‘Green mining’ is a myth:

The case for cutting EU resource consumption

EEB European Environmental Bureau

Friends of the Earth Europe

Authors Meadhbh Bolger, Diego Marin, Adrien Tofighi-Niaki, Louelle Seelmann
Contributors Alexander Dunlap, Andy Whitmore, Jean-Pierre Schweitzer, Paul Hallows, Annelies Schorpion, Colin Roche, Hal Rhoades, Stéphane Arditi, Piotr Barczak, Paul de Clerck, Nick Meynen, Jeremy Wates
Designer Gemma Bowcock
Editor responsible Rachel Tansey
Cover image evgenii_v (Adobe Stock)

European Environmental Bureau
Rue des Deux Eglises 14-16
1000 Brussels, Belgium
+32 (0)2 289 1090
eeb@eeb.org
eeb.org
meta.eeb.org

EC register for interest representatives: Identification number 06798511314-27
International non-profit association - Association internationale sans but lucratif (AISBL)
BCE identification number: 0415.814.848
RPM Tribunal de l'entreprise francophone de Bruxelles

Friends of the Earth Europe
Mundo-b building
Rue d'Edimbourg 26
1050 Brussels, Belgium
+32 (0)2 893 1000
info@foeeurope.org
friendsoftheearth.eu

EC register for interest representatives: Identification number 9825553393-31
International non-profit association - Association internationale sans but lucratif (AISBL)
BCE identification number: 443.252.089

This communication reflects the publisher's views and does not commit the donors.
With the support of the LIFE Programme of the European Union and the MAVA Foundation

Contents

Foreword 1

Executive summary 2

Introduction 6

Chapter 1 Global and EU consumption - beyond sustainable and just limits 9

Chapter 2 Harmful impacts of metals mining: to people and the planet 16

Chapter 3 Mining for the green and digital transitions 21

What the communities say: Case studies from within and outside Europe 24

Chapter 4 EU Policy Framework - the European Green Deal and beyond 29

Chapter 5 EU Policy Recommendations 34

References 44

Foreword

The world is facing multiple crises – climate, biodiversity, inequality, the Covid-19 pandemic. Each crisis compounding the other, woven together in a tapestry where the logic of taking from the earth and displacing human and non-human lives for the benefit of a few flows in a historical arc from colonialism to neoliberalism. This legacy – extractivism – views finite natural resources, whether they are fossil fuels, minerals, metals, or biomass, as valuable as long as they can be sold or exchanged for profit. The profit accumulated fuels the infinite growth of the economy. Countless lives and livelihoods have been sacrificed in the relentless pursuit of these resources and even today resource extraction continues to be the single biggest reason for deaths of environmental defenders around the world.

With climate pressures increasing and planetary boundaries being crossed, the recognition of the imperative to do things differently is in the political spotlight. Yet despite the rhetoric and incremental progress made by the EU, the overwhelming approach to tackling these crises remains one based on competition – scrambling to secure resources for 'cleaner' energy systems, and pursuing aggressive trade policies that outsource the impacts of EU overconsumption. Not only does this fly in the face of the type of international cooperation that is so badly needed to address the threat of ecological collapse as outlined by the most recent IPCC warning, but it also plays into the hands of multinational mining corporations which seek to capitalise on the Covid-19 pandemic and the climate crisis to justify the continuation of their destructive practises.

These 'green extractivism' approaches to sourcing the minerals and metals for the EU's green transition are often presented as innovations but in reality, they represent destructive models that will result in an unjust and inequitable transition. These models are now also being presented as viable solutions for Europe, as the extractive frontier expands onto the shores of Ireland, Portugal and Finland, and the deep seas, threatening communities and ecosystems alike. Without a strategic plan to tackle EU material overconsumption, extractive frontiers will continue to cause violence, worker exploitation and ecological degradation on a global scale.

This flagship report seeks to connect the EU's material overconsumption, extractivism and the European Green Deal. It asks politicians and civil society alike to reflect on current policies and systems and to examine ways in which our high-intensity, wasteful and growth-oriented economy needs to be transformed so that humanity can thrive within ecological limits.

Asad Rehman
Executive Director
War on Want

Executive Summary

EU resource consumption is inequitable and its resource extraction is beyond earth's limits, causing substantial harm

Global extraction of materials and use of energy rose rapidly in the past century, much faster than growth in population. There are massive differences in consumption between populations, and inequities in the distribution of, and access to, resources. The 1.2 billion poorest people account for just 1% of the world's consumption, while the one billion richest account for 72%.

European economies were built, in large part, through the colonisation of the Global South, channeling natural resources towards Europe. The EU continues to extract and exploit resources and labour from poorer countries and regions today, and has been consuming more than its fair share, and beyond ecological limits, for decades. The EU's material footprint (i.e. total consumption of fossil fuels, biomass, metals and non-metallic minerals, including embodied in imports) is currently 14.5 tonnes per capita, well over the global average, and about double what is considered a sustainable and just limit. Imports from outside the EU account for 20% of this.

Predictions following historical trends, current patterns of production and consumption, and excluding consequences of potential policy changes suggest a doubling in material and energy consumption by 2060.

The EU is responsible for a disproportionate part of the depletion of common global natural resources, and for extensive environmental and social harms. With respect to environmental impacts from resource use, the EU uses between 70% and 97% of the 'safe operating space' available for the whole world. This means the EU alone is close to exceeding the planetary boundaries for resource use impacts, beyond which the stable functioning of the earth's biophysical systems are in jeopardy.

Metals and minerals in the political spotlight

The EU makes up only 6% of the world's population, yet consumes 25-30% of metals produced globally. Without drastic changes, EU metal consumption is predicted to grow the fastest of all material groups, with a 63% increase per capita by 2060.

Metals and minerals have moved into the political spotlight in the EU because of their importance to the twin green and digital transitions. The (necessary) shift to wind and solar technologies, electricity systems, and batteries for electric vehicles and energy storage, is considerably materials-intensive. It is estimated that electric vehicles use four times as much copper as fossil fuel cars, and under a 'high demand' decarbonisation scenario, batteries for electric vehicles and renewables are predicted to drive up demand for lithium by almost 6000% by 2050. Supplying such demand will lead to scarcity, conflicts, increases in destructive mining generating problems akin to those that arise from digging up fossil fuels.

The rapidly growing digital sector is another key driver of demand for metals. Europeans own five times as many digital devices as the average person in the Global South, and more than double the global average, with rampant consumerism driving this trend. 25% of all the silver mined around the world goes into electronic products.

Greenwashing of mining

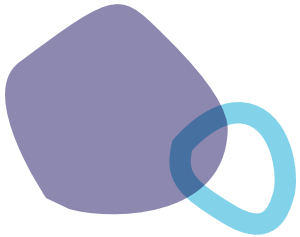
Large mining companies and governments are, however, using the fact that certain metals and minerals are key for green technologies, to greenwash the metal mining industry in general, promoting the nonsensical concept of 'green mining'. Yet metals like copper, iron and aluminium are overwhelmingly used in construction and other industries, such as the destructive military sector. Furthermore, it is estimated that carbon emissions associated with primary metal and mineral production accounted for approximately 10% of total global energy-related emissions in 2018, making industry claims of 'tackling climate change' even more unfounded.

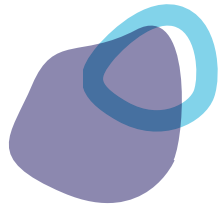
The same players push for communities' 'social acceptance' of a mining project, or 'Social Licence to Operate'. In practice, this means facilitating extractives' development with as little community input and dissent as possible, on the premise that companies will eventually start mining, and that local communities do not have a genuine right to stop them.

Environmental harms and human rights violations from mining

Metal extraction and processing is associated with serious and significant environmental impacts, including toxic effects on humans and ecosystems. Mining is the industry which produces the largest amount of global waste. Just over a decade ago, Europe was considered the region with the second highest number of tailings dam incidents in the world, after Asia. In the EU, despite the Nature Directives, mining continues to be allowed in Natura2000 areas, where 81% of habitats and 63% of the species these laws were designed to protect currently have an 'unfavourable' conservation status. Without drastic changes, the overall environmental impacts of the extraction and processing of key minerals are projected to at least double by 2060.

Mining is the deadliest industry for those who oppose it. More environmental defenders are killed for opposing mining than opposing any other industry. 50 of the 212 environmental defenders killed worldwide in 2019 were campaigning to stop mining projects. Mining for lithium, cobalt, manganese, platinum, aluminium and copper have been associated with high or very high environmental and social risks. Globally this includes 167 human rights abuse allegations, tied to 86 different mining operations, 35% of which are headquartered in Europe. The Global Environmental Justice Atlas further lists 323 socio-environmental conflicts related to the extraction of copper, lithium, rare earth elements and silver. These studies are just the tip of the iceberg - in reality, human rights violations are likely much much higher. Researchers do not have the capacity to map the overwhelming complexity of negative impacts, nor do communities impacted by mining, or potential mining, always have the capacity to elevate their struggles.





The European Green Deal - continuing consumption and mining

While much international attention has been given to the reduction of carbon emissions linked to energy use, much less attention is going towards reducing material consumption, including of metals and minerals, as well as the overall consumption of energy itself.

At the end of 2019, the European Commission published its European Green Deal, an action plan outlining the climate and environmental policies and initiatives currently being rolled out. While a substantial improvement to the policies under the former 2014-2019 Juncker Commission, in their present form, these are an insufficient response to the climate crisis, ecological degradation, human rights violations and social inequalities, and will lead to a continued increase in the demand for materials and a large number of damaging new mining projects – both inside and outside the EU.

The European Green Deal is presented as a "new growth strategy" for the EU. This means it rests on the damaging and illogical idea that we can create economic growth, while (over)consuming in similar patterns, and be 'green' at the same time. In other words, simply replacing an industrial civilization built upon fossil fuels with a green version of the same model, relying on decoupling and efficiency, rather than fundamental transformations. There is a lack of critical analysis and action on EU overconsumption, as well as the EU's globally unjust production and distribution relations.

Key recommendations

First and foremost, the EU must set targets to reduce absolute resource consumption. In particular, a binding material footprint reduction target of 65% (to five tonnes per capita) by 2050 is needed, with mid-term targets and plans. The EU must implement post-growth, truly circular policies. This includes shrinking sectors of economic activity that are ecologically destructive and offer little or no social benefit - such as the military, aerospace, fast fashion, and private cars - and maintaining or growing those that satisfy the basic needs and wellbeing of all - such as renovation of buildings, renewable energies, reusable packaging, low-impact recreational activities, and agro-ecological food networks.

Communities must be granted a genuine Right to Say No to mining projects. Natura 2000 and other protected areas should be strictly protected as 'no go areas' for extractive industries. In the long-term, societies must move towards resource democracy, in which resources are treated as common, public goods that are best left in the ground, or their management decided within a truly democratic structure, rather than considered as financial commodities to be exploited for profit.

Corporations must respect human rights and the environment in all operations, and be held to account for harms caused, including through mandatory EU due diligence legislation and just trade and investment rules.

We also need a cultural shift to build better societies. The philosophy of continuous growth and expansion has become entrenched in Western societies, but study after study shows that above a threshold that the vast majority of Europeans have already reached, material wealth does not lead to a corresponding increase in happiness, wellbeing or health. Societal values should be firmly rooted in a deep commitment to a fair sharing of resources for people and planet, and to the fundamental belief that humans are of intrinsically equal value..

Introduction

Rapidly rising global consumption rates in the past century, resulting from a significant increase in average per capita consumption combined with considerable growth in the size of the human population, have driven the extensive extraction of material resources. At the turn of the 21st century, the world consumed ten times as much as 100 years earlier.[1] The global population doubled between 1970 and 2017, yet the extraction of materials (including fossil fuels for energy) tripled, from 27.1 billion tonnes to 92.1 billion tonnes per year - an increase from 7.4 tonnes to 12.2 tonnes per capita.[2] The magnitude is such that by 2020, human-made materials outweighed all living biomass on earth.[3]

This rapid increase in consumption has generated exponential environmental and social impacts. 75% of the terrestrial environment and 40% of the marine environment are already severely altered, combined with an alarming and rapid loss of biodiversity, with close to one million species facing extinction.[4]

At the same time, consumption and its impacts are not equally distributed. The 1.2 billion poorest people account for just 1% of the world's consumption, while the one billion richest account for 72%.[5] High-income countries, which include most EU member states, are responsible for a material consumption that is 13 times greater than that of low-income countries, and 1.6 times greater than upper-middle income countries (see Figure 1).[6] Within countries and populations, there are also large disparities in material consumption, with the richest responsible for a greater share.

This conspicuous 'luxury' consumption by the rich concentrates economic activity and power, while delivering negligible extra wellbeing.[7] It is heavily dependent on resources extracted from poorer countries and regions. The 'wealth' gained by the rich has been based on practices that rely on labour and natural resource expropriation. Yet it is communities in many poorer countries, who consume the least, that suffer most from both the localised impacts of extraction, and the larger-scale impacts resulting from overconsumption and ecological destruction, such as extreme weather events caused by climate change.

As a response to ongoing, large-scale ecological breakdown and climate change, we are seeing a new approach in mainstream Western society to future human development. This approach, to some extent, recognises the impacts of industrial activity and unsustainable systems of production and consumption, but still believes that progress measured in monetary terms, represented by gross domestic product (GDP), can be sufficiently decoupled from resource consumption and environmental harms. Indeed, the European Green Deal and the Digital Transition broadly reflect this belief, with the preferred methods of solving the crises being a reliance on energy and resource efficiency, incentives for industry innovations, digital

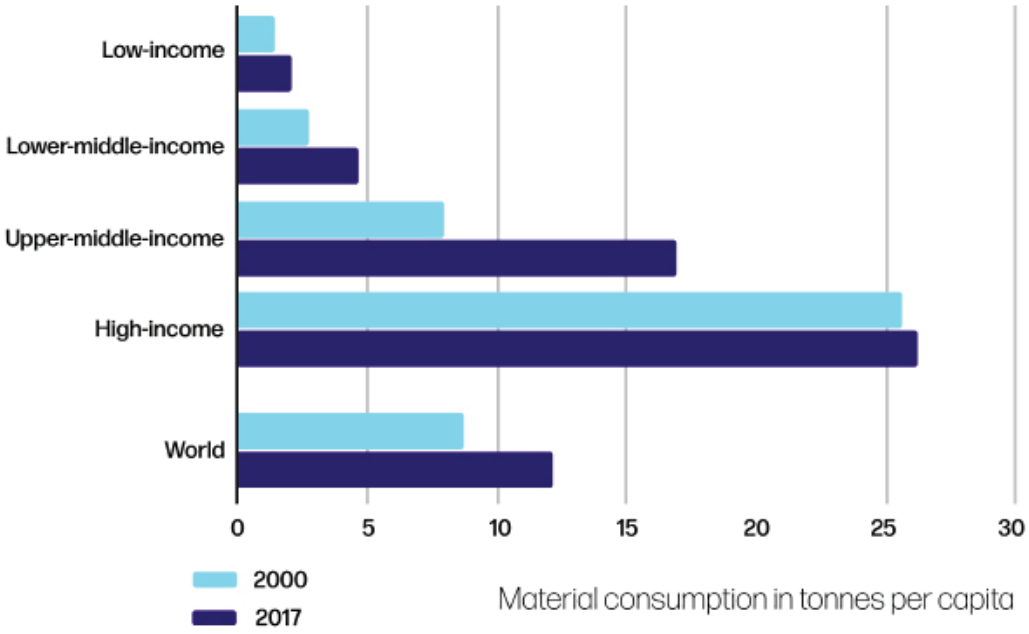


Figure 1: Higher-income countries consume 13 times more materials than low-income countries. (Note: The methodology used here differs slightly from the Eurostat material footprint methodology, which will be described in Chapter 1).[8]

and low-carbon technologies, and switching from fossil fuel vehicles to electric ones. While many of these measures are necessary steps in the transition, they are on the one hand not being introduced with the required level of ambition and on the other, need to be complemented by measures addressing the core issue of overconsumption.

This mainstream approach fails to apply a deeper analysis of how we arrived at this point in the first place. It ignores how human lives are affected by increased economic growth, rampant consumption and industrialisation,[9] and never questions the current growth-based economic system as one that is based on the continuous extraction of resources, also known as extractivism*. Nor does it fully recognise the responsibility of the Global North, including the EU.

The EU is responsible for massive overconsumption, which has also been one of the world's main drivers of historical emissions. Its material footprint is approximately double a sustainable and just level. Without fundamental policy changes - beyond mere reform - this trend will continue.

"A global narrative of planetary crisis that is ignorant of power inequalities and of reproductive forces cannot produce real change."

Stefania Barca, environmental historian

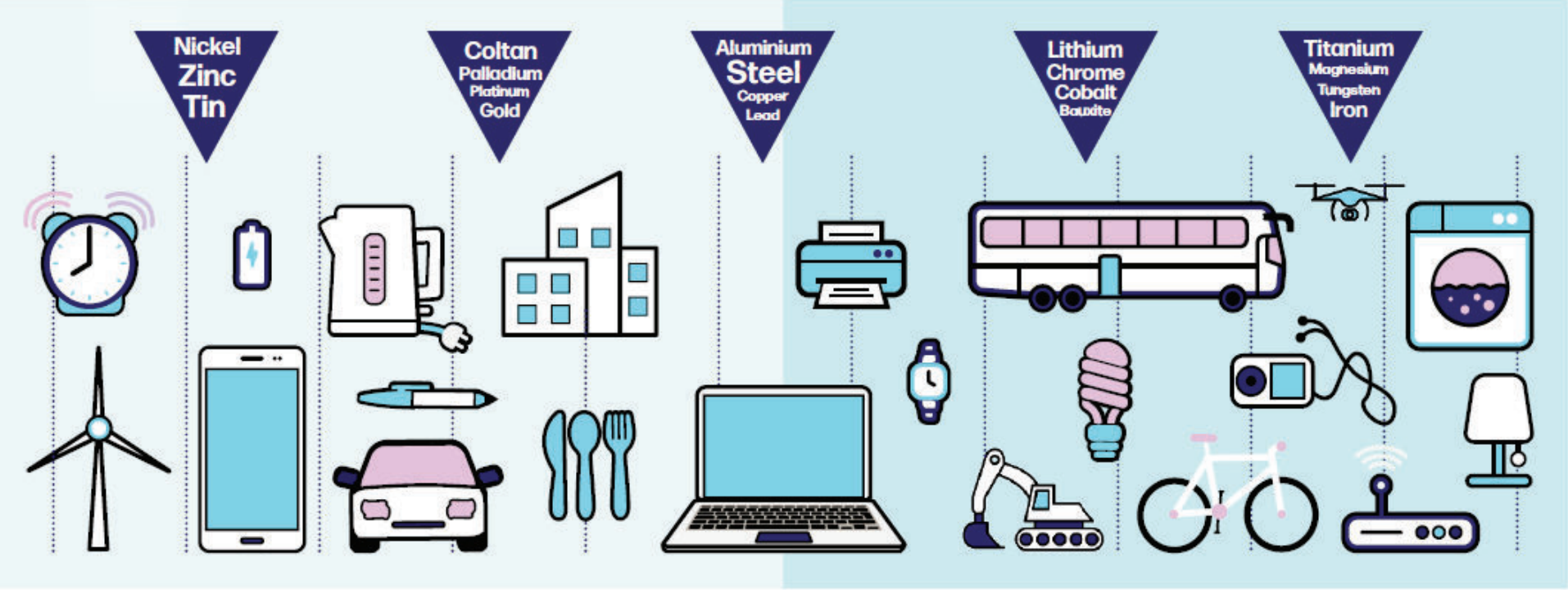


Figure 2: Uses of metals and metallic minerals. Adapted from 12 Arguments for Raw Material Transition

*There are many definitions of extractivism, one being the high-intensity and export-oriented extraction of resources rooted in colonialism and the notion that humans are separate from, and superior to, the rest of the living world.

