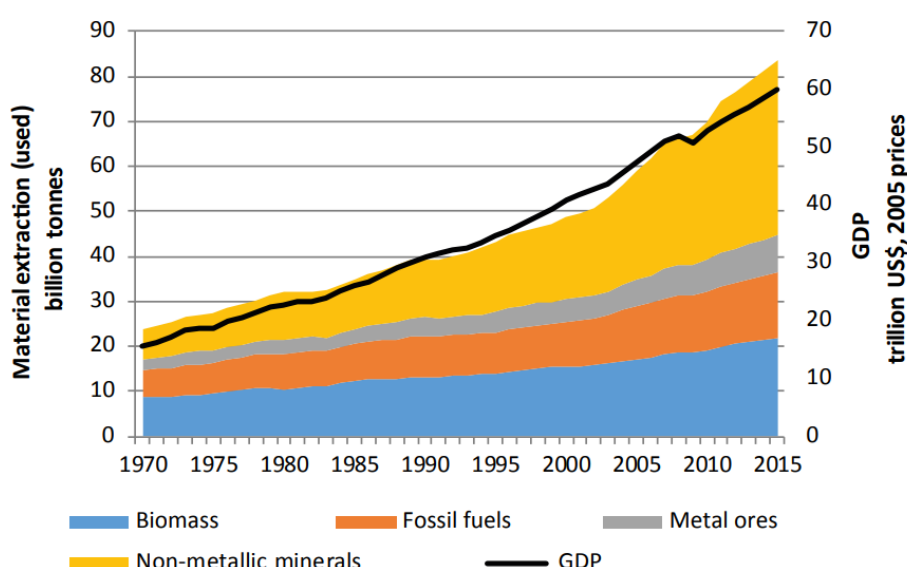
Resource use is primarily driven by population growth and economic activity. While the global population has doubled since the 1970s, resource consumption has grown threefold with an increase in per capita use, reflecting the economic growth. The global historical pattern of material resources extraction is linear with economic activity, that is, materials are extracted, traded, processed into products and disposed as waste or emissions or effluent. In fact, since 2000 the material extraction rate has overtaken GDP growth⁹. This trend is similar across the board, for metals, non-metals, fossil fuels and biomass. Global water withdrawals too grew at a rate faster than human population in the second half of the twentieth century. About 70% of global water withdrawals were used for agriculture. The resource consumption trend - if remains business as usual - is unsustainable and would remain the biggest barrier to achieve the global commitments of Paris Agreement.

1.4 Climate mitigation is only inclusive when resource efficient

Global economy and management of natural resources essentially determine GHG emissions. More efficient and accountable use of natural resources should be part of climate policies and indispensable to achieve the Paris agreement target. In the face of a growing demand and consumption of resources, resource efficiency ensures adding greater value, keeping them in use for longer, and reducing the environmental impacts of their value chain. Applying circular economy strategies in key economic sectors, including energy generation and transmission, water, construction, consumer goods or agriculture and food production sectors, can contribute huge to climate mitigation. To achieve this, we need a decoupling of economic development from GHG emissions. Decoupling is conceptualised (by International Resource Panel) as resource use or an environmental pressure growing either at a slower rate than the economic activity that is causing it (relative decoupling) or declining while the activity continues to grow (absolute decoupling). Essential is a double decoupling

9 International Resource Panel (IRP). 2019. [Global Resources Outlook 2019: natural resources for the future we want](#) IRP and UNEP, Nairobi, Kenya.

FIGURE 2: GLOBAL MATERIAL EXTRACTION & GDP, 1970-2017



Source: [International Resource Panel, 2017](#)

when both resource use (resource decoupling) and negative environmental impacts reduce proportionately, (impact decoupling) in achieving a sustainable low-carbon transition.

In this context, this brief further analyses the best policy perspectives for a resource efficient Indian economy through a possible (and proposed) National Resource Efficiency Policy, taking the European Union's (EU) flagship resource efficiency and circular economy policies and practices as a lesson.

