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Trade in commodities, obstacles to trade and illegal trade

ABSTRACT

Free trade in raw materials is of great importance for the EU. China remains the EU's main supplier of critical raw materials and thus concentrates on the most recent evidence on its export restrictions. Despite recent WTO rulings, China is still implementing a wide range of trade distorting measures in the form of export licensing or through the introduction of a resource tax. While we can trace certain welfare benefits for the Chinese domestic market following the introduction of export restrictions, we can clearly relate increasing illegal trade outflow from China to its restrictive trade policies. While the use of the WTO provides one of the most straightforward mediums to offset trade distortions, more effective measures include the addition of explicit clauses on critical raw materials in bilateral trade agreements and a strong regulatory framework in the member states prohibiting imports of conflict or illegal raw materials.

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1 Introduction

This study provides a concise report and analysis on two issues vital to EU trade in raw materials, namely a discussion of trade measures that constitute an obstacle to free trade in raw materials and an assessment of the importance of illegal trade in such materials. Available, accessible, and predictably priced critical raw materials such as unprocessed or minimally processed products of the mining sector, particularly rare earths, key fossil fuels, as well as natural resources from the forestry sector are essential to Europe's efforts to advance sustainable progress towards a hi-technology and low-carbon economy. Drawing and building upon existing studies[1], this study presents evidence of trade restrictive measures on natural resources that may be in violation of respective WTO rules among the EU's main sourcing partners and provides an up-to-date overview of empirical data on EU access to critical raw materials. It considers remedial options that the EU could implement to tackle trade barriers on raw materials that may result in illegal trade as well as ways to support third countries in their efforts to curtail illegal exports. The European Commission's Raw Materials Initiative (COM(2008)0699) clearly identifies how certain conditions including gaps in data collection can lead to distorted markets for raw materials and lead to illegal trade. Although we work on the assumption that there is a causal link between trade barriers and illegal trade practices, for which we discuss the main reasons and consider the negative effects particularly for the exporting country, we address both issues independently creating space for a more in depth analysis.

While on going efforts to enhance bilateral thematic raw materials dialogues with relevant partners (China, Mongolia, Vietnam) together with international cooperation through forums (e.g. G20, UNCTAF, WTO and the OECD) are having a positive effect, more needs to be done. Because the extractive industry is notoriously intransparent, we find that enhanced efforts to track the flow of raw materials not only from their source to the EU as currently exists, but all the way to their final end consumer, e.g. with end-user certificates, would substantially increase the EU's ability to assess specific threats to key European industries such as aerospace, telecommunications, and automobiles across different member states. This report finds that it may be beneficial to move beyond developing transparency checklists for negotiating bilateral and regional trade agreements in addition to providing an overview of international and regional agreements. It further recommends actively documenting and analysing inbound trade data on raw materials, from their FOB export point to their final destination within the EU. The European Union Raw Materials Knowledge Base (EURMKB)[2] for collection of data and the European Rare Earths Competency Network (ERECON)[3] are highly welcomed developments in this regard. These allow for greater transparency and oversight of both legal and illegal trade in raw materials, especially in the essential domain of rare earth metals. Nevertheless, the EU needs more reliable databases that employ a transparent methodology in order to assess the costs of possible disruptions for specific sectors and specific countries. Because enhanced transparency increases market predictability, which is a prerequisite for stable trade flows and reduced price volatility, the EU could consider developing a tracking system modelled on end-user licenses for dual-use technologies that follows crucial raw materials, particularly those not traditionally traded in futures markets, from mine to factory floor.

[1] OECD (2014). Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices. Accessible through: http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf . Last accessed on June 30, 2015.
[2] Accessible through: http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/knowledge-base/index_en.htm. Last accessed on June 30, 2015.
[3] Accessible through: http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/erecon/index_en.htm. Last accessed on June 30, 2015

1.1 Background

According to the OECD, some raw materials can be considered "crucial inputs for the capital and consumer goods industries around the world".[4] They tend to be geographically distributed in high concentrations and together with exportable surpluses impart an oligopolistic structure to the corresponding market.[5] This high concentration in a few exporting countries naturally increases the effect of export restrictions on trade, creating a ripple effect felt all the way up the supply chain, particularly through the higher cost of further processing. Some of the raw materials such as rare earths are essential for the transition towards a low carbon economy in the European Union and given the current insecurity regarding future gas supplies from Russia, also provide an important element of energy security. According to EU estimations, at least 30 million jobs in the EU depend on a secure supply of raw materials.[6]

This report identifies several instances of export restrictions that have contributed to episodes of global supply shortages. Our analysis of export restrictions up to the year 2015 as compared to the most recent OECD study, which traces export restrictions from 2002 to 2012, similarly finds that among the critical raw material suppliers to the EU, China remains a key focus because it has utilized various types of export restrictions and incurs significant costs associated with fighting illegal trade. We find that despite the best efforts of international institutions, the use of export restrictions is not only becoming more frequent, it is also delivering unpredictable results. That said, we observe that international rules governing raw materials export restrictions remain underdeveloped.

Restrictions on raw materials exports are mostly, but not exclusively, used by developing/emerging economies. According to the literature four reasons generally explain why governments implement such restrictions, namely increased revenues, conservation of domestic resources, environmental protection, and domestic industrial diversification.[7] Taking just one example of these, the United States, we can see how even rich states with developed economies employ such tools. Washington restricts the export of domestically produced oil and gas as part of national security policy dating back to the 1970s. Yet the central problem for the EU is not so much in the area of fossil fuels as it is in rare earth materials. While the extractive industries sector in general is notoriously intransparent, the rare earth sector, which provides vital materials for Europe's technologically advanced manufacturers (e.g. aerospace, telecommunications, etc.), is particularly opaque.

What is of particular concern is the transparency deficit in the design and implementation of existing export restricting models. The OECD has been collecting data on cases of export restrictions in raw materials since 2002. Therefore, we are increasingly capable of evaluating the effectiveness of export restrictions. The most important question here is: are such restrictions actually achieving the goals of the states implementing them? The general consensus is that export taxes and restrictions do not necessarily benefit domestic downstream industries or enhance domestic value added-processes. For example, the international community quickly reacted to Chinese export restrictions on rare earth materials by switching to alternative suppliers and investing more in alternative technologies. Thus, while export restrictions did indeed lead to a short-term price increase, China's moves actually created incentives for

[4] OECD (2014). Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices. Accessible through: http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf; p9.
[5] ibid
[6] Accessible through: http://ec.europa.eu/growth/sectors/raw-materials/index_en.htm. Last accessed on June 30, 2015.
[7] OECD (2014); Fraunhoferinstitut (2013). Study on Critical Raw Materials at EU Level; European Commission (2014). Report on Critical Raw Materials for the EU.

trade from alternative sources as consumers switched to other markets (and apparently created some incentive for illegal trade as well). This in turn translated into lower prices in the long-term.

1.2 Structure of the Report

We examine the contemporary state of play of how the EU sources raw materials in third countries against the backdrop of the EU Raw Materials Initiative and respective WTO Rules on trade in raw materials. In so doing we present and analyse the latest empirical evidence focusing on unprocessed or minimally processed products of the mining sector, including rare earth and fossil fuels as well as natural resources from the forestry sector. We find that the EU is dependent on twenty critical raw materials supplied primarily by China, the United States, Russia and Turkey. While we find extreme dependency on Antimony from China, for example, we note that more detailed statistics are necessary in order to determine precisely which markets in which member states are most vulnerable.

Next we address the question of illegal trade in raw materials involving the EU providing an empirically based assessment and analysis. To identify and evaluate the level and role of illegal trade, we compare the difference between the reported exports from, for example, China and imports from the European Union. The most important questions here are which EU sectors are most likely to be affected, i.e. face a high-risk of illegality, and which sourcing partners are most likely to be involved? We find that on the EU side the renewable energy sector is the most vulnerable and China is most likely to be the primary supplier partner. We also provide case studies on illegal trade in timber, conflict minerals, and illegal coal mining in Ukraine.

We then turn our focus to a closer examination of exporting countries where illegal trade originates and take up a discussion of at least some of the reasoning behind the practice of illegal exports of raw materials. In so doing we review some of the most important literature on obstacles to free and open trade in raw materials including export restrictions, monopolistic situations, governance issues, and local content requirements, among others.

2 EU Raw Materials Initiative

One of the central problems is assessing if not consolidating a useful overview of the state of play of how and from where the EU sources its raw materials is the lack of international norms in reporting of export restrictions. In fact, there is no universal international agreement nor central collecting international body to which states are required to notify in the event that they implement such restrictions. Thus, with the exception of the OECD 'Inventory of Restrictions on Exports of Raw Material', which provides data on export regulations in the raw materials sector (agricultural products, minerals, metals and wood) for the ten-year period from 2002-2012, it is particularly difficult to point to a single source of reliable information covering an extended period of time.[8] Recognition of this important gap in part led the EU to establish its Raw Materials Initiative (2008).[9] As a part of its trade policies dealing with market access, the EU now operates its own list of trade barriers with major trading partners.[10] However, up to date, detailed information on export restrictions is limited. This lack of recent, detailed, and systematic data on export

[8] Access through: Frank Pothen and Kilian Fink, "A Political Economy of China's Export Restrictions on Rare Earth Elements" (ZEW Discussion Papers, 2015), http://www.econstor.eu/handle/10419/109947. Last accessed on June 30, 2015

[9] European Commission (2008). *The Raw Materials Initiative — Meeting Our Critical Needs for Growth and Jobs in Europe*. COM (2008) 699. Can be accessed through: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0699:FIN:en:PDF Last accessed on June 30, 2015

[10] The full list is available through: http://madb.europa.eu/madb/barriers_crossTables.htm. Last accessed on June 30, 2015.

restrictions consequently makes it difficult to develop timely responses. Such findings are indicative of the need to extend and in some cases develop and maintain new databases on raw materials trade.

2.1 Overall Strategy

The EU Raw Materials Initiative (RMI) finds its roots in two Commission Communications. The first, "The raw materials initiative – meeting our critical needs for growth and jobs in Europe" (COM (2008) 0699) set the backdrop. It identified that key sectors of the European economy including construction, chemicals, automotive, aerospace, machinery and equipment were highly dependent on the stable and affordable import of raw materials. Collectively, these industries annually generated over €1.3 billion and employed nearly 30 million people. While self sufficient in construction minerals (e.g. gypsum and natural stone) and well endowed with industrial materials, it was highly dependent on imports of metallic minerals, particularly high-tech metals such as cobalt, platinum, rare earths, and titanium. It deemed that "reliable and undistorted access" to such materials was rapidly becoming essential to EU competitiveness.

The RMI is a strategy based on three pillars:

- ensuring a level-playing field in access to resources in third countries;
- fostering a sustainable supply of raw materials from European sources; and
- boosting resource efficiency and recycling with the EU.

The second foundational Communication, 'Tackling the challenges in commodity markets and on raw materials' (COM (2011) 0025) confirmed the importance of securing reliable and undistorted access to raw materials. It further noted that one had to seriously consider the interaction between physical and financial commodities markets, particularly in regard to price volatility and its impact on economic sustainability. The Communication identified vital changes in the global supply and demand of key commodities and raw materials. Global demand surged between 2002 and 2008 driven by economic growth particularly among emerging countries such as China. It observed that many of the EU's critical raw materials (e.g. cobalt, gallium, indium and rare earths) were not even traded on traditional commodities exchanges such as the London Mercantile Exchange (LME), rendering their respective markets even less transparent that other extractive industries and, thus, particularly vulnerable to restrictive trade measures. This in turn could create distortions and uncertainties about the regularity of flows and fair pricing. The risk of price fluctuations then caused companies dependent on these resources to take a wide range of actions from stockpiling or negotiating long-term contracts to hedging through futures contracts, which threatened in some cases to only worsen the tightness of supply against which they were trying to hedge.

The Council subsequently endorsed the Raw Materials Initiative on 10 March 2011. The European Parliament endorsed the strategy later that year (Resolution of 13 September 2011) asking to be informed of progress on an annual basis (2011/2056 (INI)) emphasizing the importance of information on Critical Raw Materials (CRM). The Commission adopted its related Common Position on 7 December 2011.