All the materials we extract, process, manufacture, distribute, use, consume and discard have direct and indirect impacts on the environment and human wellbeing. Materials can be divided into four main categories: biomass, fossil fuels, metals and non-metallic minerals. In this report, we zoom in on metals and (metallic) minerals (see Figure 2), in particular those used for the twin green and digital transitions. Although these metals and minerals do not make up the biggest share of overall material consumption, they demonstrate that in the transition towards climate neutrality and increased digitalisation, the opportunity must be taken to ensure the root causes of the climate and environmental crises are addressed.

Despite the EU's commitment to becoming the first continent in the world to reach 'net-zero' greenhouse gas emissions by 2050, achieving these targets currently encompasses massive increases in the extraction of certain minerals both in Europe and the Global South.[10] This could undermine efforts to prevent biodiversity loss and stay within the 1.5°C target, as well as recreating global injustices that continue to put further ecological pressures on those least responsible for climate change. As the 2010 People's Agreement of Cochabamba notes, "*[rich countries] must adapt their modes of life and consumption in the face of this global emergency.*"[11]

This report seeks to bring these issues to the table, and begin the conversation that is a matter of responsibility and ecological common sense for the decrease of Europe's material consumption to be an integral part of EU attempts to reach climate neutrality and a good life for all within the limits of the planet.

Chapter 1 will touch on the state of global and EU material consumption*, including for particular metals and minerals. **Chapter 2** will go into depth on the impacts of metal and mineral mining and the environmental and social harms caused by mining companies. **Chapter 3** will discuss mining for the green and digital transitions. **Chapter 4** will outline the EU policy framework in relevant areas including the European Green Deal, Circular Economy Action Plan, the Raw Materials Strategy and Due Diligence legislation. Finally, **Chapter 5** will provide an insight into a comprehensive EU policy and other recommendations.

*While recognising the role that the growth in human population can play in relation to resource extraction and environmental problems, it is the factors influencing average per capita consumption which are the focus of this report.

Chapter 1

Global and EU consumption - beyond sustainable and just limits

The EU's large material footprint

European economies were built, in large part, through the colonisation of the Global South, channelling natural resources towards Europe.[12] This continues today, though without formal links of dependency. In 2018, the EU material footprint amounted to 14.5 tonnes per capita, with imports from outside the EU making up almost 20%.[13] Around two-thirds of EU material use is for material goods and services, and one-third for energy purposes.[14] *

EU material consumption had been rising for decades, but dropped in the aftermath of the 2008 economic crisis, and ever since has remained relatively stable, rising slightly in the past few years (see Figure 3). However, the relatively stable consumption in the past decade or so is in spite of the increasing political and industry rhetoric and 'action' on 'greening the economy' and implementing 'circular economy' policies.[15]

Importantly, despite its recent relative stabilisation, a material footprint of 14.5 tonnes per capita remains well above the global average of 12.1 tonnes per capita and far above what is deemed to be sustainable and just consumption. Best available research says this is between five tonnes per capita (Wuppertal Institute)[16] and ten tonnes per capita (the UN in its Human Development Report).[17] Thus, the EU's material footprint is approximately double a sustainable and just level.

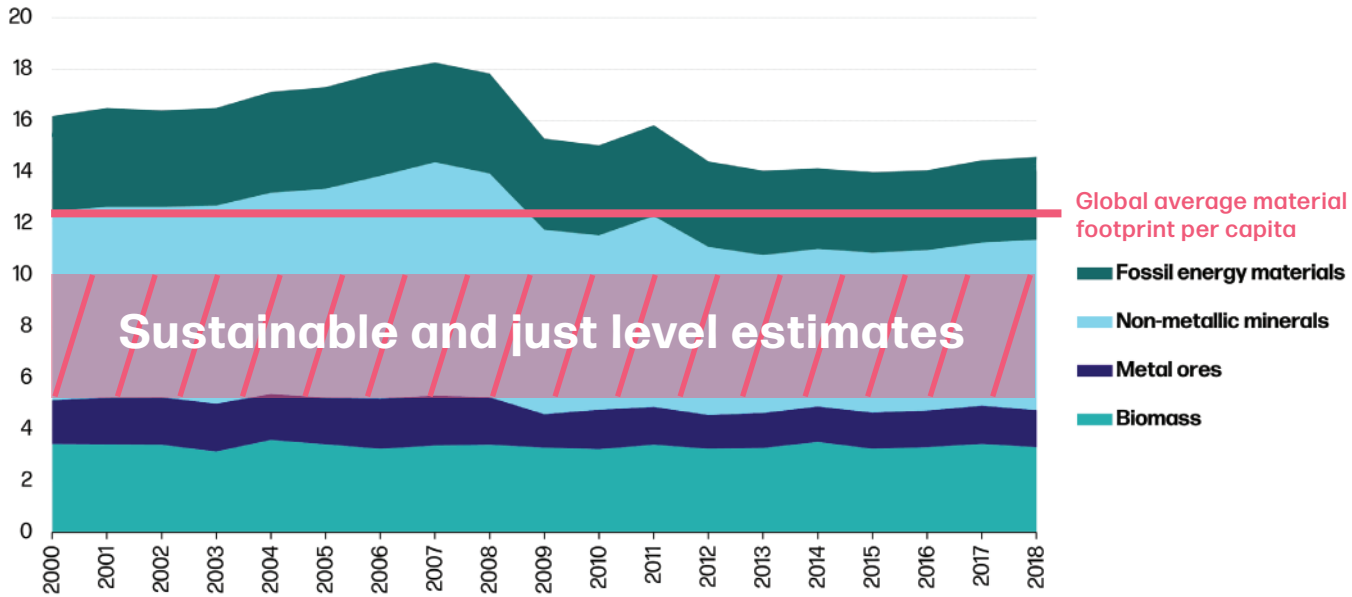


Figure 3: The EU material footprint (tonnes per capita), after growing for decades, has recently been relatively stable, but is still well above sustainable and just levels and the global average. Adapted from Eurostat, 'Material flow accounts'.

*It is of note that this 14.5 tonnes per capita for the EU differs from the UN estimates for high-income and upper-middle-income countries in the Introduction, of 26.3 and 16.9 tonnes per capita respectively, as the methodology used is different (see box 1 on Measuring material consumption).

Box 1 **Measuring material consumption**

Material consumption can be measured in different ways. Currently, the most comprehensive and practicable method is the material footprint, or raw material consumption (RMC), indicator. This measures the total mass of raw materials – biomass, fossil fuels, metals and non-metallic minerals – that are extracted along entire supply chains in order to produce the final products or services consumed in a country or region. It ensures that extraction, and its environmental and social impacts, outside of a certain country or region are taken into consideration. Because the RMC indicator is weight-based, however, it can lead to a simplification of complexities, as different materials have vastly different impacts, depending on their makeup, how they are produced, etc. Nonetheless, the material footprint indicator is still proven to be a good proxy of overall environmental damage caused.[18]

Domestic material consumption (DMC), on the other hand, although often used as an indicator, does not capture the total sum of material extraction globally for goods consumed in one country or region. For traded raw materials and products (outside of the country or region), DMC only accounts for their traded weight, which often represents a fraction of the weight of raw materials that were originally extracted for their manufacturing. For example, the 'footprint' of a smartphone (containing many metals extracted outside of Europe) using DMC would only include the weight of the small amount of metal in the final product, whereas the material footprint, or RMC, would account for the equivalent weight of the full metal ores extracted. The material footprint, or RMC, of countries or regions that are net importers of total materials is thus generally larger than their DMC.[19] The EU's DMC was 13.4 tonnes per capita in 2020.[20]

Several methodologies exist to calculate the material footprint. For the EU, using the Eurostat methodology produces the most robust and accurate results. The global figures outlined in the first section of this Chapter use the UN International Resources Panel methodology. However, Eurostat's is more detailed and robust, analysing 51 raw material categories (including, for example, crops, nuts, non-ferrous metal, zinc, slate, and natural gas) and 182 product groups (including, for example, poultry, fruits, plastic products, textiles, electrical equipment, iron ores, gold, education services, air transport services, musical instruments, ships and boats, and processed nuclear fuel).[21] There is an ongoing process between Eurostat, the UN International Resources Panel and the OECD to harmonise their existing methodologies for calculating the material footprint.

Eurostat methodology is still not perfect. For example, it does not allow you to trace back the EU's material footprint to the countries where the original extraction took place, or to examine the complexities of supply chains. Another issue, of relevance to this report, is that for metals, the weight of metal ores extracted is counted rather than the total materials extracted to get the ore, including waste rock, mine tailings or overburden, due to complexities in calculating this. The amount of waste rock in open pit mines is already commonly two to three times the amount of ore produced, and as mining advances to lower quality and deeper deposits (as global studies signal) and ore grades decline,[22]* the increasing 'material footprint' of metal is not fully visible in this indicator.

Finally, to get a full picture of resource use quantities and impacts, land, water and carbon footprints should be also measured and addressed in parallel to material footprint. It is, however, beyond the scope of this report to look into them in detail.

The EU's large material footprint - why does it matter?

Material consumption is directly correlated with local and global environmental harms, human health impacts and conflicts. Resource extraction and processing account for more than 90% of global biodiversity loss and water stress impacts, and for approximately half of global climate change emissions.[23] Natural resources are a shared inheritance, and unequal exchange is, in effect, dispossessing the people of extracting countries (see Chapter 2).

The EU's Joint Research Centre shows that the environmental impacts of the consumption of an average EU citizen are outside the 'safe operating space' for humanity † for nearly 40% of the impact categories investigated. This includes impacts from resource use, climate change, eutrophication (freshwater), human toxicity (cancer) and particulate matter. Impacts are higher compared to average global impacts per capita for almost all categories.

For impacts from resource use, the EU uses between 70% and 97% of the safe operating space available for the whole world, thus leaving less than 30%, at best, for the rest of the world.[24]

The EU's large consumption and material footprint is thus responsible for a disproportionate part of the depletion of common global natural resources, and causes extensive environmental and social harms.

* For example, a century or so ago the average copper grade was 1.6%, whereas now it is 0.4-0.5%. On average, to get 1 tonne of copper, 200 tonnes of rock have to be dug up.

† A safe operating space means the capacity of the planet to provide life-support systems for humanity is not endangered and the adaptive capacities of human societies not overburdened.

Box 2 The myth of decoupling and the limitations of resource efficiency

The decoupling of economic growth from resource consumption and its impacts is frequently proposed as an act of faith for 'sustainable development'. Decoupling means the growth rate of an environmental pressure is less than that of its economic driving force (e.g. GDP) over a given period – so that if GDP continues to rise, resource consumption and environmental impacts fall or do not rise at the same rate. However, evidence increasingly suggests that decoupling at a scale that would enable us to live within our ecological means is highly unlikely and ultimately unrealistic.[25] GDP is strongly correlated with resource consumption and its impacts - as GDP grows, the global economy churns through more energy, resources and waste each year - and this looks likely to remain the case.

The European Environment Agency acknowledged this in early 2021.[26] The EU has claimed to have achieved relative decoupling (i.e. increased the use of natural resources at a slower rate than economic growth), but based on DMC being used to measure material consumption rather than RMC. When material footprint, or RMC, is used, no decoupling has been seen.[27]

Resource efficiency is also often heralded as a solution to reduce environmental impacts. Making products and services more efficient is, of course, both positive and necessary, but it must be done in parallel with action to reduce absolute consumption, to avoid the 'rebound effect', or Jevons Paradox, i.e. where absolute consumption increases when efficiency gains are made, because of increased demand.[28]

Global and EU metal and mineral demand

The sections above look at overall material demand, i.e. for biomass, fossil fuels, metals and non-metallic minerals. We now zoom in specifically on metals and (metallic) minerals. Between 1970 and 2017, global metals extraction more than tripled, reaching 1.2 tonnes per capita in 2017.[29] In the same year, the EU's metal footprint was 1.5 tonnes per capita,[30] 25% higher than the global average.

The EU makes up only 6% of the world's population, yet consumes 25-30% of metals produced globally.[31]

Metal demand may comprise the smallest share of global and EU total material footprint (weight-based), but metal extraction and processing are associated with significant environmental impacts, including toxic effects on humans and ecosystems. The environmental impacts per kg of high-impact metal production, for example, are two to three orders of magnitude higher than those per kg of concrete production.[32] Furthermore, as noted above, the EU metal footprint only measures metal ore, yet total material extracted (including waste rock) is significantly higher, particularly in open-pit mines.

EU metal import dependency

The EU has a considerable import dependency, with 46% of metals coming from imports.[33] For several of these metals, in particular those used in energy technologies such as solar photovoltaics, wind turbines and batteries, the EU is fully reliant on imports, often coming from less than a handful of countries.[34] For example, 100% of battery grade lithium and rare earth elements are imported, with 78% of the former coming from Chile and 99% of the latter from China[35].

Reliance on metal imports is partly attributed to a lack of deposits of some metals within the EU,[36] combined with the colonial legacy and practice of rich nations' outsourcing material- and energy-intensive and polluting stages of production to the Global South and emerging economies.[37] Not that this necessarily means the EU should mine more within its borders (see Chapter 4 on recommendations).

Projections for global and EU material consumption in 2060

Looking first at projected overall material demand following historical trends, current patterns of production and consumption, and excluding consequences of potential policy changes, the UN International Resources Panel (UN-IRP) projected that global material use will more than double between 2015 and 2060. This would mean an increase from 88 billion tonnes in 2015 to 190 billion tonnes in 2060 - that's an increase of 55% per capita, from 11.9 tonnes to 18.5 tonnes per year.[38] The OECD projects an almost doubling of global material use, meaning an increase from 89 billion tonnes in 2017 to 167 billion tonnes in 2060 - or an increase of 44% per capita, from 11.9 tonnes to 16.4 tonnes per year (see Figure 4).[39]

The differences between the two figures are mainly due to the predicted growth of non-metallic minerals and biomass being lower for OECD predictions. The studies use modelling based on annual average GDP growth of 3.4% and 2.8% respectively*.

Like historical trends, this predicted growth in consumption up to 2060, at 44% and 55% per capita respectively, is much faster than predicted population growth, at 28% (higher than the 2015 population) in the UN-IRP model and 36% (higher than the 2017 population) in the OECD model.

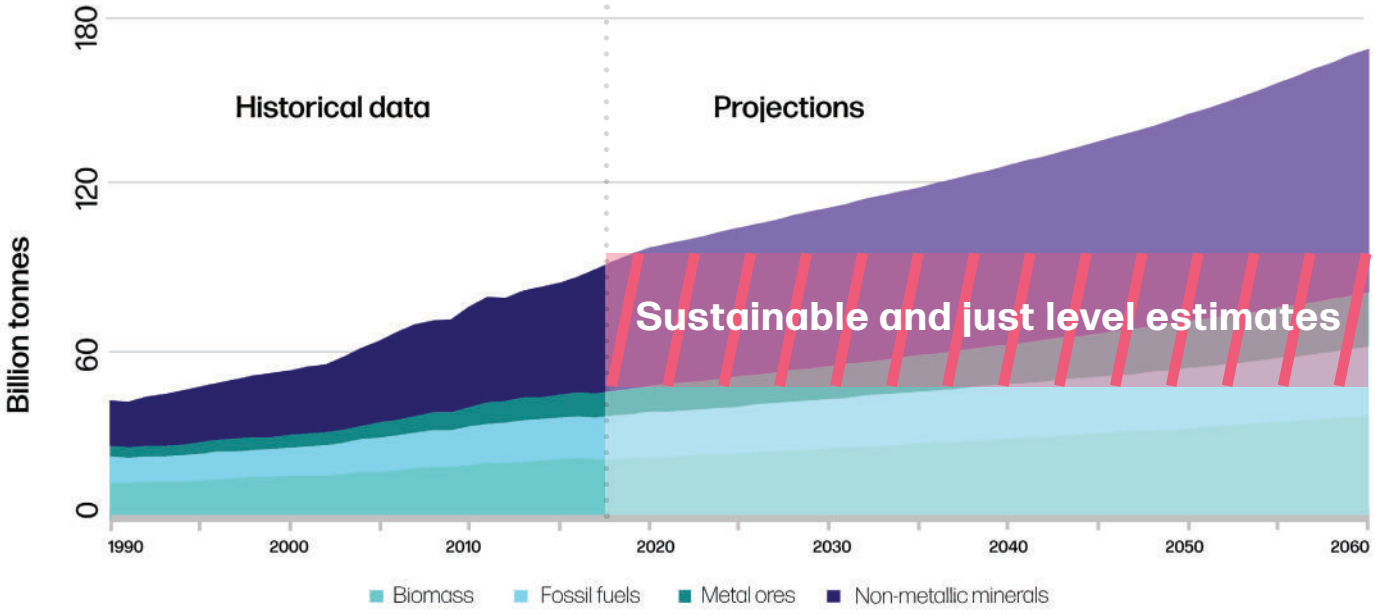


Figure 4: Growth in global material use to 2060 unless action is taken. Meaning more extraction than ever before and well above sustainable and just levels. Adapted from OECD (2019), 'Global Material Resources Outlook to 2060'.

*Note: these, and other official 'global data' sets, use growth-oriented quantitative framings which miss crucial on the ground realities - see Annex for more information

Box 3

Reducing material consumption - daunting and unrealistic, or exciting and achievable?

The philosophy of continuous growth and expansion has become entrenched in Western societies, but study after study shows that material wealth does not lead to a corresponding increase in happiness, well-being or health[40]. Research on mental health emphasises our longing, and basic need, for connection and fulfilment,[41] as opposed to consuming unnecessary goods.[42]

The responsibility is on governments, not individual change, to drive the transition away from the neoliberal growth-based economic system and put policies in place that meet the needs of all people and the planet, not of corporations and profit.

