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THE MISSING PIECE OF THE EU GREEN DEAL

The case for an EU resources law

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The case for an EU resources law

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ABBREVIATIONS

CBAM	Carbon Border Adjustment Mechanism
CBDR – RC	Common But Differentiated Responsibilities and Respective Capabilities
CE	Circular Economy
CEAP	Circular Economy Action Plan
CRMA	Critical Raw Materials Act
CRM	Critical Raw Materials
CSDDD	Corporate Sustainable Due Diligence Directive
DG	European Commission's Directorate General
DG AGRI	Directorate-General for Agriculture and Rural Development
DG BUDG	Directorate-General for Budget
DG CLIMA	Directorate-General for Climate Action
DG COMP	Directorate General for Competition
DG ECFIN	Directorate General for Economic and Financial Affairs
DG EMPL	Directorate General for Employment, Social Affairs and Inclusion
DG ENER	Directorate General for Energy
DG ENV	Directorate-General for Environment
DG GROW	Directorate General for Internal Market, Industry, Entrepreneurship and SMEs
DG INTPA	Directorate-General for International Partnerships
DG MARE	Directorate-General for Maritime Affairs and Fisheries
DG MOVE	Directorate-General for Mobility and Transport
DG REGIO	Directorate-General for Regional and Urban Policy
DG RTD	Directorate General for Research and Innovation
DG TAXUD	Directorate-General for Taxation and Customs Union
DG TRADE	Directorate-General for Trade
DMC	Domestic Material Consumption
DMI	Domestic Material Input
ECA	European Court of Auditors
EGD	European Green Deal
EEA	European Environment Agency
EEB	European Environmental Bureau
ELV	End-of-Life Vehicles
EPP	European People's Party
EPR	Extended Producer Responsibility
ESPR	Ecodesign for Sustainable Products Regulation
EU	European Union
EUROSTAT	European statistics – Statistical Office of the European Union
FTA	Free Trade Agreement
GARCERE	Global Alliance on the Circular Economy and Resource Efficiency

GDP	Gross Domestic Product
GHG	Greenhouse Gas
ICT	Information Communication Technology
IPCC	Intergovernmental Panel on Climate Change
IRP	International Resource Panel
JRC	Joint-Research Centre
LDCs	Least Developed Countries
MhA	Million hectares
NECP	National Energy and Climate Plan
OECD	Organization of Economic Cooperation and Development
RMC	Raw Material Consumption
SDG	Sustainable Development Goal
SG	European Commission's Secretariat General
TFEU	Treaty on the Functioning of the European Union
UNEP	United Nations Environment Programme
WEEE	Waste from Electrical and Electronic Equipment

Inhoud

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GLOSSARY

Circularity Rate/Circular Material Use Rate	The circularity rate is part of the EU monitoring framework on the circular economy. The circular material use rate indicator measures the share of material recycled and fed back into the economy - thus saving extraction of primary raw materials - in overall material use. The circular material use, also known as circularity rate, is defined as the ratio of the circular use of materials to the overall material use. The overall material use is measured by summing up the aggregate domestic material consumption (DMC) and the circular use of materials. The circular use of materials is approximated by the amount of waste recycled in domestic recovery plants minus imported waste destined for recovery plus exported waste destined for recovery abroad. A higher circularity rate value means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material. (*Source:* EUROSTAT)
Material Resources	In this report, material resources include fossil fuels, non-metallic minerals, metals, and biomass.
Natural Resources	In this report, natural resources are considered as the stocks of materials that exist in the natural environment. This term is conceived as broader than material resources. It includes material resources, as well as other resources such as soil, air, water etc.
Planetary Boundaries	Earth system processes that are considered vital for human survival, referenced as "planetary boundaries". These are: 1 *Climate change*: the effect of carbon and methane emissions on increasing global warming 2 *Ocean acidification*: the effect of carbon emissions on increasing acidification on the ocean 3 *Chemical pollution*: the effect of toxic material released into natural environment 4 *Biochemical flows, namely interference with the phosphorus and nitrogen cycles*: the effect of fertilizer in natural environments 5 *Freshwater use*: the effect of depleting freshwater sources 6 *Land system change*: the effect of converting natural environments into land for economic activity 7 *Change in biosphere integrity* (driven by biodiversity loss): the effect of economic activity on reduction or extinction of species 8 *Atmospheric aerosol loading*: the effect of aerosol emission on the health of species and precipitations

	9 *Stratospheric ozone depletion*: the effect of chemicals on the ozone layer "A safe operating space" is a precautionary quantitative planetary boundary for most of the nine categories within which humanity can continue to develop. Crossing these boundaries risks generating irreversible environmental changes with potentially catastrophic results for human development. Recent estimates suggests that humanity has already transgressed four of the nine boundaries: climate change, biodiversity loss, land systems change and biochemical cycles. (*Source*: Joint EEA/FOEN Report "Is Europe living within the limits of our planet?")
Resource Efficiency	Resource efficiency describes the overarching goals of increasing human well-being and economic growth while lowering the amount of resources required, and negative environmental impacts associated with resource use (doing better with less). In technical terms, resource efficiency means optimizing resource use by achieving higher outputs with lower inputs. Indicators or resource efficiency include resource productivity. (*Source*: IRP Glossary)
Resource Productivity	Resource productivity describes the economic gains achieved through resource efficiency. It depicts the value obtained from a certain amount of natural resources. At the macro-economic level, EUROSTAT measures it as the ratio between economic activity – expressed by gross domestic product (GDP) – and domestic material consumption (DMC). Resource productivity is the inverse of resource intensity. (*Source:* IRP and EUROSTAT)
Waste Hierarchy	Ranking system used for different waste management options according to their environmental benefits.
Consumption footprint	Comparing consumption to the planetary boundaries for 16 impact categories based on a life-cycle assessment and according to the 5 main areas of consumption (food, mobility, housing, households goods and appliances). (*Source*: EUROSTAT)
GHG emissions from production activities	Measuring the GHG emissions produced by production sectors (therefore excluding emissions from households) and reflecting the contribution of the circular economy to climate neutrality. (*Source*: EUROSTAT)
Material dependency	Measuring the share of imported materials on overall material use, describing how much the EU depends on imports of materials and reflects the contribution of the circular economy to security of supply of materials and energy and to the EU's open strategic autonomy. An indicator of self-sufficiency for raw materials has been used since 2018. (*Source*: EUROSTAT)

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Unless agreed otherwise, this report does not reference interviewees by name. Instead, their contributions are incorporated in our general arguments or through broad references to the interviewees' professional affiliations. The interviewees were associated with the following organizations:

- The European Commission (DG ENV and DG CLIMA)
- The Government of Finland
- Systemiq
- The Organization of Economic Cooperation and Development (OECD)
- The European Environment Agency (EEA)
- Chatham House
- The Government of The Netherlands
- The European Environmental Bureau (EEB)

This list is provided for transparency purposes. Any reference included in this report does not imply an official position expressed by any of these organizations.

SAMENVATTING

De EU Green Deal kan pas succesvol zijn als eerst de onderliggende oorzaak van de drievoudige milieucrisis van klimaatverandering, vervuiling en biodiversiteitsverlies aangepakt wordt. En die oorzaak is de overexploitatie van materiële hulpbronnen. Want de EU verbruikt meer dan haar billijke deel – met een consumptieniveau dat bijna dubbel zo hoog ligt als een duurzaam niveau. Het verbruik van materiële hulpbronnen aan banden leggen door middel van een EU wet voor materiële hulpbronnen is cruciaal om de viervoudige doelstellingen van het EU Circular Economy Action Plan te verwezenlijken en binnen de planetaire grenzen te blijven. Bovendien zal de EU haar doelstellingen op het gebied van klimaatverandering niet halen als er geen vooruitgang wordt geboekt op het gebied van het gebruik van hulpbronnen.

Een EU wet voor materiële hulpbronnen is geen tegenwicht voor de groeiende Europese welvaart. Het is daarentegen een nieuwe aanpak die voldoet aan menselijke behoeften met minder materiële hulpbronnen. Die aanpak bestaat uit een EU-systeemveranderingsbenadering met focus op de servicificatie van de economie, slim industriebeleid en materiële ontkoppeling.

Waarom een EU wet voor materiële hulpbronnen noodzakelijk is

Er zijn vier belangrijke redenen om een EU wet voor materiële hulpbronnen te ontwikkelen:

- De terugdringing van de overconsumptie in de EU
- De aanpak van de tekortkomingen van het Circular Economy Action Plan
- De ontwikkeling van een coherente milieuaanpak op EU-niveau
- Het aanboren van de groeiende belangstelling voor het verbruik van materiële hulpbronnen.

Terugdringen van de overconsumptie in de EU

Volgens een rapport van het International Resources Panel ligt de huidige wereldwijde materiaalvoetafdruk boven de ecologische grenzen van meer dan 100 ton per jaar – een cijfer dat naar verwachting de komende 40 jaar gaat verdubbelen. De EU verbruikt meer dan haar billijke deel van de materiële middelen. De materiaalvoetafdruk van de EU -dat is de totale hoeveelheid gewonnen grondstoffen die nodig is om de goederen en diensten te produceren die door inwoners van de EU worden geconsumeerd- piekte op 18 ton per hoofd van de bevolking in 2007/2008, net voor de financiële crisis. In 2021 bedroeg die 14,1 ton per hoofd van de bevolking, wat het dubbele is van het duurzame consumptieniveau. Dit heeft ertoe geleid dat de EU al vijf planetaire grenzen heeft overschreden: fijnstof, ecotoxiciteit in zoet water, klimaatverandering, gebruik van producten op basis van fossiele brandstoffen en gebruik van minerale en metalen hulpbronnen.

De tekortkomingen van het Circular Economy Action Plan (CEAP) aanpakken

In 2020 keurde de EU haar tweede actieplan goed met vier overkoepelende doelstellingen:

- De overgang versnellen naar een regeneratief groeimodel dat de planeet meer teruggeeft dan neemt
- Het verbruik van hulpbronnen binnen de grenzen van de planeet houden
- De consumptievoetafdruk van de EU verkleinen
- Het circulair materiaalgebruik in het komende decennium verdubbelen.

Het actieplan voor de circulaire economie bevat 35 kernacties om deze doelstellingen te verwezenlijken. De overgrote meerderheid van deze interventies wil echter de negatieve effecten van de huidige lineaire economie aanpakken door een beter productontwerp, een verhoging van de hulpbronnenefficiëntie door middel van reparatie en hergebruik, en een beter beheer aan het einde van de levensduur van producten. Deze interventies komen overeen met de onderste drie categorieën in de afvalhiërarchie - een rangschikkingssysteem voor verschillende afvalbeheeropties op basis van hun milieuvoordelen. De kernactiviteiten van het Circular Economy Action Plan en de bijbehorende wetgevingsvoorstellen/rechtsinstrumenten richten zich dus niet op het hoogste echelon van de afvalhiërarchie. Het zijn juist deze hogere niveaus die ernaar streven de behoefte aan producten of hulpbronnen tot een minimum te beperken door een beter systeemontwerp.

Het actieplan voor de circulaire economie wil graag binnen de grenzen van de planeet blijven door de consumptievoetafdruk van de EU te verkleinen of een reboundeffect voorkomen waarbij de netto productiviteitswinst verloren gaat in een groeiende totale consumptie. Het CEAP en de bijbehorende actieplannen en wetsvoorstellen/rechtsinstrumenten op zich zijn echter ontoereikend voor een paradigmaverschuiving in het gebruik van hulpbronnen.

Ontwikkeling van een coherente aanpak op EU-niveau

Decarbonisatie en dematerialisatie moeten hand in hand gaan. Klimaat- en energiemodellen bevestigen dat absolute reducties in het gebruik van energie en natuurlijke hulpbronnen de uitstoot van broeikasgassen aanzienlijk kunnen verminderen. Door decarbonisatie te koppelen aan dematerialisatiestrategieën worden onbedoelde negatieve gevolgen van de groene transitie vermeden. Om de netto nul doelstellingen te halen zou de totale vraag naar materialen kunnen verzesvoudigen om te voldoen aan de doelstellingen voor schone energie van verschillende mitigatiebenaderingen. Evenzo heeft een lager verbruik van materiële hulpbronnen in de EU het potentieel om de veerkracht van de EU te vergroten en de "strategische autonomie" van de EU te bereiken. De EU is sterk afhankelijk van een aantal landen voor de invoer van deze kritieke grondstoffen (CRMs) en probeert door de goedkeuring van de Critical Raw Materials Act (CRMA) de toegang tot deze materialen veilig te stellen. Door het verbruik van materiële hulpbronnen terug te dringen kan de EU haar doelstellingen op het gebied van strategische autonomie makkelijker realiseren. Ze vermindert dan immers haar afhankelijkheid van externe bronnen voor kritieke grondstoffen en vermijdt dat haar afhankelijkheid van fossiele brandstoffen wordt vervangen door een afhankelijkheid van niet-energetische grondstoffen.

Inspelen op de groeiende belangstelling

Hoewel de wetenschap duidelijk stelt dat het belangrijk is om het gebruik van materiële hulpbronnen aan te pakken, is dit een blinde vlek in de EU Green Deal. Dit is deels te wijten aan de ingrijpende economische verschuivingen die in alle sectoren nodig zijn, in combinatie met innovatieve bedrijfsmodellen. Er lijkt echter een groeiend bewustzijn te zijn -ook bij een deel van de beleidsmakers in de EU- dat de vermindering van materiële hulpbronnen een cruciaal onderdeel van de milieuagenda van de EU moet zijn.

Strategieën voor de circulaire economie van de EU-lidstaten

Hoewel het Circular Economy Action Plan de EU-lidstaten niet verplicht om een actieplan voor de circulaire economie vast te stellen, hebben drieëntwintig EU-lidstaten sinds 2023 een nationaal beleid voor de circulaire economie opgesteld. In sommige landen, zoals België en Nederland, spelen regionale en sub-nationale initiatieven ook een belangrijke rol bij de verdere ontwikkeling van de nationale strategie. Over het algemeen richten de EU-lidstaten zich op het gebied van de circulaire economie op afvalbeheer en efficiënt gebruik van hulpbronnen, wat een weerspiegeling is van de prioriteiten die op EU-niveau zijn vastgesteld. Vier EU-lidstaten hebben streefcijfers opgesteld om het absolute verbruik van materiële hulpbronnen te beperken of te verminderen. Het zijn Oostenrijk, België (Vlaanderen en Wallonië), Finland en Nederland. Deze landen streven ernaar om het materiaalverbruik of de materiaalvoetafdruk in de toekomst met een bepaald percentage te verminderen in een bepaald jaar ten opzichte van een basislijn. Het is echter geen juridische verplichting. Dit weerspiegelt het vermeende "first-mover"-risico bij het vaststellen van bindende doelstellingen, bezorgdheid over een gelijk speelveld binnen de EU, en politieke druk.

Ontwikkeling van de contouren van een EU wet voor materiële hulpbronnen

Dit rapport bespreekt verschillende instrumenten voor een EU wet voor materiële hulpbronnen en concludeert dat deze wet in de vorm van een verordening moet komen. Voorts wijst het op verschillende kwesties waarmee men rekening moet houden bij de vraag of de regulering van de interne markt of milieubescherming de rechtsgrondslag moet zijn van de EU wet voor materiële hulpbronnen. Op basis van de EU-klimaatwet en de benaderingen die in de EU-lidstaten zijn gevolgd besluit dit rapport dat een EU wet voor materiële hulpbronnen ten minste de volgende elementen moet bevatten: (i) een streefcijfer voor de vermindering van het verbruik van materiële hulpbronnen, evenals tussentijdse streefcijfers, (ii) sectorspecifieke streefcijfers en specifieke streefcijfers van de EU-lidstaten, gekoppeld aan indicatoren, (iii) een verplichting om een onafhankelijk wetenschappelijk orgaan op te richten dat zich bezighoudt met materiële hulpbronnen (iv) een verplichting voor de EU-lidstaten om nationale plannen voor de vermindering van het verbruik van materiële hulpbronnen op te stellen, (v) een verwijzing naar sectorspecifieke plannen, en (vi) een monitoringmechanisme.

- **Een juridisch bindend streefcijfer:** Reductiedoelstellingen voor het verbruik van hulpbronnen moeten dienen als inspiratiebron voor een overkoepelende visie voor de EU en haar lidstaten. Die zal op haar beurt nieuw beleid op het gebied van de circulaire economie stimuleren. Voor alle andere onderdelen van de economie zal ook rekening moeten worden gehouden met maatregelen aan de vraagzijde. Concreet kan een kerndoel worden vastgelegd hetzij als een relatieve reductiedoelstelling ten opzichte van een referentiejaar hetzij als een absolute doelstelling. Het vastleggen van een absoluut doel moet worden gekoppeld aan wetenschappelijk onderbouwde doelstellingen voor duurzame consumptie.
- **Toepassingsgebied:** Een EU wet voor materiële hulpbronnen moet betrekking hebben op alle materiële hulpbronnen: biomassa, fossiele brandstoffen, mineralen en metalen.
- **Onafhankelijke raad van wetenschappelijke adviseurs:** Bij invoering van de klimaatwet is de Europese wetenschappelijke adviesraad inzake klimaatverandering opgericht, die als onafhankelijke

adviesraad voor klimaatverandering optreedt. In het kader van het beheer van de materiële hulpbronnen moet een soortgelijk wetenschappelijk orgaan worden opgericht.

- **Materiaal-/sectorspecifieke doelstellingen:** Een doelstelling voor de vermindering van hulpbronnen voor de gehele economie zal niet specifiek genoeg zijn om actie in specifieke sectoren of voor bepaalde materialen te stimuleren. Daarom moeten voor afzonderlijke materiaalgroepen en/of specifieke sectoren specifieke verbruiksdoelstellingen worden vastgelegd op basis van hun effect op het milieu. Voor materialen kunnen specifieke streefcijfers worden vastgesteld voor kritieke materiële hulpbronnen, materialen waarvan de winning en het gebruik een hoge milieudruk uitoefenen en/of materialen die rechtstreeks bijdragen aan de klimaatcrisis, zoals fossiele brandstoffen. Er kunnen sectorspecifieke streefcijfers worden vastgelegd voor sectoren met een hoog materiaalgebruik, zoals vervoer, huishoudelijke consumptie, bouw en bouwnijverheid, landbouw en overheidsuitgaven. Sommige hiervan overlappen met de prioritaire sectoren van het actieplan voor de circulaire economie.
- **Indicatoren:** Dit rapport kijkt naar verschillende indicatoren, waaronder direct verbruik, gemeten aan de hand van het binnenlands materiaalverbruik (DMC), en de materiaalvoetafdruk, gemeten aan de hand van RMC**.** Beide indicatoren moeten worden opgenomen aangezien zij verschillende informatie verschaffen. De materiaalvoetafdrukindicator is waardevol omdat deze meting rekening houdt met materiële hulpbronnen voor de productie in land A maar consumptie in land B. DMC geeft een beeld van de territoriale consumptie. Een andere indicator die moet worden opgenomen is de consumptievoetafdruk van de EU. Die beoordeelt aan de hand van een levenscyclusanalyse of de consumptie in specifieke sectoren binnen de grenzen van de planeet past.
- **Nationale plannen van de EU-lidstaten:** Een belangrijk onderdeel van een EU wet voor materiële hulpbronnen is de verplichting voor de EU-lidstaten om nationale plannen te ontwikkelen over de manier waarop zij de tussentijdse reductiedoelstelling van het verbruik van materiële hulpbronnen willen bereiken. Dit kan men vergelijken met de klimaatwet. De lidstaten maken zich zorgen over de last die gepaard gaat met aanvullende rapportagevereisten. Een manier om deze last te verminderen, is de rapportage over klimaat en materiële hulpbronnen combineren in één geïntegreerd verslag.
- **Uitvoeringsmechanisme:** Net als de EU-klimaatwet moet de EU wet voor materiële middelen vergezeld gaan van een uitvoeringspakket. Dat moet een verordening inzake de verdeling van de inspanningen ontwikkelen, die de verschillende niveaus van circulariteit binnen de EU-lidstaten weerspiegelt, evenals verschillende mogelijkheden om over te schakelen naar een circulaire economie, en om sectorspecifieke plannen en voorschriften te ontwikkelen, zoals regelgeving inzake belastingen.

Institutionele verankering

Gezien het overkoepelende en verstrekkende karakter van een wet voor materiële hulpbronnen moet een dergelijke wet deel uitmaken van een gezamenlijk voorstel van verschillende directoraten-generaal (DG's) van de Europese Commissie. De DG-coalitie moet ten minste bestaan uit het DG Milieu, het DG Klimaatactie

en het DG Interne Markt, Industrie, Ondernemerschap en KMO's. Bovendien beschrijft dit rapport vier specifieke manieren waarop een EU wet voor materiële hulpbronnen in de EU zou kunnen worden ingevoerd:

- **Verankering van een EU wet voor materiële hulpbronnen als onderdeel van een bredere systeembenadering:** Met deze benadering zou de wet voor materiële hulpbronnen deel uitmaken van een bredere systeembenadering. De versnipperde onderdelen van de bestaande EU-regelgeving worden dan samengevoegd tot een bredere, meer systemische aanpak. Deze aanpak zou verder gaan dan een bindende reductiedoelstelling voor het verbruik van materiële hulpbronnen. Men zou bijvoorbeeld de doelstellingen op het gebied van klimaatverandering kunnen koppelen aan de circulaire economie, de strategie voor het industriebeleid van de EU, de digitale markt, en de implicaties voor ontwikkelingslanden.
- **Top-downgerichte aanpak van materiële hulpbronnen:** Deze aanpak gaat voor een op zichzelf staande wet voor materiële hulpbronnen, als ontbrekend onderdeel van de Green Deal van de EU, in lijn met dit rapport. In vergelijking met de vorige aanpak is deze aanpak beperkter, omdat ze zich uitsluitend richt op de invoering van een EU wet voor materiële hulpbronnen binnen de EU. Gezien de politieke inter-DG betrokkenheid die nodig zijn om deze aanpak te bevorderen moet deze benadering worden voortgezet door een sterk leiderschap van de secretaris-generaal, onder leiding van de voorzitter van de Commissie, om DG CLIMA, DG ENV en DG GROW (en mogelijk anderen) opdracht te geven samen te werken.
- **Verankering in de klimaatdoelstelling voor 2040:** Een andere optie is om de nadruk op materiële hulpbronnen te verankeren in de bestaande klimaatdoelstellingen. Volgens de Klimaatwet moeten voor juni 2024 nieuwe tussentijdse doelstellingen voor de vermindering van broeikasgassen in 2040 worden ontwikkeld. Bewijs dat de realisatie van de doelstellingen voor circulariteit van materialen cruciaal is om de doelstellingen voor de vermindering van broeikasgassen te halen, zou een sterk argument kunnen zijn om te pleiten voor de ontwikkeling van robuustere doelstellingen voor de circulaire economie. Door in te grijpen op de winning en productie van materiële hulpbronnen pakken we immers ook een onderliggende oorzaak van klimaatverandering aan. Deze benadering kent echter het risico dat voornamelijk materiële overwegingen als belangrijk worden beschouwd als middel om de doelstellingen op het gebied van klimaatverandering te bereiken.
- **Bottom-up benadering:** In vergelijking met de hierboven beschreven benaderingen houdt de bottom-up benadering in dat een meer organische, geleidelijke benadering wordt gevolgd om dematerialisatie in de EU te integreren. In de eerste plaats zou het de EU-lidstaten verplichten om verslag uit te brengen over belangrijke materiaalindicatoren, zoals de materiaalvoetafdruk en het materiaalverbruik -wat momenteel niet vereist is. In een tweede stap zouden de EU-lidstaten verplicht nationale actieplannen voor de circulaire economie en materialen moeten ontwikkelen. Tegelijkertijd zal een wetenschappelijk orgaan op EU-niveau opgericht worden om aanvullend onderzoek te verrichten naar de veilige operationele ruimte van de EU en duurzame doelstellingen voor materiële hulpbronnen. Deze aanpak benadrukt het belang van bewustwording rond materiële hulpbronnen bij EU-lidstaten en milieu-ngo's, de particuliere sector en burgers. Pas nadat deze elementen zijn ingevoerd, zullen de EU-leiders besprekingen beginnen over de ontwikkeling van een bindende reductiedoelstelling voor het verbruik van hulpbronnen.

Koppeling van een EU wet voor materiële hulpbronnen aan bestaande EU-instrumenten

Een EU wet voor materiële hulpbronnen zou van enorme waarde kunnen zijn voor de bestaande regelgevingsinstrumenten in de EU. Het heeft de mogelijkheid om lacunes in het bestaande EU-beleid aan te pakken, kan helpen om de doelstellingen van het Circular Economy Action Plan te verwezenlijken en kan de EU omvormen tot een circulaire economie. De voorgestelde EU-wetten of wetsvoorstellen over een belasting op huishoudelijk afval, een verplicht minimumgehalte aan gerecycleerd materiaal of een verhoging van de hulpbronnenefficiëntie kunnen *indirect* bijdragen tot een vermindering van het verbruik van materiële hulpbronnen maar leiden niet automatisch hiertoe, deels als gevolg van het reboundeffect.

