

# The EU Critical Raw Materials Act: sourcing, streamlining, circularity and sustainability

Emma Gailitis, Yasmine Khalfi, Olivia M Kowalczyk, Haisim Siddiq and Robert G Lee

*Birmingham Law School, University of Birmingham\**

## Introduction

A green economy is defined by the UN as ‘low carbon, resource efficient and socially inclusive’<sup>1</sup> in which economic growth is fuelled by public and private investment in ‘activities [and] infrastructure that allow reduced carbon emissions, enhanced energy and resource efficiency, and the prevention of loss of biodiversity’.<sup>2</sup> Carbon reduction implies a transition in the way in which we produce and consume energy which may depend upon the availability of critical raw minerals (CRMs). CRMs are a vital element of technological change upon which many sectors like ‘the net zero industry, the digital industry, aerospace, and defence sectors rely’.<sup>3</sup> This includes minerals such as ‘aluminium, cobalt, copper, lithium, magnesium, nickel, and other rare earth elements’.<sup>4</sup> These are just some of the materials mined for, but are of crucial importance to the use of renewable energy as they are ‘used in permanent magnets for wind turbines or in electric vehicles’<sup>5</sup> as well

as ‘photovoltaics ... and advancing the use of information and communication technology (ICT) and sensor technology’.<sup>6</sup> All these key technologies in making the shift to a green economy rely on CRMs, so making their extraction and regulation sustainable is paramount for the future of renewable energy.

When paired with net zero goals, CRMs become vital for a green economy. This is because CRMs are directly employed in generating renewable energy and developing cleaner technologies including solar panels, electric vehicles and wind turbines for which CRMs are said to be ‘irreplaceable’<sup>7</sup> in allowing the operation of these energy sources. On 23 May 2024, the EU’s Critical Raw Materials Act (CRMA), published as Regulation (EU) 2024/1252, entered into force as part of an attempt to establish and maintain a secure, sustainable supply of critical raw materials for the EU. In this article we analyse the EU Critical Materials Act and its provisions to secure access to CRMs. In particular, plans to streamline European production of CRMs are critically appraised, to raise wider questions of what sustainable primary and secondary production of CRMs might look like in a circular economy.

Attaining the EU goal of net zero carbon by 2050 places major dependence on CRMs, which are economically and strategically important for the economy but are subject to uneven patterns of production and high risk associated with their supply. Due to the environmental and social costs of production, to mine these metals efficiently it will be necessary to develop a circular economy, so the metals can be reutilised efficiently. The criticality of such metals is

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1 UN Environment Programme, Green Economy available at: <https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy> (last accessed 13 November 2023).

2 *ibid.*

3 European Commission Press Release, ‘Critical raw materials: ensuring secure and sustainable supply chains for EU’s green and digital future’ (16 March 2023), available at: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_1661](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1661) (last accessed 13 November 2023).

4 Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations (EU) 168/2013, (EU) 2018/858, 2018/174 and (EU) 2019/1020. Critical Raw Materials Act 2023, annex 1, section 1.

5 Philip Blenkinsop, ‘The EU’s hunt for critical minerals’ (2023) Reuters at 1. Available at: <https://www.reuters.com/markets/commodities/eus-hunt-critical-minerals-2023-12-18> (last accessed 4 March 2024).

6 Margarethe Hofmann, Heinrich Hofmann, Christian Hagelüken, Alessandra Hool, ‘Critical raw materials: a perspective from the materials science community’ (2018) 17 *Sustainable Materials and Technologies* 1 at 2.

7 European Commission, ‘Internal market industry entrepreneurship and SMEs: critical raw materials’ (2023) [https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials\\_en](https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials_en) (last accessed 13 November 2023).

largely dependent on their economic importance and the supply risk attached to them. The European Union produces relatively little of the relevant critical minerals and as demand grows, it would be prudent of the EU to exercise more careful stewardship of minerals already in circulation by recycling CRMs. This is in line with a circular economy model, the overall aim of which is to ‘enable effective flows of materials, energy, labour and information so that natural and social capital can be rebuilt’<sup>8</sup> in an ‘industrial system that is restorative and regenerative ... by design’.<sup>9</sup> The European Critical Raw Materials Act 2023 promotes this strategy, as Articles 25–28, 30 and Annex V<sup>10</sup> focus on achieving a circular economy and environmental sustainability. Therefore, as the circular economic model’s objectives are aligned with those of a green economy, effective management of secondary resources provides a practical means of achieving this. A circular economic model has some potential both to assuage modern society’s demand for CRMs and to reverse the trend to waste such material. Earth Overshoot Day in 2023 fell on 2 August<sup>11</sup> (19 May in the UK),<sup>12</sup> and aimed to illustrate the unsustainable nature of our current patterns of exploitation and consumption of natural resources.

Scarcity of CRMs is not a new problem; the US, for example, has maintained legislation on critical material stockpiling since before the Second World War. The EU has compiled a growing list of critical materials dating back to 2011. In 2020, the UK Government introduced a ‘Ten-point plan for Green Industrial Revolution’ which includes a focus on greener buildings, accelerating the shift to zero-emission vehicles and advancing offshore wind. It then proceeded to introduce a Critical Minerals Strategy in 2023. All of these examples suggest that a greener world will depend on access to CRMs.

More recently, the US has taken bold steps towards a greener economy as President Biden has made available \$400 billion in government funding, subsidies, and tax incentives to enable the conversion to low-carbon energy solutions. The US in so doing has encouraged their domestic manufacturers to engage in domestic production or processing of critical minerals. One example is to utilise

CRMs for the production of domestic battery components. This is accompanied by generous tax breaks for US consumers switching to electric vehicles, providing these have a minimum content of domestically produced components. While the EU has denounced the Biden measures as protectionist, the EU Green Industrial Deal proposes relaxing State Aid rules in Europe, and both the Net Zero Industry Act and the Critical Raw Materials Act look to boost both green technologies and mining production within Europe. This response partly reflects pressure from Member States such as France, who want to introduce measures at a domestic level, which to an extent works against the single market ideal.

