



THE CRITICAL RAW MATERIALS ACT

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Authors: Ortuño Camacho, Patricia

Supervisor: Semeijn, Janjaap

Abstract

This policy brief is intended to review the effectiveness of the Critical Raw Materials Act in promoting a resilient and sovereign supply chain of critical raw materials (CRMs) at the European Union (EU). In order to do so, a multidisciplinary methodology is adopted. Firstly, participation metrics from the European Parliament are analysed to study the evolution of intra-EU cooperation in relations to CRMs schemes. Secondly, the analysis addresses the expansion of international cooperation by examining the degree of supply diversification in strontium imports. While intra-EU cooperation has been enhanced and more attention is vested to CRMs, supply diversification is not being achieved. China remains the dominant supplier. In this review, we strongly recommend the EU to strengthen its efforts in making the Critical Raw Materials Act legally binding, so to reinforce the Open Strategic Autonomy Compass and enable a more strategically diverse trade landscape.

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1. Introducing the Policy

Strategic autonomy has often been applied in the geopolitical sphere (Roberts et al, 2019). However, when the COVID-19 pandemic highlighted the cross-sectors vulnerabilities of the European Union (EU), the need to increase strategic autonomy in sectors ranging from technological to social became imminent (Borell, 2020; Committee on Foreign Affairs, 2021; Sébastien, 2020). In other words, the transboundary crisis has nudged the EU into revitalising the concept leading to what is known as Open Strategic Autonomy (Boin, 2019; Csernatoni, 2022; Gerhke, 2021; Helwig et al., 2021). A sector worth studying in this setting is the economic sector.

Economically, Open Strategic Autonomy helps to decrease supply dependence on third parties through diversification in order to strengthen the EU's sovereignty in global supply chains (Helwig, 2020; Schmitz, 2022). Likewise, the decrease of supply dependence is strongly directed towards imported goods (Szczepański, 2021). Hence, Open Strategic Autonomy aims to secure a resilient supply of critical resources (Ursula von der Leyen, 2022). In this context, the EU is particularly targeting the supply of critical raw materials (CRMs).

Due to their importance for the twin transition, CRMs have been an EU concern since the early 2000s. The European Commission, in collaboration with various stakeholders, identifies and assesses these CRMs which are assembled in a list that is updated every three years since 2011 (European Commission, n.d.). Nonetheless, their criticality has been increasingly and more largely assessed in the last few years (Girtan et al., 2021; Müller et al., 2023; Theodosopoulos, 2020). The resolutions on how to face critical raw materials cut across the EU institutions (European Commission, 2020; European Parliament, 2021; Versailles Declaration, 2022). Among all, the Critical Raw Materials Act advanced by the Commission is significantly worth mentioning due

to the considerable attention that it has received despite its short presence (Findeisen & Wernert, 2023; Ragonnaud, 2023). This policy brief is intended to review the effectiveness of the Critical Raw Materials Act in promoting a sovereign and resilient supply of critical resources.

In this policy brief the effectiveness of the Act will be scrutinised by adopting a multidisciplinary methodology that can guarantee the reliability and credibility of the findings. Not only will the author argue whether the EU efforts to install strategic autonomy in the supply of critical raw materials are going in the right direction and at the proper speed, but she will also make appropriate recommendations in light of the findings.

2. The Critical Raw Materials Act

2.1. Context

The concept of "critical raw materials" arose in response to concerns about the scarce availability and, at the same time, the crucial security of supply of certain key resources essential to various industries and technologies. In fact, these natural resources play a significant role in the development of advanced technologies related to clean energy, information and communication technology (von der Leyen, 2022).

Beyond that, the EU demand of CRMs heavily relies on imports (European Commission, 2023). This is why the EU has devoted significant efforts to securing these resources. As of March 2023, the EU trilogue is working on what is arguably the strongest law to ensure EU access to CRMs to date. This is the Critical Materials Act; first announced in the 2022 State of the Union by Ursula von der Leyen, proposed as a regulation by the Commission in 2023 and currently under review by the European Parliament and the Council of the EU.