The German Environment Agency, for example, has published research demonstrating different future sustainability scenarios. In their "GreenSupreme" scenario they show how a reduction to a material footprint of 4.1 tonnes per capita by 2050 is possible.[43] They argue this can be done through a combination of measures targeting energy efficiency, recycling, material substitution, the use of innovative materials, and sustainable lifestyles.

While material use is projected to grow in all countries, predicted growth is strongest in emerging and developing economies, in particular China, India and Southeast Asia. There are no specific predictions for the EU as a whole, but the OECD study projects 2060 material use to be approximately 27 tonnes per capita for the 'OECD EU 17* and 18 tonnes per capita for the 'OECD EU 4'†.

It is notable that the OECD and UN-IRP predictions use the Domestic Material Consumption (DMC) indicator. For high importing regions like the EU, figures using material footprint (RMC) would certainly be higher. Considering that the current EU material footprint is 14.5 tonnes per capita, and the sustainable and just limit is likely somewhere between five and ten tonnes per capita, under these scenarios (i.e. without transformative changes), the EU is heading for colossal overconsumption with catastrophic environmental and social impacts.

The UN-IRP study also conducted a 'sustainability scenario' based on resource efficiency policies and an emissions reduction pathway consistent with 1.5°C. This results in a material use increase per capita 25% lower than the above predictions, to 14 tonnes per year instead of 18.5 tonnes. However, this is still above a sustainable and just limit (five to ten tonnes per capita). This scenario also predicts highly unequal consumption, with high-income countries (i.e. most EU countries) consuming an average of 13.6 tonnes per capita per year compared to just 8.2 tonnes for low-income countries. Clearly, policies and transformations need to go beyond those modelled and suggested.

*Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden

† France, Germany, Italy (study also included UK in this grouping)

Projections for global and EU metal consumption

Metals are used throughout the economy, and their increase is therefore driven by economic growth and consumption in general, and by sectoral changes in economic activity. Globally, the OECD predicts that metals will grow the fastest, with a per capita increase of 63%, from 1.2 tonnes per capita in 2017 to almost two tonnes per capita by 2060. In the UN-IRP 'sustainability scenario', there is a significantly slower growth.

Again, there are no specific predictions for the EU as a whole in the reports, though the OECD report does suggest EU metal demand is likely to grow at a slower rate, with non-metallic minerals growing faster.

	Predicted values (tonnes per capita)			Predicted growth from 2017 levels	
	2017	2030	2060	2030	2060
Total extraction	**11.9**	**13.0**	**16.4**	**10.0%**	**38.0%**
Biomass	2.9	3.0	3.6	4.2%	23.7%
Fossil fuels	2.0	2.0	2.4	Almost no increase	17.6%
Metals	1.2	1.4	2.0	17.6%	63.0%
Non-metallic minerals	5.9	6.6	8.4	12.3%	42.7%

Figure 5: Predicted growth in extraction of specific material groups to 2060 unless action is taken. Extraction of metals will grow the fastest. Numbers taken from OECD (2019), 'Global Material Resources Outlook to 2060'.

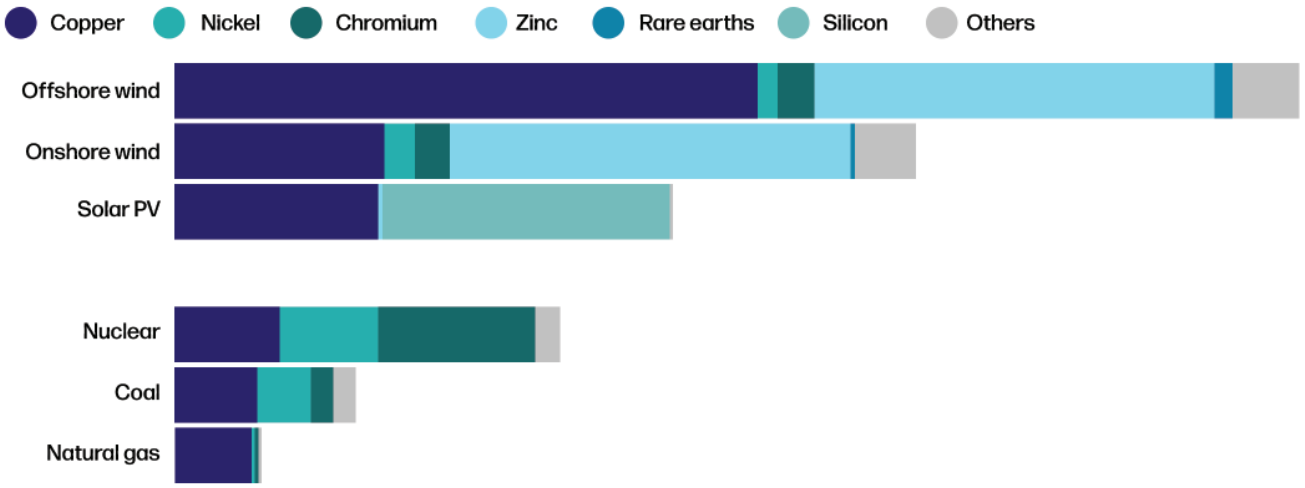
The green transition and metal and mineral demand

Despite low to no carbon emissions in the use phase, the (necessary) shift to wind and solar technologies, electricity systems, and batteries for electric vehicles and energy storage, is a material-intensive shift, which requires a more complicated set of materials (see Figure 6). In addition to significant quantities of non-metallic minerals such as concrete and graphite, and other materials like plastic and glass, solar PV technologies use aluminium, copper, silver, cadmium, gallium, germanium, indium, selenium, silicon metal and tellurium. Wind turbines use steel (including iron ore, carbon, nickel, molybdenum, titanium, manganese, vanadium, cobalt), rare earth elements, aluminium, borates and zinc. While batteries use cobalt, lithium, aluminium, lead, manganese and nickel.[44]

It is estimated that electric vehicles use four times as much copper as fossil fuel cars.[45] A recent study by the International Energy Agency stated that by the 2040s, the size of the global market for green transition minerals like lithium and copper will approach that for coal today. We are already seeing this trend: for example, half of all copper ever mined globally was extracted in a span of 23 years between 1985 and 2008. Predictions under continued economic growth show that by 2030, this increase will double again,[46]* and if copper mining continues to increase, the economically extractable ores might be depleted within a century.[47]†

Zooming in on several more of these metals - lithium, dysprosium, cobalt, and neodymium‡ - listed as Critical Raw Materials (i.e. those deemed by the EU to be of economic importance whilst having supply risks),[48]§ an EU study[49] shows that under the 'high demand' scenario,¶ solar and wind technologies will increase EU demand for these metals by up to 600% in 2030 and up to 1500% in 2050. Similarly, batteries for electric vehicles and renewables will drive 2030 demand for lithium up by 1800% and cobalt by 500%, and drive 2050 demand up by almost 6000% and 1500%, respectively.

It should be noted that these predictions are based on increases in lithium, dysprosium, cobalt, neodymium and nickel for solar and wind technologies and electric vehicles, based on current supply of these metals across *all* EU economic sectors. Thus, growth would be even higher when economy-wide demand is taken into account (for example, lithium used in portable electronics, e-bikes, data centres and base stations). The predictions also do not include the significant quantities of other metals like copper and steel needed for secondary infrastructures, such as power lines and transformers/converters. Furthermore, mining machinery, the mining itself, metals processing and transportation are all dependent on fossil fuels. This is another blind spot, and challenge to unraveling the reality of the green transition.



Excludes operational mineral requirements for nuclear, coal and natural gas

Figure 6: Energy and transport technologies like wind, solar and electric cars are material-intensive and have more complicated material requirements (displayed in materials kg/MW). Source: International Energy Agency (2021). The Role of Critical Materials in Clean Energy Transitions.

* Projected world consumption between 2009 and 2030 (21 years) is predicted to exceed all the copper metal ever mined historically prior to 2009.
† i.e. there will still be copper in the ground, but in very low concentrations at great depth or in vulnerable spots, costing greater amounts of energy and causing too much damage to nature to extract.
‡ Also includes the non-metallic mineral natural graphite which is on the CRMs list but is not a metal.
§ The list formed by the European Commission, and updated every three years, currently contains 30 metals and minerals.
¶ Models almost complete decarbonisation by 2050 and stronger decarbonisation in 2030 in line with the 55% target in the European Green Deal. Baseline is the EU share of this global supply i.e. 22%.

Digitalisation and metal and mineral demand

On average, Europeans own around 20kg worth of electrical and electronic products, with 8.9 million tonnes put on the market every year: phones, light bulbs, washing machines, electric bikes, smart technologies, kettles, and the list goes on.[50] (For context, the average laptop weighs 2.5kg, smartphone 200g, and washing machine 70kg).

Europeans own five times as many digital devices as people in the Global South, and more than double the global average.[51]

With increasing consumer advertisements and the creation of false needs, new products enter the market all the time, continuously driving up resource demand, at an ever faster pace.

The 'digitalisation' or 'digital transformation' of society is claimed to be necessary for the modern development of societies even within mainstream sustainability debates, and especially in policy-making.[52] Techno-optimism argues that the digital age promises a more connected, dematerialised world where 'sustainability' can coincide with technological advancements.[53] The rapidly growing digital sector, however, is another key driver of metal demand. Finished products, along with the digital infrastructures needed to connect these devices, will continue to put a strain on the environment as millions of tonnes of resources will need to be extracted for their exponential use.

For example, the average smartphone contains around 62 different types of metals, including rare earth elements, copper, lithium and cobalt,[54] and conflict minerals such as tin, tantalum, tungsten, gold.[55] 25% of all the silver mined around the world goes into electronic products.[56] Collectively, smartphones have consumed 107,000 tonnes of copper, 38,000 tonnes of cobalt, 157,000 tonnes of aluminium and thousands of tonnes of other materials, as well as using around 10% of global primary palladium and cobalt production during the first 10 years (2007-2017) of production.[57]

The electricity used by information and communication technologies (ICT) makes up about 10% of global electricity usage,[58] which could potentially rise to 30-50% by 2030. Even though products tend to be getting lighter, smaller, smarter, more multi-functional, and overall more energy efficient, they are also becoming more complex in their composition in terms of materials, which increases the difficulties for recycling and creates further issues in terms of waste management.

In addition, it is important to consider the negative effects of increased digitalisation, including a further proliferation of mass consumption patterns, thanks to easy access, targeted marketing and convenient online purchases, resulting in ever greater pressure on energy and resources, as well as impacts on mental health.

Metals recycling - important, but not a silver bullet

The EU is seen as a world leader when it comes to recovering metals from scrap, from both industrial production processes and post-consumer waste. The end-of-life metals recovery rates are extremely high in the construction industry, with over 95% of metals recovered. Over 90% of metals in scrapped vehicles are recovered in Europe, when the appropriate facilities are used.[59] Domestic recycling, meanwhile, accounted for 23% of metals processed in the EU in 2017 (excluding extractive waste).[60]

For most critical raw materials and those key to the energy transition, however, recycling is low, and secondary materials contribute only marginally to overall demand, often around 1% or less. Primary extraction is cheaper than recycling for these materials, and their availability at end-of-life is limited, since many have only recently seen their use increase. The contribution of recycled battery metals, for example, is quite variable, ranging from a relatively well established and efficient recycling chain for cobalt (22%) to nearly non-existent for lithium (>1%).[61] A recent report has stated that recycling for many of these metals has the potential to reduce primary demand compared to total demand (based on 2040 'business-as-usual' projections) by approximately 25% for lithium, 35% for cobalt and nickel, and 55% for copper.[62]

However, metal recycling is not a silver bullet. Its long-term potential remains relatively meagre due to natural material laws and dissipation, economic feasibility, technology availability, and fast growing demand. It is also important to note that although secondary production is more labour intensive and provides more jobs, the environmental impacts from secondary production are not negligible. For example, secondary production of zinc has relatively high impacts on energy demand, and the terrestrial ecotoxicity impact of secondary iron production is almost five times higher than that of primary iron production.[63]

Thus, recycling has a role to play in helping to slow down the increasing demand for mined metals, yet its contribution will not be enough to ensure consumption is within sustainable and just limits. Overall demand reduction, meaning less mining, must be the priority. This means a rejection of the continued growth paradigm that has led, and continues to lead, to devastating effects in the Global South as well as in Europe.

Chapter 2

Harmful impacts of metals mining: to people and the planet

Extracting resources, exploiting economies

The mining sector is known to provide infrastructure and employment benefits, but regional and local-level wellbeing indicators point to its many downsides, including social and environmental harms. This is particularly the case in the countries most exploited by extractivism and colonialism, offenses that Europe has long been responsible for.[64] While the Western 'development' narrative promises jobs and increased wellbeing, it has facilitated the perpetuation of colonial structures, allowing the settler state and industry to continue guarding or managing the resources of the local and national economies through trade and economic policy. It is no surprise that ex-colonial powers like the UK and settler colonial states like Australia and Canada dominate the mining sector.

In many cases, the political independence of formerly colonised states did not fully equate to economic independence. For countries with an abundance of natural resources, that economic dependence forced many into a resource curse', further enabling systems of oppression and poverty. Many of these countries have seen few of the wellbeing benefits, instead facing particularly high levels of poverty, civil war, corruption, human rights violations, low life expectancy and poor health care.[65]

This dependence on extraction prevents the development of other less harmful industries. It also pushes extraction deeper into rural communities and Indigenous territories, where communities are often marginalised by that state's legal systems due to residual colonial laws and definitions of land and ownership. As a result, the pressures of resource extraction, particularly mining, continue to have a disproportionate effect on those marginalised communities.

Some examples of how these injustices manifest themselves today are in trade policy, via Investor State Dispute Settlement (ISDS) mechanisms and raw material import tariffs. For example, import tariffs from EU and OECD countries on raw materials are very low compared to export taxes by resource-rich producers. World Trade Organisation (WTO) obligations restrict the ability for these countries to raise import tariffs, yet export taxes are not subject to the same WTO obligations for exporting countries.

Box 4

Europe owes ecological debts

Europe, historically and currently, owes massive ecological debts to the countries and regions it has colonised and (continues to) exploit for resources. This exploitation is largely maintained by a system built on ecologically unequal exchange, where every year, the Global North appropriates tens of billions of tonnes of raw materials and hundreds of billions of hours of human labour without proper compensation.[66] Environmental costs - both ecological harms and pollution - have been largely displaced from the Global North to the Global South.

For example, the World Bank calculated that Sub-Saharan Africa loses a total 3% of Gross National Income - around $100 billion - annually due to the economic gains from natural resources not being compensated for in the form of royalties, taxes, infrastructure, foreign revenue, jobs and other local multipliers.[67] This loss is even higher than the illicit financial flows, which are in the $50-80 billion range.[68]

On a global level, recent estimates demonstrate that through ecologically unequal exchange, the Global North drains Global South commodities amounting to €1.8 trillion per year. To give some perspective, this amount of money would be enough to end extreme poverty, globally, fifteen times over.[69] As a result of this unequal exchange, future generations in countries of the Global South are also cheated out of their natural resource inheritance.[70]

Box 5 Investor State Dispute Settlement (ISDS) in the Mining Sector

ISDS mechanisms within International Investment Agreements allow companies to take legal action against states that might support their communities' decision to 'say no'. This gives multinationals the same rights as sovereign states while placing no obligations on them to behave more responsibly. ISDS also places additional economic pressures onto resource rich countries, especially those in the Global South already tied to historically exploitative debt. In 38 ISDS mining industry claims assessed across Latin America, over half were associated with fighting to protect Indigenous peoples' territories and water.[71] As of June 2020, there were 42 publicly known pending ISDS mining claims from mining multinationals around the world, totaling at least USD$45.4 billion.[72] Some examples of states being sued by mining companies (and fined) for taking the side of local communities include Ecuador (USD$480 million, Chinese company, gold), Mexico (USD$3.54 billion, Canadian company, gold),[73] Peru (USD $36 million, Canadian company, silver),[74] Pakistan (USD$5.8 billion, Australian company, copper), and even Sweden (USD$1.8 billion, Australian company, uranium, vanadium and gold).[75]

The 'sustainability' myth of mining

Industrial mining companies and their subsidiaries or contractors are granted an enormous amount of power in the global economic system, with their corporate interests dominating political discourse, resulting in action that favours the profits of mining corporations over the interests of people and planet.

Despite the 'sustainability' rhetoric often expressed by mining companies, and supported by many governments and international organisations, none of the largest mining companies around the world score high enough to meet societal and environmental standards. The Responsible Mining Index in 2020 found that the performances of even the best-scoring companies fall considerably short of societal expectations in all areas, including community wellbeing, working conditions and environmental responsibility, and that many companies show little sign of translating corporate commitments and standards into successful business practices.[76]

It should be noted that this assessment consists of large mining multinationals, with only two EU mines by EU companies assessed. This is to be expected, given the relatively small amount of metal and mineral mining currently in the EU, despite its high consumption. However, given the rapid increase of exploration and mining in Europe, it is of concern that none of these companies meet societal and environmental standards. Other industry attempts at 'sustainability', such as biodiversity offsetting and land reclamation efforts, have also endured considerable criticism in Europe and abroad.[77]

Silver miners pushing the cart into the mines of Cerro Rico, Potosi, Bolivia. (Reisegraf, Adobe Stock)

Specific environmental and social impacts of mining

It is estimated that greenhouse gas emissions associated with primary metal and mineral production accounted for approximately 10% of total global energy-related emissions in 2018.*[78] If historical trends and current patterns of production and consumption are followed - without transformative policy changes - the overall environmental impacts of extraction and processing of key minerals are projected to at least double between 2017 and 2060, as a result of both the increased scale of extraction and production and of declining ore grades[79].

The environmental consequences of extracting, processing and using different material resources vary widely across material groups and the stage of the material life cycle. For example, steel production from iron is energy-intensive and causes the largest climate change impacts due to its current heavy reliance on coking coal, while the mining and processing of copper and precious metals cause high toxicity impacts.

The OECD investigated environmental impacts (acidification, climate change, cumulative energy demand, eutrophication, human toxicity, land use, photochemical oxidation, and aquatic and terrestrial ecotoxicity) for seven key metals: iron, aluminium, copper, zinc, lead, nickel and manganese. The results suggested that copper and nickel cause the greatest per-kg environmental impacts, while iron has the highest absolute environmental impact due to the large volumes used.