The EU’s plans for a carbon border adjustment mechanism, which will place tariffs on goods with a higher environmental footprint entering the EU single market, provide another response to such pressures. However, this has received in turn criticism from the US, which argues that the mechanism solely protects EU producers from international competition. So we see a weakening of free trade models and a declining influence of the WTO as states compete for CRMs.

## A European response: the Critical Raw Materials Act

The dangers associated with the EU’s strong reliance on imports of CRMs became increasingly apparent in the wake of the Covid-19 outbreak and the energy crisis that followed Russia’s invasion of Ukraine. The International Energy Agency estimates that in 2040, six times as many minerals will be needed to achieve global climate neutrality. The EU is dependent on significantly more critical raw resources if it is to achieve net-zero emissions by 2050.<sup>13</sup> Yet a very small proportion of these minerals emanate from EU mines.<sup>14</sup> Currently, China provides 98 per cent of the EU supply of certain rare earth elements, Turkey 98 per cent of the Borate, South Africa covers 71 per cent of the EU’s needs for platinum, and Brazil 85 per cent of its Niobium (used in jet engines).<sup>15</sup> The European Parliament’s policy analyst Guillaume Ragonnaud has suggested that:

8 ‘Towards the circular economy, opportunities for the consumer goods sector’ (2013) 2 *Ellen MacArthur Foundation* 26.

9 ‘Towards the circular economy: an economic and business rationale for an accelerated transition’ (2013) 1 *Ellen MacArthur Foundation* 7.

10 European Critical Raw Materials Act 2023, Note 4 above.

11 Earth Overshoot Day, <https://www.overshootday.org> (last accessed 16 November 2023).

12 Earth Overshoot Day, <https://www.overshootday.org/newsroom/country-overshoot-days/dates> (last accessed 13 November 2023).

13 Guillaume Ragonnaud, ‘Securing Europe’s supply of critical raw materials: the material nature of the EU’s strategic goals’ (2023): [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/739394/EPRS\\_BRI\(2023\)739394\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/739394/EPRS_BRI(2023)739394_EN.pdf) (last accessed 12 November 2023).

14 Statista Research Department, ‘Critical raw materials: EU supply by mineral & nation 2020’ (*Statista* 2020): <https://www.statista.com/statistics/1270641/critical-raw-material-supply-in-the-european-union-by-supplier-nation> (last accessed 12 November 2023).

15 *ibid.*

The industrial revolution of the EU would be threatened by a scarcity of critical raw materials as the EU would not be able to accomplish its strategic objectives. Key technology production lines may be shut down, and increased material costs may have an impact on whole industry supply networks. In terms of technical advancement, economic expansion, employment prospects, and climatic benefits, the EU would lose out on the advantages that come with the shift to a net zero and digital economy. Shortages in critical raw materials would put the EU at risk militarily.<sup>16</sup>

It was in response to the growing competition for CRMs and in the light of the current geopolitical tensions that the European Commission put forward a proposal for a Critical Raw Materials Act.<sup>17</sup>

The Critical Raw Materials Act forms part of a broader 'Green Industrial Plan' and in conjunction with the 'Net-Zero Industry Act' (NZIA) aims to reduce the EU's dependence on CRMs and foster a sustainable level playing field for the EU's CRM value chains.<sup>18</sup> It hopes to 'tackle the lack of secure and sustainable access to CRMs by increasing anticipation and mitigation of supply risks, fostering domestic CRM potential, and promoting sustainable sourcing practices'.<sup>19</sup> To reach the EU's climate and energy ambitions, it will scale up the manufacturing of key carbon neutral or 'net-zero' technologies – and thus ensure a secure, sustainable and competitive supply chain for clean energy.<sup>20</sup> The Critical Raw Materials Act also contains a proposal for regulation of many aspects of CRMs, addressing the EU's pertinent supply risks of raw minerals and additionally promoting their sustainability.<sup>21</sup> Benchmarks to be achieved by 2030 for domestic capacities are also set within the Act, alongside the strategic raw minerals value chain and the diversification of the EU's supplies. It aims to build domestic capacity within the EU by laying down the following benchmarks, generating: at least 10 per cent of the EU's annual consumption for extraction; at least 40 per cent of the EU's annual consumption for processing; at least 15 per cent of the

EU's consumption for recycling; and no more than 65 per cent of the EU's annual consumption from a single third country.<sup>22</sup>

Finally, the Critical Raw Materials Act endeavours to ensure diversification of the Union's import of raw materials, as international trade is key to supporting global production. It aims to achieve this through certain strategies, including:

- creating a CRM 'club' for all interested countries to strengthen global supply chains;
- using trade agreements to secure and diversify trade in critical raw materials;
- expanding the EU's network of strategic partnerships with a value chain approach and strong sustainability dimension;
- using the Global Gateway for soft and hard infrastructure to deploy projects along the raw materials value chain and support connectivity;
- working with EU countries to set up an EU export credit facility to lower the risk of investment abroad;
- tackling unfair trade practices related to raw materials and increasing enforcement.

The overall aim of the Act is to eliminate the EU's severe dependence on external markets and thus strengthen its own internal market by expanding its trade network, thus facilitating competitiveness and investments via cooperation between the Member States. This is to ensure that its sustainability goals are met and to establish a strong presence in the global market.

## Sustainable production of CRMs

Sustainability is a societal objective which entails the longevity of the existence of a material, species, type of energy, and so on.<sup>23</sup> It has three dimensions, namely economic, social, and (or) environmental.<sup>24</sup> The process of achieving sustainability is defined as sustainable development,<sup>25</sup> which, according to the United Nations,

16 European Parliament-ERPS policy podcasts, 'Securing Europe's supply of critical raw materials' (4 May 2023): <https://open.spotify.com/episode/6TMy7bZqBDhZABvMykL6Oz> (last accessed 12 November 2023).