Spurred by the supply vulnerabilities illustrated in the aftermath of the COVID-19 and the Russian

invasion of Ukraine, the Critical Raw Materials Act presents a thorough series of measures aiming to safeguarding the EU's access to CRMs by establishing a diverse, affordable, sustainable and resilient supply chain (European Commission, 2023; von der Leyen, 2022). The Act was officially proposed as a regulation by the Commission on March 16, 2023 but it remains under negotiation at the present time (Leikin et al., 2023). Despite this legislative deadlock, the Critical Raw Materials Act can be potentially impactful for expanding and safeguarding EU access to CRMs.

2.2. Objectives

The strategy to achieve strategic autonomy in the provision of CRM consists of two blocks. First and foremost, internal action must be strengthened. Not only does the Act include the list of critical and strategic raw materials in EU legislation, but it also sets specific targets to build national capacities throughout the CRMs supply chain and, more importantly, to diversify EU supply sources by 2030 (European Commission, 2023). Notably, the Act prohibits the Union from consuming more than 65% of any strategic feedstock at any applicable stage of processing (i.e.: extraction, processing and recycling) from a single third country.

Furthermore, in order to establish supply chain resilience against unprecedented disruptions, the Act lightens the bureaucratic burden at EU level to favour domestic projects, while promoting the coordination of CRMs stocks between Member States. Similarly, financial support for research and innovation in this sector would be boosted. Last but not least, improving the safety and cost-effectiveness of CRMs would be

accompanied by a reinforcement of national initiatives. This is intended to address any negative consequences, both domestically in the EU and in foreign nations, so that the green transition is not jeopardised at the expense of the digital transformation. Ergo, Member States shall develop national measures to improve and ensure the recyclability and circularity of CRMs.

In addition, international engagement must be expanded. The Act accepts that the EU will never be self-sufficient in this sector and therefore identifies the supplier diversification as a cornerstone of the Union's autonomy in the supply of strategic raw materials. Such diversification, however, must be directed towards reliable and reciprocal partners that will not instrumentalize trade in CRMs to exert influence on the Union. Particularly, the Act recognises that this partnership's expansion would primarily be targeted towards emerging markets and developing economies within the framework of the Global Gateway Strategy (European Commission, 2023; Global Gateway, 2023; Mouel & Poitiers, 2023). These strategic partnerships will be further advanced by the enabling of continuous cooperation and exchange of information.

To sum up, the Critical Raw Materials Act is the first comprehensive attempt to establish a resilient and autonomous CRMs supply in times when technology and sustainability define international competitiveness. The Act proposes to achieve this through facilitated and strengthened intra-EU collaboration, as well as expanded and more targeted extra-EU partnerships.

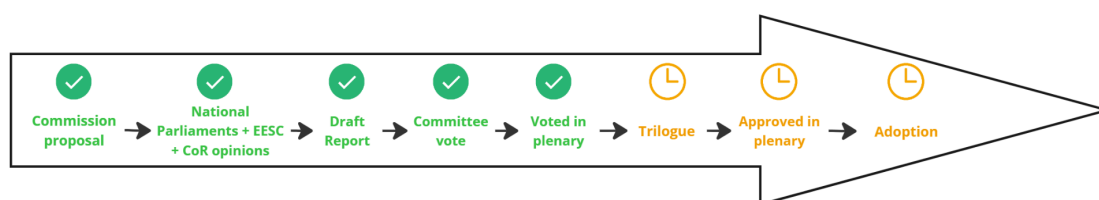


Figure 1: Process to adopt the Critical Raw Materials Act

3. Methodological Approach

In line with the aforementioned objectives set by the Critical Raw Materials Act, this section explains the multifaceted methodology considered by the author as the best approach for assessing the effectiveness of the Act in promoting a sovereign and resilient supply of CRMs.

Firstly, the research focuses on internal action by assessing intra-EU cooperation on CRMs schemes at the EP level. Thus, the first section of the review addresses the degree of cooperation in the provision of CRM's before and after the Commission's proposal, comparing data from 2019 to 2023 available at the EP website. As a result, participation metrics are employed to determine how Members of the European Parliament (MEPs) engage in EU initiatives aiming at securing a sustainable and resilient supply of CRMs. By measuring the level of participation of MEPs in joint initiatives throughout the period 2019-2023, it is possible to indicate whether the Act is encouraging internal cooperation to ensure CRMs in the short-term.