Een EU wet voor materiële hulpbronnen is ook cruciaal om inconsistenties in de bestaande EU-benaderingen van regelgeving aan te pakken. Momenteel leunt de Europese Commissie sterk op silo's. Als gevolg hiervan ontstaan compromissen en inconsistenties, in tegenstelling tot synergieën die het behalen van meerdere regelgevingsdoelstellingen zouden kunnen faciliteren. Er vinden trade-offs plaats in de EU-aanpak van decarbonisatie, waarbij rekening wordt gehouden met de impact op materialisatie, tussen de energievraag en de biodiversiteitsdoelstellingen, en tussen het uitfaseren van kunststoffen en het uitoefenen van extra druk op biomassa. Door tegelijkertijd aandacht te hebben voor decarbonisatie en dematerialisatie, worden zulke trade-offs geminimaliseerd. Dit zou de EU in staat stellen om meerdere milieucrisissen, waaronder klimaatverandering, biodiversiteitsverlies en vervuiling, in één keer het hoofd te bieden. Het inefficiënte gebruik van materiële hulpbronnen vormt immers de kern van deze drievoudige planetaire crisis.

De aanpak van het verbruik van materiële hulpbronnen is ook cruciaal om de doelstellingen van veel andere bestaande EU-verordeningen te bevorderen. Bijvoorbeeld de doelstellingen op het gebied van "strategische autonomie", de mensenrechten en de bescherming van het milieu in de waardeketens van de EU.

Internationale implicaties van een EU wet voor materiële hulpbronnen

De EU zou internationaal leiderschap kunnen tonen met een EU wet voor materiële hulpbronnen om buitensporige consumptie aan te pakken. Hoewel het herstel van de gezondheid van onze planeet een collectieve en mondiale taak is, heeft de EU een bijzondere verantwoordelijkheid hierin. Dit omwille van haar historische rol als grote uitstoter van koolstof sinds de industriële revolutie en omwille van haar huidige materiaalvoetafdruk. Die ligt ongeveer 40 à 70% hoger dan de beschikbare schattingen van duurzame niveaus om de milieudruk binnen de grenzen van de planeet te houden. Over het algemeen kent het verbruik van materiële hulpbronnen grote ongelijkheden. Landen met een hoog inkomen zijn verantwoordelijk voor 74% van het wereldwijde overtollige materiaalgebruik. Vooral de Verenigde Staten (27%) en de EU (25%) zijn hiervoor verantwoordelijk. China neemt 15% van het wereldwijde overtollige materiaalgebruik voor zijn rekening, terwijl lage- en middeninkomenslanden verantwoordelijk zijn voor slechts 8%.

In de context van de klimaatverandering heeft de EU het voortouw genomen door het eerste klimaatneutrale continent te willen zijn. De Green Deal en de EU-klimaatwet hebben de politieke ambitie van de EU om tegen 2050 koolstofneutraliteit te bereiken, scherpgesteld. Evenzo kan de EU, door een EU wet voor materiële hulpbronnen aan te nemen, leiderschap uitoefenen op het gebied van het verbruik van materiële hulpbronnen.

Bovendien kan het dit op een holistische manier doen. Door een streefcijfer voor de vermindering van het gebruik van materiële hulpbronnen vast te stellen, zou de EU andere grote spelers kunnen inspireren om haar voorbeeld te volgen. Gezien de mondiale marktmacht van de EU zou zij overheidsinstellingen, bedrijven en het maatschappelijk middenveld kunnen mobiliseren en ervoor zorgen dat het gebruik van materiële hulpbronnen een prominentere aandacht krijgt in discussies die relevant zijn voor het milieu.

Door dit te doen zou de EU haar legitimiteit rond de groene agenda kunnen terugwinnen, na het recente verzet tegen haar unilaterale groene handelsagenda.

EXECUTIVE SUMMARY

This report makes the case that, for the EU's Green Deal to be effective, it is critical to target the root cause of the triple environmental crises of climate change, pollution, and biodiversity loss: excessive extraction, production, manufacturing and consumption of material resources. This excess is not evenly distributed in the world: as highlighted in this report, the EU consumes more than its fair share – levels that are almost double the estimated sustainable consumption levels. Addressing material resource consumption by establishing an EU Material Resources Law will be critical to meet the fourfold objectives set out in the Circular Economy Action Plan (CEAP) and stay within planetary boundaries. Moreover, the EU will not achieve its climate change targets without making progress on resource consumption.

Developing an EU Material Resources Law should not be seen in opposition to growing European prosperity. Rather, it suggests a new approach in which human needs are met with less material resources through adopting a system change approach with a focus on the servicification of the economy, smart industrial policy, and decoupling.

The Case for an EU Material Resources Law

There are four main reasons to develop an EU Material Resources Law: (i) to reduce EU overconsumption; (ii) to address shortcomings set out in the CEAP; (iii) to develop a coherent environmental approach at the EU level, and (iv) to tap into growing interests in material resource consumption.

- **Reducing EU overconsumption:** According to data from the International Resources Panel report, global material footprint is already beyond ecological limits above 100 tons per year – a figure that is expected to double over the next 40 years. The EU consumes more than its fair share of material resources. The EU's material footprint (or raw material consumption (RMC)), i.e., the total amount of extracted raw materials needed to produce the goods and services consumed by residents of the EU, peaked at 18 tons per capita in 2007/2008, just before the financial crisis. In 2021, the RMC amounted to 14.1 tonnes per capita, which is double the sustainable consumption level and has led the EU to exceed the planetary boundaries for five impacts - particulate matter, ecotoxicity in freshwater, climate change, use of fossil-fuel-based products, and use of mineral and metal resources.
- **Addressing shortcomings set out in the CEAP:** In 2020, the EU adopted its second CEAP with four overarching objectives: (i) to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes; (ii) to keep its resource consumption within planetary boundaries; (iii) to strive to reduce the EU's consumption footprint; and (iv) to double its circular material use rate in the coming decade. Specifically, the CEAP establishes 35 key actions to accomplish these objectives. The vast majority of these interventions, however, addresses the

negative impacts of the current linear economy by improving product design, resource efficiency through repair and re-use, and the end-of-life management of products, which correspond to the bottom three categories in the waste hierarchy – a ranking system used for different waste management options according to their environmental benefits. The CEAP key actions and associated legislative proposals/legal instruments do not, however, focus on the highest echelon of the waste hierarchy, which seeks to minimize product or resource need through better systems design. On their own, the CEAP together with associated action plans and legislative proposals/legal instruments are insufficient to bring about a paradigm shift in resource use aligned with the CEAP's fourfold objectives to stay within planetary boundaries by reducing the EU's consumption footprint – or prevent a rebound effect where net productivity gains are lost in growing overall consumption.

- **Developing a coherent approach at the EU level:** Decarbonization and dematerialization must go hand-in-hand. Indeed, climate and energy modeling confirm that absolute reductions in the use of energy and natural resources can significantly lower Greenhouse Gas (GHG) emissions. Linking decarbonization with dematerialization strategies is also critical to avoid unintended negative consequences of the green transition. To meet net zero targets, various studies estimate that the total material demand could increase sixfold to meet clean energy goals of different mitigation approaches. Similarly, reducing EU material resources consumption has the potential to increase the EU's resilience and achieve the EU "strategic autonomy." The EU is heavily reliant on a handful of countries for imports of these Critical Raw Materials (CRMs), and through the adoption of the Critical Raw Materials Act (CRMA), is seeking to secure access to these materials. Directly reducing material resource consumption will advance the EU's strategic autonomy objectives by decreasing its dependence on external sources for CRMs and avoid a situation where the EU's "dependence on fossil fuels risks to be replaced with reliance on non-energy raw materials."
- **Tapping into growing interest:** While the science is clear about the importance of tackling material resource use, doing so by reducing material resource consumption is a blind spot in the EU's approach to the circular economy, and climate change. This is, in part, because of the profound economic shifts that are required across sectors, coupled with innovative business models. However, there appears to be growing awareness, including by a subset of policymakers in the EU, of the importance of focusing on material resource reduction as a critical part of the EU's environmental agenda.

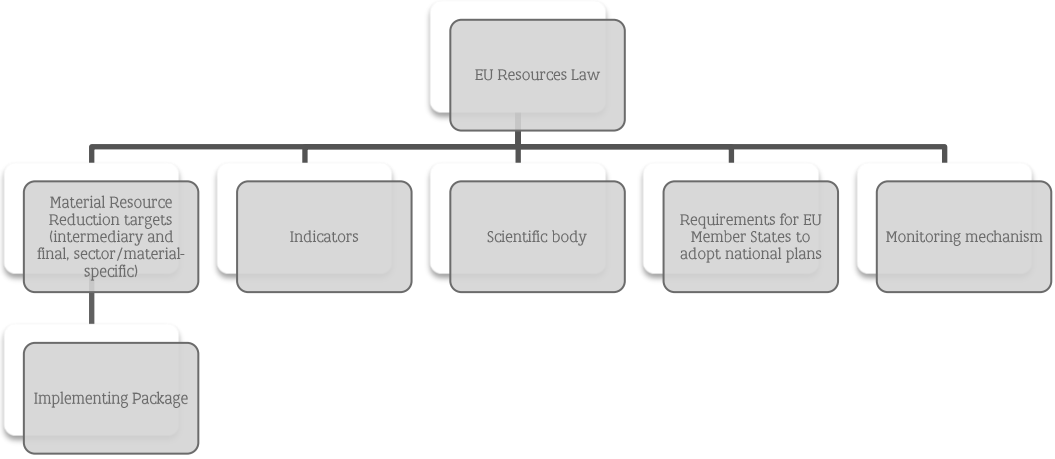
EU Member States Circular Economy Strategies

While the CEAP does not oblige EU Member States to adopt a circular economy action plan, as of 2023, twenty-three EU Member States have adopted national circular economy policies. In some countries, like Belgium and the Netherlands, regional and sub-national initiatives play an important role in further developing the national strategy. Overall, EU Member States (Member States)' circular economy approaches focus on waste management and resource efficiency, reflecting the priorities established at the EU level. Four EU Member States have adopted targets to cap or reduce absolute material resource consumption. These are Austria, Belgium (Flanders and Wallonia), Finland, and the Netherlands. They seek to reduce material consumption or material footprint by XX percent by a certain year in the future against a baseline. The main weakness of resource consumption reduction targets in EU Member States circular economy plans is that

they are not legally binding. This reflects perceived "first-mover" risk in setting binding targets, concerns about an even playing field within the EU, and political pressure. As a result, they remain aspirational and are unlikely to induce real change. Indeed, this Report has found no direct link between having a material resource consumption target and reductions in material footprint per capita over the last ten years.

Developing the contours of an EU Material Resources Law

This Report considers different instruments for an EU Material Resources Law and concludes that it should come as a regulation. It further highlights various issues to consider in determining whether internal market regulation or environmental protection should be the legal basis of the EU Material Resources Law. Based on the EU Climate Law and the approaches adopted in EU Member States, this Report recommends that an EU Material Resources Law should, at a minimum, contain the following elements: (i) a material resource consumption reduction target (and intermediary targets), sector-specific targets and specific EU Member State targets, coupled with indicators; (ii) a requirement to establish an independent scientific body focused on material resources; (iii) a requirement for EU Member States to adopt national material resource consumption reduction plans; (iv) a reference to sector-specific plans; and (v) a monitoring mechanism. These elements are represented in the diagram below.



- **A legally binding headline target:** Developing reduction target(s) on resource consumption will serve as an overarching vision for the EU and its Member States, thus driving new circular economy policies and requiring all other parts of the economy to also take into account demand-side measures. Concretely, a headline target can come as a relative reduction target *vis-à-vis* a baseline year (e.g., an XX percentage reduction in material resource consumption by XX) or an absolute target.

Establishing an absolute target must be connected to science-backed sustainable consumption targets.

- **Scope:** An EU Material Resources Law must cover all material resources: biomass, fossil fuels, minerals, and metals.
- **Independent Board of Scientific Advisors:** The Climate Law established the European Scientific Advisory Board on Climate Change, which serves independent advisory board for climate change. A similar scientific body must be established in the context of managing material resources.
- **Material/sector-specific targets:** An economy-wide resource reduction target will not be specific enough to stimulate action in specific sectors, or for certain materials. Therefore, specific consumption targets should be established for individual material groups and/or specific sectors based on their impact on the environment. For materials, specific targets could be set for critical material resources, materials whose extraction and use exert high environmental pressure, and/or materials that are directly contributing to the climate crisis, such as fossil fuels. Sector-specific targets could be set for high material-use sectors, such as transport, household consumption, construction and building, agriculture, and public spending – some of which overlap with the priority sectors identified in the CEAP.
- **Indicators:** This Report has looked into different indicators, including direct consumption, measured by Domestic Material Consumption (DMC), and material footprint, measured by RMC**.** It finds that both indicators should be included as they provide different information. The material footprint indicator is valuable because it incorporates in the measurement material resources that were used to produce goods in country A, consumed in country B. DMC provides a picture of territorial consumption. Another indicator that should be included is the EU's consumption footprint, which uses a life-cycle assessment to assess whether consumption in specific sectors fits within planetary boundaries.
- **EU Member States national plans:** An important component of an EU Material Resources Law would be to require EU Member States to develop national plans on how they intend to achieve the intermediary reduction target of material resource consumption, similar to the Climate Law. Member States are concerned about the burden of adopting additional reporting requirements. One way to potentially reduce this burden is to enable Member States to combine climate and material resource reporting into one integrated Report.
- **Implementation mechanism:** Similar to the EU Climate Law, the EU Material Resources Law should be accompanied by an implementation package. This should be used to develop an effort-sharing regulation, reflecting different levels of circularity within EU Members, as well as different capabilities to transform towards a circular economy, as well as to develop sector-specific plans and regulations, such as regulations on taxation.

Institutional Anchoring

Given the overarching and far-reaching nature of a Material Resources Law, it is important that such a Law is developed as part of a joint proposal by various Directorates General (DGs) of the European Commission. At a minimum, the DG coalition must include: the DG for Environment, the DG for Climate Action, and the DG

for the Internal Market, Industry, Entrepreneurship and SMEs. Moreover, this Report has identified four specific ways in which an EU Material Resources Law could be introduced in the EU:

- **Anchoring an EU Material Resources Law as part of a broader systems approach:** This approach would make the Material Resources Law part of a broader systems approach, connecting the fragmented pieces of existing EU regulations into a broader, more systemic approach. This approach would go beyond focusing on developing a binding reduction target for material resource consumption. It would look more broadly at connecting climate change targets with the circular economy, the EU Industrial Policy Strategy, the Digital Single Market and Horizon Europe, and developing country implications.

- **Material resource-focused top-down targeted approach:** This approach would involve advocating for a stand-alone Material Resources Law, as the missing part of the EU Green Deal, along the lines set out in this Report. Compared to the previous approach, this approach would be narrower as it exclusively focuses on adopting an EU Material Resources Law in the EU. Given the political and inter-DG involvement that would be required to advance this approach, this approach must be pursued through solid leadership from the Secretary-General, under the guidance of the President of the Commission, to direct DG CLIMA, DG ENV, and DG GROW (and potentially others) to work together.

- **Anchoring into the 2040 climate target:** Another option would be to embed an emphasis on material resources within existing climate targets. Under the Climate Law, new intermediary targets for greenhouse gases reduction by 2040 must be developed by June 2024. The development of these targets and evidence that meeting material circularity objectives will be critical to meeting GHG reduction targets could be the anchoring point to advocate for the development of more robust circular economy targets, including tackling the root cause of climate change, which concerns the extraction and production of material resources. This approach, however, risks that material considerations will be considered important predominantly as a means to the end of addressing climate change objectives.

- **Bottom-up approach:** Compared to the approaches detailed above, the bottom-up approach involves adopting a more organic, gradual approach to incorporating dematerialization in the EU. It would start by making it mandatory for EU Member States to report on key material indicators, such as material footprint and material consumption (which is currently not required), followed by requiring EU Member States to develop national circular economy and material action plans. At the same time, it will establish a scientific body at the EU level to conduct additional research on the EU's safe operation space and sustainable material resource objectives. At the same time, this approach emphasizes the importance of generating awareness about the issue of material resources among EU Member States and environmental NGOs, the private sector, and citizens. Only after these elements have been put in place will the EU leadership start discussions on the development of a binding reduction target for resource consumption.

Linking an EU Material Resources Law to Existing EU Instruments

An EU Material Resources Law could add tremendous value to existing regulatory instruments in the EU. First, it is necessary to address gaps in existing EU policies, fulfil the objectives of the CEAP, and transform the EU into a circular economy. The proposed EU regulations that focus on taxing household waste, requiring minimum recycled content in products, or increasing resource efficiency could *indirectly* contribute to reducing material resource consumption but would not automatically result in a reduction in material resource consumption, partly due to the rebound effect.

Second, developing an EU Material Resources Law would also be critical to address inconsistencies in existing EU approaches to regulation. Currently, the European Commission heavily relies on silos. As a result, trade-offs and inconsistencies ensue– as opposed to synergies that could reinforce meeting multiple regulatory objectives. Trade-offs are seen with regard to the EU's approach to decarbonization and the impacts this will have on materialization, between energy demand and biodiversity objectives, and between phasing out plastics and putting additional pressure on biomass. By focusing simultaneously on decarbonization and dematerialization, trade-offs will be minimized. This would allow the EU to confront multiple environmental crises, comprised of climate change, biodiversity loss, and pollution, all at once, given that the inefficient use of material resources is at the heart of the triple planetary crisis.

Third, an approach that targets material resource consumption would also be critical to advance the objectives of many other existing EU regulations. For example, it would be essential to achieve the EU's "strategic autonomy" objectives and will advance human rights and environmental protection in EU value chains.

International Implications of an EU Material Resources Law

Absent momentum to develop an international agreement on material resource consumption, the EU could demonstrate leadership by developing an EU Material Resources Law to tackle excessive consumption, which lies at the heart of environmental degradation and climate change. Indeed, whereas restoring the health of our planet is a collective task, the EU has a special responsibility to do so due to its historical role as a large carbon emitter since the Industrial Revolution, as well as its present material footprint, which is about 40-70% higher than available estimates of sustainable levels consistent with limiting environmental pressure within planetary boundaries. Generally, material resource consumption is marked by deep inequalities: high-income nations are responsible for 74% of global excess material use, driven primarily by the United States (27%), and the EU (25%). China is responsible for 15% of global excess material use, while low-income and middle-income countries are responsible for only 8%.

In the context of climate change, the EU has exercised leadership by striving to be the first climate-neutral continent through the Green Deal and the EU Climate Law, which turned the EU's political ambition of reaching carbon neutrality by 2050. Similarly, by adopting an EU Material Resources Law, the EU can exercise leadership concerning material resource consumption, which lies at the heart of triple environmental crises of climate change, pollution, and biodiversity loss. Moreover, it can do so in a holistic way. By establishing a material resource use reduction target, the EU could potentially inspire other major players to follow suit. At a minimum, due to the EU's global market power, targeting the EU's material resource use could mobilize efforts

by public institutions, businesses, and civil society, and will ensure that material resource use receives a more prominent focus in discussions relevant to the environment.

In doing so, the EU could reclaim legitimacy around the green agenda, which suffered in the recent backlash experienced with regard to its unilateral green trade agenda, including the controversial Carbon Border Adjustment Mechanism (CBAM).

1 INTRODUCTION

From building cars to producing food and making cement, the use of resources such as land, water, and materials (biomass, fossil fuels, metals and non-metallic minerals) is fundamental to our modern economy.[1] Over the last half a century, global material resource use has increased: between 1970 and 2017, and the annual extraction of materials more than tripled – rising from 27 billion tons to 92 billion tons.[2] The extraction, manufacture, transport, use, and discard of materials are the root causes of some of the most urgent environmental pressures we face: they are responsible for over 90% of biodiversity loss and water stress, and about half of greenhouse gas emissions.[3] These stresses on the environment and climate will reach alarming levels over the next few decades, as global material consumption is predicted to more than double in the next 40 years, while annual waste generation is predicted to increase by 70% by 2050.[4] This means that, unless we drastically alter our consumption and production patterns, by 2050, the world will be consuming as if there were three planets.[5]

In 2021, the European Union (EU)'s material consumption amounted to 14.1 tonnes per capita, which is double the sustainable consumption level and has led the EU to exceed the planetary boundaries for five impacts - particulate matter, ecotoxicity in freshwater, climate change, use of fossil-fuel-based products, and use of mineral and metal resources.[6] In 2020, the European Commission adopted an ambitious Circular Economy Action Plan (CEAP) to address this problem, highlighting four overarching objectives: (i) to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes; (ii) to keep its resource consumption within planetary boundaries; (iii) to strive to reduce the EU's consumption footprint; and (iv) to double its circular material use rate in the coming decade.[7] In response to the CEAP, numerous regulatory and non-regulatory initiatives have been adopted, ranging from the Ecodesign for Sustainable Products Regulation (ESPR), which takes an upstream approach by focusing on sustainable product design, to the EU Waste Framework Directive and Packaging and Packaging Waste Directive.[8] , which tackles the downstream part of the resources value chain.

[1] C. van der Ven, "An International Agreement on Natural Resource Management. An overview of opportunities and challenges" (2022), Study Commissioned by the Public Waste Agency of Flanders (OVAM).
[2] UNEP and IRP, "Global Resources Outlook: Natural Resources for the Future We Want" (2019); European Commission, Directorate General for the Environment, "Leading the Way to a Global Circular Economy: State of Play and Outlook" (2020), Publications Office.
[3] IRP, "Resource Efficiency and Climate Change: Material Efficiency Strategies for a Low-Carbon Future" (2020); International Resource Panel, "Global Resources Outlook 2019: Natural Resources for the Future We Want" (2019).
[4] OECD, "*Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*" (2019), OECD Publishing.
[5] See Sustainable Development Goal 12 "Ensure Sustainable Consumption and Production Patterns". Available at: https://www.un.org/sustainabledevelopment/sustainable-consumption-production/.
[6] European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of The Regions: A revised monitoring framework for the circular economy" (15 May 2023), COM (2023) 306 final.
[7] European Commission "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A new Circular Economy Action Plan For a cleaner and more competitive Europe" (11 March 2020), COM(2020) 98 final.
[8] In 2022, the Commission proposed a Regulation on Packaging and Packaging Waste, intended to replace the Packaging and Packaging Waste Directive.

Despite these and other important initiatives, what is missing in the EU's approach to a circular economy transition is a direct focus on reducing material resource use through tackling consumption. While existing approaches can contribute to less material resource use, they will not be sufficient to bring the EU's level of material resource consumption within sustainable levels. Indeed, even if more recycled content were to be used in the production of textiles and apparel - one of the objectives of the ESPR – a reduction in material resource use could be offset by increased consumption, i.e., if EU consumers would be purchasing more clothing. Similarly, waste reduction targets may limit waste generation relative to resources consumed, but they will not limit consumption generally.[9] Indeed, a July 2023 report from the European Court of Auditors (ECA) found that the EU is making plodding progress with regards to the circular economy transition, concluding that it is currently looking very challenging to achieve the EU's ambition to double the circularity rate by 2030.[10]

On their own, the CEAP, associated action plans and legislative proposals are insufficient to result in a paradigm shift in resource use aligned with the CEAP's fourfold objectives to stay within planetary boundaries by reducing the EU's consumption footprint – or prevent a rebound effect where net productivity gains are lost in growing overall consumption For the EU to reach the four overarching objectives expressed in the CEAP, it must directly address resource (over)consumption by establishing an EU Material Resources Law. Doing so would enable the EU to directly address the growing use of natural resources, which is the root cause of some of the most urgent environmental pressures, including climate change, biodiversity loss and pollution. Doing so can increase the effectiveness of the EU's regulatory approach to the circular economy transition.