17 European Commission, 'Overview of the Critical Raw Materials Act': [https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act\\_en](https://single-market-economy.ec.europa.eu/sectors/raw-materials/areas-specific-interest/critical-raw-materials/critical-raw-materials-act_en) (last accessed 9 November 2023).

18 European Commission, Note 3 above.

19 Alessandra Hool, Christoph Helbig, Gijsbert Wierink, 'Challenges and opportunities of the European Critical Raw Materials Act' 2023 *Mineral Economics* 1. Available at: <https://link.springer.com/article/10.1007/s13563-023-00394-y> (last accessed 10 January 2024).

20 *ibid.*

21 European Commission, Note 3 above.

22 *ibid.*

23 Jeffrey L Ramsey, 'On not defining sustainability' (2015) 28 *Journal of Agricultural and Environmental Ethics* 1075; available at: <https://link.springer.com/article/10.1007/s10806-015-9578-3> (last accessed 8 January 2024).

24 Ben Purvis, Yong Mao and Darren Robinson, 'Three pillars of sustainability: in search of conceptual origins' (2018) 14 *Sustainability Science* 681; available at: <https://link.springer.com/article/10.1007/s11625-018-0627-5> (last accessed 8 January 2024).

25 UNESCO, 'Sustainable development' (Unesco 20 August 2015): <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd> (last accessed 8 January 2024).

requires an integrated approach that considers not only environmental but also economic development.<sup>26</sup>

The extraction and utilisation of CRMs pose issues of sustainability because they raise both environmental and economic concerns for the European Union.<sup>27</sup> Since one of the main goals of the Critical Raw Materials Act is to enable the EU to reduce reliance on external markets for CRMs,<sup>28</sup> the EU wants to build on its single market to facilitate the utilisation of its own natural resources, remaining resilient and competitive, and to build longer-term independence from imports.<sup>29</sup> To do so, the Commission aims to facilitate access to regional mineral reserves, which are necessary for the construction of environmentally friendly technologies such as solar panels and wind turbines.<sup>30</sup> Another strategy is to enable a fast-growing internal market of CRMs through ‘faster drilling’.<sup>31</sup> Currently, obtaining permission for a mining project could take up to 15 years in the EU.<sup>32</sup> Under the Act, the EU aims to encourage Member States to assess their permitting efficiency and modernise their mining frameworks,<sup>33</sup> and, subsequently, grant mining permits more rapidly.<sup>34</sup>

Under the new legislation, the European Commission – together with the yet-to-be-established Critical Raw Materials Board – could name certain projects as strategic.<sup>35</sup>

When categorised as such, projects would benefit from a streamlined permitting process, together with support in obtaining access to finance from public and private funds.<sup>36</sup> The Act aims to reduce the administrative burden by streamlining permitting procedures for CRM projects in the EU, while asserting a high level of social and environmental protection. Additionally, selected strategic projects will benefit from support for access to finance. The shorter permitting timeframes for strategic projects are hugely ambitious, with a 24-month timeframe for extraction permits and 12 months for processing and recycling permits.

EU countries will also have to develop national programmes for exploring geological resources.<sup>37</sup> For additional financial support, the text states that ‘private investment alone is not sufficient’ and adds that the ‘effective roll-out of projects along the critical raw material value chain may require public support’ such as financial contributions from the European Investment Bank or Member States in the form of State Aid. The recent revision of the EU’s State Aid rules (that is, the Commission’s new Temporary Crisis and Transition Framework) should simplify State Aid rules for renewable energy deployments and for decarbonising industrial processes, including in the mining sector, by Member States.<sup>38</sup>

## Current frameworks for planning and permitting

### Planning for exploration and production

The exploration stage of mining is linked to Environmental Impact Assessment (EIA) and Social Impact Assessment, which are determinative as to whether a mine progresses to the construction stage. The Environmental Impact Assessment Directive<sup>39</sup> stipulates that an EIA is required for any ‘major building or development project in the EU [and] must first be assessed for their impact on the environment’.<sup>40</sup> At the very least, EIA will be required for

26 United Nations, ‘Sustainability’ *United Nations* (1987) <https://www.un.org/en/academic-impact/sustainability> (last accessed 8 January 2024).

27 Allianz Research, ‘Critical raw materials: is Europe ready to go back to the future?’ (Allianz 2023): [https://www.allianz.com/content/dam/onemarketing/azcom/Allianz\\_com/economic-research/publications/specials/en/2023/august/01\\_08\\_2023-Critical-Raw-Materials.pdf](https://www.allianz.com/content/dam/onemarketing/azcom/Allianz_com/economic-research/publications/specials/en/2023/august/01_08_2023-Critical-Raw-Materials.pdf) (last accessed 8 January 2024).

28 European Commission, Note 17 above.

29 *ibid.*

30 Hool *et al.*, Note 19 above.

31 Antonia Zimmermann, ‘Europe’s green dilemma: mining key minerals without destroying nature’ (*POLITICO* 15 March 2023): <https://www.politico.eu/article/europes-green-dilemma-mining-key-minerals-without-destroying-nature/#:~:text=Green%20groups%20have%20long%20fought> (last accessed 9 January 2024).

32 *ibid.*

33 European Commission, ‘A secure and sustainable supply of critical raw materials in support of the twin transition (2023) COM(2023) 165; available at: [https://www.europarl.europa.eu/RegData/docs\\_autres\\_institutions/commission\\_europeenne/com/2023/0165/COM\\_COM\(2023\)0165\\_EN.pdf](https://www.europarl.europa.eu/RegData/docs_autres_institutions/commission_europeenne/com/2023/0165/COM_COM(2023)0165_EN.pdf) (last accessed 9 January 2024).

34 European Round Table for Industry, ‘The EU Critical Raw Materials Act’ (2023); available at: [https://ert.eu/wp-content/uploads/2023/09/ERT-Expert-Paper-on-the-Critical-Raw-Materials-Act\\_September-2023.pdf](https://ert.eu/wp-content/uploads/2023/09/ERT-Expert-Paper-on-the-Critical-Raw-Materials-Act_September-2023.pdf) (last accessed 9 January 2024).