Secondly, the study addresses the expansion of international cooperation by examining the degree of supply diversification in CRMs imports. This approach allows to understand whether the EU is expanding its collaboration with third parties, as well as to assess its level of supply dependence. The analysis narrows down to Strontium, one of four minerals common to the 2020 and 2017 CRM lists (European Commission, 2020). The data has been gathered from *Comext*, the EU database for international trade statistics, and analysed by the researcher by calculating the variation in supply dependence of the EU on third partners from 2011 to 2023. Six Partners have been selected on the basis of strontium occurrence worldwide.

4. Findings

To assess whether the level of intra-EU cooperation is being fostered by the Critical Raw Materials Act, this research has collected all the EP

reports involving CRMs during the legislative period 2019-2023. A total of 47 have been found.

As it is clearly evidenced in *Figure 2* below, the arrival of the Critical Raw Materials Act in 2023 coincides with a remarkable increase in the number of EP Reports dealing with CRMs. Almost the double from the previous year. A great heightening can also be observed from 2020 to 2021. Yet, the amount of legislation related to CRMs is fairly changed from 2021 to 2022. Noteworthy to highlight, no data was found for the year 2019.

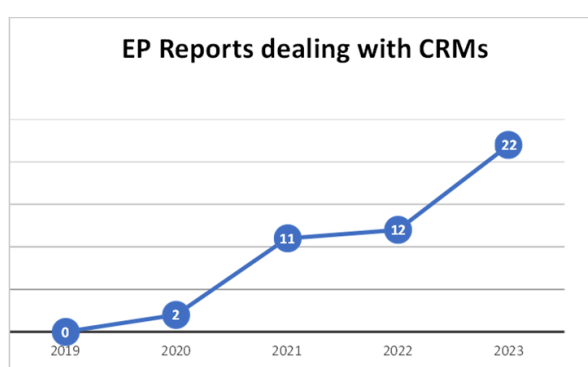


Figure 2: European Parliament Report dealing with Critical Raw Materials, 2019-2023

A closer look at the nature of the votes from 2021 to 2023 may reveal further insights. This is presented in *Figure 3* hereafter. At this point, the analysis narrows down to exclusively capture the time span 2021-2023 since these are the only figures that provide enough data for comparative analytics.

Interestingly, while the number of legislation revolving around CRMs has undoubtedly intensified, the attitude among the MEPs is less straightforward. We can observe a slight yet gradual 3% decrease in the percentage of votes in favour, going from 82% to 79% in two years. Likewise, the votes against have fluctuated 1% upwards during the 2021-2023 period, reaching 11% in the last year. However, abstentions have diminished from 10% to 9%. Thus, 1% less abstentions between 2021 and 2023. Overall, changes in MEPs attitudes are considerably subtle.

Nevertheless, it is worth noting that such a small change in voting attitudes is an understandable consequence when considering the large increase in the

number of EP reports on the subject. While the 2023 legislation regarding CRMs has doubled the size relative to 2021, the 2021 participation measures compared to 2023 have not changed substantially. This further reveals the impact that the Critical Raw Materials Act is having on the cooperation within the EU.

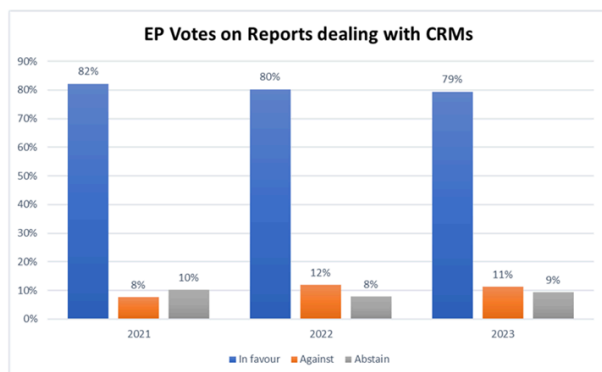


Figure 3: European Parliament Votes (in favour, against, and abstain) on Reports dealing with Critical Raw Materials, 2021-2023

Furthermore, the expansion of international cooperation in terms of strontium supply is worth observing. Data on EU strontium imports from 2011 to 2023 from six worldwide partners whose geographical conditions are prone to allow Strontium to occur - Argentina, China, Iran, Mexico, Spain and Turkey - was collected to examine whether the EU has diversified its imports among them.