Developing an EU Material Resources Law should not be seen as being in opposition to growing European prosperity. Rather, it suggests a new approach in which human needs are met with less material resources through adopting a system change approach with a focus on the servicification of the economy, smart industrial policy, and decoupling (Box 1).[11] Based on modelling undertaken for the International Resource Panel (IRP) *2019 Global Resources Outlook*, economies can still grow, even with a 25% reduction in global resources use, provided adequate resource efficiency and sustainable production and consumption policies are adopted.[12]

The purpose of this Report is to further unpack what an EU Material Resources Law could look like, and how this would be aligned both with relevant initiatives already adopted by EU Member States (Member States) as well as with existing regulatory approaches at the EU level. It does so, first, by making the case for a Material Resources Law, identifying gaps in the EU's regulatory framework for a circular economy transition. Second, it turns to the question of what an EU Material Resources Law could look like. Specifically, the Report zooms in on relevant initiatives and models adopted by EU Member States that could be used to inform the design of a Material Resources Law. It builds on the EU Climate Law, identifying best practices and key

[9] J. Potting, E. Worrell, A. Tukker, A. Heideveld, M. Hekkert, and J. Cramer, "Towards Circular Targets" (2022), Het Groene Brein.
[10] European Court of Auditors, "Circular economy. Slow transition by member states despite EU action" (2023), Special Report.
[11] For more details on system-based approaches, see Systemiq and The Club of Rome "A System Change Compass: implementing the European Green Deal in a Time of Recovery" (2020).
[12] International Resource Panel, "Making Climate Targets Achievable: Improving Well-being through Reduced Absolute Resource Use" (2022). An opinion piece of the International Resource Panel Co-Chairs Potočnik, J., Teixeira, I.

principles, respectively, that can inform the development of an EU Material Resources Law. Third, this Report highlights how an EU Material Resources Law could result in a more comprehensive and coordinated EU policy approach, with benefits for the EU's climate change and energy security agendas. Fourth, this Report turns to the international dimension of an EU Material Resources Law. In line with EU's efforts in the area of climate change, striving to be a "first mover" globally in the area of material resource consumption would strengthen with the EU's ongoing leadership with regards to green policies, and could minimize the criticism received – mostly from developing countries partners – *vis-à-vis* its unilateral approach to greening trade.

2 THE CASE FOR AN EU MATERIAL RESOURCES LAW

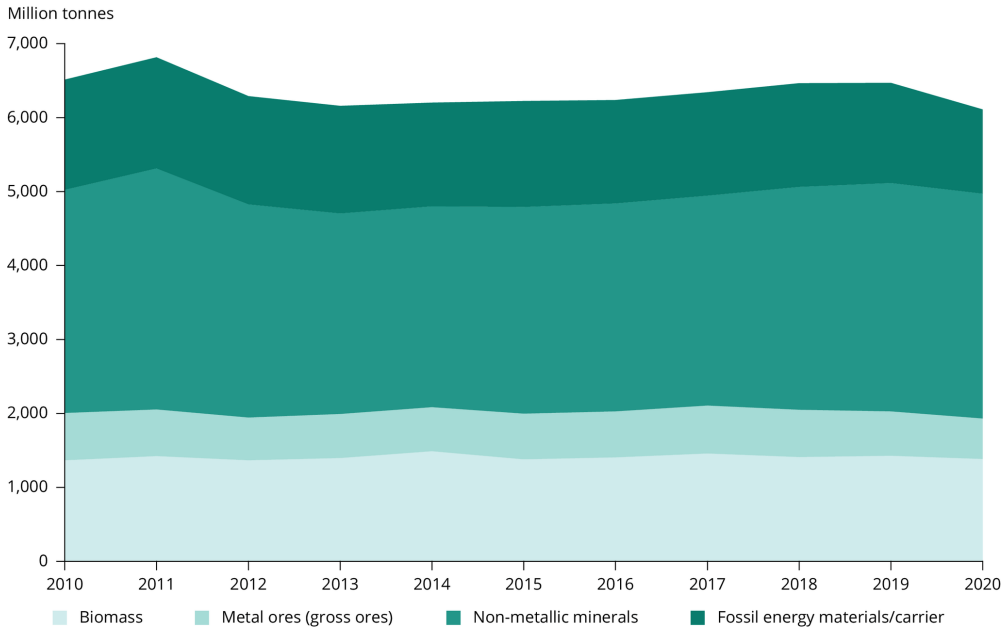
2.1 ADDRESSING MATERIAL RESOURCE CONSUMPTION IS CRITICAL TO STAYING WITHIN THE PLANETARY BOUNDARIES

According to data from an IRP report,[13] global material footprint is already beyond ecological limits above 100 tons per year – a figure that is expected to double over the next 40 years. The EU consumes more than its fair share of material resources. The EU's material footprint (or raw material consumption (RMC))[14], i.e., the total amount of extracted raw materials needed to produce the goods and services consumed by residents of the EU, peaked at 18 tons per capita in 2007/2008, just before the financial crisis. In 2021, the RMC amounted to 14.1 tonnes per capita.[15]

As illustrated in Figure 1 below, from 2010 to 2020, the EU's material footprint remained relatively stable: between 2010 and 2016, it fell by 7%; between 2016 and 2019, it increased by 5%; and in 2020, it fell again by 5% - the latter reflecting the economic effect generated by the COVID-19 pandemic. Between 2010-2020, the biggest category of material consumption in the EU comprises non-metallic minerals (50% of the footprint in 2020[16]), followed by biomass (23%), fossil fuels (19%), and metals (9%).[17] The high consumption of non-metallic minerals mainly reflects EU activities in the construction sector. Fossil fuels and metal ores are going on a slightly downward sloping trend, whereas non-metallic minerals are slightly increasing, and biomass is relatively stable.[18]

[13] OECD, "*Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*" (2019), OECD Publishing.
[14] See Box 3 below for a more elaborate explanation of relevant indicators.
[15] European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of The Regions: A revised monitoring framework for the circular economy" (15 May 2023), COM (2023) 306 final.
[16] It must be noted that non-metallic minerals have less impact on the environment and climate than metals and fossil fuels – relative to their share of the material footprint. UNEP and IRP (2019a).
[17] European Environmental agency, "Europe's material footprint (8th EAP)" (2022a).
[18] See "Raw Material Consumption by main material categories, EU 2000-2020" (Figure 1) at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Material_flow_accounts_statistics_-_material_footprints#Material_footprint_of_European_countries.

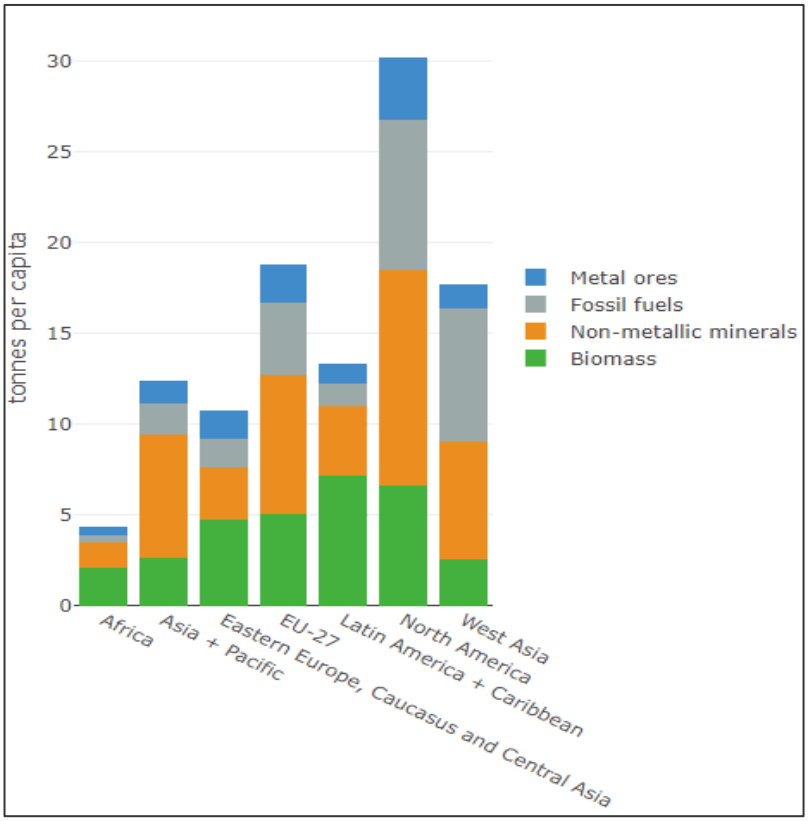
Figure 1: EU Material Footprint, expressed in million tonnes of raw material equivalent[19]



The EU's per capita material footprint is substantially higher than the global average and much higher than the material footprint in low-and middle-income countries.[20] Figure 2, which compares material footprint estimates, shows that Europe's material footprint (per capita) exceeds all regions except for North America.

[19] European Environmental Agency, (2022a).
[20] A. Meysner and T. Gore, "Towards resource consumption within planetary boundaries" (2022), Institute for European Environmental Policy.

Figure 2: Material Footprint (RMC) per capita in 2019 - by country/region and material group21



The EU's material footprint of 14.1 tons per capita in 2021 is about 40-70% higher than available estimates of sustainable levels that can be considered broadly consistent with limiting environmental pressure within planetary boundaries. Estimates by the IRP suggest these to be between 6 and 8 tons per capita.[22] In particular, the EU has exceeded the planetary boundaries for five impacts - particulate matter, ecotoxicity in freshwater, climate change, the use of fossil-fuel-based products, and the use of mineral and metal resources.[23] A scientific study from June 2023 finds that "six of the nine planetary boundaries are being transgressed, suggesting that the Earth is now well outside of the safe operation space for humanity."[24] To return to a safe operation space, the EU must do its part to bring its material footprint within sustainable levels.

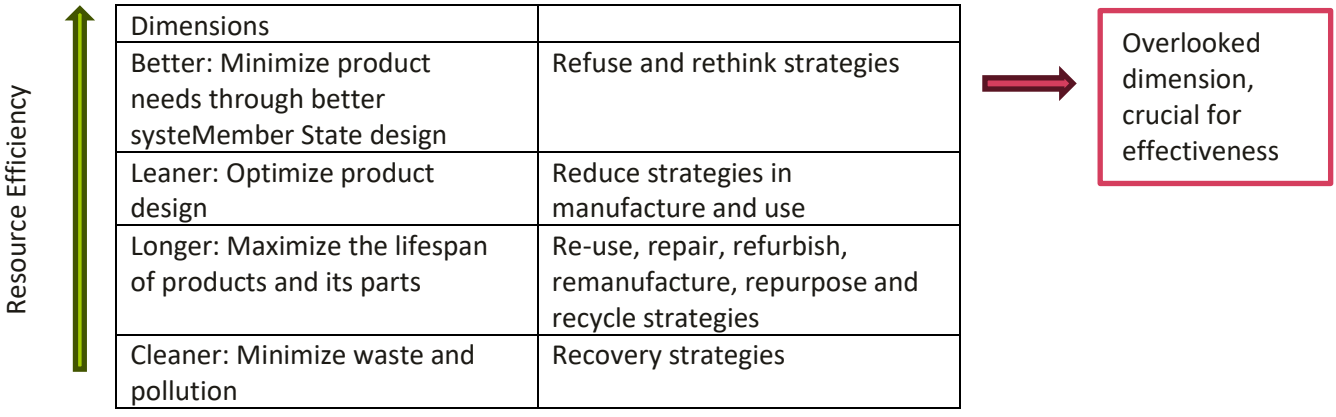
[21] MaterialFlows.Net: The Material Flow Analysis Portal. Accessed on 20 September 2023. Available at: https://www.materialflows.net/visualisation-centre/data-visualisations/.
[22] UNEP (2014), Sustainable Consumption and Production (SCP) Targets and Indicators and the SDGS. UNEP Post-2015 Discussion Paper 2. Available at: www.iisd.org/system/files/publications/scp_targets_indicators_unep.pdf.
[23] COM (2023) 306 final.
[24] K. Richardson et al., "Earth beyond six of nine planetary boundaries" (2023).

2.2 SHORTCOMINGS IN THE EU CIRCULAR ECONOMY ACTION PLAN

There is no shortage of frameworks and action plans in the EU that emphasize the importance of a circular economy transition. The EU Green Deal, adopted in 2019, seeks to develop a "new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and *where economic growth is decoupled from resource use*."[25] The latter part, which is often set aside, highlights the importance of dematerialization. In 2020, the EU adopted its second CEAP with four overarching objectives: (i) to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes; (ii) to keep its resource consumption within planetary boundaries; (iii) to strive to reduce the EU's consumption footprint; and (iv) to double its circular material use rate in the coming decade.[26]

Specifically, the CEAP establishes 35 key actions to accomplish these objectives. As further elaborated on in Table in Section 5.1 below, the vast majority of these interventions, however, address the negative impacts of the current linear economy by improving product design, resource efficiency through repair and re-use, and the end-of-life management of products, which correspond to the bottom three categories in the waste hierarchy – a ranking system used for different waste management options according to their environmental benefits - as illustrated in Table 1 below. The CEAP key actions and associated legislative proposals/legal instruments do not, however, focus on the highest echelon of the waste hierarchy, which seeks to minimize product or resource needs through better systems design.

Table 1: The Overlooked Dimension of the EU's Circular Economy Approach[27]



The emphasis on waste management is reflected in the EU Member States circular economy approaches: while most EU Member States have a circular economy action plan, only four countries – Austria, Belgium,

[25] European Commission, "Communication from the Commission: The European Green Deal" (11 December 2019), COM(2019) 640 final.
[26] COM(2020) 98 final.
[27] J. Potočnik, "Global Resource Outlook 2024: Where are we heading … and why?" (31 May 2023), Powe Point Presentation.

Finland, and the Netherlands – have adopted aspirational material resource use targets. By and large, EU Member States approaches to circularity focus on waste management. Indeed, the 2019 CEAP Commission Implementation Report highlighted that 75% of the planned EUR 7,1 billion in cohesion policy funding spending on the circular economy is related to implementing EU waste legislation.[28]

A related shortcoming concerns the absence of binding regulations and targets that focus on reducing material resource consumption. Most frameworks that include binding targets, such as the Waste Framework Directive, the proposed Packaging and Packaging Waste Regulation, the Single Plastics Use Directive, and the Batteries Regulation, all focus on end-of-life measures.[29] No binding targets have been developed that focus on minimizing product needs or material resource consumption. As a result, and unlike climate-related issues, the CEAP does not impose on EU Member States legal obligations to develop a national circular economy plan setting out how it seeks to reduce material resource consumption over a certain period.

On their own, the CEAP and associated action plans and legislative proposals/legal instruments are insufficient to result in a paradigm shift in resource use aligned with the CEAP's fourfold objectives to stay within planetary boundaries by reducing the EU's consumption footprint – or indeed prevent a rebound effect where net productivity gains are lost in growing consumption overall. Absent a binding legal instrument targeting resource use through consumption, the four-fold objectives of the CEAP remain little more than an aspiration. While existing approaches can contribute to less material resource use, they will not be sufficient to bring the EU's material resource use within sustainable levels. For example, the proposed EU regulations that focus on taxing household waste, requiring minimum recycled content in products, or increasing resource efficiency could indirectly reduce material resource consumption. However, it would not automatically result in a reduction in material resource consumption.

Indeed, reducing residual waste does not necessarily lead to reducing resource use in the aggregate. Even if waste per product is reduced, when recycling leads to low-grade secondary materials unable to replace the virgin or primary materials they originate from (typically the case), there will be insufficient substitutability. In other words, some recycled material will be produced in addition to, rather than instead of, primary materials, thereby reducing the benefits of circularity.[30] Similarly, increasing resource efficiency will not be sufficient to reduce aggregate consumption. As efficiency gains free up resources, this can lead to an increase in consumption of the same product or service, for instance, because it becomes cheaper or because these resources are allocated elsewhere.[31] This is also called the rebound effect.

The fact that increasing resource efficiency does not necessarily lead to reducing overall material resource consumption is captured in a recent Commission communication on revising the monitoring framework on the circular economy, which notes that "[t]here has been mixed progress in shifting to circular methods of

[28] European Court of Auditors (2023).
[29] A. Nogueira, "Are Soft Legal Measures in Circular Economy Action Plans Enough to Permeate EU Strong Economic Core Regulations Bringing Systemic Sustainable Change?" (2022), Circ.Econ.Sust.
[30] Potting et al (2022).
[31] L. Jensen, "Beyond growth - Pathways towards sustainable prosperity in the EU" (2023), European Parliament Research Service. C. Gonçalves Castro, A. Hofmann Trevisan, D.C.A. Pigosso, J. Mascarenhas, "The rebound effect of circular economy: Definitions, mechanisMember State and a research agenda" (2022), Journal of Cleaner Production.

production and consumption in recent years. EU production has become more resource-efficient, but EU consumption of materials and waste generation are both high and need to decrease in the future."[32] Moreover, a July 2023 report from the ECA found that the EU is making plodding progress with regard to the circular economy transition, concluding that it is currently looking very challenging to achieve the EU ambition to double the circularity rate by 2030.[33] The report notes that "there is limited evidence that the CEAPs, and in particular the actions regarding the circular design of products and production processes, were effective in influencing circular-economy activities in the member states."[34] Specifically, it found that between 2015 and 2021, the circularity rate in the EU increased only by 0.4 percentage points.[35] Between 2010 and 2020, sixteen EU Member States reduced their material footprint, but alarmingly, eleven countries saw an increase in RMC per capita.[36]

Introducing an EU Material Resources Law, with accompanying binding material footprint targets, could address the gaps identified by adopting a systems change approach to the economy in which prosperity is decoupled from resource use (see Box 1 below). Such a framework would direct the focus of the circular economy transition towards the highest ladder of the waste hierarchy, which is prevention, by minimizing product and resource needs through systems State design. It would directly address the root cause of the linear economy, i.e., excessive consumption, as opposed to seeking to mitigate the consequences of excessive consumption through waste management. As a result, it would enable the EU's transition towards a circular economy to be more effective while establishing a quantitative destination as to what levels of material footprint/resource consumption the Member States need to obtain - similar to the role of the Climate Law and the 2050 target for Greenhouse Gas (GHG) reductions.

[32] European Commission, "Circular Economy: Faster progress needed to meet EU resource-efficiency targets, ensure sustainable use of materials and enhance strategic autonomy". (May 2023).
[33] European Court of Auditors (2023).
[34] European Court of Auditors (2023).
[35] European Court of Auditors (2023).
[36] See "Material footprint of European countries" (Figure 2) at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Material_flow_accounts_statistics_-_material_footprints#Material_footprint_of_European_countries.

Box 1 – Defining a "System Change Approach"

A system change approach promotes a more holistic view of prosperity. Instead of focusing on individual phases of natural resource management (e.g., extraction and processing), it identifies all the drivers and pressures of the current system that contribute to climate change and biodiversity loss. It focuses on well-being and delivering societal needs within planetary boundaries.

The International Resource Panel defines system approach as: "The system approach (1) considers the total material throughout of the economy from resource extraction and harvest to final disposal, and their environmental impacts, (2) relates these flows to activities in production and consumption across spatial scale, time, nexus and boundary dimensions, and (3) searches for leverage points for multi-beneficial changes (technological, social or organizational), all encouraged by policies to achieve sustainable production/consumption and multi-scale sustainable resource management."

Systemiq and The Club of Rome propose the adoption of a systems change approach in the context of the EU Green Deal by focusing on three complementary actions: (i) mapping and envisioning a new economic system at the service of the people and the planet; (ii) designing and implementing impactful interventions; and (iii) mobilizing and enabling stakeholders to implement change. Their report details ten principles guiding the System Change Compass:

1. Redefining Prosperity: embracing social fairness for real prosperity
2. Redefining Natural Resource Use: prosperity decoupled from natural resource use
3. Redefining Progress: Meeting societal needs as the purpose of a model based on economic ecosystems
4. Redefining Metrics: performance measurement updated
5. Redefining Competitiveness: digitalisation and smart prosperity at the heart of European competitiveness
6. Redefining Incentives: introducing the real value of social and natural capital
7. Redefining consumption: from owning to using
8. Redefining Finance: the facilitator of the transition
9. Redefining Governance: Sharing sovereignty and working together
10. Redefining Leadership: Intergenerational agreement by system change leaders

Source: IRP online Glossary and Systemiq and The Club of Rome "A System Change Compass: implementing the European Green Deal in a time of recovery" (2020).

2.3 TOWARDS A COHERENT EU ENVIRONMENTAL APPROACH

Developing an EU Material Resources Law will also be critical, on the one hand, to meet the climate objectives, and on the other hand, to ensure that decarbonization efforts do not cause unintended consequences with regard to other pressing environmental challenges the EU faces.[37]

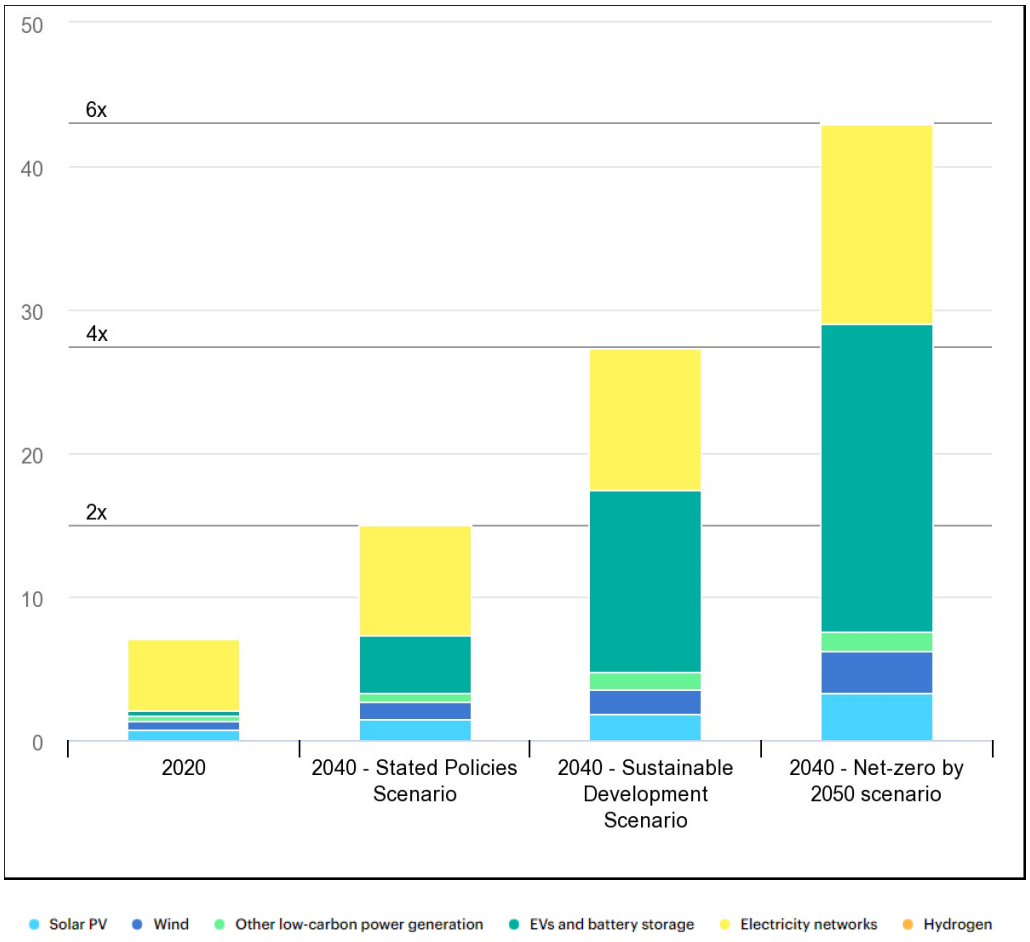
Decarbonization and dematerialization must go hand-in-hand. Indeed, climate and energy modeling confirms that absolute reductions in the use of energy and natural resources can significantly lower GHG emissions in a cost-effective way.[38] For example, improved material efficiency could reduce hard-to-abate emissions from the EU production of raw materials such as steel, cement, aluminium and plastic by over 50% by 2050.[39] Moreover, an overall reduction in material use will also contribute to lower energy demand in the economy, reducing the amount of renewable energy needed and facilitating a much faster transition to a low-carbon economy.[40]

The importance of tackling resource use to advance climate objectives has also been recognized by the Intergovernmental Panel on Climate Change (IPCC), which estimates that an absolute resource demand reduction coupled with new services provisions approaches, could reduce global GHG emissions from key sectors such as buildings, transport, food, industry, and energy supply systems by 40-70 percent by 2050, while at the same time meeting human needs.[41] Similarly, modelling focused on planetary boundaries emphasizes the importance of a drastic decrease in resource use to stay within a safe operation space.[42] The Platform on Biodiversity and Ecosystem Service states that less resource-intensive production and consumption patterns would significantly contribute to climate change, biodiversity, and air pollution objectives.[43]

Linking decarbonization with dematerialization strategies is also critical to avoid unintended negative consequences of the green transition. To meet net zero targets, various studies estimate that the total material demand could increase sixfold in order to meet clean energy goals of different mitigation approaches (see Figure 3).[44] In particular, these resources are required to make the actual technologies (e.g., solar panels and wind blades), and to support and integrate the renewable technology to the grid. For example, it is estimated that full electrification of the EU's current passenger car fleet would require more than 227 megatonnes of key materials, equivalent to 3.5% of EU's total raw material consumption.[45]

[37] IRP (2022).
[38] IRP (2022).
[39] Material Economics, “The Circular Economy a Powerful Force for Climate Mitigation: Transformative innovation for prosperous and low-carbon industry” (2018).
[40] A. Grubler et al., "A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies" (2018), Nature Energy, Volume 3, Pages 515–527.
[41] IRP (2022).
[42] IRP (2022) .
[43] IPBES, “Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services” (2019).
[44] S. Dikau, H. Miller, C. Nobletz, R. Svartzman and G. Kyriacou, “What are ‘critical minerals’ and what is their significance for climate change action?” (30 May 2023). LSE, Energy and Climate Change Explainers.
[45] E. Blot and T. Stainforth, “Net-zero, circular transition in road transport: Addressing social and environmental spillovers of materials demand changes in the road transport sector” (2022), Institute for European Environmental Policy.