In sum, the 2008-launched RMI has an internal and external component. The core of its external component focuses on the increased use of 'raw materials diplomacy' embedded in its repertoire of relations with supplier countries.[11] As this study focuses on the external trade component, it is useful to examine more closely which strategies the EU employs and which tools it uses to achieve its goal of 'ensuring a level-playing field in access to resources in third countries.'

[11] COM (2011) 0025, page 11.

Concisely formulated, the EU is trying to ensure sustainable supply of critical raw materials by

- enforcing dispute settlement through WTO;
- directly embedding provisions on restrictions of critical raw materials in trade agreements and through dialogues and diplomacy; and
- building strategic partnerships with other major raw materials importers (US, Japan) to exchange critical information.[12]

2.1.1 Enforcing dispute settlement through WTO

The World Trade Organization (WTO) offers a number of important avenues for the EU to pursue its raw materials diplomacy. It not only provides a long-standing collection of norms and procedures for fair and open trade of goods and raw materials, it also provides procedures to resolve disputes and reverse market distorting restrictions when they occur and has the authority to determine penalties and fines to be paid in the case of infringement. While the system has been generally effective, it has its shortcomings. There are long-standing cases where large players (e.g. the US with oil, gas, and multiple cases of steel, China with rare earths, and Europe with agriculture) have been accused, sometimes formally, of not playing by the same rules they demand of others. More specifically, however, while the rules of trade established originally in GATT and now WTO generally prohibit the practice of placing quantitative restrictions on exports (Article XI of the GATT), there are some notable exceptions.

What might be considered an export restriction for one country might be defended on environmental or even national security grounds. For example, trade law allows for restrictions when they are deemed necessary for the conservation of exhaustible resources (XX and XI (GATT 1994)). It is precisely this right that China has claimed on a number of occasions. This line of argumentation of course does not always work. In a recent WTO dispute (DS 431-433 initiated in 2012 and resolved in 2015) over China's restrictions on rare earth exports, raised by the United States with a long list of affected third parties (including the EU, Japan and Russia), it proved critical that China could not convincingly demonstrate that its export restrictions on tungsten and molybdenum were aimed at environmental conservation.[13] In essence China lost the case because their restrictions were focused solely on exports while no similar restrictions were imposed on domestic production. In May 2015, Beijing reported that it had implemented the WTO's recommendations bringing it into conformity with WTO rules, thus avoiding compliance proceedings.

2.1.2 Approaching trade barriers through WTO: the case of Chinese rare earths.

The aforementioned rare earth dispute with China provides a particularly cogent test of the effectiveness of EU raw materials diplomacy. Many of the key materials required by the EU's high technology industries require materials overwhelmingly concentrated in China. In the aforementioned case, the WTO proved to be an effective channel. The WTO ruled that, based on Article XX of the GATT 1994, China neither established that the relevant export quota related to the conservation of the respective exhaustible natural resource nor did it establish that the relevant export quota was 'made effective in conjunction with' restrictions on domestic production or consumption. It thus failed to establish that the relevant

[12] Summary based on: COM (2013) 442. Accessible at http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2011876%202013%20INIT. Last accessed on June 30, 2015.
[13] Dispute Settlement: Dispute DS431, China — Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds431_e.htm. Last accessed on June 30, 2015.

export quota was not applied in an arbitrary manner or put in place as an unjustifiable discrimination or a disguised restriction.[14]

While the WTO's dispute settlement framework seems to be the most straightforward approach to levelling the playing field in terms of access to raw materials in third countries, the strategy has so far proven rather inefficient if not inadequate. WTO disputes can take up to two or even three years to run their course, a timeframe in which significant economic costs and disadvantages can be inflicted upon the EU's economy (see Table 1).

Table 1 Overview Chinese WTO disputes in raw materials sector

Issue	Complainant and supporters	Timeline	Materials	Comments
Dispute DS394[15] **Dispute DS 395**[16] **Dispute DS 398**[17]	Complainants: US (DS394) EU(DS 395) Mexico (DS 398) Third parties: Argentina; Brazil; Canada; Chile; Colombia; Ecuador; India; Japan; Korea, Republic of; Norway; Chinese Taipei; Turkey; Saudi Arabia, Kingdom of	Request for consultation : June 2009 Panel report: July 2011 Appellate body report: January 2012 China had time for implementation until December 2012	various forms of bauxite, coke, fluorspar, magnesium, manganese, silicon carbide, silicon metal, yellow phosphorus and zinc	Specific export restraints concerned: export duties; export quotas; minimum export price requirements; and export licensing requirements.
Dispute DS431[18] **Dispute DS432**[19] **Dispute DS433**[20]	Complainants: US (DS431) EU(DS 432) Japan(DS 433) Third parties: Brazil; Canada; Colombia; India; Korea, Republic of; Norway; Oman; Saudi Arabia, Kingdom of; Chinese Taipei; Viet Nam; Argentina; Australia; Indonesia; Turkey; Peru; Russian Federation	Request for consultation : March 2012 Panel report: March 2014 Appellate body report: August 2014 China had time for implementation until May 2, 2014	tungsten, and molybdenum	duties (taxes), export quota, limitations on the enterprises permitted to export the materials.

[14]See: https://docs.wto.org/dol2fe/Pages/FE_Search/FE_S_S006.aspx?Query=(@Symbol=%20wt/ds431/ab/r*%20not%20rw*)&Language=ENGLISH&Context=FomerScriptedSearch&languageUIChanged=true# Same as note 12 Last accessed on June 30, 2015.

[15] WTO (2013a). "China – Measures Related to the Exportation of Various Raw Materials". Dispute DS394. Accessible at: https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds394_e.htm. Last accessed on June 30, 2015.

[16] WTO (2013b). "China – Measures Related to the Exportation of Various Raw Materials". Dispute DS395. Accessible at: https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds395_e.htm. Last accessed on June 30, 2015.

[17] WTO (2013c). "China – Measures Related to the Exportation of Various Raw Materials". Dispute DS398. Accessible at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds398_e.htm. Last accessed on June 30, 2015.

[18] WTO (2015a). "China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum". Dispute DS431. Accessible at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds431_e.htm. Last accessed on June 30, 2015.

[19] WTO (2015b). "China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum". Dispute DS432. Accessible at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds432_e.htm. Last accessed on June 30, 2015.

[20] WTO (2015c). "China – Measures Related to the Exportation of Rare Earths, Tungsten and Molybdenum". Dispute DS433. Accessible at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds433_e.htm. Last accessed on June 30, 2015.

An example of such a development occurred in 2009 shortly after China introduced its 'Rare Earth Development Plan 2009-2015', which introduced export quotas for rare earths at 35,000 tonnes per annum.[21] In the year that followed, prices of the Chinese rare earth products tripled (see Figure 1).

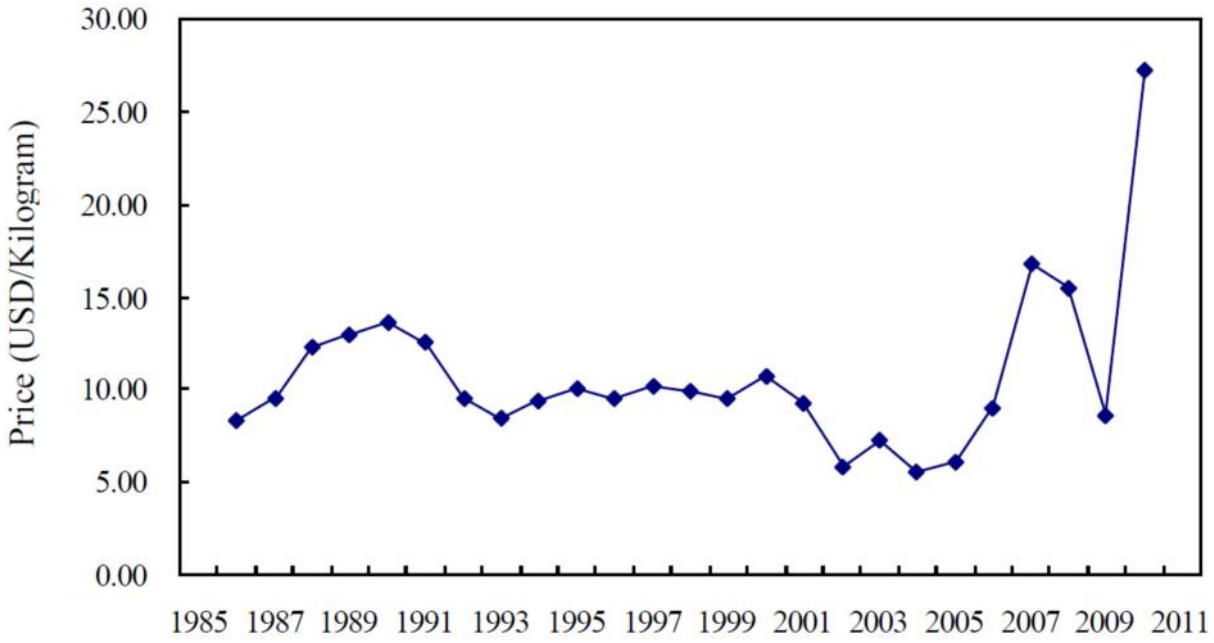

Figure 1: Price Changes in China's Rare Earth Products according to Information Office of the State Council[22]

Accentuating the vulnerabilities of relying on the traditional WTO trade dispute process, China used the time while the case was pending (2009-2015) to reinforce mergers and market consolidation within the rare earth sector. It did this by integrating the country's many small mines and smelting companies into its six rare earth majors (Baogang Group, China Minmentals, Chinaclo, Guangdong Rare Earth Corp, Ganzhou Rare Earth Group and Xiamen Tungsten) by the end of 2015 and thus concentrated its capability to control the market in the long term.[23] Although Beijing ultimately lost the case and had to lift its export restrictions, it followed up with an alternative strategy entirely domestic in orientation that had a similar effect. In May 2015, Beijing imposed a resource tax, i.e. an indirect form of export restrictions, providing China the flexibility to exert greater price control.[24] For medium and heavy rare earths that tax was levied at 27 percent. Observers and scholars agree that China's export quotas have increased Beijing's pricing power.[25]

China's dominance of the rare earth sector and its undeniable capability to control prices raises the possibility that it may use such control as a power/policy instrument. However, China has yet to do so in

[21] Lu ZHANG et al.(2015), "Did China's Rare Earth Export Policies Work? — Empirical Evidence from USA and Japan," *Resources Policy* 43 (March 2015): 82–90, doi:10.1016/j.resourpol.2014.11.007.
[22] Available through: http://english.gov.cn/archive/white_paper/2014/08/23/content_281474983043156.htm. Last accessed on June 30, 2015
[23] Xinhua (2015a). "China Modifying Rare Metals Management Regulations". *Xinhua Finance*. January 29, 2015. Accessible at: http://en.xinfinance.com/html/Industries/Materials/2015/46971.shtml. Last accessed on June 30, 2015
[24] Reuters (2015) "China Issues Details on New Resource Tax Structure for Rare Earth, Metals," Reuters, April 30, 2015, http://www.reuters.com/article/2015/04/30/us-china-rareearth-resource-tax-idUSKBN0NL12720150430. Last accessed on June 30, 2015
[25] ZHANG et al.(2015), "Did China's Rare Earth Export Policies Work?"

an explicitly documented and consistent manner; although it did allegedly block exports of rare earth metals to Japan during a diplomatic crisis over the detention of a Chinese boat captain in 2010.[26] Given the level of Chinese integration into world commodity markets and manufacturing, the explicit use of raw material export restrictions as a weapon would have noticeably negative consequences for China's economic relations, not to mention its soft power goals. Indeed, Beijing's strategy to exert control over prices in the rare earth market has backfired in two ways. First, it apparently incentivized a black market in the form of illegal mining and undocumented exports. Second, it encouraged major consumers to seek out alternative materials and suppliers. Together, these two trends actually contributed to a decrease in demand of Chinese rare earths and, consequently, in the decrease of prices.[27]

Moves by major consumers to seek out alternative materials and suppliers can be seen in the development of new mines in other regions, closer to manufacturing consumers including Texas, Greenland and Canada. Despite progress on this front, however, China still projects to dominate the rare earths sector for the foreseeable future. Because China currently lacks a large domestic down-stream sector for the rare earth materials that it mines, it focuses primarily on the exports. Yet Beijing not only dominates much of the rare earth marketplace, it also dominates the engineering and technological know-how behind the formidable, energy intensive, and environmentally destructive process of separating rare earth oxides from ore.[28]/[29] If the EU does intend to find alternative suppliers, particularly those closer to home, it will quickly discover the need to invest into rare earth refinement, account for the negative environmental consequences, and develop new recycling techniques, i.e. the other two pillars of its Raw Materials Initiative.