Figure 4 hereinafter, displays the level of imports in euros for each year and for each partner. Indeed, the biggest exporter is the People's Republic of China, which accounts for at least 95% of the EU strontium imports every year, except for 2012 - as reflected in *Table 2* in the Annex. *Table 2* encloses the evolution in the EU strontium supply dependence for each partner and overall for the period 2011-2023. When it comes to China, it appears that the Union's efforts to diversify strontium supply away from one third partner have been too soft. As a matter of fact, they have turned out to be negative efforts for this particular sample since the EU dependence on Chinese strontium has increased by 2.15% (see *Table 2*). This over-dependence on Chinese imports is further reflected in *Figure 5*,

displaying the total representation of each country's exports for the entire period 2011-2023. Likewise, *Table 1* provides the concrete values of strontium imports (in euros) for year and partner as well as the total percentage of specific weight for each partner for the span 2011-2023.

While in 2012 the Republic of Argentina played a strong role in this sector, momentarily reducing the Union's over-dependence on China, Argentinian exports heavily decreased in the following years - the concrete figures on this evolution can be found in *Table 2*. However, because in 2012 it represented 50% of the total EU imports, Argentina accounted for 6% of total EU strontium imports during the period 2011-2023, as shown in *Figure 5* and further reflected in *Table 1*. Nonetheless, greater efforts could have been done by the Union throughout the period so that there is an enhanced presence of Argentinian exports.

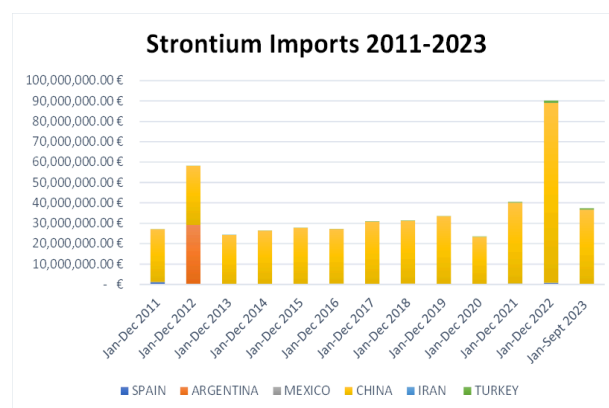


Figure 4: EU Strontium Imports from six supply partners, 2011-2023

As for the Kingdom of Spain, we expected a higher output but, the evidence disclosed that, in fact, Spanish imports generally represent 1,05% of the total strontium imports from 2011 to 2023 - see *Figure 5*. *Table 2* shows that only in 2011 did Spain account for almost 5% of the EU strontium imports. Hence, the unexpected absence of Spanish imports in *Figure 4*. Moreover, it is essential to remark that Spanish strontium exports to the EU have actually decreased by 4.05% during the time span of 2011-2023 as displayed in *Table 2* in the Annex.

In regard to the Republic of Turkey, the figures fall quite close to those of Spain despite initial expectations. In *Figure 4* Turkish exports can be hardly observed throughout the period. Their presence is noticeable, especially from 2022-2023, although in small quantities. Turkey accounts for 0.66% of the total EU strontium imports from 2011 to 2023 as envisaged in *Table 1*. Notwithstanding, *Table 2* reflects that throughout the period the EU has increased its strontium imports from Turkey by 1,89%. Thus, in spite of the small share of Turkish strontium imports, the EU has gradually increased Turkish shipping of this CRM.

The Republic of Mexico and the Islamic Republic of Iran, as minor exporters in this sample, do not constitute a representative percentage. The Union only imported strontium from Iran in 2013 and even if Mexican imports occur more often in the sample, they do so in minor quantities. Hence, Iran nor Mexico are graphically present in any of the figures albeit the data is available in *Tables 1* and *2*.