35 Publyon, ‘Critical Raw Materials Act: boosting the twin green and digital transition’ (*Publyon* 2023): <https://publyon.com/critical-raw-materials-act-boosting-the-twin-green-and-digital-transition/#:~:text=Under%20the%20new%20legislation%2C%20th,financing%2C%20including%20possible%20state%20funds> (last accessed 26 February 2024).

36 Clifford Chance, ‘The European Critical Raw Materials Act’ (2023): <https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2023/03/the-european-critical-raw-materials-act.pdf> (last accessed 26 February 2024).

37 European Commission, Note 17 above.

38 Claire Peers, ‘Note on the Critical Raw Materials Act’ (*Teneo* 30 March 2023): <https://www.teneo.com/insights/articles/note-on-the-critical-raw-materials-act/> (last accessed 9 March 2024).

39 Council Directive 2014/52/EU of 16 April 2014 Amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment OJ L124/1 (EIA Directive).

40 European Commission, ‘Environmental Impact Assessment’ [https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment\\_en?](https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment_en?) (last accessed 27 February 2024).

projects that are likely to produce significant changes to the environment. Annex 1 of the Directive stipulates that projects such as crude oil refineries,<sup>41</sup> thermal and nuclear power stations,<sup>42</sup> smelting metals,<sup>43</sup> chemical installations,<sup>44</sup> airports<sup>45</sup> and greater interference with watercourses,<sup>46</sup> per Article 4(1), are subject to a mandatory EIA. This pertains to CRMs as Annex 2 imposes further requirements regarding EIAs, specifying that activities specific to mining are subject to a mandatory EIA. Industries encompassed by this are the extractive industry,<sup>47</sup> energy,<sup>48</sup> production and processing of metals,<sup>49</sup> minerals,<sup>50</sup> and chemicals.<sup>51</sup> Additional EIA regulation in these areas illustrates that mining operations can have a significant effect on the environment and must be considered in the exploration phase. By being contained in an EU Directive, there is better hope that Member States can adopt more uniform measures when it comes to exploration, with the least invasive and harmful methods of obtaining these CRMs.

However, the Policy Department for Citizens' Rights and Constitutional Affairs Report emphasises that 'Mineral resource management, permissions and mining legislation are within the full competence of the Member States since CRMs are generally considered to be national natural assets. Member States have their national legislation on exploration, mining activities and mineral rights'.<sup>52</sup> This suggests that the extent to which environmental protection is offered is dependent on each Member State's domestic legislation and reliance on mining.

However, Directives such as the Habitats Directive<sup>53</sup> and the Birds Directive<sup>54</sup> outline methods of conservation and protection for habitat loss that may occur during the exploration process of mining. These documents are widely recognised throughout the EU; however, their effectiveness

is limited to carrying out assessments, as will be explored. Article 6 of the Habitats Directive specifies that Natura 2000 sites require an 'appropriate assessment'. This provides these protected ecological parks with an additional level of protection from any habitat or species loss, ensuring that habitat assessments will be carried out where appropriate, namely where the 'relationships between landscape pattern and life history characteristics of individual species and population-levels'<sup>55</sup> could be compromised.

The Mining Waste Directive (MWD)<sup>56</sup> was also adopted to tackle extractive waste 'resulting from exploration, extraction, treatment and storage of mineral resources as well as quarrying',<sup>57</sup> as the mining and quarrying industry represented 23.4 per cent<sup>58</sup> of total waste generation in the EU. Like most Directives regarding mining and waste,<sup>59</sup> the objectives of the MWD are to enforce obligations on Member States to minimise environmental harm and adverse effects on human health.

### Permitting

The permitting stage begins with a request to the mining authorities indicating the substance, geographical location and area requested, as well as the plan of exploration works to be implemented. In many countries, an EIA is not required, so the procedure is relatively quick. Other Member States, like Denmark, require an environmental permit for exploration. The European Commission has no responsibility for exploration permitting procedures in Europe. According to country reports, exploration in Europe is not excessively complicated. Due to the fact that in general EIA is not compulsory in exploration activities, such studies are not considered among the causes for making permitting procedures longer. In terms of the duration of mining exploration permits, for most Member States the period is between three years and ten years with several extensions of up to ten or 15 years. In Finland, for example, the period is four years with a three-year extension. Delays as such are often attributed to the time

41 EIA Directive, annex 1, section 1.

42 *ibid* 2(a), (b).

43 *ibid* 4.

44 *ibid* 6.

45 *ibid* 7(a).

46 *ibid* 8.

47 *ibid*, annex 2, section 2.

48 *ibid* section 3.

49 *ibid* section 4.

50 *ibid* section 5.

51 *ibid* section 6.

52 Policy Department for Citizen's Rights and Constitutional Affairs Directorate-General for Internal Policies, 'Social and environmental impacts of mining activities in the EU' PE 729.156 (May 2022); available at: [https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL\\_STU\(2022\)729156\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL_STU(2022)729156_EN.pdf) (last accessed 27 February 2024).

53 Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora OJ L206/7 (Habitats Directive).

54 Council Directive 2009/147/EC of 30 November 2009 on the Conservation of Wild Birds OJ L20/7 (Birds Directive).

55 KH Riitters, RV O'Neil, KB Jones, 'Assessing habitat suitability at multiple scales: a landscape-level approach' (1997) 81 *Biological Conservation* 191 at 196.

56 Council Directive 2006/21/EC of 15 March 2006 on the Management of Waste from Extractive Industries and Amending Directive 2004/35/EC OJ L102/15 (Mining Waste Directive).

57 Yvonne Scannell, 'The regulation of mining and mining waste in the European Union' (2012) 3.2 *Washington and Lee Journal of Energy, Climate, and the Environment* 178 at 230.

58 Eurostat: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste\\_statistics#Total\\_waste\\_generation](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Waste_statistics#Total_waste_generation).