2.1.3 Embedding provision in trade agreements, dialogues and diplomacy

The WTO provides a general framework for trade and resolving disputes. However, WTO rules do not always meet the needs of the EU economy. This can be clearly seen in the case of disputes with China or in the case of the US, which restricts exports of its domestically produced oil and gas to any country not falling under a special agreement or categorical assignment; or not seen in the case of Russia, which has only been a member of the WTO since 2012.[30] One possible alternative to level the playing field is through direct negotiations of bilateral free trade agreements (FTA).[31] In its bilateral trade and general foreign relations negotiations, the EU can include specific raw material clauses and discuss different types of trade barriers to create higher legal security. Examples of this include the 2011 EU-South Korea Free Trade Agreement, which specifically includes provisions on the raw materials and on-going negotiations with Vietnam, which include clauses on critical raw materials.[32]/[33] Unfortunately, such deals are more

[26] Keith Bradsher, "Amid Tension, China Blocks Vital Exports to Japan," *The New York Times*, September 22, 2010, http://www.nytimes.com/2010/09/23/business/global/23rare.html. Last accessed on June 30, 2015.

[27] Lucy Hornby, "China Axes Rare Earths Export Quotas," Financial Times, January 5, 2015, http://www.ft.com/cms/s/0/f0ec86fe-94b8-11e4-b32c-00144feabdc0.html#axzz3cwzScxv8. Last accessed on June 30, 2015.

[28] Factiva (2015). "New REE projects aim to create supply chain outside of China", *SNL Metals & Mining Daily: West Edition*. Accessed through Factiva, Inc.

[29] Factiva (2014). "Rare earths recycling and recovery: the two sides of the industry", October 2014, *Industrial Minerals, Metal Bulletin Limited*, accessed through Factiva, Inc.

[30] See the US Export Administration Regulations (EAR) of the Bureau of Industry and Security (BIS), which is an agency of the Department of Commerce. Also see the Mineral Leasing Act of 1920, the Energy Policy and Conservation Act of 1975, and the Export Administration Act of 1979.

[31] For an overview see: European Commission (2013). "The EU's bilateral trade and investment agreements – where are we?" Press Release. Memo December 3, 2013. Accessible at: http://europa.eu/rapid/press-release_MEMO-13-1080_en.htm. Last accessed on June 30, 2015.

[32]European Commission (2015). "South Korea" EC-Website Section *Trade. Countries and Regions.* http://ec.europa.eu/trade/policy/countries-and-regions/countries/south-korea/ Last accessed on June 30, 2015.

difficult to reach with major exporters of raw materials as the cases of rare earths from China and energy sector products such as gas from Russia or the US demonstrate.

In addition to direct agreements on raw materials exports, the EU can and does negotiate using indirect methods within bilateral and regional frameworks. For example, one way to insure the sustainability of raw materials supply is through investment agreements. Since the Lisbon Treaty, foreign direct investment (FDI) policies are within the sole competency of the European Union – easing co-ordination across member states. Incorporating FDI into raw materials diplomacy presents opportunities for the EU to enhance trust and stabilize flows and prices. The EU is currently negotiating such investment agreements with China and The Association of Southeast Asian Nations (ASEAN).[34] In the case of China, increased involvement of European companies in the Chinese raw materials sector would, if nothing else, lead to a more comprehensive understanding of the global rare earth market structure.

The EU has invested substantial effort into creating dialogues and forums on raw materials-related issues and can draw upon a myriad of instruments to target trade barriers, most notably through Free-Trade-Agreements (FTA) and Partnership and Cooperation Agreements (PCA). Within the scope of the former, it has been able to specify controversial topics with major raw materials suppliers. For example, it addressed the problem of dual pricing of energy and licensing and authorisation (covering the mining and hydrocarbon sectors) in its FTA negotiations with Ukraine, while during negotiations with Canada, Singapore and India, the EU addressed the issue of investment protection, a matter of particular importance for the extractive industry.[35] Mongolia provides perhaps the most explicit example to date. In negotiations over a PCA concluded in 2013 the EU directly addressed the rules related to export duties and other types of restrictions that directly affected the exports of its significant reserves of rare earth minerals.[36] Each of these cases illustrates the increasing importance of EU raw materials diplomacy. Through direct negotiations with key partners seeking export opportunities to EU markets and investments from EU companies, the EU is able to leverage their considerable consumer demand power.

Short of formal bilateral and multilateral legal agreements, the EU increasingly cooperates in the form of strategic partnerships and information exchanges. Such relationships and exchanges serve not only as trust-building mechanisms, but also provide increased transparency and predictability to the critical raw materials marketplace. Within this context the EU has long established so-called bilateral 'dialogues' with India, Japan, Russia and the United States and most recently created a trilateral initiative between the EU, the United States and Japan. The latter, which held its first annual meeting in October 2011, is particularly unique in that it is a coalition of major consumers of critical materials for a clean energy future and specifically focuses on advances in in science, technology and innovation, including a joint initiative on novel substitutes for critical metals. Such endeavors may prove critical to bilateral and multilateral trade agreements in the long run. They serve to pool the collective scientific and technical expertise of three of the world's largest economies and consumers of critical raw materials in their efforts to develop substitutes and management systems for raw material life-cycles and recycling; advances that could eventually alleviate demand on some of the most concentrated and difficult to access crucial materials.

[33] European Commission (2015). "Trade in Raw Materials" EC-Website Section *Growth.* http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/trade/index_en.htm. Last accessed on June 30, 2015.
[34] European Commission (2013). "EU Investment Negotiations with China and ASEAN" Press Release. Memo October 18, 2013. Accessible at: http://europa.eu/rapid/press-release_MEMO-13-913_en.htm. Last accessed on June 30, 2015.
[35] See European Commission Directorate General for Trade: EU Trade Policy for Raw Materials. Second Activity Report, 2012. http://trade.ec.europa.eu/doclib/docs/2012/may/tradoc_149515.pdf Last accessed on June 30, 2015.
[36] EU Mongolia PCA: http://ec.europa.eu/world/agreements/downloadFile.do?fullText=yes&treatyTransId=807 Last accessed on June 30, 2015.

2.2 Empirical data: EU sourcing of raw materials from third countries

A reliable accounting of activity in the market place is essential to any policy steps aiming to facilitate the free trade of critical raw materials. Within this context it is essential to account for the supply of unprocessed or minimally processed products of the mining sector, including rare earth metals and fossil fuels as well as natural resources from the forestry sector. Among these, the most important are those so-called critical raw materials, i.e. raw materials deemed concurrently economically important and at risk of reliable and predictable supply.

According to assessments conducted by the Ad-Hoc Working Group on Defining Critical Raw Materials (2010, 2013, 2014), which was established in 2010, there are currently twenty raw materials considered to be critical to the EU economy.[37] A list of these materials, their substitutability, and their industrial uses based on the 2013 report of the Ad-Hoc Working Group on Defining Critical Raw Materials and other reports are presented in below in Table 2.[38] The EU's list of critical materials is derived from a broader list of 54 candidate raw materials. Some ninety percent of the global supply of those comes from countries outside the EU including most of the basic, specialty and primary metals (Figure 2). While there are numerous suppliers of many of the base materials, China is by far the most important supplier in multiple categories. The situation is even more skewed in terms of the EU's list of critical raw materials, particularly rare earths.

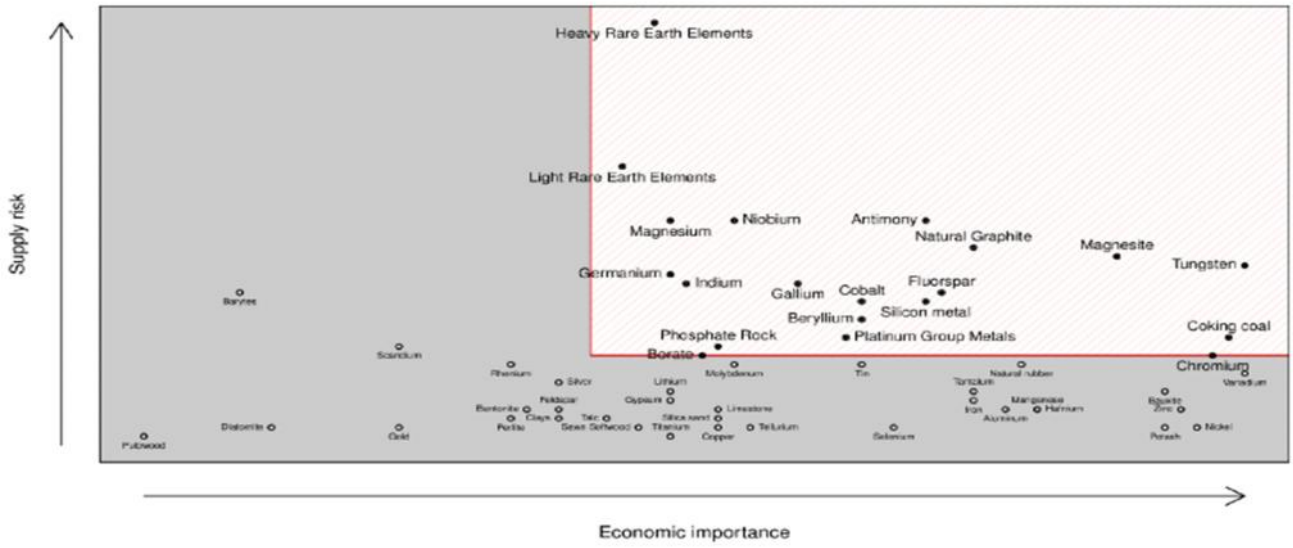

Figure 2: Economic importance /Supply risk of raw materials for the EU economy
Critical raw materials are highlighted in the red shaded criticality zone of the graph.
Source: European Commission[39]

Based on the data from the DG Internal Policies' 2012 report on critical raw material substitutionability and the European Commission's last report (2014) we can see (Table 2) the main suppliers of the respective critical raw materials.[40] Immediately observable is the concentrated supply of these critical raw

[37] For an overview see: http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm. Last accessed on June 30, 2015.
[38] For a detailed analysis and workup of each of the materials, their classification, and uses see Fraunhoferinstitut (2013). Study on Critical Raw Materials at EU Level.
[39] See: http://ec.europa.eu/enterprise/policies/raw-materials/critical/index_en.htm Last accessed on June 30, 2015.
[40] See: http://ec.europa.eu/enterprise/policies/raw-materials/files/docs/crm-communication_en.pdf. Last accessed on June 30, 2015.

materials - particularly those with low substitutability - in four key suppliers, namely China, Russia, Turkey, and the United States. We therefore concentrate most of our attention in this report on these countries. The substitutability of a material is part of the critical assessment because it provides a measure of the difficulty in substituting the material by presenting a score between 0 and 1, with 1 being the least substitutable. All of the critical materials have a substitutability score greater than or equal to 0.60. Several (Beryllium, Borates, Fluorspar, Germanium, Indium, Phosphate Rock, Platinum Group Metals, and Silicon Metals) score above 0.80 and must be of particular concern. Although they score slightly lower (0.77- 0.67), rare earths pose a special risk. Rare earths are found in very small concentrations in larger geographic deposits. They include 17 elements (lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium and yttrium). Many of these are concentrated in China and are essential for everything from hybrid automobiles and fuel cells of the future to lasers and medical X-rays (See Table 3).