In the EU, despite the Nature Directives, mining continues to be allowed in Natura2000 areas, where 81% of habitats and 63% of the species these laws were designed to protect still have an 'unfavourable' conservation status, according to the European Environment Agency.[80]

The social impacts of mining cannot be understated. Mining is the deadliest industry for those who oppose it. More environmental defenders are killed for opposing mining than opposing any other industry with 50 of the 212 environmental defenders killed worldwide in 2019 campaigning to stop mining projects.[81]

Differences in impacts are also tied to differences in the scale of mining operations, such as between industrial, or large scale, mining and artisanal scale mining (where individual miners work independently or in small collectives). It is estimated that artisanal and small-scale mining is responsible for about 15-20% of global mineral extraction and production,[82] and that approximately 100 million people (including workers and their families) depend on artisanal mining. This compares to about seven million people worldwide who depend on industrial mining.[83]

Women only represent 5% of workers in industrial mining, yet make up around 30% of workers in artisanal mining and are more exposed to mining-related environmental and health risks.[84] Workers and nearby communities of artisanal mining often face intimidation, sexual violence or exploitation, child labour, human trafficking, or are forced into poverty or economic hardships.[85] These may be apparent in the context of large-scale industrial mining, yet large-scale industrial mining also creates more long-term and indirect negative impacts[86], being a major contributor to global greenhouse gas emissions, regional conflicts, and political corruption[87].

*This excludes emissions associated with mineral aggregates, energy carriers, transport and manufacturing.

Top: *Members of the Mexican Network of People Affected by Mining (REMA) visit the Los Filos Gold Mine. (Cristian Leyva, EnvJustice Atlas).*

Middle: *A dam failure released around 12 million m³ of tailings in the city of Brumadinho, Minas Gerais, Brazil. (Christyam, Adobe Stock).*

Bottom: *The tailings dam accident in Hungary in 2010 spilled nearly 1 million m³ into the townships of Kolontar and Debencser. (Globovisión, Flickr).*

Environmental impacts:

- Destruction of habitats leading to local biodiversity loss or altering of composition.
- Soil contamination, erosion, alteration of water regimes, and gas or particulate emissions.
- Animal and plant species suffering disturbance, poisoning and burns from the toxicity of heavy metals, leading to alteration of the species.
- Downstream heavy metals pollution, and long term effects such as poor waste rock disposal leading to acid mine drainage, contamination of groundwater, wetlands, coral reefs, and other aquatic systems.
- Improper mine closure leading to breeding grounds for parasites and land collapse.
- Specific impacts related to deep sea mining - see section below.

Social and human rights impacts:

- Forced displacement of Indigenous and local communities due to the failure to provide accurate information and the disregarding of communities' rights to say no and to Free Prior and Informed Consent (FPIC), resulting in the loss of livelihoods and culture.
- Use of violence against communities opposing mining, as well as intimidation, criminalisation, stigmatisation, extrajudicial killings and wrongful imprisonment.
- Poor or illegal labour conditions such as forced labour, child labour, human trafficking, sexual exploitation, unsanitary conditions and general safety violations leading to injury, illnesses, disability or death.
- Downstream impacts on local communities including increased risks of flooding or drought, poor air quality, and deterioration and contamination of groundwater.
- Long term loss of livelihoods from downstream impacts on food and irrigation systems.
- Poor mining project governance and accountability leading to a lack of transparency over, and accountability for, violations, plus a lack of civic participation in remediation, heightened risk of conflicts or violence, heightened risk of retaliation from companies or government, and improper mine closure leading to unsafe use of the land.

Figure 7: Local environmental, social and human rights harms caused by metals mining[88] Note: policy-making and market research do not take the complexity of these impacts into account, thus the list of impacts can be seen as greatly underestimated - see Annex for more information

Box 6

Environmental Impact Assessments

Environmental Impact Assessments (EIAs) are crucial mechanisms to assess possible environmental harms, and hold mining and infrastructure projects accountable. EIAs can comprise different phases, including screening, scoping, assessment, information/consultation, decision and monitoring. The EU 2014 EIA Directive amendments sought to improve the quality and the content of EIA reports and ensure that "competent authorities will also need to prove their objectivity to avoid conflicts of interest."[89] While these amendments were crucial steps in the right direction, structural issues with EIAs continue to prevail:

- **Community participation.** Discontent with mining projects begins by excluding local populations from the design and planning stages. Incomplete or non-participatory EIAs aggravate this issue. State, company or private consultancy firms conducting EIAs have triggered serious concerns,[90] for frequently underestimating the range of environmental harms in assessments, failing to calculate seasonal changes (and corresponding consequences) and neglecting socio-ecological variables. EIAs are also accused of devaluing landscapes and articulating a type of 'corporate science'[91] suitable for project development.
- **Conflicts of interest**. Many national authorities accept and approve EIA reports with incorrect data or manipulative conclusions, often under political pressure to secure investments.[92] Governments have a stake in economic growth, material extraction and infrastructure development and thus frequently declare mines and infrastructure projects as "national interests"[93] or "declared public utilities".[94] Or, in the case of the EU, bluntly assert that "access to resources is a strategic security question". [95]
- **Enforceability.** The lack of effective mechanisms, or authorities, capable and willing to monitor and enforce high-ecological standards and restoration practices is a recurring concern. Conflicts of interest are also a challenge to enforceability.

Toxic waste from mining

Mining is the industry that produces the largest amount of waste, globally.[96] Mining waste can come in the form of waste rock (overburden) and waste from processing (tailings), which can contain toxic substances. Mining operators will often store the waste in heaps or in large ponds contained by a dam.[97] If these dams burst, they can cause severe ecological damage and pose threats to surrounding communities. Even when idle, the toxic contents can threaten surrounding bodies of water and local wildlife.[98]

The increase in mineral and metal extraction coincides with an increase in mining waste. Furthermore, as a result of declining ore rates since the 1980s, there has been a doubling of the volume of mine waste tailings generated for each unit of mineral produced.[99] The production of one tonne of copper, for example, generates around 110 tonnes of tailings and 200 tonnes of topsoil removal or overburden.[100] Declining ore grades also have an inverse exponential relationship with water consumption.[101] In the EU, mineral waste is already the second biggest waste stream, making up around 25-30% of all generated waste[102], a figure that will only increase if mining activities surge.

The increase in tailings has also led to an increase in accidents. Over the past century, the failure rate for tailings dams was more than 100 times higher than that of reservoir and power dams.[103] In the past ten years, 71 reported cases of tailings failures have been documented around the world, which have collectively spilled over 100 billion litres, claimed 482 lives, damaged 2100km of waterways and caused significant damage to local environments.[104] Some of the many devastating failures include Brumadinho (2019) and Mariana (2015) in Brazil, Mount Polley (2014) in Canada, Talvivaara (2012) in Finland, and Kolontár in Hungary (2010). Just over a decade ago, Europe was considered the region with the second highest number of tailings dam incidents in the world.[105]

Mining the deep seas?

The age of hyper-extraction is pushing the extractive frontiers ever deeper into previously unimaginable areas. Metals such as nickel, cobalt, manganese, rare-earth elements and copper can be found in the deep sea.[106] However, the deep sea also contains fragile and life-sustaining ecosystems, home to around ten million species and biodiversity as rich as tropical rainforests[107].

Like with terrestrial mining, mining of the seabed would generate tremendous amounts of waste, in the form of clouds of suspended particles, or plumes. These toxic plumes would disperse and introduce heavy metals into the food chain, compromising the health of many organisms.[108] Though there are, as yet, no operational deep sea mining projects in the world, a global exploration frenzy is underway across 1.3 million km^2 of the Pacific, Indian and Atlantic Oceans, often led by European companies and supported by certain EU Member States. European contractors hold a total of nine out of the 30 exploration contracts licensed by the International Seabed Authority.[109]

Chapter 3

Mining for the green and digital transitions

Greenwashing of mining for metals used in the green transition

Large mining companies and governments are promoting the concept of 'green mining'. By using the fact that some metals and minerals are needed for the green transition, they are effectively greenwashing the metal mining industry. When Portugal held the rotating position of the presidency of the Council of the EU in the first half of 2021, the presidency even held an European Conference on Green Mining.[110] However, this concept conflates the demand for more mining with action on climate change and social progress (see Figure 8), while dismissing those who raise concerns over continuous extractivism as foolish. When communities fight for their right to decide their futures, they are labelled as having a not-in-my-backyard ('NIMBY') attitude. Portuguese Secretary of State for Energy, João Galamba even went so far as to allege that "those who are against mines are against life."[111]

Metals like copper, iron and aluminium are used overwhelmingly in construction and other sectors. For those more closely tied to the green transition, like cobalt, lithium and rare earth elements, the pathway of more 'green' mining is driving assumptions that are unjust and unsustainable. Assumptions which reflect the inequalities and ideology of growth which led to the ecological crises in the first place, such as the ambition of having one billion, mostly private, electric vehicles on the road by 2050.[112]

Many of these metals are also used significantly in the military sector. Global military operations continue to be deeply tied to mining sites and resource extraction. Nation-states around the world are spending almost $5 billion a day on war - a deadly diversion of funds from the health of people and the planet[113]. Mining companies tend to conceal or downplay the role their minerals play in the military sector and arms trade.

Figure 8: Images sourced from Digging for Climate Change showing the greenwashing by mining companies

Impacts of mining for metals used in the green and digital transitions

The following section focuses on the social and environmental impacts of mining for metals, including critical raw materials (CRMs), that are used significantly in technologies and infrastructure related to the green and digital transitions. This does not include the severity or scale of impacts at other stages of the supply chain, such as manufacturing, transportation, installation, use and end-of-life recycling/disposal.

This specific focus provides an alarming glimpse into the likely countless serious harms occurring across numerous industries and their multiple complex supply chains.

The mining of metals for the green and digital transitions, and the companies and policies involved, is not any 'cleaner' than other kinds of mining, nor does it respect human rights more.[114]

Poor environmental and human rights protections

As noted in Chapter 1, the EU imports 46% of its metals, and up to 100% of many of the metals necessary for green transition and digitalisation technologies and infrastructure, such as lithium, borate, magnesium and rare earth elements. Countries that have been exploited and forced into resource extraction dependence - and their local communities, in particular Indigenous Peoples - are disproportionately bearing the brunt of environmental harms from both large scale mining and artisanal mining.

Mining for metals related to the green and digital transitions has already seen poor environmental and human rights safeguarding. For example, the six metals referred to in Chapter 1 as being essential for wind, solar and battery technologies (namely, lithium, cobalt, manganese, platinum, aluminium and copper) have already been associated with high or very high environmental or social risks.[115] The Business and Human Rights Resource Centre has also uncovered 167 official global human rights allegations associated with these metals,[116] tied to 86 different mining operations - 35% of these are from companies headquartered in Europe.

This makes Europe responsible for over one-third of global human rights allegations in mining for 'green and digital transition' metals.

Furthermore, 100% of the allegations associated with European mining multinationals concern companies that have existing human rights policies as part of their codes of conducts,[117] and nearly 80% already claim to adhere to internationally recognised human rights-related standards and frameworks within the mining industry (e.g. VPI*, ICMM †, OECD Guidelines, UNGP‡, UNGC §, and RMI ¶). Only one of the companies claims to adhere to The Initiative for Responsible Mining Assurance (IRMA), the leading standard on good mining practices.[118]

*The Voluntary Principles Initiative (VPI) on Security and Human Rights "guide companies in conducting a comprehensive human rights risk assessment in their engagement with public and private security providers, to ensure human rights are respected."
† The International Council on Mining and Metals (ICMM) is an international organisation dedicated to a safe, fair and sustainable mining and metals industry.
‡ UN Guiding Principles (UNGP) on business and human rights are a set of guidelines for States and companies that "provide an authoritative global standard for preventing and addressing the risk of adverse human rights impacts linked to business activity."
§ UN Global Compact Principles (UNGC) on human rights are a set of guidelines recommending business to; Principle 1: support and respect the protection of international proclaimed human rights; and Principle 2: make sure that they are not complicit in human rights abuses.
¶ Responsible Minerals Initiative (RMI) "provides tools and resources to help companies make sourcing decisions that improve regulatory compliance and support responsible sourcing globally"

Box 7

Due diligence in the mining sector

Due diligence can be a key mechanism to ensure businesses respect human rights and the environment in all their processes, providing that it is accompanied with strong measures to hold companies accountable for any harms caused.[119] Due diligence is generally operationalised via Environmental, Social and Corporate Governance (ESG) standards, which provide guidelines and recommendations on how companies conduct their business operations and how these operations influence environmental and social systems. These are often most important when assessing human rights (labour rights, land rights, Free Prior and Informed Consent of Indigenous Peoples, accountability, etc.) and environmental (environmental impact assessments, waste management, GHG emissions, etc.) due diligence.[120]

However, too often due diligence is simply a process-oriented tool, which risks becoming a tick-box exercise if it is not combined with civil, administrative and criminal liability provisions for harm caused by a company, strong enforcement and sanction mechanisms, and the right of affected communities and other stakeholders to go to court against human rights violators. Human Rights Watch states that most ESG standards, such as the UN Guiding Principles on Business and Human Rights (UNGPs), "cannot actually require companies to do anything at all. Companies can reject the principles altogether without consequence—or publicly embrace them while doing absolutely nothing to put them into practice."[121] In the case of FPIC, for example, companies often conduct basic consultations with communities in lieu of actually acquiring consent.

These findings not only confirm that companies' having human rights policies does not necessarily lead to them respecting these policies, but also that adhering to internationally recognised standards or voluntary measures is not enough to prevent human rights abuses, including by European metal mining multinationals.

The significance of this is amplified by Europe's supposed global role as a leader in 'sustainable production and consumption' - clearly, European companies are not a 'top of the class' reference for due diligence when it comes to mining for key green transition and digitalisation metals. The European Commission itself indicates that "only one in three businesses in the EU are currently undertaking due diligence on human rights and environmental impacts".[122]

This poor due diligence may be exacerbated by the inability of industry to fully account for long-term environmental and social impacts, such as the long-term health of a nearby community and its newborns or the influence of biodiversity changes on livelihoods. Added to this is the fact that there are already mechanisms protecting multinationals and their subsidiaries from reporting accurately on their relevant impacts (beyond the mere lack of legal enforcement). As noted above, these include ISDS mechanisms, which give multinationals the political and economic insurance they need to disregard due diligence, along with the absence of redress or grievance systems for victims of abuses.[123] As one study notes, "supply chain disclosures do not provide information on the actual number of human rights abuses a company has committed."[124] The overwhelming evidence, therefore, is that technologies for the green and digital transitions consist of dirty and harmful production processes.

Socially engineering the acceptance of mining

Current 'good corporate practice' calls for communities' 'social acceptance', or gaining a 'Social Licence to Operate' of a project that affects them, their resources or lands. In practice, this means facilitating development with as little community input and dissent as possible, on the premise that companies will eventually start mining, and that local communities do not have a genuine right to stop them. When community feedback or objections do not comply with prevailing pro-mining agendas, citizens' objections are frequently labelled and dismissed as originating from a not-in-my-backyard ('NIMBY') attitude. This discourse reinforces an already unacceptable power asymmetry between mining companies and local people, and creates pro-industrial bias in what should be neutral and objective consultation processes.

In the case of Indigenous Peoples, Free, Prior and Informed Consent is a specific right that is articulated in the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) allowing communities to give or withhold consent to a project that impacts their lands, territories or natural resources. However, as noted above, companies often conduct basic consultations with communities in lieu of actually acquiring consent.

What the communities say:

Case studies from within and outside Europe on environmental and social impacts of metals mining for the green and digital transition.

Countless mining-impacted communities have documented their experiences relating to metals mining and its plethora of harms. These provide evidence of the overwhelming complexity of negative impacts, which are often invisible within data collection processes and models, and therefore disregarded.

The Global Environmental Justice Atlas lists 3,479 cases of socio-environmental conflict, as of July 2021. The mining of mineral ores and building materials represents 670 of these cases, more than any other category. At least 323 conflicts are related to the extraction of copper, lithium, rare earth elements and silver. It is interesting to note that, for the second consecutive year, public acceptance is the number one business risk on Ernst and Young's risk radar for mining and metals.[125]

The following case studies further exemplify the environmental and social harms within Europe, or caused by European mining companies, for mining of key metals for the green and digital transitions. In Europe, there are already growing conflicts in Spain, Portugal, Sweden and Ireland, in parallel with increasing exploration licenses in these countries. Some startling facts include that 27% of the Republic of Ireland, and 25% of Northern Ireland, are covered by exploration permits.[126] In Spain, meanwhile, there were more than 2000 mining applications filed in 2018 alone.[127] In Finland, approximately 11% of total land area has been reserved for mining exploration. Norway has 626 active exploration permits, and Sweden has 586 exploration permits, including in Sapmí, the homeland of the Samí Indigenous People.[128]

In all the cases below, the companies involved have Environmental, Social, and Corporate Governance (ESG) obligations, either through their own commitments or indirectly through national obligations. As indicated in Box 7 on due diligence, corporate responsibility commitments via ESG standards do not suffice to guarantee proper due diligence as these are 'soft law' instruments, meaning they are often not enforceable. These case studies further illustrate the failure of voluntary or non-binding ESG standards to safeguard social and environmental systems.

Locals gather to protest the Caceres mining project, 2018. (Plataforma Salvemos La Montaña de Cáceres)

Country Site
Spain

Multinational / headquarters
Infinity Lithium, Australia

Metal / Phase
Lithium, Planning

Main industry
Electric Vehicles

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
UN Guiding Principles on Business and Human Rights, OECD Guidelines, International Finance Corporation Performance Standards

A planned lithium mine in Cáceres, Spain, continues to receive growing opposition from the city council and 134 local and environmental organisations, including through a letter sent to the European Commission.[129] The Australian company Infinity Lithium has explicitly stated resources will go towards supplying the EU's lithium-ion battery supply chain and electric vehicle industry.[130] Friends of the Earth Europe has previously highlighted the negative effects of lithium mining on communities, ecosystems, and food production, citing water pollution and depletion, the use of toxic chemicals for processing, and release of these chemicals through leaching, spills or emissions.[131] Opposition for the mine is based on the grounds that the company has not received Social License to Operate (SLO), which refers to "a local community's acceptance or approval of a project or a company's ongoing presence, beyond formal regulatory permitting processes".[132] Local communities have also requested for the Sierra de la Mosca mountain range to be considered a protected landscape. Furthermore, the city council and mayor have stated that the mine will likely contribute to long-term negative economic impacts given that the city is a UNESCO heritage site. Despite this growing opposition, Infinity Lithium is still pursuing the project.[133] Infinity Lithium is committed to three internationally recognised ESG and CSR standards.

Aerial views of the Ruashi mine showing the proximity of the mine to thousands of Lubumbashi houses. During the explosions necessary to free the ore in the mining pit, the people living closest to the mine are evacuated. After several hours, they are allowed to return to their homes. (Google maps, 2016)

Country Site
Democratic Republic of the Congo (DRC)

Multinational / headquarters
Eurasian Resources Group, Luxembourg

Metal / Phase
Cobalt, Mining

Main industry
Electronics, Electric Vehicles, Wind

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
OECD Guidelines, Global Battery Alliance, UN Guiding Principles on Business and Human Rights, International Finance Corporation Performance Standards

Eurasian Resources Group (ERG), formerly ENRC, a Kazakh multinational based in Luxembourg, has failed to engage with local communities in the Kwango province in the DRC on its cobalt and copper concessions and has failed to address severe threats to human health due to its mining activities, including the Ruashi mine.[134] Communities along the Kipembe and Luita rivers have filed complaints about drinking water contamination and lack of access to clean water due to the two rivers being polluted, which the company has been aware of but failed to remediate. Through its subsidiary Boss Mining, ERG has also been accused of forced evictions of local communities, citing human rights violations.[135] Demand for cobalt extraction is likely to surge in sub-Saharan Africa, and poor accountability mechanisms may be at the root of increased violations.[136] Yet, ERG is committed to four internationally recognised ESG and CSR standards.