59 Water Framework Directive (2000/60/EC), Waste Framework Directive (2008/98/EC), Council Directive (1999/31/EC), The Environmental Liability Directive (2004/35/EC).

it takes to obtain rights, licences and permits to even begin mining for minerals. Each phase of these projects may involve a new set of permissions which need to be acquired. Therefore, time restrictions can put pressure on national competent authorities to act speedily while still trying to assess and restrict the potential for environmental harm.

The permitting procedure for extraction differs depending on the Member State; some have a procedure which is dependent on the interested party's application for the permit, whilst others have an inherited public tender system. This means that a competent administrative body opens up a concession, in effect, a public tender to which any interested party can present a bid. Furthermore, in some Member States, initial spatial planning permission has to be issued in the area where exploitation is to be carried out before a concession can be granted. Unsurprisingly, therefore, timeframes for approvals vary considerably across Member States. Some Member States will see very few approvals and have relatively little experience, whereas others will handle more applications, but it cannot be assumed that those with more experience will be speedier. This is because there may be much more contestation in such jurisdictions about yet more mining approvals. Even where timeframes for deciding mineral approvals are set, they may not be met. All of this makes it challenging when, as we will see, the EU wishes to streamline and harmonise timescales for approval.

### Streamlining of approvals

Proposals underpinning the Act, including the proposal for Ensuring a Secure and Sustainable Supply of Critical Raw Materials,<sup>60</sup> stipulate that streamlining is necessary in order to achieve goals regarding the transition to a circular economy but also in maximising the efficiency of resource usage. In particular, it is significant for the 'extraction, processing or recycling of strategic raw minerals, or in the development and scale-up of substitutes',<sup>61</sup> 'to ensure and speed up the effectiveness and implementation ... of strategic projects',<sup>62</sup> 'the EIAs and authorisations required under Union law, including water, habitats and birds' are expressly said not to be affected by the streamlining process,<sup>63</sup> but 'reporting obligations should be streamlined

... allowing member states to fulfil their reporting obligations on projects, exploration and mining'.<sup>64</sup> Finally, Article 11 also emphasises that 'national competent authorities must coordinate and streamline the various individual assessments of the environmental impact of a particular project'.<sup>65</sup> This raises the question, however, of the extent to which streamlining can be achieved while maintaining adequate protection of the environment and ensuring sustainable modes of production.

### Streamlining and sustainability

One possible consequence of this rapid expansion and enabling of mining extractions could be a devastating impact on water and soil pollution as well as biodiversity loss. Various green campaigners and lobbyists in Brussels have begun to raise such concerns.<sup>66</sup> Due to the large area that mines occupy, there is an inevitable loss of vegetation and fauna, and massive changes to soil profiles.<sup>67</sup> Moreover, a large volume of waste rock and tailings can include high concentrations of hazardous materials, which can destroy ecosystems and constitute a crucial contribution to mining's environmental footprint.<sup>68</sup> In addition to prohibiting other land uses, mining zones are typically gated or restricted, which might limit animal migratory paths or the free movement of animals. Water impacts are equally devastating. The quantity of groundwater that develops in populated regions is likewise reduced by increased surface drainage. The mine-drying pumps can alter the direction of water flow, directing it in the direction of the mine. Reduced groundwater levels from the mine may result in drying up surrounding wells and altered patterns of plant growth, which may disrupt the balance of ecosystems in the region. Water shortages can arise from mining operations (mining, grinding, refining, and possibly additional processing), which can demand and use large volumes of water from nearby rivers, particularly in dry regions.<sup>69</sup>

64 *ibid* Provision 57.

65 *ibid*.

66 Zimmermann, Note 31 above.

67 Policy Department for Citizens' Rights and Constitutional Affairs Directorate-General for Internal Policies, 'Social and environmental impacts of mining activities in the EU Policy Department for Citizens' (2022): [https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL\\_STU\(2022\)729156\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2022/729156/IPOL_STU(2022)729156_EN.pdf) (last accessed 9 January 2024).

68 Suzi Malan, 'How to advance sustainable mining: key messages and recommendations' (2021): <https://www.iisd.org/system/files/2021-10/still-one-earth-sustainable-mining.pdf> (last accessed 9 January 2024).

69 Policy Department for Citizens' Rights and Constitutional Affairs Directorate-General for Internal Policies, Provision 10.

60 Regulation of the European Parliament and the Council Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations (EU) no 168/2013, (EU) 2018/58, (EU) 2018/1724 and (EU) 2019/1020: [https://www.europarl.europa.eu/doceo/document/TA-9-2023-0325\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2023-0325_EN.html) (last accessed 30 December 2023).

61 *ibid* Provision 9.

62 *ibid* Provision 18.

63 *ibid* Provision 24.

This poses an issue for sustainability if the extraction of CRMs is not capable of being achieved without considerable social and environmental costs. Non-governmental organisations assert that environmental laws should be retained and upheld rather than be overlooked in favour of a competitive EU internal market. ‘Especially in light of the climate crisis and the high rate of biodiversity loss, the priority cannot simply be: more mining, more mining’, said Michael Reckordt, section head for CRMs at the NGO PowerShift.<sup>70</sup>

Arguably, sustainable mineral production in the European Union is some way off under present safeguards. The need for accelerated mining to ensure independence from external markets seems only to fuel further anxiety as stakeholders suggest that ‘we will never get nature back’ if we are to proceed with such measures.<sup>71</sup> The *EU Principles for Sustainable Raw Materials* provides a regulatory framework for the extraction of CRMs;<sup>72</sup> however, it fails to consider the clash between the goals of a ‘green Europe’ and an ‘import-independent Europe’. By attempting to enable faster internal production of CRMs, there is a danger of diluting existing environmental safeguards. One suggestion to avoid this is full compliance with the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD).<sup>73</sup> These measures, however, come after mining approvals and rely on market strictures rather than direct enforcement of environmental obligations.