2. RESOURCE EFFICIENCY POLICIES & PRACTICES: THE EU AND INDIAN PERSPECTIVES

2.1 The EU flagship initiatives

In 2011, the European Commission adopted the Resource Efficiency Flagship Europe initiative along with a Roadmap for Resource Efficient Europe, as part of the Europe 2020 strategy¹⁰. The communication made it clear that resource efficiency is fundamental to a low-carbon economy for the EU. Its scope was strategically linked to climate change and all related sectors in environment and regional development. The roadmap set forth

an integrated approach, transition across sectors using all available policy instruments, supporting research and innovation, setting up of milestones and common indicators and emphasising on life-cycle data for a resource efficient economy for all EU member states. Key stakeholders were engaged, major sectors and priority measures were identified.

While resource efficiency policies continued to evolve, taking one step forward in 2015, the Commission adopted the EU action plan for a circular economy¹¹. This, eventually, has reflected into a remarkable shift in national policies across EU member states from their focus on resource efficiency towards the broader circular economy perspective. The policy formalised the use of resource productivity indicator and material flow accounting data and made it mandatory for the countries to report the database to Eurostat. Eurostat published its resource efficiency scoreboard¹² - a first ever - in 2013, marking the criticality of transparency in resource efficient governance.

2.2 National and sub-national policies in Europe

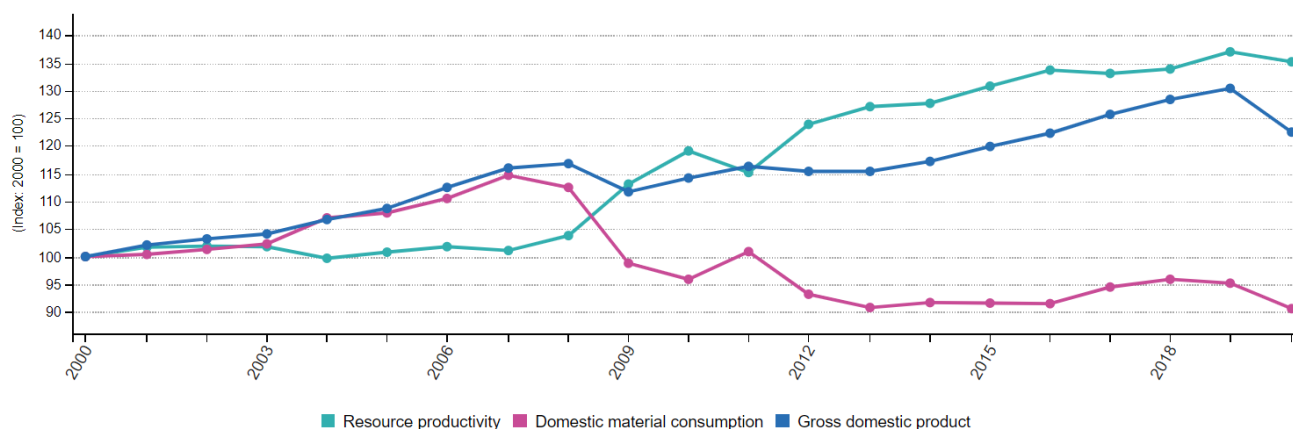
The EU flagship was followed with formulation

¹⁰ European Commission. 2011. [Roadmap to a resource efficient Europe](#)

¹¹ European Commission. 2015. [Closing the loop - An EU action plan for the Circular Economy](#).

¹² Eurostat. 2022. [Database](#).