Pristine landscape at Lake Vättern, at risk from a proposed rare earth elements (REE) mine. (Carina Gustafsson)

Country Site
Sweden

Multinational / headquarters
Leading Edge Materials, Canada

Metal / Phase
Rare earth elements (Dysprosium, Terbium, Neodymium, Praseodymium), Planning

Main industry
Electric Vehicles, Wind, Solar PV

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
UN Guiding Principles on Business and Human Rights, OECD Guidelines, International Finance Corporation Performance Standards

Located in south-central Sweden by Lake Vättern, the development of the Norra Kärr mine has been disputed for over a decade. Through its Canadian subsidiary Tasman Metals, Leading Edge Materials claims that the mine is one of the world's largest deposits for rare earth elements (REE) and capable of sustaining Europe's demand for REE for more than 20 years. Opposition lawyers, organisations and nearby communities however assert that the mine would be unable to comply with environmental regulations due to the irreversible damage that it may cause to local water systems, well beyond these 20 years.[137] Experts claim that inevitable leakage of sulphuric acid, and other chemicals and toxic byproducts, from its waste ponds and industrial area would not only severely harm the 500,000 people that depend on Lake Vättern's freshwater supply but also harm 'Natura 2000' areas, unique biodiversity zones protected by EU law.[138] 14 NGOs and local residents continue to oppose the plan, and while environmental organisations have been able to put a temporary hold on its development, Leading Edge Materials' exploration permit for the mine runs until August 2025 and remains valid according to Swedish law.[139] The company would also need an operational permit and an environmental permit before mining could start. Leading Edge Materials is committed to three internationally recognised ESG and CSR standards.

People, and reindeer, protest against the Nussir copper mine (Natur og Ungdom)

Country Site
Norway

Multinational / headquarters
Nussir ASA, Norway

Metal / Phase
Copper, Planning/mining

Main industry
Electric Vehicles, Wind, Solar PV, Electronics

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
UN Guiding Principles on Business and Human Rights, OECD Guidelines, International Finance Corporation Performance Standards

At the beginning of 2021, Nussir ASA obtained full permits for a copper mine to begin construction work on what has been deemed "one of the most environmentally damaging industrial projects in Norwegian history".[140] The copper mine is located in the Repparfjord, one of Norway's pristine north-coast Arctic fjords between the Barents and Norwegian seas. Despite an alluring zero-emissions mining plan, the project is expected to dump over two million tonnes of toxic mining waste and tailings into the Repparfjord per year for the next 15 years - that's 200 tonnes of toxic waste per hour - including chromium, nickel and copper.[141,142] The process is expected to severely contaminate regional ocean-floor biodiversity as well as spawning grounds for local salmon populations, for which the fjord is nationally recognized. Reppardfjord is also home to Norwegian and Indigenous Sámi fisher and reindeer herding populations, with local residents concerned about the negative impacts on fisheries, local food systems, and the associated socio-environmental costs. The Sámi parliament has continuously opposed the project and is appealing the mining license, stating that the Norwegian government's approval of the project is a direct threat to their livelihood and interests.[143] The head of the company estimates that they will be ready to produce copper by 2023. Nussir ASA is committed to three internationally recognised ESG and CSR standards.

Left: Workers at the Porco Mine, Bolivia (Christian Lombardi)

Country Site
Bolivia

Multinational / headquarters
Glencore, Switzerland

Metal / Phase
Zinc-lead-silver, Mining

Main industry
Construction, electronics, Wind, Solar PV

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
Voluntary Principles Initiative, International Council on Mining and Metals, UN Global Compact, International Finance Corporation Performance Standards, UN Guiding Principles on Business and Human Rights, OECD Guidelines

Via its 100% owned subsidiary, Sociedad Minera Illapa S.A., Glencore has been accused of fatal accidents, underage workers and environmental destruction in its Bolivian highland Porco mine.[144] Local doctors claim that the mine is the cause of an average of 20 deaths per year, with fluctuations in commodity prices influencing levels of production and therefore accidents. Residents of nearby villages also claim that some villages are uninhabitable thanks to contaminated rivers and poor crop yield due to acid mine drainage. Zinc traces in drinking water supplies are up to six times higher than legally permitted levels in Bolivia and Switzerland, and above-legal traces of other metals and minerals including iron and manganese have also been recorded.[145] Local cooperatives who work the mines when mechanical mining is no longer profitable still sell most of their ore to Glencore's subsidiary, yet the company claims it cannot be held accountable to the miners since it has completed its operations.[146] The human and environmental violations associated with the Porco mine are an example of the numerous negative externalities associated with improper mine closure and decommissioning. Glencore is committed to six internationally recognised ESG and CSR standards.

Country Site
Chile

Multinational / headquarters
Boliden AB, Sweden

Metal / Phase
Smelter Waste

Main industry
N/A

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
International Finance Corporation Performance Standards, UN Guiding Principles on Business and Human Rights, OECD Guidelines

Between 1984 and 1985, the Swedish mining and smelting giant Boliden dumped 20,000 tonnes of toxic smelter sludge in Chile, from its copper smelting plant in Rönnskär, Sweden. The toxic waste was imported by Chilean company Promel, now bankrupt, with the aim of extracting arsenic, silver and gold ore from the waste, but the contents were instead stored in a site in the arid Arica region in northern Chile.[147] The importation occurred a few years before the Basel Convention came into force. Over time neighbourhoods were built around the site: the inhabitants were not aware of the site's toxic contents, and around 12,000 locals suffered from high rates of cancer, infertility, and chronic coughing. The impacts were particularly damaging for children. In 1998, a significant amount of waste was transported by truck to a location slightly further from the inhabited areas, but the original site was still contaminated. It was not until 2013 that the Chilean government relocated some of the residents away from the original site.[148] In that same year, over 700 Chileans filed a claim against Boliden in a Swedish court, but by 2018, the Swedish court ruled in favour of Boliden.[149] In 2019, the European Parliament Committee on Human Rights reported the Arica case as one of 13 cases where European companies acted irresponsibly in relation to communities in the Global South.[150] Following the court's decision, lawyers are now pursuing the issue with the Swedish government, referring to its responsibility under international law to remove Boliden's toxic waste from Arica, though the Swedish government shifts the blame to Chile. The case has now been taken to the UN Human Rights Council. A May 2021 report by the UN Special Rapporteur on toxics and human rights argues that the waste should be returned to Sweden, or alternatively taken care of in Chile, and that those affected should be recompensed for the damages.[151] Boliden AB is committed to three internationally recognised ESG and CSR standards.

Country Site
Portugal

Multinational / headquarters
Savannah Resources, United Kingdom

Metal / Phase
Lithium, Planning

Main industry
Electronics, Electric Vehicles, ICTs

Environmental, Social, and Corporate Governance (ESG), or Corporate Social Responsibility (CSR) commitments
International Finance Corporation Performance Standards, UN Guiding Principles on Business and Human Rights, OECD Guidelines

Savannah Resources, based in London, is proposing the Mina do Barroso Lithium Project in the Barroso region of northern Portugal. The project is facing considerable community resistance. The mine would be located about 400m from the Covas do Barroso community in the municipality of Boticas, where agricultural and low-impact communities collectively own and work the land. This region is also one of only seven places in Europe recognised as having 'globally important agricultural heritage' by the UN.[152] Despite only being projected to provide about 5-6% of total EU lithium demand, the project has received strong support from the Portuguese state. Savannah Resources promotes its mining as 'green', as lithium is used for green transition technologies. Local communities largely oppose the project over fears about the impact the mining will have on their livelihoods, as well as on the ecotourism and gastronomy sectors of the region. The mayor of Boticas, along with the majority of the local population, views the project as inherently unsustainable due to its use of water, pollution, impact on the local environment and as a direct threat to their ways of life. In May 2021, a formal communication was submitted to the Aarhus Convention Compliance Committee over lack of transparency and claims of deliberate denial of access to information.[153] The project underwent an Environmental Impact Assessment in mid 2021. However, locals claim that the EIA contains weaknesses and failings that could result in negative ruling by the Portuguese Environmental Agency. A recent report estimates that the project would generate 83,792 million tonnes of mine waste, including 14 million tonnes of mine tailing[154]. Savannah Resources is committed to three internationally recognised ESG and CSR standards.

Local people protest the Barroso Lithium mine, Portugal, August 2021 (Unidos Em Defesa de Covas do Barroso and João Veloso)

Chapter 4

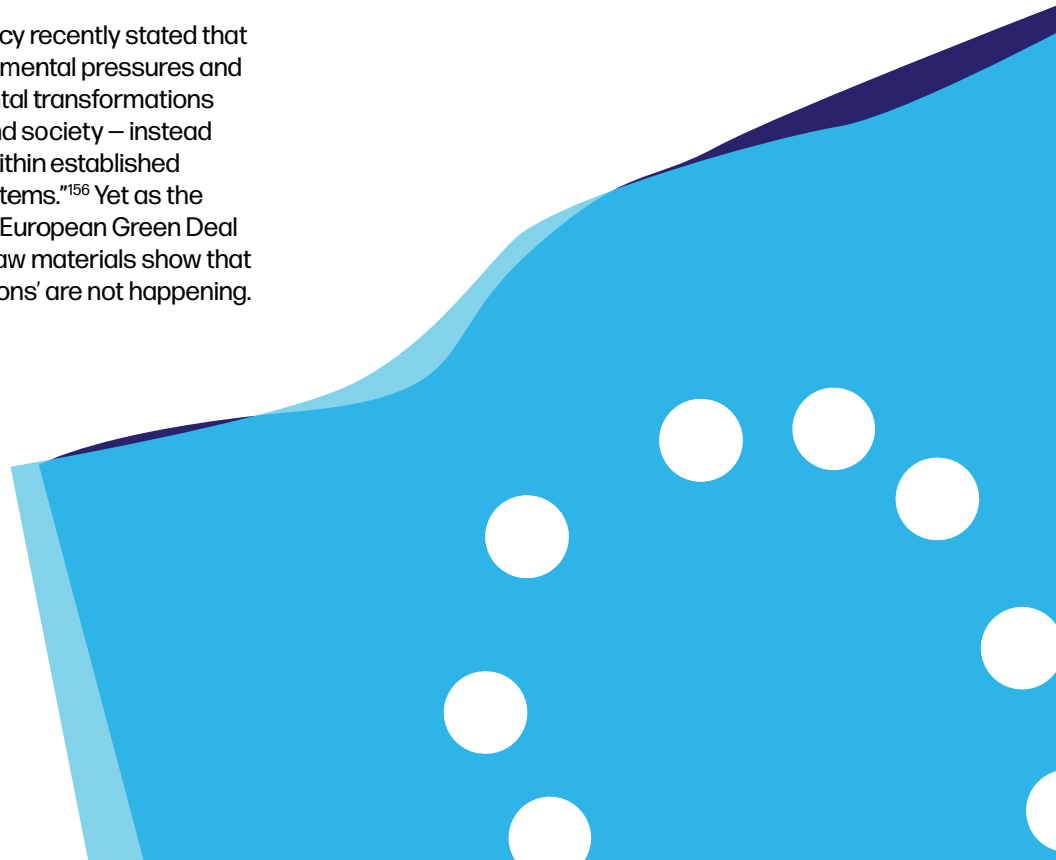
EU Policy Framework - the European Green Deal and beyond

At the end of 2019, the European Commission published its European Green Deal, an action plan outlining climate and environmental policies and initiatives that are being rolled out over the coming years. It is one of the central projects of the 2019-2024 European Commission.

Although it represents a step forward in that environmental issues are being given a high priority, unlike previously, it is still described as a "new growth strategy" for the EU, as the Commission puts it.[155] This implies acceptance of the damaging and illogical idea that we can create economic growth, while (over) consuming in similar patterns, and be 'green' at the same time. In other words, simply replacing an industrial civilization built upon fossil fuels with a green version of the same model. There is a lack of critical analysis and action on EU overconsumption levels, as well as its globally unjust distribution and production relations.

Metals and minerals have moved into the political spotlight because of their importance for the twin green and digital transitions – both key parts of the European Green Deal, and of geopolitical developments. However, because they are also based on the 'green growth' agenda, with consumption predicted to keep increasing (slower than in the past, but as shown in Chapter 1, EU consumption is already around double sustainable and just levels), this will lead to a dramatic increase in demand for, and mining of, certain metals and minerals.

The European Environment Agency recently stated that an "absolute reduction of environmental pressures and impacts would require fundamental transformations to a different type of economy and society – instead of incremental efficiency gains within established production and consumption systems."[156] Yet as the following pages outline, the main European Green Deal and other EU policies related to raw materials show that these 'fundamental transformations' are not happening.



Circular Economy Action Plan

Published in March 2020, the Circular Economy Action Plan is a package of 35 initiatives being taken forward on how we produce, consume and dispose of resources and products.

A circular economy should first and foremost have the overall aim of ensuring that resource consumption remains within planetary limits. However, the EU's action plan contains no such overarching goal. It does mention that the EU needs to "advance towards keeping its resource consumption within planetary boundaries" but there are no details of how this will be achieved.

Most measures in the action plan relate to better product design, recycling and waste management. While these are all important, we know from previous initiatives in this area that they have not led to sufficiently large reductions in material footprint or overall environmental impacts from consumption. The European Environment Agency recently stated that the circular economy "may not deliver the transformation to sustainability if circularity measures fuel a growth strategy that leads to increased material consumption."[157]

The material footprint, meanwhile, was only mentioned as a potential indicator in the monitoring framework - to be confirmed at the end of 2021.

Key Circular Economy Action Plan initiatives concerning raw materials:

Energy Performance of Buildings Directive and Strategy for a Sustainable Built Environment	The Energy Performance of Buildings Directive is not directly linked to the Circular Economy Action Plan, as it has so far focused exclusively on energy use of buildings, neglecting other important environmental impacts and the use of materials and metals in the construction sector. The Strategy for a Sustainable Built Environment will aim to ensure coherence and circularity principles across policy areas such as climate, energy and resource efficiency, management of construction and demolition waste, accessibility, digitalisation and skills.
Sustainable Products Policy Initiative (which will include a revision of the EU Ecodesign Directive)	Due at the end of 2021 or early 2022, the aim of the Sustainable Products Policy Initiative is to promote a more sustainable use of resources through better product design, durability and recycling, and to strengthen the rights of consumers. It will include a digital product passport, and tackle planned obsolescence. The 2018 Ecodesign Directive has requirements for more environmentally friendly product design for energy products. However, although it has started to deliver more systematically on material efficiency through repair and recycling provisions, the potential to save more radically on resource use through life time extension is yet to be unleashed.
Right to Repair:	Legislative and non-legislative measures establishing a new 'right to repair' will be developed in 2021. The plan will specifically target electronics as a priority sector, including a 'right to update obsolete software'. Further regulatory measures will improve durability and ensure commonality of products such as chargers.[158]
EU Batteries Regulation	The December 2020 proposal for a regulation on batteries and waste batteries, to replace the 2006 Battery Directive from 2006, is likely to be adopted in 2022. The proposal includes regulations for a second life for industrial batteries, collection, recycling and recovery targets for batteries and specific battery materials, a carbon footprint of industrial and mobility batteries, use of recycled materials, extended producer responsibility, design of portable batteries as well as due diligence along the supply chain. Overall, the draft regulation is relatively ambitious in some places, and a general step in the right direction. However, it is still part of an overall battery growth agenda, and batteries for military and aerospace applications are excluded from its scope.
Waste Shipment Regulation	The update of this regulation will restrict exports of waste outside the EU and incentivise more recycling within EU borders.

EU Energy Efficiency Directive

The July 2021 EU Energy Efficiency Directive proposal[159] enshrines the Energy Efficiency First Principle, which means that before any other energy measure is put into place (e.g. new solar panels), energy savings should be prioritised to minimise overall consumption. It also proposes binding EU targets, of reducing primary energy consumption by 36% and final energy consumption by 39% by 2030, compared to 2007 levels.

However, it is unclear how it will be ensured that Member States will set ambitious targets and enforce them. The EU target must also be more ambitious.

EU Sustainable and Smart Mobility Strategy

The EU Mobility Strategy aims to shape common transport solutions to be "sustainable, smart, and resilient"[162]. The material intensity of the strategy, however, sheds doubt on these sustainability claims. Increasing mobility rates overall are not questioned; instead, existing structures are to be replaced by new, ostensibly greener' alternatives. For example, it includes the goal that by 2030 at least 30 million electric cars are to be driven on EU roads, but offers no broader agenda of reducing private car use. Simply replacing fossil fuel cars with electric cars is not a solution: to put the strategy's levels of material intensity into perspective, there is as much cobalt in a single electric vehicle battery as there is in 1000 iPhones.[163]

The strategy, furthermore, makes no distinction between battery-powered buses and other mass transport systems, such as trams or trolley buses: both are electric but trolley buses offer the advantage of providing a cheaper alternative with a much lower environmental footprint and material demand, as they do not require batteries. Some of the positive components of the strategy, on the other hand, include commitments to increase the number of passengers travelling by rail, and to developing additional cycling infrastructure over the next ten years.

EU Raw Materials Initiative and Critical Raw Materials Action Plan

In 2008, the EU Raw Materials Initiative (RMI) was adopted, with the overarching aim of "securing reliable and unhindered access to raw materials".[160] Its three pillars are:

- 'Fair and sustainable' supply of raw materials from global markets, with the removal of 'barriers to trade' and 'barriers to access';
- Sustainable supply of raw materials within the EU, promoting raw material extraction;
- Resource efficiency and the supply of secondary raw materials through recycling.

As part of the RMI, a list of Critical Raw Materials (CRMs) – those that are of high importance to the EU economy and of high risk associated with their supply – was first developed in 2011, and has been updated every three years since. Currently, the list has 30 raw materials on it (up from 14 in 2011), including lithium, cobalt and rare earth elements.

In 2020, the list was published along with a Critical Raw Materials Action Plan, which defines four targets and ten actions, including to:

- Develop resilient supply chains for the EU's industrial ecosystems by identifying sustainable financial criteria for mining and extractive industries through the EU Taxonomy;
- Reduce import dependency through circular value addition, including mapping of the potential supply of secondary CRM from stocks and waste;
- Strengthen domestic extraction of CRMs by identifying mining and processing projects and investment needs;
- Diversify extraction in third countries and avoid distortion through international trade by developing strategic partnerships with resource-rich third countries including Canada, interested African and Latin American countries, and EU neighbouring countries. The European Commission announced Canada and Ukraine as the first strategic partnerships on raw materials in summer 2021.