All things considered, the Union did not succeed

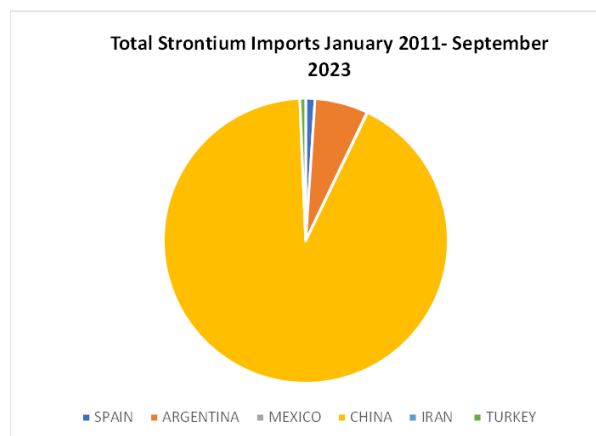


Figure 5: Total EU Strontium Imports for each supply partner, 2011-2023

in diversifying its strontium supplies. Supply dependence on China, who is a systematic rival, has increased while it has decreased on Spain, a partner who is fully like-minded to the Union. Furthermore, the increase in Turkish supplies does not make any substantial changes to EU strontium supply

dependencies. All of this is encompassed in the total variation of 0,01% in EU strontium supply dependence (see *Table 2*). Such an evolution of the EU dependence on the main strontium suppliers considered in this sample is visually summarised in *Figure 6*.

5. Discussion

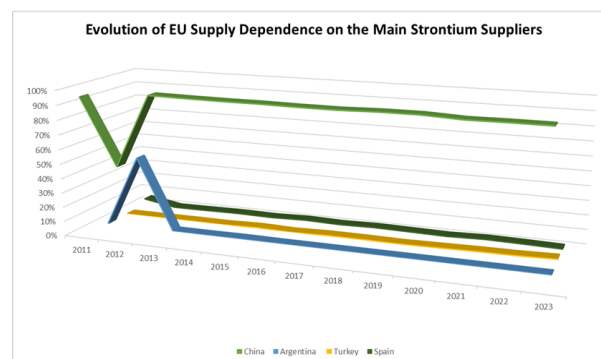


Figure 6: Evolution of the EU's dependence on the supply of strontium from each supplier, 2011-2023

By putting all the facts together, this section further comments on the findings and highlights the main take-aways.

Taking into account the evidence for the participation measures in the EP, it seems that the introduction of the Critical Raw Materials Act promoted a significant increase in legislation dealing with CRMs. The number of reports in 2023 almost doubled compared to the previous year and showed a remarkable increase compared to 2021. Hence, the data indicates a fluctuation in legislative activity related to CRMs. While there was a considerable increase from 2021 to 2023, there was relative stability in 2022. This suggests that the Critical Raw Materials Act has had a notable impact on legislative attention and focus.

Some experts have acknowledged the long-standing active participation of the EP in the raw materials area (European Commission, 2014; Lükehus, 2014). Nonetheless, the findings have shown that previously to the Act, the EP did not devote much of its discussions to these resources. In fact, other scholars support this claim by showing that the field of

CRMs was a concern originally dealt by Commission which is increasingly consulted to the EP as the Commission aims to establish a legally binding framework with the Critical Raw Materials Act (Consiglio, 2023; Hennings, 2023)

Despite the increase in legislative activity, the inner attitude among MEPs towards CRMs appears to have undergone a subtle shift. There is a moderate yet gradual decrease in the percentage of votes in favour, from 82% in 2021 to 79% in 2023. In contrast, votes against have slightly increased, reaching 11% in the last year. However, the percentage of abstentions has also marginally decreased from 10% to 9%. This may suggest a nuanced or evolving perspective among MEPs regarding the issues surrounding CRMs. In this sense, Hennings (2023) argues that the EP is putting forward more realistic goals than those proposed by the Commission. Nevertheless, the analysis must also acknowledge that changes in voting attitudes can be understood in the context of significant increase in the number and importance of EP reports on CRMs.