Figure 3: Total mineral demand for clean energy technologies by scenario, 2020 compared to 2040 (Mt)[46]



Similarly, reducing EU material resources consumption can potentially increase the EU's resilience and achieve the EU "strategic autonomy". The EU heavily relies on a handful of countries for imports of these Critical Raw Materials (CRMs), and through the adoption of the Critical Raw Materials Act (CRMA), is seeking to secure access to these materials. Reducing material resource consumption directly will be able to advance the EU's strategic autonomy objectives by decreasing its dependence on external sources for these materials and avoid a situation where the EU's "dependence on fossil fuels risks to be replaced with reliance on non-energy raw materials."[47]

[46] See IEA's "Total mineral demand for clean energy technologies by scenario, 2020 compared to 2040": https://www.iea.org/data-and-statistics/charts/total-mineral-demand-for-clean-energy-technologies-by-scenario-2020-compared-to-2040.

[47] See European Commission's in-depth review of raw materials as a strategic area for Europe's interests: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy/depth-reviews-strategic-areas-europes-interests_en.

2.4 GROWING INTEREST IN ADDRESSING MATERIAL RESOURCES USE

While the science is clear about the importance of tackling material resource use, doing so by reducing material resource consumption is a blind spot in the EU's approach to the circular economy and climate change. This is, in part, because of the profound economic shifts that are required across sectors, coupled with innovative business models.[48] However, there appears to be growing awareness, including by a subset of policymakers in the EU, of the importance of focusing on material resource reduction as a critical part of the EU's environmental agenda.

One of the priority areas highlighted in the Eight Environmental Action Plan, which will shape the EU's environmental priorities for 2030, is to "significantly decrease [e] the Union's material and consumption footprints to bring them into planetary boundaries as soon as possible, including through the introduction of Union 2030 reduction targets, as appropriate."[49] At the EU level, in 2021, the European Parliament called upon the Commission to "propose binding material and environmental footprint targets for the whole product lifecycle for each product category placed on the EU market, including the most-intensive semi-products"[50]A leaked early version of the CEAP included a target to halve the EU's material use by 2030. While this target did not make it into the final strategy, it reveals that adopting such a target has, at least, been previously considered.[51]

Moreover, the Commission's Revised Monitoring Framework for the circular economy, adopted on 15 May 2023, has added material footprint (per capita), also referred to as RMC, making it an official indicator for EU Member States – albeit a voluntary one. The update recognizes that faster progress is needed to meet EU resource efficiency-related targets, ensure sustainable material use, and enhance the EU's strategic autonomy. When launching the new monitoring framework, the Commission specifically noted that "while EU production has become more resource-efficient, EU consumption of materials remains very high and needs to decrease in the future," and that the EU must, therefore, "continue its efforts to reduce consumption of materials and generation of waste."[52] Environment Commissioner Virginijus Sinkevičius noted the "exponential rise in the extraction of resources" and that "most materials, together with the embedded energy and other resources used in their production, are too quickly discarded in our atmosphere, water and land".[53] The revised monitoring framework includes new indicators on material footprint, resource productivity, and waste prevention, as well as material import dependency and EU self-sufficiency for CRMs.

[48] IRP (2022).

[49] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 "On a General Union Environment Action Programme 2030" (2022).

[50] European Parliament, "Report on the New Circular Economy Action Plan" (28 January 2021), 2020/2077(INI).

[51] Green Alliance, "Targeting success: Why the UK needs a new vision for resource use" (2021), Policy Insight

[52] European Commission, "Circular economy: Faster progress needed to meet EU resource-efficiency targets, ensure sustainable use of materials and enhance strategic autonomy" (15 May 2023). See: https://environment.ec.europa.eu/news/circular-economy-faster-progress-needed-meet-eu-resource-efficiency-targets-ensure-sustainable-use-2023-05-15_en

[53] Ibid.

These developments suggest that it is time for the European Commission to seriously consider developing an EU Material Resources Law that can direct the EU towards an approach to dematerialization to stay within the planetary boundaries.

3 EU MEMBER STATES' CIRCULAR ECONOMY STRATEGIES HIGHLIGHT THE NEED FOR AN EU MATERIAL RESOURCES LAW

This section zooms in on circular economy strategies adopted by EU Member States (Member States). It provides an overview of EU Member States Circular Economy Strategies, followed by a more detailed analysis of the approaches adopted by Austria, Belgium, Finland, and the Netherlands that directly address material resource consumption. The fact that (i) only a subset of EU Member States had adopted targets that focus on material resource consumption and (ii) all these targets are aspirational (non-binding) emphasizes the important role an EU Material Resources Law can play. Moreover, an EU instrument will also be important to harmonize material resource consumption approaches adopted by the EU Member States, while ensuring that differences between EU Member States with regards to current levels of circularity, growth, and economic structure (e.g., share of services versus manufacturing) are reflected to ensure a just circular transition.

3.1 EU MEMBER STATES' CIRCULAR ECONOMY STRATEGIES – AN OVERVIEW

While the CEAP does not oblige EU Member States to adopt a circular economy action plan, as of 2023, twenty-three EU Member States have adopted national circular economy (CE) policies (see Table 2). Other EU Member States are preparing drafts or conducting preparatory work, except for Croatia.[54] In some countries, like Belgium and the Netherlands, regional and sub-national initiatives play an important role in developing the national strategy.[55] CE strategies differ with regard to their level of ambition and maturity, as well as the priority areas they identify.[56] Eight countries have adopted a second version of their CE strategies.[57] These further articulate the actions to be prioritized, including sector-specific plans and initiatives.

Overall, EU Member States tend to focus on waste management and resource efficiency, reflecting the priorities established at the EU level. In compliance with the requirements to transpose the EU Waste

[54] T. Geerken, S. Manoochehri, E. Di Francesco, "Circular Economy policy innovation and good practice in Member States" (2022), European Environment Agency.
[55] Geerken et al (2022).
[56] Details on each country can be found in the individual country profiles for each of the EU member states available on the Eionet website. See: https://www.eionet.europa.eu/etcs/etc-ce/products/etc-ce-reports-2022-5-circular-economy-country-profiles-a-set-of-30-country-profiles-that-summarise-policies-and-initiatives-in-the-area-of-circular-economy.
[57] Geerken et al (2022).

Framework Directive, Member States have adopted dedicated waste laws.[58] Further, they are required to report yearly or bi-yearly on the implementation of the EU waste laws.[59]

Table 2: EU Member States and Natural Resource Management: Mapping of Circular Economy and Resource Efficiency Strategies[60]

Country	*Circular Economy Strategy*			*Resource efficiency targets*	*Consumption reduction targets*
	Year	First Round	Second Round		
Belgium (federal)	2016	x	x	x	x
Flanders	2017				x
Wallonia	2020				x
Finland	2016	x	x	x	x
Netherlands	2016	x	x	x	x
Italy	2017	x	x	x	
Portugal	2017	x		x	
Denmark	2018	x	x	x	
France	2018	x			
Greece	2018	x			
Luxembourg	2018	x	x		
Slovenia	2018	x			
Poland	2019	x		x	
Germany	2020	x		x	
Latvia	2020	x			
Malta	2020	x			
Spain	2020	x	x	x	
Sweden	2020	x	x	x	

[58] Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 "On waste and repealing certain Directives" (2008), Article 40.
[59] European Commission, "Implementation of the Waste Framework Directive". See https://environment.ec.europa.eu/topics/waste-and-recycling/implementation-waste-framework-directive_en.

[60] Sources: Geerken et al (2022), Domenech and .Bahn-Walkowiak (2019), Scally (2022) and national governments' websites. While regional CE-related initiatives are present also in the Netherlands and Spain, this table only reports sub-national strategies adopted in Belgium as these are discussed in more detail in the following sections.

Cyprus	2021	x			
Czechia	2021	x			
Ireland	2021	x		x	
Romania	2021	x			
Austria	2022	x		x	x
Bulgaria	2022	x			
Estonia	2023	(action plan)			
Hungary		(prep work)		x	
Lithuania		(draft)			
Slovakia		(prep work)		x	
Croatia					

Some EU Member States have also developed dedicated strategies and targets to boost resource productivity.[61] For example, Austria seeks to increase the circularity rate, i.e., the share of material recycled and fed back into the economy, to 18% by 2030 (based on a 2015 baseline); Wallonia seeks to increase resource productivity, i.e., the ratio between economic activity and domestic material consumption (DMC) by 25% between 2020-2035; France seeks to increase resource productivity by 30% between 2010-2030; and Germany is in the process of developing concrete targets on total material productivity and circular material use rate.[62] These targets, while different, all focus on rendering resource use more efficient, rather than on diminishing the aggregate amount of resources used in the economy.[63] As highlighted earlier, improving resource efficiency is insufficient to bring about a circular economy transition that reduces material consumption, in part due to the rebound effect. As will be further elaborated upon below, only four countries (Austria, Belgium, Finland, Netherlands) explicitly target resource consumption by adopting quantitative targets (summarized in Table 3).

CE strategies also differ in their emphasis on monitoring efforts. 15 EU Member States introduced CE monitoring frameworks, most of them using a combination of indicators from the EU Monitoring Framework with national ones. Some EU Member States also have regional monitoring systems, such as the Circular

[61] T. Domenech, B. Bahn-Walkowiak, "Transition Towards a Resource Efficient Circular Economy in Europe: Policy Lessons From the EU and the Member States" (2019), Ecological Economics, Volume 155, Pages 7-19.
[62] See the 2022 Austrian Circular Economy Strategy (https://www.umweltzeichen.at/en/products/start/%C3%B6sterreichische-kreislaufwirtschaftsstrategie), the 2021 Circular Wallonia deployment strategy (https://circulareconomy.europa.eu/platform/sites/default/files/resume_de_la_politique_wallonne_en_v1_1.pdf), the 2015 Energy Transition for Green Growth Act by France (https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000031044385), the German National Circular Economy Strategy (since the strategy is still in progress, see the information paper: https://www.bmuv.de/download/die-nationale-kreislaufwirtschaftsstrategie-nkws).
[63] For precise definitions of the indicators (circular material use rate, circularity rate, and resource productivity), please refer to the Glossary at the beginning of this report.

Economy monitoring framework in Flanders, elaborated upon in Box 2 below.[64] However, only five countries (Finland, Netherlands, Portugal, Spain, and Sweden) and Flanders have so far adopted a monitoring framework in line with the EU Circular Economy Monitoring Framework,[65] suggesting limited uptake at EU Member State level.[66] This might be explained by the fact that the Circular Economy Monitoring Framework, and the May 2023 revisions to this framework, are not binding on EU Member States.

Box 2: Flanders Circular Economy Monitor

Flanders established a hub for circular economy aimed at sharing experiences and fostering innovation. The Circular Economy Monitor provides 100 indicators to monitor progress. It is based on a framework consisting of three levels of indicators: (i) the macro level, which shows progress for the whole Flanders economy; (ii) intermediate level indicators focused on four systems of needs that the economy needs to satisfy (i.e., food, housing, consumer goods, and mobility); and (iii) product groups. Interestingly, this framework presents a system approach to monitoring efforts to achieve a circular economy. This implies that instead of relying on a handful of indicators, monitoring is seen as a comprehensive exercise that involves cooperation among different stakeholders. Notably, a scientific consortium (CE Center), public agencies providing expertise on certain topics (e.g., waste), and organizations and government bodies all provide data on the different systems.

Source: Circular Economy Monitors Flanders, Available at: https://cemonitor.be/en/home-english/.

3.2 EU MEMBER STATES' CIRCULAR ECONOMY STRATEGIES ARE INSUFFICIENT TO TACKLE MATERIAL RESOURCES CONSUMPTION

Four EU Member States have adopted targets to cap or reduce absolute material resource consumption. These are Austria, Belgium, Finland, and the Netherlands. The specific targets and their indicators are set out in Table 3 below.

[64] See the indicators presented in the Flanders Circular Economy monitoring framework: https://cemonitor.be/en/indicator/.
[65] Geerken et al (2022, page 5).
[66] Geerken et al (2022).

Table 3: Overview of absolute material resource consumption targets in EU Member States

Country	Material resource use target	Indicator[67]	Year
Austria	Reduce domestic material consumption by 25% to 14 tonnes per capita by 2030 (2018 baseline)	DMC	2030
	Reduce Material Footprint by 80% to 7 tons per capita (2018 baseline)	RMC	2050
	Reduce material consumption in private households by 10% (2020 baseline)	DMC	2030
Belgium (Flanders)	Reduce material footprint by 30% Reduce material footprint by 75% in 2050	RMC	2030 2050
Belgium (Wallonia)	Reduce direct material input and domestic material consumption by 25% (2013 baseline)	DMI, DMC	2030
Finland	Ensure total consumption of primary raw materials will not exceed 2015 levels	DMC, RMC (excluding export sector)	2035
The Netherlands	Halving the use of primary abiotic raw materials (2014 baseline).	DMC, RMC	2030

Differences exist between the material resource consumption reduction targets adopted by these four EU Member States. Concerning scope, for example, the Netherlands' reduction targets focus only on abiotic materials, whereas Austria, Flanders, Wallonia, and Finland have adopted targets that cover all material resources (biomass, metals, minerals, and fossil fuels). Austria has additionally introduced a sector-specific target for private household resource consumption.

As for the timeline of the targets, Austria and Flanders have adopted both an interim (2030) and long-term (2050) target to reduce material resource consumption. The other three EU Member States focus on an intermediate goal of reducing material resource consumption by a certain percentage *vis-à-vis* a baseline level of consumption – either by 2030 or 2035. Another difference is that countries have adopted different indicators, focusing either on DMC, RMC, or Domestic Material Input (DMI) – or a combination. Table 4 below explains the differences among these indicators – which is further elaborated upon in Section 4.2.1.4 below.

[67] These indicators are further explained in Table 4.

Table 4: Overview of different indicators measuring material consumption

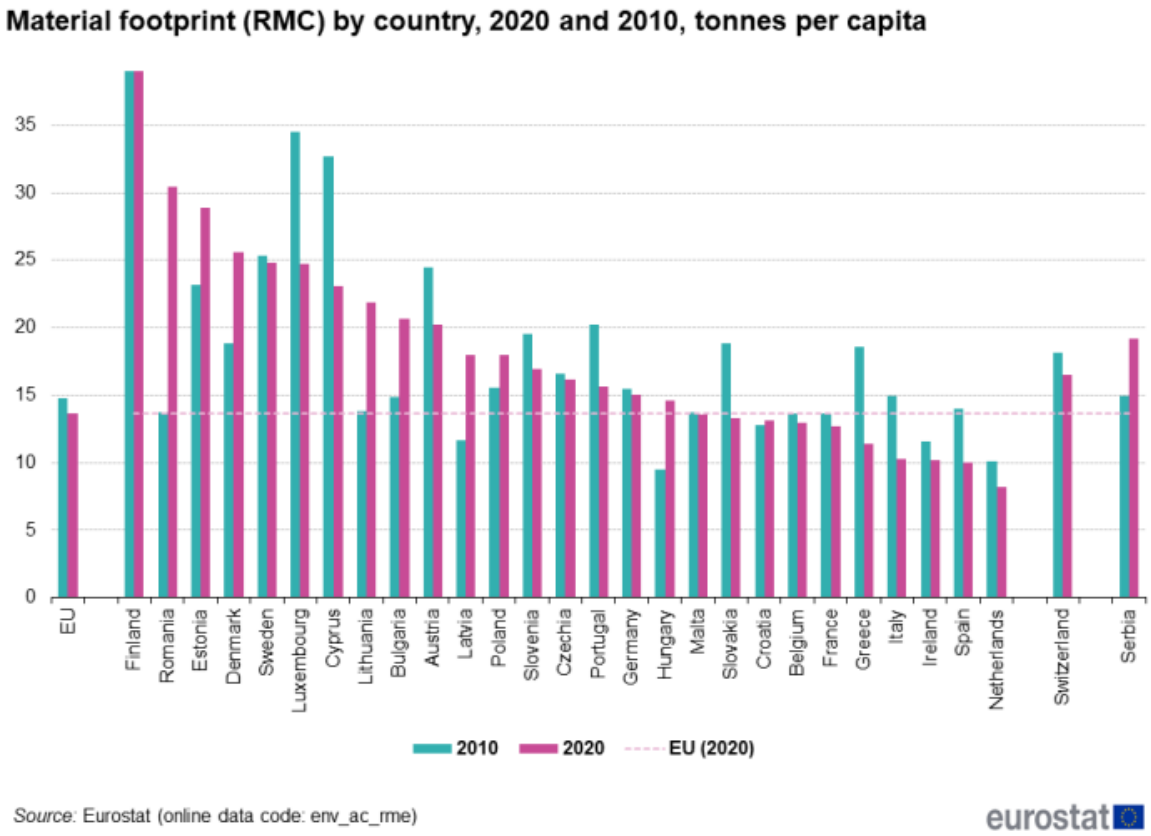
Indicator	What does it measure?	Data availability
Domestic Material Consumption (DMC)	Total amount of raw materials extracted within country, plus materials imported, minus materials exported (physical).	United Nations Environmental Programme (UNEP) and EUROSTAT (last four decades)
Material Footprint (or Raw Material Consumption (RMC))	Total amount of raw materials extracted along the entire supply chains in order to produce the final products or services consumed in that country (includes indirect flows). Eurostat: measures the total amount of raw materials required to produce the goods used by the economy (also called 'material footprint'). https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Material_flow_indicators	EUROSTAT
Domestic Material Input (DMI)	Input of materials for use in an economy, in other words - all materials which are of economic value and which are available for use in production and consumption activities.	EUROSTAT

All targets are quantitative and seek to directly reduce material resource consumption, against a baseline. This suggests that these targets could, in fact, directly address material resource consumption, as advocated for in section 2 of this Report. However, the main weakness of these targets is that they are not legally binding. As a result, they remain aspirational and are unlikely to induce real change. Indeed, there appears to be no direct link between having in place a material resource consumption target and reductions in material footprint per capita over the last ten years (see Figure 4).

As can be seen from Figure 4, while material footprint per capita decreased in all four countries between 2010 and 2020, these reductions do not significantly exceed other EU Member States' performance over this same period. In other words, the performance of EU Member States with consumption reduction targets is not noticeably distinguishable from that of Member States without consumption reduction targets. While the absence of noticeable results could stem from the fact that these measurements are premature to reflect the impact of the consumption reduction targets, it also suggests that non-binding targets do not carry the

political weight required to direct systems changes in society – and fundamentally rethink our socio-economic system to ensure that human needs are being met while using fewer resources.

Figure 4: Material footprint (tonnes per capita) by EU Member State, 2010-2020[68]



Source: Eurostat (online data code: env_ac_rme)

eurostat

Various factors might explain the lack of legally binding targets at the level of EU Member States.[69] Member States might perceive a risk in being "first-movers" in setting binding targets and may be worried about reputational risks stemming from not meeting the targets. They might also struggle to reach a whole-of-government approach and overcome the differences in objectives pursued by different ministries. This can be compounded by the absence of technical understanding about material flow, data availability as well as methodological issues specific to the development of the relevant indicators. Political incentives are lacking, as there is a mismatch between the time required for consumption reduction targets to produce results and the electoral cycles that make politicians look for "quick wins." Economically, adopting very ambitious resource consumption targets could create a competitive disadvantage *vis-à-vis* other EU Member States without stringent resource consumption requirements in place.

[68] Eurostat. See "Material footprint of European countries" (Figure 2) at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Material_flow_accounts_statistics_-_material_footprints#Material_footprint_of_European_countries

[69] Interview with Jack Barrie, from Chatham House.

Further complexities stem from the political economy of each EU Member State. Interviewees from EU Member States or agencies working closely with Member States, revealed that uncertainty surrounding the effects of potential targets and indicators complicates the interactions with national stakeholders. It requires extensive consultations with affected industries to find compromises. For example, Finland has established concrete targets to cap domestic raw material consumption, but due to incomplete information and differing perspectives, natural resources used in exports had to be excluded from this target.[70]

An EU Material Resources Law with a binding material resource consumption target for all EU Member States will be able to address many of the obstacles that Member States face in adopting binding material resource consumption targets. It would minimize concerns relevant to being the "first mover" as well as concerns about intra-EU competition, as it would impose requirements on all EU Member States simultaneously. Politically, it will ensure that sufficient resources are allocated to address material resource consumption, given that an EU Material Resources Law would require EU Member States to make resource reduction objectives a priority. An EU Material Resources Law would also lead to greater harmonization in targets and indicators, which, as illustrated in Table 3 above, are not aligned – targeting either 2030 or 2035 and using DMC or RMC as indicators. To achieve such an overarching target the European Commission will have to play an important role with regards to assessment, reporting, recommendations, and the development of additional measures, a task that cannot be accomplished by EU Member States alone. What an EU Material Resources Law could look like will be further discussed in the next section.

4 DEVELOPING THE CONTOURS OF AN EU MATERIAL RESOURCES LAW

Having established the need for an EU Material Resources Law, this section seeks to identify how this could be developed at the EU level. It focuses on: (i) the kind of instruments that could be suitable to develop an EU Material Resources Law; (ii) elements that, at a minimum, should be included in such an instrument; (iii) implementation, reporting and monitoring requirements for EU Member States; and (iv) institutional anchoring and political considerations.

4.1 INSTRUMENTS FOR AN EU MATERIAL RESOURCES LAW

4.1.1 Regulation versus Directive

When developing a new instrument at the EU level, there are four different types of EU Legal acts that can be considered: (i) regulations; (ii) directives; (iii) decisions; and (iv) recommendations. Each varies in levels of

[70] Interview with Finnish Government.

ambition, centralization, and requirements. A regulation is a applies automatically and uniformly to all EU Member States, as soon as the act enters into force. It is binding on all EU Member States. Directives are also binding and require EU Member States to achieve a certain outcome. However, they give Member States more freedom on how to do so. Another difference compared to a regulation is that a directive must be transposed into national law. Typically, this must be done within a two-year period. Decisions, while binding, are more limited in scope as they apply only to those countries (or other actors) that are specifically addressed. Recommendations enable EU institutions to share their views, but do not impose legally binding requirements.[71] The European Commission has wide discretion to determine the legal instrument it uses when developing new acts.

An EU Material Resources Law could be developed through any of these instruments. However, for it to be binding on all EU Member States, the instrument should be either a regulation or a directive. While both options are a possibility, a regulation would likely be the most appropriate instrument. In this regard, the development of the Climate Law, and the binding targets adopted to reach net zero by 2050 – including the intermediate target of reducing greenhouse gas emission by 55% below 1990 levels – could serve as a model to follow. Indeed, the binding nature of the Climate Law elevated the goal of reducing greenhouse gas emissions to net zero as a key guiding factor for many EU policies. The Commission explained its choice of Regulation in the context of the Climate Law, noting:

> "The objectives of the present proposal can best be pursued through a Regulation. This will ensure direct applicability of the provisions. Requirements are placed on Member States to contribute to achieving the long-term objective. Moreover, many of the provisions are directed to the Commission (assessment, reporting, recommendations, additional measures, review) and also to the European Environment Agency and could therefore not be implemented by national transposition. A legislative rather than a non-legislative approach is needed to anchor the long-term objective into EU law."[72]

An EU Material Resources Law could provide the overarching vision for society-wide circular economy transition, including establishing a binding headline reduction target (or targets) and indicators for EU Member States to adhere to. By setting a target, it should help to mobilize support from key stakeholder groups. When a high-level, overarching reduction target is developed with relevance for most sectors of the economy and many other EU initiatives, the instrument adopted must convey the overarching importance of these targets, making a regulation the preferred choice. The other elements that this study argues must be included in a Material Resources Law, i.e., the requirement for EU Member States to adopt national material resource consumption reduction plans, the development of a monitoring mechanism, and the development of a implementation package, further strengthen the argument that an EU Material Resources Law must come in the form of a regulation.

[71] See the EU's types of legislation at: https://european-union.europa.eu/institutions-law-budget/law/types-legislation_en.
[72] Proposal for a Regulation of the European Parliament and of the Council "Establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law)" (4 March 2020), COM(2020) 80 final.