It is striking that the action plan includes no actions geared towards drastically limiting the increase in CRMs required, or designing for the reuse of components containing those CRMs. In response to its launch, more than 230 civil society organisations and academics sent a critical Open Letter to the Commission, highlighting the action plan's omissions and recommending improvements.[161]

EU Taxonomy Regulation

The European Commission is developing a classification system that will define a uniform understanding of sustainability in economic activities. The Taxonomy is to include a list of economic activities and investments that contribute to a protected environment and sustainable social developments.

However, so far the Taxonomy Regulation defines environmental targets in a very vague manner. They are currently being fleshed out on the basis of technical criteria, with the first part of the Taxonomy list (i.e. 'Delegated Act') published in April 2021. It was criticised extensively by European civil society, for example because the criteria for forestry use for bioenergy are in clear contradiction to climate science. What's more, major uncertainties remain over how gas will be considered under the Taxonomy, despite clear calls from the technical expert group that fossil fuels should not qualify under a sustainable finance regime.

The second part of the Taxonomy list is expected at the end of 2021. This will include a section on developing criteria for mining, though the contents are currently unknown. It is imperative that critical raw materials are considered comprehensively in terms of their impacts, and not simply judged 'sustainable' because of their potential role in supporting the green transition.

EU Environmental Impact Assessment Directive

The EU Environmental Impact Assessment (EIA) Directive was updated in 2014. EIAs are crucial mechanisms for assessing ecological harms, and for holding mining and infrastructure projects accountable. The update sought to improve the "quality and the content of the reports", and ensure that "competent authorities will also need to prove their objectivity to avoid conflicts of interest." Ongoing issues with EIAs are explored in Box 6 in Chapter 2, but it should also be noted that carrying out EIAs for open-pit mining where the surface of the site is less than 25 hectares, or for underground mining, is not mandatory under EU law, but up to Member State discretion.

EU Extractive Waste Directive

The Extractive Waste Directive aims to ensure that mining waste is properly managed, to avoid damaging the environment. Of relevance to this report, are the provisions about the cleaning up of old mining sites and the recovering of materials. Member States have identified the most problematic old mining sites and are supposed to rehabilitate them. Unfortunately, though, this rehabilitation is not occurring, as governments prioritise new infrastructure over cleaning up environmentally damaging sites. Regarding mine tailings, the directive has created higher management standards for tailings facilities, but still allows the use of the least costly but most harmful mining waste disposal practices. Upstream dams, for example, report the highest rates of stability risks,[164] but are still allowed under the directive.

EU mandatory human rights and environmental due diligence legislation

The European Commission announced it would propose a new law in 2021 that would implement binding due diligence rules for EU supply chains. It has been promised that it will cover the entire supply chain and all companies regardless of their size, and that Member States will have to ensure companies can be held civilly liable for the damage they cause. Both human rights and environmental due diligence obligations will be integrated. A consultation process in early 2021 saw over 500,000 people and more than 700 civil society groups from Europe respond.[165] It is likely the proposal will be published in the second half of 2021, and enter into force in 2026. There are, additionally, due diligence requirements already proposed in the EU Batteries Regulation, covering cobalt, natural graphite, lithium, and nickel.

EU Conflict Minerals Regulation

The EU Conflict Minerals Regulation entered into force at the beginning of 2021. It aims to limit opportunities for armed groups and security forces to trade in conflict minerals – namely, gold, tin, tantalum and tungsten (3TG) - and includes human rights due diligence obligations for companies in the EU.

There is an annually updated list of Conflict and High Risks Areas, a list of industry initiatives that are considered compliant with the implementation of the OECD Guiding Principles and a 'white list' of companies whose due diligence procedures have been audited. The regulation's scope is limited in many respects: only the upstream sector (from mine to smelter) is covered, while the downstream sector (from mine to finished product or sale) is not, and it applies only to companies that exceed certain thresholds in their import quantities (e.g. for gold, the threshold is 100 kg). Major technology companies are not covered, and so far, less than 1000 companies fall within its scope.

In a recent review of its implementation by Member States, a coalition of European NGOs working on responsible mineral sourcing highlighted the shortcomings of the regulation and the general lack of transparency that hinders effective and efficient monitoring of companies.[166]

EU trade policy and raw materials chapters

As detailed in Chapter 1, the EU is heavily dependent on imports of raw materials. EU trade policy is characterised by large-scale imports of cheap and unprocessed raw materials and large-scale exports of finished goods. This results in the lowest possible tariffs on raw materials imports, while at the same time putting higher tariffs on processed products, to incentivise processing in the EU. This approach restricts the sovereignty of states in the Global South and prevents the expansion of processing in the raw material exporting countries, thereby perpetuating unjust divisions of labour that have roots in colonial history and which strengthen the extractivist development model. A case in point is the EU taking Indonesia to the World Trade Organisation dispute settlement body for putting export restrictions in place on nickel and iron ore. Another is the Chile-EU trade dispute over Chile's capacity to create lithium manufacturing plants.

The EU is pushing a trade and investment agenda that aims to liberalise global trade, with potential partnership discussions being held with almost the entire world. The European Commission published its proposal for a new trade strategy in February 2021. EU trade strategy identifies the intention to include specific commodity chapters, including 'Energy and Raw Materials Chapters' in trade agreements, in order to continue to ensure (cheap) imports of raw materials into the EU.

Raw materials chapters can be found in, for example, the EU-MERCOSUR and EU-Mexico agreements. They are also to become part of the agreements currently being negotiated with Chile, Indonesia, Australia, New Zealand and Tunisia. The EU primarily seeks to ensure market access for European investors, and prevent export duties and further processing in the country where the raw materials are extracted. In some cases, sustainability requirements are also stipulated, but they are formulated very vaguely and are not binding, nor even included in some agreements. The rights of Indigenous Peoples and the protection of the environment are neglected in trade agreements, whilst investors are given the means to exert pressure against states through special legal mechanisms. European mining companies can sue states over the regulation of the mining sector and thus secure their profits. As noted in Chapter 2, this has often been used by mining companies in the past, with the effect of preventing state regulation of the mining industry because of the risk of being sued through Investor State Dispute Settlement (ISDS) mechanisms.

Chapter 5

EU Policy Recommendations

Summary of key recommendations

Set targets and plans to reduce absolute resource consumption including a binding EU material footprint reduction target of 65% by 2050

Resource democracy where resources are treated as common, public goods

Post-growth policies to shrink sectors of economic activity that are ecologically destructive and offer little or no social benefit, and maintain or grow those that satisfy the basic needs and wellbeing of all

A circular society including designing long-lasting infrastructure and products embodying 'sufficiency and efficiency' principles

Holding industry to account including through mandatory EU due diligence legislation and granting communities a genuine Right to Say No to mining projects

Stopping destructive environmental impacts including that Natura 2000 and other protected areas should be strictly protected as 'no go areas' for extractive industries

Ending economic and resource exploitation including binding just trade and investment rules

EU policies, considered by many as ambitious, have thus far proven to be insufficient in responding to the climate crisis, ecological degradation, human rights violations and social inequalities. As they are today, plans under the European Green Deal and other EU policies, as presented in Chapter 4, will lead to a continued increase in the demand for materials and a large number of damaging new mining projects – both inside and outside the EU. This can and must be avoided.

At the root of this destruction is the continued dominance of the growth-based economic system – the inability to think of and implement economic policy outside of the growth paradigm, and the resulting constant push for more production and consumption. As long as this system remains dominant, **incremental tweaks alone will not create the major transformations and shifts needed**. Policies built around the false narrative of 'green mining' are an attempt at greenwashing which will do little to fix the root problems.

Resistance to the current system is mounting – mining-affected communities and diverse organisations across Europe and globally oppose the continuous expansion of the mining industry, and challenge the dominant narrative of unlimited growth and the policies which uphold it.[167]

In order to stay within a safe operating space for the planet, the EU has to set limits on its resource use – to actively downsize the production and consumption. **Resource reduction must be an immediate focus, not an afterthought that follows decarbonisation and greater efficiency**. Decarbonisation and dematerialisation are intrinsically linked, and actions to reduce consumption, to be more circular and to decarbonise must all happen in parallel.

This means moving to a post-growth, wellbeing, circular society – shrinking the 'bad' sectors and growing the 'good', and implementing true resource democracy, whereby resources are seen as common, public goods and distributed evenly, including for the benefit of future generations.

The EU must recognise, protect and ensure the role of communities and Indigenous Peoples both in the EU and outside it, particularly with respect to countries and regions it has colonised and (continues to) exploit for resources. This means **a true Right to Say No to mining**, holding industry to account for human rights and environmental harms through strong due diligence legislation, and an overhaul in trade and investment rules. There must be binding common standards for all mining operations, and 'no go areas' for mining brought in. These should start with Natura2000 areas in the EU and other recognised protected areas within and outside of Europe.

A cultural shift to build better societies is also needed. The philosophy of continuous growth and expansion has become entrenched in Western societies, but study after study shows that above a threshold the vast majority of Europeans have already reached, material wealth does not lead to a corresponding increase in happiness, wellbeing or health.[168] Other studies have illustrated how more wellbeing and decent work can be created for more people by ending the growth addiction.[169] **Societal values should be firmly rooted in a deep commitment to a fair share of consumption of resources and to the fundamental belief that humans are of intrinsically equal value**. Societal values that we believe are foundational are sufficiency, care and empathy, together with equality, inclusiveness and autonomy.

Set targets and plans to reduce absolute resource consumption

Sustainable and just binding EU and national level targets must be set to achieve absolute resource reduction and reduction in associated impacts, including:

- **Material footprint reduction target:** Climate policies are driven by emissions reductions targets, yet circular economy policies still lack material reduction targets. The evidence (as outlined in Chapter 1) shows that **the EU must reduce its material footprint* by 65% (to five tonnes per capita) by 2050**, from current (2018) consumption levels. Likely mid-term targets could therefore include 30% reduction by 2030 and 50% by 2040.

  The material reduction targets should be broken down into specific targets for individual material groups, to facilitate better management of those materials for which a reduction in consumption is the most urgent. For example, a higher reduction target could be implemented for material resources whose extraction and use exert the highest environmental pressure. This would ensure the target not only contributes to quantity reduction, but also to impact reduction of resource use on the environment. It is likely that **the use of some materials, such as critical raw materials, will increase in the short-term due to their necessity in green transition technologies, but even for these, it would be sensible to put limits in place, as well as a trajectory towards eventual reduction and stabilisation.**

  Building on the precedents set by energy and climate policy, material reduction targets could also be cascaded down in a more systematic way, for example, according to societal needs (housing, nutrition, mobility, leisure etc.) or at microlevel, according to product groups and services. The targets should be streamlined across all relevant EU policies, and Member States should set relevant targets to meet their fair share, accounting for their starting levels.

*Material footprint as measured by Eurostat includes fossil fuels, biomass, metals and non-metallic minerals.

The EU Consumption Footprint and EU Consumer Footprint indicators, which aim to quantify environmental impacts of consumption using Life Cycle Analysis tools, can provide guidance in setting sub-material and sub-sectoral targets, as they present a more detailed picture of the relationship between consumption and environmental impacts. They can also provide a baseline scenario on which the effects of specific policies can be tested.

The European Commission urgently needs to start this work on setting material footprint reduction targets. The European Parliament has demanded that a target be set in three separate opinion reports in 2021 alone.[170] Meanwhile, Member States such as the Netherlands[171] and Finland[172] are already setting their own targets. It is not enough for the EU material footprint to simply be monitored as part of the 2020 Circular Economy Action Plan monitoring framework: it must become the central point driving the circular economy and environmental policies. Beyond that, these must have material reduction at their core. **The mid-term assessment of the current Circular Economy Action Plan, due no later than 2022, is the opportunity for a proper debate on setting such targets**. This should include setting up a specific multi-stakeholder working group.

- **Energy consumption reduction:** To achieve less mining-and-material-intensive infrastructures for energy production and consumption, absolute energy demand first needs to be reduced. The green transition will require an increase in the production of certain critical raw materials in the short-term, such as lithium, but to prevent the massive increases currently predicted, overall energy demand needs to be reduced drastically.

  The July 2021 EU Energy Efficiency Directive proposal[173] enshrines the Energy Efficiency First Principle, which means that before any other energy measure is put into place (e.g. new solar panels), energy savings should be prioritised to minimise overall consumption. It also proposes binding EU targets, of reducing primary energy consumption by 36% and final

energy consumption by 39% by 2030, compared to 2007 levels. These are positive steps forward. However, more concrete plans are needed about how the Energy Efficiency First Principle would apply in practice. The targets also remain too low to keep rising global temperatures below 1.5°C, or to slow down rapidly growing material demand for renewable energies and infrastructure. They need to be increased to a **45% final energy consumption reduction by 2030**, and Member States must set their own targets equal to or above that, and enforce them. Neither 'energy savings' nor 'energy intensity' can be permitted to replace the requirement to achieve an absolute energy consumption reduction.

- **Land and water footprints reduction targets:** Resource consumption goes beyond materials and energy. **The EU's total consumption (or 'footprint') of land and water must also be accounted for, to give a holistic picture of the EU's consumption of all natural resources** and to avoid one-dimensional solutions or problem shifting. Material footprint and energy consumption reduction targets must be accompanied by the measuring of land and water footprints, with the view to setting reduction targets for them in the future. This dashboard approach is similar to the one applied in the Roadmap to a Resource Efficient Europe or in the Resource Efficiency Scoreboard. It is vital for the EU to accurately measure its consumption of these critical resources on a global scale, in order to account for its responsibility for land and water consumption pressures, as well as extraction and use impacts, that are caused outside its borders.

Reducing imports: The EU imports 20% of its materials (including for energy) and 46% of all metal ores; this increases to over 80% for most metals necessary for the green transition and digital technologies. The proportion of materials and metal ores that Europe imports needs to be reduced, as **we cannot simply outsource the pollution and destruction** that comes from our demand for them. However, **this must happen in line with an absolute reduction in all material consumption, as detailed above, to ensure that extraction does not greatly increase in the EU either**, impacting communities and nature.

Redistribution of resources: Any approach towards resource reduction must distribute the burden of reduction fairly, to address the undemocratic and unequal ways that products, infrastructure and services are produced and accessed. All of the policy recommendations stated here would contribute towards this.

EU leading international action on resource reduction: As initially promised in March 2020, the European Commission should initiate discussions on an international agreement on the management of natural resources, including **defining a 'safe operating space' and a planetary resource budget**.[174] This should be added as a key goal to the already-established Global Alliance on Circular Economy and Resource Efficiency, which the EU launched at the UN Environment Assembly in February 2021.[175]

Resource democracy

Transformation is required not just in the quantities consumed, harms caused, and distribution of resources, but also in who is in control of natural resources and related systems, like the energy system:

- **Resources as common, public goods:** Rather than treating, regulating and making policy about minerals and metals as if they were simply sources of capital to be extracted, commodified and sold, they should be common, public goods. **The management of natural resources should be returned to regional and local and/or customary governance structures with people and cooperatives at their heart**.

- **Small-scale mining and energy production and distribution:** EU legislation around raw material extraction generally focuses on large-scale mining. Resource extraction, and energy production and distribution, should move from the hands of big mining and energy monopolies to small-scale modern mining* that has communities and cooperatives at its core.

*As opposed to current Artisanal Mining

- **Resource democracy outside of the EU:** EU legislation should favour principles of autonomous and democratic resource extraction and energy systems abroad, as well. The EU should promote local or regional trade by favouring small and medium enterprises within foreign local markets. This would also imply a **demilitarisation of regions where resource extraction is linked to a European military presence**.

Post-growth policies in action

Resource use reduction requires a massive transformation in systems of production and consumption – how much, and how, we produce and consume. A transformation away from the endless growth model. In practice, this means implementing socially and ecologically just wellbeing and post-growth policies. **These are about reducing the material and energy throughput of the economy, whilst distributing wealth more fairly and fostering a reciprocal healthy relationship with the environment**.

Post-growth policies and plans that prioritise resources going to socially and ecologically desirable ends must be developed at all levels. Inspiration can also be obtained from non-Western thinking, for example, from existing approaches like Buen Vivir and Ecological Swaraj. Post-growth in action includes:

- **Shrinking the bad, growing the good:** Shrinking sectors of economic activity that are ecologically destructive and offer little or any social benefit - such as the military sector,[176] aerospace, fast fashion, single-use packaging, or a completely digitalised future. Maintaining or growing sectors that satisfy the basic needs and wellbeing of all - such as renovation of buildings, renewable energies, reusable packaging, cycling infrastructure, participatory activities like community theatrical productions, low-impact recreational activities, and community gardening and agro-ecological food networks.

- **From ownership to usership:** Sharing household items, tools, cars and building space, 'product as a service' business models, and more, **can cut resource demand massively, make many products and services more accessible and affordable to all, and help build greater community connections**. Legislation and policy initiatives to establish neighborhood workshops, tool libraries or urban mining initiatives[177] could offer opportunities for people to repair, borrow and lease items. The concept of usership can even be implemented in housing and the built environment, where the occupancy of housing is adjusted to the needs of people to optimise the use of space.[178]

- **Embrace working time reduction:** Reduced working time of employed people (without lowering salaries) and work sharing, if implemented under the right conditions and in a wider bundle of reforms, has many potential advantages.[179] It can reduce environmental pressures by reducing material output through less production. **Productivity gains could be rechanneled into time for leisure, care work, democracy and community activities instead of profit accumulation**.[180] An analysis of 29 high-income OECD countries, found that a **1% decrease in working hours can lower energy, environmental and carbon footprints by around 1.2%**.[181] Another study linked a 1% decrease in working hours to a 0.7 to 1.5% decrease in greenhouse gas emissions.

- **Truly sustainable mobility - reducing car dependency:** The plan to simply replace private fossil fuel-based cars with private electric cars, one for one - thereby driving up demand for, and mining of, certain metals - is not a viable solution to the climate and environmental crises. **Increasing mobility overall needs to be questioned** - for example, in the EU's Smart and Sustainable Mobility Strategy, there are commitments to increasing rail travel, but no mention of decreasing air travel in turn. Yet, it can be shown that **if five fossil-fuel cars were replaced by just one electric car, the EU would only need half as much lithium and cobalt as is currently projected**.[182] The EU, national governments and municipalities can **create less private car dependency** by, for example: increasing public transport in cities (prioritising trolley buses and trams over battery

powered buses where applicable)[183] and in rural areas (including reviving old rail infrastructure); building safe cycling infrastructure; promoting walking; improving car and ride-sharing; banning car use in city centres; and, greatly restricting (and in places banning) resource-intensive SUVs.