Table 2: Main suppliers of critical raw materials and their industrial uses in % (2012)

	SI (*)	CN	US	TR	ZA	RU	AU	MX	BR	Others (% if in 2012 or blank if pre-2012)	Industrial Uses
Antimony	0.62	92				2				Vietnam (3), Kyrgyzstan (2)	Batteries, fire retardant additive to plastics, micro-capacitors
Beryllium	0.85	9	90							Mozambique (1)	Military and consumer electronics, radar windows
Borates	0.88		6	98						Peru (2), Argentina (2)	
Chromium	0.96			16	80					India and Kazakhstan	Seawater desalination, marine technologies
Cobalt	0.71		3			96				DRC, China, Zambia	Additive for permanent magnets, super-alloys, tools and catalysts
Coking Coal	0.68		41			9	37			Australia	
Fluorspar	0.80	13			12			48		Mongolia and China	Production of Al, steel, petroleum fuels, insulations, refrigerants, et al.
Galium	0.60	39	49							Hong Kong and Kazakhstan	LEDs optical displays, new generation solar cells, military apps.
Germanium	0.86	47	35			14				China and Canada	PET catalyst, fibre optic fibres,infraredlenses
Indium	0.82	24								Hong Kong (19), Canada (13), Japan (11)	Flat Panel Liquid Chrystal Displays; new generation solar power panels
Magnesite	0.72	8		91						Russia and Slovakia	
Magnesium	0.64	91				2				Israel (5)	Light-weight vehicles,

								refractories, production of steel
Natural Graphite	0.72	57				15	Norway (9) and India	Batteries, brake linings, aluminium and steel making
Niobium	0.69				11	86	Canada (14)	Superalloys, steels
Phosphate Rock	0.98						Morocco (33), Algeria (13), China and US	
Platinum group	0.88		22	32	19		South Africa and Zimbabwe	Catalysts (vehicles and chemicals), high temperature components, fuel cells
REE(**)	0.77-0.67	41	17		35		Australia	Permanent magnets for motors and generators, electronics and displays
Silicon Metal	0.81	8			7	24	Norway (38), US, France	
Tungsten	0.70				98		Bolivia (2) and China	Tools, anvils for diamond synthesis, projectiles

(*) SI refers to 'Substitutability index'

Table 3: Rare earth elements by application

Rare Earth by Application	
Lanthanum	Hybrid automotive engines, metal alloys
Cerium	Auto catalyst, petrol refining, metal alloys
Praseodymium	Magnets
Neodymium	Auto catalyst, petroleum refining, high power/high flux magnets (HDD drives, headphones, electric motors incl. hybrid engines)
Promethium	Niche uses, light source (with phosphor), atomic battery
Samarium	Magents
Europium	Red colour for television and computer screens
Gadolinium	Magnets
Terbium	Phosphors, permanent magnets
Dysprosium	Permanent magnets, hybrid engines
Holmium	Glass, colouring lasers
Erbium	Phosphors
Thulium	Medical X-Ray units
Ytterbium	Lasers, steel alloys
Lutetium	Catalysts in petroleum refining
Yttrium	Red colour, flourescent lamps, tough ceramics, metal alloy agent
Scandium	Aluminium alloy, strengthening oxide fuel cells

Source: USGS[41]

[41] Statistics and Information, Mineral Commodity Summary, Rare Earths 2012: http://minerals.usgs.gov/minerals/pubs/commodity/rare_earths/mcs-2012-raree.pdf.

Observation of the EU's dependence on some of these materials reveals the level of risk faced by some of the EU's key industrial sectors. For example, the latest empirical data shows that the EU is 92% dependent on China for deliveries of antimony, a material used in flame-retardants and critically important for Europe's aerospace industry. Recognizing this key vulnerability, the DG for internal policy advised in a 2012 study, *Substitutionability of Critical Raw Materials*, that more research should be conducted on recycling and substitution.[42] However, the picture is not clear on what if any progress has since been made. In fact, there remains a dearth of statistics on EU economic vulnerability to disruptions and volatility of specific critical raw materials by sector, a problem that the EU needs to address in the near future. Nevertheless, some useful information does exist in terms of which member state is importing which materials. For example, the Netherlands, Germany, Italy, Belgium, the United Kingdom, France and Poland are each significant importers of antimony oxides.[43] The antimony case provides a good example of EU vulnerability. Approximately 60% of mined antimony comes from China; in Lengshuijiang province in Hunan to be specific. On one hand, China continues to maintain export quotas despite having lost a related WTO dispute case on tungsten and molybdenum. On the other, Beijing's attempts to control illegal mining led to large-scale closures in 2011 affecting some 100 mines, which in turn setoff a sharp short-term increase in prices.[44]

3 Existing restrictions on raw materials trade effecting the EU

One of the most comprehensive reviews of different types of export restrictions and their effects is the OECD study from 2014.[45] The study finds that export restrictions distort trade and that the benefits of high prices of raw materials, which can be observed after export restrictions are imposed, are short-lived at best. Export restrictions as a type of 'beggar-thy-neighbour' policy might result in retaliation of the importing countries by shifting their imports to other suppliers. In the long-run the exporting country might thus lose significant revenues. This is precisely what we observe in our case study of China's rare earth sector.

Export restrictions also seem to be a second-best option to combat depletion of resources.[46] Export restrictions can be understood as a form of subsidy for the domestic sector. While the overall production might go down in the short-term, domestic companies will not have incentives to invest in more environmentally friendly ways of production or alternative products.

Additionally, we now see some evidence of another significant domestic cost related to export restrictions. A recent systematic study shows that evidence of illegal trade in the form of a large discrepancy between importers' and exporters' statistics is more likely if export restrictions are in place.[47] World prices of raw materials go up following the introduction of export restrictions providing incentives for illegal producers to engage in criminal activities. In this regard, we also see in our case studies a significant increase of illegal trade emanating from China subsequent to Beijing's installation of its export restriction regime.

[42] http://ec.europa.eu/eip/raw-materials/en/system/files/ged/75%20Substitutability%20of%20CRM%20-%20DG%20Internal%20Policies.pdf. Last accessed on June 30, 2015

[43] http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do?dvsc=0 Last accessed on June 30, 2015

[44] http://www.ft.com/intl/cms/s/0/a66a2412-2264-11e0-b6a2-00144feab49a.html#axzz3dKDlhdJo Last accessed on June 30, 2015

[45] OECD (2014). Export Restrictions in Raw Materials Trade: Facts, Fallacies and Better Practices. Accessible through: http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf

[46] Frank Pothen and Kilian Fink (2015), "A Political Economy of China's Export Restrictions on Rare Earth Elements" (ZEW Discussion Papers, 2015), http://www.econstor.eu/handle/10419/109947. Last accessed on June 30, 2015.

[47] Pierre-Louis Vézina (2015), "Illegal Trade in Natural Resources: Evidence from Missing Exports," *International Economics*, Economics of Global Interactions, 142 (August 2015): 152–60, doi:10.1016/j.inteco.2014.09.001. Last accessed on June 30, 2015.

The use of export restrictions of various kinds has increased over the previous decade raising serious concern about the stability of raw material markets. Export restrictions in their various forms tend to distort the market in unforeseen ways. For example, many of the countries that employ export restrictions on certain raw materials concurrently import other raw materials. As one country implements restrictions similar actions can and have been taken by other suppliers thus driving up prices and increasing volatility. While some instances of trade restriction involve short-term stopgap protectionist measures (protecting domestic labour as in US steel or beefing up prices as in Chinese rare earths) others once implemented have lasted for many years. The most common types of restrictions are export permits, export taxes, and quantitative restrictions, although the latter, i.e. export prohibitions or quotas, are actually being used less frequently largely because of strict WTO rules. Nevertheless, Canada, the United States, Indonesia, Russia, and Nigeria each applied restricting measures on the export of specific wood products (coniferous sawn wood or industrial round wood) while China applied such restrictions on some 44 different products of ferrous and non-ferrous base, minor and precious metals in ore. Several of these restrictions were lifted or changed in some manner in recent years and some cases have been replaced with alternative measures with similar effect.[48] Therefore, despite major progress in recent decades to liberalize international trade in general, raw materials exports remain an object of concern.

While much of the literature and debate on the topic increasingly points to specific materials, including rare earths from China, there are a surprising number of restrictions put in place by countries traditionally seen as promoters of free trade. Not least among these is the United States, which since the 1970s has banned the export of domestically produced petroleum on national security grounds. While it is certainly possible to apply for and win an export license, it is quite difficult to acquire in practice. The recent boom in shale oil and gas has reopened debate in the US over whether the restrictions should be lifted, but it is interesting to note that no dispute has ever been brought against the US on its petroleum export restrictions. Technically, the US licensing restrictions are based on the need to safeguard exhaustible resources. Other countries use similar justification and licensing procedures on forest products such as Australia and Canada. [49/50] Russia, South Africa, and Canada each have either placed or currently place export taxes or surtaxes on various base minerals. In 2012, for example, Russia restricted exports of molybdenum, tungsten and diamonds (with an export tax) and bauxite, antimony, cobalt, copper, and sulphur (with an export licensing requirement). Meanwhile, Kazakhstan limited exports of aluminium via an export tax, as did India on chromium, and manganese, while Indonesia prohibited the export of silica sands, just to name a few.

The use of various methods beyond direct quantitative restrictions significantly increases the complexity of the global raw materials market. Table 4 presents a sample of 35 countries employing multiple methods (based on the OECD inventory) and depicts the types of restrictions on exports in raw materials for the year 2012. We find that the count of restrictions is particularly high in Afghanistan, Argentina, China, Guyana, India, Indonesia, Russia, Sri Lanka and South Africa. In fact, according to the OECD 34 countries currently apply more than one type of measure to restrict exports of raw materials. Indonesia (6), the Russian Federation (6), Canada (5), China (5), and India (5) appear to be the most creative and novel in their efforts. Meanwhile, Afghanistan, Belarus, Benin, Ghana, Rwanda, Thailand, Ukraine, and Uruguay each employed 3 while another 20 countries employed at least two types. The full overview of exports by sector is presented in Table 5, which was taken from the most recent OECD report (OECD 2014).

[48] See: http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf Last accessed on June 30, 2015.
[49] See: http://www.daff.gov.au/forestry/industries/export Last accessed on June 30, 2015.
[50] See: http://www.international.gc.ca/controls-controles/logs-bois/index.aspx?menu_id=17&menu=R Last accessed on June 30, 2015.

Table 4: Sample countries with multiple exports restrictions (2012)

Country	Export restrictions in industrial raw materials applied in 2012 (based on OECD 2014)
Afghanistan	Export tax for iron, steel, copper, nickel, zinc, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium Export licensing requirement for iron, steel, copper, nickel, zinc, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Algeria	Licensing requirement for beryllium, chromium, thallium
Argentina	Export tax for most goods, including minerals Export licensing requirement for iron, copper and cobalt
Belarus	Export quota on iron, steel, nickel, aluminum Licensing requirement for silver, platinum, gold
Benin	Export tax on gold Licensing requirement on gold and silver
Brazil	Export licensing requirement for magnesium
Dominican Republic	Export licensing requirement for iron and steel
Canada	Export tax on wood sawn
China	Export quota for bauxite, magnesium, molybdenum, phosphates, rare earth metals and other Export tax on copper, cobalt, iron, manganese, rare earth metals, tungsten, zinc and other Export licensing requirement for bauxite, molybdenum, phosphates, talc, thorium and tin
Ghana	Export prohibition for iron and steel
Guyana	Export prohibition for copper and aluminum Export licensing for iron, steel, copper, nickel, aluminum, zinc, tungsten, molybdenum, magnesium, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Jamaica	Export prohibition iron, steel, copper, aluminum, zinc, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Japan	Licensing requirement for lead, cadmium, antimony, beryllium, chromium, thallium
India	Export tax for chromium, iron, manganese, mica Export licensing requirement for chromium, manganese, silica sands Captive mining policy for coke, iron and steel, and manganese
Indonesia	Export prohibition for silica sands Export licensing requirement for precious metals and stones Qualified exporters list for diamonds
Kazakhstan	Export tax for aluminum products
Kenya	Export prohibition on iron, steel, nickel, lead, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Malaysia	Export tax for iron, steel, aluminum, copper, nickel, zinc, tin, magnesium
Morocco	Licensing requirement for iron, copper, nickel, aluminum, zinc, tin, molybdenum, tantalum, magnesium, cadmium, titanium, zirconium, antimony, beryllium,

	chromium, thallium
Nigeria	Export prohibition for iron, steel, nickel, aluminum, zinc, lead and tin
Pakistan	Export tax on iron, copper, nickel, aluminum, lead, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Paraguay	Licensing requirement for iron, steel, copper, aluminum
Russia	Export tax on coke, molybdenum, tungsten and diamonds Export licensing requirement for bauxite, antimony, cobalt, copper, sulphur, tin and other Domestic market obligation for certain precious metals and diamonds Minimum export price measure for precious metals and stones
Rwanda	Export prohibition for iron, steel, copper, nickel, aluminum, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
South Africa	Export licensing requirement for antimony, cadmium, chromium, copper, lead, molybdenum, precious metals and other Export tax for diamonds
Sri Lanka	Export tax on steel, iron, copper, nickel, aluminum, lead, tin, zinc Licensing requirement for iron, steel, copper, aluminum, lead, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Tajikistan	Export licensing for iron, steel, copper, nickel, aluminum, lead, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium, cobalt
Tanzania	Export prohibition on iron, steel, copper, nickel, aluminum, lead, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Thailand	Export tax on tropical and other types of wood Licensing requirement for different types of wood and silicates
Tunisia	Export tax on iron Licensing requirement for iron
Turkmenistan	Export licensing for zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Uganda	Export prohibition for iron, steel, copper, nickel, lead, zinc, tin, tungsten, molybdenum, tantalum, magnesium, cobalt, cadmium, titanium, zirconium, antimony, beryllium, chromium, thallium
Ukraine	Export tax on iron, steel, copper, nickel, aluminum, lead, zinc, tin, tungsten, cobalt, titanium
United States	Export prohibition on wood and coniferous wood
Uruguay	Export prohibition for iron, steel