FIGURE 3: INCREASING RESOURCE PRODUCTIVITY IN EU WITH DECOUPLING OF GDP AND DOMESTIC MATERIAL CONSUMPTION, 2000-2020



Source: [European Commission. 2021. Resource productivity statistics \(Eurostat\).](#)

of a number of dedicated national policies, strategies, roadmaps on material resource efficiency and/or circular economy. Germany adopted the German Resource Efficiency Programme (ProgRes)¹³ in 2012, updating it through a participatory process every 4 years since then in 2016 and 2020. ProgRes aims for economic decoupling of natural resource consumption through prioritising ecological necessities, reducing dependence on primary raw materials and social orientation across the value chain along with market incentives, research and innovation and voluntary measures. Finland published its national roadmap to a circular economy in 2016, updating in 2019 as roadmap 2.0 focusing on economical use of resources¹⁴. Scotland, Ireland and Wales (United Kingdom) integrated their national waste management or waste prevention programmes into policies with a broader resource efficiency scope¹⁵ ¹⁶. Belgium, Denmark, France, Italy, the Netherlands, Portugal and Slovenia have also adopted national level policy documents on circular economy. National policies started

to be rolled out also at sub-national level in Finland, Belgium (Flanders and Brussels) and UK (Scotland and Wales). City level action plans also emerged in London and Peterborough in England. Several autonomous communities in Spain also initiated working towards having their own circular economy policies¹⁷.

2.3 India's case for resource efficiency

2.3.1. Material use trend and need for resource efficiency

Between 1970 to 2010, India's material extraction increased by about 420%, with non-metallic minerals showing the highest growth reflecting the growth of the construction sector¹⁸. Population growth, urbanisation, industrialisation and economic convergence has led to a rapid increase in India's domestic material consumption along with its GDP, driving the material use growth. India extracted the second highest amount of materials (7.6%) in the world after China in 2017, though the per capita material extraction of the country remained lowest

¹³ BMUV, Federal Republic of Germany. 2022. [German Resource Efficiency Programme \(ProgRes\) – an overview.](#)

¹⁴ SITRA. 2022. [The critical move: Finland's road map to the circular economy 2.0](#)

¹⁵ Environmental Protection Agency (EPA). 2014. [Towards a resource efficient Ireland: a national strategy to 2020.](#)

¹⁶ Natural Scotland, Scottish Government. 2013. [Zero waste. Safeguarding Scotland's resources: blueprint for a more resource efficient and circular economy](#)

¹⁷ European Environmental Agency (EEA). 2019. [Resource efficiency and the circular economy in Europe 2019 – even more from less.](#) EEA Report No 26/2019/1994-2019.

¹⁸ GIZ. 2017. [Policy brief: Recommendations for an Indian Resource Efficiency Programme \(IREP\)](#)

(5.2 tonnes per capita) of the world's top ten largest extractors. India's import dependency also shows a fast increasing pattern for direct trade of materials, making it the third highest net importer in the world in 2017¹⁹. These trends in India makes it an alarming case for the country to focus on building a material-efficient economy.

India took a pledge for net zero emissions by 2070 at the UNFCCC's COP26 summit. This came with other ambitious targets including, cutting down projected carbon emission by one billion tonnes and reducing carbon intensity of the economy over 2005 levels by 45% by 2030²⁰. Besides, meeting the SDGs are already a national priority for the country which demands ensuring equal distribution of and access to natural resources. Hence, mainstreaming resource efficiency into the policies and practices becomes fundamental for the country to achieve these targets through increasing resource demand and growing population. Resource efficiency and circular economy approach can have multiple economic, social and environmental benefits in the sustainable development matrix, which can act as the drivers for their national policy integration (Fig 4).

2.3.2. Ambits of the existing associated policies

Though climate change has played the central role in shaping up of India's developmental policies in the last decade, mitigation is more of a recent wakeup call and mostly remained limited within the energy sector. Many of these climate and other sectoral policies influence resource use at different stages of product lifecycle, ranging from mining to manufacturing, consumption and end-of-use management. Yet resource efficiency was neither blended in the design of these policies nor approached in the practice. Circular economy, naturally, remained entirely uncharted in India's economic transition.