Given their high-level nature and far-reaching impact, and to avoid creating a hierarchy, material resource consumption-reduction targets should have the same legal weight as the net zero objectives set out in the Climate Law. Failure to do so could result in resource consumption targets being given less political importance than climate targets. Indeed, under the Climate Law, the European Commission must "assess the consistency of any draft measure or legislative proposal, including budgetary proposals, with the climate-neutrality objectives […] and the climate targets […] before adoption."[73] Similarly, it would be important that draft measures or legislative proposals are assessed in light of their consistency with a resource consumption reduction target. This would *not* be possible if the EU Material Resources Law was a directive.

Moreover, as highlighted earlier, neither of the EU's CEAPs were in themselves binding upon EU Member States – and they do not include the requirement to adopt national CE strategies – even though they make reference to legislative proposals which, once implemented, will be binding on EU Member States.[74] It is considered that the voluntary nature of these plans is, in part, responsible for the very limited circularity improvements that were found in the Special Report on the Circular Economy, conducted by the ECA.[75] Thus, to see a true circular transition, it is critical to ensure that the development of an EU Material Resources Law is binding on all EU Member States, and sets forth a course of action that requires prioritizing material resource reduction as a policy objective, along with the climate goals.

Adopting a regulation would also be an important signal to both EU institutions and Member States to adopt the same level of ambition and move towards harmonizing measures to achieve reduction in resource consumption in accordance with the EU targets. Leaving Member States to determine the level of ambition through their implementation choices, as seen in initiatives adopted by different EU Member States and explored in Section 3.2, bears the risk of not overcoming the high fragmentation in the approaches adopted to address resource consumption. Indeed, in proposing to change EU packaging waste legislation from a Directive to a Regulation, the European Commission noted that the existing Packaging Waste Directive had failed to achieve its objective, as "diverse national rules reduce the effectiveness of the policy and put the effective establishment of a circular economy in jeopardy."[76]

Politically, it has historically tended to be more difficult to adopt EU legislation in the form of regulations than directives. This is in part due to perceived or actual opposition from Member States to legal instruments that afford them less implementation flexibility; a 'one size fits all' approach is sometimes not appropriate, given the differences between Member States. However, recent proposals relevant to the circular economy suggest that there may now be less resistance to adopt regulations than there used to be. As mentioned, the European Commission is proposing to amend its packaging waste legislation from a Directive to a Regulation, citing concerns of fragmentation. Moreover, the Commission has proposed Regulations on Microplastics pollution and Ecodesign for Sustainable Products, and the new Batteries Regulation successfully entered into force in August 2023. These developments strengthen the case for a regulation as an appropriate – and

[73] Regulation (EU) 2021/1119 of the European Parliament and of Council, "Establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law')" (30 June 2021), Article 6(4).
[74] European Court of Auditors (2023).
[75] European Court of Auditors (2023).
[76] Proposal for a Regulation of the European Parliament and of the Council "On packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC" (30 November 2022), COM (2022) 677 final.

potentially politically acceptable – legislative instrument for an EU Material Resources Law. Another question that must be considered is the legal basis of such Material Resources Law.

4.1.2 Legal basis: internal market harmonization or environmental protection

The question of the legal basis for an EU Material Resources Law should also be considered. This concerns identifying which part of the EU Treaties gives the EU the right to act on a particular area of policy. The legal basis of a proposed measure depends on its main purpose, defined by its stated aim and content. As a general rule, the more specific legal basis should prevail over the general basis. An exception to this is a situation where the EU act pursues several objectives at the same time, that are intrinsically linked, without one objective being secondary to the other objectives.

The Material Resources Law could have either the "internal market harmonisation" or "environmental protection" as its legal basis. The legal basis for an internal-market-related policy is Article 26 of the Treaty on the Functioning of the European Union (TFEU), which allows the EU to adopt measures to establish or ensure the functioning of the internal market, ensuring the free movement of goods, persons, services and capital. Actions that are mainly aimed at market integration but also contain elements of environmental policy may use Article 114 TFEU as their legal basis. This Article allows the EU to take action on the "approximation of laws" to ensure the achievement of the internal market (referring back to Article 26). For the protection of the environment, the legal basis is Article 192 TFEU. Article 192 allows the EU to take action to achieve the objectives stated in Article 191, namely the protection of the environment and human health, and the "prudent and rational utilisation of natural resources", whilst being based on the precautionary, preventive and polluter pays principles.

Whether an EU Material Resource Law should be considered solely an environmental policy, or one that also relates to the implementation of the internal market, must be further discussed. In doing so, important differences between the two approaches should be considered. If internal market harmonization is used as the legal basis, EU Member States cannot impose further regulatory requirements once harmonization has been achieved. It is difficult under this approach for EU Member States to derogate from the harmonization requirements. By contrast, using environmental protection as the legal basis for an EU Material Resources Law would favour only minimum harmonisation, and allow EU Member States to adopt stricter national standards. The advantages and disadvantages of these legal bases, and their implications for an EU Material Resource Law, should be further considered.

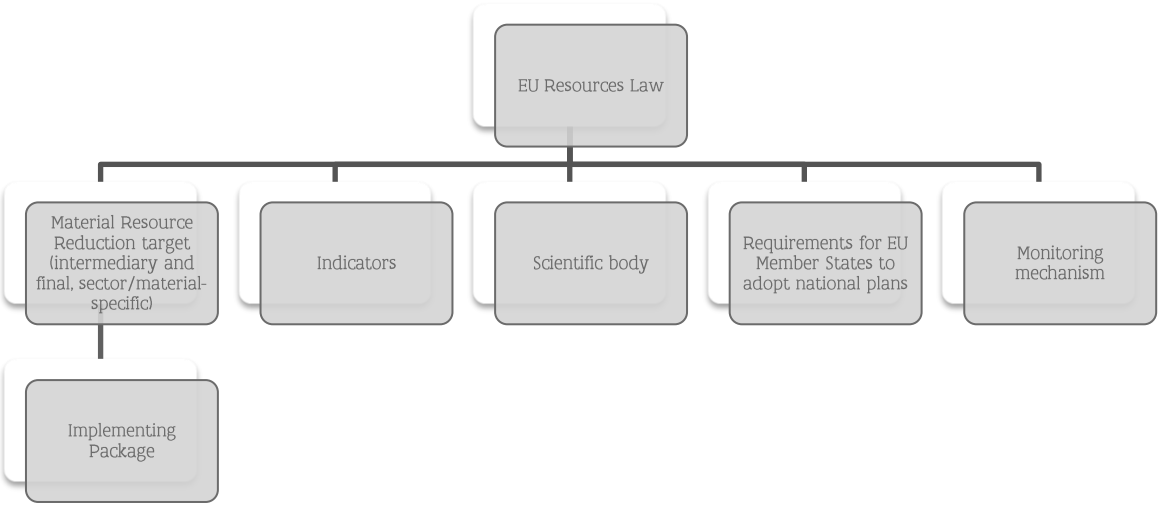
4.2 CONCRETE ELEMENTS OF AN EU MATERIAL RESOURCES LAW

Having established that the appropriate instrument for an EU Material Resources Law should be a regulation, this section zooms in on the elements that a Material Resources Law should, at a minimum, contain. It does so (i) by identifying whether elements set out in the Climate Framework could be relevant for a Material

Resources Law (see ***Fout! Verwijzingsbron niet gevonden.*** below); and (ii) by reflecting on opportunities and challenges for EU Member States with regards to addressing material resources use.

On this basis, this report recommends that an EU Material Resources Law should, at a minimum, contain the following elements: (i) a material resource consumption reduction target (and intermediary targets), sector-specific targets and specific EU Member States targets, coupled with indicators; (ii) a requirement to establish an independent scientific body focused on material resources; (iii) a requirement for EU Member States to adopt national material resource consumption reduction plans; (iv) a reference to sector-specific plans; and (v) a monitoring mechanism. These elements are illustrated in Figure 5. As will be further elaborated in this section, not all of these elements will be part of the regulatory framework itself; some, such as EU Member States-specific targets, would be developed as part of a package of implementing measures similar to the Fit-for-55 package.

Figure 5: Elements of a Material Resources Law



Source: Authors' elaboration

4.2.1 Considerations for an EU Material Resources Law

4.2.1.1 Scope

As highlighted in Section 3, most EU Member States that have established a framework to address resource consumption focus on material resources generally, which includes biomass, fossil fuels, minerals, and metals. This Report recommends that an EU Material Resources Law covers all material resources, biotic and abiotic, to prevent the substitution of abiotic with biotic materials, which creates its own set of environmental challenges. This might be difficult to accomplish politically, however; for example, the Netherlands deliberately excludes biomass from its material resource consumption reduction target. It explains this exclusion, noting that "this is because biomass is one of the most important 'renewable and commonly available natural resources', to be used to substitute abiotic resources wherever possible (the second strategic objective). As a result, biomass will increasingly be used in the production of medicines, bioplastics, biomaterials, biofuels and other products[…]".[77] However, simply replacing abiotic materials with biomass, as is happening in the context of the clean energy transition, would not lead to the desired results as it risks merely moving consumption from one type of resource to another, failing to lead to an absolute reduction in resource consumption. Thus, for the material resource consumption reduction target to be holistic, it must cover all four material categories: biomass, minerals, metals, and fossil fuels.

4.2.1.2 A legally binding headline target for material resource use

For the material resource consumption reduction target to be holistic, it must cover all four material categories: biomass, minerals, metals, and fossil fuels. A key element of the EU Material Resources Law should be establishing a legally binding headline target for material resource consumption. A target would be fundamental, as it would set a clear intention and direction to drive actions toward a desired goal.[78] Developing reduction target(s) on resource consumption will serve as an overarching vision for the EU and its Member States, thus driving new CE policies and incentivizing all other parts of the economy to also take into account demand-side measures.[79] As noted by the European Environmental Bureau (EEB), "[i]f we are to be serious about the need to reduce pressure on limited resources and reducing the waste we generate, strong targets are needed to initiate and sustain ambitious action to achieve them."[80]

The Climate Law, which establishes a legally binding GHG reduction target of 55% by 2030 and net zero by 2050, demonstrates the critical role of a headline target in guiding policy developments to ensure they converge towards the established target. Indeed, the Climate Law has triggered climate-oriented action by countries, municipalities, and businesses and has had a cascading and multiplication effect for adopting efficiency and GHG emissions reduction practices. In addition, climate targets have also been critical to unleash innovation and stir investment into relevant sectors and have generated awareness about climate change amongst EU citizens. In other words, the headline targets have turned GHG reduction into a policy priority for all EU Member States. Similar to what the net zero/- 55% reduction targets have done for climate

[77] J. Potting, A. Hanemaaijer (eds.), R. Delahaye, J. Ganzevles, R. Hoekstra and J. Lijzen, "Circular economy: what we want to know and can measure. System and baseline assessment for monitoring the progress of the circular economy in the Netherlands" (2018), Government of the Netherlands, Policy Brief.
[78] Friends of the Earth and Europe, Ecological Limits and European Environmental Bureau, "A circular economy within ecological limits: Why we need to set targets to reduce EU resource consumption and waste generation in the new Circular Economy Action Plan".
[79] European Environmental Agency, cited in Meysner and Gore (2022).
[80] Friends of the Earth et al.

change, a material resource consumption reduction target would identify a destination for the circular transition, enabling to development of a more proactive and deliberate circular economy strategy.[81]

A key difference between the GHG reduction target set out in the Climate Law, and establishing a target for reducing material resource consumption, is that for the former, an internationally accepted treaty exists, that identifies a final, science-based climate target, i.e., to stay well within 2 degrees Celsius of global temperature warming. This ensured that the Climate Law targets, anchored to the Paris Agreement objectives, received little opposition. In addition, it facilitated 'backcasting', the process of taking a vision of the future and then figuring out how to achieve it. By contrast, no international treaty has yet established a global material resource consumption reduction target to ensure the world stays within planetary boundaries.

Concretely, a headline target can come as a relative reduction target *vis-à-vis* a baseline year, or an absolute target. Establishing an absolute target must be connected to science-based sustainable consumption targets. One option is to use the research done by the IRP, which suggests that 6 to 8 tons of material resources per capita per year be an indicative target for sustainable resource consumption.[82] This figure has been the basis for Austria's material resource consumption target, as highlighted in Section 3 above. However, the science around targets for resource consumption is less well-established compared to climate change targets. The IRP is currently in the process of doing new research relative to establishing science-based targets, which could provide the basis for an absolute target on material resource consumption in the EU.

A better option that would avoid the need to have a clear absolute target is to establish a relative target against a baseline (e.g., an XX percentage reduction in material resource consumption by XX). In contrast to EU Member States have adopted different baseline years for their consumption reduction – 2013, 2014, 2015, 2018, 2020.[83] Since Sustainable Development Goal (SDG) 12 started measuring material footprint in 2015, reduction could be measured using a baseline of 2015 levels.[84] The Regulation could include a provision that would develop and enshrine in legislation such a target, based on the latest scientific evidence, at a later stage. An impact assessment must be done to establish the appropriate intermediary target for 2035, to ensure the target is economically feasible and beneficial for the EU, when proper policies are in place.

Irrespective of whether the target is absolute or relative, it is important that at least one, if not two, intermediary targets are established, given that "a 2050 target will not drive a political debate".[85] Establishing a reduction requirement for 2030 would be aligned with the EU Climate Law, as well as the Eight Environmental Action Programme to 2030, which notes as a priority to decrease the Union's material and consumption footprints to bring them into planetary boundaries as soon as possible, including through the introduction of Union 2030 reduction targets, as appropriate."[86] However, this might come too early, given the elections in 2024 and the time it will take for binding resource consumption targets to pass through the

[81] Friends of the Earth Europe et al.
[82] UNEP and IRP (2019b).
[83] For details on the baseline years adopted by different Member States, see Table 3Table 3
[84] Friends of Earth Europe et al.
[85] F. Simon, "LEAK: EU's new circular economy plan aims to halve waste by 2030" (31 January 2020), Euractiv.
[86] Decision (EU) 2022/591 of the European Parliament and of the Council of 6 April 2022 "On a General Union Environment Action Programme 2030" (2022).

Parliament and Council. Thus, 2035 might be a more realistic year, which is also aligned with a number of EU Member States resource consumption targets.

4.2.1.3 Material/sector specific targets

An economy-wide resource reduction target will not be specific enough to stimulate action in specific sectors or for certain materials.[87] Therefore, specific consumption targets should be established for individual material groups and/or specific sectors, based on their impact on the environment. For materials, specific targets could be set for critical material resources, materials whose extraction and use exert high environmental pressure, and/or materials that are directly contributing to the climate crisis, such as fossil fuels.[88] Sector-specific targets could be set for high material-use sectors, such as transport, household consumption, construction and building, agriculture, and public spending – some of which overlap with the priority sectors identified in the CEAP. For example, Austria included a 10% reduction target for household consumption. Building on lessons learned from the energy and climate approaches adopted, material reduction targets could also be adopted according to, for instance, societal needs (e.g., housing, nutrition, mobility, leisure), or according to groups or services.[89] Research must be done to gain additional insights into the relationship between material and sector-specific targets and their environmental impacts. This can be achieved by using Life Cycle Analysis tools.

From both a regulatory coherence and efficiency perspective, the targeted sectors should include the CEAP's priority sectors (transport, construction and building, etc.) where relevant, but also identify additional areas, such as household consumption, which comprises 60% of Gross Domestic Product (GDP) within the EU, and public sector consumption which is responsible for another 14% of GDP in the EU.[90] Other resource-intensive sectors include energy and food. For each of these targeted sectors, indicators that enable the measurement of material use must be developed.

These sector- and/or material-specific targets do not need to be established in the EU Material Resources Law. Rather, similar to the Climate Law, these disaggregated targets could be developed at a later stage through implementing directives or other instruments. Indeed, this could take a similar form to the Fit-for-55 Package, which has been adopted to ensure that the EU economy will meet the target of reducing GHG emissions by 55% by 2030 and targets various high-emission sectors, such as building and road transport fuels; land use, forestry, and agriculture; and cars and vans, maritime, aviation and energy.[91]

4.2.1.4 Indicators and monitoring

Monitoring progress towards a circular economy is essential both in understanding the reach of the target and assessing the effectiveness of CE policies that have been adopted to achieve the target. For example,

[87] M. Bolger, D. Marin, A. Tofighi-Niaki, and L. Seelmann, "'Green mining' is a myth: The case for cutting EU resource consumption," European Environmental Bureau and Friends of Earth Europe.
[88] Potting amd Hanemaaijer (eds.) (2018).
[89] Bolger et al.
[90] World Bank, "Squaring the Circle. Policies From Europe's Circular Economy Transition" (2022), World Bank.
[91] See "Fit for 55: Delivering on the proposals": https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/delivering-european-green-deal/fit-55-delivering-proposals_en#:~:text=Under%20the%20European%20Climate%20Law,cost%2Deffective%20and%20competitive%20way.

differences exist between adopting a material resource consumption reduction target of 50% with regards to consumption within the country (*direct consumption*, measured by DMC), and adopting the same target but also counting indirect resources' consumption during the production of imported materials, product components and products, also known as the *Material Footprint* (measured as RMC). Whereas direct consumption, measured by DMC, would not include materials used in the production of products consumed in country A but produced outside of country A, this would be included under the Material Footprint (RMC) target.

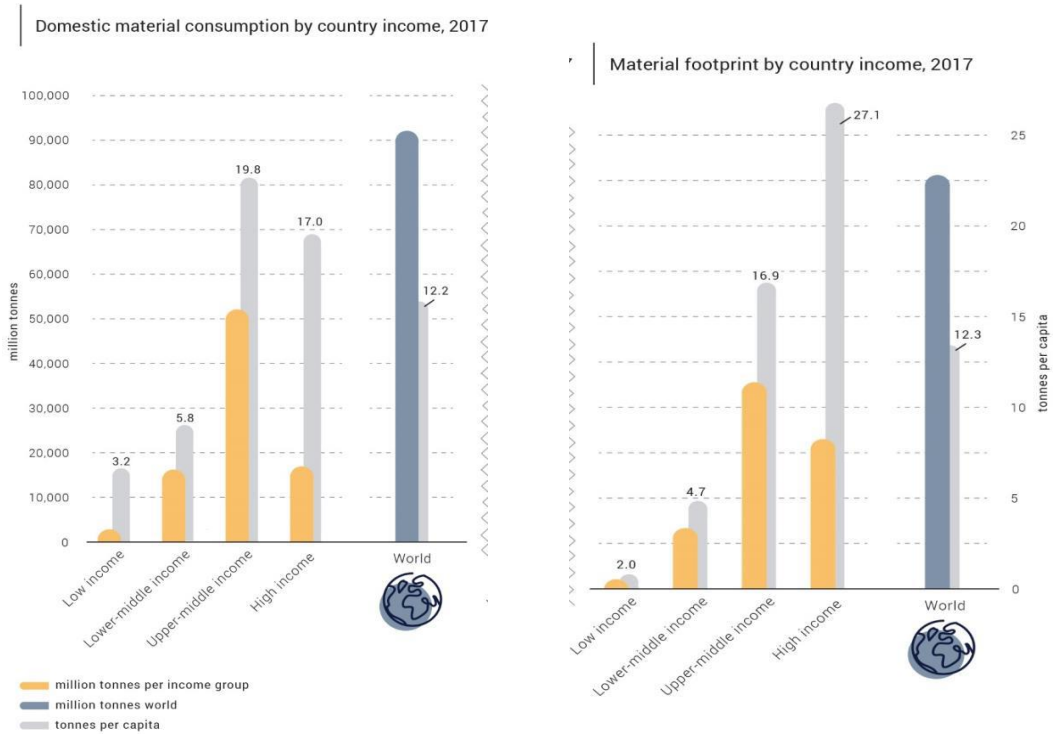
The material footprint or RMC paints a more accurate picture of material resource consumption. Indeed, it includes the total mass of raw materials that are extracted along the entire supply chain to produce the final products or services consumed in that country. [92] As a result, it accounts for materials that were extracted outside the EU and imported, thereby taking into consideration environmental and social pressures generated by the country's consumption that took place elsewhere in the world.[93] By contrast, DMC includes domestic extraction plus direct imports minus direct exports. This means that it excludes upstream flows related to imports and exports of raw materials and products originating outside the EU economy. Thus, simply outsourcing material-intensive production to a third country and subsequently re-importing manufactured materials, would enable an EU MEMBER STATE to reduce its DMC, given that it would no longer be included in the computation of DMC.

Fout! Verwijzingsbron niet gevonden. below illustrates the importance of utilizing the right indicator: when measuring material resource consumption in DMC, upper-middle-income countries are the largest per capita consumer, whereas when measured in RMC, high-income countries consume the most.

[92] Friends of Earth Europe et al.

[93] This would enhance the EU's international legitimacy when calling for a resource reduction target, thus enabling better alignment with any future international treaty on material resource use. Reflections on the international dimension of the EU framework on material resource consumption are articulated in Section 6 of this report.

Figure 6: Domestic material consumption versus material footprint consumption per capita



One problem with the RMC indicator is that it is less reliable than the DMC, due to its calculation method. Indeed, the RMC indicator is weight-based, which can lead to a simplification of complexities, as different materials have vastly different impacts depending on their makeup and how they are produced. Nonetheless, the material footprint indicator is still proven to be a good proxy of **overall** environmental damage caused.[94] Thus, the RMC indicator should be included in the Material Resources Law, but it should be complemented by the DMC indicator to accurately capture Member States material resources consumption. This would also be aligned with the updated Circular Economy Monitoring Framework, adopted in May 2023, which adds indicators on Material Footprint.

Including the DMC indicator would also enable the EU to measure *consumption footprint*, which is included in the EU's updated monitoring framework, which monitors whether EU consumption fits within planetary boundaries (see Box 3 below).[95] The consumption footprint indicator is based on life-cycle assessment and focuses on the five main areas of consumption: food, mobility, housing, household goods and appliances. These indicators would be particularly relevant if sector-specific targets are developed. Other new indicators

[94] Bolger et al.

[95] See details on the Circular Economy Action Plan on the European Commission's dedicated page: https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en.

that have been developed in the updated Circular Economy Monitoring Framework, and would be useful more generally for material reduction, include *GHG emission from production activities*. This measures the GHG emitted by production sectors and reflects the contribution of the CE to climate neutrality (this indicator could help make the case that a circular transition is critical to achieve climate objectives). Another indicator, *material dependency*, which measures the share of imported materials on overall use, thus describing how much the EU depends on imports of materials. This indicator will also be important in highlighting the relevance of material resource consumption with regard to the EU's geopolitical objectives.

While the new indicators in the updated Circular Economy Monitoring Framework will be critical in developing a more ambitious approach to circularity in the EU, they also leave room for improvement. The Report from the ECA highlighted the lack of specific design-related indicators as an issue. The Netherlands has proposed, in line with the Bellagio principles, to focus not only on material and waste flows and environmental footprint indicators but also on economic and social impact indicators to capture positive and negative impacts that may occur during a circular economy transition, as well as policy, process and behavior indicators to capture the implementation of specific CE policy measures and initiatives in key sectors.[96] However, data are not currently collected on these last two indicators by EUROSTAT or the Joint Research Centre (JRC), which suggests that adding these indicators might impose additional burdens on EU Member States.

[96] Call for evidence, circular economy revision of monitoring framework – input from the Netherlands (internal document shared during interviews).

Box 3: Overview of the revised Circular Economy Monitoring Framework

In May 2023, the Commission adopted a revised Circular Economy Monitoring Framework to better track progress in the transition to a circular economy in the EU. The new Monitoring Framework comprises 11 indicators, grouped into 5 dimensions: (1) production and consumption, (2) waste management, (3) secondary raw materials, (4) competitiveness and innovation, and (5) global sustainability and resilience. It includes the following new indicators:

- **Material footprint**, measuring the overall use of materials and reflecting the amount of materials embedded in overall consumption, including imported goods;
- **Resource productivity**, measuring the amount of GDP from materials use and demonstrating the efficiency in using materials in the production of goods and services;
- **Consumption footprint**, comparing consumption to the planetary boundaries for 16 impact categories based on a life-cycle assessment and according to the 5 main areas of consumption (food, mobility, housing, household goods and appliances);
- **GHG emissions from production activities**, measuring the GHG emissions produced by production sectors (therefore excluding emissions from households) and reflecting the contribution of the circular economy to climate neutrality;
- **Material dependency**, measuring the share of imported materials on overall material use, describing how much the EU depends on imports of materials and reflects the contribution of the circular economy to security of supply of materials and energy and to the EU's open strategic autonomy. An indicator of self-sufficiency for raw materials has been used since 2018.