## Reopening of closed mines

Although streamlined mining comes with many economic advantages for the EU, the process of maximising CRM production to reduce reliance on external markets is resulting in the issue that Member States are considering reopening mines in Europe. For example, Italy is planning to reopen mines that were closed approximately 30 years ago.<sup>74</sup> Following in the same footsteps, Germany is seeking to reopen its Käfersteige mine, which is reported to contain about 2 million tonnes of raw fluorspar and has not been

open since 1996.<sup>75</sup> Increased production of CRMs internal to the EU will give Member States a big advantage, since they will not have to rely on imports as much as before. However, this comes with several drawbacks.

This race for resources disregards the exploitation of territories belonging to local communities and residents, whose villages will be disturbed by the reopening of mines and are concerned that the EU sees their communities as ‘unexplored areas to be colonised, industrialised and with great potential for all kinds of exploitation in the name of this green transition’.<sup>76</sup> Residents argue that there should be no transition, keep things as they are, and rather focus on sustainability and circularity in an attempt to protect their communities and villages.<sup>77</sup> Those in power believe that this is a small price to pay if we are to achieve a ‘green transition’: ‘circularity of materials and increased efficiency can mitigate, to a certain extent, the expected increase in demand but not solve the problem’.<sup>78</sup> Nonetheless, disputes, protests, and disruptions in the execution of projects may result from a failure to involve stakeholders and address community concerns in the mining process.<sup>79</sup> Moreover, the reopening of mining sites involves a lot of practical issues relating to hazards, environmental protection and the safety of mining workers.<sup>80</sup> This is largely because when these mines were first in operation, many global environmental Conventions were not in existence. As a result, the reopening of old mines involves new physical dangers. For example, abandoned mines fill up with water over time, which can become acidic and harmful to the skin, irritating, or causing disease due to the presence of pathogenic microorganisms.<sup>81</sup> In addition, lethal

75 Guy Chazan, ‘The big dig: Germany reopens its mines in quest for mineral self-sufficiency’ *Financial Times* (30 April 2023); available at: <https://www.ft.com/content/9674a847-0c77-420a-a133-3c0eb855326c> (last accessed 3 March 2024).

76 Paulo Pena, ‘“Nothing will be the same”: the locals on Europe’s new mining frontiers’ (2023) *Investigate Europe* 1; available at: <https://www.investigate-europe.eu/posts/local-communities-europe-new-mines-critical-raw-materials> (last accessed 3 March 2024).

77 *ibid.*

78 Pascale, Note 75 above.

79 Daniela Pardo and Hannah Poukish, ‘Community pushes back as a company tries to reopen a historic gold mine’

(*spectrumnews1.com* 2021): <https://spectrumnews1.com/ca/la-west/inside-the-issues/2021/05/20/one-canadian-company-is-trying-to-revive-california-s-gold-rush> (last accessed 4 March 2024).

80 Arthur Longree, ‘Reopening of mines in Europe, issues and alternatives’ (2022) Justice & Peace Commission in French-speaking Belgium: <https://www.justicepaix.be/en/reopening-of-mines-in-europe-issues-and-alternatives/> (last accessed 4 March 2024).

81 Australian Department of Energy, Mines, Industry Regulation, and Safety, ‘Danger of old mine workings’ (2020) Department of Mines, Industry Regulation and Safety: <https://www.dmp.wa.gov.au/What-makes-old-mine-workings-3210.aspx> (last accessed 4 March 2024).

70 Zimmermann, Note 31 above, Provision 9.

71 *ibid.*

72 Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, *EU Principles for Sustainable Raw Materials* (Publications Office of the European Union 2021); available at: <https://op.europa.eu/en/publication-detail/-/publication/6d541f66-0f81-11ec-9151-01aa75ed71a1/language-en> (last accessed 9 January 2024).

73 European Round Table for Industry, Note 34, above, at p.6

74 Federica Pascale, ‘Italy wants to reopen mines by year’s end’ (*Euractiv* 2023): <https://www.euractiv.com/section/politics/news/italy-wants-to-reopen-mines-by-years-end/> (last accessed 3 March 2024).

concentrations of carbon monoxide build-up, methane, sulphur dioxide, and more, can absorb the majority of the oxygen in the surrounding atmosphere, causing people to fall ill.<sup>82</sup> High temperatures, unstable and unsafe structures, and increased levels of radioactivity<sup>83</sup> are among some of the dangers of reopening closed mines that are possibly noxious to humans and the environment. The impact of reopening mines is simply too grave for communities and the ecosystem as a whole and should thus be avoided and substituted with sustainable mining operations that are considerate of the impact on stakeholders as well as the safety of mining workers and the environment.

### Sustainability and circularity

Decarbonisation strategies are pivotal components of many governments' plans to achieve net zero emissions. However, it is crucial to recognise that addressing climate change cannot solely be reliant on technological advancements; it also necessitates shifts in individual and collective behaviours. Merely focusing on decarbonising energy production without tackling consumption patterns or lifestyle choices might not suffice for attaining long-term sustainability objectives. Embedded in the CRM Act, however, is the notion that an economy might be circular rather than linear in form.