- **Strictly regulating advertising:** The advertising industry - both online and offline - plays a massive role in creating artificial needs that continue to drive overconsumption, but do not lead to greater wellbeing. In Europe, it has been shown that the higher a country's advertisement expenditure in a given year, the less satisfied its citizens were a year or two later.[184] Online advertisements are responsible for about a quarter of our data consumption when we browse the internet;[185] this leads to significant environmental impacts, and most people would be happier without them. Some efforts have been made to regulate the advertising industry, at various levels. Paris, for example, has reduced outdoor advertisements and banned them from the vicinity of schools, while numerous campaigns already exist in Europe and North America calling for a ban of fossil fuel advertising.[186] New EU policies tackling advertising can be inspired by already existing ones, such as the Tobacco Advertising Directive. The regulation of car and many digital consumer device advertisements should be a key priority with respect to reducing consumption of metals for the green and digital transitions. Policies could also **create 'sanctuary spaces', limit the size and average density of advertisements, and ban days that promote consumerism frenzies, like Black Friday.**[187]

Towards a circular society

- **Buildings that are based on 'sufficiency and efficiency' principles: An overarching EU Sustainable Buildings Regulation should be developed,** to make consistent the requirements in various existing instruments, such as the Energy Performance of Buildings Directive, the Energy Efficiency Directive and the Construction Product Regulation. It should:
  - **Put renovation first:** a mandatory commitment to renovate more than 34 million homes every year in the EU, focusing on one-step deep renovations, in order to achieve a zero-energy building stock.
  - Expand the scope of carbon requirements to **include embodied carbon emissions and other resource footprints, in particular the material footprint, for construction materials and buildings**. Notably, by taking the opportunity of the revision of the Construction Products Regulation.
  - **Ensure binding circularity rules along the value chain**, including requirements on the lifetime of buildings and products, their use, reuse, and recycling.[188]
  - Prioritise a circular approach in both buildings and urban planning at the policy level, in order to leverage existing resources in the built environment. For instance, **reusing empty buildings** for social purposes could respond to the needs of society, reducing energy consumption and carbon emissions.
- **A sustainable built environment:** In addition to sustainable buildings, all potential new infrastructure and urban plans should be approached first with the mindset of 'shrinking the bad, growing the good', as detailed above. If new infrastructures, such as wind turbines, are deemed relevant, then **renovating or repurposing should come first, if possible, followed by new designs that are energy and materially efficient, long-lasting, repairable or upgradable. They must also be recyclable at the end of life**. Wind turbines, for example, could be made more circular by banning the landfill or incineration of their blades. An EU Strategy for a Sustainable Built Environment is planned for 2021, and should enhance the coherence and mutual reinforcement of the various initiatives targeting the built environment.
- **Make sustainable products the norm:** The EU sustainable products policy initiative - revising the Ecodesign Directive and proposing additional legislative measures to make products more durable, reusable, repairable, recyclable, and energy-efficient - should implement transformative changes to all products and services on the EU market,

including by:

- Broadening the scope of the Ecodesign Directive beyond energy products.
- Implementing **binding horizontal requirements for all products**, including on the substitution of hazardous substances, restrictions on disposable or single-use applications and planned obsolescence, minimum extended producer responsibility, a ban on the destruction of unsold goods, and extending the warranty for purchased goods to a minimum expected technical lifespan of a product (which for household appliances and mobile phones should be much longer than the current warranty period of two years).
- Implementing **binding vertical requirements for prioritised high impact product groups including electronics, batteries, and steel**, on minimum performance in areas such as resource efficiency and toxicity.
- Introducing **product passports** i.e. 'no data, no market', and ensuring transparency through the value chains of products on their environmental and social sustainability performance.
- Ensuring **mandatory sustainable procurement** by both public and corporate procurers.

- **Give people the Right to Repair:** Policy makers should enable businesses, citizens, civil society and other stakeholders to become active nodes in the digital transition. This means using legislation to give them the right to repair the products they own, including **legislation for repairable/disassemblable/modular design, removing proprietary barriers to reuse and refurbishing, and open access to spare parts and repair information**. Right to repair legislation should also be brought into the EU Digital Services Act. The EU can take inspiration from the French Repairability Index, which came into force in early 2021 and aims to achieve a 60% repair rate of electrical and electronic products within five years.[189]
- **Increase metal and mineral recycling:** Recycling is not a silver bullet with which to address the root of the problem of overconsumption, rather, it helps to manage the consequences. However, recycling still plays an important role. There is great potential for collection, recovering and recycling of metals in the EU through: a) **urban mining** i.e. processing of new domestic and industrial waste, for example, old electronics; b) **recovering metals from mining waste**; and, c) **landfill mining** i.e. recovering metals from current landfills for recycling. These must all be done to the highest environmental and labour standards. The mining of landfills and waste, and the development of recycling centres, should only happen with fully informed community consent. There also need to be **more ambitious metal collection and recycling targets**, and the EU Batteries Regulation can be an important driver for increasing the recycling of certain metals. The targets initially proposed by the European Commission can be increased, including to 95% for cobalt, nickel and copper in 2025 and 98% in 2030, and to 70% in 2025 and 90% in 2030 for lithium.[190] **Binding recycled content targets must also be set**, to create demand for secondary raw materials, and a ban on exporting all EU waste is also needed.

Holding industry to account: respecting human rights and the environment

The planned **mandatory EU human rights and environmental due diligence legislation** must prioritise preventing human rights, climate and environmental harms in global supply chains and giving access to justice and remedy for victims and affected people. This includes no longer using the outdated notions of 'social acceptance' or 'Social License to Operate' of a mining project, and giving communities a real Right to Say No.

The due diligence legislation must:[191]

- **Be cross-sectoral and include full value chains:** It must cover all businesses and financial investors, and oblige companies to respect human rights and the environment across their global value chains and

in business relationships, including with suppliers, licensees, contractors, clients, advisers and any other non-state or state entity linked to those businesses' operations.

- **Make companies liable for bad practices at home and abroad:** Companies must be liable for their failure to do due diligence. Separately, civil liability must be imposed for harms caused or contributed to by EU companies and their subsidiaries, and in their global value chains. **Companies shall not be able to escape liability** by arguing that they have respected due diligence obligations or through the introduction of other types of 'safe harbours'.

- **Make it easy for all victims of corporate abuse to seek justice in EU courts:** Require companies to disclose any relevant evidence within their control, particularly regarding their connection to the harm and their due diligence process. **Ensure victims have enough time to bring civil claims for damages before EU courts**, whereby governments must provide (financial) support to victims to facilitate access to justice.

- **Not rely on grievance mechanisms:** Grievance mechanisms should not be the focus of remedies in legislation on corporate accountability. The focus should be on providing access to judicial remedy i.e. access to the courts for victims.

- **Ensure true consent and a real Right to Say No to mining:** Free, Prior and Informed Consent (FPIC) of Indigenous Peoples - as enshrined in International Labour Organisation Convention 169[192] and the UN Declaration on the Rights of Indigenous Peoples - and the same principle for all (potentially) affected communities, must be made mandatory prior to any new mining project or installation by a company.[193] This includes **the right to be previously informed about the risks related to the activity before the company installs itself, the right to be protected from any pressure or harassment and to be able to freely express concerns and demands about a project or company, and the Right to Say No**. FPIC decision-making processes should be **independently governed** by authorities that do not have vested interests in the concerned projects, and should not be the kind of box-ticking exercise that so often violates cultural norms, provides inadequate information and serves as a marketing platform for the project.

- **Be effective:** Companies must face strong penalties, including criminal liability, if they break the rules.

- **Extend to the Batteries Regulation:** The proposed Batteries Regulation includes due diligence requirements covering cobalt, natural graphite, lithium and nickel. This should be expanded to include copper, iron and aluminium (bauxite), as well as including the above demands.

A Binding Treaty on Transnational Corporations and Human Rights: The EU should advocate for a meaningful Binding Treaty on Transnational Corporations and Human Rights at the UN, to create **binding and enforceable mechanisms that hold transnational corporations to account for corporate crimes and rights violations**.[194] These should translate into liability of companies for domestic or foreign harms committed, with enhanced cooperation to prosecute European companies and their value chain stakeholders.

A more comprehensive EU Conflict Minerals Regulation: Companies across the whole value chain should be included in the scope of the EU Conflict Minerals Regulation to **ensure that EU imports of manufactured goods (e.g. electronic devices, cars, machinery) are free from conflict minerals, rather than the regulation being limited to just the minerals themselves**. There should, furthermore, be much lower thresholds to import volumes and full transparency of the list of companies affected by the regulation. The list of conflict-affected and high-risk countries (CAHRA list) should be abolished, with the measures applying to all high-risk imports no matter where they are from, and all measures should be binding, with no reliance on voluntary industry schemes. These changes should be taken up in the next official review process, which the European Commission will conduct in 2023 (and every three years thereafter). [195]

Stopping destructive environmental impacts

- **Stopping unchecked biodiversity loss from mining:** Natura 2000 and Ramsar sites, conservation areas, Indigenous and community conservation areas (ICCAs), as well as the deep seas and the Arctic, should be strictly protected as **'no go areas' for extractive industries**. The EU must institute these 'no go areas', and define protection measures within policies and strategies such as the Biodiversity Strategy, and in its upcoming review of its Arctic Policy.

- **Strengthening the EU Environmental Impact Assessment Directive:** The EU should identify and close the legal loopholes that allow authorities to grant weak or incomplete EIA permits.[196] The EIA Directive should **integrate and legitimise local knowledge that reflects community value systems and communities' invaluable expertise on local ecosystem dynamics**. Permits and procedures should be strengthened, and adjusted to specific mining projects, with data approved and if possible led by local community governance. Indigenous and local community assessments such as the Major Projects Assessment Standard, developed by the First Nations Major Projects Coalition, could be considered for replication.[197] These procedures should also include better and local-level measurements of effectiveness. Finally, **EIAs for underground mining should be made mandatory** under the EIA Directive, and not left up to Member State discretion.

- **Mandatory IRMA certification for the metal and mineral mining sector through the EU Taxonomy Regulation:** TEU metal and mineral mining companies must adopt the Initiative for Responsible Mining Assurance (IRMA) certification,[198] regardless of the country of operation or industry. The second part of the Taxonomy list - being developed in 2021 - should make this mandatory for all metal and mineral mining projects. Unlike weaker standards (e.g. CERA, UNGP, OECD Guidelines), **IRMA certification happens at the mine site, rather than the company-level, and follows a step-by-step approach as opposed to a pass or fail one**. This breakdown provides better transparency about each activity and prevents companies from making overarching claims about their operations.

- **Remediation of old mining sites:** There are thousands of former mining sites in the EU, most of which have not been properly restored and continue to contaminate and harm communities and their environment. The European Commission can facilitate the remediation of these old mining sites by proceeding with the European Parliament's 2017 Resolution[199] to **develop a European standardised mechanism and shared database to account for mining and metallurgical waste facilities in the EU, and to register the chemical composition** (especially metal concentrations) in this public database. This would enable research institutions and companies to develop and implement better recovery technologies (i.e. tailings revalorisation), enable better involvement of local communities by making them aware of the real hazards, and allow Member States to ensure the ecological rehabilitation of old mining sites. It should also be ensured that Member States use EU Regional Development Funds for old mining site rehabilitation.

- **Higher standards for mine tailings:** The Extractive Waste Directive, and the related Best Available Techniques Reference Document (MWEI BREF), must follow the examples of Chile, Peru and Brazil in **banning the use of upstream tailing dams** due to environmental concerns. Additionally, although used on a much smaller scale in Europe (only in Turkey and Norway), the EU should never allow disposal of mine tailings into the sea or other water bodies.

- **Better controls on toxic mining waste:** The trade and transport of toxic mining waste should be controlled, with **toxic waste treated in the country of origin**. Companies failing to meet international waste legislation by shipping waste to countries with weaker environmental legislation should be subject to strict fines, and ultimately have their business operations - along with the violators in their value chain - banned. The EU needs to ensure that the UN Basel Convention - the international treaty designed to reduce the movements of hazardous waste between nations - is strictly enforced.

Ending economic and resource exploitation

- **Just trade and investment rules:** EU trade and investment agreements must contain binding and enforceable obligations for investors to respect human rights and the environment. EU legislation must ensure that **trade agreements oblige European investors and their subsidiaries associated with raw materials mining to comply with the domestic rules and procedures of their host country**. This includes **dealing with any legal dispute within that host country's domestic courts**, as well as prioritising and supporting the just transition of local economies via national companies or domestic SMEs.[200]

- **Abandon ISDS and other industry protection mechanisms:** Via the UN Commission on International Trade Law (UNCITRAL) Working Groups,[201] the EU should lead in **banning industry protection mechanisms that prevent countries from adopting transformative and local-level policies around resource use, infrastructure and energy**. Investor State Dispute Settlement (ISDS) mechanisms should be abandoned, and existing bilateral and regional treaties that include ISDS, such as the Energy Charter Treaty, should either be renegotiated or terminated.[202]

- **New EU law providing more rights to public interest organisations and individuals:** A new EU regulation that provides public interest organisations and individuals with procedural rights comparable to that of EU industry should be prioritised. This, along with giving individuals the possibility of filing damages claims against foreign investors or states - or states against foreign investors - would contribute to weakening the protection enjoyed by mining multinationals.[203]

- **Restricting or banning imports linked to bad human rights, labour and environmental records:** EU metals and minerals imports linked to severe human rights, labour and environmental harms, violations and/or damages should be restricted via tariffs (proportionate to the damage suffered) and import bans, and ultimately be ended. Targeted sanctions can be put in place at four levels, namely country-level, economic sectors, specific companies, and individuals.[204]

- **Reparations for ecological debt:** The EU owes a massive ecological debt to the countries and regions it colonised and continues to exploit for resources. **A 'fine and ban' approach can be implemented, whereby retributive payments for ecological debts are based on both loss and damage accounting and on environmental justice (i.e. the 'fine'), and further pollution is prohibited (i.e. the 'ban')**. Examples include the proposal by WoMin for a full-cost accounting that is sensitive to ecofeminist principles.[205] It is important to note that the reparations can and must be delinked from markets. A 'fee' that privatises resources for rich emitters will not stop pollution, as with the EU's own Emissions Trading System, whose price has bounced around in a manner that parallels global financial speculative bubbles, regularly rising but then bursting.

- **Apply Debt Cancellation:** Linked to reparations**, the EU should apply debt cancellation for countries in the Global South through the European Investment Bank**. It should also push for an impartial, independent debt cancellation mechanism from Global North countries towards Global South countries at the UN Conference on Trade and Development (UNCTAD), and through the World Trade Organisation reform. Debt cancellation would reduce pressures on countries in the Global South that depend on primary resource extraction. It would also diminish the control of many Global North governments and institutions over the South, and allow countries in the latter to recover sovereignty over their economic policy. Additionally, it would serve as a step towards reparations for the resource exploitation that has happened since colonial times.[206,207] **New, alternative domestic institutions should be set up that provide loans without interest or conditions, other than respecting social wellbeing and environmental limits**.

References

1 Schaffartzik et al. (2014). The global metabolic transition: Regional patterns and trends of global material flows, 1950–2010.

2 UNEP & Intergovernmental Resource Panel (2019). Global Resources Outlook 2019: Natural Resources for the Future We Want.

3 Elhacham et al. (2020). Global human-made mass exceeds all living biomass.

4 IPBES (2019). Nature's Dangerous Decline 'Unprecedented' Species Extinction Rates 'Accelerating.'

5 UN (2013). A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development.

6 UNEP & IRP (2019). Global Resources Outlook 2019: Natural Resources for the Future We Want.

7 Oswald, Y. (2020). Why a more equal world would be easier to decarbonise.

8 UN. Ensure sustainable consumption and production patterns.

9 Barca, S. (2021). Forces of Reproduction: Notes for a Counter-Hegemonic Anthropocene.

10 EC (2020). Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study.

11 People's Agreement of Cochabamba.

12 Dorninger, et al. (2021). Global patterns of ecologically unequal exchange: Implications for sustainability in the 21st century.

13 Eurostat. Material flow accounts statistics - material footprints.

14 Calculated from EU Raw Materials Scoreboard 2020.

15 Martinez-Alier, Joan (2021). The circularity gap and the growth of world movements for environmental justice.

16 Bringezu, Stefan (2015). Possible Target Corridor for Sustainable Use of Global Material Resources.

17 UNDP (2020). Human Development Report 2020.

18 Steinman et al. (2017). Resource Footprints are Good Proxies of Environmental Damage.

19 Giljum et al. (2014). Material Footprint Assessment in a Global Input-Output Framework.

20 Eurostat (2021). EU's material consumption down to 13.4 tonnes per person in 2020.

21 Eurostat (2020). Documentation of the EU RME model.

22 Michaux, Simon (2021). The Mining of Minerals and the Limits to Growth.; Henckens & Worrell (2020). Reviewing the availability of copper and nickel for future generations. The balance between production growth, sustainability and recycling rates.

23 A European Green Deal (2019).

24 Joint Research Center (2019). Consumption and Consumer Footprint: methodology and results.

25 Parrique et al. (2019). Decoupling debunked.; Wiedmann et al. (2020). Scientists' warning on affluence.

26 EEA (2021). Growth Without Economic Growth.

27 Wiedmann, et al. (2015). The material footprint of nations.

28 Potocnik, et al. (2020). Sufficiency: Moving beyond the gospel of eco-efficiency.

29 OECD (2019). Global Material Resources Outlook to 2060.

30 Eurostat (2021) Material flow accounts in raw material equivalents - modelling estimates.

31 Calculated from EU Raw Materials Scoreboard 2020.

32 OECD (2019). Global Material Resources Outlook to 2060.

33 European Commission (2021). EU Raw Materials Scoreboard 2020.

34 Ibid.

35 EC (2020). Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability.

36 Smol et al. (2020). Importance of sustainable mineral resource management in implementing the circular economy model and the European Green Deal.

37 UNEP & IRP (2019). Global Resources Outlook 2019: Natural Resources for the Future We Want.

38 Ibid.

39 OECD (2019). Global Material Resources Outlook to 2060.

40 Steinberger et al. (2020). Your money or your life? The carbon-development Paradox.

41 EEB & Oxfam Germany (2021). Towards a wellbeing economy that serves people and nature.

42 Matthews, David (2019). Capitalism and mental health.; Kasser, Tim (2020). The High Price of Materialism.

43 Umweltbundesamt (2019). Resource-Efficient Pathways: towards Greenhouse-Gas Neutrality – RESCUE.

44 The World Bank (2020). Climate-Smart Mining: Minerals for Climate Action.

45 Financial Times (2021). Electric cars will influence demand for metals more than oil.

46 Michaux, Simon (2021). The Mining of Minerals and the Limits to Growth.

47 Henckens, Theo (2021). Scarce mineral resources: Extraction, consumption and limits of sustainability.

48 EC (2020). Critical Raw Materials.

49 EC (2020). Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study.

50 EC (2021). EU Raw Materials Scoreboard 2020.

51 The Shift Project (2019). Lean ICT: Towards Digital Sobriety.

52 EEB & Oxfam Germany (2021). Towards a wellbeing economy that serves people and nature.

53 McAfee, Andrew (2020). More from Less the Surprising Story of How We Learned to Prosper Using Fewer Resources - and What Happens Next.