India's National Action Plan for Climate Change (NAPCC), adopted in 2008, has eight missions and all have mitigation aspects and potential. But the subsequent rolling out of the plan at the state levels (State Action

FIGURE 4: DRIVERS OF RESOURCE EFFICIENCY IN INDIA



Source: The author

Plans for Climate Change) were broadly adaptation focused. National Mission for Enhanced Energy Efficiency, National Mission for Sustainable Agriculture, National Water Mission, and Smart Cities Mission under the climate umbrella come closest to contributing partly to resource efficiency as a co-benefit to their objective but not integrated as design. Some of India's energy efficiency flagship programmes, like, Perform Achieve and Trade (PAT), Energy Efficiency Financing Platform (EEFP), Framework for Energy Efficient Economic Development (FEEED) and Market transformation for Energy Efficiency (MTEE), focus on bringing energy efficiency in industry and business through energy saving certificates, risk financing and capacity building. The Smart Cities programme under the National Sustainable Habitat and Smart City Mission – the largest pan-India public policy effort for sustainable urban development – has climate

19 UNEP & IRP. 2016. [Global material flows and resource productivity: assessment report for the UNEP International Resource Panel](#).
20 Ministry of Environment, Forest and Climate Change (MoEF&CC). 2022. [India's stand at COP-26](#). By PIB Delhi.

resilience as crosscutting theme and resource efficiency as partial co-benefit, but neither any focus on mitigation nor any strategic plan for increasing material efficiency.

Likewise, there is no strategic integration of material efficiency in the policies related to mining, designing, manufacturing and end-of-use management. National Mineral Policy aims for zero waste mining and emphasizes upgrading mining technologies but efficient extraction including extraction of associated metals along with major metals still need to be addressed. Regulations, policies and flagship schemes related to housing, trade and manufacturing, such as the National Housing and Habitat Policy, Make in India, National Manufacturing Policy, State Industrial Policies, etc. also does not align for a material efficient economy. For end-of-use management, India has regulations to tackle all types of wastes, including, solid waste, e-waste, bio-medical waste, battery waste, plastic waste, construction & demolition waste and hazardous waste. However, their enforcement, accountability for extended producer responsibility (EPR), effectiveness to bring in a closed-loop cycle is limited due to lack of resource, absence of appropriate business models and a unifying framework, exclusion of the informal sector, etc.

Resource efficiency though, remained sub-optimal in India's economic growth owing to the lack of a strategic integration and dedicated policy, but the public policy structure in India across sectors holds immense scope for a fast and efficient implementation, once initiated.

2.3.3. The draft National Resource Efficiency Policy²¹

Ministry of Environment, Forest & Climate Change, Government of India has published a draft National Resource Efficiency policy in 2019 which was open for comments but not yet adopted. The draft, a result of the European Union's Resource Efficiency Initiative (EU-REI) for India project, proposes an outline for charting the ways towards resource efficiency. Major aspects of this draft policy proposes to:

- Cover all material and natural resources: metals, non-metallic minerals, air, water, land, biomass, fossil fuels.
- Identify priority sectors as construction, transport, plastic, packaging, waste electrical and electronic equipment, agriculture, metal industry, textile, renewable energy, food. Waste is treated as a separate single largest priority area across resources and sectors.
- Plan, develop and introduce indicators of resource productivity, domestic material consumption, domestic material extraction and direct material input, to track resource efficiency. Sector specific indicators, like recovery rate, primary and secondary raw material used, environmental emissions, etc are also planned.
- Set targets for identified priority sectors and plans to build on them complementing SDGs.
- Set up a dedicated National Resource Efficiency Authority with defined roles of mainstreaming the approach, developing action plan, establishing targets, set standards and guidelines, create and maintain database, measure progress, establish audit mechanisms, support collaborations, provide training, etc.
- Identify some policy instruments, like, addressing regulatory gap to make it a feasible policy for implementation, innovative market-based instrument, green public procurement, supporting recycling & recovery, strengthening product responsibility (extended producer responsibility & shared responsibility), creation of resource efficient business models, stakeholder awareness and capacity development and R&D.