Circularity aims at reducing the environmental impacts caused by materials production and processing, including land and water use or emissions.<sup>84</sup> Circularity suggests extending the lifecycle of products; and in a circular economy, production and consumption involve sharing, leasing, reusing, repairing, refurbishing and recycling products for as long as possible. The circular economy has been conceptualised as changing the current linear resource flows by closing the loop (includes end-of-life recycling), narrowing the loop (reducing the use of materials), and slowing the loop (such as by dematerialisation).<sup>85</sup> This therefore keeps waste to a minimum as when a product reaches the end of its life; where possible the materials are kept within the economy through recycling to be used again,

realising further value.<sup>86</sup> An analysis of global resources and production databases has found that there could be severe limitations of primary supply from materials such as antimony, cadmium, chromium, cobalt, copper, indium, molybdenum, nickel, silver, and zinc within the next two decades.<sup>87</sup> To comply with the Paris Agreement, IEA (2022) has estimated that the demand for many CRMs is likely to increase by 400 per cent by 2040,<sup>88</sup> but this may be even higher if further ambitious climate policies are implemented.<sup>89</sup>

EU policies acknowledge that circularity could benefit the EU energy security by increasing the usage of recycling, based on the rationale that access to recycled materials may be more secure than that for primary CRMs. For example, a briefing by the EU on its circular economy package stated that the risks associated with supply would be mitigated, such as price volatility, availability and import dependency.<sup>90</sup> However, it is not guaranteed that recycled material is more physically secure than primary extracted materials, nor that its price is more stable due to there typically being volatility spill-over effects between markets that limit the arbitrage. A global effort to integrate the circularity concept is required to effectively address the long-term risks associated with the production and use of CRMs, which has the potential to mitigate the supply risk through mobilising all stakeholders based on a well-informed understanding of material flows.<sup>91</sup>

Currently, the EU is integrated in international trade networks as an exporter of CRMs but largely embedded in waste streams, which are then processed in other states. This is because it does not have sufficient infrastructure in place to recover CRMs from its waste flows. Therefore, an increased retention and deployment of secondary materials through recovery and recycling

82 *ibid.*

83 *ibid.*

84 Julian Allwood *et al.*, 'Material efficiency: a white paper' (2011) 35(3) *Resources, Conservation and Recycling*; available at: <https://doi.org/10.1016/j.resconrec.2010.11.00> (last accessed 3 January 2024).

85 Martin Geissdoefer *et al.*, 'The circular economy – a new sustainability paradigm?' (2017) 143 *Journal of Cleaner Production*; available at: <https://doi.org/10.1016/j.jclepro.2016.12.048> (last accessed 3 January 2024).

86 News European Parliament, 'Circular economy: definition, importance and benefits' (2023): <https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits> (last accessed 28 December 2023).

87 Vitalii Lundaev *et al.*, 'Review of critical materials for the energy transition, an analysis of global resources and production databases and the state of material circularity' (2023) 203 *Mineral Engineering*; available at: <https://doi.org/10.1016/j.mineng.2023.10828> (last accessed 4 January 2024).

88 Internal Energy Agency, 'The role of critical minerals in clean energy transitions' (2022) *World Energy Outlook*; available at: <https://iea.blob.core.windows.net/assets/830fe099-5530-48f2-a7c1-11f35d510983/WorldEnergyOutlook2022.pdf> (last accessed 5 January 2024).

89 André Månberger, 'Critical raw material supply matters and the potential of the circular economy to contribute to security' (2023) 58(2) *Intereconomics*; available at: <https://doi.org/10.2478/ie-2023-0016> (last accessed 5 January 2024).

90 Note 3 above.

91 Note 4 above.

could address the EU's current import dependency on primary CRMs. In 2020, 32.7 million tonnes of waste was exported by the EU, of which more than half (17.4 million tonnes) were ferrous metals; the main importer was Turkey (13.7 million tonnes), followed by India (2.9), UK (1.8), Switzerland (1.6), Norway (1.5), Indonesia (1.4), and Pakistan (1.4).<sup>92</sup> It has been argued that strategies to reduce waste exports will bring additional costs for waste treatment and also deprive developing countries of waste industries that provide economic growth and jobs.<sup>93</sup> The Critical Raw Materials Act states that 'the EU is committed to supporting our partner countries move up the value chain' whilst also setting targets for domestic processing and recycling that are higher than the target for domestic extraction.

The Critical Raw Materials Act strives to protect the environment by improving circularity as well as the sustainable development of critical raw material chains.<sup>94</sup> In the Critical Raw Materials Act the main circularity target is to meet 15 per cent of the EU's annual consumption of strategic raw materials through domestic recycling capacity, driving the need for increased investment in recycling technology and facilities. Progress in meeting this recycling capacity target is very much required; currently, the average end-of-life recycling input rate across the 34 CRMs in the EU is only 8.3 per cent.<sup>95</sup> It outlines that Member States will need to adopt and implement national measures to improve the collection of CRMs' rich waste and ensure its recycling into secondary CRMs. However, issues may arise in meeting recycling targets, in particular as certain materials have complex recycling processes. It is not specified in the current proposal whether recycled CRMs should originate from end-of-life products or manufacturing waste,<sup>96</sup> although the regulation does call upon Member States and private operators to investigate the potential for recovery of CRMs from extractive waste in both current mining activities and historical mining waste

sites. Furthermore, products containing permanent magnets, which are much needed for wind energy, will need to meet circularity requirements in terms of design for disassembly and information on the recyclability and recycled content.<sup>97</sup>

Several Member States, including France, Germany and Italy, have already expressed an intention to enhance collaboration to achieve the objectives outlined. And further, the Council of the European Union proposed that the benchmarks should be raised higher, suggesting an increase in the share of EU recycling to 20 per cent, and domestic processing from 40 to 50 per cent. The Council also reinforced measures to increase circularity and sustainability.<sup>98</sup>

Some of the objectives of a circular economy are to extend the life of products manufactured and retain constituent elements within the product itself. This not only has a positive environmental impact, as it reduces biodiversity loss<sup>99</sup> and total annual greenhouse emissions,<sup>100</sup> but also assists in accelerating the process of CRM independence, which is the main objective of the CRM Act.

Without sustainable production and recycling of its own CRMs, the EU is unlikely to reduce its dependence on imports. For circularity to be efficient in its governance of material flows, the starting point must be sustainable production. Many products that exist today are unsuitable for circulation as they are not recyclable, repairable or long-lasting.<sup>101</sup> Sustainable products must be produced that can be reused and recycled without deterioration. No product can claim to be circular if it is manufactured or recirculated through the consumption of large amounts of finite and non-renewable critical raw materials.<sup>102</sup> Of course, energy will always be required in a circular system, as products suitable for long-term circulation require well-designed

92 Eurostat, 'Where does EU waste go?' (2021) <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-202104201> (last accessed 6 January 2024).