Source: OECD

3.1 Export restrictions that effect the EU

Analysing the major suppliers of critical raw materials to the EU it is rather easy to identify the most likely sources of difficulty, or as some may say 'threats' to stable supplies. China and Russia are by far the most relevant countries in this regard; the former dominating the supply side in several key materials and both having issued multiple export restrictions in recent years. Yet they are not alone. The United States has issued export restrictions not only on industrial round wood and sawn wood, but as referenced above has maintained export restrictions on unrefined domestically produced petroleum and gas since the mid 1970s. The record on Russia is somewhat thinner in comparison to China and this, as mentioned earlier, results from the fact that Russia has only been a member of the WTO since 2012 (whereas China joined in 2001).[51] Therefore, Moscow has only been required to adhere to WTO rules and recording mechanisms for barely three years. Nevertheless, according to OECD data, Russia imposed a series of export restrictions on critical raw materials since 2009 and China issued 57 different export-restricting acts (quotas, licenses, etc.) on Antimony alone between 2009 to 2012.

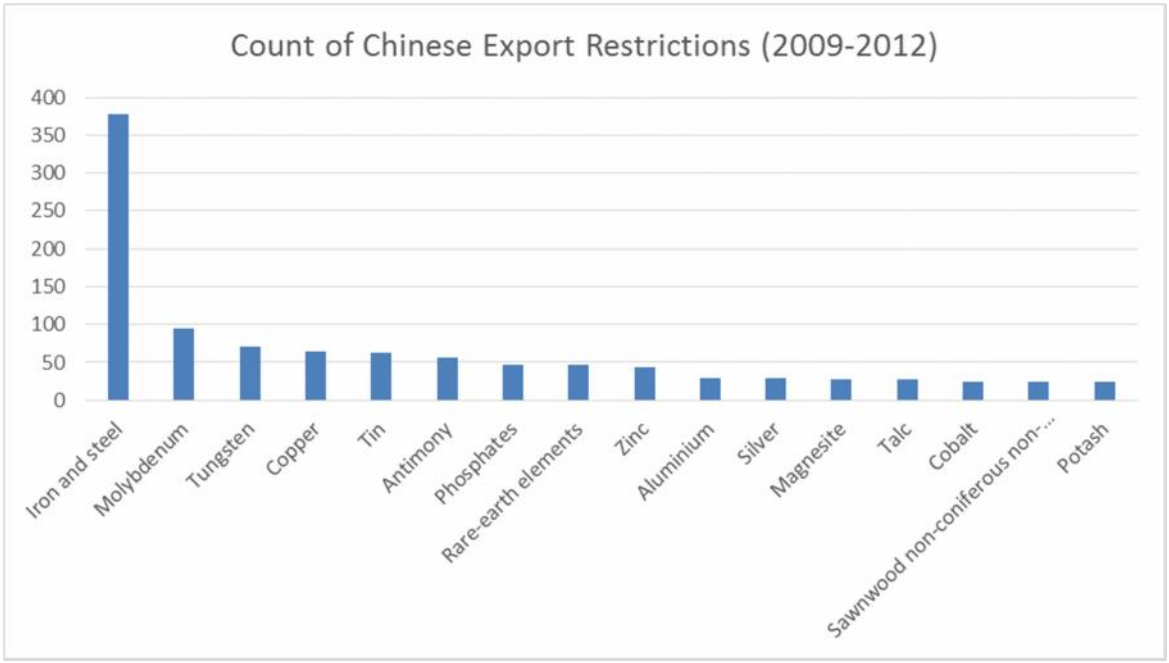

Figure 3 Chinese export restrictions, total count 2009-2012. Source: OECD.

[51]Currently, Russia has no open disputes related to critical raw materials. See: https://www.wto.org/english/thewto_e/countries_e/russia_e.htm Last accessed on June 30, 2015.

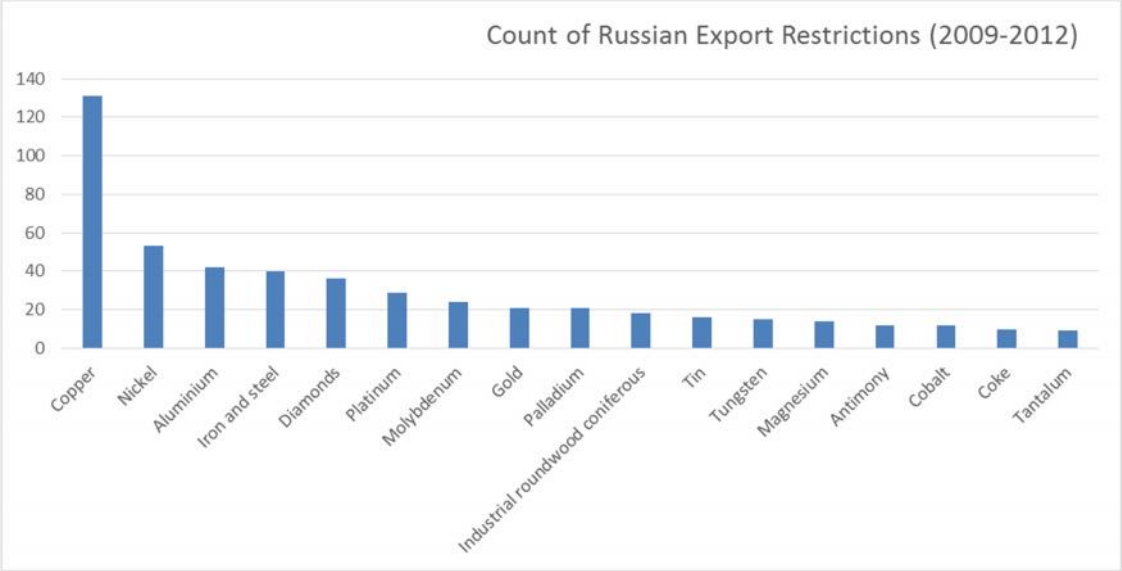

Figure 4 Russian export restrictions, total count 2009-2012. Source: OECD.

3.2 Specific restrictions related to raw materials in China

A General overview of Chinese restrictions related to raw materials can be found in official government reports including "Measures for the Administration of Export Commodities Quotas" (2001) and in the "Regulations of the People's Republic of China on Import and Export Duties". [52/53] Following recent WTO rulings, China has moved to cancel export quotas. However, it replaced these new rules on licensing, which it documents in its "Catalogue of Commodities subject to Export License Administration in 2015 (Announcement [2014] No.94)" and "License-Issuing Catalogue in Grades of Export License Administration in 2015 (Announcement [2014] No.97)".[54] The latter introduces new export licenses designed in essence to limit export of the rare metals tungsten and molybdenum.

The shift in policy approach is interesting in two ways. On one hand China has brought itself into compliance with WTO rules on quantitative restrictions of exports, i.e. it is now playing by the letter of the law in terms of rare earths tungsten and molybdenum. On the other hand, however, the transition away from the use of export quotas towards export licenses indicates that China is not playing by the spirit of law. Moreover, quantitative export quotas do still exist, but have yet to be addressed including antimony, magnesite and magnesium. For example, until July 2015, China maintained a strict export quota of 59,400 tonnes and placed an export tax of 5% on antimony ingots.

Another sign of China's use of these horizontal measures can be found in requirements for joint ventures and public tenders. In the case of the former, joint ventures require a Chinese partner. In the case of the latter, access to pubic bids are with few exceptions limited only to Chinese companies. A list of known horizontal trade restrictions employed by Beijing can be found in Table 5.

[52] http://english.mofcom.gov.cn/article/policyrelease/Businessregulations/201303/20130300045896.shtml Last accessed on June 30, 2015.
[53] http://english.mofcom.gov.cn/article/lawsdata/chineselaw/200411/20041100311020.shtml Last accessed on June 30, 2015.
[54] See more at: http://investorintel.com/technology-metals-intel/china-ends-export-quota-system-counters-strict-export-license-policy-limit-worlds-supply-rare-earths-tungsten-molybdenum/#sthash.uH0To8vl.dpuf Last accessed on June 30, 2015.

Table 5: Overview of Chinese trade restrictions

Type (Sector)	Implication	Known since	Strategy
FDI investment[55] (horizontal)	Only joint ventures with a Chinese partner are allowed, more oversight and control for foreign investments	2006	Ongoing bilateral negotiations with the "Agreement on investment with China"[56]
Investment catalogue[57] (horizontal)	In 2007 China moved the mining of raw materials such as antimony, fluorite, molybdenum, tin, and tungsten from the "restricted" category to the "prohibited" category	2010	Ongoing bilateral negotiations with the "Agreement on investment with China"[58]
Public procurement[59] (horizontal)	In principle, only Chinese companies are allowed to bid in public tenders and foreign ones are only allowed under exceptions	2007	PCA negotiations and a range of bilateral
Enforcement of Intellectual Property Rights[60] (horizontal)	Notarisation and legalisation requirements make the defence of IPRs difficult and time-consuming for foreign right holders	2009	A number of EU-China dialogues and workshops
Raw materials export restrictions[61]	China often uses trade restrictive measures, such as export duties and quotas on a broad range of key raw materials.	2008	WTO rulings (2012, 2014)

3.3 Consequences of trade restrictive measures on raw materials

The ripple effects of trade restrictive measures are numerous and impact the entire supply chain from the supplier mine (or forest) to the factory floor and thus also affect consumers around the globe.

3.3.1 Consequences for importing countries and geopolitics

Importing countries are the immediate losers from export restricting measures on raw materials. Importers end up paying a higher price for vital inputs and feedstocks, raising costs of production that are transferred to consumers. Moreover, because such measures tend to be subject to frequent changes, they tend to lead to uncertainty in the market, making it difficult for importers to plan ahead. This in turn leads to panic buying and cycles of shortages and over supply. For the high technology industries of

[55] http://madb.europa.eu/madb/barriers_details.htm?barrier_id=060138&version=3 Last accessed on June 30, 2015.
[56] http://europa.eu/rapid/press-release_MEMO-13-1080_en.htm Last accessed on June 30, 2015.
[57] http://madb.europa.eu/madb/barriers_details.htm?barrier_id=105383&version=10 Last accessed on June 30, 2015
[58] http://europa.eu/rapid/press-release_MEMO-13-1080_en.htm Last accessed on June 30, 2015.
[59] http://madb.europa.eu/madb/barriers_details.htm?barrier_id=960027&version=22 Last accessed on June 30, 2015.
[60] http://madb.europa.eu/madb/barriers_details.htm?barrier_id=095243&version=10 Last accessed on June 30, 2015.
[61] http://madb.europa.eu/madb/barriers_details.htm?barrier_id=095245&version=15 Last accessed on June 30, 2015.