The EU-REI initiative along with NITI Aayog – the public policy think-tank of Govt of India, has also published detailed strategy papers on steel, aluminium, construction and demolition, e-vehicle and electrical and electronic equipment sector²².

²¹ MoEF&CC, Govt of India. 2019. [National resource efficiency policy, 2019 \(draft\)](#)

²² EU-REI. 2019. [Resource Efficiency Initiative: Publications](#)

3. RECOMMENDATIONS: TRACING THE MISSING POLICY LINKS FOR INDIA

The draft resource efficiency policy established a baseline to begin stepping in the right direction, but to effectively address and decouple as growing and diverse an economy as India's, the policy needs to be inclusive, detailed and innovative. Inclusive of all India's critical economic sectors, detailed in addressing the gaps with right and effective policy instruments and innovative in identifying best cases and designing sector wise economic incentives. Taking Europe's best policies and practices as a case from a resource efficient to a circular economy, this section provides a need-based analytical overview for India to address its policy gaps considering the existing draft policy to decouple the economic growth from resource consumption and environmental impacts through a circular economy approach.

3.3.1. Making priority sectors & targets comprehensive

- **Sectors:** Priority sectors identified in the draft policy though include the majority of India's biggest and concerning sectors, however, it misses out critical sectors like, mining, manufacturing, mobility, forestry and tourism which are also relevant from different state perspectives. A national policy for resource efficiency has to include all state relevant priority sectors to make it inclusive and applicable for a roll out at state level.
- **Targets:** The need to set up measurable targets for each identified sector is already recognised in the draft policy, however, the targets only focus on end-of-use management, more specifically, targets for recycling, recovery and increasing share of recycled and recovered materials. Achieving circular economy would require sector wise quantitative targets for upstream, midstream and downstream, including, targets to reduce use of primary and non-renewable raw materials, harmful or hazardous substances and material intensity during

FIGURE 5: ADOPTING A NATIONAL RESOURCE EFFICIENCY POLICY FOR INDIA AS A GLANCE



Source: The author

production; reducing energy and water intensity across value chain; improving quality of design, recycling and recovery; minimising associated environmental pressures, reducing GHG emissions, reducing consumption in service sector, communication and education for a circular economy.

- **Raw materials:** Raw materials are the capital for primary sectors such as agriculture, fishing, mining, oil & gas extraction, which directly uses natural resources. Protection of raw materials is essential for sustainable and circular economy which can be endorsed through: a) Identification of critical raw materials in terms of industry demands, primary availability and economy at national and state level through surveys and research, b) compiling data for critical raw materials' domestic extraction, imports, exports

and demand projections, c) implement a strategy for and intensify research on substitution of critical raw materials, d) developing raw material strategies to use waste as a domestic source of raw materials, particularly for mining and construction, e) create national raw material platform for building a network of associated industries and organisations to work toward sustainable mining and raw material use, f) introduce raw material certification for compliance with environmental and social minimum standards.

- **Mining:** India is rich in primary raw materials and mining is one of its major and one of the most polluting industries. Sustainable mining should be looked at through: a) developing sustainable mining standards, including eco-labelling, product and environmental standards, star rating systems, etc., b) investing into indigenous technology development for co-production of by-product minerals, c) promoting sustainable public procurement, d) developing and promoting best practices on green mining technologies and practices, e) introducing economic rewards or subsidies for resource efficient mining, f) bringing regulatory reforms through holistic mining plans and scientific mine closure.
- **Forestry:** As a primary sector, forestry needs to be integrated into the policy framework to establish circular bioeconomy through closing forest-based loops by securing both conservation and promotion of forest industry. This can be achieved by a) the use of new technologies for sustainable forest management in improving monitoring, renewal and productivity of forest, b) value addition to forest products by diversifying manufacturing industries, c) promotion of wood based smart packaging and bioplastics in retail and consumer sector, d) aligning National Forest Policy for maximising value of forest based products, e) supporting demonstration of bioproducts and bio-services on a commercial basis to increase the share of

public procurement, f) exporting support for innovative bioproducts.