Source: Communication from the Commission on a Revised Monitoring Framework for the Circular Economy. (May 2023). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023DC0306

4.2.1.5 Independent board of scientific advisors

The Climate Law established the European Scientific Advisory Board on Climate Change, as independent advisory board for climate change.[97] A similar scientific body must be established in the context of managing material resources. This could be called the European Scientific Advisory Board on Material Resources Consumption. Similar to the Board on Climate Change, this body should be situated within the European

[97] European Scientific Advisory Board on Climate Change. Accessed in November 2023. Available here: https://climate-advisory-board.europa.eu/about.

Environment Agency (EEA) and tasked with providing the EU scientific knowledge, expertise and advice related to climate change. It must evaluate policies and identify actions, as well as opportunities, with the objective of achieving the EU's material resources targets. Furthermore, it must deliver concrete advice and recommendations to the European Commission, Parliament, and EU Member States, based on facts, the best available recent scientific evidence, and robust analysis. Finally, and again, similar to the Advisory Board on Climate Change, it must be entrenched in the EU scientific community and network, to access relevant expertise and evidence to support its analysis, where relevant. For material resources, establishing an Advisory Board would be particularly relevant because, in contrast to climate change, the science around material resources consumption has not been as well established.

4.2.2 Considerations and requirements for EU Member States

An EU Material Resources Law with **binding reduction targets** would require EU Member States to significantly increase their circular economy ambitions. As set out in Section 3, the CE action plans currently adopted by EU Member States, including the four Member States that have adopted non-binding material resource consumption targets, are insufficient to bring about a circular transition in the EU in line with sustainable levels of resource consumption.

The implications of an EU Material Resources Law will likely be different among EU Member States. Indeed, EU Member States have very different material footprints. Based on 2020 figures, the difference between the EU Member State with the highest material footprint (Finland, at 45 tonnes per capita) and the lowest (the Netherlands, at 8.2 tonnes per capita) was around 37 tonnes per capita.[98] Moreover, material resource use trends have gone in opposite directions for different EU Member States. Compared to 2010 data, 18 countries had reduced their material footprints – six of them with more than a quarter. However, nine EU Member States saw an increase in material footprint per capita. Romania's footprint more than doubled between 2010 and 2020.[99]

Differences in DMC and RMC per capita can be the result of many different factors – not just circular material use or resource productivity. For example, the structural composition of an economy plays an important role in DMC and RMC levels. Economies largely reliant on primary sectors typically have relatively higher DMC/RMCs per capita than economies that do not have a focus on primary sectors. This means that many Eastern European countries have higher DMCs/RMCs per capita than many of the Western European countries that have moved away from primary sectors already quite some time ago.[100] In addition, population density has an important impact on DMC/RMC per capita: as a result of the role infrastructure plays in total resource use, countries with lower population density will have, *ceteris paribus*, a higher DMC/RMC per

[98] See Eurostat's "Material flow accounts statistics - material footprints": https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Material_flow_accounts_statistics_-_material_footprints#Material_footprint_of_European_countries. These vast differences might not accurately reflect different EU Member States' circularity levels, however, as they could be related to the simplification of RME-coefficients, or reflect differences in population density, as explained below.
[99] See Eurostat's "Material footprint of European countries": https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Material_flow_accounts_statistics_-_material_footprints#Material_footprint_of_European_countries.
[100] World Bank (2022).

capita compared to countries with higher population densities. [101] Other factors that impact DMC/RMC per capita levels are capital investments through material stock accumulation, as well as a country's trade relations, as the share of raw material production that goes towards the final product consumed in other countries.

In the context of the Climate Law, differences between EU Member States' GHG emissions and capacity were addressed through the "Efforts Sharing Regulation" which assigns a different GHG reduction target to different EU Member States, recognizing differences in the capacities of Member States to take action and their GDP per capita (imposing a greater burden on the richer countries), while ensuring the individualized GHG reduction targets did not exceed the collective target.[102] In the context of resource consumption reduction, it would similarly be important to assign material resource reduction targets for each EU Member States through an "Effort Sharing Regulation" – to be developed once the material resource reduction regulation has been approved. The above factors must be considered (e.g., GDP per capita, the structure of the economy, population density), as well as current levels of material footprint and consumption footprint, GDP per capita and capacity to reduce material resource consumption. In addition, individual EU-Member States material resource consumption reduction targets cannot deviate too much from the EU reduction target. For example, if there is an EU level target to reduce material resource consumption by 50% by 2030, then an individual MEMBER STATE reduction target for 2030 should not be more than 51/52%. In addition, allocating an appropriate EU MEMBER STATE reduction target will also need to take into account the structural composition of an economy. This again highlights the importance of adopting appropriate indicators.

An important component of an EU Material Resources Law would be to **require EU Member States to develop national plans** on how they intend to achieve the intermediary reduction target of material resource consumption, similar to the Climate Law, which imposes various requirements on Member States to develop national climate and energy strategies, which go through various drafts and receive inputs from the European Commission.[103][104] Specifically, EU Member States should be required to develop a CE action plan, formed around a national material resource consumption reduction strategy detailing: (i) their overall strategy to reduce material resource consumption with their country-specific target, including the instruments they have adopted to get there; (ii) sector-specific reduction targets, focusing on the sectors that have been highlighted in the CEAP as highly resource intensive; (iii) efforts that are undertaken in areas such as research, innovation and competitiveness; and (iv) how resource reduction targets are contributing to achieving a 55% reduction in GHG emissions by 2030. Additionally, material resource reduction strategies should also include strategies relevant to dematerialization, resource efficiency, circularity, and waste management. The strategies should

[101] World Bank (2022).
[102] See "Effort sharing 2021-2030: targets and flexibilities": https://climate.ec.europa.eu/eu-action/effort-sharing-member-states-emission-targets/effort-sharing-2021-2030-targets-and-flexibilities_en.
[103] In the context of Climate Change, EU Member States are under the obligation to report their reduction commitments as part of their energy and climate plans, as well as national long-term strategies and biennial progress reports submitted under Regulation EU/2019/1999, as relevant for the achievement of the climate-neutrality objectives.
[104] European Commission, "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of The Regions: Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people" (17 September 2020), COM(2020) 562 final.

identify what measures and instruments an EU Member State intends to apply to achieve different objectives.

The fact that almost all EU Member States already have a CE plan in place or are in the process of developing one would minimize some of the efforts required to develop these plans. In addition, a binding material resource consumption reduction target would require that the CE strategies adopted by EU Member States are transposed into law.

In parallel, an EU Material Resources Law would also require EU Member States to engage in monitoring and establish clear reporting requirements. While the EU has adopted a revised circular economy monitoring framework, as explained above, with circular economy targets, this framework does not (yet) mandate EU Member States to report on these indicators. In fact, only about half of the EU Member States have the capacity to collect the relevant data to report on indicators such as material footprint and DMC. Moreover, developing additional reporting requirements for EU Member States will require addressing "target fatigue", as ministries in national governments are under-staffed and under-resourced, unable to keep up with extensive monitoring requirements for existing targets such as targets regarding waste management. When making reporting requirements on these and other key indicators mandatory for EU Member States, it would be critical to strengthen EU Member States capacity to collect the relevant data.

A lack of capacity, coupled with the fact that EU Member States are reporting on many other targets and indicators, has been identified in a number of interviews as an area of concern for EU Member States in the context of a potential Material Resources Law. Specifically, during interviews, EU Member States expressed concern that they are barely managing to comply with the existing reporting requirements and that adding another target to the existing requirements would stretch their capacity even further. This must be taken into account and addressed in a European Commission proposal for an EU Material Resources Law.

Specifically, one way to somewhat reduce the burden on EU Member States could be to require EU Member States not to produce a separate material use strategy but rather to link their material use report with existing climate reports, such as the National Energy and Climate Plan (NCEP) (Figure 7). The idea is not to embed the material resource reporting within the climate reporting but rather to create an integrated approach to climate and material resource reporting. This approach would require EU Member States to consider trade-offs and synergies between the climate and material resource consumption goals, thereby moving towards a more systems-thinking approach to the economy and the environment. This will not be without challenges, of course. For example, GHG emissions are calculated based on territorial emissions, whereas, as highlighted above, material footprint calculations will target all primary extraction that goes into final consumption, including extraction in third countries.

Figure 7: From parallel reporting to an integrated approach

Table 5: Identifying EU Climate Law targets and intermediary targets and their relevance to a potential Material Resources Law.

	Climate Law	Proposed Material Resources Law
	EU requirements	
Main target	Net zero by 2050	*Develop relative material resource reduction targets (e.g., 50% reduction of material consumption by 2050)*
Intermediary target (1)	Reduce greenhouse gas emissions by 55% compared to 1990 emissions	Conduct impact assessment to identify intermediary target. (e.g., 25% reduction of material resource consumption by 2030/2035 based on 2015 figures)
Intermediary target (2)	Target for 2040; reduction requirement to be determined	To be determined
Sector-specific targets	• Commitment to engage with industry sectors that seek to prepare roadmaps on climate neutrality. • Fit for 55 package was adopted.	• Explore developing sector and/or material specific targets once the Material Resources Law has been adopted, through an implementation package similar to Fit-for-55. • This could focus on sectors identified in the CEAP as high-material intensive or sectors such as household, food, transport, or else material groups that have a large environmental footprint.
Scientific advice	Establishes the EU Scientific Advisory Board on Climate Change as a reference point for scientific knowledge relating to climate change	Consider establishing an independent board to advise on material resources, comprised of technical and scientific experts
	EU Member State requirements	
Requirement to develop a national plan	EU Member States must report on how to meet the greenhouse gas reduction requirement is integrated on the basis of energy and climate plans, national long-term strategies, and the biennial progress reports submitted in accordance with Regulation 2018/1999.	Require EU Member States to prepare and report on a material reduction strategy.
Monitoring requirement		

Adjusting targets to reflect EU Member States different capabilities	Effort sharing regulation adopted to reflect differences between Member States	Adopt an effort-sharing regulation that sets specific resource consumption reduction targets for different EU Member States

Source: Author's elaboration

4.2.3 Institutional anchoring and political considerations

Having set out the key design elements of an EU Material Resources Law, this section focuses on the institutional and political aspects of putting it in place. It seeks to understand: (i) how an EU Material Resources Law fits within the existing European Commission's Directorate Generals (DGs), and (ii) different suggested approaches to advocate for a Material Resources Law.

Given the overarching, and far-reaching nature of an EU Material Resources Law, it would be important that such a Law would be developed as part of a joint proposal by various DGs. At a minimum, the DG coalition involved in developing an EU Material Resources Law must include:

- DG for Environment (DG ENV): responsible to develop and carry out policies on the Environment, which includes the circular economy, pollution, and biodiversity issues. Thus, the involvement of DG ENV in advocating and developing an EU Material Resources Law is critical.
- DG for Climate Action (DG CLIMA): Material resource reduction, and the circular economy more generally, is important to DG CLIMA, which focuses on reducing GHG emissions, given that, without a transition towards a circular economy, they will not be able to meet the 2030/2050 greenhouse gas reduction targets.[105]
- DG for the Internal Market, Industry, Entrepreneurship and SMEs (DG GROW): responsible for industry, business and the single market, focusing on jobs, growth and investment, as well as the internal market and the economic and monetary union. DG GROW leads efforts on digitalization and decarbonization of the European industry and SMEs. Most recently, DG GROW developed a Proposal for a European CRMA.

Further, additional DGs could be involved in consultations in the preparation of the Material Resources Law. Relevant DGs could include DGs: Agriculture and Rural Development (DG AGRI), Budget (BUDG), Competition (COMP), Economic and Financial Affairs (ECFIN), Employment, Social Affairs and Inclusion (EMPL), Energy (ENER), International Partnerships (INTPA), Maritime Affairs and Fisheries (MARE), Mobility and Transport (MOVE), Regional and Urban Policy (REGIO), Research and Innovation (RTD), Taxation and Custom Union (TAXUD), and trade (TRADE).

The involvement of DG ENV is straightforward, given that the CE agenda falls under its purview. However, it is also critical to include DG CLIMA, given the strong linkages between the climate and circular economy/material resources agendas. In particular, framing the material resource consumption approach as

[105] Interview with DG CLIMA.

indispensable to the climate agenda would be critical to develop support for this approach. Likewise, it is important to signal that the material resource consumption agenda does not seek to reduce well-being and prosperity, but rather, seeks to ensure that human needs are met with fewer material resources, including through decoupling. DG GROW will be critical to ensure that economic considerations and material resource consumption objectives are linked through industrial policy considerations. Moreover, an EU Material Resources Law needs to be connected to DG GROW's recent CRMA.

Realistically, none of these three DGs will likely be interested in pushing for a joint proposal focused on the reduction of material resource consumption. DG CLIMA, while keen on stepping up the speed of the EU's circular transition, will not be taking the lead on developing an overarching material law on resource consumption, given its focus on climate and interests in the circular economy only as a means to achieve climate objectives. DG ENV has its hands full in delivering on existing targets relevant to waste management, as well as with initiatives such as the proposal for the ESPR. In the preparation of this Report, DG GROW was not available to talk the authors about a potential Material Resources Law. This could suggest that the subject of this Report might not be apriority item for them. Indeed, the focus of the recently adopted CRMA, developed by DG GROW, is on securing the supply of CRMs to meet demand for the clean energy transition – not on reducing CRM demand generally, for instance, by shifting to more efficient transport systems. The authors' experience in interviewing officials from the EU institutions suggests some reluctance towards the idea of developing a Material Resources Law. While most interviewees from EU institutions agreed with the need to tackle material resource consumption, many considered that existing circular economy measures were sufficient to bringing about this goal.

At the same time, political factors may not favor what is perceived by many to be yet another set of targets relevant to the environment. While the EU Green Deal has led to the development of a large number of new environmental and climate laws in the pipeline, concerns about high energy prices and competitiveness are starting to change the political landscape.[106] The umbrella organization Business Europe has demanded "regulatory breathing space", with a similar position adopted by parts of the European People's Party (EPP) Group in the European Parliament.[107] Similarly, in May 2023, French President Emmanuel Macron called for a "regulatory break" on EU green law to allow industry to digest the large quantity of regulation recently presented and adopted.[108] In Germany, plans to outlaw the installation of new gas boilers in favor of heat pumps generated a backlash from consumers worried about the costs, leading to a slowing of the transition to heat pumps. Poland has brought a legal challenge against three Green Deal Regulations in the European Court of Justice, arguing that they threaten the country's energy security and will aggravate social inequality.[109]

[106] M. Engström, "Resource Efficiency: a missing piece of the EU climate puzzle?" (2023), Swedish Institute for European Policy Studies
[107] Engström (2023).
[108] S. Fleming, A. Hancock and A. Bounds, "Political pushback puts brakes on Brussels' green agenda" (16 May 2023), Financial Times.
[109] A. Hancock, "EU-China fight further muddies Brussels "Green Deal" agenda" (2023), Financial Times.

Policymakers have noticed a slowdown in the revision or introduction of more than 70 pieces of legislation that are part of the Green Deal. Environment Commissioner Virginijus Sinkevičius has proclaimed that the EU Green Deal is past its "glory age when there were streets full of people asking us to act on climate change".[110] With European Parliament elections scheduled for June 2024 and the current European Commission's term of office ending in October 2024, the Commission might be forced to delay parts of its green agenda.[111] Estimates are that around 20 percent of the Commission's original proposals may not be adopted before the elections.[112]

With a changing political climate, it will be more difficult to achieve far-reaching results on the circular economy compared to the political climate that paved the way to the EU Climate Law.[113] The EU Climate Law was adopted in the context of a confluence of factors, including awareness around the impact of climate change in the European Parliament in 2019, generated by the Paris Agreement; the leadership by von der Leyen and Timmermans in the European Commission, culminating in the EU Green Deal; and the COVID-19 pandemic, which enabled the mobilization of financial resources. The current political *milieu* surrounding material resource consumption reduction is very different. Given the current political climate, there are different options to explore in advocating for the adoption of an EU Material Resources Law – presented from most to least ambitious.

1. Anchoring an EU Material Resources Law as part of a wider systems approach: This approach would make an EU Material Resources Law part of a wider systems approach, that would connect the fragmented pieces of existing EU regulations into a broader, more systemic approach. This approach would go beyond focusing on developing a binding reduction target for material resource consumption and would look more broadly at connecting climate change targets with the circular economy, the EU Industrial Policy Strategy, the Digital Single Market and Horizon Europe, and developing country implications.[114] In other words, this would be a systems approach to decarbonizing and dematerializing the economy, with a specific focus on how our socio-economic society could be re-designed to better link well-being objectives with dematerialization and decarbonization objectives.

2. Material resource-focused top-down targeted approach: This approach would involve advocating for a stand-alone Material Resources Law, as the missing part of the EU Green Deal, along the lines set out in this report. Compared to the previous, this approach would be narrower as it exclusively focuses on the adoption of an EU Material Resources Law in the EU. Given the political and inter-DG involvement that would be required to advance this approach, this approach must be pursued through strong leadership from the Secretary-General, under the guidance of the President of the Commission, to direct DG CLIMA, DG ENV, and DG GROW (and potentially others) to work together.

[110] Hancock (2023).
[111] Fleming et al (2023).
[112] Hancock (2023).
[113] Engström (2023).
[114] D. Baldock and C. Charveriat, "30x30 Actions for a Sustainable Europe" (2018), Institute for European Environmental Policy and GLOBE EU.

3. Anchoring into 2040 climate target: Another option would be to embed an emphasis on material resources within existing climate targets. Under the Climate Law, new intermediary targets for GHG reduction by 2040 must be developed by June 2024. The development of these targets and evidence that meeting material circularity objectives will be critical to meet GHG reduction targets could be the anchoring point to advocate for the development of more robust circular economy targets, including through tackling the root cause of climate change, which concerns the extraction and production of material resources. This approach, however, could undermine resource reduction as a standalone objective, as it would be considered important predominantly as a means to the end of addressing climate change objectives.

4. Bottom-up approach: Compared to the approaches detailed above, the bottom-up approach comprises adopting a more organic, gradual approach to incorporating dematerialization in the EU. It would start by making it mandatory for EU Member States to report on key material indicators, such as material footprint and material consumption (which is currently not required), followed by requiring EU Member States to develop national circular economy and material action plans. At the same time, it will establish a scientific body at EU level to conduct additional research on the EU's safe operation space and sustainable material resource objectives. At the same time, this approach emphasizes the importance of generating awareness about the issue of material resources amongst EU Member States as well as environmental NGOs, the private sector, and citizens. Only after these elements have been put in place will the EU leadership start discussions on the development of a binding reduction target for resource consumption.

Each of these approaches has advantages and disadvantages: The top-down approach will be more difficult to get through politically, but once adopted, will be a powerful lever to induce a paradigm shift with regards to how we look at the circular transition. The bottom-up, by contrast, will be easier to get political buy-in but does not have the ambition to truly transform the EU's material resources dependence. Anchoring material resource approaches with the Climate Law would limit the effectiveness of the material resources framework as it would remain subservient to the climate agenda.

Indeed, to the extent possible, it would be important to adopt an EU Material Resources Law as a stand-alone regulation – and not by integrating it into the Climate Law. Adopting a separate EU Material Resources Law will give greater latitude in the design of the targets. If these targets were integrated within the Climate Law, the focus would primarily be on reducing emissions from resource use, which would fall short of addressing the full range of impacts associated with tackling material resource consumption. Indeed, a key reason for the development of an EU Material Resources Law is to approach resource consumption holistically and to avoid going from decarbonization towards materialization, as has been explained in this section. Incorporating material resource targets within the Climate Law would undermine this purpose.

Moreover, it would be important to keep the two frameworks separate because of their different focus. One of the identified shortcomings in the EU Climate Law is its domestic focus. It fails to adequately take into

account climate impacts that are caused by the EU but occur outside the EU's territory. It is particularly important for materials extracted and produced outside the EU, but consumed within the EU, to be considered in an EU Material Resources Law, since many of the environmental and social impacts of EU consumption occur primarily in third countries (e.g., impacts related to resource extraction and waste management). Keeping the new legislation separate would enable this aspect to be fully addressed within the legal design, allowing the EU to recognize and take responsibility for all its resource use impacts, not just those that happen within EU borders. If anything, the EU Climate Law should be incorporated into an EU Material Resources Law – not the other way around.

Ultimately, political dynamics and the extent to which momentum is building for the development of an EU Material Resources Law will be determinative of the approach adopted. The narrative to be adopted will also be key. Here, the narrative should not just be on environmental objectives, but rather, be a holistic one: by reducing our material resource consumption, we create economic opportunities for EU businesses, enhance innovation, reduce the EU's dependence on CRMs, all while meeting the wellbeing of EU citizens and material needs. A critical part of this narrative must also include a focus on a "just" transition, which takes into account the implications of the EU's approach with regard to developing countries that are most vulnerable to climate change, and /or developing countries that are economically dependent on the EU as a key export market and might find themselves impacted by decarbonization and dematerialization developments within the EU. These concerns will be further addressed in Section 6.

5 LINKING A NEW EU MATERIAL RESOURCES LAW TO EXISTING EU INSTRUMENTS

The EU has for over 20 years been working towards sustainable resource use, or resource efficiency, and there is therefore already a significant body of EU policy and legislation that relates to resource management. Since resources are used for many purposes, by many sectors of the economy, and with numerous environmental impacts, there are many areas of EU policy and legislation linked to, and impacting on, resource management. This includes instruments relating to raw materials, waste, circular economy, eco-design, climate change, trade, due diligence, and industrial policy. With the objective of better understanding how an EU Material Resources Law would add value compared to existing EU initiatives, this section highlights how such Law can (i) address an important gap in the EU Green Deal; and (ii) address trade-offs, while advancing synergies between different EU policies. This section further explores how an EU Material Resources Law could be integrated in the EU Green Deal, as well as how it could relate with regards to other EU instruments.

5.1 ADDED VALUE OF A MATERIAL RESOURCES LAW

5.1.1 Addressing gaps in existing EU policies

The EU has a long-standing competence to address environmental issues and develop a menu of policy tools to build from. With regards to the CE, the EU adopted its first CEAP in 2015, with the objective of transitioning from a linear to a circular economy. This 2015 Action Plan was followed by a revised CEAP adopted in 2020, which sets out four overarching objectives: (i) to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes; (ii) to keep its resource consumption within planetary boundaries; (iii) to strive to reduce the EU's consumption footprint; and (iv) double its circular material use rate in the coming decade.[115] By transitioning towards a circular economy, pressure will be reduced on material resources, which will be a prerequisite to achieving the EU's 2050 climate neutrality targets, as well as to halt biodiversity loss.[116]

Specifically, the CEAP establishes 35 key actions to accomplish these objectives. As set out in more detail in Table 6 below, through a combination of regulatory and non-regulatory initiatives, the CEAP emphasizes a number of priority areas for the circular transition, including:

- Making sustainable products the norm in the EU, by focusing on sustainable product design;
- Empowering consumers and public buyers by ensuring consumers receive trustworthy and relevant information on products at the point of sale, addressing greenwashing, and establishing the "right to repair";
- Enhancing circularity in production processes, including by reviewing the industrial emissions directive, developing an industry-led reporting and certification system, and promoting the use of digital technologies for tracking, tracing and mapping resources;
- Focusing on sectors that use most resources (or generate most waste) and where the potential for circularity is high, including electronics and Information Communication Technology (ICT), batteries and vehicles, packaging, plastics, textiles, construction and buildings, food, water and nutrients;
- Producing less waste through enhanced waste policy in support of waste prevention and circularity, and by creating a well-functioning market for secondary raw materials;
- Make circularity work for people, regions and cities; and
- Leading global efforts on circular economy.

However, as explained in Section 2 above, and set out in more detail in Annex 1, the vast majority of the interventions set out in these regulations focus on addressing the negative impacts of the current linear economy by improving product design, resource efficiency through repair and re-use, and the end-of-life management of products. A critical overlooked dimension of the CEAP is focusing on minimizing product need through better systems design or addressing material resource consumption – which corresponds to the highest category of the waste management hierarchy (see Table 1 above). Specifically, around 35% of the

[115] COM(2020) 98 final.

[116] See details on the Circular Economy Action Plan on the Commission's website: https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en.

key actions set out in the CEAP address end-of-life products and materials. In addition, most of the regulations that have been proposed or adopted by the EU and that include mandatory targets focus on end-of-life measures, as the below mentioned examples illustrate.[117]

- The 2008 Waste Framework Directive sets targets for the preparation for reuse and recycling of waste, including household and construction and demolition waste, and requires separate collection of paper, metal, plastic, and glass waste materials. The Directive sets out the priority order for waste management, known as the waste hierarchy, which states that priority should be given first to prevention, followed by reuse, recycling and recovery, with disposal of waste being the least desired option. It requires EU Member States to implement waste prevention measures, but at present does not contain specific waste prevention targets. However, by the end of 2024, the European Commission is required to consider the feasibility of setting quantitative reuse targets and possibly other waste prevention measures, including waste reduction targets. It is not yet clear whether this will result in amended or new EU legislation. However, "prevention" in the context of the Waste Framework Directive does not mean using less products, but rather refers to reducing waste by taking measures before a substance becomes waste.[118] In other words, waste prevention focuses on reducing a product's "waste footprint", for instance, through establishing recycling targets, but does not focus on limiting waste generation in the aggregate by reducing consumption. Even if additional recycled products would become available in the market, imperfect substitutability means that recycled materials will be produced in addition to the continued production of virgin materials.