54 Visual Capitalist (2016). The Extraordinary Raw Materials in an iPhone 6s.

55 The Ecologist (2018). Not so smart: inside the hazardous world of making smartphones.

56 Lange & Santarius (2020). Smart Green World?: Making Digitalization Work for Sustainability

57 Ibid.

58 Andrae, Anders (2015). On Global Electricity Usage of Communication Technology: Trends to 2030.

59 VUB (2020). Metals for a Climate Neutral Europe A 2050 Blueprint.

60 EC (2021). EU Raw Materials Scoreboard 2020.

61 Ibid.

62 Earthworks (2021). Reducing new mining for electric vehicle battery metals: responsible sourcing through demand reduction strategies and recycling.

63 OECD (2019). Global Material Resources Outlook to 2060.

64 Rodney, Walter (1972). How Europe Underdeveloped Africa.

65 Basu & Pegg (2020). Minerals are a shared inheritance: Accounting for the resource curse.

66 Hickel, Sullivan & Zoomkawala (2021). Rich countries drained $152tn from the global South since 1960.

67 The World Bank (2011). The Changing Wealth of Nations : Measuring Sustainable Development in the New Millennium.

68 Bond & Basu (2020). 'Unequal ecological exchange' worsens across time and space, creating growing Northern environmental liabilities

69 Hickel, Sullivan & Zoomkawala (2021) Plunder in the Post-Colonial Era.

70 Hickel, Sullivan & Zoomkawala (2021). Rich countries drained $152tn from the global South since 1960.

71 Moore & Perez Rocha (2019). Extraction Casino.

72 UNCTAD. Investment Dispute Settlement Navigator.

73 Earthworks, Institute for Policy Studies, London Mining Network, MiningWatch Canada, Terra Justa, War on Want & Yes to Life No to Mining. Voices From The Ground: How the Global Mining Industry is Profiting from the COVID-19 Pandemic.

74 AFTINET. Investor-State Dispute Settlement (ISDS) pitfalls.

75 AFTINET. Mining companies dominate ISDS treaty-shopping claims from Australian companies.

76 Responsible Mining Foundation (2020). RMI Report 2020. (Note that the data covers mainly LSM operations).

77 Brock, Andrea (2020). Securing accumulation by restoration; Huff & Orengo (2020). Resource warfare, pacification and the spectacle of 'green' development.

78 Azadi et al. (2020). Transparency on greenhouse gas emissions from mining to enable climate change mitigation.

79 OECD (2019). Global Material Resources Outlook to 2060.

80 European Environmental Agency (2020). Latest evaluation shows Europe's nature in serious, continuing decline.

81 Global Witness (2020). Defending Tomorrow.

82 Sidorenko, Sairinen & Moore (2020). Rethinking the concept of small-scale mining for technologically advanced raw materials production.

83 The World Bank (2013). Artisanal and Small-Scale Mining.

84 Arthur-Holmes & Abrefa Busia (2021). Occupying the Fringes.

85 Human Rights Watch (2020). Emergency Action Needed for Vulnerable Artisanal & Small-Scale Mining Communities & Supply Chains; Rustad, Østby (2016) Does Artisanal Mining Increase the Risk of Sexual Violence?

86 Lèbre et al. (2020). The social and environmental complexities of extracting energy transition metals.

87 Azadi et al. (2020). Transparency on greenhouse gas emissions from mining to enable climate change mitigation; Business & Human Rights Resource Center (2020). Transition Minerals Tracker.

88 Lèbre et al. (2020). The social and environmental complexities of extracting energy transition metals.; Widana, Anura (2019). Environmental Impacts of the Mining Industry: A literature review.; Haddaway et al. (2019). Evidence of the impacts of metal mining and the effectiveness of mining mitigation measures on social–ecological systems in Arctic and boreal regions.; Ashton, Love & Mahachi (2003). Appendix 2: Environmental and Social Impacts of Mining; Accountability Counsel & ACCA (2020). Accountability in Africa; Business & Human Rights Resource Center (2020). Transition Minerals Tracker.

89 European Commission. Review of the Environmental Impact Assessment (EIA) Directive.

90 Kirsch, Stuart (2014). Mining Capitalism: The Relationship between Corporations and Their Critics.

91 Ibid.

92 CEE Bankwatch Network (2021). Raw Deal: Does the new EU development model mean

more of the same destructive mining.

93 Crosby & Monaghan (2018). Policing Indigenous Movements Dissent and the Security State.

94 Dunlap, Alexander (2020). Bureaucratic land grabbing for infrastructural colonization.

95 European Commission (2020). Critical Raw Materials Resilience: Charting a Path towards greater Security and Sustainability.

96 UNEP (2017). Mine Tailings Storage: Safety Is No Accident.

97 European Commission (2006). Mining Waste.

98 Sergeant & Olden (2020). Mine waste dams threaten the environment, even when they don't fail.

99 Earthworks & MiningWatch Canada (2019). Safety First Guidelines for Responsible Mine Tailings Management.

100 Earthworks & Oxfam America (2004). Dirty Metals: Mining, Communities, and the Environment.

101 Michaux, Simon (2021). The Mining of Minerals and the Limits to Growth.

102 Eurostat (2021). Waste statistics.

103 Cornwall, Warren (2020). Catastrophic failures raise alarm about dams containing muddy mine wastes.

104 Earthworks & MiningWatch Canada (2019). A Growing Threat: Thousands of Tailings Mine Waste Sites Across the World.

105 Rico et al. (2008). Reported tailings dam failures: A review of the European incidents in the worldwide context.

106 Ecologistas en Acción (2020). Ojos que no ven...La minería submarina en España.

107 Deep Sea Conservation Coalition. About the Deep Sea.

108 Drazen et al. (2020). Midwater ecosystems must be considered when evaluating environmental risks of deep-sea mining.

109 Seas at Risk (2021). At a crossroads: Europe's role in deep sea mining.

110 European Conference on Green Mining.

111 Marin, Diego (2021). Unearthing the truth about green mining.

112 IRENA (2019). Driving a Smarter Future.

113 London Mining Network (2020). Martial Mining.

114 Temper et al. (2020). Movements shaping climate futures; Verweijen & Dunlap (2021). The evolving techniques of the social engineering of extraction.

115 Lèbre et al. (2020). The social and environmental complexities of extracting energy transition metals. (Unspecified if in operation, completed or both.)

116 Business & Human Rights Resource Center (2020). Transition Minerals Tracker.

Business & Human Rights Resource Center (2020). Transition Minerals Tracker.

117 Ibid.

118 Initiative for Responsible Mining Assurance (IRMA); Anglo American Press Release (2021). Anglo American's Unki mine

achieves IRMA 75 on responsible mining standard.

119 Principal elements of an EU mHREDD legislation (2020).

120 Kort & Esti (2020). ESG Standards: Looming challenges and pathways forward.

121 Albin-Lackey, Christopher (2013). Without Rules: A Failed Approach to Corporate Accountability.

122 European Commission (2020) Commission study shows the need for EU-level legislation on due diligence throughout the supply chain on human rights and environmental impacts

123 Ibid.

124 Chilton, Adam (2016). The Limitations of Supply Chain Disclosure Regimes.

125 Ernst and Young (2020). Top 10 business risks and opportunities – 2020.

126 Sullivan for Yes to Life, No to Mining (2021). Our Resistance is our Existence: mining and resistance on the island of Ireland.

127 Ecologistas en Acción (2019). Report: Speculative Mining in Spain.

128 Lund et al. for Yes to Life, No to Mining (2021). A Green Shift? Mining and resistance in Fennoscandia (Finland, Sweden, Norway, Sámpi).

129 Rhoades, Hannibal (2020). Cáceres rejects lithium mine.

130 Infinity Lithium Corporation. San Jose Lithium Project.

131 Friends of the Earth (2013). Factsheet on Lithium.

132 European Commission. Raw Materials Information System (RMIS).

133 Birney, Matt (2020). Infinity locks in key Spanish management.

134 Business & Human Rights Resource Center (2016). ENRC (now Eurasian Resources Group) failed to respect human rights, says UK government watchdog; SOMO (2016). Cobalt blues: Environmental pollution and human rights violations in Katanga's copper and cobalt mines.

135 Ibid.

136 Accountability Counsel & ACCA (2020). Accountability in Africa.

137 Duxbury, Charlie (2020). Sweden's ground zero for the EU's strategic materials plan.

138 Environmental Justice Atlas (2017). Norra Kärr, near lake Vättern, Sweden.

139 Leading Edge Materials – Norra Karr Project.

140 Nilse, Thomas (2019). With tailings to be dumped at sea, copper mine gets approval.

141 Ibid.

142 The Arctic (2020). Mercury and fjords: Norway set to launch toxic copper mine.

143 Staalesen, Atle (2016). Government gives thumbs up for mining company, will be allowed to dump wastes in Arctic fjord.

144 Kollbrunner, Timo (2020). We've simply been forgotten.

145 Ibid.

146 Ibid.

147 Environmental Justice Atlas (2019). Conflicto del Plomo Boliden, Cerro Chuño en Arica, Chile.

148 Environmental Defender Law Center. Residuos Mineros de Suecia Envenenan a Chilenos.

149 Business & Human Rights Resource Center (2013). Boliden lawsuit (re Chile).

150 European Parliament – DROI Committee (2019). Access to legal remedies for victims of corporate human rights abuses in third countries.

151 UN Special Rapporteurs letter: SWE2/2021 of 23.03.2021.

152 Food and Agriculture Organization Of the United Nations (2018). Barroso Agro-sylvo-pastoral System, Portugal.

153 Fundação Montescola (2021). Communication to the Aarhus Convention Compliance Committee.

154 Emerman, Steven (2021). Evaluation of the Tailings Storage Facility for the Proposed Savannah Lithium Barroso Mine, Northern Portugal.

155 von der Leyen, Ursula (2019). The European Green Deal – our new growth strategy.

156 European Environmental Agency (2021). Growth Without Economic Growth.

157 Ibid.

158 Staub, Colin (2020). European leaders vote to pursue standardized charger.

159 European Commission (2021). Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast).

160 European Commission. Policy and strategy for raw materials.

161 Civil society letter to the European Commission over concerns on EU critical raw materials plans.

162 European Commission (2021). Mobility Strategy.

163 Mills, Mark (2020). Mines, minerals, and "green" energy: A reality check.

164 Franks et al (2021). Tailings facility disclosures reveal stability risks.

165 Civil Society Coalition on mandatory human rights and environmental due diligence consultation.

166 IPIS vwz (2021). The EU Conflict Minerals Regulation: Implementation at the EU Member State level.

167 Yes to Life No to Mining (2021). EU Civil Society denounces EU raw materials plans in European Green Deal.

168 Alexander, Samuel (2012). The optimal material threshold: Toward an economics of sufficiency.

169 European Environmental Bureau & Oxfam Germany (2021). Towards a wellbeing economy that serves people and nature; European Environmental Bureau & European Youth Forum (2021). Escaping the growth and jobs treadmill.

170 European Parliament (2021). Report on the new Circular Economy Action Plan; European Parliament (2021). Report on the eighth Environment Action Programme; and European Parliament (2021). Report from Environment Committee on Critical Raw Materials Action Plan.

171 A Circular Economy in the Netherlands by 2050.

172 Finish Ministry of the Environment (2021). The circular economy program sets targets for curbing the over-consumption of natural resources.

173 European Commission (2021). Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast).

174 European Commission (2020). Leading the way to a global circular economy: state of play and outlook.

175 EU launches Global Alliance on Circular Economy and Resource Efficiency.

176 London Mining Network (2020). Martial Mining.

177 Urban mining: when communities reject the throwaway economy.

178 European Environmental Bureau (2021). A blueprint to deliver a healthy, affordable, and sustainable built environment for all.

179 Ashford, Kallis (2014). A four-day workweek : a policy for improving employment and environmental conditions in Europe.

180 Wiese & Mayrhofer (2020). Escaping the growth and jobs treadmill.

181 Knight et. al (2013). Could working less reduce pressures on the environment?; Pullinger, Martin (2014). Working time reduction policy in a sustainable economy.

182 This is a cautious estimate, taking into account an extra demand for e-buses and e-bikes, based on: European Commission (2020). Critical Raw Materials for Strategic Technologies and Sectors in the EU - A Foresight Study.

183 Bartłomiejczyk, Mikołaj (2021). Sustainable Use of the Catenary by Trolleybuses with Auxiliary Power Sources on the Example of Gdynia.

184 Torres, Nicole (2020). Advertising Makes Us Unhappy.

185 Estimate based on Arvind Parmer et al. (2015). AdblockPlus Efficacy Study; Visser, Arthur (2016). The Effect of Ad Blockers on the Energy Consumption of Mobile Web Browsing.

186 Worldwide initiatives to ban fossil fuel advertisements.

187 Friends of the Earth France (2020). Big Corpo.

188 European Environmental Bureau (2021). A blueprint to deliver a healthy, affordable, and sustainable built environment for all.

189 French government Repairability index.

190 EEB, ECOS, T&E & DUH (2021). Enhancing the sustainability of batteries.

191 Civil Society Coalition: Enforcing due diligence, what we want (2021).

192 International Labour Organization. C169 - Indigenous and Tribal Peoples Convention, 1989 (No. 169).

193 Franco, Jennifer (2016). Reclaiming Free Prior and Informed Consent (FPIC) in the context of global land grabs.

194 Stop Corporate Impunity (2020) Extensive recommendations to the binding treaty.

195 Germanwatch (2018). Governance of Mineral Supply Chains of Electronic Devices; Eurac Network (2021). The EU Conflict Minerals Regulation Implementation at the EU Member State level.

196 Ecologistas en Acción (2019). Speculative Mining in Spain.

197 First Nations Major Projects Coalition, (2019). Major Project Assessment Standard: Member-Developed Principles, Criteria, and Expectations to Guide Major Project Environmental Assessments.

198 Initiative for Responsible Mining Assurance (IRMA) Standards.

199 European Parliament (2017). Implementation of the Mining Waste Directive.

200 Friends of the Earth Europe (2018) Setting Course for Sustainable Trade: A New Trade Agenda that Serves People and the Environment.

201 United Nations Commission On International Trade Law - Working Group III: Investor-State Dispute Settlement Reform.

202 International Institute for Sustainable Development (2017). UNCITRAL and Reform of Investment Dispute Settlement.

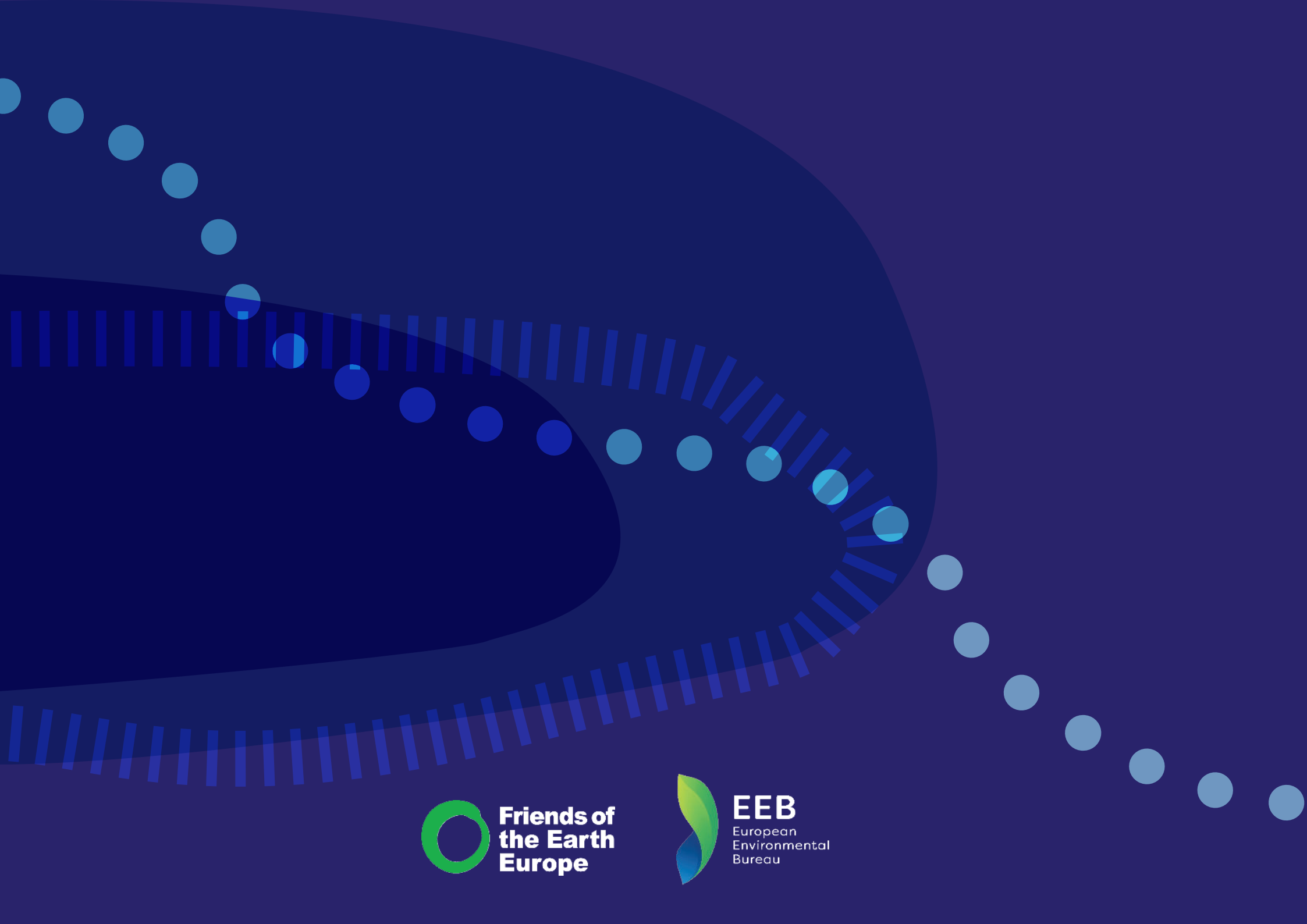
203 Power-Shift (2020) Alternatives for the 'Energy and Raw Materials Chapters' in EU trade agreements.

204 European Parliament (2019). Access to legal remedies for victims of corporate human rights abuses in third countries.

205 Womin (2021). Five Year Strategy (2020-2024).

206 Pacto Ecosocial Del Sur, For a social, ecological, economic and intercultural pact for Latin America.

207 Bankwatch (2020). Can the EIB become the "EU Development Bank"?


Friends of the Earth Europe
EEB
European Environmental Bureau