- **Manufacturing/production:** Material efficiency in manufacturing is key to achieving a circular economy. This can be initiated as voluntary agreements and can gradually transition to obligatory norms. This can be achieved by: a) introducing and intensifying information exchange on material and energy-efficient technologies and processes for industries to be able to upgrade and identify the products to be separated at the end of life cycle or repaired and maintained to be brought onto the market, b) funding small and medium enterprises (MSMEs) for transition to material and energy-efficient technologies and processes, c) introducing minimum information requirement on material and energy efficiency, lifetime, recyclability of products and set standards.

3.3.2. Addressing gaps in sectors already identified in the draft policy

- **Waste management:** An overarching National Waste Plan can be adopted connecting all the existing waste regulations with defined measures to achieve circular economy principles in the area of waste management with a focus on : a) ensuring implementation of waste regulations and extended producer responsibility, b) combating food waste with food waste prevention targets at retail and consumer level and along production and supply chains; reduced food waste in the tourism sector through voluntary agreements with food producers, c) landfill bans, d) reducing incineration of plastic and limit percentage of waste incineration, e) introducing maximum limit for household residual waste at community level and reducing the limit over time, f) cap on energy recovery or energy recovery is limited to non-recyclable materials, g) improving the quality of recycling to ensure the secondary materials produced are suitable for further application and durable.

- **Building:** Building, is another sector, which has significantly high material (cement, aluminium, steel, etc.) consumption intensity, thereby, needs robust and efficient policies to speed up the circular economy integration. This can be reached by a) introducing policies which factor in the environmental impacts across life-cycle of buildings and infrastructure, including construction and demolition waste, b) strengthening policies for improving resource and energy use during the life-cycle with improved sustainable materials, design, higher waste recycling and use of renewable energy in buildings, which would require engagement of the whole value chain in construction sector, c) developing policies to stimulate MSMEs, which constitute majority of the sector, to train and invest in resource efficient building methods and practices, d) setting resource efficient targets for the renovation and construction of buildings and infrastructure, f) promoting net zero energy and material efficiency for all new buildings.
- **Product value chain:** Circular economy needs to be integrated along the product value chain as part of the corporate strategies for effective transition of products from linear to a circular model of consumption. This can be achieved by engaging at various levels, such as:
 - a. use: extending product lifetime by promoting better servicing, repair and change of parts, trade and markets of used goods,
 - b. consumer: creating consumer demand for sustainable products by improving consumer information and promoting resource-efficient lifestyles,
 - c. business to business: leveraging collaborations to directly solve the barriers through promoting innovations, technology and partnership; ensuring repair of parts instead of single use parts across the ancillary industries,
 - d. retail: promoting and offering more

sustainable alternatives; minimising food waste; informing customers about maintenance and repair services, environmental impacts, materials and further use in life cycle.

- Establish alignment with economy and energy across sectors.

3.3.3. Strengthening of indicators, building on data and analysis

- Strengthening indicators and increasing indicator coverage to include and account materials requirement for domestic extraction, production, export, import, trade dependency, upstream and downstream potential and pressure on natural resource consumption. Adoption of indicators for, a) imports and exports of materials, b) raw material equivalents of imports and exports, c) physical and raw material trade balance, d) material footprint of consumption, e) material intensity and adjusted material intensity for trade. Material footprint indicator reflects material standard of living by taking into account of materials required for final demand including consumption and capital investment.
- Digitisation and open data is critical in building circular economy. Create a centralised open data platform with data on resource conservation from across sectors and states. This would require introducing a process of methodological harmonization for national/state level material flow accounts. Central guidebooks also need to be developed.