- Amendments to the Waste Framework Directive have been proposed by the European Commission in July 2023, which focus on food waste prevention (including through behavioural change interventions, addressing inefficiencies in the food supply chain, and encouraging food donation and other redistribution for human consumption) and promoting more circular and sustainable management of textile waste (including ensuring separate collection of textiles by the start of 2025 and introducing mandatory Extended Producer Responsibility (EPR) schemes in all Member States with financial contributions based on the circularity and environmental performance of textiles). Through requiring those placing textile products on the market to pay when such products are difficult to recycle, it seeks to incentivize a shift to produce products that generate less waste. But overall consumption is not addressed.

- Similarly, the new Batteries Regulation, adopted in July 2023, focuses on increasing battery collection and recycling in the EU by establishing minimum collection targets and a requirement to set up take-back and collection schemes; minimum recycled content targets for cobalt, lead, lithium and nickel; minimum recycling efficiencies for lead-acid, lithium-based, nickel-cadmium and other batteries; and minimum levels of reuse for recovered cobalt, copper, lead, lithium and nickel (to be achieved by the end of 2027 and 2031). It does not, however, focus on consuming less batteries through better system design. For example, this could be done by rethinking transportation, and asking how public

[117] Nogueira (2022).
[118] Potting et al. (2022, page 15).

transport systems can be improved to reduce the need for new vehicles, and thus, the demand for batteries.

- The 2022 proposal for a Regulation on Packaging and Packaging Waste, intended to replace the existing Packaging and Packaging Waste Directive, also focuses on end-of-life materials, aiming to make all packaging reusable or recyclable by 2030. It includes targets to reduce packaging waste generation and recycling targets for packaging waste and includes measures to address unnecessary packaging (including some bans); measures to promote reuse and refilling of packaging; provision to set design criteria to facilitate recycling; mandatory deposit return schemes for plastic bottles and aluminium cans; and mandatory targets for recycled plastic content in packaging. The focus of this regulation is squarely on minimizing the need for packaging and packaging waste, thereby reducing material resources used in the packaging process. Thus, if implemented this regulation would be an important step forward in minimizing packaging waste. However, the regulation is also limited, as it does not address the upstream segment of the circular economy, i.e., the need to purchase the packaged product in the first place.

- Another circular economy initiative focused on waste management is the 2000 End-of-Life Vehicles (ELV) Directive, which aims to prevent and limit waste from ELV and their components by setting targets for reuse and recovery, and for reuse and recycling. In July 2023, the European Commission proposed a new Regulation[119] to replace the existing Directive, noting that ELV are still not being handled optimally, leading to loss of resources and pollution, that existing laws have not led to improved eco-design or increase use of recycled materials, and that vehicle production remains resource-intensive and highly dependent on imported raw materials, including CRMs such as aluminium, magnesium, platinum group metals, rubber, and rare earth elements.[120] Measures included in the proposal include: minimum requirements for the circular design of vehicles to facilitate removal, reuse and recycling of materials and components (together with a requirement for manufacturers to develop a circularity strategy and circular vehicle (digital) passport for each vehicle); and a minimum requirement for recycled plastic content. Again, the focus is on waste management – not on rethinking the decision to buy a vehicle in the first place.

- A shift with regard to the CE transition can be seen in the ESPR proposed in March 2022, which focuses on product design. Specifically, products placed on the EU market would have to comply with requirements for product durability, reusability, upgradability and reparability; remanufacturing and recycling; the presence of substances that inhibit circularity; recycled content; carbon and environmental footprints; information requirements, including digital product passports for all regulated products; and energy and resource efficiency. This regulation, in contrast to the packaging regulation, waste and ELV regulation set out above, focuses upstream on product design and could have a more direct impact on material resource use. For example, to ensure a textiles product is easy

[119] Proposal for a Regulation of the European Parliament and of the Council "On circularity requirements for vehicle design and on management of end-of-life vehicles, amending Regulations (EU) 2018/858 and 2019/1020 and repealing Directives 2000/53/EC and 2005/64/EC" (13 July 2023), COM(2023) 451 final.
[120] See details on the EU End-of-life vehicles Regulation on the European Commission's website: https://environment.ec.europa.eu/topics/waste-and-recycling/end-life-vehicles/end-life-vehicles-regulation_en.

to recycle, certain combinations of fibers in products would not be allowed. Consumption would thus be impacted, as the ESPR would not give consumers the option to buy certain products, also known as choice editing.[121] However, overall consumption of products can still increase, which could negate any progress made through choice editing.

The proposed EU regulations that focus on taxing household waste, requiring minimum recycled content in products, or increasing resource efficiency could indirectly contribute to reducing material resource consumption. However, as mentioned in Section 2, it would not automatically result in a reduction in material resource consumption. Indeed, targets that seek to reduce waste generation, e.g., the proposed target to reduce packaging waste generation per capita, would reduce waste, but do not necessarily reduce aggregate material resource consumption. For example, if packaging for electronics is increasingly made from recycled material, and increasingly fully recyclable, the waste generated per product will be greatly reduced. This would enable for consumption of electronic products to be increased, while staying within packaging waste reduction targets.

Indeed, although Europe's recycling of waste into secondary materials grew faster than waste generation, the growth of secondary materials from recycling has not prevented a slight increase in resource use after the financial crisis, and before the COVID-19 pandemic. Similarly, the Communication for a Revised Monitoring Framework notes that "there has been mixed progress in shifting to more circular for systems of production and consumption in recent years. EU production has become more resource-efficient, but EU consumption of materials and generation of waste are both very high and need to decrease."[122] This means that reducing waste generation or increasing recycling or resource efficiency does not necessarily reduce resource use – unlike what is assumed by the Commission's approach that focuses on end-of-life products.[123]

Another problem is that existing laws and policies relevant to the environment tend to single out a specific material group – batteries, packaging materials, single-use plastics. Some of these approaches include consumption reduction targets, for example, with regards to single-use plastics and packaging, or, as highlighted in the Farm to Fork Strategy, with regards to food consumption patterns.[124] However, by focusing on reducing consumption within a specific category of products, they do not consider the trade-offs between material use, elaborated upon more in section 5.1.2 below. For example, if single use plastic is reduced, it will increase the use of another material, most likely the use of biomass (paper packaging etc.). What is required is to go beyond individual material focuses, towards a more holistic approach that addresses trade-offs between different material uses.

An EU Material Resources Law would redirect the focus of the CE transition towards the highest ladder of the waste hierarchy, which is prevention, by minimizing product need through system design. It would enable directly addressing the root cause of environmental degradation and climate change, i.e., excessive

[121] Interview with DG ENV.
[122] COM (2023) 306 final.
[123] Potting et al (2022, page 12).
[124] European Commission, "Farm to Fork Strategy: For a fair, healthy and environmentally-friendly food system" (2020).

consumption, as opposed to seeking to mitigate the consequences of excessive consumption through waste management.

Table 6: Overview of instruments proposed in the 2020 CEAP, and linkages to different elements in the EU's Circular Economy Approach

Type	2020 CE Action Plan	Better	Leaner	Longer	Cleaner
Regulatory Instruments (mandatory)	Legislative proposal on sustainable products (Eco-Design for Sustainable Products Regulation)	x	Yes		Yes
	Legislative proposal for consumer empowerment	x	x	x	x
	Right to repair	X	x	Yes	x
	Legislative proposal on green claims	X	x	x	x
	Revisions of the Industrial Emissions Directive	X	x	x	x
	Circular Electronics and Common Charger Initiative	X	x	x	x
	Revisions of the Directive on restrictions on the use of certain dangerous substances in electoral and electronic equipment	X	x	x	Yes
	New regulatory framework for batteries	X	x	Yes	Yes
	Restrictions of added microplastics and measures on unintentional release	X	x	x	Yes
	Initiative to replace single-use plastics	Yes	Yes	Yes	Yes
	Regulatory framework for carbon removal certification	x	x	Yes	Yes
Revision for regulatory instruments	Review of the rules on treatment of …Oils	x	x	x	
	Mandatory requirements on recycled plastic content and plastic waste reduction measures in packaging, construction materials and vehicles	x	x	Yes	Yes
	Review of essential requirements for packaging and packaging waste	x	Yes	Yes	Yes
	Revision of the rules on waste shipment	x	Yes	x	x
	Review of rules for end-of-life vehicles	x	x	x	Yes
	Waste reduction targets for specific streams	x	x	x	Yes
	EU Harmonized model for separate waste collection	x	x	x	Yes
	EU Strategy for Textiles	x	x	x	x

Non-regulatory strategies and policies	Policy Framework for bio-based, biodegradable or compostable plastics	x	x	x	Yes
	Strategy for a Sustainable Built Environment	x	x	x	x
	Leading efforts towards a global agreement on plastics		Yes	Yes	Yes
	Proposing a Global CE Alliance and initiating discussions about an international agreement on the management of natural resources	Yes	x	x	x
Market-based tools	Mainstreaming CE objectives in the context of the rules on non-financial reporting and initiatives on sustainable corporate governance	x	x	x	x
	Integration of CE objectives into FTAs and EU external policy	x	x	x	x
	Support for transition to CE	x	x	x	x
	Mandatory targets and criteria for green public procurement	x	x	x	x
	Framework to reflect new instruments	x	x	x	x
Information measures	Updating the CE Monitoring and develop additional resource use indicators, including for consumption and material footprint	x	x	x	x
	Clarify how the Directive on restrictions on the use of certain hazardous substances used electoral and electronic equipment is linked to REACH and ecodesign	x	x	x	x
	Improve measurement, modeling and public policy tools to capture synergies between CE and climate change mitigation	x	x	x	x

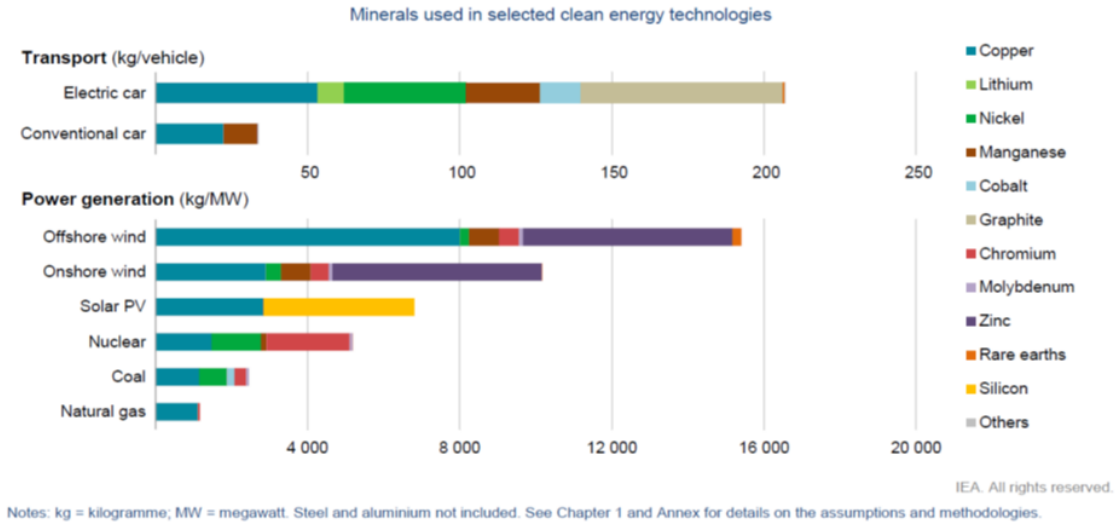
Source: Adopted from Nogueira (2022), Table 1:https://link.springer.com/article/10.1007/s43615-022-00227-0/tables/1.

5.1.2 Addressing trade-offs and creating consistency in EU policy making

Developing an EU Material Resources Law would also be critical to address inconsistencies in existing EU approaches to regulation. Currently, the European Commission is organized around operational siloes. As a result, trade-offs and inconsistencies are created – as opposed to synergies that could reinforce meeting multiple regulatory objectives.

With regards to the environmental strategy, the focus is currently on GHG reduction as the overarching objective. In doing so, the EU is not addressing the root cause of the numerous environmental challenges we face, nor is it addressing the relevant drivers and pressures. As a result, the EU has embarked on a strategy that is essentially replacing a fossil-based energy supply and demand with a material-based system. Specifically, the transition towards clean energy is heavily material-dependent. In this regard, it has been estimated that to fully electrify the current passenger car fleet, more than 227 megatons of key materials are required, which would amount to 3.5% of the EU's total raw material consumption.[125] As set out in below, electric cars require almost five times as much minerals as conventional cars. Solar PV, and offshore and onshore wind for power generation also use significantly more minerals compared to coal, for example, and natural gas. In addition, steel and other metals will likewise be critical for the clean energy transition. The EU's climate strategy is focusing on decarbonization but neglects the importance of dematerialization.

Figure 8: Minerals used in selected clean energy technologies[126]



By addressing climate change separate from material resources, and by focusing on different environmental problems, such as biodiversity and pollution, in silos, trade-offs are becoming apparent. For example, recognizing the importance of CRMs for the clean energy transition, the European Commission submitted a proposal in March 2023 for a CRMA. The main aim of the draft legislation is to secure a stable and strategic supply of the CRMs that are essential for the EU's green and digital transitions. To do this, the CRMA aims to address the EU's high dependency on specific countries for some critical materials; consider the EU domestic sourcing through new mining activities; address the negative social, environmental, and human

[125] Meysner and Gore (2022).
[126] Potočnik (2023).

rights impacts of CRM mining; and address the lack of circularity for CRMs in existing regulatory frameworks. The "Sustainability" chapter of the proposal includes provisions on improving the circularity of CRMs, certification schemes and environmental footprint declaration.

The CRMA is focused on ensuring access to CRMs – albeit sustainably and with efforts to mitigate adverse impacts – rather than attempting to reduce overall demand for those materials (although the proposal mentions improving materials efficiency and substitution of CRMs. The main quantified targets relate to securing certain percentages of EU strategic raw material consumption from domestic extraction (10%), processing (40%) and recycling (15%) by 2030. However, by focusing on reducing the EU's dependence on third countries and strengthening their supply of raw materials amid global trade disruptions, the CRMA does not consider the importance of reducing consumption of CRMs. Thus, tension exists between the CRMA and the CEAP objective of ensuring our consumption footprint stays within planetary boundaries. Indeed, the EEB has warned of "a double-edged sword", noting that "simply opening the flood gates to new mining projects in Europe would contradict the European Commission's ambition to keep resource consumption within planetary boundaries, as set out in the circular economy action plan".[127] In this regard, increasing mining in the EU might also result in conflicts with the EU Nature Restoration Law, which was adopted in June 2023 by the EU Parliament but has yet to be finalized.

There are other areas where trade-offs exist in the EU's current approach to the environment and circularity. For example, in the context of plastics, a key problem is plastic pollution. Chemical recycling can be used to increase plastic waste management. While this would be desirable from a CE perspective, it would not be a good option from a climate perspective, given that chemical recycling is high in GHG emissions.[128] Similarly, within the context of the CEAP, the focus on single use materials such as plastics, does not lend itself to adopting a holistic approach to material resource use. Moving away from single-use plastics, as set out in the Directive on Single-Use Plastic, is beneficial from a plastic waste perspective, but is not necessarily beneficial from a material resource use perspective – given the additional pressure it puts on materials such as paper or other biomass materials that too contribute to the environmental pressures.

Another example of trade-offs is the potential impacts of a switch away from fossil fuels to biobased sources of energy. One recent paper[129] estimates that the EU's Fit-for-55 package will double the EU's demand for bioenergy, resulting in around 20% of EU cropland being diverted from food production to growing energy crops, and quadrupling imports of wood for bioenergy. This poses serious risks as it would remove important habitats, including half of Europe's biologically diverse semi-natural grasslands which are critical for biodiversity and also potentially play a role in carbon sequestration and addressing agriculture-related emissions. In addition, a significant switch on EU cropland from food to energy crop production would likely lead to increased EU demand for land use outside the EU, with associated deforestation in third countries (often in the tropics). Between 1990 and 2014, there was a 9% (13 million hectares (Mha)) expansion of European forests, whilst around 11 Mha of land was deforested in third countries (75% of it in Brazil and Indonesia) to grow crops consumed in the EU[130]. There are options to tackle such trade-offs, however[131]. The EU could release around 17 Mha of cropland by 2050, as well as nearly eliminating its land-carbon trade deficit, by maintaining yield gain trends and modestly reducing biofuel consumption to 2010 levels. If in addition per capita consumption of animal products were cut by 17%, almost 28 Mha or 30% of EU cropland could be freed up, allowing for more food production, fewer imports/more exports, greater capacity for carbon storage, and potential for habitat restoration, with the associated climate and biodiversity benefits. This example clearly illustrates the need to consider and mitigate for unintended and undesirable impacts

[127] See "Europe's strategy for critical raw materials "a double-edged sword"(3 September 2020) by the European Environmental Bureau: https://eeb.org/europes-strategy-for-critical-raw-materials-a-double-edged-sword/.
[128] Interview with DG CLIMA.
[129] T. Searchinger, O. James, P. Dumas, T. Kastner and S. Wirsenius, "EU climate plan sacrifices carbon storage and biodiversity for bioenergy" (2022), Nature, Vol 612, 28 November 2022.
[130] R. Fuchs, C. Brown and M. Rounsevell, "Europe's Green Deal offshores environmental damage to other nations" (26 October 2020), Nature, Vol. 586, 671-673.
[131] T. Searchinger, O. James, P. Dumas, T. Kastner and S. Wirsenius, "EU climate plan sacrifices carbon storage and biodiversity for bioenergy" (2022), Nature, Vol 612, 28 November 2022.

when developing new EU legislation and targets – which will also be necessary in the development of an EU Material Resources Law.

By focusing simultaneously on decarbonization and dematerialization, trade-offs will be minimized, and the EU can confront multiple environmental crises, comprised of climate change, biodiversity loss and pollution, all at once, given that the inefficient use of material resources is at the heart of the triple planetary crisis.[132] At the same time, an approach that targets material resource consumption would also be critical to advance the objectives of many other existing EU regulations.

It is widely recognized that, without reducing material consumption and managing our resources more efficiently, it will not be possible to deliver on climate change and biodiversity objectives. Material extraction and production is responsible for 50% of GHG emissions and 90% of biodiversity loss. Hence, reducing material throughout in the EU is critical to contributing to the achievement of EU's climate and biodiversity targets, respectively. Specifically, material efficiency measures can reduce hard-to-abate process emissions in EU production of raw materials by over 50%. Second, material use reductions can lower overall energy demand in the EU, reducing the amount of renewable energy needed and thereby facilitating a much faster low carbon transition.[133] A recent report by the IPCC found that "strategies that deliver absolute resource demand reduction (e.g., those that avoid, reduce and improve production and consumption) and new models of service provision could reduce global GHG emissions from buildings, transport, food, industry and energy supply systems by 40-70 percent by 2050, while still being consistent with delivering basic wellbeing for all." Similarly, the Platform on Biodiversity and Ecosystem Services has noted that less resource-intensive production and consumption patterns would make a significant contribution to achieving sustainability targets, such as preventing climate change, conserving biodiversity, and controlling air pollution.[134]

Adopting a material resource focused approach will also be critical for the EU to achieving "strategic autonomy". The EU is heavily reliant on a handful of countries for imports. For instance, it imports 46% of metals. For several of these metals, parts that are used in clean energy technologies like solar photovoltaics, wind turbines and batteries, the EU is fully reliant on imports, often sourcing the materials from less than a handful of countries. For example, 100% of battery grade lithium and rare earth elements are imported, with 78% of the former coming from Chile and 99% from China, respectively.[135] For steel, key suppliers are Turkey, Russia and Ukraine, and a large percentage of the EU's crude oil comes from Russia, Saudi Arabia, and Kazakhstan. Russia's invasion into Ukraine in 2021 demonstrates the risks associated with such as high levels of dependency for key materials.[136] In this context, the CRMA seeks to reduce import dependence with regards to CRMs, as highlighted above. Reducing material resource consumption directly will be able to advance the EU's strategic autonomy objectives by decreasing its dependence on external sources for these materials.

Reducing material resource consumption will also strengthen the EU's objectives to ensure human rights and environmental protection in EU value chains are respected. Some of the EU's recent initiatives focus on addressing adverse human rights and environmental impacts associated with supply chains, including the Corporate Sustainability Due Diligence Regulation, the Regulation on Deforestation-free Products, and the EU Battery Regulation. All of these require significant due diligence processes for companies to follow, to ensure that the EU's consumption footprint is not connected to environmental harms such as deforestation, or human rights violations. Especially the extraction of raw materials has been linked with various human rights abuses, while mining has also been linked to poor and illegal labor conditions, use of violence against local communities, forced indigenous displacement and other issues. Reducing material resource demand could thus have positive implications with regards to the due diligence processes adopted

[132] SYSTEMIQ, The Club of Rome, and the Open Society European Policy Institute, "International System Change Compass the Global Implications Of Achieving The European Green Deal" (2022).
[133] Meysner and Gore (2022).
[134] IRP (2022).
[135] Bolger et al.
[136] Meysner and Gore (2022).

in these regulations,[137] as well as tackling the issue of the EU outsourcing its environmental impacts by importing materials and products from third countries.

In sum, by putting material resource use at the center of EU policymaking, it has the potential to approach trade-offs more holistically and comprehensively, while at the same time focusing on synergies between different policy objectives.

5.2 INCORPORATING AN EU MATERIAL RESOURCES LAW INTO THE EU POLICY LANDSCAPE

While it has not been at the forefront of policy making, adopting an EU Material Resources Law would be aligned with the EU Green Deal, the CEAP, and the Eight Environment Action Programme. The European Green Deal, in one of its most quoted paragraphs, highlights the target of "reaching net zero emission of greenhouse gases in 2050 and *where economic growth is decoupled from resource use*".[138] The latter part, which is often set aside, highlights the importance of dematerialization.

Developing a binding target for material resource consumption would be directly related to the four objectives set out in the CEAP, highlighted above: (i) to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes; (ii) to keep its resource consumption within planetary boundaries; (iii) to strive to reduce the EU's consumption footprint; and (iv) to double its circular material use rate in the coming decade.[139] In fact, a leaked early version of the CEAP included a target to halve the EU's material use by 2030. While this target did not make it into the final strategy, it reveals that adopting such a target has, at least, been previously considered. [140] As noted in Section 2.4, a growing awareness is emerging of the importance of addressing material resource consumption, including with references in the Eight Environmental Action Plan and the focus on material footprint as an added indicator in the Commission's Revised Monitoring Framework for the circular economy.

Consideration will need to be given to where a new EU Material Resources Law would sit within the EU's legislative framework, and its relationship with existing legislation. First, the question arises of which Commission DG might take ownership of such a legislative instrument, since it could be of relevance to the work of many different departments, including the DGs ENV, GROW, CLIMA, GROW, TRADE, TAXUD and INTPA[141]. This would be a matter for discussion within the European Commission, with the Secretariat General likely playing a crucial role in considering how to coordinate across the work of the various DGs concerned, and where the final responsibility would sit.

Second, as indicated in this Report, there is already a significant body of EU law of relevance – or with potential to contribute to – a future objective to reduce material consumption. The question of coherence will therefore need to be carefully addressed. Indeed, these existing pieces of legislation can be characterised as somewhat fragmented and inconsistent with regards to their consumption reduction ambitions and potential, and a new, EU Material Resources Law could play a key role in making the EU's approach to this matter more consistent. This would in some way mirror the approach taken in the area of climate, where the EU Climate Law has served to guide other climate-related legislation, creating a more coherent EU approach.

To be mutually supportive in achieving the green and digital transitions, the new EU Material Resources Law should have the same legal weight and sit at the same "level" in the legislative hierarchy as the EU Climate Law. As discussed, this means that a regulation is the most appropriate form of legislative act. It

[137] Meysner and Gore (2022).
[138] COM(2019) 640 final.
[139] COM(2020) 98 final.
[140] Green Alliance (2021).
[141] Noted by an official from DG CLIMA.

also suggests that it would be appropriate for the new EU Material Resources Law to sit somehow "above" the CEAP and its implementing legislation, since its resource consumption objectives would need to be taken into consideration by those existing acts, as well as any additional new implementing acts.