93 Jack Barrie *et al*, 'The role of international trade in realizing an inclusive circular economy' (2022) Royal Institute of International Affairs Research Paper.

94 European Commission, 'Critical raw materials: ensuring secure and sustainable supply chains for EU's green and digital future' (2023): <https://ec.europa.eu/commission/presscorner/detail/en/ip> (last accessed 13 January 2024).

95 Emma Watkins *et al*, 'Circularity gaps of the European Critical Raw Materials Act' (2023) Institute for European Environmental Policy: <https://ieep.eu/publications/circularity-gaps-of-the-european-critical-raw-materials-act/#:~:text=The%20main%20circularity%2Drelated%20target,the%20EU%20is%20only%208.3%25> (last accessed 13 January 2024).

96 Hool *et al*, Note 19 above, at 4.

97 Critical Raw Materials Act 2023, Articles 25–28.

98 *ibid*.

99 European Parliament, 'Circular economy: definition, importance and benefits' (www.europarl.europa.eu 12 February 2015): <https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits#:~:text=The%20circular%20economy%20is%20a> (last accessed 8 February 2024).

100 European Parliament, 'Greenhouse gas emissions by country and sector (infographic) | News | European Parliament' (Europa.eu 3 July 2018): <https://www.europarl.europa.eu/news/en/headlines/society/20180301STO98928/greenhouse-gas-emissions-by-country-and-sector-infographic> (last accessed 8 February 2024).

101 Caroline Kotter, Raphael Rocken and Patrick Moloney, 'Why circularity is key to a sustainable energy transition' (2023) Ramboll: <https://www.ramboll.com/en-gb/insights/resource-management-and-circular-economy/why-circularity-is-key-to-a-sustainable-energy-transition> (last accessed 4 February 2024).

102 *ibid*.

manufacturing that utilises energy. However, circular energy sources must be prioritised in the production of sustainable products, such as renewable solar and wind. In general far less energy is consumed in generating secondary mineral resources than in mining production.

In March 2022, the European Commission proposed a European Green Deal that aims to make sustainable products the norm; proposals include promoting eco-friendly products, educating customers about the green shift, re-evaluating construction product regulations, and developing a plan for eco-friendly textiles.<sup>103</sup> In the Green Deal, the Commission revealed plans, with the REPowerEU plan<sup>104</sup> presented in May 2022, to deploy more renewable energy, save energy and diversify its energy supplies following its goal to reach carbon neutrality by 2050.<sup>105</sup> The Green Deal points to the tripling of extraction industries between 1970 and 2017, acknowledging the impacts on climate change, biodiversity loss and water stress,<sup>106</sup> yet the Commission pursues the streamlining of approvals for more mining in Europe and confirmed at the Ecofin Council in July 2023 that it would include mining in the EU Taxonomy Regulation of sustainable investments<sup>107</sup> in the taxonomy of green investments.

## Conclusion

The Critical Raw Materials Act hopes to tackle the lack of secure and sustainable access to CRMs by increasing the mitigation of supply risks, fostering domestic CRM potential, and promoting sustainable sourcing practices, for example by building domestic capacity within the EU by generating at least 10 per cent of the EU's annual consumption for processing. Furthermore, the Act aims to ensure diversification of the EU's importation of raw

materials. It has the intention to create a multilateral association for all interested countries to work towards strengthening the global supply chain and diversifying trade in critical raw materials. The achievement of net zero and wider green deal sustainability objectives is dependent on the success of the Act, which aims to promote circular economy systems beginning with a target of meeting 15 per cent of the EU's annual consumption of strategic raw materials via domestic recycling capacity.

Demand for CRMs will mean that even with such initiatives there will be significant reliance on exploitation of primary mineral resources. As we have seen, permitting regimes for mining projects are not harmonised across the EU but can take more than ten years. Under the Act, the EU aims to encourage its Member States to modernise their mining frameworks, in order to grant mining permits more rapidly. The European Commission will identify projects as strategic, allowing them to benefit from a streamlined permitting process together with support in obtaining access to finance from public and private funds. Under the proposals, the administrative burden will be reduced with shorter permitting timeframes for strategic projects (24-month timeframe for extraction permits and 12 months for processing and recycling permits).

This hugely ambitious streamlining cannot come at the expense of appropriate scrutiny of the extractive industry. While achieving net zero targets is paramount in addressing the pressing issue of climate change, efforts at decarbonisation cannot come at the expense of wider environmental objectives such as reversing biodiversity loss. In addition, the European Union must prioritise the development of a circular economy model as part of its sustainability efforts. The effectiveness of such a model centres crucially on ensuring that initial production processes are themselves sustainable. By embracing comprehensive environmental controls and advancing a circular economy model rooted in sustainable production practices, the EU can chart a path towards achieving both environmental sustainability and net zero emissions targets. These efforts are not mutually exclusive but are complementary in creating resilient and responsible access to critical minerals and in promoting sustainable development.

103 European Commission, 'Green Deal: new proposals to make sustainable products the norm and boost Europe's resource independence' (2022) European Commission: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_2013](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_2013) (last accessed 8 February 2024).

104 European Union, 'REPowerEU: affordable, secure and sustainable energy for Europe' (2022): [https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repower-eu-affordable-secure-and-sustainable-energy-europe\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repower-eu-affordable-secure-and-sustainable-energy-europe_en) (last accessed 17 February 2024).

105 European Union, 'European Green Deal' (2023): <https://www.consilium.europa.eu/en/policies/green-deal/#:~:text=The%20European%20Green%20Deal%20is%20a%20package%20of%20policy%20initiatives,a%20modern%20and%20competitive%20economy> (last accessed 18 February 2024).

106 European Commission COM(2019) 640 Communication from the Commission on 11 December 2019 on the European Green Deal: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52019DC0640> (last accessed 19 February 2024).

107 Regulation (EU) 2020/852 of the European Parliament and EU Council.