3.3.4. Taking actions at Policy Level

- **Sectoral policies:** All sectoral policies need to be updated with a resource efficiency and circular economy approach to align with the national policy in contributing to its targets, data analytics, monitoring and implementation. In some cases, new sectoral policies, like, right to repair, metals recycling policy need to be explored with appropriate needs assessment and supportive framework.
- **Sub-national policies:** Enabling the transition towards circular economy in the medium- and long-term would require

right policy support at the state level of rolling out of the state resource efficiency policies, given India's federal governance structure and policy reporting framework for environment, climate and economy as sectors.

- Promote circular cities and circular communities as models through policy interventions, support local governments to better align economic development policies with resource efficiency objectives and closing regional material cycle.
- Introduce regulatory instruments for eco-design, eco-labelling, resource efficiency standards, obligations and responsibilities.
- Prepare a national roadmap for scheduled actions in the policy including planning, intermediate assessment, securing of funds, implementation.

3.3.5. Establishing circular business and financing mechanism

- Circular business models can be unprofitable at the beginning due to lack of market and economic challenges, insufficient skills and inadequate legislation. The draft policy proposes a 'viability gap funding' and 'dedicated green fund' for circular business models and a national sustainable public procurement as well to promote green public procurement. However, use of appropriate fiscal instruments is also crucial to stimulate innovation and business opportunities which can be initiated through:
 - a. introducing incentives to create markets for secondary materials,
 - b. greening all public and private investments,
 - c. boosting existing markets for waste and recycled raw materials,
 - d. introducing market-oriented measures: economic instruments, like, environmental taxation for environmental impact, pollution, etc to increase its share in public revenue, fees and charges for users, resource efficiency trade certificates, green finances, green procurement,

subsidies and permits in key economic sectors,

- e. establishing regular monitoring of market developments in resource-efficient products, including introduction of a market index, f) conducting sustainability impact assessment for subsidies,
- f. conducting sustainability impact assessment for subsidies,
- g. adopting resource efficiency programmes by public development banks and other players and developing innovative resource efficiency funding instruments.

3.3.6. Developing capacities and building awareness

- Resource efficiency consultancy: enhance competence pool, create nationwide consulting, provide consulting services for MSMEs and other businesses, local governments.
- Setting up resource efficiency networks across stakeholders, including, businesses, policy makers, local governments, informal sector, research institutions, end-of-use management companies to drive systemic change; create platforms which can bring the synergy, like, national raw material platform, for multi-stakeholder collaboration along the value chain.

4. CONCLUSION

There has already been a growing consensus amongst countries looking for climate neutrality or net zero that resource efficiency will be fundamental in this transition. India, too is aiming for a faster emission reduction and has already introduced a draft National Resource Efficiency Policy in 2019. A National Resource Efficiency Committee and a task force has also been set up which are currently in the process of engaging with representative stakeholders for different key sectors. This is a watershed moment for India to reshape its economic model for a sustainable growth and consumption. The European Union has been a fore-runner in bringing policy reforms for integrating resource efficiency and now approaching towards circular economy.

While the developmental challenges make India's case very different from the EU countries, but a framework for a resource efficient economy must be adopted formally to align all India's major economic sectors, critical developmental needs and environmental commitments. This policy brief looks closely at EU's adopted policies and practices and India's existing policy frameworks and recommends critical missing links for India to adopt a National Resource Efficiency Policy.

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Co-funded by the
Erasmus+ Programme
of the European Union

The European Commission supports the EUI through the European Union budget. This publication reflects the views only of the author(s), and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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doi: 10.2870/401017
ISBN:978-92-9466-174-6
ISSN: 2600-271X
QM-BA-22-015-EN-N

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