Europe this is particularly troublesome as such uncertainty makes planning for and implementing a low carbon economy very difficult.

While raw materials producers reap immediate short-term gains from export taxes and quotas, those gains set-off a chain of events that ultimately disrupt the international market and in some cases can lead to nasty geopolitical consequences. For example, in the energy sector, trade restrictive measures (quotas) on oil exports are a constant subject of tension among OPEC members, as is pricing controls on the export of natural gas by the Russian Federation. In some cases restrictions on raw materials exports have been used or at least implied as a tool of foreign policy. China's implementation of short-term restrictions on rare earth minerals essential to high-technology motors, solar power panels and fuel cells, applied in the wake of disputes with Japan in the East China Sea, have been cited as such. Regardless of intent, those restrictions led to a sudden supply shortfall in the market.

Moreover, higher world market prices resulting from trade restrictive measures do not incentivize investments in the raw materials mining sector as one would expect. In fact, according to the OECD, the opposite tends to occur because the resulting uncertainty actually curtails such investment. In other words, the market seeks predictability. Trade restrictions on the exports of raw materials thus disrupt long term planning.

3.3.2 Exporting countries

Despite the well-documented fact that export restrictions in their various manifestations tend to distort not only downstream markets but also domestic economies, countries both large and small continue to implement such measures. **What do states expect as result of the imposition of such restrictions?** Those that do implement temporary or long-term export restrictions (be they of the traditional quantitative or more horizontal class) do so on the premise that the restrictions will aid in the achievement of certain policy goals, whether they be protectionist or predatory in nature. However, such restrictions skew the allocation of domestic resources in unpredictable ways, resulting in significant and difficult to reverse policies. According to one OECD study, they may even lead to reduced revenues and negative environmental consequences for the exporter.[62]

Perhaps the most important logic underlying the use of export restrictions, and certainly an enticing one, is the immediate result derived from bolstering a specific domestic industry, fostering a domestic downstream processing industry, or reducing domestic prices on a specific commodity. In short, export restrictions of raw materials amount to an indirect subsidy with significant implications across the domestic market. While this may not seem immediately evident in the case of rare earth metals from China, it most certainly is in the case of petroleum in the US, one of the best, if not least discussed, examples. In the wake of the 1973 Arab oil embargo, the US moved to lock in domestic oil production. The goal was to limit reliance on imports from the Middle East and cushion the US from swings in the global oil market, targets that were not met as a result of the export ban. Because refined fuels were not part of the ban, all US oil (with few exceptions) now goes through US refiners. In essence, the measures provide a windfall for the refinery business in the US, which buys "oil at artificially low prices and then export[s] the gasoline and diesel abroad at a mark-up."[63] The US case lends support to the theory that raw material export restrictions tend to lead toward profit shifting in favour domestic and foreign processing firms.

[62] http://www.oecd.org/trade/benefitlib/export-restrictions-raw-materials-2014.pdf Last accessed on June 30, 2015.
[63] http://www.washingtonpost.com/blogs/wonkblog/wp/2014/01/08/u-s-oil-exports-have-been-banned-for-40-years-is-it-time-for-that-to-change/ Last accessed on June 30, 2015.

Studies by the OECD point out that while such measures may be intended to assist downstream domestic industry, the results are often quite the contrary over the long-term because the resulting lower prices reduce the incentive of raw materials producers to invest in further exploration and development. Another result is that importing countries faced with such restrictions have the incentive to seek out substitutes and alternative suppliers. Over the long run, this leads to greater supplier competition, creating pressure on the restrictive exporting country to export more. In the case of critical raw materials, this can pose quite a problem given the high supplier concentration of some of the materials. As more exporters join the fray, prices decline, lowering revenues for the country that implemented the trade restrictive measures in the first place. Subsequently faced with lower prices, new suppliers may themselves then turn to trade restrictions to bolster international prices, resulting in higher prices, i.e. adding volatility to the market and skewing it all the more.

There are certainly short-term benefits to the implementation of trade restrictive measures to be had by exporting countries. Not least among these are the protection of jobs, environmental concerns, and the desire to command (affective) control of prices. However, export taxes and restrictions do not benefit domestic downstream industries or enhance domestic value added-processes in the long run. Rather, such restrictions may actually hurt domestic industry. It comes as no surprise, therefore, that the OECD in its 2014 study "Export Restriction in Raw Materials Trade: Facts, fallacies and better practices" concludes that raw material exporters are in general subject to volatility caused by booms and busts in the market, and proscribes alternative strategies to trade restrictive measures, pointing to Chile (and the rules it placed on Copper) and Botswana (and its management of diamonds). The latter chose to implement a series on non-export restricting measures including a corporate profits tax, a royalty, and withholding tax on dividends whereby mining firms can deduct capital expenditures (with unlimited carry forward of losses) leading to a variable rate income tax and increasing profitability.[64] The result has been substantial investment in the country's infrastructure, leading to increased revenues redirected into health care and education systems that moved the country from one of the world's least developed countries in 1995 to an upper-middle income country by 2011.[65]

4 Illegal trade in raw materials

While there are a few systematic analyses and data collections on timber[66] (See Case 1 below) and conflict diamonds, we know little about the magnitude of illegal trade, routes, and hubs for many other raw materials such as rare earths or fossil fuels. The following paragraphs thus try to address a group of related questions.

- What empirical evidence exists to suggest that there is illegal trade in raw materials involving the EU?
- If such evidence does exist, where is it occurring and with which minerals?
- What are some of the reasons behind why it might be occurring?

[64] OECD (2014): 234.
[65] see UN General Assembly resolution A/RES/49/133.
[66] Lieselot Bisschop (2012). "Out of the Woods: The Illegal Trade in Tropical Timber and a European Trade Hub.," *Global Crime* 13, no. 3 (August 2012): 191–212.

4.1 Illegal trade in raw materials involving the EU: Data and empirical evidence.

Quantities of raw materials traded illegally are per definition not recorded in official databases. One possible and useful indicator to determine the scope of such illegal trade is a comparison of the difference between reported exports from suppliers and reported imports from the European Union. Given the high concentration of critical raw materials in China and the EU's dependency on the latter, it is further useful to take China as a working example. Using this method over time, we can also observe possible triggers to illegal trade, such as the imposition of trade restrictions (quotas and the like). For example, the difference between officially reported Chinese exports and EU imports of scandium and yttrium between 1992 and 2013 (Figure 5) indicate a sharp increase in unaccounted imports into the EU following a 2008 tariff hike for yttrium and then receded a bit following Beijing's efforts to promote consolidation among producers in 2010.

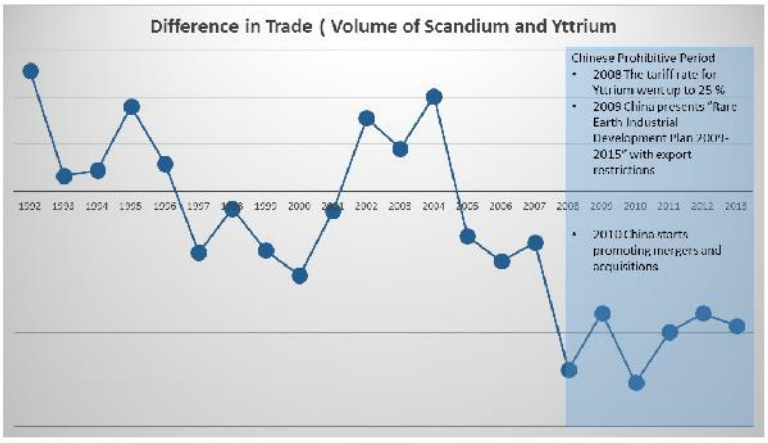

Figure 5: Example reported trade difference from China

4.1.1 EU sectors more likely to be effected (high-risk of illegality)

Europe is critically under-endowed in key raw materials that are currently irreplaceable in its industry. A disruption in the supply of some of those materials could have significant negative consequences for downstream sectors. This is most obviously reflected in the metals refining sector, which delivers processed materials to manufacturers of a wide range of necessary products including the healthcare sector (magnets made from rare earths) and electronics (aluminium and copper). The EU's pursuit of an increasingly advanced high technology industrial sector from advanced batteries and efficient electronics to aerospace requires a steady and growing stream of inputs of materials such as indium (transparent conducting layers and PV panels), platinum group materials (used to make catalytic converters to manage exhaust emissions), various rare earth elements (for magnets in wind turbines), and silicon and tellurium (for solar power).[67] In short, reliable access to predictably priced critical raw materials is essential to Europe's contemporary and future economic prosperity as well as vital to its plans to build a sustainable carbon-light economy. Price volatility and the presence of supply bottlenecks coupled with the geographic concentration of critical minerals should continue to be a concern for EU manufacturers

[67] See EU JRC (2011), Assessing metals as Supply Chain Bottlenecks in Priority Energy Technologies. Available through: https://setis.ec.europa.eu/system/files/CriticalMetalsinStrategicEnergyTechnologies-def.pdf. Last access July 30, 2015.

and policy makers alike as sudden shortages and price hikes could reduce the international competitiveness of EU companies in the long run.

Some of the economic sectors, industries, and applications that could be affected by sharp changes in supply or pricing of critical raw materials include:

- **Automobile**: hybrid automotive engines, auto catalyst, light-weight vehicles, brake linings, and permanent magnets for motors;
- **Materials/Metallurgy**: metal/steel/aluminium alloys, tough ceramics, PET catalyst, super alloys, and high temperature components;
- **Energy**: petroleum refining, light source (with phosphor), atomic batteries, lasers, strengthening oxide fuel cells, batteries, new generation solar cells, and permanent magnets for generators;
- **Consumer electronics/ICT**: high power/high flux magnets (HDD drives), red colour for television and computer screens, micro-capacitors, refrigerants, LED/LCD optical displays, fibre optic fibres, permanent magnets for electronics and displays, and audio headphones;
- **Health care**: medical X-Ray units;
- **Aerospace/military**: fire retardant additive to plastics, radar windows, infrared lenses, and projectiles;
- **Environment**: seawater desalination and marine technologies.

As mentioned earlier, it is difficult to assess the share of illegal trade in raw materials. That said, using the methodology of distinguishing between reported exports and imports helps us to identify which raw materials appear to be traded in a non-explicitly documented fashion. Looking at the list of critical raw materials (Table 2 and Table 3) and then combining it with primary and concentrated suppliers, we can identify which materials and thus sectors are most likely to be subject to illegal trade if and when restrictive trade measures are put in place. Part of the calculation, already included in Table 2, is the assumption that there is a market concentration of a material whereby any trade restrictive measure would substantially curtail its legal availability on the market. Certain materials such as niobium in Brazil, beryllium in the USA, and platinum in South Africa are likely to rise in price as demand for high-technology emerging products grows. It is, however, clearly rare earth elements and minerals such as antimony, magnesium, and tungsten - materials highly concentrated in China (among others) – that face the greatest risk of supply restriction, disruption and illegal activity. Such materials are crucial to numerous vital sectors of the economy including but not limited to renewable energy, aerospace, plastics, lighting, development environmental technologies, advanced metallurgy, and the automotive industry.

4.1.2 Exporting countries where illegal trade originates

Evidence suggests that illegal mining operations in China (rare earths) and Ukraine (coal) are resulting in illegal exports that may be finding there way into EU. Both of these issues are discussed below. The most well documented and thoroughly studied cases of illegal trade in raw materials focus on timber out of Vietnam, the world's fourth largest exporter of timber, a problem that has spread to neighbouring countries Cambodia and Laos (See case study 1). Illegal logging was first acknowledged as a major

problem at the 1992 Rio Earth Summit.[68] Illegal logging and forest crime is estimated to account for US$ 30 to US$100 billion annually.[69] Illegal logging also indirectly contributes to trade in endangered species, corruption, money laundering and organised crime; and it carries serious negative consequences for the environment and sustainable development including damaging the quality of soil and water.[70] In response to the need for action, the EU developed a Forest Law Enforcement, Governance and Trade (FLEGT) action plan and has been working on Voluntary Partnership Agreements (VPA) with key partners.