All in all, internal cooperation has been strengthened to the extent that more action is being taken in relation to CRMs at the EP level. In spite of all this boosted cooperation, it must be remarked that the Critical Raw Materials Act remains unadopted.. Finally, it is noteworthy that no data was found for the year 2019. The absence of data for this year could be a limitation in the analysis, and future research may consider exploring reasons behind this gap and its potential impact on the overall findings.

In regard to supply dependence on third partners, the findings point out that the Union continues to face challenges, with China maintaining and even strengthening a dominant role in the supply of strontium. This insight is further supported by scholars such as Le Mouel & Poitiers (2023), who state that strontium imports from China exceed the threshold of 65% market concentration intended by the Act. Thus, highlighting the imminent need to speed up supply diversification.

Conversely, Spain is losing presence albeit the abundant presence of strontium in the country and the benefits of being part of the EU customs union. Not only is the EU sustaining the overdependence on Chinese imports, but in doing so it also is hindering the opportunities to expand its international cooperation as much as its domestic production. Mexico is also wealthy in strontium (The Observatory of Economic Complexity, n.d.). However, exports to the EU are hardly present and if so, they represent a microscopic share. This further highlights the lack of diversity supply in the Union's trade landscape, perhaps, owing to price concerns (Gauret, 2023).

The limited success in strontium import diversification raises questions about the effectiveness of current strategies and the need for renewed initiatives to enhance supply security and reduce dependence on a single major supplier. Further research should extend the analysis beyond strontium imports. However, China is expected to dominate most of the markets and EU efforts to diversify may prove too premature (Welslau & Zachmann, 2023). Nevertheless, more fruitful efforts in this area would be desirable as crises such as COVID or geopolitical tensions arise without warning and the Union must be prepared for whatever comes in the current uncertain international context.

6. Recommendations

In line with the aforementioned points, we put forward three recommendations for the EU so that CRMs are secured and supply dependence on this resources is decreased:

1. *Advocate for the Critical Raw Materials Act:*

Given the observed increase in legislative activity related to CRMs and the positive impact it seems to have had on internal cooperation within the EP, there could be a push to advocate for the adoption of the Critical Raw Materials Act. Highlighting the correlation between the Act and increased legislative attention may serve as a

persuasive argument. This is the first step to engage in effective strategic management of CRMs since the Critical Raw Materials Act would be the very first binding act dealing with CRMs.

2. *Review Trade Policies*

Evaluate and potentially adjust trade policies to incentivize diversification and reduce reliance on a single major supplier. This may include tariff adjustments, trade agreements, and diplomatic efforts to foster cooperation with alternative strontium-producing regions. Even if the EU can stockpile strontium supply, the best guarantor for strategic autonomy are robust and resilient supply chains. Ergo, diversified supply chains. Hence, the EU should undertake a decisive and immediate review of its trade landscape so that supply diversification becomes a reality.

3. *Follow the Open Strategic Compass*

Last but not least, we encourage the EU to not deviate from the Open Strategic Compass established in 2022, but to increasingly foster its mission of safeguarding multilateralism whenever possible, and acting autonomously whenever it must. This compass is aware of the wickedly uncertain geopolitical interplay in the global context and puts forwards a way of action that will make the EU a resilient and independent yet cooperative player.

By implementing these recommendations, the EU can take significant steps towards securing CRMs, reducing dependence, and fostering a resilient and independent position in the face of geopolitical and economic challenges.