With regards to regulations to implement, some existing and proposed EU legislation and communications already contain elements that could contribute to a resource consumption reduction objective, as set out above. These include the ESPR, the Packaging and Packaging Waste Regulation, the Single Use Plastics Directive, the Farm to Fork Strategy, and the Batteries Regulation. However, these regulations will not be sufficient to reduce material resource consumption. Other existing regulations could also potentially contribute to a Material Resources Law, but do not yet contain adequate provisions to do so. This is the case for the proposed CRMA, the Waste Framework Directive, the Waste from Electrical and Electronic Equipment (WEEE) Directive, the proposed ELV Regulation, the Regulation on deforestation-free products, the proposed Directive on Corporate Sustainability Due Diligence, and the Carbon Border Adjustment Mechanism (CBAM), none of which currently include specific objectives or provisions to reduce consumption.

If, like the Climate Law, a new EU Material Resources Law included a requirement for its headline objective (on consumption reduction) to be taken into account by all economic sectors, this would likely encourage greater coherence of the EU legislative framework on this topic. This could be achieved, for example, by ensuring that when existing laws come up for periodic revision, they are amended in such a way that they contribute better towards consumption objectives.

In addition, new measures will be required to fill some of the gaps in the existing legislative framework, if the EU is to more seriously pursue a reduction in resource consumption. Various instruments and approaches could contribute to a dematerialisation agenda, many of which can build on existing approaches. It could include consumer engagement and information, as well as public procurement standards that take into account the material footprint. Other approaches will be more far reaching, including, for instance, the introduction of an EU-level resources taxation. This can be an environmental tax reform, designed to shift the taxation burden from labour to one based on energy use and resources, or come in the form of well-designed taxes, fees and other charges that promote the use of circular or less-resource intensive materials over more resource-intensive materials.[142] Subsidies can be adopted to promote the development of new business models that contribute to reducing material resource consumption, including business models that focus on servicification and customisation of services, or the use of digital tools (including to track material use).[143] Specifically, differential VAT rates could be considered, favouring repair and renovation services. The removal of harmful subsidies, for instance for fossil fuel, should also be included.[144] Sector-specific approach focused on tackling resource-intensive industries will also be required, as set out in Section 4. Another approach that could be considered would be to develop an over-consumption budget. In other words, this would involve requiring for EU Member States to pay if they exceed sustainable levels of per capita consumption.

6 INTERNATIONAL IMPLICATIONS OF AN EU MATERIAL RESOURCES LAW

This section explores the implications of developing an EU Material Resources Law on the EU's international ambitions with regards to material resources management. In particular, it focuses on how advancing an EU Material Resources Law would (i) strengthen the EU's international environmental leadership

[142] Eunomia, "Reimagining the Waste Framework Directive – An EU Regulatory Framework for a Circular Economy consistent with 1.5 degrees" (2023), White Paper.
[143] Baldock and Charveriat (2018).
[144] Baldock and Charveriat (2018).

aspirations; (ii) advance the objectives set out in EU trade and due diligence regulations; and (iii) pave the way to start a global discussion around the issue of resources management.

6.1 EXERCISING GLOBAL LEADERSHIP BY FOCUSING ON MATERIAL RESOURCE CONSUMPTION BY THE EU

The CEAP highlights the importance of a global transition towards a "just, climate neutral, resource-efficient and circular economy", and emphasizes the need to define a "Safe Operation Space" for all.[145] In an earlier report commissioned by OVAM, the feasibility of developing an international agreement on the management of natural resources was considered.[146] This report highlighted the importance of developing such an international agreement, identifying the challenges and opportunities. An international agreement on natural resources consumption with treaty status would, similar to what the Paris Agreement did for climate change, legally require State Parties to develop national action plans and report on how they are seeking to stay within the world's safe operation space. It would both legitimize and facilitate the adoption of an-EU wide Material Resources Law. However, given the fact that the EU's material resource consumption levels are higher than most low and middle-income developing countries, reaching global agreement on such an agreement might not be immediately feasible.

Absent momentum to develop an international agreement on material resource consumption, the EU could demonstrate leadership by developing an EU Material Resources Law to tackle excessive consumption, which lies at the heart of environmental degradation and climate change. The EU has a chance to be first mover on this issue, thereby exercising global leadership.

In understanding the opportunities for international leadership linked to advancing a Material Resources Law, it is important to zoom in on the current context and the role of the EU in exercising international green leadership, predominantly through trade. While the adoption of a series of green initiatives, such as the CBAM, the Deforestation-free Products Regulation, and the Corporate Sustainable Due Diligence Directive (CSDDD) has made the EU a "first mover" on many key environmental issues, these initiatives have been received with negative reactions by many of the EU's trading partners.[147] A key critique from developing countries centers on the unilateral nature of the measures, with Brussels seeing itself as an exporter of rules to third countries. Another major criticism concerns the issue of justice and fairness: given that the contributions from many developing countries and least developed countries (LDCs) to issues of climate change and environmental challenges are negligible, it would not be fair to require the same mitigation or environmental standards. In the context of the Paris Agreement, this was addressed through Common But Differentiated Responsibilities and Respective Capabilities (CBDR – RC).[148] A similar approach would have to be adopted to reflect justice and fairness principles in the possible future development of an international treaty on material resource consumption.

The EU can pre-empt these issues by establishing a Material Resources Law. Doing so would signal a new narrative, in which the EU's responsibility and leadership to address environmental problems stand central, coupled with an increased emphasis on justice and fairness *vis-à-vis* developing countries and LDCs. Developing an EU Material Resources Law could be critical in advancing this improved narrative in the context of its green transition.

Whereas restoring the health of our planet is a collective task, the EU has a special responsibility to do so due to its role as a large carbon emitter since the industrial revolution, as well as its high material footprint, which is about 40-70% higher than available estimates of sustainable levels that can be considered broadly consistent with limiting environmental pressure within planetary boundaries. To put this in a global context,

[145] COM(2020) 98 final.
[146] Van der Ven (2022).
[147] P. Lamy, G. Pons, C. van der Ven, and C. Azevedo, "EU trade and the environment: Development as the missing side of the triangle" (2023), Europe Jacques Delors, Policy Paper.
[148] Lamy et al. (2023).

high-income nations are responsible for 74% of global excess material use, driven primarily by the United States (27%), and the EU (25%). China is responsible for 15% of global excess material use, while low-income and middle-income countries are responsible for only 8%. Given that the EU is thus responsible for a quarter of global excess material use, it has a responsibility to reduce its own resource consumption, and the associated environmental impacts (including those generated outside its borders), to fair and sustainable levels.[149]

Current extraction and use of material resources is characterized by deep inequalities.[150] Developing an EU Material Resources Law would respond to these inequalities. The average person in a high-income country has a material footprint which is over 13 times greater than in low-income countries. While a person in a high-income country consumes much more than they need, more than 10% of the world's population today suffers from extreme poverty and are not able to meet their basic needs. To ensure that the basic needs of populations in LDCs are met, they would have to increase their material resource use. The only way to do so, while not further exceeding planetary boundaries, would be through addressing excess resource use in high-income countries, including the EU.

In the context of climate change, the EU has exercised leadership by striving to be the first climate-neutral continent through the Green Deal and the Climate Law, which turned the EU's political ambition of reaching carbon neutrality by 2050 – and to reduce emissions to 55% by 2030 – into a legal obligation.[151] Further, the EU has been actively involved in brokering the recent Kunming-Montreal Global Biodiversity Framework.[152] In the area of resource use, the EU has already displayed leadership in the development of the international plastics treaty.[153] Moreover, the EU has played a central role in establishing the Global Alliance on the Circular Economy and Resource Efficiency (GARCERE), which aims to provide a global impetus for initiatives related to the circular economy and resource efficiency, building on existing international efforts. Similarly, through adopting a Material Resources Law, the EU can exercise leadership with regards to material resource consumption, which lies at the heart of climate change and most other environmental problems. And it can do so in a holistic way. By establishing an EU material resource use reduction target, it could potentially inspire other major players to follow suit. At a minimum, due to the EU's global market power, targeting the EU's material resource use could mobilize efforts by public institutions, business and civil society, and will ensure that material resource use receives a more prominent focus in discussions relevant to the environment.

Tackling excess EU material consumption would also signal a change compared to many of the EU instruments that have recently been adopted, such as the CSDDD and the EU Deforestation-free Products Regulation, which focus on greening the supply-side of the value chain by imposing production standards on products sold in the EU market. Yet EU initiatives that focus on greening trade do not address excess resource consumption directly but seek to advance climate and environmental objectives through greening production. As mentioned earlier, however, if consumption keeps increasing, the environmental gains obtained from greening the production side could be eclipsed.

In sum, an EU Material Resources Law would have important implications for the EU's global environmental leadership, as it would demonstrate the EU's commitment to take responsibility for its excess material resource consumption and the associated environmental implications, that would reflect inherent inequalities in global well-being. Similar to the role it has played in the context of climate change, the EU could be a first mover on reduction of material resource consumption.

[149] Sytemiq et al (2022).
[150] IRP (2022).
[151] Lamy et al (2023).
[152] See "EU at COP15 global biodiversity conference":https://environment.ec.europa.eu/topics/nature-and-biodiversity/eu-cop15-global-biodiversity-conference_en.
[153] See "EU calls for agreement on global rules to end plastic pollution" (26 May 2023): https://environment.ec.europa.eu/news/eu-calls-agreement-global-rules-end-plastic-pollution-2023-05-26_en#:~:text=An%20international%20plastics%20treaty%20is,packaging%20to%20measures%20on%20microplastics.

6.2 ADDRESSING ECONOMIC IMPLICATIONS ON DEVELOPING COUNTRIES

Addressing material resource consumption in the EU could have significant implications for resource-rich developing countries, which depend on key markets like the EU for export. Many LDCs and low-income developing countries depend heavily on the extraction of biomass, metals, and minerals, that are subsequently exported to the EU. [154] If the EU becomes more circular, and adopts an EU Resources Law, *ceteris paribus*, we can expect to witness reduced demand for primary raw materials, or, at a minimum, smaller increases than expected (given that the demand for primary raw materials will only increase for the foreseeable future).

These trends will have serious implications for commodity-dependent low- and middle-income countries, where resource revenues have been a key driver of economic growth.[155] For example, it has been estimated that at least 10 percent of low-income countries' GDP comes from natural resource rents.[156] In addition, reduced material resource consumption in the EU could have serious implications for developing countries dependent on the EU market for trade in intermediary goods, such as clothing/textiles, electronics or cars. Indeed, to move towards a society that focuses on meeting human needs while using less materials, for instance, through enhanced servicification and sharing systems, demand for these intermediary goods will, *ceteris paribus*, decline. Regulatory initiatives that are currently being developed, such as the ESPR, will require that products comply with performance, eco-design and transparency requirements, further complicating EU market access.

EU trading partners can opt to approach changes in international supply chains as an opportunity, to adopt an economic model away from primary material production.[157] Opportunities will emerge in developing secondary raw materials, such as recycled steel, copper, and plastics, as well as new services models that will be critical for the EU's dematerialization.[158] EU trading partners could focus on developing competitive industries, services and products in these areas, that could facilitate a country's diversification away from dominant export industry (e.g. raw materials or clothing), thus strengthening a country's economic resilience. However, the extent to which the EU's trading partners will be able to diversify depends on the partner country's export concentration to the EU market as well as its ability and available resources to adopt, invest and redirect to different export markets[159] [160]. For trading partners that are dependent on the EU, a sudden change in market dynamics would be difficult to respond to and will likely have detrimental implications.

In developing a Material Resources Law, the EU must look for a new balance between developing more sustainable industries at home, while enabling a just global transition. To do so, it is important for the EU, as a first step, to conduct an impact assessment that studies the implications of such a regulation on key EU trading partners. As a second step, the EU could develop new partnerships with affected partners that are dependent on the EU to export materials, focusing on facilitating the diversification of trading partners into circular business models and industries through focusing on technology transfer in relevant areas, as well as by targeting capacity building, aid-for-trade programs, and development finance to facilitating a circular transition in developing countries. In addition, the EU must ensure that local resources are made available for domestic development, that mining operations are carried out sustainably, and that it provides sufficient financing to its trading partners to facilitate a sustainable transition in the partner country.[161]

[154] World Bank (2022).
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7 CONCLUSIONS

This Report has made the case that, for the EU's Green Deal to be effective, it is critical to target the root cause of the triple environmental crises of climate change, pollution, and biodiversity loss: excessive extraction, production, manufacturing and consumption of material resources. This excess is not evenly distributed in the world: as highlighted in this report, the EU consumes more than its fair share – levels that are almost double the estimated sustainable consumption levels. Addressing material resource consumption will be critical to meet the fourfold objectives set out in the CEAP and stay within planetary boundaries by reducing the EU's consumption footprint. Moreover, the EU will not achieve its climate change targets without making progress on resource consumption.

This Report has highlighted those existing efforts made under the CEAP, and by EU Member States, are insufficient to bring about a paradigm shift in material resource consumption. They are deficient, either because they are not legally binding, because they are focusing almost exclusively on downstream circularity, by addressing packaging, waste management and recycling, and because there is no overall guiding objective. While existing regulations and initiatives that seek to advance a circular transition have the potential to reduce material consumption, on their own, they will be insufficient to prevent a rebound effect, for example, because net productivity gains are lost in growing consumption overall. Unsurprisingly, progress made on the circular transition has been negligible – with some EU Member States having regressed over the last ten years.

Similar to climate change, where there is clean scientific evidence that we should strive to stay within 1.5 degrees of warming, there is ample scientific evidence that excessive consumption has led the world to exceed six out of the nine planetary boundaries. However, in contrast to the climate change approach, this has not resulted in a widely discussed, and accepted, quantifiable target that guides countries policy making. To change this, this Report calls on the EU to take up a leadership role and develop a Material Resources Law, which includes a quantifiable target for material footprint per capita. This report has explained how this EU Material Resources Law could look like, adopting the Climate Law as a foundation. At a minimum, an EU Material Resources Law should contain a target, indicators, the requirement for EU Member States to establish national plans, and monitoring requirements. There should also be an implementation package, similar to Fit-for-55, which would ensure there is a "just" transition within the EU and adopt complementary regulations to bring about the paradigm shift. Focusing on excessive consumption would also enable the EU to advance its strategic autonomy agenda, by reducing dependence on trading partners for critical raw materials, the demand of which will increase significantly as a result of the green transition, while leveraging synergies between the climate and circularity agendas. Failure to focus on resources directly will risk that the EU will replace its decarbonisation agenda with a materialization approach – exchanging fossil fuel dependency with material dependency.

Adopting an EU Material Resources Law will not be an easy task. Recent developments suggest that the wide-spread support for the EU Green Deal might be wavering. At the same time, there appears to be an increased interest in focusing on addressing material resource consumption, not only by individual EU Member States, but also by the European Commission, as reflected in the Eight Environmental Action Programme, and the Revised Monitoring Framework, both of which highlight the importance of tackling material resource consumption. The 2024 elections could be a good political window to push for a resource-centric agenda. In doing so, narrative will be key: the material resources agenda should not solely be linked to the environment, but it must also demonstrate key economic benefits, while ensuring that individual needs and well-being are met. A systems' approach that links industrial policy, with the EU's digitalization, climate and circular agendas, while at the same time ensuring a just global transition through new

partnerships with developing country partners, would lead to a more coherent EU approach to a circular and green economy – as envisioned by the EU Green Deal. A great deal of work remains to be done, including with regards to science, as well as adopting concrete regulations and policies to bring about this system shift. But incorporating a material resources framework in discussions will be a starting point that ensures that, at a minimum, resource considerations receive the attention they deserve.

ANNEX TABLE 1: KEY ELEMENTS OF EXISTING EU INSTRUMENTS AND THEIR LINK TO MATERIAL RESOURCE CONSUMPTION

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
Critical Raw Materials Act (proposed March 2023)	Critical raw materials	No, reducing consumption of CRM is not the focus of this Act	Yes: • Target for 15% of CRM consumption to be met through EU recycling capacity by 2030.	Yes
Waste Framework Directive (2008, as amended)	Municipal waste (in particular paper, metal, plastic, glass) and construction & demolition (C&D) waste	To some extent. Focuses on reducing waste through recycling, but weaker on actual reduction of waste generation (aside from requiring Member States to implement waste prevention measures). By end 2024, the EC will consider the feasibility of setting quantitative reuse targets and possibly other waste prevention measures, including waste reduction targets; as yet unclear whether this will result in amended/new legislation.	Yes, targets to increase preparation for reuse and recycling of materials (at least paper, metal, plastic and glass) could reduce demand for primary raw materials: • By 2020: minimum 50% by weight • By 2025: minimum 55% • By 2030: minimum 60% • By 2035: minimum 65% • By 2020, minimum 70% preparation for reuse, recycling and other material recovery (including backfilling operations) of non-hazardous C&D waste	Yes
Amendment to Waste Framework Directive (proposed July 2023)	Food waste, textile waste	No, focus is on waste reduction, not consumption reduction	Yes: • Target to reduce food waste generation in processing and manufacturing by 10% by end 2030 (compared to 2020) • Target to reduce food waste per capita, jointly in retail and other distribution of food, in restaurants and food services and in households, by 30% by end 2030 (compared to 2020). • Requires separate collection of textile waste by start 2025 and introduction of mandatory EPR (with fees based on circularity and environmental performance of textiles).	Yes

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
Batteries Regulation (2023)	Batteries	Yes, if recycled content and reuse targets are met, consumption of virgin material should decrease: Recycled content targets: • Within 8 years: cobalt 16%, lead 85%, lithium 6%, nickel 6% • Within 13 years: cobalt 26%, lead 85%, lithium 12%, nickel 15% Minimum reuse levels for materials recovered from waste batteries: • By end 2027: cobalt 90%, copper 90%, lead 90%, lithium 50%, nickel 90% • By end 2031: cobalt 95%, copper 95%, lead 95%, lithium 80%, nickel 95%	Yes: Waste collection targets: • 45% by 2023, 63% by 2027 and 73% by 2030 for portable batteries • 51% by 2028 and 61% by 2031 for light means of transport batteries. Minimum recycling efficiency targets for battery types: • By end 2025: lead-acid 75%, lithium-based 65%, nickel-cadmium 80%, other 50% • By end 2030: lead-acid 80%, lithium-based 70%, nickel-cadmium 80%, other 50%	Yes

Packaging Regulation (proposed Nov 2022)	Packaging	Yes:
		• Requires companies to offer a percentage of their products in reusable or refillable packaging
		• Bans some types of unnecessary packaging, e.g. single-use packaging for fruit/vegetables and for food and beverages to be consumed inside restaurants/cafes, single-use packaging for fruits and vegetables, miniature packaging in hotels
		• Makes provision for introduction of design for recycling criteria and requires deposit return system for plastic bottles and aluminium cans
		• Mandatory rates of recycled content in new plastic packaging
			Yes:
			• Headline target to reduce packaging waste by 15% by 2040 (5% by 2030, and 10% by 2035) per Member State per capita (compared to 2018), through reuse and recycling
			• Recycling targets for total packaging waste:
			  ○ 65% by end 2025
			  ○ 70% by end 2030
			• Ferrous metal packaging:
			  ○ 70% by end 2025
			  ○ 80% by end 2030
			• Aluminium packaging:
			  ○ 50% by end 2025
			  ○ 60% by end 2030
			• Glass packaging:
			  ○ 70% by end 2025
			  ○ 75% by end 2030
			• Paper and cardboard packaging:
			  ○ 75% by end 2025
				Yes

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
			○ 85% by end 2030 • Plastic packaging: ○ 50% by end 2025 ○ 55% by end 2030 • Wood packaging: ○ 25% by end 2025 ○ 30% by end 2030	
Single Use Plastics Directive (2019)	Specific single use plastic products	Yes: • Requirement for MEMBER STATE to achieve "an ambitious and sustained reduction in consumption" of certain single-use plastic products (drinking cups, containers of prepared food) by 2026, compared to 2022 levels; but no specific reduction target set. • Ban on placing on the market oxo-degradable plastics and specific SUP products (cotton bud sticks, cutlery, plates, straws, beverage stirrers, balloon sticks, EPS food and beverage containers and cups).	Yes: • Recycled content requirement (25% for PET beverage bottles by 2025, 30% by 2030). • Separate collection for recycling requirement (77% of beverage bottles by 2025, 90% by 2029).	Yes
WEEE Directive (2012)	Waste electrical and electronic equipment	No, the Directive aims to promote efficient resource use and reduce waste generation, but does not specifically aim to reduce consumption.	Yes: • Collection target of 65% (by weight of EEE placed on the market) or 85% of WEEE generated in the MEMBER STATE, from 2019 onwards. • Recycling targets from 2018: 80% for large equipment and temperature exchange equipment; 70% for screens and monitors; 55% for small IT and telecommunications equipment; and 80% for lamps.	Yes
ELV Regulation (proposed Jul 2023)	End-of-life vehicles	No, the Regulation aims to "enhance the transition of the automotive industry to a circular economy" and bring about greater resource efficiency, but does not directly aim for actual reduction of resource consumption.	Yes: • Target for vehicles to be 85% reusable or recyclable by mass; and 95% reusable or recoverable by mass (design-related targets).	Yes

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
			• Target for reuse and recycling of 85%, and for reuse and recovery of 95% (by average weight per vehicle, excluding batteries) (actual waste management targets). • Target for 25% of plastic used to come from recycling (of which 25% from recycled ELVs) (design-related target). Target for at least 30% by weight of plastics to be recycled.	
Ecodesign for Sustainable Products Regulation (proposed March 2022)	Applies in principle to almost all physical goods placed on the EU market	Yes: • Aims to contribute to decoupling economic development from natural resource use, and strengthening recycled materials markets • Focus on design of design of more environmentally sustainable and circular products • Will allow requirements to be set on: o durability, reusability, upgradability and reparability o recycled content	Yes: • Will allow requirements to be set on: o remanufacturing and recycling o presence of substances that inhibit circularity o carbon and environmental footprints o information requirements, including digital product passports o energy and resource efficiency • Includes measures to end the destruction of unsold consumer goods, and provide incentives for sustainable products	No
EU Strategy for Sustainable and Circular Textiles (2022)	Textiles	Yes, if the objective to promote more durable and repairable textiles is met.	Yes: • Consideration will be given to setting mandatory targets for preparing for reuse and recycling of textile waste (as part of the planned 2024 review of EU waste legislation). • Promotion of durable, repairable and recyclable textiles, and minimum recycled content, through eco-design requirements.	No
Renovation Wave for Europe strategy (2020) and Construction Products Regulation (revision proposed Mar 2022)	Buildings and construction products	Yes, if the following objectives are met: to minimize the overall amount of raw materials used; to promote reuse of materials and use of secondary raw materials/ waste materials; material durability, repairability and ease of re-manufacturing.	Yes: • Promotion of life-cycle thinking and circularity to minimise buildings' footprint (Strategy). • Review of material recovery targets (planned for 2024) (announced in Strategy). • Requirements for product durability, repairability, recyclability and ease of re-manufacturing (Regulation). • Minimum recycled content obligations (Regulation).	No

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
Regulation on deforestation-free products (2023)	Specific forestry-related products (cattle, cocoa, coffee, oil palm, rubber, soya and wood and derived products e.g. beef, leather, chocolate, furniture)	No, the Regulation aims to support sustainable consumption and production, but does not specifically aim to reduce the consumption of products.	Yes, may lead to some reduction in consumption if products associated with deforestation are removed from the EU supply chain.	No
Farm to Fork Strategy (2020)	Food	Yes: • Target to reduce by 50% the use and risk of chemical pesticides, and more hazardous pesticides, by 2030.	Yes: • Target to reduce nutrient losses by 50% and maintain soil fertility (leading to 20% less fertilizer use by 2030). • Target to reach 25% of agricultural land under organic farming by 2030.	No
Corporate Sustainability Due Diligence Directive (proposed Feb 2022)	Products and services provided by the largest companies active in the EU, including the textiles, agriculture, forestry, fisheries, food, and mineral resource sectors.	No, the Directive does have environmental objectives, but focuses on minimizing biodiversity, pollution and hazardous waste impacts, rather than directly focusing on resource efficiency or circularity.	Yes, since the Directive aims to foster more sustainable corporate behaviour along value chains.	No
European Climate Law (2021)	Economy-wide	No, the Law does not directly address consumption reduction	Sets legally binding target of net zero greenhouse gas (GHG) emissions by 2050, with intermediate target of 55% reduction by 2030 (compared to 1990 levels) and provision to set a second intermediate target for 2040. Includes commitment to negative emissions after 2050.	Yes
Carbon Border Adjustment Mechanism (transitional phase from Oct 2023; full	Cement, iron and steel, aluminum, fertilizers, electricity and hydrogen	No, the CBAM aims to account for embedded carbon emissions, but does not directly aim to reduce consumption	Yes: • Aims to tackle carbon leakage from carbon-intensive production in third countries • Will adjust imported products' prices to ensure they include a fair reflection of embedded carbon emissions	No

EU instrument	Products covered	Directly reduces resource consumption?	Indirectly reduces resource consumption?	Includes binding targets
implementation from Jan 2026)				

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