While data on illegal timber trade has allowed concerted international and EU action, other key raw materials remain largely outside the international communities' regulatory radar. Recent advances in technology in particular have substantially increased the importance and demand for minerals, rare earths especially, out of China. The presence of a black market for rare earths out of China is borne out in the difference between the customs reports of China and those of its trading partners. According to official, but rough, Chinese estimates, the difference between Chinese exports and foreign imports of rare earths is a ratio of around 1.2.[71] While statistical discrepancies between reported export and imports will always be present, the magnitude of the difference indicates presence of illegal exports. Importantly, there is no central database of illegal trades in raw materials. Therefore, it is impossible to assess the precise magnitude of illegal trade. Nevertheless, we can add to our analysis above the difference in the official record between exports and imports based on the news reports and make some preliminary assessments.

Wang Qinhua, the vice president of the China Nonferrous Metal Industry Association, estimates that around one third of the total Chinese rare earth output is produced through illegal mining.[72] Illegal mining operations are particularly dangerous for miners because regulations are ignored and oversight thwarted. It is a serious issue for governments. According to some estimates, half of the deadly accidents across all of China's mines stem from illegal operations.[73] It is however difficult to assess the extent to which such figures accurately reflect reality. Given the penalties involved and on-going anti-corruption campaign of Chinese President Xi Jinping, local Chinese government officials have an incentive to misrepresent the statistics in order to shift the blame and avoid responsibility.

Another sign of the apparent existence of this black market is official Chinese initiatives to combat illegal mining. The most notable among these was a 2013 campaign of the government that resulted in the suspension of 126 rare earth companies operating in China.[74] While the crackdown could also be explained as a government attempt to consolidate control of the market, the campaign led to significant

[68] Lieselot Bisschop (2012). "Out of the Woods: The Illegal Trade in Tropical Timber and a European Trade Hub.," Global Crime 13, no. 3 (August 2012): 191–212.

[69] Nellemann, C. et al. (2014). The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resouces. A UNEP Rapid Response Assessment. United Nations Environment Programme. Available through: http://www.unep.org/unea/docs/RRAcrimecrisis.pdf. Last accessed in June 30, 2015.

[70] See as cited in Bisschop (2012): Tim Boekhout van Solinge, 'Eco-Crime: The Tropical Timber Trade', in *Organized Crime: Culture, Markets and Policies*, ed. Dina Siegel and Hans Nelen (New York: Springer, 2008); Rosaleen Duffy, 'Global Governance, Criminalisation and Environmental Change', *Global Crime* 7, no. 1 (2007); TRACER, *The Rough Guide to Traceable Certified Forest Products* (Viborg: Special- Trykkeriet, 2011); and WWF, *Illegal Wood for the European Market. An Analysis of the EU Import and Export of Illegal Wood and Related Products* (Frankfurt am Main, Germany: World Wildlife Fund, 2008).

[71] See: http://ycls.miit.gov.cn/n11293472/n11295125/n11299425/n14676844.files/n14675980.pdf. Last accessed on June 30, 2015.

[72] Xinhua (2015b). "China Illegal Rare Earth Mining Hit 40,000 Tonnes Each Yr, Expert," *xinhua08.com*, accessed June 13, 2015, http://en.xinhua08.com/a/20141103/1406631.shtml.

[73] See: http://www.rfa.org/english/commentaries/energy_watch/mines-12032012103013.html Last accessed on June 30, 2015.

[74] Tracy Yang (2015), "China starts 6-month crackdown on illegal mining of rare earths". SNL Metals&Mining Daily: East Edition. Accessed through factiva, Inc.

clashes between local governments and illegal miners indicating the complexity and risk of gauging the degree of control China actually exerts over its mining sector.[75]

Empirical analysis of the trade in critical raw materials reveals that outside of countries undergoing open conflict, a class that includes diamonds from Africa and relatively small quantities of petroleum from Nigeria, Syria and Iraq, the most important source for Europe remains China. The reasons for this are:

- The Chinese raw material market is highly fragmented;
- China's institutional and legal setting is weak; and
- Growing international demand creates payoffs for illegal trade.

The New York-based Natural Resource Governance Institute (NRGI), a multi-stakeholder NGO, provides regular reports on the activities of the extractive industries in their use of national endowments of oil, gas and minerals. In recent reports it finds that China falls short in several key categories when it comes to transparency, leading to a number of difficulties. For example, there appears to be a lack of clarity on precisely which authority is in charge of resource governance making it difficult to enter the market or to find an authority to track on-going activities. State owned companies dominate and receive preferential treatment. Given that the regulatory framework for licensing lacks a path for appeals, it thus becomes difficult for competitors to legally acquire licenses and exacerbates the possibility for corruption of local government officials who oversee local mines. As a result there appears to be a number of unlicensed mines operating at the consent of local authorities, but without the consent or knowledge of officials in Beijing. In short, existing regulations China where they are explicitly known are poorly enforced.[76]

The sources of illegal trade from China are, of course, not purely internal. Growing demand for specific resources with few to no substitutes coupled with lack of alternative suppliers creates powerful incentives for illegal traders. This powerful pull effect may be a possible explanation for the proliferation of illegal mining operations inside Chinese territory. One indicator of this effect may be the incredibly high number deaths occurring in Chinese coal mines resulting from lackadaisical control or absent oversight of safety rules, something that would be a logical outcome of unlicensed mining or local corruption. If this is indeed the case, and illegal miners are taking advantage of loopholes, corruption, and the governance problems stemming from the sheer dimension of China's territorial space, illegal trade networks will only exacerbate the environmental and social costs normally associated with the extractive industries.

The most identifiable cause of illegal trade stemming from China is of course its use of trade restrictions, which incentivize illegal mining and trade. A systematic review of Chinese trade restrictions reveals two broad types employed by Beijing, namely horizontal restrictions such as those limiting FDI opportunities and the more traditional ones limiting the export of specific raw materials (See Table 5). The presence of non-traditional quantitative trade restrictions complicates the raw materials trade picture in China, but it also offers opportunities for remedial efforts inline with past successful efforts by the EU in its PCA and FTA negotiations. In essence, while the EU can and has raised legal disputes on some of the specific trade restrictions with limited success, it will need to work harder in the area of horizontal restrictions if it wants to take wind out of the sails of China-sourced illegal raw materials trade.

[75] Factiva (2015). "China must readjust rare earth industry", Industry Updates. Accessed through factiva, Inc.
[76] See: http://www.resourcegovernance.org/countries/asia-pacific/china/overview Last accessed on June 30, 2015.

4.2 Meaningful Case Studies

4.2.1 Drivers of illegal trade in raw material and the link to export restrictions

As we have shown above, one of the major incentives for illegal trade is increasing prices of the material (for example resulting from an introduction of export restrictions) and weak property rights in a combination with fragmented market (China). One of the most visible drivers of that illegal trade is the lack of alternative income opportunities in raw material exporting countries. While many OECD countries also produce raw materials, their economies tend to be well developed, regulated, and diversified. Alternatively, countries with undiversified economies tend to exhibit other features that reinforce the advantages of illegal trade.

For example, many raw materials exporters lack a strict rule of law, which opens not only avenues for corruption and exports that do not meet formal documentation standards, but is often a sign of government's inability to maintain reasonable oversight of its territory, leading to smuggling opportunities. The end effect is lost revenues for the government, increasing pressures to increase resource rents, sending most countries that lack institutional quality into spiral commonly referred to as a resource curse; a feature most visible in countries where oil and or gas dominate export revenues and governments.[77] Economies that are over-dependent on revenues from mineral exports tend to suffer from corruption creating "a fisherman's market for rent-seeking behavior" where those with cash "jockey to acquire lucrative contracts, using the revenues to bribe and manipulate those in power".[78] Meanwhile, volatility of commodity prices on international markets leads to significant fiscal planning and spending problems, which in turn hamper trade liberalization and reduce the quality of public spending.[79] All of these forces come together in countries were there are significant quantities of mineral resources, little to emerging institutional quality and oversight, and poor governance of territory.

Added to this dynamic is the feature of export restrictions in their various forms. Those restrictions, even when caused by legitimate needs to protect the environment or preserve exhaustible resources, constrain legitimate avenues of revenues for the extractive industries. At the surface, such restrictions put a limit on supplies, which in theory should drive up prices making it more attractive to mine and sell raw materials. However, where the regulatory framework to control mining and exports is weak, a loophole exits that is in some cases too attractive to ignore. This creates not only incentives for local illegal miners, but also negatively affects foreign firms by adding risk to investments. In countries like China, where an effort is underway to consolidate small mine operators, smelters and related industries into a few large-scale operations, the scales are tilted against small and medium enterprises, reducing diversification even further within the extractive sector. Therefore, seen in the larger picture of the traditional economics of diversification or the lack thereof, export restrictions can and often do act as force multipliers.

[77] Schubert, Samuel R. (2006). "Revisiting the Oil Curse", *Development* (2006) 49, 64–70. doi:10.1057/palgrave.development.1100291.

[78] Schubert, Samuel R., "Being rich in energy resources – a blessing or a curse", Study for the European Parliament 2007. Accessible through: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2007/348614/EXPO-AFET_ET(2007)348614_EN.pdf. Last access on August 11.

[79] Karl, Terry Lynn and Gary Ian (2009), "The Global Record," in Foreign Policy In Focus, Interhemispheric Resource Center/Institute for Policy Studies/SEEN, Washington, DC & Silver City, NM, January 2004. pp35-42. Last accessed on June 30, 2015.

4.2.2 The case of illegal timber

Illegal logging is one of the oldest and well-examined problems in the world of international trade. A number of initiatives have been developed in order to tackle illegal timber trade Since the Rio Summit in 1992. Similar to other illegal trade activities, illegal timber trade is associated with high environmental costs through deforestation, social costs through the financing of conflicts, and economic costs through the losses of tax revenues.[80] The organisation 'Global Timber' estimates there are some significant flows in illegal sawn wood to the EU from Russia and Cameroon. On a global scale, however, China remains one of the leading importers of illegal timber.[81]

The EU has developed two major types of instruments in order to fight illegal timber: (1) internal regulations and (2) bilateral partnership agreements. One of the major EU regulations within the sector is Regulation No 995/2010 of the European Parliament and of the Council of 20 October 2010, which establishes the obligations of European operators who place timber and timber products on the market.[82] The regulation prohibits placing illegal timber on the European market and requires that EU market actors exercise 'due diligence'. The principle of due diligence, in turn, is built on three pillars: (1) information (requiring detailed information about the supplier), (2) risk assessment (related to the risks of illegal trade in the supply chain), and (3) risk mitigation (if the risk of illegal trade increases, additional information can be requested). While the wording of the regulation is both clear and strict, the level of implementation differs from member state to member state. For example, Poland, Spain, Greece, Hungary and Romania have not implemented appropriate penalties and checks for the operators.[83]

While there are some challenges associated with the regulation of the EU internal market, a much more difficult problem is the enforcement of commitments by the world's major suppliers of timber. Imposing export restrictions on some of the most important raw materials can lead to a shift of environmental externalities to other countries. For example, the world's fourth largest exporter of timer, Vietnam, made significant strides to increase natural conservation of its forests and did so through export restrictions. That approach backfired spawning illegal timber imports to Vietnam from Cambodia and Laos.[84] To tackle the problem with external suppliers the EU uses bilateral partnership agreements through the FLEGT action plan (Forest Law Enforcement, Governance and Trade). One of the main mechanisms of FLEGT is a Voluntary Partnership Agreement (VPA), which leads to a legally binding agreement to ensure that products exported to the EU are legal.[85] At present, the EU is still negotiating the VPA with Vietnam[86] and Laos[87] and has not yet begun negotiations with Cambodia.

[80] Bisschop, "Out of the Woods: The Illegal Trade in Tropical Timber and a European Trade Hub." Last accessed on June 30, 2015.
[81] See statistics through: http://www.globaltimber.org.uk/overview.htm Last accessed on June 30, 2015.
[82] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010R0995 Last accessed on June 30, 2015.
[83] See: http://ec.europa.eu/environment/forests/pdf/EUTR%20implementation%20scoreboard.pdf Last accessed on June 30, 2015
[84] "Trade in Illegal Timber: The Response in Vietnam," *Chatham House*, accessed June 27, 2015, http://www.chathamhouse.org//node/16451. Last accessed on June 30, 2015.
[85] See: http://www.euflegt.efi.int/vpa Last accessed on June 30, 2015.
[86] See: http://www.euflegt.efi.int/vietnam Last accessed on June 30, 2015.
[87] See: http://www.euflegt.efi.int/laos Last accessed on June 30, 2015.