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8. Annex

	SPAIN	ARGENTINA	MEXICO	CHINA	IRAN	TURKEY	Total Import per year
Jan-Dec 2011	1,216,244.00€	- €	- €	25,885,147.00€	- €	4,827.00 €	27,106,218.00 €
Jan-Dec 2012	204,587.00 €	28,980,844.00 €	- €	28,980,844.00€	- €	1,833.00 €	58,168,108.00 €
Jan-Dec 2013	150,385.00 €	- €	- €	24,116,281.00€	86.00 €	26,133.00 €	24,292,885.00 €
Jan-Dec 2014	239,647.00 €	- €	50,426.00 €	26,206,926.00€	- €	329.00 €	26,497,328.00 €
Jan-Dec 2015	158,980.00 €	49,596.00 €	- €	27,554,981.00€	- €	176,647.00 €	27,940,204.00 €
Jan-Dec 2016	355,019.00 €	- €	28,475.00 €	26,861,838.00 €	- €	233.00 €	27,245,565.00 €
Jan-Dec 2017	229,768.00 €	- €	121,351.00 €	30,520,580.00 €	- €	197,590.00 €	31,069,289.00 €
Jan-Dec 2018	401,057.00 €	- €	2.00 €	30,919,982.00 €	- €	188,155.00 €	31,509,196.00 €
Jan-Dec 2019	320,320.00 €	348.00 €	2,864.00 €	33,165,082.00 €	- €	105,944.00 €	33,594,558.00 €
Jan-Dec 2020	137,569.00 €	520.00 €	- €	23,246,763.00 €	- €	164,039.00 €	23,548,891.00 €
Jan-Dec 2021	543,962.00 €	- €	179.00 €	39,564,935.00 €	- €	447,360.00 €	40,556,436.00 €
Jan-Dec 2022	899,324.00 €	- €	- €	88,178,520.00 €	- €	1,142,628.00 €	90,220,472.00 €
Jan-Sept 2023	163,443.00 €	- €	3,748.00 €	36,517,514.00 €	- €	712,041.00 €	37,396,746.00 €
TOTAL	5,020,305.00€	29,031,308.00€	207,045.00€	441,719,393.00€	86.00 €	3,167,759.00€	479,145,896.00€
	1.05%	6.06%	0.04%	92.19%	0.00%	0.66%	100%

Table 1: EU Import balances in euros for each country and each year, 2011-2023

	CHINA		ARGENTINA		TURKEY		SPAIN		MEXICO		IRAN	
	Specific weight	Supply dependence variance	Specific weight	Supply dependence variance	Specific weight	Supply dependence variance	Specific weight	Supply dependence variance	Specific weight	Supply dependence variance	Specific weight	Supply dependence variance
2011	95.50%		0.00%		0.02%		4.49%		0.00%		0.00%	
2012	49.82%	45.67%	49.82%	49.82%	0.00%	0.01%	0.81%	-4.14%	0.00%	0.00%	0.00%	0.00%
2013	99.27%	49.43%	0.00%	49.82%	0.11%	0.10%	0.62%	0.27%	0.00%	0.00%	0.00%	0.00%
2014	96.96%	0.37%	0.00%	0.00%	0.90%	0.11%	0.90%	0.29%	0.39%	0.19%	0.00%	0.00%
2015	96.62%	0.28%	0.18%	0.18%	0.83%	0.83%	0.37%	0.34%	0.00%	0.19%	0.00%	0.00%
2016	96.99%	0.03%	0.00%	0.18%	0.90%	0.63%	1.30%	0.73%	0.10%	0.10%	0.00%	0.00%
2017	96.23%	0.36%	0.00%	0.00%	0.64%	0.64%	0.74%	-0.56%	0.39%	0.29%	0.00%	0.00%
2018	96.19%	0.10%	0.00%	0.00%	0.90%	0.64%	1.27%	0.33%	0.00%	0.39%	0.00%	0.00%
2019	96.72%	0.99%	0.00%	0.00%	0.32%	0.28%	0.95%	-0.32%	0.01%	0.01%	0.00%	0.00%
2020	96.72%	0.00%	0.00%	0.00%	0.70%	0.38%	0.38%	-0.37%	0.00%	0.01%	0.00%	0.00%
2021	97.56%	1.16%	0.00%	0.00%	1.30%	0.41%	1.34%	0.76%	0.00%	0.00%	0.00%	0.00%
2022	97.74%	0.18%	0.00%	0.00%	1.27%	0.64%	1.00%	-0.34%	0.00%	0.00%	0.00%	0.00%
2023	97.65%	0.09%	0.00%	0.00%	1.90%	0.64%	0.44%	0.56%	0.01%	0.01%	0.00%	0.00%
	Depend. Variation	2.15%	Depend. Variation	0.00%	Depend. Variation	1.89%	Depend. Variation	-4.05%	Depend. Variation	0.01%	Depend. Variation	0.00%
												TOTAL

Table 2: Supply Dependence Analysis and corresponding annual and total variation, 2011-2023