4.2.3 The case of Antimony, Germanium, Indium, and Magnesite from China

China maintained an annual export quota of 59,400 tons and placed a 5% export duty on the export of antimony ingots through July 2015. It also recently declared that will issue new quotas in the near future (China issues quotas on non-WTO-disputed raw materials for six months at a time). Allegedly in response to illegal mining of its antimony, Chinese officials closed around 100 illegal and unlicensed mines in January 2011, leading to a sudden and sharp increase in global prices.[88] Around 60 percent of China's antimony is produced in Lengshuijiang province (in Hunan), where Beijing closed several additional mines in May 2015.[89] That same month shipments of antimony were delayed; allegedly over tensions between China and Vietnam over a dispute about a Chinese oilrig operating waters mutually claimed as sovereign territory.[90] The latter event, no matter how short in duration, lends credence to the concern that the high concentration of raw materials in China may be used as a geo-economic weapon abroad.

That said, China's strict control of antimony exports and its apparent attempts to consolidate the market have given rise to alleged incidents of illegal exports and tax evasion.[91] The New York Times reported in 2010 that Chinese rare earths were actively being smuggled into Vietnam and sold to Japanese traders.[92] Furthermore, China's recent efforts to crackdown on illegal mining came on the heels of a 2013 campaign that suspended production at 126 rare earth companies. At the time, China identified at least 19,000 tonnes of rare earths that were being illegally mined. According Jia Yinsong, head of the China's Rare Earth Office, profits from illegal mining of rare earths have been used to bribe local government officials. Most recently, in response to a WTO ruling in May 2015, China dropped its export taxes on germanium and indium, the latter of which has been under pressure due to incidents of fake trade.[93] It subsequently replaced the export tax with purchasable export licenses covering a total of 158,000 tons.[94] Other recent incidences of illegal trade in raw materials out of China include a June 2014 report that Chinese customs officials cracked down a smuggling ring that illegally exported 80,000 tons of magnesite.[95]

4.2.4 The case of conflict minerals

As already mentioned illegal trade is associated not only with significant economic costs but might also be an important source of income for criminal activities. It may even provide the means for insurgent groups to finance conflicts and thus increase the likelihood of civil wars.[96] In this context some of the most widely cited and researched examples are related to the Democratic Republic of Congo (DRC). The DRC is rich in terms of natural resources, but has been so riddled with some of the deadliest sporadic

[88] See: http://www.ft.com/intl/cms/s/0/a66a2412-2264-11e0-b6a2-00144feab49a.html#axzz3dKDlhdJo Last accessed on June 30, 2015.
[89] James Heywood and Ellie Wang, "Lengshuijiang Antimony Shutdowns: What Is the Background?," *Metal Bulletin Daily*, May 11, 2015, 1–1.
[90] Chloe Smith, "Antimony Shipments Delayed on China-Vietnam Tensions.," *Metal Bulletin Daily*, no. 416 (May 23, 2014): 1–1.
[91] Li Xiaowei, "China Customs Lifts Minimum Magnesium Export Price to Combat Tax Evasion," *Metal Bulletin Daily*, no. 269 (7/1/2011 2011): 1–1.
[92] See: http://www.nytimes.com/2010/12/30/business/global/30smuggle.html?_r=0 Last accessed on June 30, 2015.
[93] James Heywood, "China Scrapping Indium, Germanium Export Taxes a Boon for Producers," *Metal Bulletin Daily*, May 11, 2015, 1–1.
[94] Metal Bulletin Daily (2015). "China Issues First Batch of Indium Export Licences for 2015," *Metal Bulletin Daily*, January 19, 2015, 1–1.
[95] Metal Bulletin Daily (2014)."Group behind Ferro-Silicon, Magnesite Smuggling Caught in China," *Metal Bulletin Daily*, no. 419 (June 16, 2014): 1–1.
[96] Paul Collier and Anke Hoeffler, "On Economic Causes of Civil War," *Oxford Economic Papers* 50, no. 4 (October 1, 1998): 563–73, doi:10.1093/oep/50.4.563.

conflicts since 1998 that BBC once referred to it as 'Africa's World War'.[97] A complex supply chain with many intermediaries provides cassiterite (for tin), wolframite (for tungsten), coltan (for tantalum), and gold ore from eastern Congo to the international markets.[98] An important milestone to fight the flow of conflict minerals from Congo comes from the US Congress. The Dodd Frank Wall Street Reform and Consumer Protection Act passed in July 2010 requires all US companies to report the use of tin, tungsten, tantalum and gold originating from the DRC.[99] In the US, the first reports on the implementation were due by June 2014. A similar regulation is not in force at the European Union level, even though there is a proposal for a regulation setting up a Union system for supply chain due diligence and self-certification of responsible importers of tin, tantalum and tungsten, their ores, and gold originating in conflict-affected and high-risk areas (2014/0059 (COD)).[100] This proposal is presently under consideration by the European Parliament and the Council of Ministers. While the European Parliament has adopted its position (contrary to the Commission's proposal by opting for mandatory due diligence), the Commission's proposal still needs to pass through the Council. It is expected that there will be tough negotiations and it is thus difficult to assess when the legislation will enter in force.

4.2.5 The case of coal from Ukraine

Recent reports indicate that there are incidences of illegal coal mining in the Donbass mining region of eastern Ukraine.[101] The Ukrainian case reveals the significance of conflict and instability on the question of illegal mining and trade in raw materials. Since the outbreak of conflict in Ukraine, some 70 percent of the countries larger coalmines have been closed opening up opportunities for the country's smaller mines known as 'kopanki'. Already in existence since the 1990s, these small mines have allegedly fallen under control of organized criminal networks and, amidst the on-going conflict, provide an alternative income source for many people.[102] Most of the 'kopankis' are located in the Donbass region. Miners were highly respected and enjoyed special privileges in Soviet times. However, the post-Soviet period brought economic decline to the mines, which were subsequently abandoned by the government creating opportunities for criminal operations. Insofar as it exists, it is a particularly troublesome issue in terms of health and safety issues and carries with it significant social and environmental costs. Unfortunately, it is difficult to assess how much of this coal actually stays within the Ukrainian market and how much is directed towards the EU. Nevertheless, Ukraine is ranked second in terms of coal mine accidents, second only to China.[103] Given that at least some illegal mining in China is resulting in illegal trade and given Ukraine's proximity to the EU, it is worth further investigation.

[97] BBC (2015)."Democratic Republic of Congo Country Profile - Overview," *BBC News*, accessed June 28, 2015, http://www.bbc.com/news/world-africa-13283212. Last accessed on June 30, 2015.
[98] Nick Heath, "How Conflict Minerals Funded a War That Killed Millions, and Why Tech Giants Are Finally Cleaning up Their Act - Feature," *TechRepublic*, accessed June 28, 2015, http://www.techrepublic.com/article/how-conflict-minerals-funded-a-war-that-killed-millions/. Last accessed on June 30, 2015.
[99] Can be access through: https://www.sec.gov/about/laws/wallstreetreform-cpa.pdf Last accessed on June 30, 2015.
[100] The draft can accessed here: http://trade.ec.europa.eu/doclib/docs/2014/march/tradoc_152227.pdf Last accessed on June 30, 2015.
[101] See: http://www.aljazeera.com/indepth/features/2014/12/illegal-coal-mines-lifeline-ukraine-201412149473940849O.html Last accessed on June 30, 2015.
[102] See: http://www.bloomberg.com/bw/articles/2013-11-27/ukraines-illegal-coal-mines-lure-desperate-workers Last accessed on June 30, 2015.
[103] Peter Burgherr and Stefan Hirschberg, "Comparative Risk Assessment of Severe Accidents in the Energy Sector," *Energy Policy*, Nuclear Energy and Sustainable Development: Selected Topics, 74, Supplement 1 (Dezember 2014): S45–56, doi:10.1016/j.enpol.2014.01.035.

5 Assessment of possible remedial effects

Based on the analysis above, we have generated the following table (Table 5), which provides an overview and rough assessment based on a grading scale between A (for excellent) and C (for average) of remedial instruments for trade distorting practices. We conclude that one of the best mechanisms for both the exporting and importing countries is to develop strong EU regulations as has been done with the timber regulation (No 995/2010) or the currently negotiated regulation on tin, tantalum, tungsten and gold originating from conflict regions (2014/0059 (COD)) with clear requirements of due diligence. We argue in favour of this instrument because it can ensure the highest levels of legal security and compliance. As we have described in the case with China, fighting export restrictions is difficult as long as there are incentives at the domestic level to increase prices or to consolidate the market. One of the major factors affecting the price volatility is the presence of illegal trade flows, which can lead to a significant drop in prices if there is a sudden oversupply. Thus, if illegal trade is fought from the importing as well as exporting sides, the incentives for export restrictive measure might decrease. China fights illegal trade at the domestic level, but will only be partially successful as long as a profitable market for illegal minerals exists. If major importing countries in the EU change their regulations in way that prevents illegal exports entering the European market, it would be highly beneficial for both sides. ***We thus suggest drafting EU regulations to a wider range of raw materials that specifically addresses not only so-called conflict minerals, but also illegally-mined or illegally exported materials as was done for timber.***

We moreover suggest continuing with the additional, pro-active, ex-ante instruments such as bilateral trade agreements, FDI and informal dialogues. While these instruments are not legally binding they create a sound basis for information flow and increase the levels of trust necessary for future co-operation.

Table 5: EU remedial instruments and a score of their performance

Instrument	Benefits	Problems	Overall Grade
EU regulations	Legally binding; given the strong rule of law with the EU compliance rate will be high.	Might create competitiveness disadvantages for European companies; companies might move their headquarters to other less demanding regulatory regimes.	**A**
WTO Dispute Settlement	Clear, internationally recognized procedures; Legally binding decisions.	Rules too broad; long procedure (2-3 years); Actions possible only ex-post.	**B**
Bilateral TRade AgreementS	Ex-ante long-term strategy; Tailored to the interests of the trading partners.	Long negotiation rounds; difficult to agree on specific clauses.	**B**
FDI	Possible technology and regulation spillovers.	Major suppliers have restrictive investment policies, which make market entry of foreign companies risky, if not impossible.	**B**
informal dialogues	Important information exchange with strategic partners; building Trust for future negotiations.	Not legally binding.	**C**

6 Recommendations

The EU can most effectively regulate its internal market (e.g. regulations on timber or conflict minerals). However, the different types of export restrictions or significant illegal trade flows will continue to prevail unless the major raw material exporters change their domestic regulations.

While continuing to use traditional channels through the WTO and other fora to curtail and prevent the imposition of export restrictions by key suppliers of critical raw materials, the EU should continue to strengthen EU raw materials diplomacy by taking the following concrete steps:

- In co-operation with major exporters, consider establishing a critical raw materials end-user certificate program that would record movements of raw materials from mine to factory floor. Such a system, similar to end-user licenses for dual use technologies, would:
    - Establish a baseline of data for assessing the vulnerability of specific EU economic sectors in specific member states based on the raw material in question;
    - Allow for better evaluation of the magnitude of illegal trade;
    - Provide the basis for conducting further studies on the economic, social and environmental consequences and costs of illegal trade and its relation to export restrictions;
    - Provide the basis for legally binding requirements with which EU-based companies and member state customs authorities work thus ensuring that they process only legal trade;
- Create new regulations at the European level that commit producers to verify the legality of the source of their products;
    - While the EP has already proposed legislation in regards to conflict minerals, additional legislation is needed to limit non-regulated sales, corruption, and illegal trade in critical raw materials.
- Expand efforts to establish and include critical raw materials clauses in bilateral agreements, PCA, and FTAs, as well as legally binding initiatives, with major exporters to enforce existing agreements;
- Continue to work within existing coalitions and dialogues with other major importers, such as the US-Japan-EU trilateral working group on critical raw materials to develop alternatives to major critical materials;
- Increase research funding to identify substitutes for critical raw materials;
- Increase efforts to identify new third-party sources of critical raw materials.

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